

2016 Annual Report of the American Association of Poison Control Centers' National Poison Data System (NPDS): 34th Annual Report

David D. Gummin, James B. Mowry, Daniel A. Spyker, Daniel E. Brooks, Michael O. Fraser & William Banner

To cite this article: David D. Gummin, James B. Mowry, Daniel A. Spyker, Daniel E. Brooks, Michael O. Fraser & William Banner (2017) 2016 Annual Report of the American Association of Poison Control Centers' National Poison Data System (NPDS): 34th Annual Report, Clinical Toxicology, 55:10, 1072-1254, DOI: [10.1080/15563650.2017.1388087](https://doi.org/10.1080/15563650.2017.1388087)

To link to this article: <https://doi.org/10.1080/15563650.2017.1388087>



Published online: 29 Nov 2017.



Submit your article to this journal [↗](#)



Article views: 2152



View Crossmark data [↗](#)



Citing articles: 27 View citing articles [↗](#)

2016 Annual Report of the American Association of Poison Control Centers' National Poison Data System (NPDS): 34th Annual Report

David D. Gummin MD^{a,b}, James B. Mowry PharmD^c, Daniel A. Spyker PhD, MD^{d,e}, Daniel E. Brooks MD^f, Michael O. Fraser MPH^g and William Banner MD, PhD^h

^aWisconsin Poison Center, Milwaukee, WI, USA; ^bDepartment of Emergency Medicine, Section of Medical Toxicology, Medical College of Wisconsin, Milwaukee, WI, USA; ^cIndiana Poison Center, Indiana University Health, Indianapolis, IN, USA; ^dDepartment of Emergency Medicine, Oregon Poison Center, Oregon Health & Science University, Portland, OR, USA; ^eDepartment of Biopharmaceutical Sciences, University of California, San Francisco, CA, USA; ^fDepartment of Medical Toxicology, Banner University Medical Center - Phoenix, Phoenix, AZ, USA; ^gAmerican Association of Poison Control Centers, Alexandria, VA, USA; ^hOklahoma Center for Poison and Drug Information, University of Oklahoma College of Pharmacy, Oklahoma City, OK, USA

Table of contents

Introduction	1076
<i>The NPDS products database</i>	1076
Methods	1076
<i>Characterization of participating poison centers and population served</i>	1076
<i>Call management – specialized poison exposure emergency providers</i>	1076
<i>NPDS – near real-time data capture</i>	1077
<i>Annual report case inclusion criteria</i>	1077
<i>Statistical methods</i>	1080
<i>NPDS surveillance</i>	1080
<i>Fatality case review and narrative selection</i>	1081
<i>Pediatric fatality case review</i>	1082
Results	1082
<i>Information calls to poison centers</i>	1082
<i>Exposure calls to poison centers</i>	1083
<i>Age and gender distributions</i>	1085
<i>Caller site and exposure site</i>	1086
<i>Exposures in pregnancy</i>	1086
<i>Chronicity</i>	1088
<i>Reason for exposure</i>	1088
<i>Scenarios</i>	1088
<i>Reason by age</i>	1088
<i>Route of exposure</i>	1088
<i>Clinical effects</i>	1089
<i>Case management site</i>	1090
<i>Medical outcome</i>	1091
<i>Decontamination procedures and specific antidotes</i>	1091
<i>Top substances in human exposures</i>	1091
<i>Changes over time</i>	1092
<i>Distribution of suicides</i>	1092
<i>Plant exposures</i>	1092
<i>Deaths and exposure-related fatalities</i>	1092
<i>All fatalities – all ages</i>	1093
<i>Pediatric fatalities – age ≤5 years</i>	1095
<i>Pediatric fatalities – ages 6–12 years</i>	1096

Adolescent fatalities – ages 13–19 years	1096
Pregnancy and fatalities	1096
AAPCC surveillance results	1096
Discussion	1236
Summary	1236
Disclaimer	1237
Disclosure statement	1237
References	1237
Appendix A: Acknowledgments	1237
Poison centers (PCs)	1237
AAPCC fatality review team	1239
AAPCC micromedex joint coding group	1240
AAPCC rapid coding team	1240
AAPCC surveillance team	1240
Regional poison center fatality awards	1240
Appendix B: Data definitions	1240
Reason for exposure	1240
Medical outcome	1241
Relative contribution to fatality (RCF)	1241
Appendix C	1241
Narratives of selected cases	1241

List of Figures and Tables

Figure 1. Human exposure cases, information calls and animal exposure cases by day since 1 January 2000	1080
Figure 2. All drug identification and law enforcement drug identification calls by day since 1 January 2000	1080
Figure 3. Health care facility (HCF) exposure cases and HCF information calls by day since 1 January 2000	1081
Figure 4. Substance categories with the greatest rate of exposure increase since 1 January 2000 for more severe outcomes (Top 4)	1094
Figure 5. Change in encounters by outcome from Year 2006	1095
Figure 6. NPDS exposures and the CDC fatalities for heroin and prescription opioids	1236
Table 1A. AAPCC population served and reported exposures (1983–2016)	1077
Table 1B. Non-human exposures by animal type	1077
Table 1C. Distribution of information calls	1078
Table 2. Site of call and site of exposure, human exposure cases	1082
Table 3A. Age and gender distribution of human exposures	1082
Table 3B. Population-adjusted exposures by age group	1082
Table 4. Distribution of age and gender for fatalities	1083
Table 5. Number of substances involved in human exposure cases	1083
Table 6A. Reason for human exposure cases	1083
Table 6B. Scenarios for therapeutic errors by age	1084
Table 7. Distribution of reason for exposure by age	1084
Table 8. Distribution of reason for exposure and age for fatalities	1085
Table 9. Route of exposure for human exposure cases	1085
Table 10. Management site of human exposures	1085
Table 11. Medical outcome of human exposure cases by patient age	1086
Table 12. Medical outcome by reason for exposure in human exposures	1086
Table 13. Duration of clinical effects by medical outcome	1086
Table 14. Decontamination and therapeutic interventions	1086
Table 15. Therapy provided in human exposures by age	1087
Table 16A. Decontamination trends (1985–2016)	1088
Table 16B. Decontamination trends: total human and pediatric exposures ≤ 5 Years a	1088
Table 17A. Substance categories most frequently involved in human exposures (top 25)	1089
Table 17B. Substance categories with the greatest rate of exposure increase (Top 25)	1089
Table 17C. Substance categories most frequently involved in pediatric (≤ 5 years) exposures (Top 25)	1090
Table 17D. Substance categories most frequently involved in adult (≥ 20 years) exposures (Top 25)	1090
Table 17E. Substance categories most frequently involved in pediatric (≤ 5 years) deaths	1091

Table 17F. Substance categories most frequently identified in drug identification calls (Top 25)	1091
Table 18. Categories associated with largest number of fatalities (Top 25)	1095
Table 19A. Comparisons of death data (1985–2016)	1096
Table 19B. Comparisons of direct and indirect death data (2000–2016)	1096
Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures	1098
Table 22(A). Demographic profile of SINGLE SUBSTANCE nonpharmaceuticals exposure cases by generic category	1205
Table 22(B). Demographic profile of SINGLE SUBSTANCE pharmaceuticals exposure cases by generic category	1220

Fatality Narrative Contents

Case 41. Acute model racing fuel ingestion: undoubtedly responsible	1242
Case 65. Acute hymenoptera sting: undoubtedly responsible	1242
Case 66. Acute rattlesnake bite: undoubtedly responsible	1242
Case 67. Acute envenomation (Crotalidae) bite: undoubtedly responsible	1242
Case 80. Acute ethyl chloride inhalation and ethanol ingestion: undoubtedly responsible	1242
Case 84. Acute sodium metasilicate and ethanol ingestion: undoubtedly responsible	1242
Case 93. Acute hydrochloric acid ingestion: undoubtedly responsible	1242
Case 103. Acute cyanide ingestion: undoubtedly responsible	1243
Case 107. Acute hydrofluoric acid ingestion: undoubtedly responsible	1243
Case 110. Acute anhydrous ammonia inhalation, ocular, dermal: undoubtedly responsible	1243
Case 119. Bleach (peroxide) ingestion: undoubtedly responsible	1243
Case 124. Acute drain cleaner (hydrochloric acid) ingestion: probably responsible	1243
Case 140. Acute hydrogen peroxide ingestion: undoubtedly responsible	1243
Case 147. Acute carbon monoxide inhalation: undoubtedly responsible	1243
Case 162. Acute helium inhalation: undoubtedly responsible	1243
Case 169. Acute carbon dioxide inhalation: undoubtedly responsible	1244
Case 171. Acute carbon dioxide inhalation: undoubtedly responsible	1244
Case 192. Acute carbon monoxide inhalation: undoubtedly responsible	1244
Case 206. Acute chlorine gas inhalation: probably responsible	1244
Case 221. Acute argon gas inhalation: undoubtedly responsible	1244
Case 230. Acute nickel carbonyl inhalation: probably responsible	1244
Case 232. Acute copper ingestion: undoubtedly responsible	1244
Case 233. Acute arsenic and BAL exposure: probably responsible	1245
Case 234. Acute hydrocarbon ingestion with aspiration: undoubtedly responsible	1245
Case 253. Fluorinated hydrocarbon inhalation and sertraline ingestion: undoubtedly responsible	1245
Case 259. Acute cleaner (acid) and ethanol ingestion: undoubtedly responsible	1245
Case 260. Acute ammonium bifluoride ingestion: undoubtedly responsible	1245
Case 261. Acute chloramine inhalation/nasal: undoubtedly responsible	1245
Case 264. Acute hydrofluoric and sulfuric acid cleaner ingestion: undoubtedly responsible	1246
Case 267. Acute cyclopeptide mushroom ingestion: undoubtedly responsible	1246
Case 269. Acute dinitrophenol and energy drink ingestion: undoubtedly responsible	1246
Case 272. Acute sulfuryl fluoride, cocaine inhalation: undoubtedly responsible	1246
Case 276. Acute paraquat ingestion: undoubtedly responsible	1246
Case 278. Chlorophenoxy herbicide, cleaner (anionic/nonionic), sodium hydroxide, bupropion, sertraline, and trazodone ingestion: undoubtedly responsible	1246
Case 282. Acute carbamate insecticide ingestion: undoubtedly responsible	1247
Case 285. Acute ricin injection/ingestion: probably responsible	1247
Case 286. Acute cardiac glycoside ingestion: undoubtedly responsible	1247
Case 288. Acute ibogaine ingestion: probably responsible	1247
Case 289. Acute cardiac glycoside ingestion: undoubtedly responsible	1247
Case 297. Acute methadone ingestion: undoubtedly responsible	1247
Case 299. Acute-on-chronic APAP ingestion: contributory	1247
Case 301. Acute fentanyl (transdermal) ingestion: undoubtedly responsible	1248
Case 304. Acute tramadol ingestion: undoubtedly responsible	1248
Case 317. Acute colchicine ingestion: undoubtedly responsible	1248
Case 324. Acute APAP ingestion: undoubtedly responsible	1248
Case 341. U-47700, caffeine, levamisole, nicotine, alprazolam, cocaine, cocaine, marijuana and benzodiazepine ingestion/snorting: undoubtedly responsible	1248
Case 669. Acute salicylate ingestion: undoubtedly responsible	1249

Case 720. Acute salicylate ingestion: undoubtedly responsible	1249
Case 722. Acute buprenorphine/naloxone (sublingual film) ingestion: undoubtedly responsible	1249
Case 725. Acute lidocaine parenteral: undoubtedly responsible	1249
Case 743. Valproic acid ingestion: undoubtedly responsible	1249
Case 755. Acute amitriptyline ingestion: undoubtedly responsible	1249
Case 900. Acute diphenhydramine ingestion: undoubtedly responsible	1249
Case 904. Chronic antineoplastic drug parenteral: contributory	1250
Case 905. Acute-on-chronic methotrexate ingestion: undoubtedly responsible	1250
Case 921. Acute-on-chronic propranolol ingestion: undoubtedly responsible	1250
Case 1014. Acute-on-chronic treprostinil parenteral: undoubtedly responsible	1250
Case 1027. Acute-on-chronic metoprolol ingestion: undoubtedly responsible	1250
Case 1114. Acute-on-chronic digoxin ingestion: undoubtedly responsible	1250
Case 1121. Acute-on-chronic propafenone ingestion: undoubtedly responsible	1251
Case 1131. Acute magnesium sulfate ingestion: undoubtedly responsible	1251
Case 1133. Acute zinc ingestion: undoubtedly responsible	1251
Case 1137. Loperamide ingestion: undoubtedly responsible	1251
Case 1201. Acute benzodiazepine ingestion: probably responsible	1251
Case 1311. Phencyclidine exposure: probably responsible	1251
Case 1404. Acute cocaine, tropacocaine, levamisole and ethanol ingestion, aspiration (with ingestion): undoubtedly responsible	1252
Case 1444. Acute camphor and ethanol ingestion: undoubtedly responsible	1252
Case 1445. Acute cantharidin ingestion: probably responsible	1252
Case 1492. Acute ethanol, pentobarbital and phenytoin ingestion: undoubtedly responsible	1252

ABSTRACT

Introduction: This is the 34th Annual Report of the American Association of Poison Control Centers' (AAPCC) National Poison Data System (NPDS). As of 1 January 2016, 55 of the nation's poison centers (PCs) uploaded case data automatically to NPDS. The upload interval was 9.50 [7.33, 14.6] (median [25%, 75%]) min, facilitating a near real-time national exposure and information database and surveillance system.

Methods: We analyzed the case data tabulating specific indices from NPDS. The methodology was similar to that of previous years. Where changes were introduced, the differences are identified. Cases with medical outcomes of death were evaluated by a team of medical and clinical toxicologist reviewers using an ordinal scale of 1–6 to assess the Relative Contribution to Fatality (RCF) of the exposure.

Results: In 2016, 2,710,042 closed encounters were logged by NPDS: 2,159,032 human exposures, 54,019 animal exposures, 490,215 information cases, 6687 human confirmed non-exposures, and 89 animal confirmed non-exposures. US PCs also made 2,718,022 follow-up calls in 2016. Total encounters showed a 2.94% decline from 2015, while health care facility (HCF) human exposure cases increased by 3.63% from 2015. All information calls decreased by 12.5% but HCF information calls increased 0.454%, and while medication identification requests (Drug ID) decreased 29.6%, human exposure cases were essentially flat, decreasing by 0.431%. Human exposures with less serious outcomes have decreased 2.59% per year since 2008 while those with more serious outcomes (moderate, major or death) have increased by 4.39% per year since 2000.

The top five substance classes most frequently involved in all human exposures were analgesics (11.2%), household cleaning substances (7.54%), cosmetics/personal care products (7.20%), sedatives/hypnotics/antipsychotics (5.84%), and antidepressants (4.74%). As a class, sedative/hypnotics/antipsychotics exposures increased most rapidly, by 10.7% per year (2088 cases/year), over the last 15 years for cases showing more serious outcomes. The top five most common exposures in children age 5 years or less were cosmetics/personal care products (13.3%), household cleaning substances (11.1%), analgesics (9.21%), foreign bodies/toys/miscellaneous (6.48%), and topical preparations (5.07%). Drug identification requests comprised 28.1% of all information calls. NPDS documented 1977 human exposures resulting in death; 1492 (75.5%) of these were judged as related (RCF of 1 – undoubtedly responsible, 2 – probably responsible, or 3 – contributory).

Conclusions: These data support the continued value of PC expertise and need for specialized medical toxicology information to manage more serious exposures, despite a decrease in cases involving less serious exposures. Unintentional and intentional exposures continue to be a significant cause of morbidity and mortality in the US. The near real-time, always current status of NPDS represents a national public health resource for collecting and monitoring US exposure cases and information calls. The continuing mission of NPDS is to provide a nationwide infrastructure for surveillance for all types of exposures (e.g. foreign body, infectious, venomous, chemical agent, or commercial product), and the identification and tracking of significant public health events. NPDS is a model system for the real-time surveillance of national and global public health.

NOTE: Comparison of exposure or outcome data from previous AAPCC Annual Reports is problematic. In particular, the identification of fatalities (attribution of a death to the exposure) differed from pre-2006 Annual Reports (see Fatality Case Review – Methods). Death cases were

described as all cases resulting in death and those determined to be exposure-related fatalities. Likewise, Table 22 (Exposure Cases by Generic Category) since year 2006 restricts the breakdown of included deaths to single-substance cases to improve precision and avoid misinterpretation.

Introduction

This is the 34th Annual Report of the American Association of Poison Control Centers' (AAPCC; <http://www.aapcc.org>) National Poison Data System (NPDS) [1]. On 1 January 2016, 55 regional poison centers (PCs) serving the entire population of the 50 United States, American Samoa, District of Columbia, Federated States of Micronesia, Guam, Puerto Rico, and the US Virgin Islands submitted information and exposure case data collected during the course of providing telephonic patient tailored exposure management and poison information.

NPDS is the data warehouse for the nation's PCs. Poison centers place emphasis on exposure management, accurate data collection and coding, and responding to the continuing need for poison related public and professional education. The PC's healthcare professionals are available free of charge to users, 24-h a day, every day of the year. Poison centers respond to questions from the public, health care professionals, and public health agencies. The continuous staff dedication at the PCs is evident as the number of exposure and information call encounters averages 3.0 million annually. Poison center encounters either involve an exposed human or animal (EXPOSURE CALL) or a request for information with no person or animal exposed to any foreign body, viral, bacterial, venom, chemical agent, or commercial product (INFORMATION CALL). A unique feature of PC case management is the use of follow-up calls to monitor case progress and medical outcome.

The NPDS products database

The NPDS products database contains over 430,000 products ranging from viral and bacterial agents to commercial chemical and drug products. The products database is maintained and continuously updated by data analysts at the Micromedex Poisindex® System (Micromedex Healthcare Series [Internet database], Greenwood Village, CO: Truven Health Analytics). A robust generic coding system categorizes the product data into 1092 generic codes. These generic codes collapse into Pharmaceutical (530) and Non-Pharmaceutical (562) groups. These two groups are divided into Major (68) and Minor (181) categories. The generic coding schema undergoes continuous improvement through the work of the AAPCC – Micromedex Joint Coding Group. The group consists of AAPCC members and editorial and lexicon staff working to meet best terminology practices. The generic code system provides enhanced report granularity as reflected in Table 22. The following 23 new generic codes were introduced in 2016.

Methods

Characterization of participating poison centers and population served

All 55 US PCs submitted data to AAPCC through 31 December 2016. Fifty-three centers (96.4%) were accredited by AAPCC as of 1 July 2016. The entire population of the 50 United States, American Samoa, the District of Columbia, Federated States of

Generic Codes Added in 2016^a

1	Angiotensin Converting Enzyme Inhibitor in Combination with Diuretic
2	Angiotensin Converting Enzyme Inhibitor in Combination with Other Drugs (Excluding Calcium Antagonists)
3	Angiotensin Receptor Blocker in Combination with Diuretic
4	Angiotensin Receptor Blocker in Combination with Other Drugs (Excluding Calcium Antagonists)
5	Antihyperlipidemic Combinations (Excluding Calcium Antagonists)
6	Antihypertensive in Combination with Diuretic
7	Antihypertensive in Combination with Other Drugs (Excluding Diuretics)
8	Beta Blocker in Combination with Diuretic
9	Beta Blocker in Combination with Other Drugs (Excluding Calcium Antagonists)
10	Calcium Antagonist in Combination with Angiotensin Converting Enzyme Inhibitor
11	Calcium Antagonist in Combination with Angiotensin Receptor Blocker
12	Calcium Antagonist in Combination with Antihyperlipidemic
13	Calcium Antagonist in Combination with Diuretic
14	Calcium Antagonist in Combination with Other Drugs
15	Hypoglycemic: Biguanide Combinations (Excluding Sulfonylurea)
16	Hypoglycemic: Other or Unknown Oral Hypoglycemic Combination
17	Hypoglycemic: Sulfonylurea Combinations
18	Marijuana: Concentrated Extract (Including Oils and Tinctures)
19	Marijuana: Edible Preparation
20	Marijuana: Oral Capsule or Pill Preparation
21	Marijuana: Other or Unknown Preparation
22	Marijuana: Topical Preparation
23	Marijuana: Undried Plant

^aBecause the new codes were added during 2016, the numbers for these generic codes in Table 22 do not reflect the entire year. For completeness, certain categories require customized data retrieval until they have been in place for more than one calendar year.

Micronesia, Guam, Puerto Rico, and the US Virgin Islands was served by the US PC network in 2016 [2].

The average number of human exposure cases managed per day by all US PCs was 5899. Similar to other years, higher volumes were observed in the warmer months, with a mean of 6224 cases per day in June compared with 5427 per day in December. On an average, US PCs received a call about an actual human exposure every 14.6 seconds.

Call management – specialized poison exposure emergency providers

Poison center Managing Directors are primarily responsible for patient care/information service operations, clinical education, and staff instruction. Most are pharmacists or nurses with American Board of Applied Toxicology (ABAT) board certification in clinical toxicology. Medical direction is provided by Medical Directors who are board-certified physician medical toxicologists. At some PCs, the Managing and Medical Director roles are held by the same individual.

Calls received at US PCs are managed by healthcare professionals who have received specialized training in toxicology to allow for assessment, triage, management and monitoring of toxic exposure emergencies. These providers include medical and clinical toxicologists, registered nurses, pharmacists (PharmD or BS), physicians, and physician assistants. Most commonly, registered nurses and pharmacists make up the contingent of "Specialists in Poison Information" (SPIs) or "Certified Specialists in Poison Information" (CSPIs) in the US. These (C)SPIs triage lay public calls to the most appropriate level of care and provide health care professionals with the most up-to-date management

recommendations to care for their poisoned/overdosed patients. In order for a SPI to become nationally certified as a CSPI, (s)he must log a minimum of 2000h in a PC and handle 2000 human exposure cases prior to being considered eligible to take the national certification examination. Of note, while the only individuals eligible to sit for the CSPI examination are nurses, pharmacists, physicians and physicians assistants, there is a lack of an appropriate, core toxicology training within most graduate medical education curricula to allow them to be prepared for PC patient management operations. These individuals must receive significant additional training beyond their degree programs to become (C)SPIs. Such training is only offered within the PCs. "Poison Information Providers" (PIPs) are allied healthcare professionals who are allowed to manage information-type and low acuity (non-hospital) cases while working under the supervision of a CSPI. Poison centers undergo a rigorous accreditation process administered by the AAPCC and must submit an annual accreditation report and an extensive reaccreditation application every ten years.

NPDS – near real-time data capture

Extensively enhanced over its predecessor, the Toxic Exposure Surveillance System (TESS) which began collecting data in 1983, and near real-time data since 2003, NPDS was launched on 12 April 2006. NPDS is the data repository for all US PCs and includes all case information collected by its predecessor. In 2016, all 55 US PCs uploaded case data automatically to NPDS in near real-time, making NPDS one of the few operational systems of its kind. Poison center staff record cases contemporaneously in 1 of 4 electronic medical record systems. Each PC uploads case data automatically. The time to upload data for all PCs is 9.50 [7.33, 14.6] (median [25%, 75%]) minutes creating a real-time national exposure database and surveillance system.

The web-based NPDS software facilitates the detection, analysis, and reporting of surveillance anomalies. System software offers a myriad of surveillance uses allowing AAPCC, its member centers and public health agencies to utilize NPDS exposure data. Users are able to access local and regional data for their own areas and view national aggregate data. Custom surveillance definitions are available, along with ad hoc reporting tools. Information in the NPDS database is dynamic. Each year the database is locked prior to extraction of annual report data to prevent inadvertent changes and ensure consistent, reproducible reports. Additional information including autopsy data on fatalities may now be added after the lock date as an addenda to the fatality narrative. The 2016 database was locked on 1 August 2017 at 16:22 EDT.

Annual report case inclusion criteria

Note: In this and last years' reports, human and animal "exposure calls" have been renamed to human and animal "exposure cases", since a single call may result in multiple cases and the NPDS database contains information about

Table 1A. AAPCC Population served and reported exposures (1983–2016).

Year	No. of participating centers	Population served (in millions)	Human exposures	Exposures per thousand population
1983	16	43.1	251,012	5.8
1984	47	99.8	730,224	7.3
1985	56	113.6	900,513	7.9
1986	57	132.1	1,098,894	8.3
1987	63	137.5	1,166,940	8.5
1988	64	155.7	1,368,748	8.8
1989	70	182.4	1,581,540	8.7
1990	72	191.7	1,713,462	8.9
1991	73	200.7	1,837,939	9.2
1992	68	196.7	1,864,188	9.5
1993	64	181.3	1,751,476	9.7
1994	65	215.9	1,926,438	8.9
1995	67	218.5	2,023,089	9.3
1996	67	232.3	2,155,952	9.3
1997	66	250.1	2,192,088	8.8
1998	65	257.5	2,241,082	8.7
1999	64	260.9	2,201,156	8.4
2000	63	270.6	2,168,248	8.0
2001	64	281.3	2,267,979	8.1
2002	64	291.6	2,380,028	8.2
2003	64	294.7	2,395,582	8.1
2004	62	293.7	2,438,643	8.3
2005	61	296.4	2,424,180	8.2
2006	61	299.4	2,403,539	8.0
2007	61	305.6	2,482,041	8.1
2008	61	308.5 ^b	2,491,049	8.1
2009	60	310.9 ^b	2,479,355	8.0
2010	60 ^a	313.3 ^b	2,384,825	7.6
2011	57 ^c	315.7 ^b	2,334,004	7.4
2012	57	318.0 ^b	2,275,141	7.2
2013	57 ^d	320.2 ^e	2,188,013	6.8
2014	56 ^d	322.9 ^f	2,165,142	6.7
2015	55 ^g	325.4 ^h	2,168,371	6.7
2016	55	327.0 ⁱ	2,159,032	6.6
Total			66,609,913	

^aAs of 1 July 2010, there were 60 participating centers.

^bAAPCC total as of 1 July Mid Year US Census (2012 data for 50 United States, District of Columbia and Puerto Rico; 2011 data for Guam; 2010 data for American Samoa, Federated States of Micronesia, and the US Virgin Islands).

^cAs of 1 July 2011, there were 57 participating centers.

^dOne participating center closed in September 2013. Their data are included in the 2013 totals but not in the 2014 data.

^eAAPCC total as of 1 July Mid Year US Census (2013 data for 50 United States, District of Columbia and Puerto Rico, Guam, American Samoa, Federated States of Micronesia, and the US Virgin Islands).

^fAAPCC total as of 1 July Mid Year US Census (2014 data for 50 United States, District of Columbia and Puerto Rico, Guam, American Samoa, Federated States of Micronesia, and the US Virgin Islands) [2,3].

^gOne participating center closed in July 2014. Their data are included in the 2014 totals but not in the 2015 data.

^hAAPCC total as of 1 July Mid Year US Census (2015 data for 50 United States, District of Columbia and Puerto Rico, Guam, American Samoa, Federated States of Micronesia, and the US Virgin Islands) [2,3].

ⁱAAPCC total as of 1 July Mid Year US Census (2016 data for 50 United States, District of Columbia and Puerto Rico, Guam, American Samoa, Federated States of Micronesia, and the US Virgin Islands) [2,3].

Table 1B. Non-human exposures by animal type.

Animal	N	%
Dog	48,539	89.86
Cat	4712	8.72
Bird	162	0.30
Rodent/lagomorph	121	0.22
Horse	98	0.18
Sheep/goat	59	0.11
Cow	36	0.07
Aquatic	22	0.04
Other	270	0.50
Total	54,019	100.00

Table 1C. Distribution of information calls.

Information call type	N	% of Info. calls
Drug identification		
Public inquiry: drug sometimes involved in abuse	52,921	10.80
Public inquiry: drug not known to be abused	28,853	5.89
Public inquiry: unknown abuse potential	1199	0.24
Public inquiry: unable to identify	12,633	2.58
HCP inquiry: drug sometimes involved in abuse	1028	0.21
HCP inquiry: drug not known to be abused	1682	0.34
HCP inquiry: unknown abuse potential	80	0.02
HCP inquiry: unable to identify	672	0.14
Law Enf. Inquiry: drug sometimes involved in abuse	23,066	4.71
Law Enf. Inquiry: drug not known to be abused	11,820	2.41
Law Enf. Inquiry: unknown abuse potential	419	0.09
Law Enf. Inquiry: unable to identify	2891	0.59
Other drug ID	616	0.13
Subtotal	137,880	28.13
Drug information		
Adverse effects (no known exposure)	7759	1.58
Brand / generic name clarifications	793	0.16
Calculations	104	0.02
Compatibility of parenteral medications	140	0.03
Compounding	219	0.04
Contraindications	1370	0.28
Dietary supplement, herbal, and homeopathic	407	0.08
Dosage	10,004	2.04
Dosage form / formulation	1188	0.24
Drug use during breast-feeding	1717	0.35
Drug-drug interactions	20,351	4.15
Drug-food interactions	1403	0.29
Foreign drug	123	0.03
Generic substitution	183	0.04
Indications / therapeutic use	5774	1.18
Medication administration	4380	0.89
Medication availability	376	0.08
Medication disposal	2194	0.45
Pharmacokinetics	1383	0.28
Pharmacology	805	0.16
Regulatory	1713	0.35
Stability / storage	1753	0.36
Therapeutic drug monitoring	312	0.06
Other drug info	16,396	3.34
Subtotal	80,847	16.49
Environmental information		
Air quality	1,520	0.31
Carbon monoxide – no known patient(s)	577	0.12
Carbon monoxide alarm use	582	0.12
Chem/bioterrorism/weapons (suspected or confirmed)	6	0.00
Clarification of media reports of environmental contamination	25	0.01
Clarification of substances involved in a HAZMAT incident – no known victim(s)	93	0.02
General questions about contamination of air and/or soil	358	0.07
HAZMAT planning	106	0.02
Lead – no known patient(s)	554	0.11
Mercury thermometer cleanup	1064	0.22
Mercury (excluding thermometers) cleanup	2115	0.43
Notification of a HAZMAT incident – no known patient(s)	696	0.14
Pesticide application by a professional pest control operator	604	0.12
Pesticides (other)	2347	0.48
Potential toxicity of chemicals in the environment	1082	0.22
Radiation	49	0.01
Safe disposal of chemicals	1017	0.21
Water purity / contamination	765	0.16
Other environmental	3106	0.63
Subtotal	16,666	3.40
Medical information		
Dental questions	106	0.02
Diagnostic or treatment recommendations for diseases or conditions – non-toxicology	6912	1.41
Disease prevention	1564	0.32
Explanation of disease states	4945	1.01
General first-aid	850	0.17
Interpretation of non-toxicology laboratory reports	123	0.03
Medical terminology questions	48	0.01
Rabies - no known patient(s)	223	0.05
Sunburn management	48	0.01
Other medical	46,377	9.46
Subtotal	61,196	12.48

(continued)

Table 1C. Continued

Information call type	N	% of Info. calls
Occupational information		
Occupational treatment / first-aid guidelines – no known patient(s)	24	0.00
Information on chemicals in the workplace	91	0.02
MSDS interpretation	25	0.01
Occupational MSDS requests	431	0.09
Routine toxicity monitoring	21	0.00
Safe handling of workplace chemicals	52	0.01
Other occupational	186	0.04
Subtotal	830	0.17
Poison information		
Analytical toxicology	703	0.14
Carcinogenicity	50	0.01
Food poisoning – no known patient(s)	1890	0.39
Food preparation / handling practices	5364	1.09
General toxicity	21,335	4.35
Mutagenicity	44	0.01
Plant toxicity	1644	0.34
Recalls of non-drug products (including food)	256	0.05
Safe use of household products	3567	0.73
Toxicology information for legal use / litigation	149	0.03
Other poison	15,092	3.08
Subtotal	50,094	10.22
Prevention/safety/education		
Confirmation of poison center number	12,531	2.56
General (non-poison) injury prevention requests	522	0.11
Media requests	181	0.04
Poison prevention material requests	6241	1.27
Poison prevention week date inquiries	27	0.01
Professional education presentation requests	171	0.03
Public education presentation requests	251	0.05
Other prevention	801	0.16
Subtotal	20,725	4.23
Teratogenicity information		
Teratogenicity	2054	0.42
Subtotal	2054	0.42
Other information		
Other	47,911	9.77
Subtotal	47,911	9.77
Substance abuse		
Drug screen information	2460	0.50
Effects of illicit substances – no known patient(s)	125	0.03
New trend information	144	0.03
Withdrawal from illicit substances – no known patient(s)	92	0.02
Other substance abuse	454	0.09
Subtotal	3275	0.67
Administrative		
Expert witness requests	36	0.01
Faculty activities	36	0.01
Funding	16	0.00
Personnel issues	141	0.03
Poison center record request	141	0.03
Product replacement/malfunction (issues intended for the manufacturer)	2602	0.53
Scheduling of poison center rotations	86	0.02
Other administration	17,222	3.51
Subtotal	20,280	4.14
Caller referred		
Immediate referral – animal poison center or veterinarian	17,070	3.05
Immediate referral – animal poison center or veterinarian	18,750	3.82
Immediate referral – drug identification	1791	0.37
Immediate referral – drug information	126	0.03
Immediate referral – health department	9511	1.94
Immediate referral – medical advice line	570	0.12
Immediate referral – pediatric triage service	106	0.02
Immediate referral – pesticide hotline	319	0.07
Immediate referral – pharmacy	517	0.11
Immediate referral – poison center	3171	0.65
Immediate referral – private physician	2003	0.41
Immediate referral – psychiatric crisis line	106	0.02
Immediate referral – teratology information program	142	0.03
Other call referral	11,345	2.31
Total	490,215	100.00

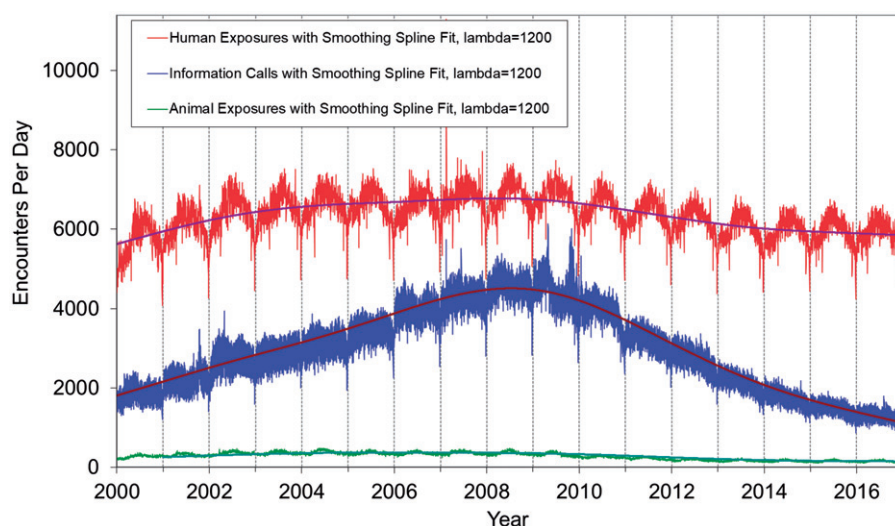


Figure 1. Human exposure cases, information calls and animal exposure cases by day since 1 January 2000. Smoothing spline fits using $\lambda = 1200$ for human exposures had associated $RSqr = 0.426$, information calls $RSqr = 0.891$, and animal exposures $RSqr = 0.858$.

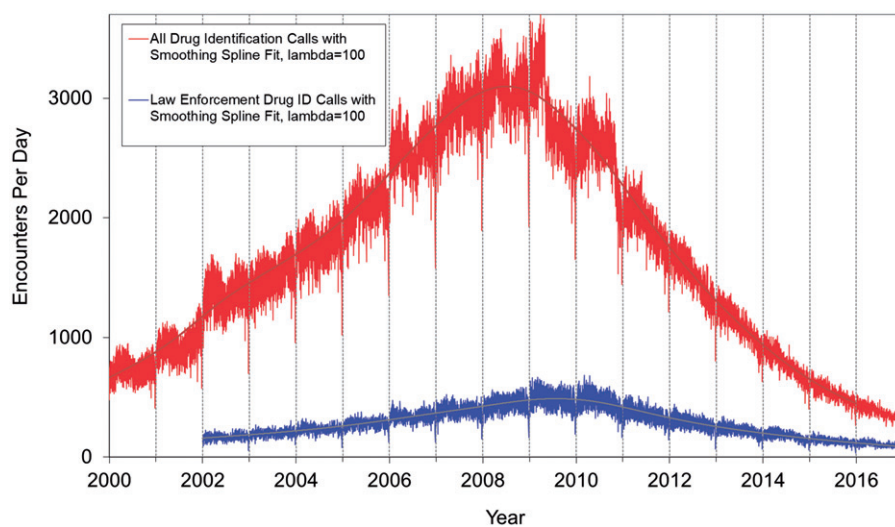


Figure 2. All drug identification and law enforcement drug identification calls by day since 1 January 2000. Smoothing spline fits used $\lambda = 100$, all drug identification calls had associated $RSqr = 0.960$, and law enforcement drug ID calls $RSqr = 0.849$.

individual exposure cases. The information in this report reflects only those cases that are not duplicates and classified by the PC as CLOSED. A case is closed when the PC has determined that no further follow-up/recommendations are required or no further information is available. Exposure cases are followed to obtain the most precise medical outcome possible. Depending on the case specifics, most cases are “closed” within a few hours of the initial call. Some cases regarding complex hospitalized patients or resulting in death may remain open for weeks or months while data continues to be collected. Follow-up calls provide a proven mechanism for monitoring the appropriateness of management recommendations, enabling continual updates of case information, augmenting patient guidelines, and providing poison prevention education, as well as obtaining final/known medical outcome status to make the data collected as accurate and complete as possible.

Statistical methods

All tables except [Tables 3\(B\)](#) and [17\(B\)](#) were generated directly by the NPDS web-based application and can thus be reproduced by each PC. The analyses for [Figures 1–4](#) and [Table 17\(B\)](#) were done using SAS JMP[®] version 12.0.1 (SAS Institute, Cary, NC) and summary counts were generated by the NPDS web-based application.

NPDS surveillance

As previously noted, all of the active US PCs upload case data automatically to NPDS. This unique near real-time upload is the foundation of the NPDS surveillance system, making both spatial and temporal case volume and case based surveillance possible. NPDS software allows creation of volume and case based definitions. Definitions can be

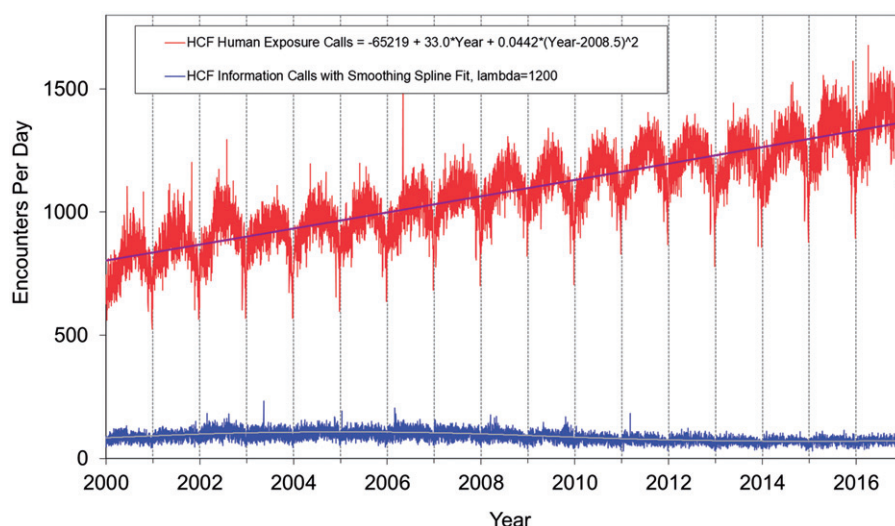


Figure 3. Health care facility (HCF) exposure cases and HCF information calls by day since 1 January 2000. Both linear and second order (quadratic) terms were statistically significant for regression of HCF human exposure with associated $RSqr = 0.742$. Smoothing spline fit with $\lambda = 1200$ for HCF information calls had associated $RSqr = 0.353$.

applied to national, regional, state, or ZIP code coverage areas. Geocentric definitions can also be created, which use cases reported from a geographic location regardless of which PC managed the case. This functionality is available not only to the AAPCC surveillance team, but to every PC. Poison centers also have the ability to share NPDS real-time surveillance technology with external organizations such as their state and local health departments or other regulatory agencies. Another NPDS feature is the ability to generate system alerts on adverse drug events and other drug or commercial products of public health interest like contaminated food or product recalls. Thus, NPDS can provide real-time adverse event monitoring, surveillance, resilience, response and situational awareness.

Surveillance definitions can be created to monitor a variety of parameters, i.e. volume; case based; on any desired substance or commercial product in the Micromedex Poisindex products database; and/or set of clinical effects or other parameters. The products database contains over 430,000 entries ranging from viral and bacterial agents to commercial chemical and drug products. Surveillance definitions may be constructed using volume or case-based definitions with a variety of mathematical options and historical baseline periods from 1 to 15 years. NPDS surveillance tools include:

- Volume Alert Surveillance Definitions
- Total Call Volume
- Human Exposure Call Volume
- Animal Exposure Call Volume
- Information Call Volume
- Clinical Effects Volume (signs and symptoms, or laboratory abnormalities)
- Case Based Surveillance Definitions utilizing various NPDS data fields linked in Boolean expressions
 - Substance
 - Clinical Effects
 - Species
 - Medical Outcome and others

- Syndromic Surveillance Definitions allows Boolean based definitions utilizing various NPDS data fields to be run based on historical trends for user defined periods of interest.

Incoming data is monitored continuously and anomalous signals generate an automated email alert to the AAPCC's surveillance team, designated PC or public health agency staff. These anomaly alerts are reviewed daily by the AAPCC surveillance team, the PC, or the public health agency that created the surveillance definition. When reports of potential public health significance are detected, additional information is obtained from reporting PCs via the NPDS surveillance correspondence system or phone as appropriate. The PC then alerts their respective local or state health departments. Public health issues are brought to the attention of the Health Studies Branch, National Center for Environmental Health, Centers for Disease Control and Prevention (HSB/NCEH/CDC). This near real-time tracking ability is a unique feature offered by NPDS and the PCs.

AAPCC Surveillance Team clinical and medical toxicologists review surveillance definitions on a regular basis to fine-tune the queries. The CDC, as well as state and local health departments with NPDS access as granted by their respective PCs, also have the ability to create surveillance definitions for routine surveillance tasks or to respond to emerging public health events.

Fatality case review and narrative selection

NPDS fatality cases are recorded as DEATH or DEATH (INDIRECT REPORT). Medical outcome of death is by direct report. Deaths (indirect reports) are deaths that the PC acquired from medical examiners or media, but did not manage or answer any questions related specifically to that case.

Although PCs may report death as an outcome, the death may not be a direct result of the exposure. We define exposure-related fatality as a death judged by the AAPCC Fatality Review

Team to be at least contributory to the exposure. The definitions used for the Relative Contribution to Fatality (RCF) classification are defined in [Appendix B](#) and the methods to select narratives for publication are described in [Appendix C](#). For details of the AAPCC fatality review process, see the 2008 annual report [1].

Pediatric fatality case review

A focused Pediatric Fatality Review team composed of six pediatric toxicologists evaluated cases for patients under 20 years of age. The panel reviewed the documentation of all such cases, with specific focus on the conditions behind the poisoning exposure and finding commonalities which might inform efforts at prevention. The reviewed pediatric fatality cases exhibited a bimodal age distribution. Exposures causing death in children ≤ 5 years of age were mostly coded as "Unintentional-General," while those in ages >13 years were mostly "Intentional." Often the Reason Code did not capture the complexities of the case. For example, there were few mentions of details such as the involvement of law enforcement or child protective services. While there were some complete and informative reports, in many narratives the

Table 2. Site of call and site of exposure, human exposure cases.

Site	Site of caller		Site of exposure	
	N	%	N	%
Residence				
Own	1,458,293	67.54	1,961,761	90.86
Other	29,230	1.35	47,408	2.20
Workplace	22,244	1.03	36,781	1.70
Health care facility	500,649	23.19	7073	0.33
School	10,391	0.48	28,553	1.32
Restaurant/food service	473	0.02	4951	0.23
Public area	7525	0.35	22,474	1.04
Other	124,692	5.78	27,135	1.26
Unknown	5,535	0.26	22,896	1.06

circumstances which preceded the exposure thought responsible for the death were unclear or absent. In response to these findings, the pediatric fatality review team developed and distributed Pediatric Narrative Guidelines, with specific attention to the root cause of these cases. Poison centers are requested to heed these guidelines and the need for a more in-depth investigation of "causality."

Results

Information calls to poison centers

Data from 490,215 information calls to PCs in 2016 ([Table 1\(C\)](#)) was transmitted to NPDS, including calls in

Table 3(B). Population-Adjusted Exposures by Age Group

Age group	Exposures/ 100 k population	Number of exposures ^a	Population ^b
Children (<20)			
<1	2849	114,147	4,007,157
1	8083	326,087	4,034,009
2	7675	309,487	4,032,577
3	3478	139,939	4,023,628
4	1711	68,973	4,030,495
5	1022	41,674	4,076,128
Child 6–12	448	130,604	29,142,676
Teen 13–19	558	165,853	29,704,242
Subgroup	1569	1,303,193	83,050,912
Adults (≥ 20)			
20–29	415	190,157	45,805,022
30–39	356	152,978	43,028,073
40–49	290	119,465	41,129,152
50–59	267	118,302	44,321,378
60–69	236	86,583	36,749,106
70–79	255	52,145	20,481,139
80–89	289	28,543	9,882,082
90+	265	6,679	2,523,430
Subgroup	345	842,034	243,919,382
Overall total	660	2,159,032	326,970,294

^aNumber of exposures excludes UNKNOWN ages from the individual age categories, but includes them in the subtotals and overall total (see [Table 3\(A\)](#)).

Table 3(A). Age and gender distribution of human exposures.

Age (y)	Male		Female		Unknown gender		Total		Cumulative total	
	N	% of age group total	N	% of age group total	N	% of age group total	N	% of total exposures	N	%
Children (<20)										
<1	59,457	52.09	54,307	47.58	383	0.34	114,147	5.29	114,147	5.29
1	169,380	51.94	156,186	47.90	521	0.16	326,087	15.10	440,234	20.39
2	162,134	52.39	146,798	47.43	555	0.18	309,487	14.33	749,721	34.72
3	76,886	54.94	62,700	44.81	353	0.25	139,939	6.48	889,660	41.21
4	38,844	56.32	29,918	43.38	211	0.31	68,973	3.19	958,633	44.40
5	23,814	57.14	17,689	42.45	171	0.41	41,674	1.93	1,000,307	46.33
Unknown ≤ 5	882	43.30	838	41.14	317	15.56	2037	0.09	1,002,344	46.43
Child 6–12	74,647	57.16	54,938	42.06	1,019	0.78	130,604	6.05	1,132,948	52.47
Teen 13–19	61,659	37.18	103,422	62.36	772	0.47	165,853	7.68	1,298,801	60.16
Unknown Child	1608	36.61	1498	34.11	1286	29.28	4392	0.20	1,303,193	60.36
Subtotal	669,311	51.36	628,294	48.21	5588	0.43	1,303,193	60.36	1,303,193	60.36
Adults (≥ 20)										
20–29	88,079	46.32	101,909	53.59	169	0.09	190,157	8.81	1,493,350	69.17
30–39	67,046	43.83	85,830	56.11	102	0.07	152,978	7.09	1,646,328	76.25
40–49	49,219	41.20	70,177	58.74	69	0.06	119,465	5.53	1,765,793	81.79
50–59	47,809	40.41	70,403	59.51	90	0.08	118,302	5.48	1,884,095	87.27
60–69	33,363	38.53	53,162	61.40	58	0.07	86,583	4.01	1,970,678	91.28
70–79	18,933	36.31	33,176	63.62	36	0.07	52,145	2.42	2,022,823	93.69
80–89	9886	34.64	18,640	65.30	17	0.06	28,543	1.32	2,051,366	95.01
≥ 90	2105	31.52	4571	68.44	3	0.04	6679	0.31	2,058,045	95.32
Unknown adult	33,692	38.65	51,300	58.84	2190	2.51	87,182	4.04	2,145,227	99.36
Subtotal	350,132	41.58	489,168	58.09	2734	0.32	842,034	39.00	2,145,227	99.36
Other										
Unknown age	4433	32.11	5875	42.56	3497	25.33	13,805	0.64	2,159,032	100.00
Total	1,023,876	47.42	1,123,337	52.03	11,819	0.55	2,159,032	100.00	2,159,032	100.00

Table 4. Distribution of age^a and gender for fatalities^b

Age (y)	Male	Female	Unknown	Total (%)	Cumulative total (%)
< 1 year	1	2	0	3 (0.2)	3 (0.2)
1 year	4	1	0	5 (0.4)	8 (0.6)
2 years	4	2	0	6 (0.4)	14 (1.0)
3 years	5	0	0	5 (0.4)	19 (1.3)
4 years	1	0	0	1 (0.1)	20 (1.4)
5 years	3	1	0	4 (0.3)	24 (1.7)
Unknown <=5 years	0	0	0	0 (0.0)	24 (1.7)
Child 6–12 years	1	6	0	7 (0.5)	31 (2.2)
Teen 13–19 years	20	22	0	42 (3.0)	73 (5.2)
20–29 years	118	80	0	198 (14.0)	271 (19.2)
30–39 years	125	124	0	249 (17.6)	520 (36.8)
40–49 years	111	139	0	250 (17.7)	770 (54.4)
50–59 years	94	155	0	249 (17.6)	1019 (72.0)
60–69 years	93	110	0	203 (14.4)	1222 (86.4)
70–79 years	38	62	0	100 (7.1)	1322 (93.4)
80–89 years	23	38	0	61 (4.3)	1383 (97.7)
>= 90 years	9	6	0	15 (1.1)	1398 (98.8)
Unknown adult	9	3	0	12 (0.9)	1410 (99.7)
Unknown age	2	1	2	5 (0.4)	1415 (100.0)
Total	661	752	2	1415 (100.0)	1415 (100.0)

^aAge includes cases with both actual and estimated ages as shown in Table 21.

^bIncludes cases with RCF of 1 – undoubtedly responsible, 2 – probably responsible, or 3 – contributory. This excludes reports with outcome of Death INDIRECT.

Table 5. Number of substances involved in human exposure cases.

No. of substances	Human exposures		Fatal exposures ^a	
	N	%	N	%
1	1,905,848	88.27	593	41.91
2	158,282	7.33	366	25.87
3	53,004	2.45	180	12.72
4	21,736	1.01	119	8.41
5	9636	0.45	52	3.67
6	4417	0.20	38	2.69
7	2462	0.11	24	1.70
8	1415	0.07	16	1.13
>=9	2232	0.10	27	1.91
Total	2,159,032	100.00	1415	100.00

^aIncludes cases with RCF of 1 – undoubtedly responsible, 2 – probably responsible, or 3 – contributory. This excludes reports with outcome of Death INDIRECT.

optional reporting categories such as prevention/safety/education (20,725), administrative (20,280), and caller referral (48,457).

Figure 2 shows that all Drug ID calls have decreased dramatically since mid-2008 through 2016. Law enforcement Drug ID Calls also showed a decline. The most frequent information call was for Drug ID, comprising 137,880 calls to PCs during the year. Of these, 77,015 (55.9%) were identified as drugs with known abuse potential. However, these cases were categorized based on the drug's abuse potential without knowledge of whether abuse was actually intended.

While the number of Drug Information calls decreased 7.20% from 2015 (87,117 calls) to 2016 (80,847 calls), the distribution of these call types slightly increased to 16.5% of all information request calls. The most common drug information requests were about drug–drug interactions, followed by other drug information, questions about dosage, inquiries of adverse effects (without a known exposure), and therapeutic use and indications. Environmental inquiries comprised 3.40% of all information calls. Of these environmental inquiries, specific questions related to

Table 6(A). Reason for human exposure cases.

Reason	N	% Human exposures
Unintentional		
Unintentional – general	1,115,088	51.6
Unintentional – therapeutic error	276,743	12.8
Unintentional – misuse	136,397	6.3
Unintentional – environmental	55,953	2.6
Unintentional – bite/sting	43,775	2.0
Unintentional – occupational	28,041	1.3
Unintentional – food poisoning	19,852	0.9
Unintentional – unknown	3796	0.2
Subtotal	1,679,645	77.8
Intentional		
Intentional – suspected suicide	262,969	12.2
Intentional – misuse	58,726	2.7
Intentional – abuse	49,473	2.3
Intentional – unknown	19,692	0.9
Subtotal	390,860	18.1
Adverse reaction		
Adverse reaction – drug	36,904	1.7
Adverse reaction – other	11,297	0.5
Adverse reaction – food	5547	0.3
Subtotal	53,748	2.5
Unknown		
Unknown reason	17,877	0.8
Subtotal	17,877	0.8
Other		
Other – contamination/tampering	7695	0.4
Other – malicious	7448	0.3
Other – withdrawal	1759	0.1
Subtotal	16,902	0.8
Total	2,159,032	100.0

cleanup of mercury (thermometers and other) remained the most common, followed by questions involving pesticides and air quality.

Of all the information calls, poison information comprised 10.2% of the requests with inquiries involving general toxicity the most common followed by questions involving food preparation practices/food poisoning, safe use of household products and plant toxicity.

Exposure calls to poison centers

In 2016, the participating PCs logged 2,710,042 total encounters including 2,159,032 closed human exposure cases (Table 1(A)), 54,019 animal exposures (Table 1(B)), 490,215 information calls (Table 1(C)), 6687 human confirmed non-exposures, and 89 animal confirmed non-exposures. An additional 290 cases were still open at the time the database was locked. The cumulative AAPCC database now contains more than 66 million human exposure case records (Table 1(A)). A total of 18,814,865 information calls have been logged into the AAPCC database since the year 2000.

Figure 1 shows the human exposures, information calls and animal exposures by day since 1 January 2000. Smoothing spline fit of these data shows departure from linearity (declining rate of cases since mid-2007) for Human Exposure Cases with some flattening over the last 2 years. Information calls are declining more rapidly and are also described by a smoothing spline fit, and Animal Exposure Cases have likewise been declining since mid-2005. The 2 May 2006 exposure data spike on Figure 1 was the result of 602 children in a Midwest school reporting a noxious odor which caused anxiety, but resolved without sequelae.

Table 6(B). Scenarios for therapeutic errors^a by age^b.

Scenario	N	<=5 year (row %)	6–12 y (row %)	13–19 y (row %)	>=20 y (row %)	Unknown child (row %)	Unknown adult (row %)	Unknown age (row %)
Inadvertently took/given medication twice	84,297	16.32	11.88	5.58	60.38	0.05	5.54	0.26
Wrong medication taken/given	46,100	15.43	11.52	5.90	61.59	0.06	5.18	0.33
Other incorrect dose	40,824	32.04	11.65	6.39	45.88	0.10	3.58	0.36
Medication doses given/taken too close together	30,298	16.45	9.44	6.34	61.51	0.06	5.91	0.30
Inadvertently took/given someone else's medication	23,872	15.04	19.30	7.03	54.13	0.06	4.26	0.18
Other/unknown therapeutic error	16,829	20.17	10.32	7.00	55.11	0.14	6.77	0.51
Incorrect dosing route	12,346	8.50	4.11	3.30	72.74	0.15	10.46	0.75
Confused units of measure	9103	58.78	18.61	3.76	17.40	0.09	1.31	0.05
Incorrect formulation or concentration given	5968	48.58	15.85	4.73	28.49	0.03	2.20	0.13
Dispensing cup error	5541	67.05	19.13	2.58	10.32	0.11	0.69	0.13
Health professional/iatrogenic error (pharmacist/nurse/physician)	5436	25.02	11.33	6.38	52.26	0.18	3.88	0.94
More than 1 product containing same ingredient	4520	10.31	14.40	13.03	55.95	0.04	5.73	0.53
Drug interaction	2418	6.87	8.68	6.29	64.19	0.25	13.19	0.54
10-fold dosing error	1328	58.66	8.21	2.86	28.01	0.38	1.51	0.38
Incorrect formulation or concentration dispensed	1211	44.84	16.27	5.12	31.21	0.00	2.06	0.50
Exposure through breast milk	173	93.06	0.58	0.00	2.89	1.73	1.16	0.58

^aAll cases with a scenario category of therapeutic error regardless of reason.^bOf the human exposure cases reported to U.S. Poison Centers in 2016, 415,071 (19.2%) were coded to one or more of 54 scenarios.**Table 7.** Distribution of reason for exposure by age.

Reason	<=5 year		6–12 year		13–19 year		>=20 year		Unknown child		Unknown adult		Unknown age		Total	
	N	Row %	N	Row %	N	Row %	N	Row %	N	Row %	N	Row %	N	Row %	N	%
Unintentional	996,705	62.00	112,234	6.98	56,086	3.49	434,470	27.03	3,869	0.24	68,210	4.24	8071	0.50	1,679,645	77.80
Intentional	90	0.02	13,285	3.49	102,060	26.79	262,376	68.87	206	0.05	9655	2.53	3188	0.84	390,860	18.10
Adverse reaction	3422	7.18	2576	5.40	3873	8.12	36,852	77.29	123	0.26	5945	12.47	957	2.01	53,748	2.49
Unknown	883	5.32	970	5.84	1999	12.04	11,883	71.58	65	0.39	1210	7.29	867	5.22	17,877	0.83
Other	1244	8.51	1539	10.53	1835	12.56	9271	63.45	129	0.88	2162	14.80	722	4.94	16,902	0.78
Total	1,002,344	48.48	130,604	6.32	165,853	8.02	754,852	36.51	4392	0.21	87,182	4.22	13,805	0.67	2,159,032	100.00

A hallmark of PC case management is the use of follow-up calls to monitor case progress and medical outcome. US PCs made 2,718,022 follow-up calls in 2016. Follow-up calls were done in 47.1% of human exposure cases. One follow-up call was made in 22.2% of human exposure cases and multiple follow-up calls (range 2–173) were placed in 25.0% of cases. For human exposure cases in which follow up calls were documented, an average of 2.58 calls per case was done.

Figure 3 shows a graphic summary and analyses of Health Care Facility (HCF) Exposure and HCF information calls. HCF Exposure Cases slightly departs from linearity but continues to increase at a steady rate, while the rate of HCF information calls has declined since early 2005 although has leveled off since late 2013. This increasing use of the PCs for the more serious exposures (HCF cases) is important in the face of the overall decline in exposure and information encounters.

Tables 22(A) (Non-pharmaceuticals) and 22(B) (Pharmaceuticals) provide summary demographic data on patient age, reason for exposure, medical outcome, and use of a HCF for all 2,159,032 human exposure cases, presented by substance categories. The Pharmaceuticals category includes both licit and illicit drugs.

Column 1: Name of the major, minor generic categories and their associated generic substances. Note that for pharmaceuticals, the generic category or generic substance listed is for the initial FDA approved indication and may not reflect current indications or uses for the pharmaceutical.

Column 2: Number of Case Mentions (all exposures) in grey shading displays the number of times that the specific generic code was reported in any human exposure case. If a human exposure case has multiple instances of a specific generic code it is only counted once.

Column 3: Number of Single Exposures displays the number of human exposure cases that identified only one substance (one case, one substance).

The succeeding columns (Age, Reason, Treatment Site, and Outcome) show selected detail from these single-substance exposure cases. Death cases include both cases that have the outcome of Death or Death (indirect report). These death cases are not limited by the RCF.

Tables 22(A) and 22(B) restrict the breakdown columns to single-substance cases. Prior to 2007, when multi-substance exposures were included, a relatively innocuous substance could be mentioned in a death column when, for example, the death was attributed to an antidepressant, opioid, or cyanide. This subtlety was not always appreciated by the user of this table. The restriction of the breakdowns to single-substance exposures should increase precision and reduce misrepresentation of the results in this unique by-substance table. Single substance cases reflect the majority (88.3%) of all exposures. In contrast, only 41.9% of fatalities are single substance exposures (Table 5).

Tables 22(A) and 22(B) tabulate 2,576,766 substance-exposures, of which 1,905,848 were single-substance exposures, including 980,550 (51.4%) non-pharmaceuticals and 925,298

Table 8. Distribution of reason for exposure and age for fatalities^a.

Reason	<=5 year	6–12 year	13–19 year	>=20 year	Unknown child	Unknown adult	Unknown age	Total
Unintentional								
Unintentional – general	9	0	1	18	0	0	0	28
Unintentional – environmental	8	1	1	33	0	0	1	44
Unintentional – occupational	0	0	0	13	0	1	0	14
Unintentional – therapeutic error	0	0	0	26	0	0	0	26
Unintentional – misuse	0	0	0	16	0	0	0	16
Unintentional – bite/sting	0	0	0	5	0	0	0	5
Unintentional – food poisoning	0	1	0	1	0	0	0	2
Unintentional – unknown	0	0	0	5	0	0	0	5
Subtotal	17	2	2	117	0	1	1	140
Intentional								
Intentional – suspected suicide	0	3	26	725	0	3	2	759
Intentional – misuse	0	1	0	57	0	0	0	58
Intentional – abuse	0	0	9	188	0	4	2	203
Intentional – unknown	0	1	1	76	0	1	0	79
Subtotal	0	5	36	1,046	0	8	4	1,099
Other								
Other – contamination/tampering	0	0	0	1	0	0	0	1
Other – malicious	3	0	0	1	0	0	0	4
Other – withdrawal	0	0	0	2	0	0	0	2
Subtotal	3	0	0	4	0	0	0	7
Adverse reaction								
Adverse reaction – drug	0	0	0	37	0	0	0	37
Adverse reaction – other	0	0	0	1	0	0	0	1
Subtotal	0	0	0	38	0	0	0	38
Unknown								
Unknown reason	4	0	4	120	0	3	0	131
Subtotal	4	0	4	120	0	3	0	131
Total	24	7	42	1325	0	12	5	1415

^aIncludes cases with RCF of 1 – undoubtedly responsible, 2 – probably responsible, or 3 – contributory. This excludes reports with outcome of Death INDIRECT.

Table 9. Route of exposure for human exposure cases.

Route	Human exposures			Fatal exposures ^a		
	N	% of all routes	% of all cases	N	% of all routes	% of all cases
Ingestion	1,810,030	79.63	83.84	1138	73.42	80.42
Dermal	152,020	6.69	7.04	15	0.97	1.06
Inhalation/nasal	133,761	5.88	6.20	136	8.77	9.61
Ocular	91,207	4.01	4.22	1	0.06	0.07
Bite/sting	43,735	1.92	2.03	5	0.32	0.35
Parenteral	20,687	0.91	0.96	92	5.94	6.50
Unknown	14,274	0.63	0.66	128	8.26	9.05
Other	2517	0.11	0.12	3	0.19	0.21
Otic	1764	0.08	0.08	0	0.0	0
Aspiration (with ingestion)	1212	0.05	0.06	32	2.06	2.26
Vaginal	987	0.04	0.05	0	0.0	0
Rectal	782	0.03	0.04	0	0.0	0
Total number of routes	2,272,976	100.00	105.28	1550	100.00	109.54 ^b

^aIncludes cases with RCF of 1 – undoubtedly responsible, 2 – probably responsible, or 3 – contributory. This excludes reports with outcome of Death INDIRECT.

^bEach exposure case may have more than one route.

Table 10. Management site of human exposures.

Site of management	N	%
Managed on site, non-HCF	1,437,493	66.6
Managed in healthcare facility		
Treated/evaluated and released	303,668	14.1
Admitted to critical care unit	102,668	4.8
Patient lost to follow-up/left AMA	85,183	4.0
Admitted to psychiatric facility	79,348	3.7
Admitted to non-critical care unit	76,591	3.6
Subtotal (managed in HCF)	647,458	30.0
Other	19,737	0.9
Refused referral	27,501	1.3
Unknown	26,843	1.2
Total	2,159,032	100.0

(48.6%) pharmaceuticals. In 22.0% of single-substance exposures that involved pharmaceutical substances, the reason for exposure was intentional, compared to only 3.94% when the

exposure involved a non-pharmaceutical substance. Correspondingly, treatment in a HCF was provided in a higher percentage of exposures that involved pharmaceutical substances (32.8%) compared with non-pharmaceutical substances (17.0%). Exposures to pharmaceuticals also had more severe outcomes. Of single-substance exposure-related fatal cases, 690 (72.9%) were pharmaceuticals compared with 256 (27.1%) non-pharmaceuticals.

Age and gender distributions

The age and gender distribution of human exposures is outlined in Table 3(A). Children younger than 3 years of age were involved in 34.7% of exposures and children ≤5 years accounted for approximately half of all human exposures

Table 11. Medical outcome of human exposure cases by patient age^a.

Outcome	<=5 year		6–12 year		13–19 year		>=20 year		Unknown child		Unknown adult		Unknown age		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
No effect	234,640	23.41	23,215	17.78	31,391	18.93	94,887	12.57	832	18.94	9,005	10.33	1,664	12.1	395,634	18.32
Minor effect	84,227	8.40	19,478	14.91	47,272	28.50	178,623	23.66	493	11.22	12,062	13.84	1,945	14.1	344,100	15.94
Moderate effect	9853	0.98	4365	3.34	27,375	16.51	119,473	15.83	56	1.28	2,522	2.89	533	3.9	164,177	7.60
Major effect	832	0.08	246	0.19	2824	1.70	20,528	2.72	5	0.11	145	0.17	48	0.4	24,628	1.14
Death	37	0.00	12	0.01	63	0.04	1,707	0.23	0	0.00	21	0.02	12	0.1	1,852	0.09
No follow-up, non-toxic	171,295	17.09	18,247	13.97	6952	4.19	42,829	5.67	533	12.14	10,669	12.24	895	6.5	251,420	11.65
No follow-up, minimal toxicity	470,571	46.95	59,228	45.35	35,620	21.48	226,198	29.97	1,861	42.37	38,635	44.32	4195	30.4	836,308	38.74
No follow-up, potentially toxic	17,567	1.75	2938	2.25	10,290	6.20	40,197	5.33	495	11.27	10,653	12.22	4072	29.5	86,212	3.99
Unrelated effect	13,315	1.33	2874	2.20	4058	2.45	30,321	4.02	117	2.66	3458	3.97	433	3.1	54,576	2.53
Death, indirect report	7	0.00	1	0.00	8	0.00	89	0.01	0	0.00	12	0.01	8	0.1	125	0.01
Total	1,002,344	100.00	130,604	100.0	165,853	100.00	754,852	100.00	4,392	100.00	87,182	100.00	13,805	100.00	2,159,032	100.00

^aTotal number of cases where Death was an outcome (1852 + 125) is greater than the number of fatalities (1415) judged to be exposure-related (RCF of 1 – undoubtedly responsible, 2 – probably responsible, or 3 – contributory).

Table 12. Medical outcome by reason for exposure in human exposures^a.

Outcome	Unintentional		Intentional		Other		Adverse reaction		Unknown		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
No effect	324,274	19.31	66,041	16.90	2120	12.54	1792	3.33	1407	7.87	395,634	18.32
Minor effect	208,966	12.44	116,562	29.82	2948	17.44	12,673	23.58	2951	16.51	344,100	15.94
Moderate effect	43,694	2.60	106,763	27.31	1416	8.38	7813	14.54	4491	25.12	164,177	7.60
Major effect	2770	0.16	19,238	4.92	168	0.99	852	1.59	1600	8.95	24,628	1.14
Death	183	0.01	1322	0.34	17	0.10	79	0.15	251	1.40	1852	0.09
Death, indirect report	21	0.00	71	0.02	5	0.03	4	0.01	24	0.13	125	0.01
No follow-up, non-toxic	244,742	14.57	3975	1.02	1219	7.21	1192	2.22	292	1.63	251,420	11.65
No follow-up, minimal toxicity	777,427	46.29	32,883	8.41	6027	35.66	17,846	33.20	2125	11.89	836,308	38.74
No follow-up, potentially toxic	42,745	2.54	35,412	9.06	1699	10.05	3276	6.10	3080	17.23	86,212	3.99
Unrelated effect	34,823	2.07	8593	2.20	1283	7.59	8221	15.30	1656	9.26	54,576	2.53
Total	1,679,645	100.00	390,860	100.00	16,902	100.00	53,748	100.00	17,877	100.00	2,159,032	100.00

^aTotal number of cases where Death was an outcome (1852 + 125) is greater than the number of fatalities (1415) judged to be exposure-related (RCF of 1 – undoubtedly responsible, 2 – probably responsible, or 3 – contributory).

Table 13. Duration of clinical effects by medical outcome.

Duration of effect	Minor effect		Moderate effect		Major effect	
	N	%	N	%	N	%
<=2 h	107,039	31.11	7,390	4.50	755	3.07
>2 h, <=8 h	95,699	27.81	32,646	19.88	1478	6.00
>8 h, <=24 h	66,230	19.25	59,763	36.40	5174	21.01
>24 h, <=3 d	21,488	6.24	34,145	20.80	8556	34.74
>3 d, <=1 week	4031	1.17	8219	5.01	4561	18.52
>1 week, <=1 month	1200	0.35	1689	1.03	1362	5.53
>1 month	395	0.11	345	0.21	188	0.76
Anticipated permanent	460	0.13	180	0.11	491	1.99
Unknown	47,558	13.82	19,800	12.06	2063	8.38
Total	344,100	100.00	164,177	100.00	24,628	100.00

Table 14. Decontamination and therapeutic interventions.

Therapy	N	%
Decontamination only	1,027,581	47.6
Therapeutic intervention only	268,028	12.4
Decontamination and therapeutic intervention	131,248	6.1
Not coded	732,175	33.9
Total	2,159,032	100.0

(46.4%). A male predominance was found among cases involving children ≤ 12 years, but this gender distribution was reversed in teenagers and adults, with females comprising the majority of reported exposures. The overall rate of poison exposures is 660/100,000 population (Table 3(B)).

The highest rates of poison exposures are in children aged one (8083/100,000 population) and two (7675/100,000 population) and decline progressively as the age rises, resulting in a rate of 345/100,000 population in adults ≥ 20 years.

Caller site and exposure site

As shown in Table 2, of the 2,159,032 human exposures reported, 68.9% of calls originated from a residence (own or other) but 93.1% actually occurred at a residence (own or other). Another 23.2% of calls were made from a HCF. Beyond residences, exposures occurred in the workplace (1.70% of cases), schools (1.32%), HCF (0.328%), and restaurants or food services (0.229%).

Exposures in pregnancy

Exposure during pregnancy occurred in 7287 women (0.338% of all human exposures). Of those with known pregnancy duration ($n=6769$), 31.7% occurred in the first trimester, 37.9% in the second trimester, and 30.4% in the third trimester. Most (72.0%) were unintentional exposures and 21.2% were intentional exposures. There were seven deaths in pregnant females in 2016.

Table 15. Therapy provided in human exposures by age.

Therapy	<=5 year	6–12 year	13–19 year	>=20 year	Unknown child	Unknown adult	Unknown age	Total
Decontamination								
Cathartic	376	118	1500	2971	1	14	5	4985
Charcoal, multiple doses	53	11	297	678	0	6	0	1045
Charcoal, single dose	6,280	853	11,421	20,902	2	113	17	39,588
Dilute/irrigate/wash	478,121	49,517	28,544	179,700	1,241	28,670	2606	768,399
Food/snack	128,831	11,529	6118	31,884	221	4456	285	183,324
Fresh air	6546	3932	4514	40,167	654	10,660	1503	67,976
Ipecac	22	5	22	38	0	1	0	88
Lavage	47	20	337	1029	0	4	3	1440
Other emetic	7131	625	1309	5409	8	429	63	14,974
Whole bowel irrigation	61	19	310	1259	0	4	0	1653
Other Therapies								
2-PAM	5	0	4	42	0	1	0	52
Alkalinization	109	85	2126	9975	0	24	5	12,324
Amyl nitrite	0	0	0	3	0	0	0	3
Antiarrhythmic	8	12	285	1868	0	10	1	2184
Antibiotics	1758	748	1265	14,311	9	455	47	18,593
Anticonvulsants ^a	76	34	195	1191	0	5	0	1,501
Antiemetics	1342	694	7,723	15,704	2	94	11	25,570
Antihistamines	1839	1165	1,704	9355	14	774	92	14,943
Antihypertensives	19	16	173	2995	0	8	1	3212
Antivenin (fab fragment)	203	224	157	1647	0	12	4	2247
Antivenin/antitoxin ^b	60	38	33	281	10	4	2	428
Atropine	101	38	163	1336	0	3	0	1641
BAL	2	0	2	7	0	0	0	11
Benzodiazepines	1123	523	7069	31,604	1	155	28	40,503
Bronchodilators	398	180	373	4616	5	139	99	5810
Calcium	7357	515	328	3067	6	79	6	11,358
Cardioversion	4	1	26	277	0	4	0	312
CPR	69	14	114	1552	0	11	5	1765
Deferoxamine	7	0	28	29	0	0	0	64
ECMO	5	1	14	34	0	0	0	54
EDTA	15	1	1	4	0	0	0	21
Ethanol	0	1	2	74	0	4	0	81
Extracorp. procedure (other)	2	0	4	61	0	0	0	67
Fab fragments	13	10	19	570	0	3	0	615
Fluids, IV	6395	2614	34,459	128,947	2	540	102	173,059
Flumazenil	89	26	200	1406	1	7	1	1730
Folate	12	1	31	1628	0	3	0	1675
Fomepizole	111	10	107	1806	0	7	3	2044
Glucagon	44	10	130	2098	0	4	1	2287
Glucose, > 5%	426	31	389	4130	0	13	3	4992
Hemodialysis	8	4	133	2668	0	10	2	2825
Hemoperfusion	0	0	3	33	0	0	0	36
Hydroxocobalamin	12	7	2	101	0	1	0	123
Hyperbaric oxygen	20	29	51	414	2	9	2	527
Insulin	11	11	163	2307	0	4	0	2496
Intubation	545	142	1974	20,872	0	115	22	23,670
Methylene blue	8	1	16	157	0	2	0	184
NAC, IV	170	253	5585	15,655	0	67	18	21,748
NAC, PO	43	44	975	2,346	0	5	6	3419
Nalmefene	0	0	2	11	0	0	0	13
Naloxone	1147	192	2087	21,835	2	175	64	25,502
Neuromuscular blocker	56	7	181	1709	0	10	0	1963
Octreotide	101	4	55	392	0	1	0	553
Other	32,232	7191	12,729	78,621	122	3657	732	135,284
Oxygen	1572	708	3926	44,972	13	440	160	51,791
Pacemaker	0	1	5	193	0	0	0	199
Penicillamine	0	0	0	0	1	0	0	1
Physostigmine	8	9	142	237	0	0	1	397
Phytonadione	10	9	89	641	0	1	0	750
Pyridoxine	4	2	36	449	0	3	0	494
Sedation (other)	441	145	2152	19,081	0	99	21	21,939
Sodium nitrite	4	1	2	22	0	0	0	29
Sodium thiosulfate	5	2	1	37	0	0	0	45
Steroids	611	324	527	4827	6	279	110	6684
Succimer	102	9	9	57	0	1	0	178
Transplantation	1	1	1	10	0	0	0	13
Vasopressors	86	38	412	6746	0	24	7	7,313
Ventilator	507	137	1870	19,882	0	109	20	22,525

^aExcludes benzodiazepines.^bExcludes Fab fragments.

Table 16(A). Decontamination trends (1985–2016).

Year	Human exposures	Ipecac administered (% of all exposures)	Activated charcoal administered (% of all exposures)	Exposures involving children ≤5 y (% of all exposures)	Ipecac administered (% of child exposures)	Activated charcoal administered (% of child exposures)
1985	886,389	132,947 (14.999)	41,063 (4.6)	568,691 (64.2)	94,919 (16.6908)	14,718 (2.59)
1986	1,095,228	145,516 (13.286)	56,481 (5.2)	690,137 (63.0)	99,688 (14.4447)	18,191 (2.64)
1987	1,164,648	117,840 (10.118)	60,310 (5.2)	730,228 (62.7)	83,443 (11.427)	18,507 (2.53)
1988	1,364,113	114,654 (8.4050)	88,876 (6.5)	843,106 (61.8)	80,749 (9.5776)	26,118 (3.10)
1989	1,578,968	110,545 (7.0011)	101,368 (6.4)	963,924 (61.0)	79,192 (8.2156)	30,345 (3.15)
1990	1,646,946	98,986 (6.0103)	108,341 (6.6)	999,751 (60.7)	73,469 (7.3487)	31,579 (3.16)
1991	1,836,364	94,877 (5.1666)	129,092 (7.0)	1,099,179 (59.9)	73,069 (6.6476)	36,177 (3.29)
1992	1,862,796	79,493 (4.2674)	135,625 (7.3)	1,094,256 (58.7)	63,486 (5.8018)	38,937 (3.56)
1993	1,747,147	65,078 (3.7248)	127,893 (7.3)	978,560 (56.0)	50,834 (5.1948)	35,791 (3.66)
1994	1,926,992	51,356 (2.6651)	138,247 (7.2)	1,042,651 (54.1)	41,489 (3.9792)	35,670 (3.42)
1995	2,023,089	47,359 (2.3409)	155,880 (7.7)	1,070,472 (52.9)	38,372 (3.5846)	38,095 (3.56)
1996	2,155,952	39,376 (1.8264)	157,331 (7.3)	1,137,263 (52.7)	32,622 (2.8685)	37,986 (3.34)
1997	2,192,088	32,098 (1.4643)	156,213 (7.1)	1,150,931 (52.5)	26,536 (2.3056)	35,856 (3.12)
1998	2,241,082	26,653 (1.1893)	152,134 (6.8)	1,180,989 (52.7)	22,247 (1.8838)	34,302 (2.90)
1999	2,201,156	21,942 (0.9968)	145,853 (6.6)	1,154,799 (52.5)	18,326 (1.5869)	33,812 (2.93)
2000	2,168,248	18,177 (0.8383)	145,911 (6.7)	1,142,796 (52.7)	15,239 (1.3335)	31,554 (2.76)
2001	2,267,979	16,058 (0.7080)	149,442 (6.6)	1,169,478 (51.6)	13,389 (1.1449)	30,367 (2.60)
2002	2,380,028	13,555 (0.5695)	149,527 (6.3)	1,227,381 (51.6)	11,163 (0.9095)	30,340 (2.47)
2003	2,395,582	9284 (0.3875)	140,412 (5.9)	1,245,584 (52.0)	7310 (0.5869)	28,888 (2.32)
2004	2,438,643	4701 (0.1928)	135,969 (5.6)	1,250,536 (51.3)	3366 (0.2692)	28,335 (2.27)
2005	2,424,180	3027 (0.1249)	123,263 (5.1)	1,233,695 (50.9)	1999 (0.1620)	26,338 (2.13)
2006	2,403,539	2176 (0.0905)	111,351 (4.6)	1,223,815 (50.9)	1337 (0.1092)	23,843 (1.95)
2007	2,482,041	1740 (0.0701)	106,010 (4.3)	1,271,595 (51.2)	1052 (0.0827)	22,829 (1.80)
2008	2,491,049	1205 (0.0484)	97,297 (3.9)	1,292,754 (51.9)	641 (0.0496)	21,286 (1.65)
2009	2,479,355	658 (0.0265)	84,805 (3.4)	1,290,784 (52.1)	330 (0.0256)	19,168 (1.48)
2010	2,384,825	360 (0.0200)	74,431 (3.1)	1,207,575 (50.6)	163 (0.0100)	16,581 (1.37)
2011	2,334,004	262 (0.0100)	66,770 (2.9)	1,144,729 (49.1)	98 (0.0100)	13,930 (1.22)
2012	2,275,141	193 (0.0100)	57,888 (2.5)	1,102,307 (48.5)	83 (0.0100)	11,284 (1.02)
2013	2,188,013	134 (0.0100)	50,459 (2.3)	1,049,475 (48.0)	42 (0.0000)	9334 (0.89)
2014	2,165,142	132 (0.0061)	46,030 (2.1)	1,031,927 (47.7)	41 (0.0040)	7977 (0.77)
2015	2,168,371	105 (0.0048)	42,712 (2.0)	1,017,369 (46.9)	29 (0.0029)	6965 (0.68)
2016	2,159,032	88 (0.0041)	40,633 (1.9)	1,002,344 (46.4)	22 (0.0022)	6333 (0.63)

Table 16B. Decontamination trends: total human and pediatric exposures <=5 years^a.

Therapy	Human exposures		Exposures children ≤5 year	
	N	%	N	%
Activated charcoal administered	40,633	1.88	6333	0.63
Cathartic	4985	0.23	376	0.04
Ipecac administered	88	0.00	22	0.00
Lavage	1440	0.07	47	0.00
Other Emetic	14,974	0.69	7131	0.71
Whole Bowel Irrigation	1653	0.08	61	0.01
Total	63,773	2.95	13,970	1.39

^aHuman exposures = 2,159,032; pediatric exposures = 1,002,344.

Chronicity

Most human exposures, 1,873,714 (86.8%), were acute cases (single, repeated or continuous exposure occurring over 8 hours or less) compared with 1050 acute cases among the 1977 fatalities (53.1%). Chronic exposures (continuous or repeated exposures occurring over >8 h) comprised 2.17% (46,822) of all human exposures. Acute-on-chronic exposures (single exposure that was preceded by a continuous, repeated, or intermittent exposure occurring over a period greater than 8 h) numbered 206,192 (9.55%).

Reason for exposure

The reason category for most human exposures was unintentional (77.8%), including: unintentional general (51.6%),

therapeutic error (12.8%), and unintentional misuse (6.3%) (Table 6(A)).

Scenarios

Of the total 276,743 therapeutic errors, the most common scenarios for all ages included inadvertent double-dosing (30.5%), wrong medication taken or given (16.7%), other incorrect dose (14.8%), doses given/taken too close together (10.9%), and inadvertent exposure to someone else's medication (8.6%). The types of therapeutic errors observed are different for each age group and are summarized in Table 6(B).

Reason by age

Intentional exposures accounted for 18.1% of human exposures. Suicidal intent was suspected in 12.2% of cases, intentional misuse in 2.72%, and intentional abuse in 2.29%. Unintentional exposures outnumbered intentional exposures in all age groups with the exception of ages 13–19 years (Table 7). In contrast, of the 1415 reported fatalities with RCF 1–3, the major reason reported for children ≤5 years was unintentional while most fatalities in adults (≥20 years) were intentional (Table 8).

Route of exposure

Ingestion was the route of exposure in 83.8% of cases (Table 9), followed in frequency by dermal (7.04%), inhalation/nasal (6.20%), and ocular routes (4.22%). For the 1415

Table 17(A). Substance categories most frequently involved in human exposures (top 25).

Substance (major generic category)	All substances	% ^a	Single substance exposures	% ^b
Analgesics	290,561	11.19	184,255	9.67
Cleaning substances (household)	195,715	7.54	176,828	9.28
Cosmetics/personal care products	186,970	7.20	180,065	9.45
Sedative/hypnotics/antipsychotics	151,620	5.84	55,314	2.90
Antidepressants	122,975	4.74	51,509	2.70
Antihistamines	108,777	4.19	75,833	3.98
Cardiovascular drugs	107,493	4.14	46,890	2.46
Foreign bodies/toys/miscellaneous	93,911	3.62	90,667	4.76
Pesticides	83,559	3.22	77,573	4.07
Topical preparations	72,134	2.78	70,352	3.69
Alcohols	72,088	2.78	22,289	1.17
Stimulants and street drugs	66,132	2.55	36,486	1.91
Vitamins	63,931	2.46	54,276	2.85
Anticonvulsants	63,488	2.45	25,844	1.36
Hormones and hormone antagonists	57,316	2.21	38,090	2.00
Cold and cough preparations	56,720	2.19	39,435	2.07
Antimicrobials	55,654	2.14	45,180	2.37
Dietary supplements/herbals/homeopathic	51,272	1.98	42,523	2.23
Gastrointestinal preparations	49,443	1.90	36,158	1.90
Bites and envenomations	48,423	1.87	46,989	2.47
Plants	47,793	1.84	45,150	2.37
Chemicals	39,807	1.53	33,910	1.78
Fumes/gases/vapors	34,345	1.32	31,337	1.64
Other/unknown non-drug substances	29,968	1.15	27,350	1.44
Hydrocarbons	29,796	1.15	27,807	1.46

^aPercentages are based on the total number of substances reported in all exposures ($N = 2,595,526$).^bPercentages are based on the total number of single substance exposures ($N = 1,905,848$).**Table 17B.** Substance categories with the greatest rate of exposure increase (top 25).

Substance (major generic category)	Increase in serious exposures per year ^a		All substances in 2016
	Mean	95% CI ^b	
Sedative/hypnotics/antipsychotics	2088	[1719, 2457]	50,894
Analgesics	1863	[1594, 2132]	49,546
Antidepressants	1312	[1177, 1447]	40,068
Cardiovascular drugs	984	[943, 1024]	22,052
Alcohols	930	[863, 997]	24,081
Stimulants and street drugs	863	[585, 1142]	25,066
Anticonvulsants	693	[630, 757]	17,725
Antihistamines	616	[526, 707]	15,966
Muscle relaxants	441	[381, 502]	10,153
Unknown drug	376	[311, 442]	8941
Hormones and hormone antagonists	252	[239, 265]	6695
Cold and cough preparations	242	[182, 302]	7722
Gastrointestinal preparations	93.3	[76, 111]	3365
Miscellaneous drugs	84.9	[56, 114]	2186
Diuretics	53.4	[45, 62]	1566
Anticoagulants	50.9	[45, 57]	1173
Electrolytes and minerals	41.0	[35, 47]	1093
Vitamins	37.5	[31, 44]	1036
Anticholinergic drugs	34.4	[26, 43]	1062
Other/unknown nondrug substances	29.5	[5, 55]	1160
Weapons of mass destruction	17.1	[9, 25]	310
Antimicrobials	14.0	[-6, 34]	2638
Automotive/aircraft/boat products	11.7	[2, 22]	1240
Tobacco/nicotine/eCigarette products	11.6	[5, 18]	371
Essential oils	11.5	[10, 13]	260

^aSerious exposures have outcomes of moderate, major, or death.^bIncrease and confidence intervals are based on least squares linear regression of the number of calls per year for 2000–2016.

exposure-related fatalities, ingestion (80.4%), inhalation/nasal (9.61%), unknown (9.05%), and parenteral (6.50%) were the predominant exposure routes. Each exposure case may have more than one route.

Clinical effects

The NPDS database allows for the coding of up to 131 individual clinical effects (signs, symptoms, or laboratory abnormalities) for each case. Each clinical effect can be further

categorized as related, not related, or unknown if related. Clinical effects were coded in 821,577 (38.1%) cases (17.7% had one effect, 9.69% had two effects, 5.34% had three effects, 2.46% had four effects, 1.22% had five effects, and 1.67% had >5 effects coded). Of clinical effects coded, 77.1% were deemed related to the exposure, 9.94% were considered not related, and 13.0% were coded as unknown if related.

Table 17(C). Substance categories most frequently involved in pediatric (≤ 5 years) exposures (top 25)^a.

Substance (major generic category)	All substances	% ^b	Single substance exposures	% ^c
Cosmetics/personal care products	138,904	13.29	136,004	13.98
Cleaning substances (household)	115,701	11.07	111,445	11.45
Analgesics	96,312	9.21	87,710	9.02
Foreign bodies/toys/miscellaneous	67,771	6.48	65,864	6.77
Topical preparations	52,984	5.07	52,030	5.35
Antihistamines	47,476	4.54	43,143	4.43
Vitamins	46,306	4.43	41,912	4.31
Pesticides	34,608	3.31	33,458	3.44
Dietary supplements/herbals/homeopathic	34,443	3.29	32,059	3.30
Plants	28,636	2.74	27,565	2.83
Gastrointestinal preparations	27,617	2.64	24,933	2.56
Antimicrobials	24,710	2.36	23,274	2.39
Cardiovascular drugs	21,940	2.10	13,824	1.42
Cold and cough preparations	21,098	2.02	19,267	1.98
Arts/crafts/office supplies	20,723	1.98	20,096	2.07
Electrolytes and minerals	18,420	1.76	16,700	1.72
Hormones and hormone antagonists	18,416	1.76	14,346	1.47
Deodorizers	17,611	1.68	17,398	1.79
Essential oils	13,981	1.34	13,264	1.36
Other/unknown nondrug substances	12,907	1.23	12,118	1.25
Tobacco/nicotine/eCigarette products	11,462	1.10	11,358	1.17
Antidepressants	11,390	1.09	8244	0.85
Sedative/hypnotics/antipsychotics	10,498	1.00	8119	0.83
Chemicals	10,111	0.97	9328	0.96
Alcohols	9838	0.94	9562	0.98

^aIncludes all children with actual or estimated ages ≤ 5 years old. Results do not include “unknown child” or “unknown age”.

^bPercentages are based on the total number of substances reported in pediatric exposures ($N = 1,045,339$).

^cPercentages are based on the total number of single substance pediatric exposures ($N = 972,914$).

Table 17(D). Substance categories most frequently involved in adult (≥ 20 years) exposures (top 25)^a.

Substance (major generic category)	All substances	% ^b	Single substance exposures	% ^c
Analgesics	134,737	11.59	61,641	9.28
Sedative/hypnotics/antipsychotics	117,948	10.14	36,793	5.54
Antidepressants	80,916	6.96	28,144	4.24
Cardiovascular drugs	72,985	6.28	26,408	3.98
Cleaning substances (household)	63,102	5.43	50,780	7.64
Alcohols	55,325	4.76	10,025	1.51
Anticonvulsants	47,118	4.05	16,640	2.51
Pesticides	40,970	3.52	36,706	5.53
Stimulants and street drugs	38,509	3.31	17,853	2.69
Antihistamines	36,904	3.17	17,549	2.64
Hormones and hormone antagonists	33,043	2.84	19,925	3.00
Bites and envenomations	32,526	2.80	31,425	4.73
Cosmetics/personal care products	31,211	2.68	28,421	4.28
Fumes/gases/vapors	24,638	2.12	22,452	3.38
Chemicals	23,988	2.06	19,707	2.97
Antimicrobials	22,557	1.94	16,186	2.44
Muscle relaxants	20,841	1.79	7511	1.13
Cold and cough preparations	20,264	1.74	11,028	1.66
Hydrocarbons	16,940	1.46	15,608	2.35
Gastrointestinal preparations	16,592	1.43	7997	1.20
Topical preparations	14,799	1.27	14,201	2.14
Unknown drug	14,626	1.26	9128	1.37
Foreign bodies/toys/miscellaneous	12,856	1.11	11,871	1.79
Other/unknown nondrug substances	12,478	1.07	11,088	1.67
Miscellaneous drugs	12,271	1.06	6215	0.94

^aIncludes all adults with actual or estimated ages ≥ 20 years old. Results also include “unknown adult” but do not include “unknown age”.

^bPercentages are based on the total number of substances reported in adult exposures ($N = 1,162,641$).

^cPercentages are based on the total number of single substance adult exposures ($N = 664,227$).

Case management site

The majority of cases reported to PCs were managed outside of a HCF (66.6%), usually at the site of exposure, primarily the patient's own residence (Table 10). Treatment in a HCF was rendered in 30.0% of cases. Only 1.27% of cases were referred to a HCF but refused referral.

Of the 647,458 cases managed in a HCF, 303,668 (46.9%) were treated and released, 102,668 (15.9%) were admitted for critical care, 76,591 (11.8%) were admitted to a non-critical unit, and 79,348 (12.3%) were admitted directly to a psychiatric facility.

The percentage of patients treated in a HCF varied considerably with age. Only 12.8% of children ≤ 5 years and only

Table 17(E). Substance categories most frequently involved in pediatric (≤ 5 years) deaths^a

Substance (major generic category)	All substances	% ^b	Single substance exposures	% ^c
Fumes/gases/vapors	12	18.18	8	21.62
Analgesics	11	16.67	9	24.32
Cardiovascular drugs	7	10.61	1	2.70
Antidepressants	6	9.09	1	2.70
Antihistamines	5	7.58	3	8.11
Batteries	4	6.06	4	10.81
Unknown drug	4	6.06	4	10.81
Stimulants and street drugs	3	4.55	1	2.70
Chemicals	2	3.03	0	0.00
Pesticides	2	3.03	1	2.70
Plants	2	3.03	2	5.41
Sedative/hypnotics/antipsychotics	2	3.03	0	0.00
Alcohols	1	1.52	1	2.70
Antimicrobials	1	1.52	0	0.00
Cosmetics/personal care products	1	1.52	1	2.70
Dietary supplements/herbals/homeopathic	1	1.52	1	2.70
Diuretics	1	1.52	0	0.00
Hormones and hormone antagonists	1	1.52	0	0.00
Total	66	100.00	37	100.00

^aIncludes all children with actual or estimated ages ≤ 5 years old. Results do not include "unknown child" or "unknown age". Includes death and death, indirect regardless of RCF.

^bPercentages are based on the total number of substances reported in pediatric fatalities ($N = 66$).

^cPercentages are based on the total number of single substance pediatric fatalities ($N = 37$).

Table 17(F). Substance categories most frequently identified in drug identification calls (top 25).

Substance (major generic category)	All substances	% ^a
Analgesics	57,281	35.00
Sedative/hypnotics/antipsychotics	29,468	18.01
Unknown drug	9808	5.99
Cardiovascular drugs	9681	5.92
Antidepressants	8329	5.09
Muscle relaxants	7520	4.59
Anticonvulsants	6301	3.85
Antihistamines	6274	3.83
Stimulants and street drugs	5634	3.44
Antimicrobials	5362	3.28
Information calls	4652	2.84
Hormones and hormone antagonists	3390	2.07
Gastrointestinal preparations	3335	2.04
Diuretics	1984	1.21
Miscellaneous drugs	1329	0.81
Cold and cough preparations	787	0.48
Anticholinergic drugs	396	0.24
Asthma therapies	395	0.24
Anticoagulants	383	0.23
Electrolytes and minerals	350	0.21
Vitamins	314	0.19
Dietary supplements/herbals/homeopathic	108	0.07
Other/unknown nondrug substances	103	0.06
Narcotic antagonists	82	0.05
Antineoplastics	66	0.04

^aPercentages are based on the total number of substances reported in all drug identification calls ($N = 163,663$).

17.6% of children between 6 and 12 years were managed in a HCF compared with 64.8% of teenagers (13–19 years) and 48.9% of adults (age ≥ 20 years).

Medical outcome

Table 11 displays the medical outcome of human exposure cases distributed by age. Older age groups exhibit a greater number of severe medical outcomes. Table 12 compares medical outcome and reason for exposure and shows a greater frequency of serious outcomes in intentional exposures.

The duration of effect is required for all cases which report at least one clinical effect and have a medical outcome of minor, moderate or major effect ($n = 532,905$; 24.7% of exposures). Table 13 demonstrates an increasing duration of the clinical effects observed with more severe outcomes.

Decontamination procedures and specific antidotes

Tables 14 and 15 outline the use of decontamination procedures, specific physiological antagonists (antidotes), and measures to enhance elimination in the treatment of patients reported in the NPDS database. These should be interpreted as minimum frequencies because of the limitations of telephone data gathering.

Ipecac-induced emesis for poisoning continues to decline as shown in Tables 16(A) and 16(B). Ipecac was administered in only 22 (0.00219%) pediatric exposures in 2016. The continued decrease in ipecac syrup use over the last two decades was likely a result of ipecac use guidelines issued in 1997 by the American Academy of Clinical Toxicology and the European Association of Poisons Centres and Clinical Toxicologists and updated in 2004 [3,4]. In a separate report, the American Academy of Pediatrics concluded not only that ipecac should no longer be used routinely as a home treatment strategy but also recommended disposal of home ipecac stocks [5]. A decline was also observed since the early 1990s for reported use of activated charcoal. While not as dramatic as the decline in use of ipecac, reported use of activated charcoal decreased from 3.66% of pediatric cases in 1993 to just 0.632% in 2016.

Top substances in human exposures

Table 17(A) presents the most common 25 substance categories, listed by frequency of human exposure for cases with more serious outcomes (moderate, severe, and death). This

ranking provides an indication where prevention efforts might be focused, as well as the types of serious exposures PCs regularly manage. It is relevant to know whether exposures to these substances are increasing or decreasing.

To better understand these relationships, we examined exposures with more serious outcomes per year over the last 16 years for the change over time for each of the 68 major generic categories via least squares linear regression. The serious outcome exposure cases per year over this period were increasing for 36 and decreasing for 32 of the 68 categories with data over the entire time period. The change over time for the 16 yearly values was statistically significant ($p < .05$) for 48 of the 68 categories with data for the entire time period. Table 17(B) shows the 25 categories which were increasing the most rapidly. Statistical significance of the linear regressions can be verified by noting the 95% confidence interval on the rate of increase excludes zero for all but one of the 25 categories. Figure 4 shows the change over time and linear regressions for the top four increasing categories in Table 17(B).

Tables 17(C) and 17(D) present exposure results for children and adults, respectively, and show the differences between substance categories involved in pediatric and adult exposures.

Table 17(E) reports the 25 categories of substances most frequently involved in pediatric (≤ 5 years) fatalities in 2016.

Table 17(F) reports the 25 Drug ID categories most frequently queried in 2016, highlighting the value of Drug ID information to the AAPCC, public health, public safety, and regulatory agencies. Internet based resources do not afford the caller the option to speak with a health care professional if needed. Proper resources to continue this vital public service are essential, especially since the top 10 substance categories include antibiotics as well as drugs with widespread use and abuse potential such as opioids and benzodiazepines.

Table 17(G) reports the 25 substance categories most frequently reported in exposures involving pregnant patients.

Changes over time

Total encounters peaked in 2008 at 4,333,012 calls with 2,491,049 human exposure cases and 1,703,762 information calls. Total encounters decreased 2.94% from 2,792,130 in 2015 to 2,710,042 in 2016. Information calls decreased by 12.5% from 560,467 calls in 2015 to 490,215 in 2016, with a 29.6% decrease in drug identification calls and a 0.454% increase in HCF information calls. Human exposures remained essentially level, decreasing by 0.431% from 2,168,371 to 2,159,032 cases over the same time period.

Figure 5 shows the year-to-year change through 2016 as a percentage of year 2000 for human exposure cases broken down into cases with more serious outcomes (death, major effect, and moderate effect) and less serious outcomes (minor effect, no effect, not followed (non-toxic), not followed (minimal toxicity possible), unable to follow (potentially toxic), and unrelated effect). Since 2000, cases with more serious outcomes have increased by 4.39% (95% CI

[4.06%, 4.72%]) per year from 108,148 cases in 2000 to 190,657 cases in 2016. However, cases with less serious outcomes have decreased since 2008 by 2.59% (95% CI [-3.35%, -1.82%]) per year from 2,339,460 in 2008 to 1,968,250 cases in 2016. This has driven the overall decrease in human exposures since 2008.

Thus, we see a consistent increase in exposure cases from HCFs (Figure 3) and for more severe exposures (Figure 5), despite a decrease in cases involving less severe exposures.

Distribution of suicides

Table 19(A) shows a modest variation in the distribution of suicides and pediatric deaths over the past 2 decades as reported to the NPDS national database. Within the last decade, the percent of exposures determined to be suspected suicides ranged from 30.3% to 50.5% and the percent of pediatric cases has ranged from 1.52% to 3.18%. The relatively large change seen for 2011 and 2012 reflects the large increase in indirect death reports in those years. Analyses of suicides and pediatric deaths for Direct and Indirect reports are shown in Table 19(B).

Plant exposures

Table 20 provides the number of times the specific plant was reported to NPDS ($N = 47,793$). The 25 most commonly involved plant species and categories account for 41.3% of all plant exposures reported. Three of the top five categories in the table are essentially synonymous for unknown plant and comprise 11.2% (5,357/47,793) of all plant exposures. For a variety of reasons, it was not possible to make a precise identification in these three groups. The top most frequent plant exposures where positive plant identification was made were (descending order): *Phytolacca americana*, *Cherry* (species unspecified), *Spathiphyllum* species, *Ilex* species, *Philodendron* (species unspecified), *Caladium* species, *mold* (food-related), and *Malus* species.

Deaths and exposure-related fatalities

A listing of cases (Table 21) and summary of cases (Tables 4, 5, 8, 9, 18, and 22) are provided for fatal cases for which there exists reasonable confidence that the death was a result of that exposure (exposure-related fatalities). Tables 11, 12, and 19 consider all deaths, irrespective of the RCF. Beginning in 2010, deaths recorded as Indirect Report were not further reviewed by the AAPCC fatality review team and the RCF was determined by the reporting PC.

There were 125 deaths, indirect and 1852 deaths. Of these 1977 cases, 1492 were judged exposure-related fatalities (RCF = 1 – undoubtedly responsible, 2 – probably responsible, or 3 – contributory). The remaining 485 cases were judged as follows: 98 as RCF = 4 – probably not responsible, 62 as RCF = 5 – clearly not responsible, and 325 as RCF = 6 – unknown.

Deaths are sorted in Table 21 according to the category, then substance deemed most likely responsible for the death

Table	Fatalities included	RCF	N
4	Death only	1,2,3	1415
5	Death only	1,2,3	1415
8	Death only	1,2,3	1415
9	Death only	1,2,3	1415
11	Death and Death (indirect report)	All	1977
12	Death and Death (indirect report)	All	1977
17E	Pediatric Death and Death (indirect report)	All	44
18	Death only	1,2,3	1415
19A	Death and Death (indirect report)	All	1977
19B	Death and Death (indirect report)	All	1977
21	Death and Death (indirect report)	1,2,3	1492
22	Death and Death (indirect report) - Single substance deaths only	All	946

(Cause Rank), and then by patient age. The Cause Rank permits the PC to judge 2 or more substances as indistinguishable in terms of cause, e.g. two substances which appear equally likely to have caused the death could have Substance Rank of 1,2 and Cause Rank of 1,1. Additional agents implicated are listed below the primary agent in the order of their contribution to the fatality.

As shown in Table 5, a single substance was implicated in 88.3% of reported human exposures, and 11.7% of patients were exposed to two or more drugs or products. The exposure-related fatalities involved a single substance in 593 cases (41.9%), two substances in 366 cases (25.9%), three in 180 cases (12.7%), and four or more in the balance of the cases.

In Table 21, the Annual Report ID number [bracketed] indicates that the narrative for that case is included in Appendix C. The letters following the Annual Report ID number indicate: i=Death, Indirect report (occurred in 77, 5.2% of cases), p=prehospital cardiac and/or respiratory arrest (occurred in 546 of 1,492, 36.6% of cases), h=hospital records reviewed (occurred in 945, 63.3% of cases), a=autopsy report reviewed (occurred in 439, 29.4% of cases). The distribution of NPDS RCF was 1=undoubtedly responsible in 782 cases (52.4%), 2=probably responsible in 564 cases (37.8%), and 3=contributory in 146 cases (9.79%). The denominator for these (Table 21) percentages is 1492.

All fatalities – all ages

Table 4 presents the age and gender distribution for these 1415 exposure-related fatalities (excluding death, indirect). The age distribution of reported fatalities showed a decrease in deaths among children (<20 years old) compared to 2015, with 73 cases representing 5.16% of fatalities. This was an absolute decrease of 17 fatalities with an 18.9% decrease in that age group. The age distribution of reported fatalities in adults (≥20 years) is similar to prior years with 1337 of 1415 (94.5%) fatal cases occurring in that age group and five (0.353%) occurring in unknown age patients. While children ≤5 years old were involved in the majority of exposures, the 24 deaths in this group comprised just 1.70% of the exposure-related fatalities. The number of deaths in this age group remained unchanged from 2015. Most (66.9%) of the fatalities occurred in 20–59-year-old individuals, a slightly increased percentage from prior years.

Table 21 lists each of the 1492 human fatalities (including death, indirect report) along with all of the substances involved for each case. Please note: the substance listed in

column 3 of Tables 21 (alternate name) was chosen to be the most specific generic name based upon the Micromedex Poisindex product name and generic code selected for that substance. Alternate names are maintained in the NPDS for each substance involved in a fatality. The cross-references at the end of each major category section in Table 21 list all cases that identify the substance as other than the primary substance. This alternate name may not agree with the AAPCC generic categories used in the summary tables (including Table 22).

Table 18 lists the top 25 minor generic substance categories associated with reported fatalities and the number of single substance exposure fatalities for that category: miscellaneous sedative/hypnotics/antipsychotics, opioids, miscellaneous stimulants and street drugs, and miscellaneous alcohols lead this list followed by acetaminophen alone, calcium antagonist, acetaminophen combinations, beta blockers, selective serotonin reuptake inhibitors (SSRIs), miscellaneous antihistamines, and miscellaneous antidepressants. Note that Table 18 is sorted by all substances to which a patient was exposed (i.e. a patient exposed to an opioid may have also been exposed to one or more other products) and shows single substance exposures in the right-hand column.

The first ranked substance (Table 21) was a pharmaceutical in 1196 (80.2%) of the 1492 fatalities. These 1196 first ranked pharmaceuticals included

429 analgesics (142 acetaminophen, 38 acetaminophen/hydrocodone, 36 fentanyl, 36 salicylate, 28 oxycodone, 20 hydrocodone, 20 methadone, 19 acetaminophen/oxycodone, 13 tramadol, 11 acetaminophen/diphenhydramine, 10 morphine)

215 cardiovascular drugs (56 amlodipine, 26 diltiazem, 20 metoprolol, 17 verapamil, 14 digoxin, 14 propranolol, 10 carvedilol, 9 diltiazem [extended release], 8 beta blocker)

177 stimulants/street drugs (94 heroin, 39 cocaine, 21 methamphetamine, 5 amphetamine)

124 antidepressants (36 amitriptyline, 27 bupropion, 12 venlafaxine, 11 bupropion [extended release], 7 nortriptyline, 4 doxepin)

71 sedative/hypnotic/antipsychotics (14 quetiapine, 13 alprazolam, 7 zolpidem, 6 lorazepam, 5 benzodiazepine)

The exposure was acute (A) in 842 (56.4%), acute on chronic (A/C) in 318 (21.3%), chronic (C) in 83 (5.6%), and unknown (U) in 249 (16.7%).

A total of 1556 tissue concentrations for 1 or more related analytes were reported in 711 cases. Most of these (1439) involved fatalities with RCF of 1–3, and are listed in Table 21, while all tissue concentrations are available to the PCs through the NPDS Enterprise Reports. These 143 analytes included: 246 acetaminophen, 185 ethanol, 79 salicylate, 49 fentanyl, 39 carboxyhemoglobin, 34 methanol, 30 diphenhydramine, 28 alprazolam, 26 benzoylcegonine, 24 methadone, 23 morphine (free), 22 morphine, 18 digoxin, 18 ethylene glycol, 17 diazepam, 17 7-aminoclonazepam, 17 oxycodone, 16 nortriptyline, 15 nordiazepam, 15 norfentanyl, 15 amphetamine, 14 amitriptyline, 14 bupropion, 13 citalopram, 13 methamphetamine, and 13 hydrocodone.

Table 17G. Substance categories most frequently involved in pregnant exposures^a (top 25).

Substance (major generic category)	All substances	% ^b	Single substance exposures	% ^c
Analgesics	980	11.33	589	9.29
Cleaning substances (household)	663	7.67	505	7.97
Pesticides	587	6.79	527	8.31
Bites and envenomations	559	6.46	397	6.26
Fumes/gases/vapors	510	5.90	482	7.60
Infectious and toxin-mediated diseases	315	3.64	191	3.01
Sedative/hypnotics/antipsychotics	313	3.62	133	2.10
Vitamins	307	3.55	234	3.69
Antidepressants	297	3.43	149	2.35
Antihistamines	266	3.08	175	2.76
Other/unknown nondrug substances	229	2.65	155	2.45
Foreign bodies/toys/miscellaneous	214	2.47	204	3.22
Antimicrobials	213	2.46	153	2.41
Cosmetics/personal care products	203	2.35	187	2.95
Stimulants and street drugs	199	2.30	95	1.50
Chemicals	182	2.10	158	2.49
Gastrointestinal preparations	160	1.85	123	1.94
Hydrocarbons	154	1.78	144	2.27
Electrolytes and minerals	148	1.71	107	1.69
Cold and cough preparations	142	1.64	85	1.34
Plants	138	1.60	124	1.96
Hormones and hormone antagonists	136	1.57	106	1.67
Cardiovascular drugs	133	1.54	75	1.18
Alcohols	125	1.45	45	0.71
Information calls	124	1.43	99	1.56

^aIncludes all patient classified as pregnant and all female patients with a "duration of pregnancy" greater than 0.

^bPercentages are based on the total number of substances reported in pregnant exposures ($N = 8647$).

^cPercentages are based on the total number of single substance pregnant exposures ($N = 6338$).

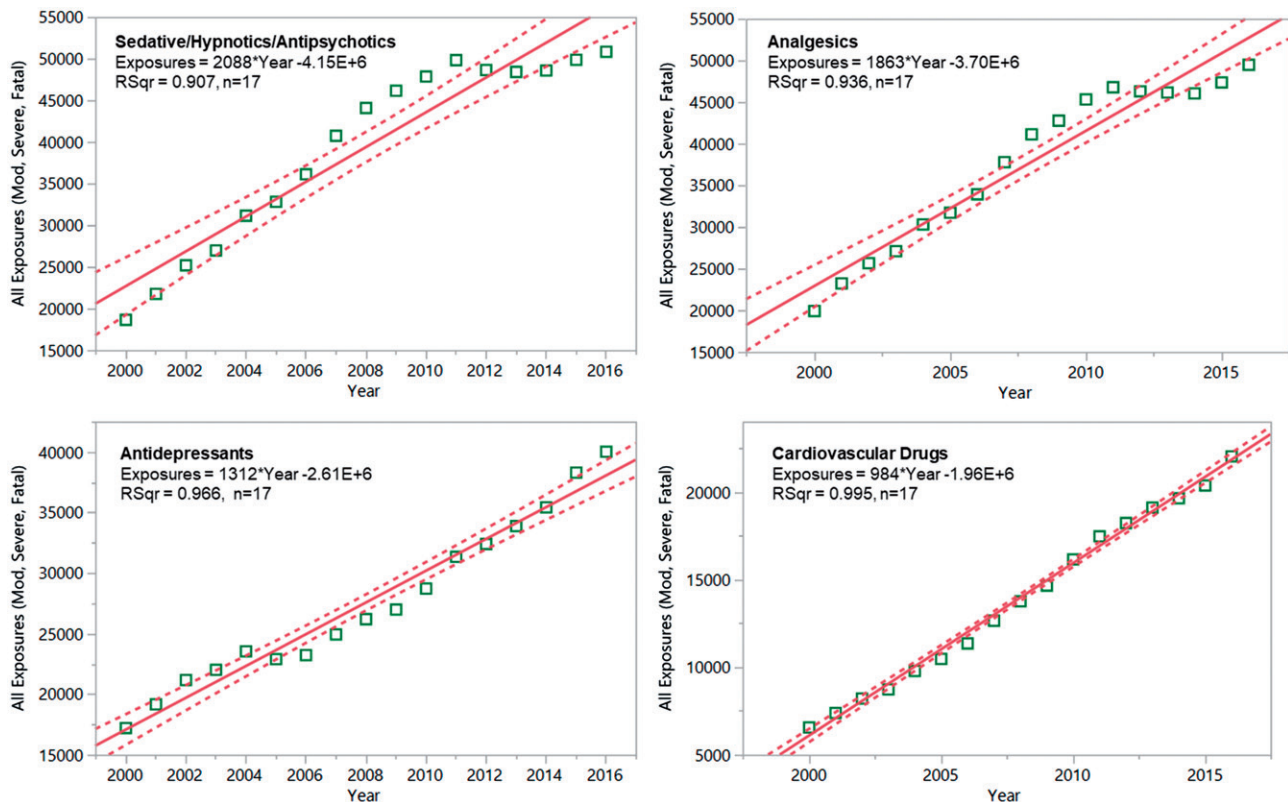


Figure 4. Substance categories with the greatest rate of exposure increase since 1 January 2000 for more severe outcomes (Top 4). Solid lines show least-squares linear regressions for the human exposure cases per year for that category (□). Broken lines show 95% confidence interval on the regression.

Route of exposure was ingestion only in 1054 cases (70.6%), inhalation/nasal in 112 cases (8.04%), and parenteral in 67 cases (4.49%). Parenteral cases decreased by 36.8% from 2015. Most other exposures recorded a combination of routes or an unknown route.

The intentional exposure reason was suspected suicide in 775 cases (51.9%), abuse in 234 cases (15.7%), unknown in 83 cases (5.56%), and misuse in 59 cases (3.95%). Unintentional exposure reasons were environmental in 56 cases (3.75%), general in 31 cases 2.08%), therapeutic error in

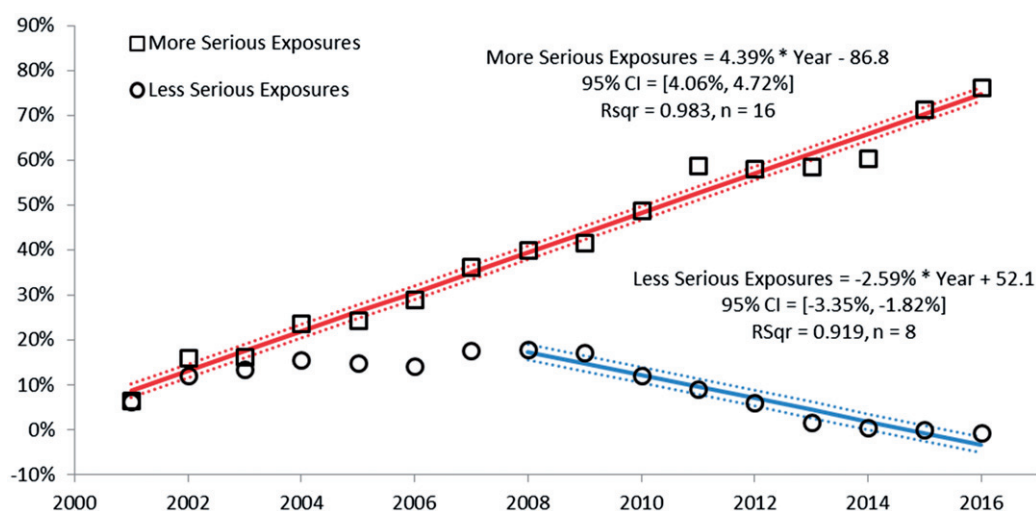


Figure 5. Change in encounters by outcome from Year 2000. The figure shows the percent change from baseline (year 2000) for human exposure cases divided among the 10 medical outcomes. The more serious exposures (major, moderate, and death) increased. The less serious exposures (no effect, minor effect, not followed (non-toxic), not followed (minimal toxicity possible), unable to follow (potentially toxic) and unrelated effect) decreased after 2008. Solid lines show least-squares linear regressions for the change in more serious exposures per year (\square) and less serious exposures (\circ). Broken lines show 95% confidence intervals on the regression.

Table 18. Categories associated with largest number of fatalities (top 25)^a.

Substance (minor generic category)	All substances	% ^b	Single substance exposures	% ^c
Miscellaneous sedative/hypnotics/antipsychotics	416	12.20	15	2.53
Opioids	283	8.30	38	6.41
Miscellaneous stimulants and street drugs	260	7.62	68	11.47
Miscellaneous alcohols	237	6.95	17	2.87
Acetaminophen alone	184	5.39	73	12.31
Calcium antagonists	142	4.16	19	3.20
Acetaminophen combinations	129	3.78	36	6.07
Beta blockers	115	3.37	11	1.85
Selective serotonin reuptake inhibitors (SSRI)	102	2.99	1	0.17
Miscellaneous antihistamines	95	2.79	11	1.85
Miscellaneous antidepressants	92	2.70	9	1.52
Miscellaneous unknown drug	89	2.61	23	3.88
Miscellaneous fumes/gases/vapors	80	2.35	47	7.93
Hypoglycemic, single agent	72	2.11	10	1.69
Tricyclic antidepressants (TCA)	66	1.93	20	3.37
Acetylsalicylic acid alone	65	1.91	18	3.04
Miscellaneous anticonvulsants	64	1.88	2	0.34
Nonsteroidal antiinflammatory drugs	64	1.88	9	1.52
Miscellaneous cardiovascular drugs	62	1.82	21	3.54
Miscellaneous muscle relaxants	61	1.79	6	1.01
Anticonvulsants: gamma aminobutyric acid and analogs	60	1.76	3	0.51
Serotonin norepinephrine reuptake inhibitors (SNRI)	51	1.50	3	0.51
Miscellaneous chemicals	47	1.38	17	2.87
Angiotensin converting enzyme inhibitor	39	1.14	0	0.00
Cannabinoids and analogs	32	0.94	0	0.00

^aNumbers represent total exposures associated with 1415 fatalities (with RCF of 1 – undoubtedly responsible, 2 – probably responsible, or 3 – contributory); each fatality may have had exposure to more than one substance.

^bPercentages are based on the total number of substances reported in fatal exposures ($N = 3411$).

^cPercentages are based on the total number of single substance fatal exposures ($N = 593$).

27 cases (1.81%), and misuse in 16 cases (1.07%). Adverse drug reaction was the reason in 38 (2.55%).

Pediatric fatalities – age ≤ 5 years

Although children younger than 6 years were involved in the majority of exposures, they comprised only 44 of 1977 (2.23%) of fatalities. These numbers are similar to those reported since 1985 (Table 19(A), all RCFs and includes indirect deaths). Table 8 (RCF 1, 2, or 3, excludes indirect deaths) shows the percentage fatalities in children ≤ 5 years related to total pediatric exposures was 24/1,002,344 = 0.00239%. By

comparison, 1337/842,034 = 0.159% of all adult exposures involved a fatality. Of these 24 pediatric fatalities, 17 (70.8%) were reported as unintentional, four (16.7%) were reported as unknown, and three (12.5%) were coded as resulting as other – malicious (Table 8).

The 30 fatalities in children ≤ 5 years old in Table 21 (includes death, indirect reports and RCF 1–3) included 16 pharmaceuticals and 14 non-pharmaceuticals. The first ranked substances associated with these fatalities included fumes/gases/vapors (10), analgesics (9), batteries (disc/button; 4), stimulants and street drugs (3), antihistamines (2), antidepressants (1), and cardiovascular drugs (1).

Pediatric fatalities – ages 6–12 years

In the age range 6–12 years, there were seven reported fatalities: three were intentional suspected suicide, one was unintentional environmental, one was unintentional food poisoning, one was intentional misuse, and one was intentional unknown reason (Table 8). The seven fatalities listed in Table 21 (includes death, indirect reports and RCF 1–3)

Table 19(A). Comparisons of death data (1985–2016)^a.

Year	Total fatalities		Suicides		Pediatric deaths ^b	
	N	% of cases	N	% of deaths	N	% of deaths
1985	328	0.036	174	53.0	20	6.1
1986	406	0.037	223	54.9	15	3.7
1987	398	0.034	227	57.0	22	5.5
1988	544	0.040	296	54.4	30	5.5
1989	590	0.037	323	54.7	24	4.1
1990	553	0.032	320	57.9	21	3.8
1991	764	0.042	408	53.4	44	5.8
1992	705	0.038	395	56.0	29	4.1
1993	626	0.036	338	54.0	27	4.3
1994	766	0.040	410	53.5	26	3.4
1995	724	0.036	405	55.9	20	2.8
1996	726	0.034	358	49.3	29	4.0
1997	786	0.036	418	53.2	25	3.2
1998	775	0.035	421	54.3	16	2.1
1999	873	0.040	472	54.1	24	2.7
2000	921	0.042	477	51.8	20	2.2
2001	1085	0.048	553	51.0	27	2.5
2002	1170	0.049	635	54.3	27	2.3
2003	1109	0.046	592	53.4	35	3.2
2004	1190	0.049	642	53.9	27	2.3
2005	1438	0.059	674	46.9	32	2.2
2006	1515	0.063	705	46.5	39	2.6
2007	1597	0.064	737	46.1	47	2.9
2008	1756	0.070	797	45.4	39	2.2
2009	1544	0.062	779	50.5	37	2.4
2010	1730	0.072	779	45.0	55	3.2
2011	2765	0.118	865	31.3	42	1.5
2012	2937	0.129	890	30.3	46	1.6
2013	2477	0.113	785	31.7	51	2.1
2014	1835	0.085	790	43.1	34	1.9
2015	1831	0.084	814	44.5	42	2.3
2016	1977	0.091	906	45.8	44	2.2

^aHuman exposures with medical outcome of death or death, indirect regardless of RCF.

^bIncludes all children with actual or estimated ages ≤ 5 years old. Results do not include “unknown child” or “unknown age”. Includes death and death, indirect regardless of RCF.

included analgesics (2), fumes/gases/vapors (1), infectious and toxin-mediated diseases (1), antidepressants (1), antihistamines (1), and cardiovascular drugs (1).

Adolescent fatalities – ages 13–19 years

In the age range 13–19 years, there were 42 reported fatalities, a decrease of 16 (27.6%) from 2015, and included 36 intentional, two unintentional, and four unknown reason (Table 8). The 42 fatalities listed in Table 21 (includes death, indirect reports and RCF 1–3) included 37 pharmaceuticals and 10 non-pharmaceuticals. The first ranked pharmaceuticals associated with these fatalities included: analgesics (14), antidepressants (8), stimulants and street drugs (4), anticonvulsants (2), antihistamines (2) cardiovascular drugs (2), sedative/hypnotics/antipsychotics (2), unknown drug (2), and cold and cough preparations (1). The first ranked non-pharmaceutical associated with these fatalities included: alcohols (2), automotive/aircraft/boat products (2), fumes/gases/vapors (2), chemicals (1), hydrocarbons (1), pesticides (1), and plants (1).

Pregnancy and fatalities

There were seven deaths in pregnant women reported to NPDS in 2016. A total of 43 deaths of pregnant women have been reported from the years 2000 through 2016. The majority (35 of 43, 81.4%) were intentional exposures (misuse, abuse, or suspected suicide).

AAPCC surveillance results

Key components of the NPDS surveillance system include the automated monitoring tools available to the NPDS user community. In addition to AAPCC national surveillance definitions, 28 PCs utilize NPDS as a part of their surveillance programs. The CDC, six state health departments, one county health department, and one state police department run surveillance definitions in NPDS. Since Surveillance Anomaly 1,

Table 19(B). Comparisons of direct and indirect death data (2000–2016)^a.

Year	All deaths			Suicides				Pediatric deaths					
	Total	Direct	Indirect	Total	% of deaths	Direct	% of direct	Indirect	Total	% of deaths	Direct	% of direct	Indirect
2000	864	845	19	448	51.85	443	52.43	5	18	2.08	18	2.13	0
2001	1,066	952	114	542	50.84	503	52.84	39	26	2.44	24	2.52	2
2002	850	739	111	455	53.53	436	59.00	19	24	2.82	15	2.03	9
2003	867	826	41	464	53.52	454	54.96	10	29	3.34	22	2.66	7
2004	955	898	57	516	54.03	501	55.79	15	25	2.62	21	2.34	4
2005	1423	1332	91	666	46.80	656	49.25	10	32	2.25	26	1.95	6
2006	1515	1415	100	705	46.53	687	48.55	18	39	2.57	32	2.26	7
2007	1597	1502	95	737	46.15	712	47.40	25	47	2.94	41	2.73	6
2008	1756	1535	221	797	45.39	750	48.86	47	39	2.22	32	2.08	7
2009	1544	1452	92	779	50.45	748	51.52	31	37	2.40	31	2.13	6
2010	1730	1455	275	779	45.03	732	50.31	47	55	3.18	47	3.23	8
2011	2765	1503	1262	865	31.28	758	50.43	107	42	1.52	31	2.06	11
2012	2937	1507	1430	890	30.30	759	50.36	131	46	1.57	30	1.99	16
2013	2477	1552	925	785	31.69	698	44.97	87	51	2.06	43	2.77	8
2014	1835	1559	276	790	43.05	757	48.56	33	34	1.85	23	1.48	11
2015	1831	1670	161	814	44.46	784	46.95	30	42	2.29	34	2.04	8
2016	1977	1852	125	906	45.83	885	47.79	21	44	2.23	37	2.00	7

^aHuman exposures with medical outcome of death or death, indirect regardless of RCF.

Table 20. Frequency of plant exposures (top 25)^a.

	Botanical name or category	AAPCC Generic Code Name	N
1	Plants-general-unknown	Unknown Toxic Types or Unknown if Toxic	2213
2	Unknown Botanical Name	Unknown Toxic Types or Unknown if Toxic	1721
3	Plants-toxicodendrol	Skin Irritants (Excluding Oxalate Containing Plants)	1594
4	<i>Phytolacca americana</i> (L.)	Gastrointestinal Irritants (Excluding Oxalate Containing Plants)	1500
5	BOTANICAL TERMS	Unknown Toxic Types or Unknown if Toxic	1423
6	Cherry (Species unspecified)	Amygdalin and/or Cyanogenic Glycosides	1338
7	Plants-pokeweed	Other Toxic Types	1004
8	<i>Spathiphyllum</i> spp.	Oxalates	850
9	Plants-cardiac glycosides	Cardiac Glycosides (Excluding Drugs)	795
10	<i>Ilex</i> spp. (not otherwise specified)	Gastrointestinal Irritants (Excluding Oxalate Containing Plants)	757
11	<i>Philodendron</i> spp.	Oxalates	561
12	<i>Caladium</i> spp.	Oxalates	544
13	Mold, food related	Unknown Toxic Types or Unknown if Toxic	496
14	Plants-oxalates	Oxalates	494
15	Berry (not otherwise specified)	Unknown Toxic Types or Unknown if Toxic	486
16	<i>Malus</i> spp.	Amygdalin and/or Cyanogenic Glycosides	468
17	<i>Zantedeschia aethiopica</i>	Oxalates	443
18	<i>Euphorbia tirucalli</i> (L.)	Skin Irritants (Excluding Oxalate Containing Plants)	440
19	Plants-mitragyna	Hallucinogenics	428
20	<i>Solanum dulcamara</i>	Solanine	404
21	<i>Solanum nigrum</i>	Solanine	394
22	<i>Taxus canadensis</i>	Other Toxic Types	372
23	<i>Epipremnum areum</i>	Oxalates	358
24	Unknown Botanical Name	Non-Toxic	340
25	<i>Begonia argenteo-guttata</i>	Non-Toxic	339

^aNumber of substances related to a human exposure with a Major Generic Category of Plant. Unknown Botanical Name represents substances with a Major Generic Category of Plant and a NULL substance code. Total =47,793.

generated at 2:00pm EDT on 17 September 2006, over 304,000 anomalies have been detected and reported. Over 2100 were confirmed as being of public health significance with PCs working collaboratively with their local and state health departments and, in some instances the CDC, on the public health issues identified.

At the time of this report, 310 surveillance definitions run continuously, monitoring case and clinical effects volume and a variety of case-based definitions from food poisoning to nerve agents. These definitions represent the surveillance work by many PCs, state health departments, the AAPCC, and the Health Studies Branch, Division of Environmental Hazards and Health Effects, National Center for Environmental Health, and CDC. NPDS has also been used for surveillance during mass gathering events, such as the Super Bowl.

The methodology for automating surveillance continues to be improved in efforts to detect the index case of any relevant public health event. Algorithms for identifying the index case vary greatly with regard to the substance to be identified. No individual algorithm works for every application [6]. The magnitude and penetrance of NPDS are critical to epidemiologic surveillance and to the ability to substantiate situational awareness for clinicians, policymakers, and public health officials nationwide. Typically, NPDS surveillance detects the response to an event, rather than predicting an event. This fosters situational awareness and resilience during and after a public health event. Situational awareness is undoubtedly beneficial to public health surveillance [7].

As an illustrative example, the regional pattern and granularity of the opioid epidemic in the United States continue to evolve. Recent implementation of legal and other restrictions on availability of prescription opioid analgesics has curbed the use of licit opioids, while ostensibly driving the market toward illicit opioid use. This is evident in trends toward

increasing exposures to heroin as well as to fentanyl and high potency fentanyl analogs. We examined the more serious (Outcome = Moderate, Major or Death) NPDS single-substance exposures to heroin (generic code 0037702) and to opioid medications (23 generic codes). We compared these exposures with unintentional mortality data from the CDC's National Center for Health Statistics [8] for 2000 through 2016 (Figure 6). Identification of opioid type and search methodology followed from those previously described [1,9].

Both NPDS and CDC prescription opioid cases steadily increased until 2010, after which they plateaued and have decreased in more recent years. In contrast, heroin cases from both data sources show relatively slow increases until 2010, after which the frequency of reported cases is rapidly increasing. This dramatic increase over time suggests that a decrease in prescription opioid morbidity and mortality is overshadowed by the increase in heroin morbidity and mortality. The difference in absolute frequencies between the CDC and NPDS data may reflect voluntary reporting into NPDS compared with the CDC's more comprehensive use of national death certificate data.

Heroin exposures and deaths continue to climb sharply, and this increase in NPDS exposures continues up to the present. Continuing availability of heroin, its low price and high purity are likely contributors to the increase in heroin morbidity and mortality. CDC mortality figures show unintentional heroin overdose (OD) deaths nearly tripling from 2011 to 2015, while those involving synthetic opioids nearly doubled between 2013 and 2014. The rise in heroin consumption and in complications of heroin use has in turn been linked to prescription opioid use, with prior misuse of licit opioids as a major risk factor for heroin initiation. Illicit fentanyl or potent fentanyl derivatives are often sold as heroin or found as adulterants of street heroin. This may be contributing to recent increases in drug OD deaths involving

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures.

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
Non-Pharmaceutical Exposures										
Alcohols										
1h	15 y M	Ethanol	2	1	U	Ingst + Inhal	Int-S	2		
		Metformin	1	1						
		Marijuana	3	3						
2ph	18 y F	Ethanol	1	1	A	Ingst + Inhal	Int-U	2	Ethanol	184 mg/dL in serum @ unknown
		Marijuana	2	2						
3ph	25 y F	Ethanol	1	1	A	Ingst	Int-S	2	Ethanol	505 mg/dL in serum @ unknown
		Acetaminophen/dextromethorphan/doxylamine	2	2						
4	25 y M	Ethanol	1	1	A	Ingst	Int-S	1		
		Cardiac glycoside (bufadienolide)	2	2						
5a	28 y F	Methanol	1	1	A	Ingst	Int-S	1	Methanol	0.238% (wt/vol) in serum @ autopsy
		Methanol	1	1					Methanol	228 mg/dL in blood (unspecified) @ unknown
		Diphenhydramine	2	2					Diphenhydramine	0.3 mg/L in blood (unspecified) @ autopsy
6p	29 y F	Ethanol	1	1	A	Ingst	Int-S	2		
		Alprazolam	2	2						
7h	30 y M	Alcohol, unknown	1	1	A	Ingst	Int-S	3	Ethanol	153 mg/dL in blood (unspecified) @ unknown
8	30 y M	Methanol	1	1	U	Ingst	Int-S	1	Methanol	379 mg/dL in blood (unspecified) @ unknown
		Drug, unknown	2	2						
9ph	32 y M	Isopropanol	1	1	A	Ingst	Int-A	2		
		Ethanol	2	2						
10ph	32 y M	Ethanol	1	1	A	Ingst + Unk	Int-A	2	Ethanol	258 mg/dL in blood (unspecified) @ unknown
		Heroin	2	2						
		THC homolog	3	3						
11ph	35 y M	Ethanol	1	1	U	Ingst	Int-A	1	Ethanol	115 mcg/dL in blood (unspecified) @ unknown
		Lorazepam	2	2						
12	38 y F	Ethanol	1	1	A/C	Ingst	Int-S	1		
		Venlafaxine	2	2						
		Lamotrigine	3	3						
		Topiramate	4	4						
		Diltiazem	5	5						
		Salicylate	6	6						
13h	41 y F	Ethanol	1	1	C	Unk	Int-A	3	Ethanol	59 mg/dL in blood (unspecified) @ unknown
14h	42 y M	Ethanol	1	1	C	Ingst	Oth-W	3	Ethanol	48 mg/dL in blood (unspecified) @ unknown
15pa	42 y F	Ethanol	1	1	A	Unk	Int-A	1	Ethanol	0.3% (wt/vol) in blood (unspecified) @ autopsy
		Ethanol	1	1					Ethanol	0.44% (wt/vol) in blood (unspecified) @ autopsy

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
16p	45 y M	Ethanol	1	1	A	Ingst	Int-S	1	Ethanol	0.46% (wt/vol) in blood (unspecified) @ autopsy
		Ethanol	1	1					Ethanol	0.47% (wt/vol) in urine (quantitative only) @ autopsy
		Ethanol	1	1					Ethanol	0.51% (wt/vol) in vitreous @ autopsy
17a	45 y M	Ethanol	1	1	U	Unk	Unk	1	Methanol	88 mg/dL in blood (unspecified) @ unknown
		Methanol	1	1						
18h	45 y M	Drug, unknown	2	2	C	Ingst	Int-A	2		
		Ethanol	1	1						
19ha	46 y M	Acetaminophen	2	2	A	Unk	Int-U	2	Ethanol	279 mg/dL in blood (unspecified) @ unknown
		Ethanol	1	1						
20h	46 y M	Drug, unknown	2	2	A	Ingst	Unk	3	Ethanol	165 mg/dL in plasma @ unknown
		Ethanol (non-beverage)	1	1						
21ph	47 y F	Ethanol	1	1	A/C	Ingst	Int-A	3	Ethanol	13 mg/dL in blood (unspecified) @ unknown
22h	49 y F	Diphenhydramine	2	2	A	Ingst	Int-S	1		
		Methanol	1	1					Methanol	13 mg/dL in serum @ 17 h (pe)
		Methanol	1	1					Methanol	176 mg/dL in serum @ 0.5 h (pe)
		Methanol	1	1					Methanol	34 mg/dL in serum @ 12 h (pe)
		Methanol	1	1					Methanol	7 mg/dL in serum @ 19 h (pe)
23ha	50 y M	Methanol	1	1	U	Ingst	Unk	1	Methanol	222 mg/dL in blood (unspecified) @ unknown
		Methanol	1	1					Methanol	24 mg/dL in blood (unspecified) @ autopsy
		Methanol	1	1					Methanol	29 mg/dL in vitreous @ autopsy
24h	51 y M	Ethanol	1	1	U	Ingst	Unk	2		
		Substance (non-drug), unknown	2	2						
25h	52 y M	Methanol	1	1	A	Ingst	Int-S	1	Methanol	485 mg/dL in blood (unspecified) @ unknown
26ph	52 y F	Ethanol	1	1	U	Ingst	Int-S	2	Ethanol	187 mg/dL in serum @ 1 m (pe)
27p	53 y F	Hydroxyzine	2	2	A	Ingst	Unk	2	Methanol	10.2 mg/dL in serum @ unknown
		Methanol	1	1						
28h	53 y F	Ethanol	1	1	C	Ingst	Unk	3	Ethanol	16 mg/dL in blood (unspecified) @ unknown
29h	53 y M	Cough syrup	2	2	U	Ingst	Unk	3		
		Ethanol	1	1						
30ha	55 y F	Metformin	2	2	A	Ingst	Oth-C	1	Methanol	0.08 g/dL in blood (unspecified) @ unknown
		Methanol	1	1						
		Methanol	1	1						

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
31ha	57 y F	Ethanol	1	1	A/C	Ingst	Unt-U	1	Ethanol	95 mg/dL in serum @ autopsy
		Benzodiazepine	2	2					Nordiazepam	14 ng/mL in serum @ autopsy
		Benzodiazepine	2	2					Midazolam	28 ng/mL in serum @ autopsy
		Benzodiazepine	2	2					Diazepam	6 ng/mL in serum @ autopsy
32	57 y F	Brodifacoum	3	3						
		Ethanol	1	1	U	Ingst + Unk	Int-S	2	Ethanol	34 mg/dL in blood (unspecified) @ unknown
33h	58 y F	Drug, unknown	2	2						
		Methanol	1	1	A	Ingst	Int-S	1	Methanol	61 mg/dL in blood (unspecified) @ unknown
34h	58 y F				A	Ingst	Int-S	1		
		Methanol	1	1					Methanol	140 mg/dL in blood (unspecified) @ unknown
35	61 y M				A/C	Ingst	Unk	3		
		Ethanol	1	1						
36pha	61 y F				A	Unk	Unk	2		
		Methanol	1	1					Methanol	27 mg/dL in blood (unspecified) @ unknown
37h	63 y M				A	Ingst	Int-S	2		
		Alcohol, unknown	1	1						
		Salicylate	2	2					Salicylate	18 mg/dL in blood (unspecified) @ unknown
38h	66 y M	Acetaminophen	3	3						
		Methanol	1	1	A	Ingst	Int-S	1	Methanol	184 mg/dL in blood (unspecified) @ unknown
		Methanol	1	1					Methanol	33 mg/dL in blood (unspecified) @ 24 h (pe)
39h	79 y M				U	Ingst	Unk	1		
		Methanol	1	1					Methanol	281 mg/dL in blood (unspecified) @ 1 d (pe)
		Methanol	1	1					Methanol	36 mg/dL in blood (unspecified) @ 3 d (pe)
		Methanol	1	1					Methanol	560 mg/dL in blood (unspecified) @ 4 h (pe)
		Methanol	1	1					Methanol	97 mg/dL in blood (unspecified) @ 2 d (pe)
40ph	unknown adult (>=20 yrs) F				A	Ingst	Int-S	2		
		Ethanol	1	1					Ethanol	45 mg/dL in blood (unspecified) @ 1 h (pe)
		Cocaine	2	2					Benzoylcognine	510 ng/mL in blood (unspecified) @ autopsy
		Hydrocodone	3	3					Morphine (free)	29 ng/mL in blood (unspecified) @ autopsy
See also case 45, 48, 50, 55, 60, 80, 83, 84, 92, 94, 96, 100, 114, 133, 143, 160, 163, 167, 172, 179, 186, 193, 198, 249, 250, 259, 284, 308, 309, 314, 338, 339, 348, 350, 351, 352, 358, 359, 361, 363, 365, 369, 381, 382, 390, 391, 398, 411, 413, 415, 417, 419, 420, 423, 433, 436, 439, 445, 446, 459, 462, 468, 482, 483, 484, 487, 490, 494, 496, 497, 514, 516, 520, 521, 523, 529, 532, 533, 535, 538, 546, 549, 550, 554, 556, 560, 562, 567, 572, 578, 600, 609, 611, 614, 617, 619, 643, 650, 729, 734, 737, 738, 748, 749, 767, 768, 773, 780, 783, 792, 795, 797, 800, 806, 811, 812, 816, 820, 821, 832, 838, 839, 850, 853, 861, 862, 873, 884, 890, 891, 892, 901, 919, 922, 925, 928, 941, 946, 956, 976, 977, 978, 993, 996, 1000, 1002, 1011, 1029, 1045, 1047, 1051, 1059, 1087, 1124, 1126, 1127, 1132, 1139, 1152, 1166, 1169, 1184, 1186, 1204, 1207, 1210, 1213, 1214, 1215, 1218, 1219, 1220, 1225, 1228, 1233, 1259, 1269, 1272, 1278, 1305, 1318, 1326, 1337, 1339, 1340, 1350, 1357, 1359, 1360, 1361, 1370, 1375, 1377, 1378, 1390, 1391, 1392, 1400, 1404, 1405, 1408, 1413, 1421, 1422, 1424, 1426, 1427, 1428, 1440, 1444, 1455, 1465, 1480, 1486, 1492										
Automotive/aircraft/boat products										
[41ha]	16 y M	Automotive-aircraft-boat product	1	1	A	Ingst	Int-A	1		

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
42phai	16 y U	Automotive-aircraft-boat product	1	1	A	Ingst	Int-A	1	Methanol	110 mg/dL in blood (unspecified) @ autopsy
43h	30 y F	Ethylene glycol (antifreeze)	1	1	A	Ingst	Int-S	2		
44h	31 y M	Methanol	1	1	A	Ingst	Unt-U	1		
45h	32 y M	Methanol	1	1	A	Ingst	Int-S	1	Methanol	205 mg/dL in blood (unspecified) @ unknown
46a	36 y M	Ethanol	2	2	A	Ingst	Int-S	1		
		Ethylene glycol (antifreeze)	1	1					Ethylene glycol	1254 mg/dL in plasma @ unknown
		Butalbital	2	2					Butalbital	11.8 ng/mL in blood (unspecified) @ autopsy
		Marijuana	3	3					Carboxy-thc	13.8 ng/mL in blood (unspecified) @ autopsy
47	36 y M	Methanol	1	1	A	Ingst	Int-A	1		
48	38 y M	Ethylene glycol (antifreeze)	1	1	A	Ingst	Int-S	3		
		Ethanol	2	2						
49h	43 y M	Glycol/methanol	1	1	C	Ingst	Int-A	1	Methanol	461 mg/dL in serum @ unknown
		Chemical, unknown	2	2						
50h	45 y F	Methanol	1	1	A	Ingst	Int-S	1	Methanol	198 mg/dL in blood (unspecified) @ Unspecified
		Methanol	1	1					Methanol	95 mg/dL in blood (unspecified) @ Unspecified
		Ethanol	2	2						
51	47 y F	Glycol/methanol	1	1	A	Ingst	Int-M	1		
52ph	48 y M	Ethylene glycol (antifreeze)	1	1	A	Ingst	Int-S	1	Ethylene glycol	131 mcg/dL in serum @ unknown
53h	49 y M	Methanol	1	1	A	Ingst	Int-U	1	Methanol	166 mg/dL in blood (unspecified) @ unknown
		Ethylene glycol (antifreeze)	2	2						
54h	54 y F	Methanol	1	1	A	Ingst	Int-S	1	Methanol	0 mg/dL in blood (unspecified) @ unknown
		Methanol	1	1					Methanol	80 mg/dL in blood (unspecified) @ unknown
55ha	55 y M	Ethylene glycol (antifreeze)	1	1	A	Ingst	Int-A	2	Ethylene glycol	360 mg/dL in blood (unspecified) @ autopsy
		Isopropanol	2	2					Isopropanol	13 mg/dL in blood (unspecified) @ autopsy
		Isopropanol	2	2					Acetone	18 mg/dL in blood (unspecified) @ autopsy
56	56 y M	Ethylene glycol (antifreeze)	1	1	A/C	Ingst	Int-S	2		
57h	57 y M	Ethylene glycol (antifreeze)	1	1	A	Ingst	Int-S	1	Ethylene glycol	6584.9 mcg/mL in blood (unspecified) @ 2 d (pe)
		Rodenticide, unknown	2	2						
58	62 y M	Methanol	1	1	A	Ingst	Int-S	1	Methanol	340 mg/dL in blood (unspecified) @ unknown

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
59phi	65 y M	Acetaminophen/ diphenhydramine	2	2	A	Ingst	Int-S	2		
		Beta blocker	3	3						
		Ethylene glycol (antifreeze)	1	1						
60	65 y M	Lorazepam	2	2	A	Ingst	Unk	1	Methanol	331 mg/dL in blood (unspecified) @ unknown
		Methanol	1	1						
		Ethanol	2	2						
Batteries										
61ai	2 y F				A	Ingst	Unt-G	1		
		Battery, disc (lithium)	1	1						
62i	4 y F				A	Ingst	Unt-G	1		
		Battery, disc (lithium)	1	1						
63i	3 m F				A	Ingst	Unt-G	1		
		Battery, disc	1	1						
64a	13 m M				A	Ingst	Unt-G	1		
		Battery, disc (lithium)	1	1						
Bites and envenomations										
[65ph]	23 y M				A	B-S	Unt-B	1		
		Sting (hymenoptera)	1	1						
[66ha]	48 y M				A	B-S	Unt-B	1		
		Envenomation (crotalinae)	1	1						
[67ph]	53 y M				A	B-S	Unt-B	1		
		Envenomation (crotalid)	1	1						
68ph	70 y M				A	B-S	Unt-B	1		
		Sting (hymenoptera)	1	1						
69h	91 y M				A	B-S	Unt-B	3		
		Sting (hymenoptera)	1	1						
Chemicals										
70h	16 y M				A	Ingst	Unk	2		
		Potassium nitrate	1	1						
71ha	20 y M				A	Ingst	Int-S	1		
		Ethylene glycol (antifreeze)	1	1						
		Ricin	2	1						
72ha	22 y M				A	Ingst	Int-U	1		
		Ethylene glycol (antifreeze)	1	1					Ethylene glycol	101 mg/dL in blood (unspecified) @ unknown
		Ethylene glycol (antifreeze)	1	1					Ethylene glycol	940 mg/dL in urine (quantitative only) @ unknown
		Cocaine	2	2					Benzoyllecognine	0.055 mg/L in blood (unspecified) @ unknown
		Methamphetamine	3	3						
		Hydrocodone	4	4						
73pi	24 y M				A	Unk	Int-S	1		
		Cyanide	1	1						
74ha	26 y M				A	Ingst	Int-S	2		
		Ethylene glycol (antifreeze)	1	1						
		Doxylamine	2	2						
75	26 y M				A	Inhal	Unt-E	1		
		Cyanide	1	1						
		Carbon monoxide	2	2					Carboxyhemoglobin	19.7% in blood (unspecified) @ 1 h (pe)
76p	27 y F				A	Ingst	Int-S	1		
		Ethylene glycol (antifreeze)	1	1						
77i	27 y F				A	Unk	Int-S	1		
		Cyanide	1	1						
78ph	28 y F				U	Inhal	Int-A	1		
		Chemical (inhalation), unknown	1	1						

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
79p	30 y M	Ethylene glycol (antifreeze)	1	1	A	Ingst	Int-U	1	Ethylene glycol	80 mg/dL in serum @ 1 h (pe)
[80pha]	32 y M	Ethyl chloride	1	1	A	Inhal	Int-A	1	Ethanol	110 mg/dL in serum @ 12 h (pe)
		Ethanol	2	2						
81	33 y M	Ethylene glycol (antifreeze)	1	1	A	Ingst	Int-S	1	Ethylene glycol	88 mg/dL in blood (unspecified) @ 1 h (pe)
82h	35 y M	Ethylene glycol (antifreeze)	1	1	A	Ingst + Aspir	Int-S	1	Ethylene glycol	120 mg/dL in blood (unspecified) @ 1 h (pe)
83ph	38 y M	Cyanide	1	1	U	Unk	Int-S	1	Cyanide	16 mcg/mL in blood (unspecified) @ autopsy
		Ethanol	2	2					Ethanol	110 mg/dL in vitreous @ autopsy
		Ethanol	2	2					Ethanol	79 mg/dL in blood (unspecified) @ autopsy
[84ha]	38 y M	Sodium metasilicate	1	1	A	Ingst	Int-S	1		
		Ethanol	2	2					Ethanol	149 mg/dL in serum @ unknown
85ph	40 y F	Cyanide	1	1	A	Inhal	Unt-E	1		
		Carbon monoxide	2	2						
86ha	41 y M	Ethylene glycol (antifreeze)	1	1	A	Ingst	Unk	1	Ethylene glycol	61 mg/dL in plasma @ unknown
		Chemical, unknown	2	2						
87	41 y F	Ethylene glycol (antifreeze)	1	1	A/C	Ingst	Int-S	1		
		Escitalopram	2	2						
		Loratadine	3	3						
		Furosemide	4	4						
		Levothyroxine	5	5						
		Folic acid	6	6						
		Vitamin B-1	7	7						
88ph	43 y M	Cyanide	1	1	A	Inhal	Unt-E	1		
		Carbon monoxide	2	2					Carboxyhemoglobin	43% in plasma @ 0.5 h (pe)
89ph	45 y F	Ethylene glycol (antifreeze)	1	1	A	Ingst	Int-S	2		
		Substance (non-drug), unknown	2	1						
90	47 y M	Ethylene glycol (antifreeze)	1	1	A	Ingst	Int-S	3	Ethylene glycol	3 mg/dL in blood (unspecified) @ unknown
		Vitamins (multiple)/iron	2	2					Iron	318 mcg/dL in serum @ unknown
		Naproxen	3	3						
91	52 y M	Ethylene glycol (antifreeze)	1	1	A	Ingst	Unk	1		
92h	53 y M	Ethylene glycol (antifreeze)	1	1	A	Ingst	Unk	2		
		Acetaminophen	2	2						
		Ethanol	3	3					Ethanol	280 mg/dL in blood (unspecified) @ unknown
[93ha]	54 y M	Hydrochloric acid	1	1	A	Ingst	Int-S	1		
94ha	55 y F	Ethylene glycol (antifreeze)	1	1	U	Ingst	Int-S	1	Ethylene glycol	210 mg/dL in serum @ unknown
		Clonazepam	2	2						
		Lithium	3	3						
		Ethanol	4	4						
		Drug, unknown	5	5						

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
95	56 y F	Ammonia	1	1	A	Inhal	Unt-O	2		
		Hypochlorite	2	2						
96	56 y F	Ethylene glycol (antifreeze)	1	1	A	Ingst	Int-S	1	Ethylene glycol	88.63 mg/dL in blood (unspecified) @ autopsy
		Topiramate	2	1						
		Bupropion	3	2						
		Trazodone	4	3						
		Metoprolol	5	4						
		Ethanol	6	5					Ethanol	11 mg/dL in blood (unspecified) @ unknown
97h	57 y F	Ethylene glycol (antifreeze)	1	1	U	Ingst	Int-S	2		
98h	57 y F	Ethylene glycol (antifreeze)	1	1	U	Ingst + Aspir	Int-S	1	Ethylene glycol	436.6 mg/dL in blood (unspecified) @ unknown
99ha	60 y M	Asenapine	2	2	A	Ingst	Unt-M	1		
		Ethylene glycol (antifreeze)	1	1						
100ha	61 y M	Ethylene glycol (antifreeze)	1	1	A	Ingst	Int-U	1		
		Ethanol	2	2						
101p	61 y F	Borate	1	1	A/C	Ingst	Int-U	2		
102ha	62 y M	Hydrofluoric acid	1	1	A	Ingst	Int-S	1		
[103ph]	62 y M	Cyanide	1	1	A	Ingst	Int-S	1		
104ph	65 y M	Strychnine	1	1	A	Ingst	Int-S	2		
105ph	67 y M	Ethylene glycol (antifreeze)	1	1	A	Ingst	Int-S	1	Ethylene glycol	8.6 mg/dL in serum @ 1 d (pe)
106ph	68 y M	Cyanide	1	1	U	Ingst	Int-S	2		
[107]	71 y M	Hydrofluoric acid	1	1	A	Ingst	Unt-O	1		
108p	73 y F	Cyanide	1	1	A	Ingst	Int-S	1		
109pa	75 y M	Ethylene glycol (antifreeze)	1	1	A	Unk	Int-S	1	Ethylene glycol	180 mg/dL in blood (unspecified) @ autopsy
		Diphenhydramine	2	2					Diphenhydramine	0.2 mg/L in blood (unspecified) @ autopsy
[110h]	80 y M				A	Inhal + Oc + Der-Unt-O m		1		
111	92 y F	Ammonia	1	1	A	Ingst	Int-S	2		
112p	unknown adult (>=20 yrs) F	Hydrochloric acid	1	1	A	Unk	Int-S	2		
		cyanide	1	1						
See also case 49, 148, 167, 188, 203, 212, 226, 318, 910, 944										
Cleaning substances (household)										
113p	30 y F				A	Ingst + Inhal + - Aspir + Derm	Unt-O	2		
		Cleaner (household)	1	1						
		Hypochlorite	2	2						
114ph	31 y F	Ammonium hydroxide	1	1	A	Ingst	Int-S	1		
		Hypochlorite	2	2						
		Drain cleaner (alkali)	3	3						
		Ethanol	4	4						
		Ethanol (non-beverage)	5	5						
		Drug, unknown	6	6						

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
115p	38 y F	Hypochlorite	1	1	A	Par + Unk	Int-S	2		
		Morphine	2	2						
116h	42 y F	Drain cleaner (alkali)	1	1	A	Ingst	Int-S	1		
117h	45 y M	Sodium hydroxide	1	1	A	Ingst	Int-S	1		
118ha	55 y F	Drain cleaner (alkali)	1	1	A	Ingst + Inhal	Int-S	1		
[119ha]	57 y F	Bleach, peroxide	1	1	U	Ingst	Int-S	1		
120h	57 y F	Cleaner (household)	1	1	A	Ingst	Int-S	2		
121ph	58 y F	Cleaner (anionic/non-ionic)	1	1	A	Ingst	Unt-G	2		
122h	59 y F	Acid toilet bowl cleaner	1	1	A	Ingst	Int-S	2		
123	60 y F	Toilet bowl cleaner (alkali)	1	1	A	Ingst	Int-S	1		
[124h]	64 y F	Drain cleaner (hydrochloric acid)	1	1	A	Ingst	Int-S	2		
125hi	65 y M	Disinfectant (isopropanol/pine oil)	1	1	A	Ingst + Aspir	Unk	1		
126	66 y F	Drain cleaner (alkali)	1	1	A	Ingst	Int-S	1		
127ha	66 y M	Drain cleaner (alkali)	1	1	A	Ingst	Int-S	2		
128h	71 y M	Drain cleaner (alkali)	1	1	A/C	Ingst	Int-S	1		
		Warfarin	2	2						
		Digoxin	3	3					Digoxin	3.8 mcg/mL in blood (unspecified) @ 48 h (pe)
		Digoxin	3	3					Digoxin	4.7 mcg/mL in blood (unspecified) @ 20 h (pe)
		Digoxin	3	3					Digoxin	5.5 mcg/mL in blood (unspecified) @ 8 h (pe)
		Atenolol	4	4						
129	73 y F	Hypochlorite	1	1	A	Ingst	Unt-M	2		
		Drain cleaner (alkali)	2	2						
130h	77 y F	Cleaner (acid)	1	1	A	Ingst	Int-S	1		
		Ethanol (non-beverage)	2	2					Ethanol	130 mg/dL in serum @ 1 h (pe)
131	78 y F	Drain cleaner (alkali)	1	1	A	Ingst	Unt-G	1		
132ha	81 y F	Sodium hydroxide	1	1	A	Ingst	Unt-M	1		
133h	81 y M	Cleaner (isopropanol)	2	1	A	Ingst	Int-U	2		
		Methanol	1	1						
134h	83 y F	Disinfectant (cationic)	1	1	A	Ingst + Aspir	Unt-M	2		
135h	87 y M	Drain cleaner (alkali)	1	1	A	Ingst	Unt-G	1		
136h	87 y F	Phosphoric acid	1	1	A	Ingst	Int-S	2		
137h	89 y M	Cleaner (anionic/non-ionic)	1	1	A	Ingst + Inhal + Aspir	Unt-G	3		
138ha	89 y M	Drain cleaner (alkali)	1	1	A	Ingst	Unt-G	1		
139h	91 y M	Chlorhexidine	1	1	A	Ingst + Aspir	Unt-G	2		

See also case 95, 278, 877, 1049

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
Cosmetics/personal care products										
[140h]	60 y F				A	Ingst	Int-U	1		
141p	72 y M	Hydrogen peroxide	1	1	A	Ingst	Int-A	3		
		Ethanol (non-beverage)	1	1						
See also case 114, 130										
Deodorizers										
142h	74 y F				A	Ingst	Unt-G	3		
143h	78 y F	Septic system deoderizer	1	1	A	Ingst	Unt-M	2		
		Septic system deoderizer	1	1						
		Ethanol	2	2					Ethanol	74 mg/dL in serum @ unknown
144h	82 y M				A	Ingst	Unt-M	3		
145h	95 y M	Caustic	1	1	A	Ingst	Unt-M	2		
		Deodorizer	1	1						
Fumes/gases/vapors										
146	2 y M				A	Inhal	Unt-E	1		
		Carbon monoxide	1	1					Carboxyhemo globin	40% in whole blood @ unknown
[147pa]	3 y M				A	Inhal	Unt-E	1		
		Carbon monoxide	1	1					Carboxyhemo globin	60% in blood (unspecified) @ autopsy
148pha	3 y M				A	Inhal	Unt-E	1		
		Carbon monoxide	1	1					Carboxyhemo globin	54% in blood (unspecified) @ 30 m (pe)
		Cyanide	2	2						
		Carbon monoxide	3	3						
149pha	3 y M				A	Inhal	Unt-E	1		
		Carbon monoxide	1	1					Carboxyhemo globin	30% in whole blood @ unknown
150pha	3 y M				A	Inhal	Unt-E	1		
		Carbon monoxide	1	1					Carboxyhemo globin	34% in whole blood @ unknown
151pha	4 y M				A	Inhal	Unt-E	1		
		Carbon monoxide	1	1					Carboxyhemo globin	50.1% in whole blood @ autopsy
152pi	4 y M				A	Inhal	Unt-E	1		
		Carbon monoxide	1	1						
153ph	5 y M				A	Inhal	Unt-E	1		
		Carbon monoxide	1	1						
154pha	5 y M				A	Inhal	Unt-E	1		
		Carbon monoxide	1	1					Carboxyhemo globin	40% in blood (unspecified) @ autopsy
		Carbon monoxide	2	2						
155p	11 y F				A	Inhal	Unt-E	1		
		Carbon monoxide	1	1					Carboxyhemo globin	56% in whole blood @ 30 m (pe)
156pha	14 y F				A	Inhal	Unt-E	1		
		Carbon monoxide	1	1					Methemoglobin	13% in blood (unspecified) @ unknown
		Carbon monoxide	1	1					Carboxyhemo globin	7.8% in blood (unspecified) @ unknown
157ph	17 y M				A	Inhal	Int-S	1		
		Carbon monoxide	1	1					Carboxyhemo globin	50% in blood (unspecified) @ 10 m (pe)
158pi	20 y F				A	Inhal	Int-S	2		
		Hydrogen sulfide	1	1						
159pa	20 y F				A	Inhal	Unt-E	1		
		Carbon monoxide	1	1					Carboxyhemo globin	60% in blood (unspecified) @ autopsy
160pai	21 y F				A	Inhal	Unt-E	1		
		Carbon monoxide	1	1						
		Ethanol	2	2					Ethanol	0.08 mg/L in blood (unspecified) @ autopsy
		Ethanol	2	2					Ethanol	0.09 mg/L in vitreous @ autopsy

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
161pa	23 y M	Carbon monoxide	1	1	A	Inhal	Unt-E	1	Carboxyhemo- globin	60% in blood (unspecified) @ autopsy
[162ph]	26 y M	Helium	1	1	A	Inhal	Int-A	1		
163pai	29 y M	Carbon monoxide	1	1	A	Inhal	Unt-E	1		
		Ethanol	2	2					Ethanol	0.09 mg/L in muscle @ autopsy
		Ethanol	2	2					Ethanol	0.17 mg/L in blood (unspecified) @ autopsy
		Marijuana	3	3					Delta-9-thc	3 ng/mL in blood (unspecified) @ autopsy
		Marijuana	3	3					11-Oh-thc (11-hydroxy-delta-9-tetrahydrocannabinol)	9.4 ng/mL in blood (unspecified) @ autopsy
164p	30 y F	Carbon monoxide	1	1	A	Inhal	Int-S	2		
165ph	31 y F	Carbon monoxide	1	1	A	Inhal	Unt-E	1		
166pha	32 y F	Carbon monoxide	1	1	A	Inhal	Unt-E	1		
		Carbon monoxide	2	2					Carboxyhemo- globin	50.5% in blood (unspecified) @ autopsy
167ph	32 y M	Carbon monoxide	1	1	A	Inhal	Unt-E	1		
		Cyanide	2	2						
		Ethanol	3	3						
168ph	32 y F	Carbon monoxide	1	1	A	Inhal	Int-S	1		
[169ph]	33 y M	Carbon dioxide	1	1	A	Inhal	Unt-E	1		
170pa	34 y M	Fume-gas-vapor, unknown	1	1	A	Inhal + Derm	Unt-O	1		
[171pha]	34 y M	Carbon dioxide	1	1	A	Inhal	Unt-E	1		
172pha	37 y F	Carbon monoxide	1	1	A	Inhal	Int-S	1	Carboxyhemo- globin	29.9% in whole blood @ 1.5 h (pe)
		Carbon monoxide	1	1					Carboxyhemo- globin	5% in blood (unspecified) @ autopsy
		Oxycodone	2	2					Oxycodone (free)	2600 ng/mL in blood (unspecified) @ autopsy
		Oxycodone	2	2					Oxymorphone	92 ng/mL in blood (unspecified) @ autopsy
		Diazepam	3	3					Nordiazepam	1000 ng/mL in blood (unspecified) @ autopsy
		Diazepam	3	3					Oxazepam	120 ng/mL in blood (unspecified) @ autopsy
		Diazepam	3	3					Temazepam	350 ng/mL in blood (unspecified) @ autopsy
		Diazepam	3	3					Diazepam	4300 ng/mL in blood (unspecified) @ autopsy
		Tapentadol	4	4					Tapentadol	2400 ng/mL in blood (unspecified) @ autopsy
		Diphenhydramine	5	5					Diphenhydramine	380 ng/mL in blood (unspecified) @ autopsy
		Doxylamine	6	6					Doxylamine	340 ng/mL in blood (unspecified) @ autopsy
		Dextromethorphan	7	7					Dextromethorphan	310 ng/mL in blood (unspecified) @ autopsy
		Ethanol	8	8					Ethanol	18 mg/dL in blood (unspecified) @ 1.5 h (pe)
		Acetaminophen	9	9					Acetaminophen	83 mcg/mL in blood (unspecified) @ autopsy
		Acetaminophen	9	9					Acetaminophen	86.8 mg/L in blood (unspecified) @ 1.5 h (pe)
		Amphetamine	10	10						

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
173pa	38 y F	Carbon monoxide	1	1	A	Ingst + Inhal	Int-S	3	Carboxyhemo- globin	22% in blood (unspecified) @ autopsy
		Gabapentin	2	2					Gabapentin	4 mg/L in blood (unspecified) @ autopsy
		Sertraline	3	3						
174ph	42 y F	Carbon monoxide	1	1	A	Inhal	Int-S	1		
175phi	43 y M	Carbon monoxide	1	1	A	Inhal	Unt-E	1		
176h	43 y M	Argon gas	1	1	A	Inhal	Unt-O	1		
177ha	44 y M	Hydrogen sulfide	1	1	A	Inhal + Derm	Unt-O	1		
178ph	45 y F	Carbon monoxide	1	1	A	Inhal	Unt-E	1	Carboxyhemo- globin	28% in blood (unspecified) @ unknown
179pha	45 y M	Carbon monoxide	1	1	A	Ingst + Inhal	Unt-E	1	Carboxyhemo- globin	9% in blood (unspecified) @ 1 h (pe)
		Ethanol	2	2					Ethanol	142 mg/dL in blood (unspecified) @ 1 h (pe)
180ph	46 y M	Carbon monoxide	1	1	A	Inhal	Unt-E	1	Carboxyhemo- globin	43.7% in blood (unspecified) @ 15 m (pe)
181p	47 y M	Asphyxiant, simple	1	1	A	Inhal	Int-A	1		
182p	47 y F	Carbon monoxide	1	1	A	Inhal	Unt-E	1		
183p	48 y F	Hydrogen sulfide	1	1	A	Inhal	Unk	2		
184h	49 y M	Carbon monoxide	1	1	A	Inhal	Unt-E	1		
185pai	50 y M	Carbon monoxide	1	1	U	Inhal	Unk	1	Carboxyhemo- globin	60.2% in blood (unspecified) @ autopsy
186p	53 y M	Carbon monoxide	1	1	A	Ingst	Int-S	2	Carboxyhemo- globin	42% in blood (unspecified) @ unknown
		Ethanol	2	2						
187a	54 y F	Carbon monoxide	1	1	A	Inhal	Unt-E	1		
188ph	54 y M	Carbon monoxide	1	1	A	Inhal	Int-S	1	Carboxyhemo- globin	2.5% in blood (unspecified) @ unknown
		Carbon monoxide	1	1					Carboxyhemo- globin	50% in blood (unspecified) @ unknown
		Carbon monoxide	1	1					Carboxyhemo- globin	57% in blood (unspecified) @ unknown
		Cyanide	2	2						
189pa	54 y M	Argon gas	1	1	A	Inhal	Int-S	1		
		Carbon monoxide	2	2					Carboxyhemo- globin	16% in blood (unspecified) @ autopsy
190pa	55 y F	Carbon monoxide	1	1	A	Ingst + Inhal	Int-S	1	Carboxyhemo- globin	8.1% in blood (unspecified) @ unknown
		Benzodiazepine	2	2					Alprazolam	80 ng/mL in blood (unspecified) @ autopsy
		Hydromorphone	3	3					Hydromorphone	6.3 ng/mL in blood (unspecified) @ autopsy
		Hydrocodone	4	4					Hydrocodone (free)	45 ng/mL in blood (unspecified) @ autopsy
		Acetaminophen	5	5					Acetaminophen	24.7 mg/L in blood (unspecified) @ unknown
191pha	56 y M	Hydrogen sulfide	1	1	A	Inhal	Unt-O	1		
[192ph]	57 y M	Carbon monoxide	1	1	A	Ingst	Int-S	1	Carboxyhemo- globin	51.6% in serum @ 30 m (pe)
193ph	58 y M	Carbon monoxide	1	1	A	Inhal	Int-S	1		

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
194pha	58 y M	Ethanol	2	2						
		Carbon monoxide	1	1	A	Inhal	Unt-E	1	Carboxyhemo globin	21% in plasma @ 30 m (pe)
195p	58 y M	Carbon monoxide	1	1	A	Inhal	Unt-E	3		
196	59 y M	Carbon monoxide	1	1	A	Ingst	Int-S	2		
		Trazodone	2	2						
197ha	60 y M	Hydrogen sulfide	1	1	A	Inhal + Derm	Unt-O	1		
198pa	60 y F	Carbon monoxide	1	1	A	Ingst + Inhal	Unt-E	1	Carboxyhemo globin	60% in blood (unspecified) @ autopsy
		Ethanol	2	2					Ethanol	260 mg/dL in blood (unspecified) @ autopsy
199p	60 y M	Carbon monoxide	1	1	A	Inhal	Unt-E	1		
200h	61 y F	Carbon monoxide	1	1	A	Ingst + Inhal	Int-S	1		
		Zolpidem	2	2						
201h	61 y F	Carbon monoxide	1	1	A	Inhal	Unt-E	3		
		Carbon monoxide	2	2						
202ph	61 y M	Carbon dioxide	1	1	A	Inhal	Unt-E	1		
203p	64 y F	Carbon monoxide	1	1	A	Inhal	Unt-E	1	Carboxyhemo globin	9% in blood (unspecified) @ 1 h (pe)
		Cyanide	2	2						
204ph	65 y M	Chlorine	1	1	A	Inhal + Derm	Unt-M	1		
205pi	67 y M	Carbon monoxide	1	1	A	Inhal	Unt-E	1		
[206ph]	68 y M	Chlorine gas	1	1	A	Inhal	Unt-O	2		
207pa	69 y F	Carbon monoxide	1	1	A	Inhal	Unt-E	1	Carboxyhemo globin	30% in blood (unspecified) @ autopsy
208ph	73 y F	Carbon monoxide	1	1	A	Inhal	Unt-E	1		
		Carbon monoxide	2	2						
209h	73 y F	Carbon monoxide	1	1	A	Inhal	Unt-E	3	Carboxyhemo globin	0.8% in whole blood @ 20 m (pe)
		Carbon monoxide	2	1						
210ph	75 y F	Carbon monoxide	1	1	A	Inhal	Unt-E	1	Carboxyhemo globin	38% in blood (unspecified) @ autopsy
211pa	75 y M	Carbon monoxide	1	1	A	Inhal	Int-M	3		
		Nicotine	2	2						
212ph	76 y F	Carbon monoxide	1	1	A	Inhal	Unt-E	1	Carboxyhemo globin	40% in blood (unspecified) @ 1 h (pe)
		Cyanide	2	2						
213a	77 y F	Carbon monoxide	1	1	A	Inhal	Unt-E	3	Carboxyhemo globin	45.8% in plasma @ unknown
214ph	82 y M	Carbon monoxide	1	1	A	Inhal	Unt-E	1		
215	85 y F	Carbon monoxide	1	1	A	Ingst	Int-S	2		
		Atenolol	2	2						
		Salicylate	3	3						
		Acetaminophen/ oxycodone	4	4						
216pa	92 y F	Carbon monoxide	1	1	A	Inhal	Unt-E	1	Carboxyhemo globin	60% in blood (unspecified) @ autopsy
217pi	12 m U	Carbon monoxide	1	1	A	Inhal	Unt-E	1		

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
218ph	60+ y F									
		Carbon monoxide	1	1	A	Inhal	Unt-E	2		
219pi	unknown adult (>=20 yrs) M				C	Inhal	Unt-E	1		
		Carbon monoxide	1	1						
220p	unknown adult (>=20 yrs) M				A	Inhal	Int-S	1		
		Propane	1	1						
[221pa]	unknown adult (>=20 yrs) M				A	Inhal	Unt-O	1		
		Argon gas	1	1						
222phi	unknown adult (>=20 yrs) U				A	Inhal	Unt-E	1		
		Carbon monoxide	1	1						
224pi	unknown adult (>=20 yrs) M				A	Inhal	Unt-E	1		
		Carbon monoxide	1	1						
223pi	unknown adult (>=20 yrs) M				A	Inhal	Unt-E	1		
		Carbon monoxide	1	1						
225ph	unknown age U				A	Inhal	Unt-E	2		
		Carbon monoxide	1	1						
226p	unknown age M				U	Inhal	Int-S	1		
		Carbon monoxide	1	1						
		Formic acid	2	2						
		Sulfuric acid	3	3						
227p	unknown age M				A	Inhal	Int-S	2		
		Hydrogen sulfide	1	1						
228pi	unknown age U				U	Inhal	Unt-E	2		
		Carbon monoxide	1	1						
See also case 75, 85, 88, 250										
Heavy metals										
229pai	28 y M				A	Inhal	Unt-E	1		
		Mercury (elemental)	1	1						
[230]	55 y M				A	Inhal	Unt-O	2		
		Nickel carbonyl	1	1					Nickle	335 mcg/24hr in urine (quantitative only) @ unknown
		Nickel carbonyl	1	1					Nickle	57.8 mcg/24hr in urine (quantitative only) @ unknown
231ha	57 y F				A/C	Ingst	Int-S	1		
		Potassium chloride	1	1					Potassium	7 mmol/L in serum @ unknown
		Potassium chloride	1	1					Potassium	8.5 mmol/L in serum @ unknown
		Baclofen	2	2						
		Rivaroxaban	3	3						
		Metformin	4	4						
		Methylphenidate	5	5						
		Eszopiclone	6	6						
		Furosemide	7	7						
		Clonazepam	8	8						
		Tramadol	9	9						
		Alprazolam	10	10						
		Hydrochlorothiazide	11	11						

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
[232h]	68 y F				A	Ingst	Int-S	1		
		Copper	1	1						
[233h]	72 y M	Arsenic	1	1	A	Unk	Unt-U	2	Arsenic	27 mcg/L in whole blood @ unknown
See also case 486, 929, 1016, 1031, 1382										
Hydrocarbons										
[234]	17 y F				A	Ingst + Aspir	Unt-G	1		
		Hydrocarbon	1	1						
235p	21 y F	Fluorinated hydrocarbon	1	1	U	Inhal	Int-A	1		
236ha	25 y M	Fluorinated hydrocarbon	1	1	A	Inhal	Int-A	1		
237ph	25 y F	Fluorinated hydrocarbon	1	1	A	Inhal	Int-A	2		
238	26 y M	Fluorinated hydrocarbon	1	1	A/C	Inhal	Int-A	1		
239h	26 y M	Fluorinated hydrocarbon	1	1	A	Inhal	Int-A	2		
240h	27 y F	Fluorinated hydrocarbon	1	1	A	Inhal	Int-A	1		
241p	28 y M	Fluorinated hydrocarbon	1	1	C	Inhal	Int-A	2		
242	30 y F	Fluorinated hydrocarbon	1	1	A	Inhal	Int-A	2		
243pha	30 y M	Fluorinated hydrocarbon	1	1	A/C	Inhal	Int-A	1	1,1-Difluoroethane	4.5 mg/L in urine (quantitative only) @ unknown
244h	32 y M	Fluorinated hydrocarbon	1	1	A/C	Inhal	Int-A	1		
245ha	34 y M	Hydrocarbon (inhalation)	1	1	A	Inhal + Derm	Int-A	1	1,1-Difluoroethane	93 mcg/mL in blood (unspecified) @ autopsy
246h	34 y M	Hydrocarbon	1	1	A	Ingst	Unk	2		
247	35 y F	Fluorinated hydrocarbon	1	1	C	Inhal	Int-A	2		
248p	38 y M	Fluorinated hydrocarbon	1	1	A	Inhal	Int-A	1		
249h	40 y M	Fluorinated hydrocarbon	1	1	A	Ingst + Inhal + - Aspir	Int-A	1		
250pai	41 y F	Fluorinated hydrocarbon	1	1	A	Ingst + Inhal + P-Int-U ar		1		
		Fluorinated hydrocarbon	1	1						
		Carbon monoxide	2	2					Carboxyhemo globin @ autopsy	20% in blood (unspecified) @ autopsy
		Oxymorphone	3	3					Oxymorphone	21 ng/mL in blood (unspecified) @ autopsy
		Fentanyl	4	4					Fentanyl	11 ng/mL in blood (unspecified) @ autopsy
		Fentanyl	4	4					Norfentanyl	2.2 ng/mL in blood (unspecified) @ autopsy
		Ethanol	5	5					Ethanol	0.12% (wt/vol) in blood (unspecified) @ autopsy
251ha	44 y M	Fluorinated hydrocarbon	1	1	A	Inhal	Int-A	3		
252ph	45 y M	Fluorinated hydrocarbon	1	1	A	Inhal	Int-S	1		
[253ha]	47 y M	Fluorinated hydrocarbon	1	1	U	Ingst + Inhal	Int-S	1	1,1-difluoroethane	47 mcg/mL in whole blood @ autopsy
		Fluorinated hydrocarbon	1	1					1,1-difluoroethane	78 mcg/mL in blood (unspecified) @ unknown
		Sertraline	2	2					Desmethylsertraline	160 ng/mL in blood (unspecified) @ 1 h (pe)
		Sertraline	2	2					Sertraline	45 ng/mL in blood (unspecified) @ 1 h (pe)
254h	47 y F	Fluorinated hydrocarbon	1	1	U	Inhal	Int-A	1	1,1-Difluoroethane	5.9 mcg/mL in blood (unspecified) @ autopsy

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
255pha	49 y M				U	Inhal	Int-A	3		
256	60 y F	Fluorinated hydrocarbon	1	1						
		Lamp oil	1	1	A	Ingst + Aspir	Int-S	1		
		Trazodone	2	2						
		Venlafaxine	3	3						
		Antihistamine, NOS	4	4						
257	unknown adult (>=20 yrs) M				U	Unk	Unk	2		
		Fluorinated hydrocarbon	1	1						
		Morphine	2	2						
Industrial cleaners										
258h	23 y F				A	Ingst + Derm	Int-S	2		
[259ha]	44 y M	Potassium hydroxide	1	1	A	Ingst + Derm	Int-S	1		
		Cleaner (acid)	1	1						
		Ethanol	2	2						
[260ha]	49 y F	Ammonium bifluoride	1	1	A	Ingst	Unt-M	1		
[261ha]	66 y M				A	Inhal	Unt-M	1		
		Chloramine	1	1						
262	73 y F				A	Ingst	Unt-M	1		
		Sodium hydroxide	1	1						
263	73 y F				A	Ingst	Unt-G	1		
		Sodium hydroxide	1	1						
[264]	87 y M				A	Ingst	Unt-M	1		
		Cleaner (acid)	1	1						
Infectious and toxin-mediated diseases										
265p	9 y M				A	Ingst	Unt-F	2		
		Food poisoning, unknown	1	1						
Matches/fireworks/explosives										
266p	unknown adult (>=20 yrs) M				A	Derm	Unk	1		
		Fireworks	1	1						
Mushrooms										
[267]	84 y F				A	Ingst	Unt-F	1		
		Mushroom (cyclopeptides)	1	1						
See Also case 1449										
Other/unknown non-drug substances										
268ph	36 y M				A	Unk	Int-S	2		
		Methanol	1	1						
See also case 24, 89, 853										
Pesticides										
[269h]	19 y M				A	Ingst	Int-S	1		
		Dinitrophenol	1	1						
		Energy drink	2	2						
270h	21 y M				A	Ingst	Unk	2		
		Dinitrophenol	1	1						
271hai	23 y M				A	Ingst	Int-U	2		
		Dinitrophenol	1	1						
[272ha]	24 y M				A	Inhal	Unt-E	1		
		Sulfuryl fluoride	1	1						
		Cocaine	2	2					Benzoylecognine	0.17 mg/L in blood (unspecified) @ unknown
273a	25 y M				A	Inhal	Int-M	1		
		Sulfuryl fluoride	1	1						
		None	2	2						
		None	3	3						
274h	25 y F				A	Ingst	Int-S	1		
		Paraquat	1	1						

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
275ph	35 y M	Paraquat	2	2						
		Herbicide	1	1	A	Ingst	Unk	2		
[276h]	47 y M	Paraquat	1	1	A	Ingst	Int-M	1		
277h	50 y M	Carbamate	1	1	A	Ingst	Int-S	1		
[278pha]	51 y F	chlorophenoxy herbicide	1	1	A	Ingst	Int-S	1		
		Cleaner (anionic/non-ionic)	2	2						
		Sodium hydroxide	3	3						
		Bupropion	4	4						
		Sertraline	5	5						
		Trazodone	6	6						
279p	56 y M	Phosphine	1	1	A	Ingst	Int-S	1		
280	59 y M	Glyphosate	1	1	A	Ingst	Int-S	1		
281	61 y F	Glyphosate	1	1	A	Ingst + Aspir	Int-S	1		
[282h]	72 y M	Carbamate insecticide	1	1	A	Ingst	Int-S	1		
283h	77 y M	Organophosphate	1	1	A	Ingst	Int-S	2		
284ha	81 y M	Glyphosate	1	1	A	Ingst	Int-S	3		
		Ethanol	2	2						
See also case 31, 57, 1143										
Plants										
[285ha]	18 y M	Ricin	1	1	A	Ingst + Par	Int-S	2		
[286h]	22 y M	Cardiac glycoside	1	1	A	Ingst	Int-S	1	Digoxin	1.3 ng/mL in blood (unspecified) @ 10 h (pe)
287p	22 y M	Mitragyna	1	1	U	Ingst	Unk	2		
[288pha]	26 y M	lbogaine	1	1	A	Ingst	Int-U	2		
[289h]	30 y M	Cardiac glycoside	1	1	A	Ingst	Unk	1		
290	30 y F	Nerium oleander	1	1	A	Ingst	Int-S	2		
291	38 y F	Mitragyna speciosa korthals	1	1	A	Ingst	Int-S	2		
		Diphenhydramine	2	2						
292	49 y F	Cardiac glycoside	1	1	A	Ingst	Int-S	1		
293	74 y M	Aleurites moluccana	1	1	A	Ingst	Unt-M	1		
See also case 71, 358, 549, 1440										
Weapons of mass destruction										
294h	25 y F	Non-powder, unknown	1	1	A	Unk	Int-S	2		
Pharmaceutical exposures										
Analgesics										
295h	2 y F	Methadone	1	1	A	Ingst	Unt-G	2		
296pa	2 y M	Oxycodone	1	1	A	Ingst	Oth-M	1	Oxycodone	1700 ng/mL in blood (unspecified) @ autopsy
		Oxycodone	1	1					Oxymorphone	57 ng/mL in blood (unspecified) @ autopsy
[297p]	2 y F	Methadone	1	1	A	Ingst	Oth-M	1	Methadone	78 ng/mL in blood (unspecified) @ unknown
298ph	2 y M	Buprenorphine (sublingual tablet)	1	1	A	Ingst	Unt-G	2		

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
[299ha]	3 y M	Acetaminophen	1	1	A/C	Ingst	Unt-G	3	Acetaminophen	15 mcg/mL in blood (unspecified) @ unknown
		Acetaminophen	1	1					Acetaminophen	29 mcg/mL in blood (unspecified) @ unknown
300ph	12 y F	Oxycodone	1	1	A	Ingst	Int-S	1	Oxycodone (total)	2758 ng/mL in blood (unspecified) @ unknown
		Oxycodone	1	1					Oxymorphone	4895 ng/mL in blood (unspecified) @ unknown
		Promethazine	2	2					Promethazine	67 ng/mL in blood (unspecified) @ unknown
[301pha]	12 y F	Fentanyl (transdermal)	1	1	A	Ingst	Int-M	1	Fentanyl	106.5 ng/mL in urine (quantitative only) @ unknown
		Fentanyl (transdermal)	1	1					Fentanyl	15 ng/mL in blood (unspecified) @ autopsy
		Fentanyl (transdermal)	1	1					Norfentanyl	2 ng/mL in blood (unspecified) @ autopsy
		Fentanyl (transdermal)	1	1					Norfentanyl	580.8 ng/mL in urine (quantitative only) @ unknown
302pai	13 y M	U-47700	1	1	A	Unk	Int-A	1		
303pai	13 y M	U-47700	1	1	A	Unk	Unk	1		
		Trazodone	2	2						
[304pha]	13 y F	Tramadol	1	1	A	Ingst	Int-A	1	Tramadol	0.617 mg/L in blood (unspecified) @ 1 h (pe)
305	14 y F	Acetaminophen	1	1	A	Ingst	Int-S	1	Acetaminophen	75 mcg/mL in blood (unspecified) @ 13 h (pe)
306ph	14 y M	Diphenhydramine	2	2						
		Acetaminophen/oxycodone	1	1	U	Ingst	Int-S	1	Acetaminophen	80.5 mcg/mL in blood (unspecified) @ unknown
307h	14 y F	Zolpidem	2	2	A	Ingst	Int-S	1		
308	16 y M	Acetaminophen	1	1	A	Ingst	Int-S	1		
		Acetaminophen/hydrocodone	1	1						
		Acetaminophen/oxycodone	2	2						
		Oxycodone (extended release)	3	3						
		Morphine	4	4						
		Lorazepam	5	5						
		Skeletal muscle relaxant	6	6						
		Ethanol	7	7						
309ph	16 y M	Oxycodone	1	1	A	Ingst	Int-S	1		
		Lorazepam	2	2						
		Ethanol	3	3					Ethanol	112 mg/dL in serum @ unknown
310pha	17 y M	Morphine	1	1	A	Ingst	Int-A	2	Morphine (free)	128 ng/mL in blood (unspecified) @ autopsy
311pha	17 y F	Fentanyl	1	1	U	Ingst + Inhal	Unk	1	Norfentanyl	160 ng/mL in plasma @ unknown
		Fentanyl	1	1					Fentanyl	50 ng/mL in plasma @ unknown
		Methylphenidate (extended release)	2	1						

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
312h	17 y F	Salicylate	1	1	A	Ingst	Int-S	2	Salicylate	83.4 mg/dL in blood (unspecified) @ unknown
		Salicylate	1	1					Salicylate	86.8 mg/dL in blood (unspecified) @ unknown
		Diphenhydramine	2	2						
		Alprazolam	3	3						
		Naproxen	4	4						
313ha	17 y F	Morphine	1	1	A	Ingst	Int-A	2		
		Methamphetamine	2	2						
		Alprazolam	3	3						
314ph	18 y M	Acetaminophen/hydrocodone	1	1	A	Ingst	Int-A	2		
		Fentanyl	2	2						
		Lorazepam	3	3						
		Ethanol	4	4						
		Alprazolam	5	5						
315pha	18 y M	Fentanyl	1	1	A	Par	Int-A	1	Fentanyl	0.076 mg/kg in liver @ autopsy
		Fentanyl	1	1					Fentanyl	9.1 ng/mL in blood (unspecified) @ autopsy
		Heroin	2	1					Morphine	0.08 mg/L in blood (unspecified) @ autopsy
		Heroin	2	1					Morphine	0.093 mg/L in urine (quantitative only) @ autopsy
316h	20 y F	Acetaminophen	1	1	A	Ingst	Int-S	1	Acetaminophen	596 mg/L in blood (unspecified) @ unknown
		Acetaminophen	1	1					Acetaminophen	720 mcg/mL in serum @ unknown
		Hydrocodone	2	2					Hydromorphone	15 ng/mL in blood (unspecified) @ unknown
		Hydrocodone	2	2					Hydrocodone	914 ng/mL in blood (unspecified) @ unknown
[317h]	20 y F-Pregnant	Colchicine	1	1	A	Ingst	Int-S	1	Colchicine	7.2 mcg/L in serum @ unknown
318p	20 y F	Acetaminophen	1	1	A	Ingst	Int-S	1	Acetaminophen	418 mcg/mL in blood (unspecified) @ unknown
		Chemical, unknown	2	2						
		Lithium	3	3					Lithium	1.7 mEq/L in blood (unspecified) @ unknown
		Carbamazepine	4	4					Carbamazepine	11.2 mcg/mL in blood (unspecified) @ unknown
319pa	20 y F	Carfentanil	1	1	U	Ingst + Unk	Int-A	1	Carfentanil	0.2 ng/mL in blood (unspecified) @ autopsy
		Furanylfentanyl	2	2					Furanyl fentanyl	2.5 ng/mL in blood (unspecified) @ autopsy
		Alprazolam	3	3					Alprazolam	19 ng/mL in blood (unspecified) @ autopsy
		Cocaine	4	4					Benzoyllecognine	2000 ng/mL in blood (unspecified) @ autopsy
		Cocaine	4	4					Cocaine	84 ng/mL in blood (unspecified) @ autopsy
		Cyclobenzaprine	5	5					Cyclobenzaprine	80 ng/mL in blood (unspecified) @ autopsy
320h	21 y F	Acetaminophen	1	1	A	Ingst	Int-S	1	Acetaminophen	55 mcg/mL in blood (unspecified) @ 10 h (pe)

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
321pa	21 y M	Acetaminophen	1	1					Acetaminophen	69 mcg/mL in blood (unspecified) @ 30 m (pe)
		Opioid	1	1	A	Ingst	Int-A	1		
322	21 y M	Alprazolam	2	2						
		Fentanyl	1	1	U	Unk	Unk	2		
		Benzodiazepine	2	2						
323	21 y F	Acetaminophen	1	1	A	Ingst	Int-S	1	Acetaminophen	66 mcg/mL in blood (unspecified) @ unknown
[324ha]	21 y F-Pregnant				A	Ingst	Int-S	1		
		Acetaminophen	1	1					Acetaminophen	52 mcg/mL in serum @ unknown
325	21 y F	Acetaminophen	1	1	A	Ingst	Int-S	1	Acetaminophen	55 mcg/mL in serum @ unknown
326pa	21 y M				A/C	Ingst + Inhal + P-Int-A ar		1		
		Fentanyl	1	1					Fentanyl	0.13 mcg/g in liver @ autopsy
		Fentanyl	1	1					Fentanyl	6.6 ng/mL in blood (unspecified) @ autopsy
		Oxycodone	2	2					Oxycodone (total)	0.059 mg/L in blood (unspecified) @ autopsy
		Codeine	3	3					Codeine	0.052 mg/L in blood (unspecified) @ autopsy
		Alprazolam	4	4					Alprazolam	0.031 mg/L in blood (unspecified) @ autopsy
327pai	21 y M				U	Unk	Unk	1		
		Carfentanil	1	1					Carfentanil	0.34 ng/mL in blood (unspecified) @ autopsy
		Chlorpheniramine	2	2					Chlorpheniramine	210 ng/mL in blood (unspecified) @ autopsy
		Dextromethorphan	3	3					Dextromethorphan	280 ng/mL in blood (unspecified) @ autopsy
328h	22 y M	Methadone	1	1	U	Ingst	Unk	2		
329pha	22 y M	Hydrocodone	1	1	U	Unk	Unk	2	Morphine	39 ng/mL in blood (unspecified) @ unknown
		Alprazolam	2	2					Alprazolam	51 ng/mL in serum @ unknown
		Amphetamine	3	3						
330	22 y F	Acetaminophen	1	1	A	Ingst	Int-S	1	Acetaminophen	121.8 mcg/mL in blood (unspecified) @ unknown
		Diphenhydramine	2	2						
		6-mercaptopurine	3	3						
331p	23 y M	Fentanyl	1	1	U	Par + Unk	Int-A	2		
		Heroin	2	2						
		Cocaine	3	3						
332ha	23 y M	Oxycodone	1	1	A	Par	Int-A	1	Oxycodone	51 ng/mL in blood (unspecified) @ unknown
		Fentanyl	2	2					Fentanyl	5.2 ng/mL in blood (unspecified) @ unknown
		Alprazolam	3	3					Alprazolam	11 ng/mL in blood (unspecified) @ unknown
		Methamphetamine	4	4					Methamphetamine	740 ng/mL in blood (unspecified) @ unknown
		Methamphetamine	4	4					Amphetamine	78 ng/mL in blood (unspecified) @ unknown

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
333	24 y F	Heroin	5	5						
		Acetaminophen/ diphenhydramine	1	1	A	Ingst	Int-S	2		
334h	24 y F	Acetaminophen	1	1	A	Ingst	Int-S	1	Acetaminophen	23 mcg/mL in blood (unspecified) @ unknown
335pa	24 y M				U	Ingst + Aspir + - Par	Int-U	1		
		U-47700	1	1						
		Flubromazepam	2	2						
		Amitriptyline	3	3					Amitriptyline	410 mcg/L in blood (unspecified) @ autopsy
		Diphenhydramine	4	4					Diphenhydramine	220 mcg/L in blood (unspecified) @ autopsy
336ph	24 y M	Hydrocodone	1	1	A	Unk	Unk	2		
337pa	24 y F				U	Ingst + Inhal	Int-A	2		
		Carfentanil	1	1					Carfentanil	0.53 ng/mL in blood (unspecified) @ autopsy
		Cocaine	2	2					Benzoyllecognine	200 ng/mL in blood (unspecified) @ autopsy
		Chlorpheniramine	3	3					Chlorpheniramine	240 ng/mL in blood (unspecified) @ autopsy
		Dextromethorphan	4	4					Dextromethorphan	2800 ng/mL in blood (unspecified) @ autopsy
338pa	24 y M				A	Par	Int-A	1		
		Hydrocodone	1	1						
		Ethanol	2	2					Ethanol	0.01 g/dL in blood (unspecified) @ 1 h (pe)
339ph	25 y F				U	Ingst	Unk	2		
		Hydrocodone	1	1						
		Ethanol	2	2					Ethanol	184 mg/dL in blood (unspecified) @ unknown
340ph	25 y F				A/C	Ingst	Int-S	1		
		Tramadol	1	1					o-Demethyl tramadol	190 ng/mL in plasma @ 12 h (pe)
		Tramadol	1	1					Tramadol	740 ng/mL in plasma @ 12 h (pe)
[341pha]	25 y M				U	Ingst + Inhal	Unk	1		
		U-47700	1	1					u-47700	0.18 mg/L in blood (unspecified) @ unknown
		Alprazolam	2	2					Alprazolam	0.11 mg/L in blood (unspecified) @ unknown
		Cocaine	3	3						
		Cocaine	4	4					Benzoyllecognine	0.026 mg/L in blood (unspecified) @ unknown
		Marijuana	5	5						
		Benzodiazepine	6	6						
		Caffeine	7	7						
		Levamisole	8	8						
		Nicotine	9	9						
342pha	25 y F				A	Ingst	Int-S	1		
		Methadone	1	1					Methadone	180 ng/mL in blood (unspecified) @ autopsy
		Methadone	1	1					Methadone	270 ng/mL in blood (unspecified) @ 15 m (pe)
		Methadone	1	1					Eddp (2-ethylidene-1,5-dimethyl-3,3-diphenyl pyrrolidine)	31 ng/mL in blood (unspecified) @ 15 m (pe)
		Methadone	1	1					Eddp (2-ethylidene-1,5-dimethyl-3,3-diphenyl pyrrolidine)	82 ng/mL in blood (unspecified) @ autopsy
		Oxycodone	2	2					Oxycodone (free)	17 ng/mL in blood (unspecified) @ 15 m (pe)

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
343ph	25 y M	Lamotrigine	3	3	A/C	Ingst + Inhal	Int-S	2	Lamotrigine	11 mcg/mL in blood (unspecified) @ autopsy
		Lamotrigine	3	3					Lamotrigine	16 mcg/mL in blood (unspecified) @ 15 m (pe)
		Clonazepam	4	4					7-aminoclonazepam	19 ng/mL in blood (unspecified) @ autopsy
		Tramadol	5	5						
		Hydroxyzine	6	6						
		Pregabalin	7	7						
		Quetiapine	8	8						
		Diazepam	9	9						
		Oxycodone	1	1						
		Fentanyl	1	1						
344pi	26 y F	Street drug	2	2	A	Ingst	Int-A	1		
345h	26 y M	Acetaminophen	1	1	A/C	Ingst	Int-S	1		
		Ibuprofen	2	2						
346ph	26 y M	Hydrocodone	1	1	U	Ingst	Int-A	1		
347h	26 y M	Cocaine	2	2	U	Ingst + Inhal	Int-S	1		
		Salicylate	1	1					Salicylate	43.7 mg/dL in blood (unspecified) @ 45 m (pe)
		Salicylate	1	1					Salicylate	66.7 mg/dL in blood (unspecified) @ 3 h (pe)
		Salicylate	1	1					Salicylate	90.4 mg/dL in blood (unspecified) @ 8 h (pe)
		Salicylate	1	1					Salicylate	95.1 mg/dL in blood (unspecified) @ 14 h (pe)
		Quetiapine	2	2						
		Cocaine	3	3						
		Alprazolam	4	4						
		Fentanyl	1	1					Fentanyl	0.025 mg/L in blood (unspecified) @ autopsy
		Ethanol	2	2					Ethanol	0.06% (wt/vol) in blood (unspecified) @ autopsy
348pa	26 y M	Ethanol	2	2	A	Unk	Int-A	1	Ethanol	0.07% (wt/vol) in blood (unspecified) @ autopsy
		Ethanol	2	2					Ethanol	0.08% (wt/vol) in vitreous @ autopsy
		Ethanol	2	2					Ethanol	0.1% (wt/vol) in urine (quantitative only) @ autopsy
349h	26 y F	Oxycodone	1	1	A/C	Ingst	Int-S	2		
350ai	26 y M	Lorazepam	2	2	A	Ingst + Par	Int-A	1		
		Fentanyl	1	1					Fentanyl	5.4 ng/mL in blood (unspecified) @ autopsy
		Morphine	2	2						
		Ethanol	3	3					Ethanol	0.1% (wt/vol) in blood (unspecified) @ autopsy
		Diphenhydramine	4	4					Diphenhydramine	1.1 mcg/mL in blood (unspecified) @ autopsy
351	26 y M				A	Ingst	Int-S	1		
		Ibuprofen	1	1						
		Cyclobenzaprine	2	2						
		Ethanol	3	3						
		Naproxen	4	4						
352ph	26 y M	Melatonin	5	5	U	Ingst + Unk	Int-S	2		
		Oxycodone	1	1					Oxycodone	425 ng/mL in blood (unspecified) @ 1 h (pe)
		Alprazolam	2	2					Alprazolam	36 ng/mL in blood (unspecified) @ 1 h (pe)

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
353h	26 y F	Ethanol	3	2					Ethanol	40 mg/dL in blood (unspecified) @ 1 h (pe)
354p	26 y M	Acetaminophen/opioid	1	1	U	Ingst	Unk	2		
355h	27 y M	Tramadol	1	1	A	Ingst	Int-S	2		
		Benzodiazepine	2	2						
		Acetaminophen	1	1	A	Ingst	Int-S	1	Acetaminophen	309 mcg/mL in blood (unspecified) @ unknown
356pha	27 y M				U	Inhal	Int-A	2		
		Methadone	1	1					Methadone	240 ng/mL in whole blood @ autopsy
		Methadone	1	1					Eddp (2-ethylidene-1,5-dimethyl-3,3-diphenyl pyrrolidine)	34 ng/mL in whole blood @ autopsy
		Diazepam	2	2					Nordiazepam	130 ng/mL in whole blood @ autopsy
		Diazepam	2	2					Diazepam	53 ng/mL in whole blood @ autopsy
357h	27 y M	Salicylate	1	1	A	Ingst	Int-S	1	Salicylate	106.9 mg/dL in blood (unspecified) @ unknown
		Salicylate	1	1					Salicylate	111 mg/dL in plasma @ unknown
358pa	27 y M				A	Unk	Int-A	1		
		U-47700	1	1					u-47700	4.6 mg/kg in liver @ autopsy
		Dextromethorphan	2	2					Dextromethorphan	12 mg/kg in liver @ autopsy
		Diphenhydramine	3	3					Diphenhydramine	3.7 mg/kg in liver @ autopsy
		Ethanol	4	4					Ethanol	70 mg/dL In Brain @ autopsy
		Mitragyna speciosa korthals	5	5						
359p	27 y F	Bupropion	6	6	U	Unk	Unk	1		
		Fentanyl	1	1					Fentanyl	0.008 mg/L in blood (unspecified) @ autopsy
		Heroin	2	2					Morphine (free)	100 mcg/L in blood (unspecified) @ autopsy
		Sertraline	3	3					Sertraline	1 mg/L in blood (unspecified) @ autopsy
		Sertraline	3	3					Desmethylsertraline	1.6 mg/L in blood (unspecified) @ autopsy
		Lamotrigine	4	4					Lamotrigine	3.8 mg/L in blood (unspecified) @ autopsy
		Diphenhydramine	5	5					Diphenhydramine	0.2 mg/L in blood (unspecified) @ autopsy
		Ethanol	6	6					Ethanol	0.09% (wt/vol) in blood (unspecified) @ autopsy
		Ethanol	6	6					Ethanol	0.11% (wt/vol) in vitreous @ autopsy
		Ethanol	6	6					Ethanol	0.14% (wt/vol) in urine (quantitative only) @ autopsy
360	27 y F	Buprenorphine	1	1	A	Par	Int-A	1		
361a	28 y F	Salicylate	1	1	A	Ingst	Int-S	1	Salicylate	57 mg/dL in plasma @ 1 h (pe)
		Salicylate	1	1					Salicylate	81 mg/dL in blood (unspecified) @ autopsy
		Salicylate	1	1					Salicylate	89.7 mcg/dL in plasma @ 4 h (pe)
		Citalopram	2	2					Citalopram	2100 ng/mL in blood (unspecified) @ autopsy

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
362pha	28 y F	Quetiapine	3	3					Quetiapine	2700 ng/mL in blood (unspecified) @ autopsy
		Ethanol	4	4						
		Methadone	1	1	U	Unk	Unk	1	Methadone	130 ng/mL in whole blood @ autopsy
		Oxycodone	2	2						
363h	28 y M	Alprazolam	3	3					Alprazolam	36 ng/mL in blood (unspecified) @ autopsy
		Acetaminophen	1	1	U	Ingst	Int-S	1	Acetaminophen	300 mcg/mL in serum @ unknown
		Ethanol	2	2					Ethanol	81 mg/dL in serum @ unknown
364p	28 y M				A	Ingst	Int-S	2		
365pa	28 y M	Acetaminophen/hydrocodone	1	1						
		Alprazolam	2	2						
		Fentanyl	1	1	U	Inhal	Int-A	1	Fentanyl	0.04 mg/L in blood (unspecified) @ autopsy
		Cocaine	2	2						
		Ethanol (non-beverage)	3	3					Ethanol	0.04% (wt/vol) in blood (unspecified) @ autopsy
366h	28 y F	Ethanol (non-beverage)	3	3					Ethanol	0.06% (wt/vol) in vitreous @ autopsy
		Ethanol (non-beverage)	3	3					Ethanol	0.09% (wt/vol) in urine (quantitative only) @ autopsy
		Salicylate	1	1	A	Ingst	Int-S	1	Salicylate	100 mg/dL in serum @ 12 h (pe)
		Clonazepam	2	2						
367	28 y M	Acetaminophen	1	1	A	Ingst	Int-M	1	Acetaminophen	29 mcg/mL in blood (unspecified) @ unknown
368	28 y M				A	Ingst	Int-S	1		
369pha	28 y F	Acetaminophen	1	1						
		Hydrocodone	1	1	A	Ingst + Inhal	Int-A	2		
		Ethanol	2	2					Ethanol	130 mg/dL in blood (unspecified) @ unknown
370pha	28 y M				A/C	Ingst	Int-A	1		
		Methadone	1	1					Methadone	0.36 mg/L in blood (unspecified) @ autopsy
		Methadone	1	1					Methadone	1.6 mg/kg in liver @ autopsy
		Clonazepam	2	2					Clonazepam	0.006 mg/L in blood (unspecified) @ autopsy
		Clonazepam	2	2					7-Aminoclonazepam	0.2 mg/L in blood (unspecified) @ autopsy
371	28 y M	Alprazolam	3	3						
		Salicylate	1	1	U	Ingst	Int-S	2	Salicylate	61.5 mg/dL in blood (unspecified) @ 1 h (pe)
		Salicylate	1	1					Salicylate	73.4 mg/dL in blood (unspecified) @ 4 h (pe)
		Quetiapine	2	2						
		Cough and cold preparation	3	3						
372a	29 y F				A/C	Ingst	Int-M	2		
373	29 y M	Acetaminophen	1	1						
		Acetaminophen	1	1	A	Ingst	Int-U	1	Acetaminophen	266 mcg/mL in blood (unspecified) @ unknown
374pha	29 y F	Drug, unknown	2	2						
		Morphine	1	1	A	Ingst	Int-S	2	Morphine	778 ng/mL in blood (unspecified) @ autopsy
		Cyclobenzaprine	2	2						
		Venlafaxine	3	3						

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
375pa	29 y F	Fentanyl	1	1	A	Ingst + Unk	Int-A	1	Fentanyl	0.012 mg/L in blood (unspecified) @ autopsy
		Alprazolam	2	2					Alprazolam	0.048 mg/L in blood (unspecified) @ autopsy
		Methadone	3	3					Methadone	0.05 mg/L in blood (unspecified) @ autopsy
		Methadone	3	3					Methadone	0.2 mg/kg in liver @ autopsy
		Oxycodone	4	4					Oxycodone	0.4 mg/kg in liver @ autopsy
		Oxycodone	4	4					Oxycodone	0.5 mg/L in blood (unspecified) @ autopsy
		Diazepam	5	5					Nordiazepam	0.09 mg/L in blood (unspecified) @ autopsy
376pha	30 y F	U-47700	1	1	A/C	Par	Int-A	1		
377pa	30 y F-Pregnant				U	Ingst + Par	Unk	1		
		Fentanyl	1	1					Fentanyl	0.077 mg/kg in liver @ autopsy
		Fentanyl	1	1					Fentanyl	8.9 ng/mL in blood (unspecified) @ autopsy
		Buprenorphine	2	2					Buprenorphine	2 ng/mL in blood (unspecified) @ autopsy
		Buprenorphine	2	2					Norbuprenorphine	5.5 ng/mL in blood (unspecified) @ autopsy
		Heroin	3	3					Morphine	0.047 mg/L in vitreous @ autopsy
		Gabapentin	4	4					Gabapentin	12 mg/L in blood (unspecified) @ autopsy
		Meloxicam	5	5						
		Levothyroxin	6	6						
378h	30 y F	Acetaminophen/hydrocodone	1	1	U	Ingst	Int-S	3		
		Amphetamine	2	2						
379ph	30 y F	Acetaminophen/oxycodone	1	1	A	Ingst	Int-S	1	Oxycodone	1610 ng/mL in blood (unspecified) @ unknown
		Acetaminophen/oxycodone	1	1					Acetaminophen	166.9 mcg/mL in blood (unspecified) @ 5 h (pe)
		Tramadol	2	2					Tramadol	0.53 mcg/L in blood (unspecified) @ unknown
		Skeletal muscle relaxant	3	3						
		Duloxetine	4	4						
		Citalopram	5	5						
380ha	30 y M	Tramadol	1	1	A	Ingst	Int-S	2		
		Phencyclidine	2	2						
		Drug, unknown	3	3						
381ai	30 y M				U	Ingst + Unk	Int-A	1		
		Furanyl fentanyl	1	1					Furanyl fentanyl	0.97 ng/mL in blood (unspecified) @ autopsy
		Fentanyl	2	2						
		Ethanol	3	3					Ethanol	62 mg/dL in blood (unspecified) @ autopsy
382ha	31 y F				U	Ingst	Int-S	1		
		Acetaminophen	1	1					Acetaminophen	466 mcg/mL in blood (unspecified) @ unknown
		Amlodipine	2	2					Amlodipine	73 ng/mL in blood (unspecified) @ autopsy
		Ethanol	3	3					Ethanol	0.03% in blood (unspecified) @ unknown
		Benazepril	4	4						
383h	31 y M				A/C	Ingst	Int-S	2		
		Acetaminophen	1	1					Acetaminophen	201.1 mcg/mL in serum @ unknown
		Acetaminophen	1	1					Acetaminophen	224.2 mcg/mL in serum @ unknown

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
384ph	31 y F	Acetaminophen	1	1	U	Ingst	Unk	2	Acetaminophen	386 mcg/mL in serum @ unknown
		Baclofen	2	2						
		Bupropion (extended release)	3	3						
385p	31 y F	Acetaminophen/oxycodone	1	1	A	Ingst	Int-S	2		
		Propranolol	2	2						
		Oxycodone	1	1					Acetaminophen	15 mcg/mL in serum @ 1 h (pe)
386pha	31 y F	Acetaminophen	2	2	A	Par	Int-A	1		
		Methadone	3	3						
		Fentanyl	1	1					Norfentanyl	1.7 ng/mL in blood (unspecified) @ unknown
387h	31 y F	Fentanyl	1	1	A	Ingst	Int-S	1	Fentanyl	12 ng/mL in blood (unspecified) @ unknown
		Phenobarbital	2	2					Phenobarbital	8.1 mcg/mL in serum @ unknown
		Morphine	3	3					Morphine	190 ng/mL in blood (unspecified) @ unknown
388h	31 y F	Codeine	4	4	A	Ingst	Int-S	1	Codeine	7.9 ng/mL in blood (unspecified) @ unknown
		Acetaminophen	1	1					Acetaminophen	200 mcg/mL in serum @ 42 h (pe)
		Acetaminophen	1	1					Acetaminophen	477 mcg/mL in serum @ 36 h (pe)
389pai	31 y M	Acetaminophen	1	1	C	Ingst	Int-M	2	Acetaminophen	503 mcg/mL in serum @ 31 h (pe)
		Acetaminophen	1	1					Acetaminophen	752 mcg/mL in serum @ 4 h (pe)
		Acetaminophen	1	1					Acetaminophen	142 mcg/mL in serum @ 1 h (pe)
390pa	32 y M	Acetaminophen	1	1	A	Ingst	Int-A	1		
		Oxycodone	1	1					Oxycodone	0.4 mg/L in blood (unspecified) @ autopsy
		Oxycodone	1	1					Oxycodone	0.7 mg/L in blood (unspecified) @ autopsy
391p	32 y F	Alprazolam	2	2	U	Ingst	Int-S	1	Alprazolam	0.06 mg/L in whole blood @ autopsy
		Hydrocodone	1	1						
		Ethanol	2	2						
392p	32 y F	Benzodiazepine	3	3	A	Ingst + Inhal	Int-A	1		
		Tramadol	1	1						
		Hydrocodone	2	2						
393h	32 y F	Alprazolam	3	3	U	Ingst	Int-S	1	Acetaminophen	35.8 mcg/mL in blood (unspecified) @ 1 h (pe)
		Ethanol	4	4					Ethanol	262 mg/dL in blood (unspecified) @ 1 h (pe)
394ph	32 y F	Tramadol	1	1	A	Ingst	Int-U	2		
		Methadone	2	2						
		Alprazolam	3	3						
395h	32 y F	Acetaminophen/hydrocodone	1	1	A/C	Ingst	Int-U	2	Acetaminophen	62 mcg/mL in plasma @ 8 s (pa)
		Acetaminophen	1	1					Acetaminophen	49 mcg/mL in blood (unspecified) @ 2 h (pe)
		Acetaminophen	1	1					Acetaminophen	58 mcg/mL in blood (unspecified) @ 1 h (pe)

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
395h	32 y F	Salicylate	1	1	A	Ingst	Int-S	1	Salicylate	100 mg/dL in serum @ unknown
396ha	33 y F	Acetaminophen	1	1	U	Ingst	Int-U	1	Acetaminophen	52 mg/L in serum @ unknown
397pa	33 y M	Fentanyl	1	1	A/C	Inhal	Int-A	1		
398a	33 y F	Acetaminophen	1	1	A	Ingst	Int-S	1	Acetaminophen	353 mg/L in blood (unspecified) @ unknown
399	33 y F	Cocaine	2	2	A/C	Ingst	Int-S	1		
		Ethanol (non-beverage)	3	3						
		Acetaminophen	1	1					Acetaminophen	400 mg/L in serum @ 12 h (pe)
		Acetaminophen	1	1					Acetaminophen	494 mg/L in serum @ 30 m (pe)
		Codeine	2	2						
400ph	33 y F	Citalopram	3	3	A	Ingst	Int-S	1		
		Acetaminophen/hydrocodone	1	1					Hydromorphone	12.5 ng/mL in blood (unspecified) @ autopsy
		Acetaminophen/hydrocodone	1	1					Hydrocodone	18306 ng/mL in urine (quantitative only) @ autopsy
		Acetaminophen/hydrocodone	1	1					Hydrocodone	327 ng/mL in blood (unspecified) @ autopsy
		Acetaminophen/hydrocodone	1	1					Acetaminophen	491 mcg/mL in blood (unspecified) @ autopsy
		Acetaminophen/hydrocodone	1	1					Hydromorphone	607 ng/mL in urine (quantitative only) @ autopsy
		Acetaminophen/codeine	2	2					Codeine	3.96 mcg/mL in blood (unspecified) @ autopsy
		Acetaminophen/codeine	2	2					Codeine	400 mcg/mL in urine (quantitative only) @ unknown
401a	33 y F	Oxycodone	1	1	U	Ingst	Int-S	1	Oxymorphone	11 ng/mL in blood (unspecified) @ autopsy
		Oxycodone	1	1					Oxycodone	430 ng/mL in blood (unspecified) @ autopsy
		Nortriptyline	2	2						
		Cyclobenzaprine	3	3						
		Amphetamine/dextroamphetamine	4	4					Amphetamine	21 ng/mL in blood (unspecified) @ autopsy
		Duloxetine	5	5						
		Naproxen	6	6						
		Gabapentin	7	7						
		Sulfamethoxazole/trimethoprim	8	8						
402h	33 y M	Montelukast	9	9	A	Ingst	Int-S	2		
		Acetaminophen	1	1					Acetaminophen	338 mcg/mL in serum @ unknown
403pha	33 y M	Salicylate	2	2	U	Unk	Unk	1		
		Fentanyl	1	1					Fentanyl	8.9 ng/mL in blood (unspecified) @ unknown
		Diazepam	2	2					Diazepam	171 ng/mL in blood (unspecified) @ unknown
		Diazepam	2	2					Nordiazepam	194 ng/mL in blood (unspecified) @ unknown
404pai	33 y F	Fentanyl	1	1	A	Ingst	Int-A	1	Fentanyl	4 ng/mL in blood (unspecified) @ autopsy
		Oxycodone	2	2					Oxycodone (free)	60 ng/mL in blood (unspecified) @ autopsy
		Cocaine	3	3					Ecgonine methyl ester	22 ng/mL in blood (unspecified) @ autopsy

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
405pa	33 y F	Cocaine	3	3	A	Unk	Unk	1	Benzoyllecognine	248 ng/mL in blood (unspecified) @ autopsy
		Alprazolam	4	4					Alprazolam	84 ng/mL in blood (unspecified) @ autopsy
		Quetiapine	5	5					Quetiapine	35 ng/mL in blood (unspecified) @ autopsy
		Fentanyl	1	1					Fentanyl	0.023 mg/L in blood (unspecified) @ autopsy
		Diphenhydramine	2	2					Diphenhydramine	0.09 mg/L in blood (unspecified) @ autopsy
		Fluoxetine	3	3					Fluoxetine	1.4 mg/L in blood (unspecified) @ autopsy
406h	34 y F	Acetaminophen/ oxycodone	1	1	C	Ingst	Int-U	3	Acetaminophen	31 mcg/mL in blood (unspecified) @ unknown
407h	34 y F- Pregnant				U	Unk	Int-A	1		
408pha	34 y M	Hydrocodone	1	1	A	Unk	Int-U	1		
		Benzodiazepine	2	2						
		Hydrocodone	1	1						
		Cocaine	2	2						
		Amphetamine	3	3						
409ha	35 y F	Nicotine	4	4	A	Ingst + Par	Int-U	2		
		Salicylate	5	5						
		Oxymorphone	1	1						
		Acetaminophen	2	2					Acetaminophen	54.2 mcg/mL in serum @ unknown
		Amphetamine/ dextroamphetamine	3	3						
		Amphetamine Drug, unknown	4	4						
410h	35 y M	Hydrocodone	5	5	A/C	Ingst	Int-M	2		
		Acetaminophen	6	6						
411pa	35 y F		1	1	A	Ingst	Int-U	1		
		Methadone	1	1					Methadone	0.18 mg/L in blood (unspecified) @ autopsy
		Ethanol	2	2					Ethanol	0.018 g/dL in blood (unspecified) @ autopsy
412h	35 y F				A/C	Ingst	Int-S	1		
		Tramadol	1	1					Tramadol	9.5 mg/L in blood (unspecified) @ unknown
		Venlafaxine	2	2					Venlafaxine	3.6 mg/L in blood (unspecified) @ unknown
413p	35 y M				A	Inhal	Int-A	1		
414i	35 y M	Fentanyl	1	1	A	Ingst	Int-S	1		
		Ethanol	2	2						
415pa	35 y M	Salicylate	1	1	A	Unk	Int-A	1	Salicylate	79 mg/dL in serum @ unknown
		Fentanyl	1	1					Fentanyl	0.004 mg/L in blood (unspecified) @ autopsy
		Alprazolam	2	2					Alprazolam	0.036 mg/L in blood (unspecified) @ autopsy
		Ethanol	3	3					Ethanol	0.06% (wt/vol) in blood (unspecified) @ autopsy
		Ethanol	3	3					Ethanol	0.08% (wt/vol) in blood (unspecified) @ autopsy
		Ethanol	3	3					Ethanol	0.1% (wt/vol) in vitreous @ autopsy
		Ethanol	3	3					Ethanol	0.12% (wt/vol) in urine (quantitative only) @ autopsy
416ha	35 y F	Acetaminophen	1	1	U	Unk	Unk	1	Acetaminophen	4 mcg/mL in serum @ 1 h (pe)
417h	36 y M	Salicylate	1	1	A	Ingst	Int-S	1	Salicylate	75.1 mg/dL in serum @ 5 m (pe)

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
418ph	36 y F	Diphenhydramine	2	2	A	Ingst	Int-S	2	Acetaminophen	370 mcg/mL in blood (unspecified) @ unknown
		Ethanol	3	3						
		Guafensin	4	4						
419	36 y F	Acetaminophen	1	1	C	Ingst	Int-M	2	Acetaminophen	25 mg/L in blood (unspecified) @ unknown
		Acetaminophen/ hydrocodone	2	2						
		Ethanol	3	3						
420pha	36 y F	Hydrocodone	1	1	A	Ingst + Unk	Int-S	1	6-Monoacetyl morphine	200 ng/mL in blood (unspecified) @ unknown
		Hydrocodone	1	1					Morphine (free)	78 ng/mL in blood (unspecified) @ unknown
		Benzodiazepine	2	2					Alprazolam	19 ng/mL in blood (unspecified) @ unknown
		Cocaine	3	3					Benzoyllecognine	1000 ng/mL in blood (unspecified) @ unknown
		Cocaine	3	3					Cocaine	20 ng/mL in blood (unspecified) @ unknown
		Ethanol	4	4					Norfentanyl	6.9 ng/mL in blood (unspecified) @ unknown
		Fentanyl	5	5					Fentanyl	9 ng/mL in blood (unspecified) @ unknown
		Fentanyl	5	5					Acetyl fentanyl	1.1 ng/mL in blood (unspecified) @ unknown
		Fentanyl	6	6						
		Fentanyl	6	6						
421h	36 y F	Colchicine	1	1	U	Ingst	Int-U	2		
		Drug, unknown	2	2						
		Quetiapine	3	3						
422	36 y F	Acetaminophen	1	1	A/C	Ingst	Int-S	1	Acetaminophen	85.1 mcg/mL in blood (unspecified) @ unknown
		Clonazepam	2	2						
		Pregabalin	3	3						
423ha	36 y F	Carisoprodol	4	4	A/C	Ingst	Unt-T	1	Acetaminophen	108 mcg/mL in serum @ unknown
		Acetaminophen	1	1						
		Ethanol	2	2						
424ph	36 y F	Oxycodone	1	1	A	Ingst	Int-S	2	Oxycodone (free)	260 ng/mL in blood (unspecified) @ 1 h (pe)
		Oxycodone	1	1					Oxymorphone	9.5 ng/mL in blood (unspecified) @ 1 h (pe)
		Acetaminophen	3	2					Acetaminophen	30.3 mcg/mL in blood (unspecified) @ 1 h (pe)
		Clonazepam	2	2					7-aminoclonazepam	160 ng/mL in blood (unspecified) @ 1 h (pe)
		Clonazepam	2	2					Clonazepam	57 ng/mL in blood (unspecified) @ 1 h (pe)
		Marijuana	4	4					Delta-9-thc	0.51 ng/mL in blood (unspecified) @ 1 h (pe)
		Marijuana	4	4					Delta-9-carboxy-thc	6.2 ng/mL in blood (unspecified) @ 1 h (pe)
		Fentanyl	1	1					Fentanyl	0.6 ng/mL in blood (unspecified) @ autopsy
		Fentanyl	1	1						
425a	36 y F	Methamphetamine	2	2	A	Unk	Int-S	1		
		Amphetamine	3	3						
		Fentanyl	1	1						
426ph	36 y M	Fentanyl	1	1	A	Unk	Unk	1		
		Methamphetamine	2	2						
		Amphetamine	3	3						

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
427pa	36 y M				A	Ingst	Int-U	3		
428pha	37 y M	Fentanyl	1	1	A	Unk	Int-A	2		
		Fentanyl	1	1					Norfentanyl	0.62 ng/mL in blood (unspecified) @ 1 h (pe)
		Fentanyl	1	1					Fentanyl	3.6 ng/mL in blood (unspecified) @ 1 h (pe)
		Oxycodone	2	2					Oxycodone (free)	26 ng/mL in blood (unspecified) @ 1 h (pe)
		Lorazepam	3	3					Lorazepam	16 ng/mL in blood (unspecified) @ 1 h (pe)
		Clonazepam	4	4					7-aminoclonazepam	14 ng/mL in blood (unspecified) @ 1 h (pe)
429ha	37 y F	Acetaminophen	1	1	A	Ingst	Int-S	1		
430pha	37 y M	Fentanyl	1	1	A	Unk	Int-A	2	Norfentanyl	0.46 ng/mL in blood (unspecified) @ autopsy
		Fentanyl	1	1					Fentanyl	2 ng/mL in blood (unspecified) @ autopsy
		Marijuana	2	2					Delta-9-thc	1.8 ng/mL in blood (unspecified) @ autopsy
431h	37 y F	Acetaminophen	1	1	A	Ingst	Int-S	1	Acetaminophen	257 mcg/mL in blood (unspecified) @ 2 h (pe)
		Acetaminophen	1	1					Acetaminophen	62.2 mcg/mL in blood (unspecified) @ 2 d (pe)
432ph	38 y M				A	Ingst	Int-S	2		
433ha	38 y F	Fentanyl	1	1	U	Ingst	Int-S	1		
		Tramadol	2	2						
		Salicylate	1	1					Salicylate	50.1 mg/dL in blood (unspecified) @ unknown
		Salicylate	1	1					Salicylate	72 mg/dL in blood (unspecified) @ unknown
		Ethanol	2	2					Ethanol	0.14 g/dL in blood (unspecified) @ unknown
		Ethanol	2	2					Ethanol	0.18 g/dL in blood (unspecified) @ unknown
434p	38 y F	Ethanol	2	2	A	Ingst	Int-S	1	Ethanol	0.18 g/dL in vitreous @ autopsy
		Ethanol	2	2					Ethanol	135 mg/dL in blood (unspecified) @ unknown
434p	38 y F	Acetaminophen	1	1	A	Ingst	Int-U	2		
435pha	38 y F	Fentanyl	1	1	A	Par	Int-A	1	Fentanyl	2.9 ng/mL in serum @ 1 h (pe)
		Heroin	2	2						
		Hydrocodone	3	3						
436ha	38 y F	Acetaminophen	1	1	A	Ingst	Int-S	1		
		Ethanol	2	2						
437h	38 y M	Acetaminophen	1	1	C	Ingst	Unk	1	Acetaminophen	55 mcg/mL in serum @ unknown
438h	38 y F	Acetaminophen	1	1	A/C	Ingst	Int-S	1	Iron	294 mcg/dL in blood (unspecified) @ 24 h (pe)
		Acetaminophen	1	1					Acetaminophen	41.5 mg/L in blood (unspecified) @ 48 h (pe)
		Iron	2	2						
		Alprazolam	3	3						
		Lorazepam	4	4						
439ha	38 y F	Acetaminophen	1	1	C	Ingst	Int-M	1	Acetaminophen	82 mg/L in serum @ 15 m (pe)
		Ibuprofen	2	2						

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
440h	38 y M	Ethanol	3	3					Ethanol	12 mg/dL in serum @ 15 m (pe)
		Acetaminophen	1	1	C	Ingst	Int-M	1	Acetaminophen	98 mcg/mL in plasma @ unknown
441	39 y F	Salicylate	1	1	A	Ingst	Unk	1	Salicylate	100.9 mg/dL in serum @ unknown
442h	39 y F	Acetaminophen/ hydrocodone	1	1	A	Ingst	Int-S	2	Acetaminophen	42 mg/L in serum @ unknown
		Lorazepam	2	2					Lorazepam	114 ng/mL in blood (unspecified) @ unknown
443ph	39 y M	Diphenhydramine	3	3						
		Acetaminophen/ hydrocodone	1	1	A	Ingst	Int-S	2	Acetaminophen	3 mcg/mL in blood (unspecified) @ unknown
		Alprazolam	2	2						
		Gabapentin	3	3						
444h	39 y M	Dextroamphetamine	4	4						
		Ibuprofen	1	1	A	Ingst	Int-S	2		
445ha	39 y M	Methadone	1	1	A	Ingst	Int-A	1	Methadone	0.13 mg/L in blood (unspecified) @ unknown
		Hydroxyzine	2	2					Hydroxyzine	0.12 mg/L in blood (unspecified) @ unknown
		THC homolog	3	3						
		Ethanol	4	4					Ethanol	0.01 g/dL in blood (unspecified) @ unknown
446h	39 y M	Ibuprofen	1	1	U	Ingst	Int-S	2		
		Ethanol	2	2						
447	39 y M	Acetaminophen	1	1	U	Ingst	Int-M	1	Acetaminophen	164 mcg/mL in serum @ 4 h (pe)
448h	40 y M	Acetaminophen	1	1	C	Ingst	Int-U	1	Acetaminophen	9 mcg/mL in blood (unspecified) @ unknown
449h	40 y M	Salicylate	1	1	A	Ingst	Int-S	1	Salicylate	21.4 mg/dL in serum @ 30 m (pe)
		Salicylate	1	1					Salicylate	67.8 mg/dL in serum @ 3 h (pe)
		Salicylate	1	1					Salicylate	93.7 mg/dL in serum @ 7 h (pe)
450ha	40 y F	Acetaminophen/ hydrocodone	1	1	A/C	Ingst	Int-S	1		
451h	40 y F	Acetaminophen/ diphenhydramine	1	1	C	Ingst	Int-M	1	Acetaminophen	26 mcg/mL in serum @ unknown
452h	40 y F	Acetaminophen	1	1	A	Ingst	Unt-G	2	Acetaminophen	105.7 mcg/mL in serum @ 1 h (pe)
453h	40 y F	Acetaminophen	1	1	U	Ingst	Int-S	2	Acetaminophen	51.1 mcg/mL in serum @ unknown
454ph	40 y M	Oxycodone	1	1	A	Ingst	Int-S	2		
		Drug, unknown	2	2						
455h	41 y M	Acetaminophen	1	1	C	Ingst	Int-S	1	Acetaminophen	21 mcg/mL in blood (unspecified) @ 48 h (pe)
		Acetaminophen	1	1					Salicylate	6.7 mg/dL in blood (unspecified) @ 48 h (pe)

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time				
456h	41 y F	Ibuprofen	2	2	A/C	Ingst	Int-S	2	Acetaminophen	55 mcg/mL in serum @ unknown				
		Acetaminophen	1	1										
		Drug, unknown	2	2										
457ph	41 y M	Hydrocodone	1	1	A	Par	Int-A	1	Acetaminophen	111 mcg/mL in blood (unspecified) @ unknown				
458h	41 y F	Acetaminophen	1	1	U	Ingst	Int-S	1						
		Bismuth subsalicylate	2	2										
		Calcium carbonate	3	3										
459h	41 y F	Ondansetron	4	4	A/C	Ingst	Int-S	3	Acetaminophen	14 mcg/mL in blood (unspecified) @ unknown				
		Acetaminophen/hydrocodone	1	1										
		Ethanol	2	2										
460h	41 y F	Acetaminophen	1	1	U	Ingst	Int-S	2	Acetaminophen	101.5 mcg/mL in blood (unspecified) @ unknown				
		Drug, unknown	2	1										
		Drug, unknown	2	1										
461ph	41 y M	Fentanyl	1	1	A/C	Par	Int-A	2	Acetaminophen	50 mcg/mL in serum @ 1 d (pe)				
462h	41 y F	Heroin	2	1	A	Ingst	Int-S	1						
		Acetaminophen	1	1										
463pa	42 y M	Ethanol (non-beverage)	2	2	A	Ingst	Unk	1	Norfentanyl	1.4 ng/mL in blood (unspecified) @ autopsy				
		Fentanyl	1	1							Fentanyl	5.8 ng/mL in blood (unspecified) @ autopsy		
		Fentanyl	1	1									Chlordiazepoxide	59 ng/mL in blood (unspecified) @ autopsy
		Chlordiazepoxide	2	2										
		Alprazolam	3	3										
464h	42 y M	Acetaminophen	1	1	A/C	Ingst	Int-A	2						
465	42 y F	Acetaminophen	1	1	C	Ingst	Unk	1	Acetaminophen	51 mcg/mL in blood (unspecified) @ unknown				
466pha	42 y F	Oxycodone	1	1	A/C	Ingst	Int-S	2	Acetaminophen	54 mcg/mL in blood (unspecified) @ 2 h (pe)				
		Trazodone	2	2										
		Acetaminophen/dextromethorphan/doxylamine	3	3										
		Alprazolam	4	4										
467h	42 y F	Acetaminophen/diphenhydramine	1	1	C	Ingst	Int-M	2	Acetaminophen	37 mcg/mL in blood (unspecified) @ unknown				
		Acetaminophen	2	2										
		Acetaminophen/hydrocodone	3	3										
		Sertraline	4	4										
		Clonazepam	5	5										
		Mirtazapine	6	6										
		Pantoprazole	7	7										

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
468	43 y F	Acetaminophen	1	1	U	Ingst	Unk	1	Acetaminophen	23 mcg/mL in serum @ unknown
469h	43 y F	Ethanol	2	2	U	Ingst	Int-S	2		
		Tramadol	1	1						
470	43 y M	Clonazepam	2	2	A	Ingst	Int-S	1	Acetaminophen	600 mcg/mL in serum @ 0 h (pe)
471	43 y F	Acetaminophen	1	1	A	Ingst	Int-S	1	Acetaminophen	14.3 mcg/mL in serum @ 3 d (pe)
		Acetaminophen	1	1					Acetaminophen	217.2 mcg/mL in serum @ 21 h (pe)
472	43 y M	Hydrocodone	1	1	A	Unk	Int-A	2		
		Drug, unknown	2	2						
473h	43 y F	Acetaminophen/opioid	1	1	A	Ingst	Int-S	2	Acetaminophen	13.3 mcg/mL in serum @ unknown
474	43 y F	Benzodiazepine	2	2	U	Ingst	Unt-G	2		
		Acetaminophen	1	1						
		Hydrocodone	2	2						
475ha	43 y F	Benzodiazepine	3	3	C	Ingst	Int-M	2	Acetaminophen	33 mcg/mL in blood (unspecified) @ autopsy
		Acetaminophen	1	1					Midazolam	218 ng/mL in blood (unspecified) @ autopsy
		Midazolam	2	2						
		Caffeine/salicylamide/salicylate	3	3						
476h	43 y M	Acetaminophen	1	1	A	Ingst	Int-S	1	Acetaminophen	156 mcg/mL in blood (unspecified) @ 14 h (pe)
		Acetaminophen	1	1					Acetaminophen	89.1 mcg/mL in blood (unspecified) @ 21 h (pe)
		Acetaminophen	1	1					Acetaminophen	9.9 mcg/mL in blood (unspecified) @ 79.5 h (pe)
477p	43 y F	Acetaminophen/oxycodone	1	1	A	Ingst	Int-U	2		
		Quetiapine	2	2						
478a	43 y F	Methadone	1	1	A	Ingst	Int-S	1	Methadone	0.1 mg/L in blood (unspecified) @ unknown
479pha	44 y F	Tramadol	1	1	A/C	Ingst	Int-S	1	Tramadol	0.64 mg/L in serum @ 11 h (pe)
		Citalopram	2	2					Citalopram	0.05 mg/L in serum @ 11 h (pe)
		Mirtazapine	3	3					Mirtazapine	0.23 mg/L in serum @ 11 h (pe)
480ph	44 y F	Gabapentin	4	4	A	Ingst + Aspir	Int-U	1		
		Hydrocodone	1	1						
		Benzodiazepine	2	2						
		Amphetamine	3	3						
		Cocaine	4	4						
481h	44 y M	Colchicine	1	1	A	Ingst	Int-S	1		
482pa	44 y F	Methadone	1	1	U	Ingst	Int-A	1	Methadone	0.29 mg/L in blood (unspecified) @ autopsy
		Methadone	1	1					Methadone	1.2 mg/kg in liver @ autopsy
		Morphine	2	2					Morphine	0.1 mg/L in blood (unspecified) @ autopsy
		Morphine	2	2					Morphine	5.2 mg/L in urine (quantitative only) @ autopsy

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
483h	44 y M	Amitriptyline	3	3	A	Ingst	Int-S	1	Amitriptyline	0.61 mg/L in blood (unspecified) @ autopsy
		Amitriptyline	3	3					Nortriptyline	2.5 mg/L in blood (unspecified) @ autopsy
		Amitriptyline	3	3					Nortriptyline	31 mg/kg in liver @ autopsy
		Amitriptyline	3	3					Amitriptyline	7.5 mg/kg in liver @ autopsy
		Ompazole	4	4					Ethanol	20 mg/dL in blood (unspecified) @ autopsy
		Eszopilclone	5	5						
		Valproic acid	6	6						
		Ethanol	7	7						
		Acetaminophen	1	1					Acetaminophen	167 mcg/mL in blood (unspecified) @ 27 h (pe)
		Acetaminophen	1	1					Acetaminophen	368 mcg/mL in blood (unspecified) @ 9.5 h (pe)
		Acetaminophen	1	1					Acetaminophen	370 mcg/mL in blood (unspecified) @ 5.5 h (pe)
		Acetaminophen	1	1					Acetaminophen	433 mcg/mL in blood (unspecified) @ 14 h (pe)
		Acetaminophen	1	1					Acetaminophen	79.9 mcg/mL in blood (unspecified) @ 33 h (pe)
		Ethanol	2	2					Ethanol	102 mg/dL in blood (unspecified) @ 5.5 h (pe)
484ph	44 y M	Hydrocodone	1	1	A/C	Ingst	Int-S	2	Ethanol	71 mg/dL in blood (unspecified) @ unknown
		Cocaine	2	2						
		Marijuana	3	3						
		Ethanol	4	4						
485h	44 y F	Acetaminophen	1	1	C	Ingst	Int-U	3		
486ha	45 y M	Salicylate	2	2	A	Ingst + Par	Int-S	1	Salicylate	59 mg/dL in plasma @ unknown
		Salicylate	1	1					Potassium	5.7 mEq/L in serum @ 3 h (pe)
		Potassium chloride	2	2					Potassium	6.6 mEq/L in serum @ 15 m (pe)
		Acetaminophen	3	3					Acetaminophen	10.7 mcg/mL in plasma @ unknown
487pha	45 y F	Oxycodone	1	1	A	Ingst	Int-S	2	Oxycodone	15 ng/mL in blood (unspecified) @ autopsy
		Cyclobenzaprine	2	2					Cyclobenzaprine	82 ng/mL in blood (unspecified) @ autopsy
		Acetaminophen	3	3					Acetaminophen	68 mcg/mL in blood (unspecified) @ unknown
		Ethanol	4	4					Ethanol	61 mg/dL in blood (unspecified) @ unknown
		Cocaine	5	5					Delta-9-carboxy-thc	0.5 ng/mL in blood (unspecified) @ autopsy
		Marijuana	6	6						
488	45 y F	Salicylate	1	1	A	Ingst	Int-U	2	Salicylate	128 mg/dL in serum @ unknown
		Caffeine/salicylamide/salicylate	2	2						

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
489ph	45 y F	Acetaminophen/ hydrocodone	1	1	C	Ingst	Int-U	2	Hydrocodone	260 ng/mL in serum @ unknown
490pai	45 y M	Fentanyl	1	1	A	Unk	Int-A	1	Fentanyl	0.007 mg/L in blood (unspecified) @ autopsy
		Ethanol	2	2					Ethanol	0.2% (wt/vol) in blood (unspecified) @ autopsy
		Ethanol	2	2					Ethanol	0.22% (wt/vol) in blood (unspecified) @ autopsy
		Ethanol	2	2					Ethanol	0.29% (wt/vol) in vitreous @ autopsy
		Ethanol	2	2					Ethanol	0.33% (wt/vol) in urine (quantitative only) @ autopsy
491a	45 y M	Methadone	1	1	A	Ingst + Aspir + - Unk	Int-U	1	Methadone	0.09 mg/L in blood (unspecified) @ 1 h (pe)
		Hydromorphone	2	2					Hydromorphone	0.02 mg/L in blood (unspecified) @ 1 h (pe)
		Morphine	3	3					Morphine (free)	0.11 mg/L in blood (unspecified) @ 1 h (pe)
		Morphine	3	3					Morphine	2.08 mg/L in blood (unspecified) @ 1 h (pe)
		Oxycodone	4	4					Oxycodone	0.04 mg/L in blood (unspecified) @ 1 h (pe)
492h	45 y F	Hydrocodone	1	1	U	Ingst + Unk	Int-S	2		
		Gabapentin	2	2						
		Benzodiazepine	3	3						
493ph	45 y F	Oxycodone	1	1	A/C	Ingst	Int-S	1		
		Acetaminophen	2	2					Acetaminophen	329 mcg/mL in serum @ unknown
		Pregabalin	3	3						
		Pregabalin	4	4						
		Venlafaxine	5	5						
		Omeprazole	6	6						
494h	45 y M	Acetaminophen/ diphenhydramine	1	1	A	Ingst	Int-S	1	Acetaminophen	527 mcg/mL in plasma @ unknown
		Trihexyphenidyl	2	2						
		Paliperidone	3	3						
		Ethanol	4	4						
495pha	45 y F	Oxycodone (extended release)	1	1	A/C	Ingst	Int-U	1	Oxycodone (free)	1100 ng/mL in blood (unspecified) @ autopsy
		Oxycodone (extended release)	1	1					Oxymorphone	57 ng/mL in blood (unspecified) @ autopsy
		Tizanidine	2	2						
		Zolpidem	3	3					Zolpidem	250 ng/mL in blood (unspecified) @ autopsy
496pa	46 y M	Morphine	1	1	A	Ingst	Unk	1	Morphine (free)	23 mcg/L in blood (unspecified) @ autopsy
		Ethanol	2	2					Ethanol	0.14% (wt/vol) in blood (unspecified) @ autopsy
		Quetiapine	3	3						
		Trazodone	4	4					Trazodone	0.1 mg/L in blood (unspecified) @ autopsy
497h	46 y F	Acetaminophen/codeine	1	1	U	Ingst	Int-S	1	Acetaminophen	19.9 mcg/mL in blood (unspecified) @ unknown
		Ethanol	2	2					Ethanol	11 mg/dL in whole blood @ unknown
498	46 y M	Buprenorphine/naloxone (sublingual film)	1	1	U	Ingst	Int-U	3		

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
499h	47 y F	Acetaminophen/ diphenhydramine	1	1	C	Ingst	Int-M	2	Acetaminophen	57 mcg/mL in serum @ 1 d (pe)
		Acetaminophen/ diphenhydramine	1	1					Acetaminophen	64 mcg/mL in serum @ unknown
500h	47 y F	Acetaminophen/ hydrocodone	1	1	C	Ingst	Int-U	3	Acetaminophen	187.9 mcg/mL in serum @ 1 h (pe)
501pa	47 y F	Oxymorphone	1	1	A/C	Ingst	Int-A	1	Oxymorphone	0.069 mg/L in blood (unspecified) @ autopsy
502ph	47 y F	Acetaminophen	1	1	U	Ingst	Int-S	1		
		Paroxetine	2	2						
		Drug, unknown	3	3						
503p	47 y F	Hydrocodone and acetaminophen	1	1	U	Unk	Unk	2		
504ph	47 y M	Acetaminophen/ oxycodone	1	1	A	Ingst	Int-S	2	Acetaminophen	54 mcg/mL in plasma @ unknown
505h	47 y F	Tramadol	1	1	A	Ingst	Unk	2		
		Alprazolam	2	2						
506ph	47 y M	Methadone	1	1	A/C	Ingst	Int-S	2		
		Clonazepam	2	2						
		Drug, unknown	3	3						
507h	47 y M	Acetaminophen	1	1	C	Ingst	Unt-T	3		
508h	48 y F	Colchicine	1	1	A/C	Ingst	Int-S	3		
509h	48 y F	Acetaminophen/ hydrocodone	1	1	A/C	Ingst	Int-S	1		
		Methadone	2	2						
510ha	48 y M	Acetaminophen	1	1	U	Ingst	Int-S	1	Acetaminophen	860 mg/L In unknown @ unknown
		Salicylate	2	2					Salicylate	27 mg/dL in serum @ 1 h (pe)
511h	48 y F	Hydromorphone	1	1	A	Par	Int-S	2	Hydromorphone	110 ng/mL in blood (unspecified) @ unknown
		Cyclobenzaprine	2	2					Cyclobenzaprine	300 ng/mL in blood (unspecified) @ unknown
		Zolpidem	3	3					Zolpidem	245 ng/mL in blood (unspecified) @ unknown
		Fluoxetine	4	4					Norfluoxetine	230 ng/mL in blood (unspecified) @ unknown
		Fluoxetine	4	4					Fluoxetine	310 ng/mL in blood (unspecified) @ unknown
		Diazepam	5	5					Nordiazepam	0.2 mcg/mL in blood (unspecified) @ unknown
		Diazepam	5	5					Diazepam	0.3 mcg/mL in blood (unspecified) @ unknown
		Promethazine	6	6					Promethazine	22 ng/mL in blood (unspecified) @ unknown
		Diphenhydramine	7	7					Diphenhydramine	50 ng/mL in blood (unspecified) @ unknown
512ha	48 y F	Acetaminophen	1	1	U	Ingst	Int-S	1	Acetaminophen	629 mcg/mL in serum @ 5 h (pe)

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
513h	48 y F	Acetaminophen	1	1	C	Ingst	Int-M	1	Acetaminophen	69 mcg/mL in serum @ unknown
514	48 y F	Hydrocodone	1	1	A	Ingst	Int-S	2		
		Propranolol	2	2						
		Lamotrigine	3	3						
		Sertraline	4	4						
		Buspirone	5	5						
		Trazodone	6	6						
		Ethanol	7	7					Ethanol	474 mg/dL in blood (unspecified) @ unknown
515pha	48 y M	Clonazepam	8	8	U	Par	Int-A	1		
		Fentanyl	1	1					Norfentanyl	1.2 ng/mL in blood (unspecified) @ unknown
		Fentanyl	1	1					Fentanyl	3.6 ng/mL in blood (unspecified) @ unknown
516h	49 y M	Acetaminophen	1	1	A	Ingst	Unk	1	Acetaminophen	74 mg/dL in plasma @ unknown
		Ethanol	2	2					Ethanol	81 mg/dL in plasma @ unknown
		Salicylate	3	3					Salicylate	9.6 mg/dL in plasma @ unknown
517	49 y F	Acetaminophen	1	1	A	Ingst	Int-S	1	Acetaminophen	115.8 mcg/mL in blood (unspecified) @ 12 h (pe)
		Acetaminophen	1	1					Acetaminophen	71.7 mcg/mL in blood (unspecified) @ 24 h (pe)
518ha	49 y F	Acetaminophen	1	1	C	Ingst	Int-M	1	Acetaminophen	84.8 mg/L in blood (unspecified) @ unknown
519ph	49 y M	Oxymorphone (extended release)	1	1	A	Ingst + Par	Int-A	1		
520ph	49 y M	Alprazolam	2	2	U	Ingst	Int-U	2		
		Buprenorphine/naloxone (sublingual film)	1	1						
		Clonazepam	2	2						
		Chlordiazepoxide	3	3						
		Amphetamine	4	4						
		Ethanol	5	5					Ethanol	23 mg/dL in serum @ unknown
521	49 y M	Acetaminophen	1	1	C	Ingst	Int-M	1	Acetaminophen	31 mcg/mL in blood (unspecified) @ 1 h (pe)
		Ethanol	2	2						
522ha	50 y F	Acetaminophen	1	1	U	Ingst	Int-S	1	Acetaminophen	1401 mcg/mL in serum @ 20 m (pe)
		Acetaminophen	1	1					Acetaminophen	1655 mcg/mL in serum @ 10 h (pe)
		Acetaminophen	1	1					Acetaminophen	760 mcg/mL in blood (unspecified) @ 10 h (pe)
		Acetaminophen	1	1					Acetaminophen	840 mcg/mL in blood (unspecified) @ 20 m (pe)
		Warfarin	2	2						
		Phenothiazine	3	3						
		Rivaroxaban	4	4						
		Ondansetron	5	5						
		Ibuprofen	6	6						

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
523pa	50 y M	Cough and cold preparation	7	7	A	Oth	Int-A	1		
		Lorazepam	8	8						
		Caffeine	9	9						
		Fentanyl	1	1					Fentanyl	0.009 mg/L in blood (unspecified) @ autopsy
		Cocaine	2	2					Cocaine	0.3 mg/L in blood (unspecified) @ autopsy
		Ethanol	3	3					Ethanol	0.02% in blood (unspecified) @ autopsy
524pha	50 y F	Ethanol	3	3	U	Unk	Unk	1	Ethanol	0.04% in vitreous @ autopsy
		Ethanol	3	3					Ethanol	0.06% in urine (quantitative only) @ autopsy
		Fentanyl	1	1						
		Clonazepam	2	2					Clonazepam	33 ng/mL in blood (unspecified) @ unknown
		Diphenhydramine	3	3					Diphenhydramine	84 ng/mL in blood (unspecified) @ unknown
525h	50 y M	Citalopram	4	4	A	Ingst	Int-M	2		
526	50 y F	Ibuprofen	1	1	A/C	Ingst	Int-S	1		
		Acetaminophen	1	1					Acetaminophen	13 mcg/mL in serum @ 43 h (pe)
527ph	50 y F	Clonazepam	3	2	A	Ingst	Int-S	2		
		Paroxetine	2	2						
		Lamotrigine	4	3						
		Levothyroxine	5	4						
		Ibuprofen	1	1						
		Hydroxyzine	2	2						
528	50 y F	Methocarbamol	3	3	A	Ingst	Int-S	1		
		Baclofen	4	4						
		Rosuvastatin	5	5						
		Hydromorphone	6	6						
		Gabapentin	7	7						
		Salicylate	1	1					Salicylate	116 mg/dL in blood (unspecified) @ unknown
529h	50 y M	Gabapentin	2	2	C	Ingst	Int-S	1		
		Acetaminophen/hydrocodone	3	3						
		Acetaminophen	1	1						
530ph	50 y M	Ethanol	2	2	A/C	Ingst	Int-S	2		
		Acetaminophen/oxycodone	1	1					Oxymorphone	1.3 ng/mL in whole blood @ autopsy
		Acetaminophen/oxycodone	1	1					Oxycodone	30 ng/mL in whole blood @ autopsy
531	50 y F	Acetaminophen	1	1	C	Ingst	Int-M	3		
532hi	50 y F				U	Ingst	Int-M	2		
		Acetaminophen	1	1						
		Ethanol	2	2						
		Amphetamine	3	3						
533	51 y M	Cocaine	4	4	U	Ingst	Int-S	2		
		Acetaminophen	1	1					Acetaminophen	592 mcg/mL in blood (unspecified) @ unknown
		Drug, unknown	2	2						
		Ethanol	3	3						

(Continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
534h	51 y F	Morphine	1	1	A	Ingst + Par	Int-A	2		
		Acetaminophen/ oxycodone	2	2					Acetaminophen	12 mcg/mL in blood (unspecified) @ unknown
		Acetaminophen/ oxycodone	2	2					Acetaminophen	45 mcg/mL in blood (unspecified) @ unknown
535ha	51 y F	Acetaminophen	1	1	A	Ingst	Int-S	1	Acetaminophen	20 mcg/mL in blood (unspecified) @ 15 m (pe)
		Ethanol	2	2					Ethanol	12 mg/dL in blood (unspecified) @ 15 m (pe)
		Citalopram	3	3					Citalopram	80 ng/mL in blood (unspecified) @ unknown
536p	51 y F	Methadone	1	1	A	Ingst	Int-S	2		
		Hydromorphone	2	2						
		Clonazepam	3	3						
		Hydroxyzine	4	4						
		Gabapentin	5	5						
537ph	51 y M	Hydrocodone acetaminophen combo	1	1	A	Ingst	Int-S	1	Acetaminophen	28.7 mcg/mL in serum @ unknown
		Drug, unknown	2	2						
		Alprazolam	3	3						
538h	51 y F	Acetaminophen	1	1	A/C	Ingst	Int-M	1		
		Ethanol	2	2						
539a	52 y F	Acetaminophen	1	1	A	Ingst	Int-S	1	Acetaminophen	300 mg/L in blood (unspecified) @ unknown
540h	52 y F	Fentanyl	1	1	U	Derm	Int-A	3		
541	52 y M	Acetaminophen	1	1	A/C	Ingst	Int-M	1		
542h	52 y M	Salicylate	1	1	U	Ingst	Int-S	2		
		Foreign body	2	2						
543ph	52 y M	Acetaminophen	1	1	A	Ingst	Int-S	2	Acetaminophen	72 mcg/mL in serum @ unknown
544	52 y F	Acetaminophen	1	1	A	Ingst	Int-S	1	Acetaminophen	63 mcg/mL in serum @ unknown
		Acetaminophen/ caffeine	2	2						
545	52 y M	Salicylate	1	1	A	Ingst	Int-S	1	Salicylate	108 mg/dL in serum @ unknown
546hi	52 y M	Acetaminophen/ diphenhydramine	1	1	U	Ingst	Int-S	1	Acetaminophen	225 mcg/mL in serum @ 1 h (pe)
		Ethanol	2	2					Ethanol	201 mg/dL in serum @ 1 h (pe)
		Sertraline	3	3						
		Ibuprofen	4	4						
547h	53 y F	Acetaminophen	1	1	A	Ingst	Unk	2	Acetaminophen	4.7 mcg/mL in blood (unspecified) @ unknown
548ph	53 y M	Oxycodone (extended release)	1	1	U	Ingst	Int-A	2		
549	53 y F	Acetaminophen/ diphenhydramine	1	1	C	Ingst	Int-M	1		
		Mitragyna	2	2						
		Ethanol	3	3						
550pha	54 y M	Fentanyl	1	1	A	Par	Int-A	1	Norfentanyl	0 ng/mL in whole blood @ unknown

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
551ha	54 y M	Fentanyl	1	1	C	Ingst	Unt-T	2	Fentanyl	2.8 ng/mL in whole blood @ unknown
		Ethanol	2	2					Ethanol	0.285% (wt/vol) in whole blood @ unknown
		Acetaminophen	1	1					Acetaminophen	227 mcg/mL in blood (unspecified) @ unknown
		Ibuprofen	2	2					Ibuprofen	12.6 mg/L in blood (unspecified) @ unknown
		Naproxen	3	3					Naproxen	13.9 mg/L in blood (unspecified) @ unknown
552h	54 y M	Salicylate	1	1	A	Ingst	Int-S	1	Salicylate	111 mg/dL in blood (unspecified) @ unknown
553	54 y F	Acetaminophen	1	1	A	Ingst	Int-S	3	Acetaminophen	100 mcg/mL in serum @ unknown
554h	54 y F	Acetaminophen	1	1	A	Ingst	Int-M	1	Acetaminophen	49 mg/L in blood (unspecified) @ unknown
		Drug, unknown	2	2						
		Salicylate	3	3					Salicylate	6 mg/dL in blood (unspecified) @ unknown
		Ethanol	4	4					Ethanol	65 mg/dL in blood (unspecified) @ unknown
555a	54 y F				A/C	Ingst	Unk	2		
		Acetaminophen/hydrocodone	1	1					Dihydrocodeine/hydrocodol (free)	110 ng/mL in blood (unspecified) @ autopsy
		Acetaminophen/hydrocodone	1	1					Hydrocodone (free)	310 ng/mL in blood (unspecified) @ autopsy
		Acetaminophen/hydrocodone	1	1					Hydromorphone	4.3 ng/mL in blood (unspecified) @ autopsy
		Baclofen	2	2					Baclofen	0.61 mcg/mL in blood (unspecified) @ autopsy
		Alprazolam	3	3					Alprazolam	53 ng/mL in blood (unspecified) @ autopsy
556h	54 y M	Acetaminophen	1	1	A	Ingst	Int-A	2		
		Ethanol	2	2						
		Ibuprofen	3	3						
		Isopropanol	4	4						
		Atorvastatin	5	5						
557h	54 y F	Acetaminophen	1	1	A	Ingst + Aspir	Int-S	2		
558	54 y F	Salicylate	1	1	A	Ingst	Int-S	1	Salicylate	106.9 mg/dL in blood (unspecified) @ 10 h (pe)
559ha	55 y M				A/C	Ingst	Int-S	2		
		Methadone	1	1					Methadone	1800 ng/mL in blood (unspecified) @ 1 d (pe)
		Methadone	1	1					Methadone metabolite	200 ng/mL in blood (unspecified) @ 1 d (pe)
		Acetaminophen	2	2					Acetaminophen	14.2 mcg/mL in blood (unspecified) @ 1 d (pe)
		Oxycodone	3	3					Oxymorphone	100 ng/mL in blood (unspecified) @ 1 d (pe)
		Oxycodone	3	3					Oxycodone	260 ng/mL in blood (unspecified) @ 1 d (pe)
		Diphenhydramine	4	4					Diphenhydramine	32 ng/mL in blood (unspecified) @ 1 d (pe)
		Aripiprazole	5	5						
		Trazodone	6	6						
		Gabapentin	7	7						
		Duloxetine	8	8						
560	55 y F	Atenolol	9	9	A	Ingst + Aspir	Int-S	1		
		Omeprazole	10	10						
		Acetaminophen	1	1					Acetaminophen	385 mcg/mL in serum @ 1 h (pe)

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
561	55 y M	Ethanol	2	2						
562ha	55 y F	Acetaminophen	1	1	A	Ingst	Int-S	1		
		Acetaminophen	1	1	A	Ingst	Int-S	1	Acetaminophen	692 mcg/mL in serum @ 4 h (pe)
		Ethanol	2	2					Ethanol	368 mg/dL in serum @ unknown
563	55 y F	Acetaminophen/oxycodone	1	1	U	Ingst	Int-S	1		
564h	55 y F	Acetaminophen/hydrocodone	1	1	C	Ingst	Int-A	3		
		Lorazepam	2	2						
565ph	55 y F	Acetaminophen/diphenhydramine	1	1	A	Ingst	Int-S	2	Acetaminophen	61 mcg/mL in blood (unspecified) @ unknown
		Acetaminophen/hydrocodone	2	2						
566	55 y M	Morphine	1	1	A/C	Ingst + Aspir	Int-S	2		
567ha	55 y M	Acetaminophen/hydrocodone	1	1	A/C	Ingst	Int-S	2	Acetaminophen	73 mcg/mL in serum @ 2 h (pe)
		Isopropanol	2	2						
568h	55 y M	Salicylate	1	1	A	Ingst	Int-S	1		
		Alprazolam	2	2						
569h	56 y F	Oxycodone	1	1	C	Ingst	Int-M	3		
		Marijuana	2	2						
570h	56 y F	Acetaminophen	1	1	A/C	Ingst	Int-M	2	Acetaminophen	100 mcg/mL in blood (unspecified) @ unknown
		Amlodipine	2	2					Amlodipine	82.9 ng/mL in blood (unspecified) @ unknown
571ha	56 y F	Acetaminophen	1	1	A	Ingst	Int-S	1	Acetaminophen	127.6 mcg/mL in serum @ unknown
572ph	56 y M	Tramadol	1	1	A	Unk	Unk	2		
		Ethanol	2	2					Ethanol	60 mg/dL in blood (unspecified) @ unknown
573h	56 y F	Acetaminophen	1	1	A	Ingst	Int-S	1	Acetaminophen	15 mcg/mL in serum @ unknown
574	56 y F	Salicylate	1	1	C	Ingst	Int-M	1		
575h	56 y F	Acetaminophen	1	1	A/C	Ingst	Int-M	3	Acetaminophen	25 mcg/mL in serum @ unknown
576	56 y F	Acetaminophen	1	1	U	Ingst	Int-U	2		
		Metformin	2	2						
577ph	56 y F	Acetaminophen	1	1	C	Ingst	Unt-M	2		
578h	57 y F	Acetaminophen	1	1	A	Ingst	Int-S	2	Acetaminophen	290 mcg/mL in blood (unspecified) @ unknown
		Acetaminophen	1	1					Acetaminophen	370 mcg/mL in blood (unspecified) @ unknown
		Acetaminophen	1	1					Acetaminophen	670 mcg/mL in blood (unspecified) @ unknown
		Clonazepam	2	2						
		Ethanol	3	3					Ethanol	152 mg/dL in blood (unspecified) @ unknown

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
579h	57 y M	Acetaminophen/ diphenhydramine	1	1	A/C	Ingst	Unk	2		
580h	57 y M	Hydrocodone	1	1	A	Ingst	Int-S	2		
		Benzodiazepine	2	2						
		Bupropion (extended release)	3	3						
		Venlafaxine	4	4						
		Losartan	5	5						
		Insulin	6	6						
581h	57 y F	Acetaminophen/ oxycodone	1	1	U	Ingst	Int-S	1		
582pha	57 y F	Acetaminophen/ oxycodone	1	1	A/C	Ingst	Unk	1	Oxymorphone	10 ng/mL in blood (unspecified) @ 1 h (pe)
		Acetaminophen/ oxycodone	1	1					Acetaminophen	43.5 mcg/mL in serum @ unknown
		Acetaminophen/ oxycodone	1	1					Oxycodone (free)	970 ng/mL in blood (unspecified) @ 1 h (pe)
583a	57 y M	Morphine	1	1	A/C	Ingst	Int-S	1	Tramadol	0.26 mg/L in blood (unspecified) @ autopsy
		Morphine	1	1					Morphine	0.75 mg/L in blood (unspecified) @ autopsy
584h	57 y F	Eszopiclone	2	2	A	Ingst	Int-S	2		
		Acetaminophen	1	1					Acetaminophen	349 mcg/mL in blood (unspecified) @ unknown
585h	58 y F	Methadone	2	2	A	Ingst	Int-U	1		
		Acetaminophen	1	1						
		Salicylate	2	2						
		Drug, unknown	3	3						
586p	58 y F	Acetaminophen/ hydrocodone	1	1	A	Ingst	Int-S	1	Acetaminophen	7 mcg/mL in blood (unspecified) @ 60 m (pe)
587h	58 y F	Alprazolam	2	2	U	Ingst	Int-S	1		
		Acetaminophen	1	1						
		Drug, unknown	2	2						
588pha	58 y M	Fentanyl	1	1	A	Unk	Int-A	1		
		Heroin	2	2						
		Cocaine	3	3						
589	58 y F	Acetaminophen	1	1	A	Ingst	Int-S	2		
590h	59 y M	Acetaminophen	1	1	C	Ingst	Int-A	3	Acetaminophen	25 mcg/mL in blood (unspecified) @ unknown
591i	59 y M	Acetaminophen/ hydrocodone	1	1	A	Ingst	Int-S	2		
		Clonazepam	2	2						
592ha	59 y M	Acetaminophen	1	1	C	Ingst	Int-U	3		
		Salicylate	2	1						
593ha	59 y F	Acetaminophen	1	1	A	Ingst	Int-S	1		
594h	59 y F	Hydrocodone	1	1	A/C	Ingst	Int-S	1		
		Benzodiazepine	2	2						
		Methadone	3	3						
		Oxycodone	4	4						
		Drug, unknown	5	5						
		Desvenlafaxine	6	6						
595ha	59 y F	Acetaminophen/ oxycodone	1	1	A/C	Ingst + Derm	Int-A	1	Oxycodone (free)	31 ng/mL in blood (unspecified) @ unknown

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time				
	59 y F	Acetaminophen/oxycodone	1	1					Acetaminophen	38 mcg/mL in blood (unspecified) @ autopsy				
		Oxycodone (extended release)	2	2					Fentanyl	0.49 ng/mL in blood (unspecified) @ unknown				
		Fentanyl	3	3						Norfentanyl	8.6 ng/mL in blood (unspecified) @ unknown			
		Fentanyl	3	3						Promethazine	13 ng/mL in blood (unspecified) @ unknown			
		Promethazine	4	4										
596h	59 y F				A	Ingst	Int-S	3						
597ph	59 y M	Acetaminophen/oxycodone	1	1										
		Morphine	2	2							A	Ingst	Unk	2
		Clonazepam	3	3										
598h	59 y M	Oxycodone	1	1										
		Lisinopril	2	2							A/C	Ingst	Unk	1
599p	59 y M	Oxycodone	1	1										
		Acetaminophen/oxycodone	2	2							A	Ingst	Int-S	2
600ha	59 y F	Diazepam	2	2										
		Naproxen	1	1							U	Ingst	Int-S	1
									Naproxen	760 mcg/mL in blood (unspecified) @ unknown				
		Ethanol	2	2					Ethanol	206 mg/dL in blood (unspecified) @ unknown				
		Acetaminophen	3	3					Acetaminophen	43.4 mcg/mL in serum @ 1 m (pe)				
		Acetaminophen	3	3					Acetaminophen	44.5 mcg/mL in serum @ 1 d (pe)				
		Diphenhydramine	4	4					Diphenhydramine	170 ng/mL in blood (unspecified) @ unknown				
601p	60 y M				U	Ingst	Int-S	3						
	60 y M	Acetaminophen/opioid	1	1					Acetaminophen	88 mcg/mL in blood (unspecified) @ unknown				
		Hydroxyzine	2	2										
		Gabapentin	3	3										
		Losartan	4	4										
		Hydrochlorothiazide	5	5										
		Furosemide	6	6										
		Bupropion	7	7										
		Warfarin	8	8										
		Simvastatin	9	9										
		Metformin	10	10										
		Colchicine	11	11										
602h	60 y M				A	Ingst	Unt-T	2						
603h	60 y F	Colchicine	1	1										
		Acetaminophen	1	1							A	Ingst	Int-S	2
604h	60 y F								Acetaminophen	99 mg/mL in blood (unspecified) @ unknown				
		Acetaminophen	1	1					Acetaminophen	223 mg/mL in blood (unspecified) @ 15 h (pe)				
		Acetaminophen	1	1					Acetaminophen	338 mcg/mL in blood (unspecified) @ 10 h (pe)				
605ha	60 y F				U	Ingst	Int-S	2						
	60 y F	Acetaminophen/oxycodone	1	1					Oxymorphone	233 ng/mL in urine (quantitative only) @ unknown				
		Acetaminophen/oxycodone	1	1					Acetaminophen	37.3 mcg/mL in blood (unspecified) @ unknown				

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
		Methocarbamol	2	2						
		Lorazepam	3	3					Lorazepam	499 ng/mL in urine (quantitative only) @ unknown
		Clonazepam	4	4					7-Aminoclonazepam	753 ng/mL in urine (quantitative only) @ unknown
		Oxcarbazepine	5	5					Oxcarbazepine	28 mcg/mL in blood (unspecified) @ unknown
		Topiramate	6	6					Topiramate	20.4 mcg/mL in blood (unspecified) @ unknown
606h	60 y F				A/C	Ingst	Int-S	2		
		Oxycodone	1	1						
607h	61 y F	Buprenorphine	2	2	U	Ingst	Int-M	1		
		Acetaminophen	1	1					Acetaminophen	56 mcg/mL in blood (unspecified) @ unknown
608pa	61 y F				A	Ingst	Int-M	1		
		Methadone	1	1					Eddp (2-ethylidene-1,5-dimethyl-3,3-diphenyl pyrrolidine)	33 ng/mL in blood (unspecified) @ autopsy
		Methadone	1	1					Methadone	360 ng/mL in blood (unspecified) @ autopsy
		Diphenhydramine	2	2					Diphenhydramine	360 ng/mL in blood (unspecified) @ autopsy
		Dextromethorphan	3	3					Dextromethorphan	81 ng/mL in blood (unspecified) @ autopsy
		Clonazepam	4	4					Clonazepam	3.2 ng/mL in blood (unspecified) @ autopsy
		Clonazepam	4	4					7-Aminoclonazepam	31 ng/mL in blood (unspecified) @ autopsy
609	61 y F				A	Ingst	Int-S	1		
		Acetaminophen	1	1					Acetaminophen	41.6 mcg/mL in serum @ 1 h (pe)
610h	61 y F	Ethanol (non-beverage)	2	2	A/C	Ingst	Int-M	2		
611ha	61 y M	Hydrocodone	1	1	U	Ingst	Unt-M	3		
		Acetaminophen	1	1					Acetaminophen	54 mcg/mL in blood (unspecified) @ unknown
		Acetaminophen	1	1					Acetaminophen	61 mcg/mL in blood (unspecified) @ unknown
		Ethanol	2	2					Ethanol	16 mg/dL in blood (unspecified) @ unknown
612p	61 y F				A	Ingst	Int-S	2		
		Acetaminophen/oxycodone	1	1						
613	61 y F				A	Ingst	Unk	2		
		Methadone	1	1						
		Diazepam	2	2						
		Temazepam	3	3						
614	61 y M				A	Ingst	Int-M	2		
		Acetaminophen	1	1					Acetaminophen	34.5 mcg/mL in plasma @ unknown
		Ethanol	2	2					Ethanol	168 mg/dL in serum @ unknown
615h	61 y F				A	Ingst	Int-S	2		
		Acetaminophen/hydrocodone	1	1						
616h	61 y M				U	Unk	Int-M	3		
		Hydrocodone	1	1						
617h	62 y M				C	Ingst	Unk	3		
		Acetaminophen	1	1					Ethanol	10 mg/dL in whole blood @ unknown
		Acetaminophen	1	1					Acetaminophen	17 mcg/mL in blood (unspecified) @ unknown
		Ibuprofen	2	2						

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
618h	62 y F	Ethanol	3	3						
		Acetaminophen/codeine	1	1	A	Ingst	Int-S	1	Acetaminophen	41 mcg/mL in blood (unspecified) @ unknown
619	62 y F	Acetaminophen	1	1	A	Ingst	Int-S	1	Acetaminophen	112 mcg/mL in blood (unspecified) @ 23 h (pe)
		Asenapine	2	2						
		Alprazolam	3	3						
		Paroxetine	4	4						
		Zolpidem	5	5						
		Quetiapine	6	6						
		Ethanol	7	7						
620h	62 y F	Acetaminophen/oxycodone	1	1	A	Ingst	Int-S	3	Acetaminophen	107 mcg/mL in plasma @ unknown
621pha	62 y F	Acetaminophen/opioid	1	1	A	Ingst	Int-S	1	Hydrocodone	1898 ng/mL in blood (unspecified) @ unknown
		Acetaminophen/opioid	1	1					Acetaminophen	262 mcg/mL in blood (unspecified) @ unknown
		Acetaminophen/opioid	1	1					Hydromorphone	7 ng/mL in blood (unspecified) @ unknown
622	62 y F	Oxycodone	1	1	A	Ingst	Int-S	1		
		Alprazolam	2	2						
623	62 y F	Acetaminophen/hydrocodone	1	1	A/C	Ingst	Int-M	3	Acetaminophen	14 mcg/mL in blood (unspecified) @ 1 h (pe)
624h	62 y F	Acetaminophen/diphenhydramine	1	1	A	Ingst	Int-S	2	Acetaminophen	121 mcg/mL in serum @ unknown
625ph	62 y F	Oxycodone	1	1	U	Unk	Unk	2		
		Heroin	2	2						
		Amphetamine	3	3						
626	63 y F	Oxycodone	1	1	U	Ingst + Derm	Int-M	2		
		Butalbital	2	2						
		Naproxen	3	3						
		Lidocaine	4	4						
627h	63 y F	Acetaminophen	1	1	A/C	Ingst	Int-S	1	Acetaminophen	146 mcg/mL in serum @ unknown
		Quetiapine	2	2						
628	63 y F	Acetaminophen/hydrocodone	1	1	A/C	Ingst	Int-S	2	Acetaminophen	177 mcg/mL in plasma @ unknown
		Lorazepam	2	2						
		Propofol	3	3						
629h	63 y M	Salicylate	1	1	A	Ingst	Int-S	1	Salicylate	44 mg/dL in blood (unspecified) @ 2 h (pe)
		Acetaminophen	2	2					Acetaminophen	128 mcg/mL in blood (unspecified) @ 2 h (pe)
630pi	63 y F	Fentanyl (transdermal)	1	1	A/C	Ingst	Int-A	2		
631h	63 y F	Acetaminophen	1	1	U	Ingst	Int-U	1	Acetaminophen	148 mcg/mL in plasma @ unknown
		Acetaminophen/dextromethorphan/doxylamine	2	2						
632pa	63 y M	Methadone	1	1	A	Oth + Unk	Unk	1	Methadone	0.7 mg/L in blood (unspecified) @ autopsy
		Methadone	1	1					Methadone	2.2 mg/kg in liver @ autopsy
		Hydroxyzine	2	2					Hydroxyzine	0.4 mg/L in blood (unspecified) @ autopsy

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
633	64 y M	Amphetamine	3	3	U	Ingst	Unk	2	Amphetamine	0.08 mg/L in blood (unspecified) @ autopsy
		Alprazolam	4	4					Alprazolam	0.07 mg/L in blood (unspecified) @ autopsy
		Salicylate	1	1					Salicylate	60 mg/dL in serum @ 5 m (pe)
634	64 y F	Acetaminophen/hydrocodone	1	1	U	Ingst	Int-S	2	Acetaminophen	49 mcg/mL in serum @ 1 h (pe)
635h	64 y M	Salicylate	1	1	A	Ingst	Unk	1	Salicylate	100.6 mg/dL in blood (unspecified) @ unknown
		Acetaminophen	1	1					Acetaminophen	32 mcg/mL in blood (unspecified) @ unknown
636	64 y M	Acetaminophen	1	1	A/C	Ingst	Unt-M	1	Acetaminophen	32 mcg/mL in blood (unspecified) @ unknown
637h	64 y M	Acetaminophen/hydrocodone	1	1	A/C	Ingst	Int-S	1	Acetaminophen	430 mcg/mL in blood (unspecified) @ unknown
		Barbiturate	2	2					Barbiturate	2
638ph	64 y M	Benzodiazepine	3	3	A/C	Ingst	Int-U	2	Benzodiazepine	3
		Morphine	1	1					Morphine	1
639h	64 y M	Acetaminophen	1	1	U	Ingst	Int-S	2	Acetaminophen	105.5 mcg/mL in serum @ unknown
		Salicylate	2	2					Salicylate	9.3 mg/dL in serum @ unknown
		Salicylate	2	2					Salicylate	9.3 mg/dL in serum @ unknown
640h	64 y M	Acetaminophen	1	1	A	Ingst + Aspir + - Derm	Int-S	2	Acetaminophen	105.5 mcg/mL in serum @ unknown
641pa	65 y M	Droperidol/fentanyl	1	1	U	Ingst	Unk	2	Droperidol/fentanyl	1
		Ibuprofen	2	2					Ibuprofen	2
		Methadone	1	1					Methadone	1
642	65 y F	Methadone	1	1	C	Ingst	Int-M	3	Eddp (2-ethylidene-1,5-dimethyl-3,3-diphenyl pyrrolidine)	1000 ng/mL in blood (unspecified) @ autopsy
		Methadone	1	1					Methadone	4000 ng/mL in blood (unspecified) @ autopsy
643h	65 y F	Ibuprofen	1	1	U	Ingst + Unk	Int-S	1	Ibuprofen	1
644h	66 y F	Acetaminophen	1	1	A	Ingst	Int-S	2	Acetaminophen	469 mcg/mL in blood (unspecified) @ unknown
		Hydrocodone	2	2					Hydrocodone	2
		Ethanol	3	3					Ethanol	3
645h	66 y M	Oxycodone	1	1	A	Ingst	Int-S	2	Oxycodone	1
		Acetaminophen	2	2					Acetaminophen	2
646h	66 y F	Acetaminophen/diphenhydramine	1	1	A	Ingst	Int-S	1	Acetaminophen/diphenhydramine	1
		Morphine (extended release)	1	1					Morphine (extended release)	1
		Diazepam	2	2					Diazepam	2
647	66 y M	Quetiapine	3	3	A	Ingst	Int-S	2	Quetiapine	3
		Colchicine	1	1					Colchicine	1
		Salicylate	2	2					Salicylate	2
648ha	66 y F	Allopurinol	3	3	A	Ingst	Int-S	1	Allopurinol	3
		Acetaminophen/codeine	4	4					Acetaminophen/codeine	4
		Acetaminophen	1	1					Acetaminophen	1
649a	66 y F	Acetaminophen	1	1	A	Ingst	Int-S	1	Salicylate	5.7 mg/dL in blood (unspecified) @ unknown

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
650h	66 y F	Acetaminophen	1	1					Acetaminophen	510 mg/L in blood (unspecified) @ unknown
		Salicylate	2	2	U	Ingst	Unt-U	2		
		Acetaminophen/hydrocodone	1	1					Acetaminophen	143 mcg/mL in blood (unspecified) @ unknown
		Acetaminophen/hydrocodone	1	1					Acetaminophen	75.8 mcg/mL in blood (unspecified) @ unknown
		Alcohol, unknown	2	2					Ethanol	0.01 mg/dL in blood (unspecified) @ unknown
651pha	67 y F				A	Ingst	Int-S	3		
652	67 y M	Acetaminophen Drug, unknown	1	1						
			2	2						
653	67 y F	Methadone	1	1	A	Ingst	Int-A	3		
654	67 y F	Oxycodone	1	1	U	Ingst	Unk	2		
		Acetaminophen	2	2						
655h	68 y F	Acetaminophen	1	1	A	Ingst	Int-S	1	Acetaminophen	280 mcg/mL in blood (unspecified) @ 4 d (pe)
		Acetaminophen	1	1					Acetaminophen	300 mcg/mL in blood (unspecified) @ 3 d (pe)
		Acetaminophen	1	1					Acetaminophen	381 mcg/mL in blood (unspecified) @ 3 d (pe)
		Acetaminophen	1	1					Acetaminophen	497 mcg/mL in blood (unspecified) @ 3 d (pe)
		Acetaminophen	1	1					Acetaminophen	553 mcg/mL in blood (unspecified) @ 3 d (pe)
		Acetaminophen	1	1					Acetaminophen	690 mcg/mL in blood (unspecified) @ 2 d (pe)
656pha	68 y F	Salicylate	1	1	A	Ingst	Int-A	1		
657h	68 y F	Fentanyl	1	1					Fentanyl	0.033 mg/L in blood (unspecified) @ autopsy
		Fentanyl	1	1					Fentanyl	0.039 mg/L in vitreous @ autopsy
		Fentanyl	1	1					Fentanyl	2.2 mg/L in urine (quantitative only) @ autopsy
		Fentanyl	1	1					Fentanyl	2.87 mg/L In Bile @ autopsy
658h	68 y M	Acetaminophen/hydrocodone	1	1	A/C	Ingst	Int-S	3	Acetaminophen	205 mg/L in serum @ 1 h (pe)
		Benzodiazepine	2	2						
		Gabapentin	3	3						
659p	68 y F	Acetaminophen/hydrocodone	1	1	C	Ingst	Int-M	2	Acetaminophen	50 mg/L in blood (unspecified) @ unknown
660h	68 y F	Acetaminophen Drug, unknown	1	1	U	Ingst + Unk	Int-S	2	Acetaminophen	118 mcg/mL in plasma @ unknown
			2	1						
661	69 y F	Salicylate	1	1	A	Ingst	Int-S	1	Salicylate	115 mg/dL in blood (unspecified) @ unknown
		Salicylate	1	1					Salicylate	69 mg/dL in blood (unspecified) @ unknown
		Salicylate	1	1					Salicylate	95 mg/dL in blood (unspecified) @ unknown
662pha	69 y F	Salicylate	1	1	U	Ingst	Int-S	3		
		Clopidogrel	2	2						
662pha	69 y F	Acetaminophen/oxycodone	1	1	A/C	Ingst	Int-S	1	Oxycodone	174 ng/mL in blood (unspecified) @ unknown

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
663h	69 y M	Acetaminophen/ oxycodone	1	1	A/C	Ingst	Int-S	2	Acetaminophen	98 mcg/mL in blood (unspecified) @ unknown
		Diazepam	2	2					Nordiazepam	253 ng/mL in urine (quantitative only) @ unknown
		Diazepam	2	2					Oxazepam	805 ng/mL in urine (quantitative only) @ unknown
		Acetaminophen/ hydrocodone	1	1						
		Zolpidem	2	2						
664h	69 y F	Pregabalin	3	3	U	Ingst	Unk	2		
		Drug, unknown	4	4						
		Acetaminophen	1	1					Acetaminophen	18.2 mcg/mL in serum @ unknown
665h	70 y F	Acetaminophen/ hydrocodone	1	1	A	Ingst + Aspir	Int-S	1	Acetaminophen	32 mcg/mL in blood (unspecified) @ unknown
		Acetaminophen/ hydrocodone	1	1					Hydrocodone	456 ng/mL in blood (unspecified) @ unknown
		Diazepam	2	2					Diazepam	192 ng/mL in blood (unspecified) @ unknown
		Zolpidem	3	3					Zolpidem	1.17 mg/L in blood (unspecified) @ unknown
		Tizanidine	4	4						
666p	70 y F	Oxycodone	1	1	A	Ingst	Int-S	2		
667hi	70 y F	Acetaminophen	1	1	C	Ingst	Unt-T	1	Acetaminophen	336 mcg/mL in plasma @ unknown
668h	70 y M	Acetaminophen	1	1	A	Ingst	Int-S	1	Acetaminophen	128.1 mcg/mL in serum @ unknown
		Acetaminophen	1	1					Acetaminophen	16.1 mcg/mL in serum @ unknown
		Acetaminophen	1	1					Acetaminophen	37.5 mcg/mL in serum @ unknown
		Acetaminophen	1	1					Acetaminophen	87.8 mcg/mL in serum @ unknown
[669h]	71 y M	Salicylate	1	1	A	Ingst	Int-S	1	Salicylate	67.5 mg/dL in serum @ 8 h (pe)
		Salicylate	1	1					Salicylate	72.4 mg/dL in serum @ 12 h (pe)
670	71 y M				A	Par	Unt-T	3		
671h	71 y F	Droperidol/fentanyl	1	1	A	Ingst + Derm	Int-S	3		
		Fentanyl (transdermal)	1	1						
672ha	71 y F	Benzodiazepine	2	2	C	Ingst	Int-U	1		
		Acetaminophen	1	1					Acetaminophen	36 mcg/mL in blood (unspecified) @ unknown
		Citalopram	2	2					Citalopram	0.18 mcg/mL in blood (unspecified) @ unknown
673	71 y M				A	Ingst	Int-S	1		
		Salicylate	1	1					Salicylate	106.5 mg/dL in serum @ 4.5 h (pe)
		Salicylate	1	1					Salicylate	31 mg/dL in serum @ 30 m (pe)
		Salicylate	1	1					Salicylate	77.5 mg/dL in serum @ 2 h (pe)
		Salicylate	1	1					Salicylate	97.7 mg/dL in serum @ 7 h (pe)
674h	72 y F	Acetaminophen	1	1	A	Ingst	Int-M	1	Acetaminophen	29 mcg/mL in serum @ 10 m (pe)

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
675	72 y F	Milk thistle	2	2	A	Ingst	Int-S	2		
		Bismuth subsalicylate	3	3						
		Tramadol	1	1						
		Citalopram	2	2						
		Alprazolam	3	3						
676p	72 y M	Acetaminophen	4	4	U	Ingst	Unk	3		
		Celecoxib	5	5						
		Salicylate	1	1					Salicylate	22 mg/dL in blood (unspecified) @ 3 d (pe)
		Salicylate	1	1					Salicylate	28 mg/dL in blood (unspecified) @ 18 h (pe)
		Salicylate	1	1					Salicylate	32 mg/dL in blood (unspecified) @ 10 h (pe)
677h	72 y F	Salicylate	1	1	A	Ingst	Unt-T	1	Salicylate	40 mg/dL in blood (unspecified) @ 3 h (pe)
		Salicylate	1	1					Salicylate	64 mg/dL in blood (unspecified) @ 1 h (pe)
		Acetaminophen/hydrocodone	1	1						
		Acetaminophen/hydrocodone	1	1					Hydrocodone (free)	0.56 mg/L in blood (unspecified) @ autopsy
		Acetaminophen/hydrocodone	1	1					Acetaminophen	30 mg/L in blood (unspecified) @ unknown
679h	73 y M	Acetaminophen	1	1	A	Ingst	Int-S	3	Acetaminophen	410 mcg/mL in blood (unspecified) @ 4 h (pe)
680h	73 y M	Salicylate	1	1	A	Ingst	Int-S	1	Salicylate	104.4 mg/dL in blood (unspecified) @ 26.5 h (pe)
		Salicylate	1	1					Salicylate	68.8 mg/dL in blood (unspecified) @ 13 h (pe)
		Salicylate	1	1					Salicylate	85.66 mg/dL in blood (unspecified) @ 17 h (pe)
		Salicylate	1	1					Salicylate	94 mg/dL in blood (unspecified) @ 20 h (pe)
		Salicylate	1	1					Salicylate	95 mg/dL in blood (unspecified) @ 23 h (pe)
681h	73 y M	Salicylate	1	1	A/C	Ingst	Int-S	1	Salicylate	97.6 mg/dL in blood (unspecified) @ 25 h (pe)
		Atropine/diphenoxylate	2	2						
		Hydroxychloroquine	3	3						
		Tamsulosin	4	4						
		Ranitidine	5	5						
682a	73 y F	Acetaminophen/hydrocodone	1	1	A	Ingst	Int-S	1		
		Zolpidem	2	2						
683h	73 y F	Acetaminophen	1	1	A/C	Ingst	Int-S	3		
		Acetaminophen/hydrocodone	1	1						
684	74 y F	Acetaminophen	1	1	A	Ingst	Int-S	2		
		Oxycodone	2	2						
685h	74 y F	Acetaminophen	1	1	C	Ingst	Int-U	3		
		Acetaminophen	1	1						
686	75 y M	Acetaminophen	1	1	A	Ingst	Int-S	2		
		Acetaminophen/hydrocodone	1	1						
									Acetaminophen	59 mcg/mL in blood (unspecified) @ 48 h (pe)

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
687h	76 y F	Acetaminophen/ hydrocodone Drug, unknown	1 2	1 1	A	Ingst	Unk	1		
688h	76 y F	Salicylate	1	1	A	Ingst	Int-S	2	Salicylate	103.8 mg/dL in blood (unspecified) @ 22 h (pe)
		Salicylate	1	1					Salicylate	108 mg/dL in blood (unspecified) @ unknown
		Salicylate	1	1					Salicylate	37.6 mg/dL in blood (unspecified) @ 14 h (pe)
		Salicylate	1	1					Salicylate	65.9 mg/dL in blood (unspecified) @ 17 h (pe)
		Salicylate	1	1					Salicylate	69.9 mg/dL in blood (unspecified) @ 3.5 h (pe)
		Salicylate	1	1					Salicylate	91 mg/dL in blood (unspecified) @ unknown
		Salicylate	1	1					Salicylate	98 mg/dL in blood (unspecified) @ unknown
		Acetaminophen	2	2					Acetaminophen	178.3 mcg/mL in blood (unspecified) @ 3.5 h (pe)
689h	76 y M	Acetaminophen	1	1	A/C	Ingst	Int-M	1	Acetaminophen	82.6 mcg/mL in serum @ unknown
690ha	77 y F	Acetaminophen	1	1	C	Ingst	Unt-T	3		
691	77 y F	Acetaminophen	1	1	U	Ingst	Unk	2	Acetaminophen	18 mcg/mL in blood (unspecified) @ unknown
692ha	78 y F	Acetaminophen	1	1	A	Ingst	Unt-G	1		
693	78 y M	Colchicine	1	1	A	Ingst	Unt-T	1		
694h	79 y F	Acetaminophen	1	1	C	Ingst	Int-M	2	Acetaminophen	37 mcg/mL in blood (unspecified) @ unknown
695ha	79 y M	Acetaminophen/ oxycodone	1	1	A/C	Ingst	Int-U	3	Oxycodone	0.31 mg/L in serum @ 1 m (pe)
		Acetaminophen/ oxycodone	1	1					Acetaminophen	34 mg/L in serum @ 1 m (pe)
		Acetaminophen/ oxycodone	1	1					Acetaminophen	62 mg/L in serum @ 3 h (pe)
696pha	79 y M	Morphine	1	1	A	Ingst	Int-S	1	Morphine (free)	981 ng/mL in blood (unspecified) @ 1 h (pe)
697h	80 y F	Naproxen	1	1	A	Ingst	Int-U	3		
698	80 y F	Acetaminophen/ oxycodone	1	1	U	Ingst	Int-S	3		
		Valproic acid	2	2						
699	80 y F	Acetaminophen	1	1	A	Ingst	Unk	2		
700	80 y F	Acetaminophen/ hydrocodone	1	1	A	Ingst	Int-S	1	Acetaminophen	109 mcg/mL in blood (unspecified) @ unknown
701h	80 y M	Benzodiazepine	2	2	A	Ingst	Int-S	1		
		Acetaminophen/opioid	1	1					Acetaminophen	338 mg/L in blood (unspecified) @ unknown
		Oxycodone	2	2						
702h	80 y F				C	Ingst	Int-M	1		

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
703h	81 y M	Acetaminophen	1	1					Acetaminophen	126 mcg/mL in plasma @ unknown
		Acetaminophen/opioid	1	1	A	Ingst + Aspir	Int-U	2	Acetaminophen	88 mcg/mL in blood (unspecified) @ unknown
704h	82 y F	Salicylate	1	1	U	Ingst	Unk	2	Salicylate	71 mg/dL in serum @ unknown
705h	83 y F	Acetaminophen/hydrocodone	1	1	U	Ingst	Int-U	2		
706a	84 y F	Acetaminophen/oxycodone	1	1	A/C	Ingst	Int-S	2	Acetaminophen	228 mcg/mL in blood (unspecified) @ unknown
		Acetaminophen/oxycodone	1	1					Acetaminophen	235 mcg/mL in blood (unspecified) @ unknown
		Acetaminophen/oxycodone	1	1					Oxycodone	2600 ng/mL in blood (unspecified) @ unknown
		Lorazepam	2	2						
		Clonazepam	3	3						
707p	85 y M	Acetaminophen/hydrocodone	1	1	A	Ingst	Int-S	1	Acetaminophen	126 mcg/mL in blood (unspecified) @ 1 h (pe)
708h	85 y F	Acetaminophen	1	1	A/C	Ingst	Unt-T	1	Acetaminophen	98 mcg/mL in blood (unspecified) @ unknown
709a	86 y F	Salicylate	1	1	A	Ingst	Int-S	1	Salicylate	350 mcg/mL in blood (unspecified) @ unknown
		Salicylate	1	1					Salicylate	62.7 mg/dL in blood (unspecified) @ unknown
		Salicylate	1	1					Salicylate	74.5 mg/dL in blood (unspecified) @ unknown
710ha	87 y F	Alprazolam	2	2	A/C	Ingst	Int-S	2		
		Acetaminophen	1	1					Acetaminophen	370 mcg/mL in serum @ unknown
		Diphenhydramine	2	2					Diphenhydramine	600 ng/mL in blood (unspecified) @ unknown
		Nifedipine	3	3					Nifedipine	26 ng/mL in serum @ unknown
711p	87 y M	Acetaminophen	1	1	A	Ingst	Int-S	1		
712	88 y F	Acetaminophen/hydrocodone	1	1	A	Ingst	Int-S	2	Acetaminophen	192 mg/dL in blood (unspecified) @ unknown
713ha	88 y F	Oxymorphone	1	1	U	Ingst	Int-M	1		
714	88 y F	Acetaminophen	1	1	A	Ingst	Int-S	2	Acetaminophen	600 mcg/mL in blood (unspecified) @ unknown
715	89 y F	Tramadol	1	1	A/C	Ingst	Int-S	2		
		Gabapentin	2	2						
716a	90 y M	Acetaminophen/hydrocodone	1	1	A	Ingst	Int-S	2	Hydrocodone	32.1 ng/mL in blood (unspecified) @ autopsy
717	91 y F	Salicylate	1	1	A	Ingst	Unk	1	Salicylate	111 mg/dL in blood (unspecified) @ 3 h (pe)
718pa	93 y M	Morphine	1	1	A	Ingst	Unt-G	3		
719ph	10 m F	Oxycodone	1	1	A	Ingst	Unk	2		

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
[720]	13 m M	Salicylate	1	1	A	Ingst	Unt-G	1	Salicylate	94 mg/dL in blood (unspecified) @ unknown
721p	14 m M	Oxycodone	1	1	U	Unk	Unk	2		
[722ph]	15 m F	Buprenorphine/naloxone (sublingual film)	1	1	A	Ingst	Unt-G	1	Buprenorphine	5.6 ng/mL in blood (unspecified) @ autopsy
		Buprenorphine/naloxone (sublingual film)	1	1					Norbuprenorphine	6.8 ng/mL in blood (unspecified) @ autopsy
723h	unknown adult (>=20 yrs) F				U	Unk	Int-U	2		
		Acetaminophen	1	1						
		Drug, unknown	2	2						
See also case 12, 18, 37, 40, 58, 72, 90, 92, 115, 172, 190, 215, 231, 250, 257, 730, 731, 735, 775, 780, 782, 784, 790, 794, 796, 797, 803, 805, 806, 812, 819, 825, 829, 831, 835, 839, 840, 841, 845, 847, 852, 854, 855, 867, 875, 883, 884, 893, 922, 929, 930, 931, 932, 934, 935, 937, 938, 939, 943, 946, 951, 957, 958, 969, 972, 973, 974, 976, 979, 991, 992, 996, 997, 1002, 1003, 1006, 1007, 1008, 1010, 1022, 1026, 1032, 1036, 1037, 1041, 1049, 1050, 1055, 1065, 1069, 1079, 1082, 1085, 1093, 1094, 1103, 1109, 1110, 1113, 1123, 1128, 1130, 1132, 1135, 1141, 1145, 1146, 1147, 1153, 1158, 1161, 1168, 1174, 1179, 1182, 1183, 1184, 1186, 1187, 1189, 1192, 1195, 1197, 1200, 1204, 1207, 1217, 1219, 1221, 1224, 1230, 1234, 1237, 1242, 1244, 1245, 1247, 1250, 1254, 1255, 1257, 1259, 1260, 1266, 1300, 1301, 1305, 1306, 1308, 1309, 1315, 1318, 1323, 1326, 1327, 1336, 1339, 1350, 1353, 1356, 1357, 1358, 1361, 1367, 1374, 1382, 1385, 1388, 1390, 1397, 1408, 1410, 1411, 1412, 1413, 1419, 1420, 1428, 1433, 1436, 1456, 1459, 1465, 1469, 1475, 1476, 1477, 1480, 1485, 1489										
Anesthetics										
724pai	39 y F	Lidocaine	1	1	A	Par	AR-D	3		
[725h]	55 y F	Lidocaine	1	1	A	Par	Unt-T	1		
726	69 y F	Lidocaine	1	1	A	Par	Unt-T	2		
See also case 626, 1357, 1457										
Anticoagulants										
727	50 y F	Enoxaparin	1	1	C	Par	AR-D	3		
728h	83 y F	Rivaroxaban	1	1	C	Ingst	AR-D	1		
		Linezolid	2	2						
		Carbidopa/levodopa	3	3						
See also case 128, 231, 522, 601, 661, 929, 930, 946, 974, 997, 1026, 1036, 1052, 1063, 1085, 1091, 1103, 1115, 1122, 1158										
Anticonvulsants										
729ha	17 y F	Lamotrigine	1	1	A/C	Ingst	Int-S	1		
		Olanzapine	2	1						
		Citalopram	3	3						
		Ethanol	4	4						
730h	18 y M	Gabapentin	1	1	A	Ingst	Int-S	2		
		Diclofenac	2	2						
		Acetaminophen/dextromethorphan/pseudoephedrine	3	3						
		Levothyroxine	4	4						
731ha	21 y M	Lamotrigine	1	1	A	Ingst	Int-S	3	Lamotrigine	7 mcg/mL in blood (unspecified) @ unknown
		Diphenhydramine	2	2					Diphenhydramine	630 ng/mL in blood (unspecified) @ unknown
		Marijuana	3	3					Delta-9-thc	0.59 ng/mL in blood (unspecified) @ unknown
		Marijuana	3	3					Delta-9-carboxy-thc	7.6 ng/mL in blood (unspecified) @ unknown
		Vortioxetine	4	4						
		Fexofenadine	5	5						
		Naproxen	6	6						

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
732h	22 y F	Levothyroxine	7	7	A/C	Ingst	Int-S	2		
		Cetirizine	8	8						
		Doxycycline	9	9						
733h	28 y M	Pregabalin	1	1	A/C	Ingst	Int-S	1	Valproic acid	458 mcg/mL in serum @ unknown
		Valproic acid (extended release)	1	1						
		Lithium (extended release)	2	2						
734pha	28 y M	Risperidone	3	3	A	Ingst	Int-U	2	Lithium	1.45 mEq/L in serum @ unknown
		Hydroxyzine	4	4						
		Quetiapine	5	5						
		Oxcarbazepine	1	1						
		Ethanol	2	2						
735	29 y M				A	Ingst	Int-S	2	10-Hydroxycarbazepine	27 mcg/mL in serum @ unknown
736ph	34 y F	Gabapentin	1	1	C	Ingst	Int-S	3		
		Acetaminophen/hydrocodone	2	2						
		Quetiapine	3	3						
737	38 y M	Valproic acid	1	1	A	Ingst	Int-S	1	Ethanol	155 mg/dL in serum @ 5 h (pe)
		Lamotrigine	1	1						
		Ethanol	2	2						
738p	38 y F	Metoprolol	3	3	A	Ingst	Int-U	2		
		Lisinopril	4	4						
		Trazodone	5	5						
		Diphenhydramine	6	6						
		Valproic acid	7	7						
		Eszopiclone	8	8						
		Oxybutynin	9	9						
		Gabapentin	1	1						
		Ethanol	2	2						
739p	39 y F	Drug, unknown	3	3	U	Ingst	Int-U	3		
740ha	40 y F	Gabapentin	1	1	A	Ingst	Int-S	1	Valproic acid	220 mcg/mL in blood (unspecified) @ 555 h (pe)
		Valproic acid	1	1						
741p	41 y F	Zolpidem	2	2	C	Ingst	Int-A	1		
		Ziprasidone	3	3						
		Alprazolam	4	4						
742h	45 y M	Gabapentin	1	1	U	Ingst	AR-D	2		
		Phenytoin	1	1						
[743h]	46 y F				U	Ingst	Int-S	1	Valproic acid	195 mg/L in serum @ 4 d (pe)
		Valproic acid	1	1						
744h	47 y F	Valproic acid	1	1	A/C	Ingst	Int-S	1	Valproic acid	311 mg/L in serum @ 3 d (pe)
745h	51 y F	Valproic acid (extended release)	1	1	A/C	Ingst	Int-S	1	Valproic acid	202.3 mg/L in blood (unspecified) @ 4 d (pe)
		Valproic acid (extended release)	1	1						
		Valproic acid (extended release)	1	1						
		Valproic acid (extended release)	1	1						
		Carvedilol	3	2						
		Quetiapine	2	2						
		Lisinopril	4	3						
		Valproic acid	1	1						
		Lamotrigine	2	2						

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time		
746	52 y F	Haloperidol	3	3	U	Ingst	Int-S	1				
		Donepezil	4	4								
		Olanzapine	5	5								
		Hydroxyzine	6	6								
		Benztropine	7	7								
		Duloxetine	8	8								
747ha	53 y F	Carbamazepine	1	1	A/C	Ingst	Int-S	1	Carbamazepine	35.7 mg/L in serum @ 7 h (pe)		
		Fluoxetine	2	2							Carbamazepine	44 mg/L in serum @ 2 d (pe)
748h	54 y F	Carbamazepine	1	1	A	Ingst	Int-S	2	Carbamazepine	44.5 mcg/mL in serum @ 12 h (pe)		
		Hydroxyzine	2	2								
		Carbamazepine	1	1								
749h	56 y M	Clonazepam	2	2	A/C	Ingst	Unk	2	Phenytoin	40 mcg/mL in serum @ unknown		
		Gabapentin	3	3								
		Alcohol, unknown	4	4								
		Phenytoin	1	1								
750ha	59 y F	Ethanol	2	2	U	Ingst	Int-S	2	Ethanol	323 mg/dL in serum @ unknown		
		Carbamazepine	1	1							Carbamazepine	26.2 mcg/mL in blood (unspecified) @ 1 d (pe)
		Carbamazepine	1	1							Carbamazepine	29 mcg/mL in blood (unspecified) @ 1 d (pe)
		Metoprolol	2	2							Alprazolam	85 ng/mL in blood (unspecified) @ 1 d (pe)
		Alprazolam	3	3								
		Donepezil	4	4								
751h	61 y F	Quetiapine	5	5	A/C	Ingst	Int-S	3	Phenytoin	54.1 mcg/mL in blood (unspecified) @ 3 d (pe)		
		Fluoxetine	6	6								
		Phenytoin	1	1								
		Phenytoin	1	1								
		Phenytoin	1	1								
752a	62 y M	Alprazolam	2	2	C	Ingst	AR-D	3	Phenytoin	23 mg/L in whole blood @ autopsy		
		Phenytoin	1	1								
		Phenytoin	1	1								
753	67 y M				A/C	Ingst	Int-S	2				
754	81 y F	Oxcarbazepine	1	1	A/C	Ingst	Int-S	2				
		Cyclobenzaprine	2	2								
		Methocarbamol	3	3								
See also case 12, 96, 173, 318, 342, 359, 377, 401, 422, 443, 479, 482, 492, 493, 514, 526, 527, 528, 536, 559, 601, 605, 657, 663, 698, 715, 761, 763, 764, 771, 772, 775, 784, 791, 793, 794, 795, 796, 797, 798, 804, 812, 819, 820, 822, 825, 826, 830, 832, 843, 848, 893, 896, 916, 924, 926, 933, 938, 945, 949, 950, 951, 956, 961, 972, 979, 992, 1003, 1010, 1013, 1017, 1035, 1036, 1047, 1050, 1053, 1139, 1145, 1146, 1154, 1158, 1159, 1168, 1174, 1184, 1196, 1197, 1199, 1210, 1217, 1221, 1227, 1228, 1235, 1244, 1246, 1412, 1459, 1465, 1471	2 y M				A	Ingst	Unt-G	1	Amitriptyline	373 ng/mL in serum @ unknown		
		Amitriptyline	1	1							Nortriptyline	80 ng/mL in serum @ unknown
		Amitriptyline	1	1							Nortriptyline	500 ng/mL in blood (unspecified) @ unknown
756a	8 y F	Amitriptyline	1	1	C	Ingst	Int-U	2	Amitriptyline	520 ng/mL in blood (unspecified) @ unknown		

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
757ph	14 y F	Amphetamine/dextroamphetamine	2	2	A/C	Ingst	Int-S	2	Amphetamine	170 ng/mL in blood (unspecified) @ unknown
		Mirtazapine	3	3						
		Bupropion	1	1						
		Fluoxetine	2	2						
758h	14 y M	Aripiprazole	3	3	U	Unk	Unk	1	Bupropion	200 ng/mL in blood (unspecified) @ 28 h (pe)
		Bupropion	1	1						
		Bupropion	1	1					Hydroxybupropion	2400 ng/mL in blood (unspecified) @ 28 h (pe)
759h	15 y F	Meclizine	2	2	A	Ingst	Int-S	2		
		Amitriptyline	1	1						
760h	18 y F	Bupropion	1	1	A	Ingst	Int-S	1		
		Duloxetine	2	2						
761ha	18 y M	Bupropion	1	1	A	Ingst	Int-S	1		
		Quetiapine	2	2						
		Oxcarbazepine	3	3						
		Melatonin	4	4					10-hydroxycarbazepine	62 mcg/mL in whole blood @ autopsy
762pha	18 y F	Nortriptyline	1	1	A	Ingst	Int-S	1		
763	19 y F	Venlafaxine	1	1	A	Ingst	Int-S	2		
		Lamotrigine	2	2						
		Doxylamine	3	3						
		Diphenhydramine	4	4						
764pai	19 y M	Bupropion (extended release)	1	1	U	Ingst	Int-S	1	Bupropion	9839 ng/mL in blood (unspecified) @ autopsy
		Mirtazapine	2	2					Mirtazapine	14 ng/mL in blood (unspecified) @ autopsy
		Pregabalin	3	2						
		Aripiprazole	4	3						
765ha	20 y F	Citalopram	1	1	U	Ingst	Int-S	1	Citalopram	7600 ng/mL in blood (unspecified) @ 1 h (pe)
		Clonazepam	2	2					7-Aminoclonazepam	11 ng/mL in blood (unspecified) @ 1 h (pe)
		Clonazepam	2	2					Clonazepam	51 ng/mL in blood (unspecified) @ 1 h (pe)
		Alprazolam	3	3					Alprazolam	92 ng/mL in blood (unspecified) @ 1 h (pe)
		Methylphenidate	4	4					Methylphenidate	5.2 ng/mL in blood (unspecified) @ 1 h (pe)
766h	21 y F	Bupropion	1	1	A/C	Ingst	Int-S	2		
		Lorazepam	2	2						
767	21 y M	Bupropion	1	1	A/C	Ingst	Int-S	1		
768ph	21 y F	Fluoxetine	1	1	A/C	Ingst	Int-S	2		
		Hydroxyzine	2	2						
		Ethanol	3	3						
		Melatonin	4	4					Ethanol	67 mg/dL in serum @ unknown
769p	21 y M	Bupropion	1	1	A	Ingst	Int-S	2		
		Escitalopram	2	2						
770p	23 y F	Venlafaxine	1	1	A	Ingst + Aspir	Int-S	3		
771ha	24 y F	Amitriptyline	1	1	A/C	Ingst	Int-S	1	Amitriptyline	1200 ng/mL in blood (unspecified) @ 6 h (pe)
		Amitriptyline	1	1					Nortriptyline	590 ng/mL in blood (unspecified) @ 6 h (pe)
		Lamotrigine	2	2					Lamotrigine	47 mcg/mL in blood (unspecified) @ unknown

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
772h	24 y F	Alprazolam	3	3	A	Ingst	Int-S	1	Alpha-oh-alprazolam	36 ng/mL in blood (unspecified) @ unknown
		Alprazolam	3	3					Alprazolam	620 ng/mL in blood (unspecified) @ unknown
		Diazepam	4	4					Diazepam	1100 ng/mL in blood (unspecified) @ unknown
		Diazepam	4	4					Nordiazepam	180 ng/mL in blood (unspecified) @ unknown
		Bupropion	1	1						
		Isocarboxazid	2	2						
		Citalopram	3	3						
773ha	24 y M	Lamotrigine	4	4	A	Ingst	Int-S	1		
		Quetiapine	5	5						
		Lurasidone	6	6						
		Diazepam	7	7						
		Bupropion (extended release)	1	1					Bupropion	12 mcg/mL in whole blood @ autopsy
		Bupropion (extended release)	1	1					Bupropion	7.9 mcg/mL in whole blood @ autopsy
		Fluoxetine	2	2					Fluoxetine	3.5 mcg/mL in whole blood @ autopsy
774ha	25 y F	Fluoxetine	2	2	A	Ingst	Int-S	1	Fluoxetine	3.9 mcg/mL in whole blood @ autopsy
		Ethanol	3	3					Ethanol	350 mg/dL in plasma @ unknown
		Nortriptyline	1	1					Nortriptyline	2800 mcg/mL in blood (unspecified) @ unknown
775pa	28 y M	Tetrahydrocannabinol	2	2	A/C	Ingst	Int-U	1		
		Amitriptyline	1	1					Amitriptyline	1100 ng/mL in whole blood @ autopsy
		Amitriptyline	1	1					Nortriptyline	1500 ng/mL in whole blood @ autopsy
		Haloperidol	2	2					Haloperidol	11 ng/mL in whole blood @ autopsy
		Pimozide	3	3						
		Clonazepam	4	4					Clonazepam	4.1 ng/mL in whole blood @ autopsy
		Clonazepam	4	4					7-Aminoclonazepam	83 ng/mL in whole blood @ autopsy
		Valproic acid	5	5						
		Benzotropine	6	6						
		Ranitidine	7	7						
		Ibuprofen	8	8						
776h	29 y M	Sulfamethoxazole/trimethoprim	9	9						
		Loratadine	10	10						
		Gabapentin	11	11						
777h	29 y F	Venlafaxine	1	1	A/C	Ingst	Int-S	2		
778p	29 y M	Bupropion	1	1	U	Ingst	Int-A	2		
		Citalopram	2	2						
779h	29 y F	Etizolam	1	1	A/C	Ingst	Int-S	1		
780h	30 y F	Amitriptyline	1	1	A	Ingst	Int-S	1		
		Benzodiazepine	2	2						
		Amitriptyline	1	1						
		Ethanol	2	2					Ethanol	78 mg/dL in blood (unspecified) @ 6 h (pe)
		Acetaminophen/oxycodone	3	3						
781h	30 y M	Drug, unknown	4	4	A/C	Ingst	Int-S	2		
		Bupropion (extended release)	1	1						

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
782h	30 y F	Bupropion	1	1	A/C	Ingst	Int-S	1		
		Trazodone	2	2						
		Venlafaxine	3	3						
		Meloxicam	4	4						
		Lisinopril	5	5						
		Triamterene	6	6						
783	31 y F	Escitalopram	1	1	A/C	Ingst + Aspir	Int-S	2		
		Benzodiazepine	2	2						
		Ethanol	3	3					Ethanol	0 mg/dL in serum @ unknown
784pa	31 y M	Amitriptyline	1	1	A/C	Ingst	Int-S	2	Nortriptyline	37 ng/mL in whole blood @ autopsy
		Amitriptyline	1	1					Amitriptyline	84 ng/mL in whole blood @ autopsy
		Tizanidine	2	2						
		Gabapentin	3	3					Gabapentin	62.1 mcg/mL in whole blood @ autopsy
		Hydrocodone	4	4					Hydromorphone	12 ng/mL in whole blood @ autopsy
		Hydrocodone	4	4					Hydrocodone	143 ng/mL in whole blood @ autopsy
		Hydrocodone	4	4					Dihydrocodeine	30 ng/mL in whole blood @ autopsy
785	31 y M	Bupropion	1	1	A	Ingst	Int-S	2		
786h	31 y F	Bupropion	1	1	A/C	Ingst	Int-S	2		
787ph	32 y M	Bupropion (extended release)	1	1	A	Ingst	Int-S	3		
		Cocaine	2	2						
788h	32 y F	Sertraline	1	1	A	Ingst	Int-S	3		
		Dicyclomine	2	2						
		Benzodiazepine	3	3						
		Zolpidem	4	4						
789h	32 y F	Amitriptyline	1	1	A	Ingst	Int-S	2		
790pa	33 y F	Bupropion	1	1	A/C	Ingst + Par	Int-S	2		
		Heroin	2	2						
		Fentanyl	3	3						
791p	34 y F	Bupropion (extended release)	1	1	A	Ingst	Int-S	1		
		Risperidone	2	2						
		Valproic acid	3	3						
792ha	34 y F	Amitriptyline	1	1	A	Ingst	Int-S	1	amitriptyline	3700 ng/mL in blood (unspecified) @ unknown
		Amitriptyline	1	1					nortriptyline	710 ng/mL in blood (unspecified) @ unknown
		Bupropion	2	2					bupropion	11 ng/mL in blood (unspecified) @ unknown
		Bupropion	2	2					hydroxybupropion	230 ng/mL in blood (unspecified) @ unknown
		Citalopram	3	3					citalopram	230 ng/mL in blood (unspecified) @ unknown
		Ethanol	4	4					ethanol	18 mg/dL in blood (unspecified) @ unknown
793h	34 y M	Bupropion	1	1	A	Ingst	Int-S	2		
		Carbamazepine	2	2					carbamazepine	21.6 mcg/mL in blood (unspecified) @ 14 h (pe)

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
794pha	35 y M	Carbamazepine	2	2	U	Ingst + Unk	Int-S	1	Carbamazepine	22 mcg/mL in blood (unspecified) @ 30 m (pe)
		Terazosin	3	3						
		Bupropion	1	1					Hydroxybupropion	1900 ng/mL in blood (unspecified) @ autopsy
		Bupropion	1	1					Bupropion	3900 ng/mL in blood (unspecified) @ autopsy
		Hydroxyzine	2	2					Hydroxyzine	350 ng/mL in blood (unspecified) @ autopsy
		Diphenhydramine	3	3					Diphenhydramine	160 ng/mL in blood (unspecified) @ autopsy
		Fentanyl	4	4					Norfentanyl	0.39 ng/mL in blood (unspecified) @ autopsy
		Fentanyl	4	4					Fentanyl	3.7 ng/mL in blood (unspecified) @ autopsy
		Olanzapine	5	5					Olanzapine	87 ng/mL in blood (unspecified) @ autopsy
		Levetiracetam	6	6					Levetiracetam	42 mcg/mL in blood (unspecified) @ autopsy
		Methamphetamine	7	7					Methamphetamine	8.7 ng/mL in blood (unspecified) @ autopsy
795ha	35 y F			A/C	Ingst	Int-S	1			
		Nortriptyline	1					1	Nortriptyline	2500 ng/mL in blood (unspecified) @ autopsy
		Ethanol	2					2		
		Diazepam	3					3	Diazepam	21 ng/mL in blood (unspecified) @ autopsy
		Diazepam	3					3	Nordiazepam	40 ng/mL in blood (unspecified) @ autopsy
		Gabapentin	4					4	Gabapentin	64 ng/mL in blood (unspecified) @ autopsy
		Sertraline	5					5	Desmethylsertraline	120 ng/mL in blood (unspecified) @ autopsy
796ha	35 y F	Sertraline	5	5	A	Ingst	Int-S	1	Sertraline	15 ng/mL in blood (unspecified) @ autopsy
		Bupropion	1	1						
		Diphenhydramine	2	2						
		Lamotrigine	3	3					Lamotrigine	40.8 mcg/mL in blood (unspecified) @ autopsy
		Fluoxetine	4	4					Norfluoxetine	0.48 mcg/mL in blood (unspecified) @ unknown
		Fluoxetine	4	4					Fluoxetine	1.5 mcg/mL in blood (unspecified) @ unknown
		Acetaminophen	5	5						
		Alprazolam	6	6						
		Zolpidem	7	7						
		Omeprazole	8	8						
797h	36 y F			A	Ingst	Int-S	3			
		Amitriptyline	1					1		
		Escitaopram	2					2		
		Gabapentin	3					3		
		Ibuprofen	4					4		
		Ethanol	5					5	Ethanol	218 mg/dL in blood (unspecified) @ 1 h (pe)
798	37 y M			U	Ingst	Int-S	2			
		Nortriptyline	1					1		
		Quetiapine	2					2		
		Zolpidem	3					3		
		Alprazolam	4					4		
799pa	37 y M	Gabapentin	5	5	A/C	Ingst	Int-U	2		
		Baclofen	6	6						
		Bupropion	1	1					Hydroxybupropion	3900 ng/mL in blood (unspecified) @ autopsy
		Bupropion	1	1					Bupropion	820 ng/mL in blood (unspecified) @ autopsy
		Venlafaxine	2	2					Venlafaxine	890 ng/mL in blood (unspecified) @ autopsy
800ph	37 y F			A	Ingst	Int-S	2			
		Amitriptyline	1					1		
		Ethanol	2	2						

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
801ha	37 y F	Bupropion (extended release)	1	1	A/C	Ingst	Int-S	1		
802h	37 y F	Bupropion (extended release)	1	1	A/C	Ingst	Int-S	2		
803h	38 y F	Venlafaxine	1	1	A/C	Ingst	Int-S	1		
		Alprazolam	2	2						
		Hydrocodone	3	3						
804	38 y F	Bupropion	1	1	A/C	Ingst	Int-S	1		
		Quetiapine	2	2						
		Lamotrigine	3	3						
805h	38 y M	Doxepin	1	1	A	Ingst	Int-S	2		
		Tramadol	2	2						
		Venlafaxine	3	3						
		Clonazepam	4	4						
806ha	39 y M	Bupropion	1	1	A	Ingst	Int-S	1	Bupropion	180 ng/mL in serum @ unknown
		Bupropion	1	1					Hydroxybupropion	490 ng/mL in serum @ unknown
		Amlodipine	2	2						
		Escitalopram	3	3					Escitalopram	1300 ng/mL in serum @ unknown
		Salicylate	4	4					Salicylate	220 mcg/mL in serum @ unknown
		Losartan	5	5						
		Levothyroxine	6	6						
		Ethanol	7	7					Ethanol	42 mg/dL in serum @ unknown
807h	39 y F	Doxepin	1	1	A/C	Ingst	Int-S	2		
808	40 y F	Lithium	1	1	A	Ingst	Int-S	3	Lithium	3.9 mEq/L in blood (unspecified) @ unknown
		Thyroid preparation Drug, unknown	2	2						
			3	3						
809phi	40 y F	Doxepin	1	1	A	Ingst	Int-S	2		
		Alprazolam	2	2						
810p	40 y F	Amitriptyline	1	1	A	Ingst	Int-S	2		
811hai	40 y F	Venlafaxine (extended release)	1	1	A/C	Ingst	Int-S	2	Venlafaxine	39 mg/dL in blood (unspecified) @ 1 h (pe)
		Ethanol	2	2					Ethanol	0.16 g/dL in blood (unspecified) @ 1 h (pe)
812p	40 y M	Venlafaxine	1	1	A	Ingst	Int-S	2		
		Quetiapine	2	2						
		Hydroxyzine	3	3						
		Ethanol	4	4						
		Sertraline	5	5						
		Gabapentin	6	6						
		Zolpidem	7	7						
		Acetaminophen	8	8						
		Acetaminophen	9	9						
813h	41 y F	Amitriptyline	1	1	A/C	Ingst	Int-S	2		
814pha	41 y F	Amitriptyline	1	1	A	Ingst	Int-S	1		
		Clonazepam	2	2						
		Trazodone	3	3					Trazodone	7.4 mcg/mL in blood (unspecified) @ unknown
		Angiotensin converting enzyme inhibitor	4	4						
		Chlordiazepoxide	5	5						
815h	41 y M	Bupropion	1	1	A/C	Ingst	Int-S	1		
		Alpha blocker	2	2						

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
816	42 y M	Amitriptyline	1	1	A/C	Ingst	Int-S	2		
		Ethanol	2	2						
817ha	43 y F	Venlafaxine	1	1	U	Ingst	Int-S	1	Venlafaxine	29015 ng/mL in blood (unspecified) @ 1 h (pe)
		Venlafaxine	1	1					o-Desmethyl-venlafaxine	5098 ng/mL in blood (unspecified) @ 1 h (pe)
		Trazodone	2	2					Trazodone	0.68 mcg/mL in blood (unspecified) @ 1 h (pe)
818	43 y F	Amitriptyline	1	1	A/C	Ingst	Int-S	2		
		Escitalopram	2	2						
		Lorazepam	3	3						
		Lithium	4	4					Lithium	2.9 mEq/L in serum @ unknown
819	44 y F	Venlafaxine (extended release)	1	1	A	Ingst	Int-S	2		
		Baclofen	2	2						
		Salicylate	3	3						
		Lamotrigine (extended release)	4	4						
		Clonazepam	5	5						
820pha	44 y F	Venlafaxine	1	1	U	Ingst	Int-S	1	o-Desmethyl-venlafaxine	1900 ng/mL in blood (unspecified) @ autopsy
		Venlafaxine	1	1					Venlafaxine	23,000 ng/mL in blood (unspecified) @ autopsy
		Lamotrigine	2	2					Lamotrigine	58 mcg/mL in blood (unspecified) @ autopsy
		Fluoxetine	3	3						
		Simvastatin	4	4						
		Ethanol	5	5					Ethanol	28 mg/dL in urine (quantitative only) @ autopsy
821h	45 y M	Lithium	1	1	U	Ingst	Oth-W	2	Lithium	2.5 ng/mL in blood (unspecified) @ unknown
822ph	45 y M	Ethanol	2	2	A	Ingst	Int-S	2		
		Bupropion (extended release)	1	1						
		Sertraline	2	2						
		Lamotrigine	3	3						
823pa	46 y F	Venlafaxine	1	1	U	Ingst	Int-S	1	Venlafaxine	247 ng/mL in blood (unspecified) @ autopsy
		Quetiapine	2	2					Quetiapine	5703 ng/mL in blood (unspecified) @ autopsy
		Drug, unknown	3	3					Buprenorphine	0.6 ng/mL in blood (unspecified) @ autopsy
		Drug, unknown	3	3					Methamphetamine	1407 ng/mL in blood (unspecified) @ autopsy
		Drug, unknown	3	3					Diphenhydramine	65.1 ng/mL in blood (unspecified) @ autopsy
824	47 y F	Amitriptyline	1	1	C	Ingst	Int-S	2		
825ph	48 y F	Duloxetine	1	1	A/C	Ingst	Int-S	2		
		Lamotrigine	2	2						
		Lamotrigine	3	3						
		Pregabalin	4	4						
		Cyclooxygenase-2 inhibitor	5	5						
826p	48 y F	Protriptyline	1	1	U	Ingst	Unk	2		
827h	49 y F	Venlafaxine	1	1	A/C	Ingst	Int-S	2		
828h	49 y F	Bupropion (extended release)	1	1	A/C	Ingst	Int-S	1		
		Lisinopril	2	2						
829ph	49 y F				U	Ingst	Unk	2		

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
830h	50 y M	Amitriptyline	1	1	A	Ingst	Int-S	2	Amitriptyline	295 ng/mL in blood (unspecified) @ 2 h (pe)
		Amitriptyline	1	1					Nortriptyline	333 ng/mL in blood (unspecified) @ 2 h (pe)
		Methadone	2	2						
		Nicotine	3	3						
		Diphenhydramine	4	4						
		Caffeine	5	5						
831ha	50 y F	Metronidazole	6	6	A/C	Ingst	Int-S	1		
		Citalopram	1	1						
		Duloxetine	2	2						
832h	50 y F	Lamotrigine	3	3	A/C	Ingst	Int-S	2		
		Paroxetine	1	1					Paroxetine	3761 ng/mL in serum @ 1 h (pe)
		Tramadol	2	2					Tramadol	4.084 mg/L in serum @ 1 h (pe)
833	51 y F	Bupropion	1	1	A/C	Ingst	Int-S	1		
		Venlafaxine	2	2						
		Ethanol	3	3					Ethanol	50 mg/dL in blood (unspecified) @ unknown
		Methylenedioxymethamphetamine (MDMA)	4	4						
		Methocarbamol	5	5						
		Drug, unknown	6	6						
		Lamotrigine (extended release)	7	7						
		Benzodiazepine	8	8						
834ph	51 y F	Amitriptyline	1	1	A	Ingst	Int-S	1		
835ph	52 y F	Cyclic antidepressant, unknown	1	1	A/C	Ingst	Int-S	1		
		Beta blocker	2	2						
		Amitriptyline	1	1						
836	52 y F	Tapentadol (extended release)	2	2	A/C	Ingst	Int-S	2		
		Diazepam	3	3						
		Amitriptyline	1	1						
837h	52 y F	Metformin	2	2	A	Ingst	Int-S	2		
838ph	52 y F	Doxepin	1	1	C	Ingst	Int-S	1		
		Amitriptyline	1	1						
		Ethanol	2	2					Ethanol	150 mg/dL in blood (unspecified) @ 2 h (pe)
839h	53 y F	Venlafaxine	1	1	U	Ingst	Int-M	3		
		Ethanol	2	2					Ethanol	0 mg/dL in serum @ unknown
		Acetaminophen/diphenhydramine	3	3					Acetaminophen	0 mcg/mL in serum @ unknown
840	54 y F	Bupropion (extended release)	1	1	A	Ingst	Int-S	1		
		Venlafaxine	2	2						
		Linacotide	3	3						
		Loratadine	4	4						
		Salicylate	5	5					Salicylate	0.5 mg/dL in serum @ 1 h (pe)
		Vitamin D	6	6						
841	54 y F	Bupropion	1	1	A	Ingst	Int-S	2		
842pha	55 y F	Celecoxib	2	2	A	Ingst	Int-S	2		
		Trazodone	1	1						
		Cyclobenzaprine	2	2						
		Alprazolam	3	3						

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
843ha	55 y F	Venlafaxine	1	1	A	Ingst	Int-S	1		
		Mirtazapine	2	2						
		Gabapentin	3	3						
844h	55 y F	Amitriptyline	1	1	A/C	Ingst	Int-S	2		
845pha	55 y F	Trazodone	1	1	U	Ingst	Int-S	1	Mcpp (meta-chloro-phenyl piperazine)	230 ng/mL in blood (unspecified) @ unknown
		Trazodone	1	1					Trazodone	6.5 mcg/mL in blood (unspecified) @ unknown
		Clonazepam	2	2					Clonazepam	42 ng/mL in blood (unspecified) @ unknown
		Acetaminophen	3	3					Hydrocodone (free)	370 ng/mL in blood (unspecified) @ unknown
		Acetaminophen	3	3					Acetaminophen	45 mcg/mL in plasma @ unknown
846ha	55 y M	Bupropion (extended release)	1	1	A/C	Ingst	Int-S	1		
		Escitalopram	2	2					Citalopram	0.27 mg/L in blood (unspecified) @ 2.5 h (pe)
		Venlafaxine	3	3					o-Desmethyl-venlafaxine	0.27 mg/L in serum @ 8 h (pe)
		Venlafaxine	3	3					o-Desmethyl-venlafaxine	0.32 mg/L in blood (unspecified) @ 2.5 h (pe)
		Venlafaxine	3	3					Venlafaxine	1.9 mg/L in serum @ 8 h (pe)
		Alpha blocker	4	4						
847pha	56 y F	Amitriptyline	1	1	A	Ingst	Int-S	1	Nortriptyline	0.12 mcg/mL in whole blood @ autopsy
		Amitriptyline	1	1					Amitriptyline	0.49 mcg/mL in whole blood @ autopsy
		Morphine	2	2					Morphine	183 ng/mL in whole blood @ autopsy
		Lorazepam	3	3					Lorazepam	12 ng/mL in whole blood @ autopsy
		Clonazepam	4	4					7-Aminoclonazepam	21 ng/mL in whole blood @ autopsy
		Lisinopril	5	5						
848ha	56 y F	Escitalopram	1	1	U	Ingst	Int-S	2	Citalopram	82 mg/kg in liver @ autopsy
		Escitalopram	1	1					Citalopram	9.6 mg/L in blood (unspecified) @ autopsy
		Drug, unknown	3	2						
		Lamotrigine	2	2					Lamotrigine	150 mg/L in blood (unspecified) @ autopsy
849h	57 y M	Amitriptyline	1	1	A/C	Ingst	Int-S	2		
		Cyclobenzaprine	2	2						
		Zolpidem	3	3						
850	57 y F	Bupropion	1	1	A	Ingst	Int-S	2		
		Mirtazapine	2	2						
		Ethanol	3	3					Ethanol	0.087 g/dL in blood (unspecified) @ unknown
851	58 y F	Phenelzine	1	1	A/C	Ingst	Int-S	1		
		Duloxetine	2	2						
		Drug, unknown	3	3						
852p	60 y F	Amitriptyline	1	1	A/C	Ingst	Int-S	1		
		Baclofen	2	2						
		Tramadol	3	3						

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
853h	60 y F	Cyclic antidepressant, unknown	1	1	A	Ingst	Int-S	3		
		Alprazolam	2	2						
		Citalopram	3	3						
		Ethanol	4	4					Ethanol	146 mg/dL in blood (unspecified) @ unknown
		Substance (non-drug), unknown	5	5						
854ph	61 y F	Amitriptyline	1	1	A/C	Ingst	Int-S	2		
		Hydrocodone	2	2						
		Drug, unknown	3	3						
855a	62 y M	Phenelzine	1	1	U	Ingst	AR-D	1	Phenelzine	4.8 ng/mL in blood (unspecified) @ unknown
		Ziprasidone	2	2					Ziprasidone	14 ng/mL in blood (unspecified) @ autopsy
		Meloxicam	3	3						
		Zolpidem	4	4						
		Alprazolam	5	5						
		Losartan	6	6						
856	62 y F	Nortriptyline	1	1	A	Ingst	Int-S	1		
857h	62 y F	Nortriptyline	1	1	A/C	Ingst	Int-S	2		
		Lorazepam	2	2						
858p	62 y F	Cyclic antidepressant, unknown	1	1	U	Ingst	Unk	2		
859	63 y F	Bupropion	1	1	A/C	Ingst	Int-S	2	Bupropion	105.4 ng/mL in blood (unspecified) @ 20 h (pe)
		Bupropion	1	1					Hydroxybupropion	2696.6 ng/mL in blood (unspecified) @ 20 h (pe)
860ha	64 y F	Fluoxetine	1	1	U	Ingst	Int-S	2		
861	64 y M	Amitriptyline	1	1	U	Ingst	Int-S	3		
		Ethanol	2	2						
862	65 y F	Amitriptyline	1	1	U	Ingst	Int-S	1		
		Ethanol	2	2					Ethanol	195 mg/dL in serum @ unknown
863h	66 y F	Amitriptyline	1	1	A	Ingst	Int-S	1		
864p	67 y F	Amitriptyline	1	1	A/C	Ingst	Int-S	2		
865ha	67 y M	Amitriptyline	2	1	A	Ingst	Int-S	1	Amitriptyline	122 ng/mL in blood (unspecified) @ autopsy
		Amitriptyline	2	1					Nortriptyline	94 ng/mL in blood (unspecified) @ autopsy
		Zolpidem	1	1					Zolpidem	1260 ng/mL in blood (unspecified) @ autopsy
866	68 y F	Citalopram	1	1	A/C	Ingst + Unk	Int-S	1		
		Clonazepam	2	2						
		Drug, unknown	3	3						
867ha	68 y F	Bupropion	1	1	A/C	Ingst	Int-S	3		
		Ibuprofen	2	2						
868ph	69 y F	Nortriptyline	1	1	A	Ingst	Int-S	1		
869h	69 y F	Lithium	1	1	C	Ingst	AR-D	3	Lithium	2.89 mEq/L in serum @ 5 d (pe)
870ph	69 y F	Desipramine	1	1	A/C	Ingst	Unk	1	Desipramine	1000 ng/mL in serum @ 10 m (pe)

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
871ha	70 y M	Amitriptyline	1	1	U	Ingst	Int-U	1	Amitriptyline	1300 ng/mL in blood (unspecified) @ unknown
		Amitriptyline	1	1					Nortriptyline	270 ng/mL in blood (unspecified) @ unknown
872h	73 y F	Amitriptyline	1	1	A/C	Ingst	Int-S	1		
873	73 y F	Desipramine	1	1	A	Ingst	Int-S	2		
		Ethanol	2	2						
874h	74 y F	Bupropion	1	1	A/C	Ingst	Int-S	3		
		Amlodipine	2	2						
		Fluoxetine	3	2						
		Diphenhydramine	4	3						
875	79 y M	Trazodone	1	1	A	Ingst	Int-S	3		
		Acetaminophen	2	2						
876h	83 y M	Bupropion	1	1	U	Ingst	Int-S	2		
877h	85 y F	Venlafaxine	1	1	A	Ingst	Int-S	1		
		Hypochlorite	2	2						
878p	unknown adult (>=20 yrs) M				A	Ingst + Par	Int-A	2		
		Amitriptyline	1	1						
		Heroin	2	2						
See also case 12, 87, 94, 96, 173, 196, 253, 256, 278, 303, 318, 335, 358, 359, 361, 374, 379, 383, 399, 401, 405, 412, 466, 467, 479, 482, 493, 496, 502, 511, 514, 524, 526, 535, 546, 559, 571, 580, 594, 601, 619, 672, 675, 729, 731, 733, 737, 745, 746, 750, 881, 890, 893, 897, 909, 915, 916, 917, 922, 923, 925, 926, 933, 935, 938, 949, 952, 954, 956, 958, 960, 969, 972, 975, 978, 981, 987, 996, 997, 999, 1000, 1002, 1003, 1006, 1010, 1013, 1025, 1026, 1035, 1038, 1041, 1049, 1051, 1052, 1053, 1056, 1060, 1061, 1065, 1067, 1068, 1069, 1070, 1077, 1080, 1082, 1093, 1098, 1113, 1115, 1138, 1139, 1146, 1147, 1151, 1154, 1158, 1162, 1168, 1174, 1175, 1179, 1184, 1197, 1217, 1228, 1244, 1246, 1247, 1248, 1249, 1250, 1251, 1252, 1253, 1299, 1323, 1360, 1386, 1400, 1465										
Antihistamines										
879a	5 y M	Diphenhydramine	1	1	A	Ingst	Oth-M	1	Diphenhydramine	1.9 mg/L in whole blood @ autopsy
		Diphenhydramine	1	1					Diphenhydramine	10 mg/kg in liver @ autopsy
		Diphenhydramine	1	1					Diphenhydramine	2.5 mg/L in whole blood @ autopsy
880h	12 y F	Diphenhydramine	1	1	A	Ingst	Int-S	1		
881pha	14 y F	Diphenhydramine	1	1	A	Ingst	Int-S	1	Diphenhydramine	18000 ng/mL in blood (unspecified) @ 1 h (pe)
		Escitalopram	2	2						
882pha	19 y M	Diphenhydramine	1	1	A	Ingst	Int-S	1		
883pa	22 y M	Diphenhydramine	1	1	A	Ingst	Int-A	2		
		Opioid	2	2						
884h	25 y F	Diphenhydramine	1	1	A	Ingst	Int-S	1		
		Ethanol	2	2					Ethanol	197 mg/dL in blood (unspecified) @ unknown
		Ibuprofen	3	2						
885	27 y F	Diphenhydramine	1	1	U	Ingst	Int-S	2		
886h	28 y M	Diphenhydramine	1	1	A	Ingst	Int-S	2		
887ph	28 y M	Diphenhydramine	1	1	A	Ingst	Int-S	1		
888h	28 y M	Diphenhydramine	1	1	A	Ingst	Int-S	1		
889ph	29 y M	Diphenhydramine	1	1	A	Ingst	Int-S	2		
890ha	30 y F	Diphenhydramine	1	1	A	Ingst	Int-S	1	Diphenhydramine	10.6 mg/L in blood (unspecified) @ 8 h (pe)

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
891a	34 y F	Ethanol	2	2	A	Ingst	Int-S	3	Ethanol	0.07 g/dL in blood (unspecified) @ 8 h (pe)
		Fluoxetine	3	3					Fluoxetine	0.14 mg/L in blood (unspecified) @ 8 h (pe)
		Fluoxetine	3	3					Norfluoxetine	0.17 mg/L in blood (unspecified) @ 8 h (pe)
		Benzodiazepine	4	4					Diazepam	0.25 mg/L in blood (unspecified) @ 8 h (pe)
		Benzodiazepine	4	4					Nordiazepam	0.27 mg/L in blood (unspecified) @ 8 h (pe)
892a	35 y F	Diphenhydramine	2	1	A	Ingst	Int-S	1	Diphenhydramine	18000 ng/mL in blood (unspecified) @ autopsy
		Ethanol	1	1						
		Diphenhydramine	1	1						
		Acetaminophen/ chlorpheniramine/ phenylephrine	2	2					Phenylephrine	20 ng/mL in blood (unspecified) @ autopsy
		Acetaminophen/ chlorpheniramine/ phenylephrine	2	2					Acetaminophen	51 mcg/mL in blood (unspecified) @ autopsy
893	43 y M	Ethanol	3	3	A	Ingst	Int-S	2		
		Diphenhydramine	1	1						
		Cyclobenzaprine	2	2						
		Gabapentin	3	3						
		Levothyroxine	4	4						
		Acetaminophen/ diphenhydramine	5	5						
		Fluoxetine	6	6						
		Atorvastatin	7	7						
		Lorazepam	8	8						
894p	45 y M				A/C	Ingst	Int-S	2		
895ha	57 y F	Diphenhydramine	1	1	A	Ingst	Int-S	1	Diphenhydramine	3 mg/kg in blood (unspecified) @ 1.5 h (pe)
		Diphenhydramine	1	1					Diphenhydramine	40 mg/kg in liver @ 2 d (pe)
		Diazepam	2	2					Diazepam	0.65 mg/L in blood (unspecified) @ 1.5 h (pe)
896h	61 y F				A	Ingst	Int-S	2		
		Hydroxyzine	1	1						
		Lamotrigine	2	2						
897ha	63 y F	Drug, unknown	3	3	A/C	Ingst	Int-S	1		
		Diphenhydramine	1	1						
		Fluoxetine	2	2					Norfluoxetine	266 ng/mL in blood (unspecified) @ unknown
		Fluoxetine	2	2					Fluoxetine	670 ng/mL in blood (unspecified) @ unknown
898ph	64 y M	Escitalopram	3	3	A	Ingst	Int-M	2		
		Risperidone	4	4						
		Diphenhydramine	1	1						
899ha	79 y M				U	Ingst	Unk	2		
		Diphenhydramine	1	1						
		Dextromethorphan/ guaifenesin	2	2						
[900pha]	8 m M	Benzodiazepine	3	3	A	Ingst	Unk	1		
		Diphenhydramine	1	1						

See also case 5, 21, 26, 74, 87, 109, 172, 256, 291, 300, 305, 312, 327, 330, 335, 337, 342, 350, 358, 359, 405, 417, 442, 445, 511, 524, 527, 536, 559, 571, 595, 600, 601, 608, 632, 680, 710, 731, 733, 737, 745, 747, 763, 768, 775, 794, 796, 812, 829, 840, 874, 929, 933, 940, 944, 951, 970, 994, 996, 1005, 1069, 1132, 1152, 1168, 1174, 1192, 1211, 1243, 1323, 1391, 1471

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
Antimicrobials										
901pa	36 y M	Tilmicosin	1	1	A	Ingst + Par	Unt-O	2		
		Ethanol	2	2					Ethanol	140 mg/dL in blood (unspecified) @ autopsy
902ph	36 y M	Tilmicosin	1	1	U	Par	Unt-G	2		
903h	49 y F	Hydroxychloroquine	1	1	A	Ingst	Int-S	1		
		Methotrexate	2	2						
See also case 341, 401, 680, 728, 731, 775, 829, 926, 980, 1010, 1323, 1324, 1326, 1327, 1357, 1404, 1418, 1432										
Antineoplastics										
[904h]	59 y M	Antineoplastic drug	1	1	C	Par	AR-D	3		
[905h]	68 y M	Methotrexate	1	1	A/C	Ingst	Unt-T	1		
See also case 330, 903										
Asthma therapies										
906h	68 y M	Theophylline	1	1	C	Ingst	Unt-T	1	Theophylline	43 mcg/mL in blood (unspecified) @ unknown
907h	84 y M	Theophylline	1	1	C	Ingst	AR-D	3	Theophylline	14.9 mcg/mL in blood (unspecified) @ 2 d (pe)
		Theophylline	1	1					Theophylline	16 mcg/mL in blood (unspecified) @ 1 d (pe)
		Theophylline	1	1					Theophylline	19.7 mcg/mL in blood (unspecified) @ 1 d (pe)
		Theophylline	1	1					Theophylline	35.7 mcg/mL in blood (unspecified) @ unknown
See also case 401, 1010, 1139										
Cardiovascular drugs										
908ph	11 y F	Propranolol	1	1	A	Ingst	Int-S	1		
		Beta blocker	2	2						
		Methocarbamol	3	3						
909pa	16 y F	Metoprolol	1	1	A	Ingst	Int-S	1		
		Flecainide	2	2					Flecainide	3.1 mcg/mL in blood (unspecified) @ unknown
		Imipramine	3	3						
		Citalopram	4	4					Citalopram	350 ng/mL in blood (unspecified) @ unknown
		Bupropion	5	5					Bupropion	11 ng/mL in blood (unspecified) @ unknown
		Bupropion	5	5					Hydroxybupropion	150 ng/mL in blood (unspecified) @ unknown
910ha	18 y F	Amlodipine	1	1	A	Ingst	Int-S	1		
		Ethylene glycol (antifreeze)	2	2					Ethylene glycol	112 mg/dL in blood (unspecified) @ 8 h (pe)
		Ethylene glycol (antifreeze)	2	2					Ethylene glycol	34 mg/dL in blood (unspecified) @ 1 d (pe)
		Hydrochlorothiazide	3	3						
911h	21 y F	Labetalol	1	1	U	Ingst	Int-S	2		
		Clonazepam	2	2						
912h	21 y M	Propranolol	1	1	A	Ingst	Int-S	2	Propranolol	12000 ng/mL in blood (unspecified) @ autopsy
		Risperidone	2	2						
		Alpha blocker	3	3						
913h	21 y M	Metoprolol	1	1	A	Ingst	Int-S	1		
		Diltiazem (extended release)	2	2						

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
914h	21 y M				A	Ingst	Int-S	1		
915h	22 y M	Verapamil	1	1						
		Diltiazem	1	1	A/C	Ingst	Int-S	1		
		Citalopram	2	2						
916ha	28 y F	Propranolol	1	1	A/C	Ingst + Aspir	Int-S	1	Propranolol	5.5 mg/L in serum @ 7.5 h (pe)
		Escitalopram	2	2					Citalopram	0.76 mg/L in serum @ 7.5 h (pe)
		Lamotrigine	3	3						
		Mirtazapine	4	4						
		Cyclobenzaprine	5	5						
		Buspirone	6	6						
		Clonazepam	7	7						
		Activated charcoal	8	8						
917ha	28 y M	Metoprolol	1	1	A/C	Ingst	Int-S	2		
		Amitriptyline	2	2						
918h	32 y F	Beta blocker	1	1	A	Ingst	Int-S	2		
919	33 y M				A/C	Ingst	Int-S	2		
		Diltiazem	1	1						
		Lisinopril	2	2						
		Ethanol	3	3						
920h	35 y F	Diltiazem	1	1	A	Ingst	Int-S	1		
[921pha]	36 y F	Propranolol	1	1	A/C	Ingst	Int-S	1	Propranolol	5300 ng/mL in blood (unspecified) @ unknown
922h	36 y F				A	Ingst	Int-S	2		
		Propranolol	1	1						
		Escitalopram	2	2						
		Amitriptyline	3	3						
		Alprazolam	4	4						
		Acetaminophen	5	5						
		Ethanol	6	6					Ethanol	177 mg/dL in blood (unspecified) @ 2 h (pe)
		Cocaine	7	7						
923h	36 y F				A/C	Ingst	Int-S	1		
		Amlodipine	1	1						
		Metoprolol	2	2						
		Trazodone	3	3						
		Fluoxetine	4	4						
924h	37 y M	Amlodipine	1	1	A/C	Ingst	Int-S	1		
		Gabapentin	2	2						
925	37 y F				A/C	Ingst	Int-S	1		
		Nebivolol	1	1						
		Lurasidone	2	2						
		Duloxetine	3	3						
		Lisinopril	4	4						
		Bupropion (extended release)	5	5						
		Alprazolam	6	6						
		Ethanol	7	7						
926pa	37 y F	Propranolol	1	1	A/C	Ingst	Int-S	1		
		Duloxetine	2	2						
		Clonazepam	3	3						
		Gabapentin	4	4						
		Thyroid preparation	5	5						
		Valacyclovir	6	6						
		Magnesium oxide	7	7						
		Eszopiclone	8	8						
		Vitamin D	9	9						
		Esomeprazole	10	10						
927a	38 y M	Propranolol	1	1	A/C	Ingst	Int-S	1	Propranolol	3200 ng/mL in blood (unspecified) @ 30 m (pe)
928ha	38 y M	Quetiapine	2	2	A	Ingst	Int-S	1		
		Amlodipine/benazepril	1	1						
		Ethanol	2	2						

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
929hi	38 y M	Amlodipine	1	1	U	Ingst	Int-S	1		
		Clopidogrel	2	2						
		Promethazine	3	3						
		Hydrochlorothiazide	4	4						
		Ibuprofen	5	5						
		Potassium chloride	6	6						
930h	38 y M	Amlodipine	1	1	A/C	Ingst	Int-S	1		
		Ranolazine	2	2						
		Prasugrel	3	3						
		Salicylate	4	4						
		Atorvastatin	5	5						
931	39 y F	Amlodipine	1	1	A	Ingst	Int-S	1		
		Metoprolol	2	2						
		Fentanyl (transdermal)	3	3						
		Oxycodone	4	4						
		Diazepam	5	5						
932ha	40 y M	Amlodipine	1	1	A/C	Ingst	Int-S	2		
		Clonidine	2	2					Clonidine	24 ng/mL in blood (unspecified) @ unknown
		Losartan	3	3						
		Hydrochlorothiazide	4	4						
		Indomethacin	5	5						
		Ibuprofen	6	6						
		Fenobibrate	7	7						
		Simvastatin	8	8						
		Norepinephrine	9	9						
		Dopamine	10	10						
		Acetaminophen	11	11					Acetaminophen	59 mcg/mL in plasma @ 2 h (pe)
933ha	40 y F	Verapamil	1	1	A/C	Ingst	Int-S	1	Verapamil	0.223 mg/L in whole blood @ autopsy
		Topiramate	2	2					Topiramate	4.2 mg/L in whole blood @ autopsy
		Venlafaxine	3	3					Venlafaxine	0.104 mg/L in whole blood @ autopsy
		Venlafaxine	3	3					Norvenlafaxine	0.327 mg/L in whole blood @ autopsy
		Diphenhydramine	4	4					Diphenhydramine	0.115 mg/L in whole blood @ autopsy
		Butalbital	5	5					Butalbital	2.5 mg/L in whole blood @ autopsy
934p	40 y F	Propranolol	1	1	A	Ingst	Int-S	2		
		U-47700	2	2						
935ha	40 y F	Amlodipine	1	1	A/C	Ingst	Int-S	1		
		Propranolol	2	2						
		Venlafaxine	3	3						
		Quetiapine	4	4						
		Alpha blocker	5	5						
		Acetaminophen/antihistamine/dextromethorphan	6	6					Acetaminophen	18.9 mcg/mL in plasma @ 2.5 h (pe)
		Acetaminophen/antihistamine/dextromethorphan	6	6					Acetaminophen	9.8 mcg/mL in blood (unspecified) @ 4 h (pe)
		Pantoprazole	8	7						
		Salicylate	7	7						
936h	41 y M	Metoprolol	1	1	A/C	Ingst	Int-S	1		
		Amlodipine	2	2						
		Hydrochlorothiazide	3	3						
937ha	41 y F	Amlodipine	1	1	A	Ingst	Int-S	1		
		Lisinopril	2	2						
		Hydrochlorothiazide	3	3						
		Oxycodone	4	4						

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
938h	43 y F	Dextromethorphan	5	5	A/C	Ingst	Int-S	3	Midazolam	0.023 mg/L in blood (unspecified) @ autopsy
		Dextromethorphan	5	5					Dextromethorphan	0.54 mg/L in blood (unspecified) @ autopsy
		Atenolol	1	1						
		Alprazolam	2	2						
		Acetaminophen/hydrocodone	3	3						
		Acetaminophen/butalbital/cafeine	4	4						
		Phenytoin	5	5						
939ai	43 y F	Gabapentin	6	6	A	Ingst	Unk	2		
		Fluoxetine	7	7						
		Clonidine	1	1						
940pa	43 y F	Morphine	2	2	A	Ingst	Int-S	3	Morphine (free)	0.25 mcg/mL in whole blood @ unknown
		Beta blocker	1	1					Propranolol	1600 ng/mL in whole blood @ autopsy
		Diphenhydramine	2	2					Diphenhydramine	210 ng/mL in blood (unspecified) @ autopsy
		Cyclobenzaprine	3	3					Cyclobenzaprine	150 ng/mL in blood (unspecified) @ autopsy
		Benzodiazepine	4	4					Lorazepam	19 ng/mL in blood (unspecified) @ autopsy
941	44 y F	Verapamil	1	1	A/C	Ingst	Int-S	1		
		Ethanol	2	2						
942h	44 y M	Diltiazem	1	1	A/C	Ingst	Int-S	2		
		Metoprolol	2	2						
943h	44 y M	Amlodipine/hydrochlorothiazide/olmesartan	1	1	A	Ingst	Int-S	1		
		Ibuprofen	2	2						
944	44 y F	Verapamil	1	1	A/C	Ingst	Int-S	2		
		Hydroxyzine	2	2						
		Olanzapine	3	3						
		Lorazepam	4	4						
		Chemical, unknown	5	5						
945h	44 y F	Amlodipine	1	1	A	Ingst	Int-S	2		
		Cyclobenzaprine	2	2						
		Gabapentin	3	3						
946	45 y M	Diltiazem (extended release)	1	1	A	Ingst	Int-S	1		
		Antiplatelet drug	2	2						
		Allopurinol	3	3						
		Pantoprazole	4	4						
		Simvastatin	5	5						
		Ibuprofen	6	6						
		Ethanol	7	7					Ethanol	0.17 mg/dL in serum @ 1 h (pe)
947h	45 y M	Amlodipine	1	1	A/C	Ingst	Int-S	2		
		Quetiapine	2	2						
		Aripiprazole	3	3						
		Clonazepam	4	4						
948h	45 y F	Diltiazem	1	1	A	Ingst	Int-S	2		
		Lisinopril	2	2						
949ph	45 y F	Propranolol	1	1	A	Ingst	Int-S	2		
		Valproic acid	2	2						
		Olanzapine	3	3						
		Bupropion	4	4						
950	45 y M	Clonidine	1	1	A/C	Ingst	Int-S	2		
		Gabapentin	2	2						

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
951h	45 y M				U	Ingst	Int-S	2		
		Amlodipine	1	1						
		Hydrocodone	2	2						
		Diphenhydramine	3	3						
		Gabapentin	4	4						
952ph	46 y M				A	Ingst	Int-S	1	Metoprolol	5094 ng/mL in blood (unspecified) @ autopsy
		Metoprolol	1	1						
		Bupropion	2	2						
953h	46 y M				U	Ingst	Oth-M	3	Amlodipine	18 ng/mL in serum @ unknown
		Amlodipine	1	1						
954ha	46 y F				A	Ingst	Int-S	1	Verapamil	2.68 ng/mL in serum @ autopsy
		Verapamil	1	1						
		Propranolol	2	2						
		Citalopram	3	3					Citalopram	0.432 ng/mL in serum @ autopsy
955pha	46 y F				A	Ingst	Int-S	1		
		Metoprolol	1	1						
		Flecainide	2	2						
		Chlordiazepoxide	3	3						
956h	46 y M				A/C	Ingst	Int-S	2		
		Amlodipine	1	1						
		Lamotrigine	2	2						
		Metformin	3	3						
		Citalopram	4	4						
		Fenofibrate	5	5						
		Alpha blocker	6	6						
		Quetiapine	7	7						
		Lisinopril	8	8						
		Bupropion (extended release)	9	9						
		Ethanol	10	10						
957h	46 y M				A	Ingst	Int-S	2		
		Verapamil	1	1						
		Nadolol	2	2						
		Tramadol	3	3						
958h	46 y M				A	Ingst	Int-M	2		
		Carvedilol	1	1						
		Alprazolam	2	2						
		Bupropion	3	3						
		Lorazepam	4	4						
		Lisinopril	5	5						
		Acetaminophen/hydrocodone	6	6						
959h	46 y M				A	Ingst	Unk	2		
		Diltiazem	1	1						
960h	46 y F				A	Ingst	Int-S	2		
		Propranolol	1	1						
		Trazodone	2	2						
		Paroxetine	3	3						
961	47 y M				A	Ingst	Int-S	2		
		Beta blocker	1	1						
		Gabapentin	2	2						
962h	47 y M				U	Ingst	Int-S	1		
		Verapamil	1	1						
963	47 y F				A	Ingst	Int-S	1		
		Calcium antagonist	1	1						
964	47 y M				A/C	Ingst	Int-S	1		
		Amlodipine	1	1						
965h	47 y F				A/C	Ingst	Int-S	2		
		Amlodipine	1	1						
		Clonidine	2	2						
		Lisinopril	3	3						
		Hydrochlorothiazide	4	4						
966ha	47 y M				A/C	Ingst	Int-U	1	Amlodipine	890 ng/mL in blood (unspecified) @ unknown
		Amlodipine	1	1						
967	47 y F				A	Ingst	Int-S	1		
		Diltiazem (extended release)	1	1						
		Propafenone	2	2						
968	48 y M				A/C	Ingst	Unt-T	1		
		Beta blocker	1	1						

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
969ph	48 y M	Amlodipine	1	1	A	Ingst	Int-S	1		
		Atenolol	2	2						
		Sildenafil	3	3						
		Oxycodone	4	4						
		Duloxetine	5	5						
		Tamsulosin	6	6						
		Clonazepam	7	7						
970	49 y F	Verapamil	1	1	A	Ingst	Int-S	2		
		Diphenhydramine	2	2						
		Clonazepam	3	3						
		Levothyroxin	4	4						
971h	49 y M	Amlodipine	1	1	A	Ingst	Int-M	2		
		Carvedilol	2	2						
		Metoprolol	3	3						
972a	49 y F	Diltiazem	1	1	A/C	Ingst	Int-S	1	Diltiazem	19 mg/L in blood (unspecified) @ autopsy
		Diltiazem	1	1					Diltiazem	20 mg/L in blood (unspecified) @ autopsy
		Acetaminophen/butalbital/caffeine/codeine	2	2						
		Acetaminophen/butalbital/caffeine	3	3						
		Zolpidem (extended release)	4	4					Zolpidem	0.2 mg/L in blood (unspecified) @ autopsy
		Topiramate	5	5						
		Citalopram	6	6					Citalopram	0.2 mg/L in blood (unspecified) @ autopsy
973ha	49 y F	Diltiazem	1	1	A	Ingst	Int-S	1	Diltiazem	4100 ng/mL in serum @ autopsy
		Diltiazem	1	1					Diltiazem	75 ng/mL in serum @ autopsy
		Losartan	2	2						
		Acetaminophen	3	3					Acetaminophen	30 mcg/mL in serum @ autopsy
		Acetaminophen	3	3					Acetaminophen	47 mcg/mL in serum @ 6 h (pe)
		Acetaminophen	3	3					Acetaminophen	48 mcg/mL in serum @ autopsy
		Salicylate	4	4					Salicylate	19 mg/dL in serum @ 6 h (pe)
974ha	49 y M	Metoprolol (extended release)	1	1	A	Ingst	Int-S	1	Metoprolol	5660 ng/mL in blood (unspecified) @ autopsy
		Lisinopril	2	2						
		Rivaroxaban	3	3						
		Furosemide	4	4						
		Diuretics, potassium sparing	5	5						
		Salicylate	6	6						
		Cocaine	7	7					Benzoyllecognine	1240 ng/mL in blood (unspecified) @ autopsy
		Cocaine	7	7					Ecgonine methyl ester	339 ng/mL in blood (unspecified) @ autopsy
975	49 y M	Verapamil	1	1	U	Ingst	Int-S	2		
		Bupropion	2	2						
		Citalopram	3	3						
		Antipsychotic (atypical)	4	4						
		Trazodone	5	5						
		Ziprasidone	6	6						
		Mirtazapine	7	7						
		Antacid (proton pump inhibitor)	8	8						
976pha	50 y F	Metoprolol	1	1	A/C	Ingst	Int-S	1	Metoprolol	44 mcg/mL in blood (unspecified) @ autopsy
		Ethanol	2	2					Ethanol	0.19% (wt/vol) in plasma @ autopsy

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
		Morphine	3	3					Morphine	38 ng/mL in blood (unspecified) @ autopsy
		Marijuana	4	4					11-Oh-thc (11-hydroxy-delta-9-tetrahydrocannabinol)	2.8 ng/mL in blood (unspecified) @ autopsy
977h	50 y F	Diltiazem (extended release)	1	1	A/C	Ingst	Int-S	1		
978ha	50 y F	Ethanol	2	2	A	Ingst	Int-S	1		
		Atenolol Bupropion	1 2	1 2					Bupropion	0.77 mg/L in blood (unspecified) @ unknown
979h	50 y F	Sertraline	3	3						
		Ethanol	4	4					Ethanol	0.22% in whole blood @ unknown
980p	50 y F	Nifedipine	1	1	A/C	Ingst	Int-S	2		
		Carvedilol	2	2						
		Tramadol	3	3						
		Topiramate	4	4						
		Omeprazole	5	5						
981	50 y F	Beta blocker	1	1	A/C	Ingst	Int-S	1		
		Lorazepam	2	2						
		Corticosteroids	3	3						
		Antibiotic, unknown	4	4						
982h	51 y F	Amlodipine	1	1	A	Ingst	Int-S	2		
		Amitriptyline	2	2						
		Lurasidone	3	3						
983h	51 y M	Digoxin	1	1	U	Ingst	Int-S	1		
		Carvedilol	1	1						
984h	51 y F	Metformin	2	2	U	Ingst	Unk	3		
		Diltiazem (extended release)	1	1						
985a	51 y F	Diltiazem	1	1	A/C	Ingst	Int-S	1	Diltiazem	490 ng/mL in blood (unspecified) @ 4 h (pe)
		Metoprolol	2	2						
986h	51 y F	Digoxin	1	1	C	Ingst	AR-D	3	Digoxin	3.9 ng/mL in serum @ unknown
987a	52 y F	Atenolol	1	1	A	Ingst	Int-S	2		
		Citalopram	2	2					Citalopram	4.7 mg/L in blood (unspecified) @ autopsy
		Citalopram	2	2					Citalopram	9.1 mg/L in blood (unspecified) @ autopsy
988a	52 y F	Diltiazem	1	1	U	Ingst	Int-S	1	Diazepam	30 mg/L in blood (unspecified) @ autopsy
989	52 y F	Amlodipine	1	1	A/C	Ingst	Int-S	1		
		Beta blocker	2	2						
		Lisinopril	3	3						
		Atorvastatin	4	4						
990ha	53 y F	Nebivolol	1	1	A/C	Ingst	Int-S	2		
		Amlodipine	2	2						
		Benazepril	3	3						
991h	53 y F	Hydrochlorothiazide/irbesartan	1	1	A/C	Ingst	Int-S	1		
992ha	53 y F	Salicylate	2	2	A	Ingst	Int-S	1		
		Diltiazem	1	1					Diltiazem	19.4 mg/L in blood (unspecified) @ unknown

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
993ha	53 y F	Acetaminophen/ butalbital/caffeine	2	2	A/C	Ingst	Int-S	1	Acetaminophen	21.9 mg/L in blood (unspecified) @ unknown
		Acetaminophen/ butalbital/caffeine	2	2					Butalbital	9 mg/L in blood (unspecified) @ unknown
		Propranolol	3	3					Propranolol	3.1 mg/L in blood (unspecified) @ autopsy
		Gabapentin	4	4					Gabapentin	44.6 mg/L in blood (unspecified) @ autopsy
		Propranolol	1	1					Propranolol	350 ng/mL in whole blood @ unknown
		Diltiazem (extended release)	2	2					Diltiazem	230 ng/mL in blood (unspecified) @ unknown
		Ethanol	3	3					Ethanol	131 mg/dL in blood (unspecified) @ unknown
994ha	53 y F			A	Ingst	Int-S	1			
		Amlodipine	1	1					Amlodipine	770 ng/mL in blood (unspecified) @ autopsy
995h	53 y F	Cocaine	2	2	A	Ingst	Int-S	2		
		Diphenhydramine	3	3						
996h	53 y F	Beta blocker	1	1	U	Ingst + Inhal	Int-S	1		
		Amlodipine	1	1						
		Doxepin	2	1					Doxepin	3.1 mg/kg in blood (unspecified) @ 4 h (pe)
		Lacquer/paint/varnish, unknown	3	3						
		Cyclobenzaprine	4	4						
		Methylphenidate	5	5						
		Meclizine	6	6						
		Clonazepam	7	7						
		Acetaminophen/ oxycodone	8	8						
		Paroxetine	9	9						
		Omeprazole	10	10						
		Ethanol	11	11						
		Iron	12	12						
		Promethazine	13	13						
		Morphine	14	14						
		Quetiapine	15	15						
		Almotriptan	16	16						
		Carisoprodol	17	17						
997h	53 y F				A/C	Ingst	Int-S	1		
998h	54 y F	Metoprolol	1	1	A	Ingst	Unt-T	2		
		Bupropion	2	2						
		Ticagrelor	3	3						
		Buspirone	4	4						
		Salicylate	5	5						
		Folic acid	6	6						
		Atorvastain	7	7						
		Propranolol	1	1						
999h	54 y F				A/C	Ingst	Int-S	2		
		Metoprolol	1	1						
		Duloxetine	2	2						
1000ph	54 y M				A	Ingst	Int-S	2		
		Carvedilol	1	1						
		Citalopram	2	2						
		Ethanol	3	3						
		Alprazolam	4	4						
1001h	54 y F				A/C	Ingst	Int-S	1		
1002ha	54 y F				A/C	Ingst + Aspir	Int-S	1		
		Amlodipine	1	1						
		Trazodone	2	2					Trazodone	2.2 mcg/mL in blood (unspecified) @ autopsy
		Ethanol	3	3					Ethanol	123 mg/dL in blood (unspecified) @ autopsy
		Ketorolac	4	4						

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
1003i	55 y F	Metoprolol	1	1	A/C	Ingst	Int-S	3		
		Hydrochlorothiazide/ lisinopril	2	2						
		Tramadol	3	3						
		Benzonatate	4	4						
		Mirtazapine	5	5						
		Lurasidone	6	6						
		Trazodone	7	7						
		Diphenhydramine/ naproxen	8	8						
		Diphenhydramine/ ibuprofen	9	9						
		Gabapentin	10	10						
		Temazepam	11	11						
		Lorazepam	12	12						
		Melatonin	13	13						
1004	55 y M	Digoxin	1	1	C	Ingst	AR-D	3	Digoxin	3.6 ng/mL in serum @ unknown
1005	55 y F	Verapamil	1	1	A/C	Ingst	Int-S	2		
		Diltiazem	2	2						
		Clonazepam	3	3						
		Hydroxyzine	4	4						
1006h	55 y M	Amlodipine	1	1	C	Ingst	Int-S	1		
		Hydrochlorothiazide/ losartan	2	2						
		Acetaminophen/ oxycodone	3	3					Acetaminophen	23.4 mcg/mL in blood (unspecified) @ unknown
		Mirtazapine	4	4						
		Diazepam	5	5						
1007h	55 y F	Diltiazem	1	1	A/C	Ingst	Int-S	1		
		Acetaminophen/ oxycodone	2	2						
1008h	55 y M	Amlodipine	1	1	C	Ingst	Int-S	1		
		Metformin	2	2						
		Morphine	3	3						
1009h	56 y M	Verapamil	1	1	A	Ingst	Int-S	1		
1010	56 y F	Propranolol	1	1	A/C	Ingst	Int-S	2		
		Escitalopram	2	2						
		Lamotrigine	3	3						
		Acetaminophen/ oxycodone	4	4						
		Ibuprofen	5	5						
		Montelukast	6	6						
		Ondansetron	7	7						
		Acyclovir	8	8						
		Alprazolam	9	9						
1011h	56 y F	Amlodipine	1	1	A	Ingst	Int-U	1		
		Ethanol	2	2					Ethanol	157 mg/dL in blood (unspecified) @ unknown
1012	56 y F	Beta blocker	1	1	A	Ingst	Int-S	2		
1013a	56 y M	Carvedilol	1	1	A	Ingst	Int-S	1		
		Valproic acid	2	2						
		Escitalopram	3	3						
		Sitagliptin	4	4						
		Mirtazapine	5	5						
		Phenytoin	6	6						
		Primidone	7	7						
[1014a]	56 y F	Treprostinil	1	1	A/C	Par	Unt-T	1		
1015h	57 y M				A/C	Ingst	Int-S	1		

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
1016p	57 y F	Amlodipine	1	1	A/C	Ingst	Int-S	1		
		Carvedilol	2	2						
		Metformin	3	3						
1017h	57 y M	Diltiazem	1	1	A	Ingst	Int-S	3		
		Alprazolam	2	2						
		Potassium chloride	3	3						
1018h	57 y M	Metoprolol	1	1	A	Ingst	AR-D	3		
		Furosemide	2	2						
		Omeprazole	3	3						
1019ha	58 y M	Iron	4	4	A/C	Ingst	Int-S	1		
		Dicyclomine	5	5						
		Lamotrigine	6	6						
1020h	58 y F	Verapamil	1	1	A/C	Ingst	Int-S	2	Metformin	16 mg/L in blood (unspecified) @ 1 h (pe)
		Amlodipine	1	1						
		Metformin	2	2						
1021ha	58 y F	Verapamil	1	1	A/C	Ingst	Int-S	1	Amlodipine	150 ng/mL in blood (unspecified) @ unknown
		Amlodipine	1	1						
		Ziprasidone	2	2						
1022	58 y F	Clonazepam	3	3	U	Ingst	Int-S	2	Clonazepam	0.04 mg/L in blood (unspecified) @ unknown
		Clonazepam	3	3						
		Clonazepam	3	3						
1023	59 y M	Amlodipine	1	1	A/C	Ingst	Int-S	1		
		Tramadol	2	2						
		Alprazolam	3	3						
1024h	59 y M	Quetiapine	4	4	A	Ingst	Int-S	1		
		Levothyroxine	5	5						
		Zolpidem	6	6						
1025a	59 y M	Amlodipine	1	1	A/C	Ingst	Int-S	2		
		Losartan	2	2						
		Amlodipine	1	1						
1026h	60 y M	Amlodipine	1	1	A/C	Ingst	Int-S	1		
		Fluoxetine	2	2						
		Bupropion	3	3						
[1027ha]	60 y M	Carvedilol	1	1	A/C	Ingst	Int-S	2		
		Amlodipine	2	2						
		Hydrochlorothiazide/lisinopril	3	3						
1028	60 y F	Clopidogrel	4	4	A	Ingst	Int-S	1		
		Duloxetine	5	5						
		Acetaminophen/hydrocodone	6	6						
1029ph	60 y F	Dexlansoprazole	7	7	A/C	Ingst	Int-S	2		
		Quetiapine	8	8						
		Metoprolol	1	1						
1030ph	60 y M	Atenolol	1	1	A	Ingst	Int-S	1		
		Amlodipine	1	1						
		Ethanol	2	2						
1030ph	60 y M	Carvedilol	1	1	A/C	Ingst	Int-S	2		
		Nifedipine (extended release)	2	2						

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
1031h	60 y F	Ace inhibitor	3	3	A	Ingst	Int-S	1		
		Amlodipine	1	1						
		Furosemide	2	2						
		Potassium chloride	3	3						
1032h	60 y M				A/C	Ingst	Int-S	2		
		Carvedilol	1	1					Salicylate	16.1 mg/dL in blood (unspecified) @ 8 h (pe)
		Salicylate	2	2					Salicylate	22 mg/dL in blood (unspecified) @ unknown
		Salicylate	2	2						
		Lisinopril	3	3						
		Atorvastatin	4	4						
		Vitamin D	5	5						
		Benzodiazepine	6	6					Lorazepam	69 ng/mL in blood (unspecified) @ unknown
		Hydrocodone	7	7					Hydrocodone (free)	33 ng/mL in blood (unspecified) @ unknown
		Amphetamine	8	8					Amphetamine	47 ng/mL in blood (unspecified) @ unknown
1033ha	60 y F				A	Ingst	Int-S	1		
		Diltiazem (extended release)	1	1					Diltiazem	1090 ng/mL in blood (unspecified) @ autopsy
1034h	60 y F				A/C	Ingst	Int-S	1		
		Metoprolol	1	1						
		Amlodipine	2	2						
1035pha	60 y M				A	Ingst	Int-S	1		
		Verapamil	1	1					Verapamil	1440 ng/mL in blood (unspecified) @ unknown
		Atenolol	2	2					Atenolol	121 ng/mL in blood (unspecified) @ autopsy
		Gabapentin	3	3						
		Sertraline	4	4						
1036h	61 y F				A/C	Ingst	Int-S	2		
		Propafenone	1	1						
		Tizanidine	2	2						
		Tramadol	3	3						
		Gabapentin	4	4						
		Clonazepam	5	5						
		Rivaroxaban	6	6						
1037	61 y M				A/C	Ingst	Int-S	2		
		Amlodipine	1	1						
		Beta blocker	2	2						
		Metformin	3	3						
		Salicylate	4	4						
		Atorvastatin	5	5						
1038ph	61 y F				A/C	Ingst	Int-S	1		
		Propanolol	1	1						
		Bupropion	2	2						
		Clonazepam	3	3						
1039p	61 y M				A	Ingst	Int-S	2		
		Amlodipine	1	1						
		Losartan	2	2						
1040h	61 y M				A	Ingst	AR-D	2		
		Digoxin	1	1					Digoxin	4.4 ng/mL in serum @ unknown
1041h	62 y M				A/C	Ingst	Int-S	2		
		Amlodipine	1	1						
		Acetaminophen/hydrocodone	2	2					Acetaminophen	40.5 mcg/mL in blood (unspecified) @ unknown
		Quetiapine	3	3						
		Diazepam	4	4						
		Mirtazapine	5	5						
1042h	62 y F				A	Ingst	Int-S	1		
		Diltiazem	1	1						
1043h	62 y M				A/C	Ingst	Int-S	2		
		Amlodipine	1	1						
		Benazepril	2	2						

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
1044h	62 y F				U	Ingst	Int-S	2		
		Amlodipine	1	1						
		Atenolol	2	2						
1045h	62 y M				A	Ingst	Int-S	1		
		Amlodipine	1	1						
		Carvedilol	2	2						
		Ethanol	3	3						
		Temazepam	4	3						
1046ha	62 y F				A/C	Ingst	Int-S	2		
		Diltiazem	1	1					Diltiazem	400 ng/mL in blood (unspecified) @ 30 m (pe)
		Carvedilol	2	2						
		Alprazolam	3	3					Alprazolam	96 ng/mL in blood (unspecified) @ 30 m (pe)
		Alpha blocker	4	4						
1047h	62 y F				U	Ingst	Int-S	3		
		Diltiazem (extended release)	1	1						
		Topiramate	2	2						
		Cyclobenzaprine	3	3						
		Diazepam	4	4						
		Ethanol	5	5					Ethanol	244 mg/dL in blood (unspecified) @ unknown
		Marijuana	6	6						
1048h	63 y M				A	Ingst	AR-D	2		
		Digoxin	1	1					Digoxin	3.2 ng/mL in blood (unspecified) @ unknown
1049a	63 y M				U	Ingst	Int-S	1		
		Propranolol	1	1						
		Bupropion	2	2						
		Sodium hydroxide	3	3						
		Ibuprofen	4	4						
1050ha	63 y M				A/C	Ingst	Int-S	2		
		Carvedilol	1	1						
		Amlodipine	2	2						
		Clonazepam	3	3					7-Aminoclonazepam	0.02 mg/L in blood (unspecified) @ 15 m (pe)
		Valproic acid	4	4						
		Colchicine	5	5						
		Allopurinol	6	6						
		Vitamin D	7	7						
		Atorvastatin	8	8						
1051h	63 y M				A/C	Ingst	Int-S	2		
		Amlodipine	1	1						
		Fluoxetine	2	2						
		Ethanol	3	3					Ethanol	332 mg/dL in blood (unspecified) @ 2 h (pe)
1052h	63 y F				A/C	Ingst	Int-S	1		
		Carvedilol	1	1						
		Sertraline	2	2						
		Mirtazapine	3	3						
		Antiplatelet drug	4	4						
		Lisinopril	5	5						
		Alprazolam	6	6						
		Atorvastatin	7	7						
		Drug, unknown	8	8						
1053h	64 y F				A/C	Ingst	Int-S	1		
		Diltiazem (extended release)	1	1						
		Primidone	2	2						
		Fluoxetine	3	3						
1054h	65 y F				U	Ingst	Int-S	1		
		Verapamil	1	1						
		Clonidine	2	2						
1055p	65 y M				A/C	Ingst	Int-S	2		
		Losartan	1	1						
		Oxycodone	2	2						
		Lorazepam	3	3						
1056h	65 y F				A	Ingst	Int-S	2		

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
1057pa	65 y F	Atenolol	1	1	A/C	Ingst	Int-S	1		
		Amitriptyline	2	2						
		Clonazepam	3	3						
1058h	65 y M	Metoprolol (extended release)	1	1	A	Ingst	Int-S	1		
		Drug, unknown	2	2						
		Diltiazem	1	1						
1059h	66 y F	Perindopril	2	2	A/C	Ingst	Int-S	1		
		Allopurinol	3	3						
		Pantoprazole	4	4						
1060h	67 y F	Furosemide	5	5	A	Ingst	Int-S	1		
		Diltiazem	1	1						
		Ethanol	2	2						
1061ha	67 y M	Amlodipine	1	1	A/C	Ingst	Int-S	1		
		Carvedilol	2	2						
		Amitriptyline	3	3						
1062ha	67 y F	Duloxetine	4	4	A/C	Ingst	Int-S	1		
		Flecainide	1	1						
		Verapamil	2	2						
1063ha	67 y M	Escitalopram	3	3	A/C	Ingst	Int-S	1		
		Alprazolam	4	4						
		Verapamil	1	1						
1064h	67 y F	Alprazolam	2	2	A/C	Ingst + Par	Int-S	2		
		Metoprolol	1	1						
		Warfarin	2	2						
1065ph	68 y F	Benzotropine	3	3	A/C	Ingst	Int-S	1		
		Labetalol	1	1						
		Insulin	2	2						
1066h	68 y M	Digoxin	3	3	A	Ingst	AR-O	3		
		Acetaminophen/hydrocodone	4	4						
		Amitriptyline	5	5						
1067	68 y F	Lisinopril	6	6	A	Ingst	Int-S	1		
		Phenothiazine	7	7						
		Oxybutynin	8	8						
1068h	69 y M	Atorvastatin	9	9	A/C	Ingst	Int-S	1		
		Cardiac glycoside	1	1						
		Diltiazem	1	1						
1069h	69 y F	Propranolol	2	2	A/C	Ingst	Int-S	1		
		Metformin	3	3						
		Glyburide	4	4						
1069h	69 y F	Escitalopram	5	5	A/C	Ingst	Int-S	1		
		Losartan	6	6						
		Levothyroxine	7	7						
1069h	69 y F	Lorazepam	8	8	A/C	Ingst	Int-S	1		
		Amlodipine	1	1						
		Metoprolol	2	2						
1069h	69 y F	Hydrochlorothiazide	3	3	A/C	Ingst	Int-S	1		
		Duloxetine	4	4						
		Memantine	5	5						
1069h	69 y F	Amlodipine	1	1	A/C	Ingst	Int-S	1		
		Diltiazem (extended release)	2	2						
		Metoprolol	3	3						

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
		Acetaminophen/ oxycodone	3	3					Acetaminophen	14.7 mg/L in blood (unspecified) @ 1 m (pe)
		Lisinopril	4	4						
		Diazepam	5	5						
		Mirtazapine	6	6						
		Famotidine	7	7						
		Esomeprazole	8	8						
1070	69 y M	Amlodipine	1	1	A/C	Ingst	Int-S	2		
		Fluoxetine	2	2						
		Benzodiazepine	3	3						
		Hydrochlorothiazide	4	4						
1071	69 y F	Cardiac glycoside	1	1	C	Ingst	AR-D	3		
1072h	69 y F	Calcium antagonist	1	1	A	Ingst	Int-S	1		
		Oral hypoglycemic (sulfonylurea)	2	2						
		Hydrochlorothiazide/ lisinopril	3	3						
1073	69 y M	Diltiazem	1	1	A	Ingst	Int-S	2		
1074h	70 y F	Diltiazem	1	1	A	Ingst	Int-S	2		
		Charcoal	2	2						
		Polyethylene glycol	3	3						
1075h	70 y F	Digoxin	1	1	A/C	Ingst	AR-D	3	Digoxin	3.07 ng/mL in serum @ 24 h (pe)
		Digoxin	1	1					Digoxin	3.98 ng/mL in serum @ 10 h (pe)
1076ph	70 y F	Diltiazem	1	1	U	Ingst	Int-S	2		
		Zolpidem	2	2						
1077h	70 y M	Diltiazem (extended release)	1	1	A/C	Ingst	Int-S	3		
		Venlafaxine	2	2						
		Donepezil	3	3						
		Lisinopril	4	4						
1078	71 y F	Digoxin	1	1	C	Ingst	AR-D	3	Digoxin	2.3 mcg/mL in blood (unspecified) @ 1 h (pe)
1079ph	72 y F	Amlodipine	1	1	A/C	Ingst	Int-S	2		
		Acetaminophen	2	2					Acetaminophen	50 mcg/mL in serum @ unknown
		Hydrocodone	3	2						
		Temazepam	4	3						
		Diazepam	5	4						
		Levothyroxine	6	5						
1080h	72 y M	Diltiazem	1	1	A/C	Ingst	Int-S	1		
		Losartan	2	2						
		Duloxetine	3	3						
		Lorazepam	4	4						
		Mirtazapine	5	5						
1081	72 y F	Beta blocker	1	1	U	Unk	Unk	2		
		Amlodipine	2	2						
1082h	73 y F	Metoprolol	1	1	A/C	Ingst	Int-S	1		
		Duloxetine	2	2						
		Trazodone	3	3						
		Donepezil	4	4						
		Baclofen	5	5						
		Benzotropine	6	6						
		Lurasidone	7	7						
		Alprazolam	8	8						
		Zolpidem	9	9						
		Meloxicam	10	10						
		Salicylate	11	11						
		Levothyroxine	12	12						

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
1083	73 y M	Omeprazole	13	13	A/C	Ingst	Unt-T	3		
		Vitamin D	14	14						
		Verapamil	1	1						
1084	74 y F	Metoprolol	2	2	A/C	Ingst	Unt-G	2		
		Nifedipine	1	1						
1085ha	74 y F	Metoprolol	2	2	A/C	Ingst	Int-S	2		
		Amlodipine	1	1						
		Amiodarone	2	2						
		Salicylate	3	3						
		Potassium	4	4						
		Rivaroxaban	5	5						
		Hydralazine	6	6						
		Losartan	7	7						
1086	74 y F	Sotalol	1	1	C	Ingst	AR-D	2		
1087h	75 y M				U	Ingst	Int-S	2		
		Alpha blocker	1	1						
		Nebivolol	2	2						
		Lisinopril	3	3						
		Hydrochlorothiazide	4	4						
		Ethanol	5	5						
		Simvastatin	6	6						
1088h	76 y F	Esomeprazole	7	7	A/C	Ingst	Unt-T	1		
		Diltiazem	1	1						
		Metoprolol	2	2						
		Carvedilol	3	3						
		Nifedipine	4	4						
		Hydralazine	5	5						
		Isosorbide mononitrate	6	6						
		Clonidine	7	7						
		Terazosin	8	8						
		Clorazepate	9	9						
1089	76 y F	Digoxin	1	1	A	Ingst	AR-D	3		
1090	77 y F				A/C	Ingst	AR-D	3	Digoxin	4.8 ng/mL in serum @ 1 h (pe)
		Digoxin	1	1						
1091ha	77 y M				A/C	Ingst	Unt-G	2		
		Metoprolol	1	1						
		Lisinopril	2	2						
		Nitroglycerin	3	3						
1092	77 y F	Rivaroxaban	4	4	A/C	Ingst	Int-S	2		
		Amlodipine	1	1						
		Metoprolol	2	2						
1093h	77 y M				A	Ingst	Int-S	1		
		Metoprolol	1	1						
		Amlodipine	2	2						
		Tramadol	3	3						
		Lorazepam	4	4						
		Ibuprofen	5	5						
1094ph	77 y M	Paroxetine	6	6	A/C	Ingst	Int-S	2		
		Ranolazine	1	1						
		Naproxen	2	2						
1095h	77 y F				A	Ingst	Int-S	2		
		Diltiazem	1	1						
		Metoprolol	2	2						
1096h	78 y F	Alprazolam	3	3	A/C	Ingst	Int-S	2		
		Carvedilol	1	1						
1097h	78 y F				A/C	Ingst	AR-D	3		
1098h	78 y F	Diltiazem	1	1	A/C	Ingst	Int-S	1		
		Amlodipine	1	1						
		Losartan	2	2						
		Fluoxetine	3	3						
		Hydrochlorothiazide	4	4						

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
1099	80 y F				A/C	Ingst	Int-S	1		
		Diltiazem (extended release)	1	1						
		Nifedipine	2	2						
1100	80 y F	Cardiac glycoside	1	1	C	Ingst	AR-D	3		
1101h	81 y F	Digoxin	1	1	C	Ingst	AR-D	3	Digoxin	3.9 ng/mL in serum @ unknown
		Metformin	2	2						
1102h	81 y F	Nifedipine	1	1	A	Ingst	Unt-T	2		
		Metoprolol (extended release)	2	2						
		Amio	3	3						
1103ha	82 y M	Diltiazem	1	1	A	Ingst	Int-S	1		
		Lisinopril	2	2						
		Naproxen	3	3					Naproxen	353 mg/L in blood (unspecified) @ unknown
		Warfarin	4	4						
		Levothyroxine	5	5						
1104h	83 y F	Propafenone	1	1	A/C	Ingst	Int-S	2		
1105	83 y F	Sotalol	1	1	A	Ingst	AR-D	3		
1106h	84 y F	Digoxin	1	1	C	Ingst	AR-D	3	Digoxin	4 ng/mL in blood (unspecified) @ unknown
1107p	85 y M	Cardiac glycoside	1	1	U	Unk	Unk	3	Digoxin	2.7 ng/mL in blood (unspecified) @ unknown
1108ha	86 y F	Amlodipine	1	1	A/C	Ingst	Int-S	1	Amlodipine	610 ng/mL in blood (unspecified) @ 3 d (pe)
		Donepezil	2	2					Donepezil	29 ng/mL in blood (unspecified) @ 3 d (pe)
1109	86 y F	Metoprolol	1	1	A/C	Ingst	Int-S	1		
		Amlodipine	2	2						
		Acetaminophen/diphenhydramine	3	3						
		Diazepam	4	4						
1110h	86 y F	Amlodipine/benazepril	1	1	A/C	Ingst	Int-S	2		
		Metoprolol	2	2						
		Hydrochlorothiazide	3	3						
		Ibuprofen	4	4						
1111h	87 y M	Metoprolol	1	1	A/C	Ingst	Int-S	2		
		Amlodipine	2	2						
1112h	87 y F	Flecainide	1	1	C	Ingst	AR-D	2		
1113h	89 y F	Metoprolol	1	1	A	Ingst	Int-U	1		
		Citalopram	2	2					Citalopram	2.45 mg/L in blood (unspecified) @ unknown
		Lisinopril	3	3						
		Trazodone	4	4						
		Prednisone	5	5						
		Oxycodone	6	6					Oxycodone	3 ng/mL in blood (unspecified) @ unknown
[1114ha]	89 y F	Digoxin	1	1	A/C	Ingst	Int-S	1	Digoxin	24 ng/mL in serum @ 5 h (pe)
1115h	89 y M	Nifedipine	1	1	A/C	Ingst	Int-S	2		
		Glipizide	2	2						
		Sitagliptin	3	3						
		Losartan	4	4						
		Warfarin	5	5						
		Quetiapine	6	6						

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
1116ha	89 y F	Citalopram	7	7	A/C	Ingst	Int-U	1		
		Amlodipine	1	1						
		Lisinopril	2	2						
1117h	90 y F	Calcium antagonist	1	1	A	Ingst	Int-S	1		
		Levothyroxine	2	2						
1118	93 y F	Digoxin	1	1	C	Ingst	AR-D	1		
1119h	95 y M	Digoxin	1	1	C	Ingst	Unt-T	2		
1120a	96 y F	Digoxin	1	1	A	Ingst	Int-U	1		
		Amlodipine	1	1					Amlodipine	0.2 mg/L in blood (unspecified) @ autopsy
		Metoprolol (extended release)	2	2					Metoprolol	0.3 mg/L in blood (unspecified) @ autopsy
		Metoprolol (extended release)	2	2					Metoprolol	0.7 mg/L in serum @ autopsy
		Hydralazine	3	3						
		Levothyoxin	4	4						
		Thiazide	5	5						
		Omeprazole	6	6						
[1121pha]	22 m M	Propafenone	1	1	A/C	Ingst	Unt-G	1	Propafenone	10 mcg/mL in blood (unspecified) @ autopsy
1122ph	50+ y F	Cardiac glycoside	1	1	A	Ingst	Int-S	1		
		Diltiazem	2	1						
		Warfarin	3	2						
		Alprazolam	4	3						
See also case 4, 12, 58, 96, 128, 215, 382, 384, 514, 527, 556, 559, 570, 571, 580, 597, 601, 680, 710, 737, 744, 750, 782, 793, 806, 814, 815, 820, 828, 834, 846, 847, 855, 874, 893, 1123, 1139, 1145, 1154, 1155, 1158, 1162, 1166, 1168, 1193, 1197, 1227, 1232, 1235, 1244, 1400, 1490										
Cold and cough preparations										
1123ha	16 y F				A	Ingst	Int-S	2		
		Benzonatate	1	1						
		Metoprolol (extended release)	2	2						
		Acetaminophen/codeine	3	3						
		Ibuprofen	4	4					Ibuprofen	36 mcg/mL in blood (unspecified) @ unknown
1124	20 y M	Benzonatate	1	1	A	Ingst	Int-S	1		
		Ethanol	2	2						
1125ph	30 y M	Dextromethorphan/guaifenesin	1	1	A	Ingst	Int-U	2		
1126pai	31 y F				A	Ingst	Int-S	1		
		Benzonatate	1	1						
		Ethanol	2	2						
		Drug, unknown	3	3						
		Methocarbamol	4	3						
1127pha	43 y F	Benzonatate	1	1	A/C	Ingst	Int-S	1		
		Ethanol	2	2					Ethanol	260 mg/dL in blood (unspecified) @ unknown
1128	51 y F				A	Ingst	Int-S	1		
		Dextromethorphan	1	1						
		Salicylate	2	2						
		Acetaminophen	3	3						
See also case 3, 172, 327, 337, 358, 371, 417, 466, 522, 608, 631, 730, 758, 892, 899, 935, 937, 996, 1003, 1287, 1308, 1350, 1368, 1420										
Diagnostic agents										
1129h	56 y F	IV contrast	1	1	A	Par	Unt-T	3		
Electrolytes and minerals										
1130	30 y F	Iron	1	1	A	Ingst	Int-S	1	Iron	1457 mcg/dL in blood (unspecified) @ 12 h (pe)

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
[1131h]	39 y M	Iron	1	1	A	Ingst	Int-S	1	Iron	328 mcg/dL in blood (unspecified) @ 48 h (pe)
		Iron	1	1					Iron	501 mcg/dL in blood (unspecified) @ 39 h (pe)
		Iron	1	1					Iron	741 mcg/dL in blood (unspecified) @ 24 h (pe)
		Acetaminophen	2	2					Acetaminophen	144 mcg/mL in blood (unspecified) @ 39 h (pe)
		Acetaminophen	2	2					Acetaminophen	246 mcg/mL in blood (unspecified) @ 24 h (pe)
		Acetaminophen	2	2					Acetaminophen	295 mcg/mL in blood (unspecified) @ 9 h (pe)
		Acetaminophen	2	2					Acetaminophen	32 mcg/mL in blood (unspecified) @ 48 h (pe)
		Acetaminophen	2	2					Acetaminophen	369 mcg/mL in blood (unspecified) @ 5 h (pe)
		Acetaminophen	2	2					Acetaminophen	375 mcg/mL in blood (unspecified) @ 1 h (pe)
		Acetaminophen	2	2					Acetaminophen	382 mcg/mL in blood (unspecified) @ 4 h (pe)
		Salicylate	3	3					Salicylate	14 mg/dL in blood (unspecified) @ 1 h (pe)
		Cocaine	4	4						
		Magnesium sulfate	1	1						
1132ha	41 y F	Iron	1	1	A	Ingst	Int-S	1	Iron	1187 mcg/dL in blood (unspecified) @ 9 h (pe)
		Iron	1	1					Iron	1441 mcg/dL in blood (unspecified) @ unknown
		Iron	1	1					Iron	2200 mcg/dL in blood (unspecified) @ 6 h (pe)
		Iron	1	1					Iron	912 mcg/dL in blood (unspecified) @ 1 h (pe)
		Diphenhydramine	2	2					Diphenhydramine	1500 ng/mL in blood (unspecified) @ unknown
		Ibuprofen	3	3					Ibuprofen	220 mcg/mL in blood (unspecified) @ unknown
		Ethanol	4	4					Ethanol	100 mg/dL in blood (unspecified) @ unknown
[1133ha]	46 y M				A	Ingst	Unt-G	1		
1134h	60 y F	Zinc	1	1	A	Ingst	Int-S	2		
1135hi	63 y F	Potassium chloride	1	1	A/C	Ingst	Int-S	2		
		Iron	1	1						
		Ibuprofen	2	2						
1136h	64 y M	Levothyroxine	3	3	A	Ingst	Unk	3		
		Iron dextran	1	1					Iron	525 mcg/dL in blood (unspecified) @ 1 h (pe)
See also case 438, 458, 926, 996, 1017, 1085, 1154, 1174										
Gastrointestinal preparations										
[1137ph]	34 y M				U	Ingst	Int-A	1		
1138ph	34 y M	Loperamide	1	1	U	Ingst	Int-A	2		
		Loperamide	1	1					Desmethyloperamide	120 ng/mL in blood (unspecified) @ unknown
		Loperamide	1	1					Loperamide	18 ng/mL in blood (unspecified) @ unknown
		Bupropion	2	2						

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
		Venlafaxine	3	3						
		Mirtazapine	4	4						
		Cyclobenzaprine	5	5						
See also case 458, 467, 482, 493, 559, 571, 674, 680, 737, 788, 796, 840, 926, 935, 946, 975, 979, 996, 1010, 1017, 1026, 1058, 1065, 1069, 1074, 1082, 1087, 1120, 1152, 1162, 1168, 1174, 1197, 1224, 1244										
Hormones and hormone antagonists										
1139a	22 y M				A/C	Ingst	Int-S	1		
		Metformin	1	1						
		Venlafaxine	2	2					o-Desmethyl-venlafaxine	104 ng/mL in blood (unspecified) @ unknown
		Ethanol	3	3					Ethanol	85 mg/dL in blood (unspecified) @ unknown
		Lamotrigine	4	4					Lamotrigine	2.3 mcg/mL in blood (unspecified) @ unknown
		Buspirone	5	5						
		Lisinopril	6	6						
		Montelukast	7	7						
		Simvastatin	8	8						
1140h	27 y M				U	Ingst + Par	Int-S	2		
		Insulin (glargine)	1	1						
		Metformin	2	2						
1141pha	29 y F				A/C	Ingst	Int-S	1		
		Insulin (glargine)	1	1						
		Oxycodone	2	2						
1142ha	34 y M				A	Par	Int-S	1		
		Insulin (glargine)	1	1						
		Drug, unknown	2	2						
1143ph	35 y M				U	Ingst	Int-S	2		
		Glipizide	1	1						
		Insecticide, unknown	2	2						
1144	35 y M				A/C	Ingst	Int-S	1		
		Metformin	1	1						
		Glyburide	2	2						
		Risperidone	3	3						
		Buspirone	4	4						
1145ph	38 y F				A	Ingst	AR-D	2		
		Metformin	1	1						
		Valproic acid	2	2					Valproic acid	26.9 mcg/mL in serum @ unknown
		Clonazepam	3	3						
		Lisinopril	4	4						
		Acetaminophen	5	5					Acetaminophen	17.6 mcg/mL in serum @ unknown
1146ha	40 y F				A/C	Ingst + Aspir + - Par	Int-S	1		
		Insulin (aspart)	1	1						
		Tapentadol	2	2					Tapentadol	0.86 mg/mL in blood (unspecified) @ unknown
		Zolpidem	3	3					Zolpidem	0.59 mg/mL in blood (unspecified) @ unknown
		Clonazepam	4	4					Clonazepam	0.028 mg/mL in blood (unspecified) @ unknown
		Clonazepam	4	4					7-Aminoclonazepam	0.062 mg/mL in blood (unspecified) @ unknown
		Gabapentin	5	5					Gabapentin	1.1 mg/mL in blood (unspecified) @ unknown
		Venlafaxine	6	6					Venlafaxine	0.25 mg/mL in blood (unspecified) @ unknown
		Venlafaxine	6	6					o-Desmethyl-venlafaxine	0.48 mg/mL in blood (unspecified) @ unknown
		Trazodone	7	7						
1147ha	41 y F				A/C	Ingst	Int-S	1		
		Metformin	1	1						

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
1148h	42 y F	Alprazolam	2	2	A	Unk	Int-S	2	Alprazolam	27 ng/mL in blood (unspecified) @ autopsy
		Escitaopram	3	3					Citalopram	425 ng/mL in blood (unspecified) @ autopsy
		Naproxen	4	4					Naproxen	201 mcg/mL in blood (unspecified) @ autopsy
		Metformin	1	1						
1149h	44 y F	Glipizide	1	1	C	Ingst	AR-D	2		
1150ha	44 y M	Metformin	1	1	A/C	Ingst	Int-S	1	Metformin	280 mcg/mL in blood (unspecified) @ 1 h (pe)
		Glipizide	2	2						
1151h	46 y F	Glipizide	1	1	A	Ingst	Int-S	1		
		Metformin	2	2						
		Insulin	3	3						
		Trazodone	4	4						
		Fluoxetine	5	5						
		Sertraline	6	6						
1152	48 y M	Metformin	1	1	A	Ingst	Int-S	2		
		Ethanol	2	2					Ethanol	126 mg/dL in blood (unspecified) @ unknown
1153h	49 y F	Oxybutynin	3	3	A	Ingst	Unk	2		
		Meclizine	4	4						
		Metformin	1	1						
1154h	53 y F	Acetaminophen	2	2	A	Ingst	Int-S	2		
		Glimepiride	1	1						
1155h	53 y M	Lisinopril	2	2	A/C	Ingst	Int-S	2		
		Pregabalin	3	3						
		Potassium chloride	4	4						
		Oral hypoglycemics	5	5						
		Atorvastain	6	6						
		Mirtazapine	7	7						
		Metformin	1	1						
		Atenolol	2	2						
1156	53 y F	Clonazepam	3	3	A/C	Ingst + Par	Int-S	1		
		Sildenafil	4	4						
1157h	54 y M	Insulin	1	1	A	Ingst	Int-S	1		
		Clonazepam	2	2						
1158pha	55 y F	Metformin	1	1	A/C	Ingst + Par	Int-S	2		
		Ropinirole	2	2						
1158pha	55 y F	Insulin	1	1	A/C	Ingst + Par	Int-S	2		
		Metformin	2	2						
		Diazepam	3	3						
		Rivaroxaban	4	4						
		Ezetimibe	5	5						
		Cyclobenzaprine	6	6						
		Tramadol	7	7						
		Trazodone	8	8						
		Lamotrigine	9	9						
		Furosemide	10	10						
		Risperidone	11	11						
		Bupropion	12	12						
		Acetaminophen/oxycodone	13	13						
		Spiroonolactone	14	14						
		Mirtazapine	15	15						
		Paroxetine	16	16						
		Levothyroxine	17	17						
1159h	56 y M	Insulin	1	1	A	Ingst + Par	Int-S	3		
		Gabapentin	2	2						
		Metformin	3	3						

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
1160h	57 y M				A	Ingst	Int-S	2		
1161ha	59 y M	Metformin	1	1	A	Ingst	Int-S	2		
		Metformin	1	1					Acetaminophen	170 mcg/mL in blood (unspecified) @ autopsy
		Acetaminophen/hydrocodone	2	2					Hydrocodone (free)	2000 ng/mL in blood (unspecified) @ autopsy
		Acetaminophen/hydrocodone	2	2						
		Benzodiazepine	3	3						
1162h	60 y M				A/C	Ingst	Int-S	1		
		Metformin	1	1						
		Empagliflozin	2	2						
		Tadalafil	3	3						
		Losartan	4	4						
		Omeprazole	5	5						
		Sertraline	6	6						
		Senna alkaloids	7	7						
		Levothyroxine	8	8						
		Hydrochlorothiazide	9	9						
1163h	60 y F				A	Ingst	AR-D	3		
		Glipizide	1	1						
1164ph	60 y M				U	Ingst	Unk	2		
		Metformin	1	1						
1165h	61 y M				C	Ingst	Unt-T	2		
		Dapagliflozin/metformin	1	1						
		Metformin	2	2						
1166h	65 y M				A/C	Ingst	Int-S	1		
		Metformin	1	1						
		Losartan	2	2						
		Hydrochlorothiazide	3	3						
		Levothyroxine	4	3						
		Ethanol	5	4						
1167h	66 y M				A/C	Ingst	Int-S	1		
		Metformin	1	1						
1168h	70 y F				A	Ingst	Int-S	2		
		Glimepiride	1	1						
		Acetaminophen	2	2						
		Metformin	3	3						
		Quetiapine	4	4						
		Omeprazole	5	5						
		Baclofen	6	6						
		Fluoxetine	7	7						
		Fexofenadine	8	8						
		Gabapentin	9	9						
		Diazepam	10	10						
		Pantoprazole	11	11						
		Cetirizine	12	12						
		Rosuvastatin	13	13						
		Levothyroxine	14	14						
1169h	70 y M				A	Ingst	Int-S	1		
		Metformin	1	1						
		Ethanol	2	2						
1170h	72 y F				C	Ingst	AR-D	3		
		Metformin	1	1						
1171h	74 y F				C	Ingst	Unt-T	3		
		Metformin	1	1						
1172	75 y M				C	Ingst	AR-D	3		
		Metformin	1	1						
1173h	76 y F				U	Ingst	Unk	2		
		Metformin	1	1						
1174h	77 y F				A	Ingst	Unt-T	2		
		Glimepiride	1	1						
		Pregabalin	2	2						
		Metformin	3	3						
		Ibuprofen	4	4						
		Furosemide	5	5						
		Paroxetine	6	6						
		Diphenhydramine	7	7						
		Omeprazole	8	8						
		Potassium chloride	9	9						
		Cinnamaldehyde	10	10						

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
See also case 1, 29, 87, 231, 377, 526, 576, 580, 601, 730, 731, 806, 808, 836, 893, 926, 956, 970, 980, 983, 1008, 1013, 1015, 1019, 1022, 1037, 1064, 1067, 1072, 1079, 1082, 1101, 1103, 1113, 1115, 1117, 1120, 1135, 1215, 1247, 1257, 1338, 1356										
Miscellaneous drugs										
1175	46 y F				A/C	Ingst	Int-S	3		
		Pramipexole	1	1						
		Sertraline	2	2						
		Lorazepam	3	3						
1176	71 y F				A	Par	AR-D	2		
		Cholinesterase inhibitor	1	1						
1177h	91 y M				A	Par	AR-D	3		
		Rasburicase	1	1						
See also case 233, 522, 647, 728, 745, 750, 832, 946, 1050, 1058, 1068, 1077, 1082, 1108, 1142, 1157										
Muscle relaxants										
1178ha	21 y F				A	Ingst	Int-S	3		
		Baclofen	1	1					Baclofen	0.021 mcg/mL in blood (unspecified) @ 2 d (pe)
1179ph	27 y F				U	Ingst	Int-S	1		
		Carisoprodol	1	1						
		Tramadol	2	2						
		Mirtazapine	3	3						
1180ph	33 y M				A/C	Ingst	Int-S	2		
		Tizanidine	1	1						
1181i	33 y M				A	Ingst	Int-S	1		
		Baclofen	1	1						
1182a	36 y F				A	Ingst	Int-S	1		
		Tizanidine	1	1						
		Risperidone	2	2						
		Methamphetamine	3	3						
		Hydrocodone	4	4						
		Benzodiazepine	5	5						
1183h	46 y F				A/C	Ingst	Unk	2		
		Skeletal muscle relaxant	1	1						
		Oxycodone	2	2						
		Lorazepam	3	3						
1184ha	47 y M				A	Ingst	Int-S	1		
		Baclofen	1	1					Baclofen	3.5 mcg/mL in whole blood @ unknown
		Bupropion	2	2					Bupropion	3.9 mcg/mL in whole blood @ unknown
		Codeine	3	3					Codeine	0.25 mcg/mL in whole blood @ unknown
		Gabapentin	4	4					Gabapentin	44 mcg/mL in whole blood @ unknown
		Ethanol	5	5					Ethanol	79 mg/dL in plasma @ unknown
1185p	51 y F				A	Ingst	Int-S	1		
		Orphenadrine	1	1						
		Alprazolam	2	2						
1186	52 y F				A/C	Ingst + Aspir	Int-S	2		
		Carisoprodol	1	1					Carisoprodol	33 mcg/mL in serum @ 1 h (pe)
		Meprobamate	2	2					Meprobamate	9.3 mcg/mL in serum @ 1 h (pe)
		Tramadol	3	2						
		Lisdexamfetamine	4	3						
		Ethanol	5	4					Ethanol	140 mg/dL in serum @ 1 h (pe)
1187	52 y F				U	Ingst + Aspir	Int-S	3		
		Baclofen	1	1						
		Acetaminophen/codeine	2	2					Acetaminophen	66 mcg/mL in serum @ unknown
		Acetaminophen/codeine	2	2					Acetaminophen	89 mcg/mL in serum @ unknown
1188h	58 y F				A	Oth	Unt-T	2		
		Baclofen	1	1						
1189	61 y M				C	Ingst	Int-M	3		
		Cyclobenzaprine	1	1						
		Morphine (extended release)	2	2						
		Acetaminophen/hydrocodone	3	3						
		Alprazolam	4	4						
1190h	61 y M				A/C	Ingst	Int-S	3		
		Carisoprodol	1	1						

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
1191	64 y M	Cyclobenzaprine	1	1	A/C	Ingst + Aspir	Int-S	2		
1192h	65 y M	Cyclobenzaprine	1	1	U	Ingst	Int-S	3		
		Diphenhydramine	2	2						
		U-47700	3	3						
		Benzodiazepine	4	4						
1193p	66 y M	Cyclobenzaprine	1	1	A/C	Ingst	Int-S	2		
		Lisinopril	2	2						
1194h	68 y M	Cyclobenzaprine	1	1	A	Ingst	Int-U	3		
1195h	75 y F	Cyclobenzaprine	1	1	A	Ingst	Unk	2		
		Baclofen	1	1						
		Tramadol	2	2						
See also case 231, 308, 319, 351, 374, 379, 383, 401, 422, 487, 495, 511, 527, 555, 571, 605, 665, 753, 784, 798, 819, 832, 842, 849, 852, 893, 908, 916, 940, 945, 996, 1036, 1047, 1082, 1126, 1138, 1158, 1168, 1217, 1224, 1234, 1412, 1450										
Sedative/hypnotics/antipsychotics										
1196	18 y F	Quetiapine	1	1	A/C	Ingst	Int-S	1		
		Lamotrigine	2	2						
1197a	19 y M	Fluphenazine	1	1	A	Ingst	Int-S	2		
		Valproic acid (extended release)	2	2						
		Quetiapine	3	3						
		Oxycodone	4	4						
		Benzotropine	5	5						
		Sertraline	6	6					Sertraline	0.09 mg/L in blood (unspecified) @ autopsy
		Sertraline	6	6					Desmethylsertraline	0.2 mg/L in blood (unspecified) @ autopsy
		Hydrochlorothiazide	7	7						
		Lorazepam	8	8						
		Omeprazole	9	9						
		Oxcarbazepine	10	10						
		Levetiracetam	11	11						
		Lisinopril	12	12						
1198p	20 y F	Olanzapine	1	1	U	Ingst	Int-S	1		
1199pha	21 y M	Quetiapine	1	1	A	Ingst	Int-S	1		
		Alprazolam	2	2						
		Lorazepam	3	3						
		Valproic acid	4	4					Valproic acid	200 mcg/mL in blood (unspecified) @ 2 d (pe)
		Valproic acid	4	4					Valproic acid	285 mg/L in blood (unspecified) @ unknown
1200	22 y F	Risperidone	1	1	A	Ingst	Int-S	1		
		Acetaminophen	2	2						
[1201pha]	24 y M	Benzodiazepine	1	1	A	Ingst	Int-A	2		
1202pha	25 y M	Aripiprazole	1	1	U	Unk	Unk	2		
1203pha	26 y M	Sedative/hypnotic/anti-anxiety/anti-psychotic	1	1	A	Unk	Int-A	2		
1204ph	26 y F	Clonazepam	1	1	A/C	Ingst	Int-S	1	Clonazepam	6.3 ng/mL in blood (unspecified) @ 7 h (pe)
		Clonazepam	1	1					7-Aminoclonazepam	71 ng/mL in blood (unspecified) @ 7 h (pe)
		Fentanyl	2	2						
		Drug, unknown	3	3						
		Phenobarbital	4	4					Phenobarbital	4.6 mcg/mL in blood (unspecified) @ 7 h (pe)
		Ethanol	5	5					Ethanol	27 mg/dL in blood (unspecified) @ 30 m (pe)
1205h	28 y F	Zolpidem	1	1	A/C	Ingst	Int-S	2		
		Quetiapine	2	2						

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
1206a	30 y M				A	Ingst	Int-S	2		
1207ph	31 y M	Quetiapine	1	1	A	Ingst	Int-A	2		
		Alprazolam	1	1						
		Fentanyl	2	2						
		Ethanol	3	3						
1208h	34 y M				U	Ingst	Unk	2		
		Haloperidol	1	1						
		Risperidone	2	2						
		Quetiapine	3	3						
1209ph	35 y F				A/C	Ingst	Int-S	2		
		Alprazolam	1	1						
1210h	35 y M				A/C	Ingst	Int-S	1		
		Quetiapine	1	1						
		Lamotrigine	2	2						
		Gabapentin	3	3						
		Ethanol	4	4					Ethanol	256 mg/dL in blood (unspecified) @ 1.75 h (pe)
1211h	37 y M				A	Par	Unt-U	3		
		Triazolam	1	1						
		Antihistamine	2	2						
1212h	37 y F				A/C	Ingst	Int-S	2		
		Quetiapine	1	1						
		Clonazepam	2	2						
		THC homolog	3	3						
		Cocaine	4	4						
1213pha	38 y F				A	Ingst	Int-S	1		
		Quetiapine	1	1					Quetiapine	3900 ng/mL in blood (unspecified) @ unknown
		Ethanol	2	2					Ethanol	0.108 g/dL in blood (unspecified) @ unknown
		Cocaine	3	3					Benzoyllecognine	754 ng/mL in blood (unspecified) @ unknown
1214h	38 y F				A	Ingst	Int-S	1		
		Doxylamine	1	1						
		Lorazepam	2	2						
		Ethanol	3	3						
1215phi	39 y M				A	Ingst + Inhal + - Unk	Int-A	2		
		Alprazolam	1	1						
		Heroin	2	2						
		Ethanol	3	3					Ethanol	170 mg/dL in serum @ 1 h (pe)
		Androgen	4	4						
1216pi	40 y M				U	Unk	Unk	2		
		Alprazolam	1	1						
1217ph	41 y F				A	Ingst	Int-S	2		
		Lorazepam	1	1						
		Acetaminophen/oxycodone	2	2						
		Carisoprodol	3	3						
		Gabapentin	4	4						
		Acetaminophen	5	5						
		Zolpidem	6	6						
		Duloxetine	7	7						
		Hydrochlorothiazide	8	8						
		Meloxicam	9	9						
1218pha	41 y F				U	Ingst	Int-S	1		
		Quetiapine	1	1					Quetiapine	19.9 mcg/mL in blood (unspecified) @ unknown
		Ethanol	2	2					Ethanol	0.21 g/dL in blood (unspecified) @ unknown
1219ph	43 y M				A	Ingst	Int-S	1		
		Alprazolam	1	1						
		Ethanol	2	2					Ethanol	106 mg/dL in serum @ unknown
		Acetaminophen	3	3						

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
1220p	43 y F	Zolpidem (extended release)	1	1	A	Ingst + Unk	Unt-G	2		
		Ethanol	2	2					Ethanol	294 mg/dL in serum @ unknown
1221ph	44 y F	Zolpidem	1	1	A/C	Ingst	Int-S	2		
		Quetiapine	2	2						
		Acetaminophen/butalbital/caffeine/codeine	3	3						
		Gabapentin	4	4						
1222	45 y F	Lorazepam	1	1	A	Ingst	Unt-T	3		
1223	45 y F	Alprazolam	1	1	A/C	Ingst	Unk	2		
		Amphetamine/dextroamphetamine	2	2						
1224ha	45 y F	Clonazepam	1	1	A/C	Ingst	Unk	2		
		Glycopyrrolate	2	2					7-Aminoclonazepam	14 ng/mL in blood (unspecified) @ autopsy
		Baclofen	3	3						
		Hydromorphone	4	4						
1225a	46 y F	Quetiapine	1	1	U	Ingst	Int-U	2		
		Ethanol	2	2					Ethanol	205 mg/dL in blood (unspecified) @ autopsy
		Ethanol	2	2					Ethanol	282 mg/dL in blood (unspecified) @ unknown
1226ph	46 y M	Clozapine	1	1	A	Ingst	Int-S	2		
		Clonazepam	2	2						
1227ha	47 y F	Quetiapine	1	1	U	Ingst	Int-S	1		
		Topiramate	2	2					Quetiapine	16000 ng/mL in blood (unspecified) @ unknown
		Metoprolol	3	3					Topiramate	3900 ng/mL in blood (unspecified) @ unknown
		Alprazolam	4	4						
		Gabapentin	5	5						
1228pa	48 y F	Quetiapine	1	1	U	Ingst	Int-S	1		
		Valproic acid (extended release)	2	2					Quetiapine	19000 ng/mL in blood (unspecified) @ autopsy
		Trazodone	3	3					MCP (meta-chlorophenyl piperazine)	200 mcg/mL in blood (unspecified) @ autopsy
		Trazodone	3	3					Trazodone	3.6 mcg/mL in blood (unspecified) @ autopsy
		Ethanol	4	4					Ethanol	47 mg/dL in vitreous @ autopsy
		Phenobarbital	5	5					Phenobarbital	4.29 mcg/mL in blood (unspecified) @ autopsy
		Sertraline	6	6					Sertraline	140 mcg/mL in blood (unspecified) @ autopsy
		Sertraline	6	6					Desmethylsertraline	520 mcg/mL in blood (unspecified) @ autopsy
1229ph	48 y F	Quetiapine	1	1	A/C	Ingst	Int-S	2		
1230ph	49 y F	Alprazolam	1	1	U	Ingst + Par	Int-U	1		
		Oxycodone	2	2						
1231ph	49 y M	Alprazolam	1	1	U	Unk	Int-A	2		
1232ph	49 y M	Quetiapine	1	1	A/C	Ingst	Int-S	2		

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
1233h	50 y M	Diazepam	2	2	A	Par	AR-D	2		
		Lisinopril	3	3						
		Drug, unknown	4	4						
		Propofol	1	1						
1234pha	51 y F	Ziprasidone	2	2	U	Ingst	Int-U	2		
		Ethanol	3	3						
		Diazepam	1	1						
		Acetaminophen/butal-bital/caffeine	2	2						
1235ha	52 y M	Buprenorphine	3	3	A/C	Ingst	Int-S	3	Zolpidem	0.326 mg/L in blood (unspecified) @ unknown
		Zolpidem	4	4						
		Carisoprodol	5	5						
		Zolpidem	1	1						
1236pha	53 y F	Caffeine	2	2	A/C	Ingst	Int-S	1	Caffeine	67 mcg/mL in blood (unspecified) @ unknown
		Quetiapine	3	3						
		Gabapentin	4	4						
		Metoprolol (extended release)	5	5						
1237ph	54 y M	Alprazolam	1	1	A	Ingst	Int-S	1	Alprazolam	576 ng/mL in blood (unspecified) @ unknown
		Cocaine	2	2						
		Quetiapine	1	1						
		Acetaminophen/oxycodone	2	2						
1238ha	55 y F	Lorazepam	1	1	U	Ingst	Int-S	2		
		Clonazepam	2	2						
		Haloperidol	1	1						
		Alprazolam	1	1						
1240p	56 y F	Risperidone	1	1	A/C	Ingst	Int-U	1		
		Alprazolam	1	1						
		Risperidone	1	1						
		Zolpidem	1	1						
1241p	56 y M	Acetaminophen/oxycodone	2	2	A	Ingst	Int-S	2	Acetaminophen	81.4 mcg/mL in serum @ unknown
		Zolpidem	1	1						
		Acetaminophen/oxycodone	2	2						
		Alprazolam	1	1						
1242pha	57 y F	Ranitidine	2	2	A	Ingst	Int-S	2		
		Alprazolam	1	1						
		Ranitidine	2	2						
		Olanzapine	1	1						
1243p	58 y F	Gabapentin	2	2	A/C	Ingst	Int-S	2		
		Amphetamine	3	3						
		Sertraline	4	4						
		Alpha blocker	5	5						
1244h	58 y M	Ibuprofen	6	6	A/C	Ingst	Int-S	2		
		Meloxicam	7	7						
		Pravastatin	8	8						
		Melatonin	9	9						
1245h	58 y F	Chenodeoxycholic acid	10	10	A/C	Ingst	Int-S	2		
		Benzodiazepine	1	1						
		Buprenorphine/nalox-one (sublingual film)	2	2						
		Tramadol	3	3						
1246ha	59 y F	Perphenazine	1	1	A/C	Ingst	Int-S	1		
		Fluoxetine	2	2						
		Lamotrigine	3	3						

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
1247h	59 y F	Benzodiazepine	1	1	A/C	Ingst	Int-S	2		
		Acetaminophen/codeine	2	2						
		Sertraline	3	3						
		Metformin	4	4						
1248h	62 y F	Quetiapine	1	1	A	Ingst	Int-S	2		
		Buspirone	3	2						
		Paroxetine	2	2						
		Lorazepam	4	4						
1249	63 y M	Risperidone	1	1	A/C	Ingst	Int-S	2		
		Bupropion (extended release)	2	2						
1250	63 y M	Alprazolam	1	1	A/C	Ingst	Int-S	3		
		Mirtazapine	2	2						
		Acetaminophen	3	3						
1251a	64 y M	Zolpidem	1	1	C	Ingst	Int-S	1	Zolpidem	670 ng/mL in blood (unspecified) @ 1 h (pe)
		Sertraline	2	2						
1252h	65 y F	Ziprasidone	1	1	A	Ingst	Int-S	2		
		Clonazepam	2	2						
		Trazodone	3	3						
1253ha	67 y F	Alprazolam	1	1	A/C	Ingst	Int-S	1		
		Trazodone	2	1					Trazodone	40 ng/mL in blood (unspecified) @ autopsy
1254h	67 y M	Barbiturate	1	1	A	Ingst	Int-U	1	Phenobarbital	109.8 mcg/mL in blood (unspecified) @ 2 h (pe)
		Acetaminophen	2	2					Acetaminophen	34.8 mcg/mL in blood (unspecified) @ 2 h (pe)
1255pha	69 y F	Lorazepam	1	1	A/C	Ingst	Int-S	2		
		Oxycodone	2	2						
1256h	73 y M	Paliperidone	1	1	C	Ingst + Par	AR-D	3		
		Haloperidol	2	2						
		Quetiapine	3	3						
1257	74 y M	Zolpidem	1	1	A	Ingst	Int-S	2		
		Acetaminophen/hydrocodone	2	2						
		Insulin	3	3						
1258	78 y F	Phenobarbital	1	1	A	Ingst	Int-S	1	Phenobarbital	80.8 mcg/mL in blood (unspecified) @ unknown
1259ph	78 y F	Zolpidem	1	1	A	Ingst	Int-S	3		
		Ethanol (non-beverage)	2	2					Ethanol	180 mg/dL in serum @ unknown
		Salicylate	3	3						
1260ha	80 y M	Barbiturate	1	1	A	Ingst	Int-S	3		
		Morphine	2	2						
1261i	85 y M	Benzodiazepine	1	1	A	Ingst	Int-S	2		
1262h	88 y M	Lorazepam	1	1	A/C	Ingst	Int-S	2		
1263a	88 y M	Secobarbital	1	1	A	Ingst	Int-S	1		
1264ha	88 y F	Lorazepam	1	1	U	Ingst + Aspir	Unk	3		
1265	91 y M	Benzodiazepine	1	1	A/C	Ingst	Unk	2		
1266h	92 y M	Temazepam	1	1	A	Ingst	Int-S	2		

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
		Acetaminophen/hydrocodone	2	2					Acetaminophen	55 mcg/mL in serum @ unknown
		Lorazepam	3	3						
See also case 6, 11, 31, 46, 59, 94, 98, 172, 190, 200, 231, 306, 308, 309, 312, 313, 314, 319, 321, 322, 326, 329, 332, 335, 341, 342, 347, 349, 352, 354, 356, 361, 362, 364, 366, 370, 371, 375, 386, 389, 390, 391, 392, 403, 404, 407, 415, 420, 421, 422, 424, 428, 438, 442, 443, 463, 466, 467, 469, 473, 474, 475, 477, 480, 482, 492, 494, 495, 496, 505, 506, 511, 514, 519, 520, 522, 524, 526, 536, 537, 555, 559, 564, 568, 571, 578, 580, 583, 586, 591, 594, 596, 599, 605, 608, 613, 619, 622, 626, 627, 628, 632, 637, 646, 657, 662, 663, 665, 671, 675, 681, 700, 705, 706, 709, 729, 733, 735, 737, 740, 744, 745, 748, 750, 751, 754, 757, 761, 763, 764, 765, 766, 771, 772, 775, 779, 783, 788, 791, 794, 795, 796, 798, 803, 804, 805, 809, 812, 814, 818, 819, 823, 832, 835, 842, 845, 847, 849, 853, 855, 857, 865, 866, 890, 893, 895, 897, 899, 911, 912, 916, 922, 925, 926, 927, 931, 933, 935, 938, 940, 944, 947, 949, 955, 956, 958, 969, 970, 972, 975, 980, 981, 996, 997, 1000, 1003, 1005, 1006, 1010, 1016, 1021, 1022, 1026, 1032, 1036, 1038, 1041, 1045, 1046, 1047, 1050, 1052, 1055, 1056, 1061, 1062, 1065, 1067, 1069, 1070, 1076, 1079, 1080, 1082, 1088, 1093, 1095, 1109, 1115, 1122, 1139, 1144, 1145, 1146, 1147, 1155, 1156, 1158, 1161, 1168, 1175, 1182, 1183, 1185, 1186, 1189, 1192, 1271, 1289, 1293, 1299, 1306, 1309, 1340, 1342, 1354, 1360, 1362, 1368, 1382, 1388, 1400, 1403, 1406, 1411, 1412, 1414, 1419, 1426, 1455, 1459, 1465										
Stimulants and street drugs										
1267	5 y F				A	Unk	Unt-G	1		
		Methamphetamine	1	1						
1268i	17 y M				U	Inhal	Int-A	2		
		THC homolog	1	1						
1269ha	17 y F				U	Unk	Unk	2		
		Cocaine	1	1						
		Isopropanol	2	2					Isopropanol	84 mg/dL in blood (unspecified) @ autopsy
1270h	17 y F				A	Inhal	Int-A	2		
		Methamphetamine	1	1						
		Marijuana	2	2						
1271pa	19 y M				A	Unk	Int-A	1		
		Heroin	1	1					Morphine	771 ng/mL in urine (quantitative only) @ autopsy
		Alprazolam	2	2					Alprazolam	9 ng/mL in serum @ autopsy
		Marijuana	3	3					Carboxy-thc	40 ng/mL in urine (quantitative only) @ autopsy
1272ph	20 y M				A/C	Par	Int-A	2		
		Heroin	1	1						
		Ethanol	2	2						
1273pi	20 y M				A	Par	Int-A	1		
		Heroin	1	1						
1274p	20 y M				U	Par	Int-A	1		
		Heroin	1	1						
1275pi	20 y F				A	Par	Int-A	1		
		Heroin	1	1						
1276p	21 y M				A	Ingst	Int-A	2		
		Amphetamine (hallucinogenic)	1	1						
1277ha	21 y M				A	Ingst	Int-A	1		
		Methamphetamine	1	1						
		Drug, unknown	2	2						
1278pa	21 y F				A	Ingst	Int-A	1		
		Methamphetamine	1	1					MDMA (3,4-methylenedioxymethamphetamine)	1000 ng/mL in blood (unspecified) @ autopsy
		Methamphetamine	1	1					MDA (3,4-methylenedioxymphetamine)	180 ng/mL in blood (unspecified) @ autopsy
		Methamphetamine	1	1					MDA (3,4-methylenedioxymphetamine)	77 ng/mL in blood (unspecified) @ autopsy
		Methamphetamine	1	1					MDMA (3,4-methylenedioxymethamphetamine)	910 ng/mL in blood (unspecified) @ autopsy
		Cocaine	2	2						
		Marijuana	3	3						
		Ethanol	4	4						
1279p	21 y M				A/C	Par	Int-A	1		
		Heroin	1	1						
1280	22 y M				A	Par	Int-U	2		
		Heroin	1	1						
1281a	22 y F				A	Inhal	Int-A	1		
		Methylenedioxymethamphetamine (MDMA)	1	1						
		Methamphetamine	2	2						
1282a	22 y M				U	Ingst	Int-A	1		
		Methamphetamine	1	1					Methamphetamine	10.094 mcg/mL in blood (unspecified) @ autopsy

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
1283pa	22 y F	Methamphetamine	1	1	A	Inhal	Int-A	1	Amphetamine	370 ng/mL in blood (unspecified) @ autopsy
		Marijuana	2	2					Carboxy-thc	45.6 mg/mL in blood (unspecified) @ autopsy
		Heroin	1	1					Morphine (free)	36 mcg/L in blood (unspecified) @ autopsy
1284phai	22 y M	Amphetamine (hallucinogenic)	1	1	U	Unk	Int-A	1	MDA (3,4-methylene-dioxyampheta mine)	0.08 mg/L in blood (unspecified) @ 1 h (pe)
		Amphetamine (hallucinogenic)	1	1					MDMA (3,4-methylenedioxy-methamphetamine)	1.2 mg/L in blood (unspecified) @ 1 h (pe)
1285ph	22 y F	Heroin	1	1	A/C	Ingst	Int-A	2		
1286pha	22 y F	Heroin	1	1	A	Ingst	Int-S	2		
1287ph	22 y M	Cocaine	1	1	A/C	Ingst	Int-A	2		
		Dextromethorphan/guaifenesin	2	1						
1288ph	23 y M	Methylenedioxy-mphetamine (MDMA)	1	1	A	Unk	Int-A	2		
1289pha	23 y M	Heroin	1	1	U	Ingst + Par	Int-A	1	Morphine (free)	19 ng/mL in blood (unspecified) @ unknown
		Alprazolam	2	2					Alprazolam	59 ng/mL in blood (unspecified) @ unknown
1290ph	23 y M	Cocaine	1	1	A	Ingst	Int-M	1		
		Cocaine	2	2						
1291ha	23 y M	Methamphetamine	1	1	A	Ingst	Int-A	1	Methamphetamine	230 ng/mL in blood (unspecified) @ 10 m (pe)
		Methamphetamine	1	1					Amphetamine	24 ng/mL in blood (unspecified) @ 10 m (pe)
1292h	23 y M	Methamphetamine	1	1	A	Ingst	Int-S	1		
1293h	24 y M	Amphetamine	1	1	U	Ingst + Unk	Int-A	2		
		Clonazepam	2	2						
1294ha	24 y M	Methamphetamine	1	1	A	Ingst	Int-M	1	Amphetamine	0.06 mcg/mL in blood (unspecified) @ autopsy
		Methamphetamine	1	1					Methamphetamine	5.1 mcg/mL in blood (unspecified) @ 1 h (pe)
		Methamphetamine	1	1					Methamphetamine	5.4 mcg/mL in blood (unspecified) @ autopsy
1295ph	24 y F	Heroin	1	1	U	Unk	Int-U	1		
1296h	24 y M	Methamphetamine	1	1	A	Ingst + Aspir	Int-M	2		
		Methylenedioxy-mphetamine (MDMA)	2	2						
		Carbon	3	3						
1297a	24 y M	Methamphetamine	1	1	U	Par	Int-A	1		
1298	24 y M	Phencyclidine	1	1	A	Ingst	Int-A	1		
1299a	24 y M	THC homolog, AM2201	1	1	A/C	Ingst + Inhal	Int-A	2	am-2201 [1-(5-fluoropentyl)-3-(1-naphthoyl)indole]	3.8 ng/mL in blood (unspecified) @ unknown
		Marijuana	2	2					THC (tetrahydrocannabinol)	3 ng/mL in blood (unspecified) @ unknown

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
1300pa	24 y M	Nortriptyline	3	3					Nortriptyline	60 ng/mL in blood (unspecified) @ unknown
		Bupropion	4	4					Bupropion	58.5 ng/mL in blood (unspecified) @ unknown
		Diazepam	5	5					Nordiazepam	58.8 ng/mL in blood (unspecified) @ unknown
		Midazolam	6	6					Midazolam	107 ng/mL in blood (unspecified) @ unknown
		Heroin	1	1	A	Par	Int-A	1		
1301ph	24 y F	Fentanyl	2	2					Fentanyl	12 ng/mL in blood (unspecified) @ autopsy
		Heroin	1	1	A	Unk	Int-A	2		
1302pi	24 y M	Carfentanil	2	2						
		Heroin	1	1	A	Par	Int-A	1		
1303pi	25 y M	Heroin	1	1	A	Unk	Int-A	1		
1304pai	25 y M	Heroin	1	1	A	Unk	Int-A	1		
		Heroin	1	1					Morphine (free)	260 mcg/L in blood (unspecified) @ autopsy
1305ph	25 y F				A	Ingst + Unk	Int-U	2		
		Cocaine	1	1						
		Ethanol	2	2						
		Fentanyl	3	3						
		Oxycodone	4	4						
1306pha	25 y M	Amphetamine	5	5						
		Heroin	1	1	A	Unk	Int-A	1	Morphine	31 ng/mL in blood (unspecified) @ unknown
		Heroin	1	1					6-Monoacetyl morphine	500 ng/mL in blood (unspecified) @ unknown
		Diazepam	2	2					Diazepam	160 ng/mL in blood (unspecified) @ unknown
		Diazepam	2	2					Nordiazepam	180 ng/mL in blood (unspecified) @ unknown
		Acetaminophen/hydrocodone	3	3						
		Marijuana	4	4					Delta-9-thc	2.9 ng/mL in blood (unspecified) @ unknown
		Marijuana	4	4					Delta-9-carboxy-thc	58 ng/mL in blood (unspecified) @ unknown
		Marijuana	4	4					11-OH-thc (11-hydroxy-delta-9-tetrahydrocannabinol)	9 ng/mL in blood (unspecified) @ unknown
		Heroin	1	1	A	Unk	Int-A	2		
1307ph	25 y M	Heroin	1	1	A	Unk	Int-A	2		
1308pa	25 y F	Heroin	1	1	A	Unk	Int-A	2	Morphine (free)	10 mcg/L in blood (unspecified) @ autopsy
		Cocaine	3	2					Benzoylceognine	0.2 mg/L in blood (unspecified) @ autopsy
		Fentanyl	2	2						
		Dextromethorphan	4	3						
		Methamphetamine	5	4					Methamphetamine	0.1 mg/L in blood (unspecified) @ autopsy
1309pha	26 y M	Amphetamine	6	5					Amphetamine	0.06 mg/L in blood (unspecified) @ autopsy
		Heroin	1	1	U	Ingst	Int-U	1	Morphine	16 ng/mL in vitreous @ autopsy

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
1310	26 y M	Heroin	1	1					6-monoacetyl morphine	5.5 ng/mL in vitreous @ autopsy
		Fentanyl	2	2					Norfentanyl	0.73 ng/mL in blood (unspecified) @ unknown
		Fentanyl	2	2					Fentanyl	1.7 ng/mL in blood (unspecified) @ unknown
		Cocaine	3	3					Benzoyllecognine	480 ng/mL in blood (unspecified) @ unknown
		Diazepam	4	4					Nordiazepam	110 mg/mL in blood (unspecified) @ unknown
		Diazepam	4	4					Diazepam	79 ng/mL in blood (unspecified) @ unknown
		Lorazepam	5	5					Lorazepam	5.5 ng/mL in blood (unspecified) @ unknown
		Alprazolam	6	6					Alprazolam	9.5 ng/mL in blood (unspecified) @ unknown
1311pha	26 y F	Heroin	1	1	A	Unk	Int-A	2		
1312	26 y F	Phencyclidine	1	1	U	Unk	Int-A	2	Phencyclidine	340 ng/mL in plasma @ 15 m (pe)
		Methamphetamine	1	1	A	Ingst	Int-A	1		
1313ha	26 y F	Methamphetamine	1	1	U	Ingst	Int-A	1		
		Methamphetamine	1	1					Methamphetamine	3.5 mg/L in blood (unspecified) @ 15 m (pe)
1314p	26 y M	Heroin	1	1	C	Par	Int-A	1		
1315ph	26 y F	Cocaine	1	1	U	Unk	Int-A	1		
		Hydrocodone	2	2						
1316ph	28 y M	Heroin	1	1	A	Unk	Int-A	1		
1317p	28 y F	Heroin	1	1	A/C	Unk	Int-S	2		
1318pi	28 y F	Heroin	1	1	A	Unk	Int-A	1		
		Heroin	1	1					Morphine (free)	74 mcg/L in blood (unspecified) @ autopsy
		Fentanyl	2	2						
		Oxycodone	3	3						
		Ethanol	4	4					Ethanol	0.05% (wt/vol) in vitreous @ autopsy
1319p	28 y M	Ethanol	4	4					Ethanol	0.06% (wt/vol) in urine (quantitative only) @ autopsy
		Ethanol	4	4					Ethanol	0.07% (wt/vol) in blood (unspecified) @ autopsy
		Heroin	1	1	A/C	Par	Int-A	1		
		Amphetamine/dextroamphetamine	1	1	A/C	Ingst	Int-S	2		
1321ha	28 y M	THC homolog	1	1	U	Inhal + Unk	Int-A	1		
		Cocaine	2	2					Benzoyllecognine	0.1 mg/L in blood (unspecified) @ autopsy
1322	28 y M	Amphetamine (hallucinogenic)	1	1	A	Ingst	Int-A	2		
1323pha	28 y F	Heroin	1	1	A	Unk	Int-A	1		
		Methamphetamine	2	2					Morphine	0.03 mg/L in blood (unspecified) @ 1 h (pe)
		Methamphetamine	2	2					Amphetamine	0.08 mg/L in blood (unspecified) @ 1 h (pe)
		Methamphetamine	2	2					Methamphetamine	1.49 mg/L in blood (unspecified) @ 1 h (pe)

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
1324h	28 y M	Bupropion	3	3	A	Ingst + Unk	Unk	1	Bupropion	12 ng/mL in blood (unspecified) @ 1 h (pe)
		Bupropion	3	3					Hydroxybupropion	130 ng/mL in blood (unspecified) @ 1 h (pe)
		Hydroxyzine	4	4					Hydroxyzine	14 ng/mL in blood (unspecified) @ 1 h (pe)
		Sertraline	5	5					Desmethylsertraline	180 ng/mL in blood (unspecified) @ 1 h (pe)
		Sertraline	5	5					Sertraline	62 ng/mL in blood (unspecified) @ 1 h (pe)
		Ibuprofen	6	6						
		Quinine	7	7						
1325p	28 y M	Cocaine	1	1	A	Par	Int-A	2		
		Levamisole	2	2						
1326pa	29 y F	Heroin	1	1	A	Par	Int-A	1		
		Heroin	1	1					Fentanyl	0.005 mg/L in blood (unspecified) @ autopsy
		Fentanyl	2	2						
		Quinine	3	3						
		Ethanol	4	4					Ethanol	0.06% in blood (unspecified) @ autopsy
		Ethanol	4	4					Ethanol	0.07% in blood (unspecified) @ autopsy
		Ethanol	4	4					Ethanol	0.07% in vitreous @ autopsy
1327h	29 y F	Ethanol	4	4	A	Ingst	Unk	3	Ethanol	0.08% in urine (quantitative only) @ autopsy
		Cocaine	1	1						
		Hydrocodone	2	2						
		Acetaminophen	3	3					Acetaminophen	116 mcg/mL in blood (unspecified) @ 1 h (pe)
		Levamisole	4	4						
		Heroin	1	1						
		Cocaine	2	2						
1329p	30 y F	Heroin	1	1	U	Unk	Int-A	2		
		Cocaine	2	2						
1330ph	30 y F	Heroin	1	1	A	Par	Int-A	1		
		Heroin	1	1						
1331ai	30 y F	Heroin	1	1	A	Unk	Int-A	1	Morphine	488 ng/mL in blood (unspecified) @ unknown
		Heroin	1	1						
1332ph	30 y F	Cocaine	1	1	U	Inhal	Int-A	2		
1333p	31 y F-Pregnant	Heroin	1	1	A/C	Par	Int-A	1		
		Heroin	1	1						
1334pha	31 y F	Heroin	1	1	A/C	Par	Int-A	2	Codeine	15 ng/mL in blood (unspecified) @ unknown
		Heroin	1	1					Morphine (free)	250 ng/mL in blood (unspecified) @ unknown
		Heroin	1	1						
1335pha	31 y M	Heroin	1	1	U	Par	Int-A	1	Codeine	10 ng/mL in blood (unspecified) @ unknown
		Heroin	1	1					6-monoacetyl morphine	12 ng/mL in blood (unspecified) @ unknown
		Heroin	1	1					Morphine (total)	130 ng/mL in blood (unspecified) @ unknown
		Heroin	1	1						
1336pha	31 y M	Methamphetamine	1	1	A	Ingst	Unk	1	Amphetamine	14,010 ng/mL in urine (quantitative only) @ unknown

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
1337ph	31 y M	Methamphetamine	1	1	A	Unk	Int-U	1	Methamphetamine	701 ng/mL in blood (unspecified) @ unknown
		Cocaine	2	2					Benzoyllecognine	465 ng/mL in urine (quantitative only) @ unknown
		Heroin	3	3					Morphine	44,942 ng/mL in urine (quantitative only) @ unknown
		Heroin	3	3					6-monoacetylmorphine	995 ng/mL in urine (quantitative only) @ unknown
		Droperidol/fentanyl	4	4					Delta-9-carboxy-thc	62 ng/mL in urine (quantitative only) @ unknown
		Marijuana	5	5						
		Heroin	1	1					Ethanol	126 mg/dL in blood (unspecified) @ unknown
		Ethanol	2	2						
		Heroin	1	1					A	Ingst + Par
		Levothyroxine	2	2						
1338ph	32 y F	Heroin	1	1	A	Ingst + Par	Int-A	1		
		Levothyroxine	2	2						
		Drug, unknown stimulant or street drug	1	1						
		Drug, unknown	2	2						
		Hydrocodone	3	3						
1339pha	32 y M	Ethanol	4	4	A	Ingst + Unk	Int-A	2		
		Heroin	1	1						
		Alprazolam	2	2						
		Ethanol	3	3						
		Heroin	4	4						
1340pai	32 y F	Heroin	1	1	A	Ingst + Inhal + P-Int-A ar	Int-A	1		
		Alprazolam	2	2						
		Ethanol	3	3						
		Heroin	1	1						
		Alprazolam	2	2						
1341pha	32 y F	Ethanol	3	3	C	Par	Int-A	1		
		Heroin	1	1						
		Alprazolam	2	2						
		Ethanol	3	3						
		Heroin	1	1						
1342h	32 y M	Heroin	1	1	U	Par	Unk	1		
		Naltrexone	2	2						
		Cocaine	3	3						
		Diazepam	4	4						
		Heroin	1	1						
1343p	33 y F	Cocaine	2	2	A	Inhal + Par	Int-A	1		
		Heroin	1	1						
		Amphetamine (hallucinogenic), alpha-PDP	1	1						
		Phencyclidine	1	1						
		Heroin	1	1						
1344	33 y M	Cocaine	2	2	A	Unk	Int-S	1		
		Amphetamine (hallucinogenic), alpha-PDP	1	1						
		Phencyclidine	1	1						
		Heroin	1	1						
		Drug, unknown stimulant or street drug	2	2						
1345pha	33 y F	Heroin	1	1	A	Ingst	Unk	1		
		Phencyclidine	1	1						
		Heroin	1	1						
		Drug, unknown stimulant or street drug	2	2						
		Heroin	1	1						
1346h	33 y M	Heroin	1	1	A/C	Ingst	Int-A	3		
		Heroin	1	1						
		Drug, unknown stimulant or street drug	2	2						
		Heroin	1	1						
		Heroin	1	1						
1347p	33 y M	Heroin	1	1	A	Par	Int-S	2		
		Drug, unknown stimulant or street drug	2	2						
		Heroin	1	1						
		Heroin	1	1						
		Heroin	1	1						
1348p	33 y M	Heroin	1	1	A	Par	Int-A	1		
		Heroin	1	1						
		Heroin	1	1						
		Heroin	1	1						
		Heroin	1	1						
1349	33 y M	Heroin	1	1	A/C	Ingst	Int-A	1		
		Methylenedioxymethamphetamine (MDMA)	1	1						
		Heroin	1	1						
		Heroin	1	1						
		Heroin	1	1						
1350p	33 y F	Heroin	1	1	A	Ingst + Par	Int-S	1		
		Benzonatate	2	2						
		Acetaminophen	3	3						
		Heroin	1	1						
		Ethanol	4	4						

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
1351ph	34 y M				U	Par	Int-A	1		
1352pa	34 y M	Heroin	1	1						
		Cocaine	1	1	A/C	Unk	Int-A	1		
		Marijuana	2	2						
1353pa	34 y F	Heroin	1	1	A	Unk	Int-A	1		
		Fentanyl	2	2					Fentanyl	0.03 mg/L in blood (unspecified) @ autopsy
1354pha	34 y F				A	Ingst + Inhal	Int-U	1		
		Cocaine	1	1					Benzoyllecognine	217 ng/mL in blood (unspecified) @ autopsy
		Cocaine	1	1					Benzoyllecognine	607 ng/mL in blood (unspecified) @ 1 h (pe)
		Benzodiazepine	2	2					Diazepam	146 ng/mL in blood (unspecified) @ 1 h (pe)
		Benzodiazepine	2	2					Nordiazepam	61 ng/mL in blood (unspecified) @ autopsy
		Benzodiazepine	2	2					Diazepam	86 ng/mL in blood (unspecified) @ autopsy
1355pai	34 y M				A	Unk	Int-A	1		
		Cocaine	1	1						
1356ph	34 y M				A/C	Ingst + Inhal + Aspir	Int-S	2		
		Cocaine	1	1						
		Metformin	2	2						
		Oxycodone	3	3						
1357pai	35 y M				A	Unk	Int-A	1		
		Heroin	1	1					Morphine (free)	44 mcg/L in blood (unspecified) @ autopsy
		Fentanyl	2	2					Fentanyl	0.065 mg/L in blood (unspecified) @ autopsy
		Codeine	3	3						
		Quinine	4	4						
		Ethanol	5	5					Ethanol	0.01% in blood (unspecified) @ autopsy
		Procaine	6	6						
1358h	35 y M				A	Ingst + Inhal + P-Int-A ar		2		
		Cocaine	1	1						
		Heroin	2	2						
		Acetaminophen/hydrocodone	3	3						
1359a	35 y F				A	Ingst	Int-M	1		
		Methamphetamine	1	1						
		Ethanol	2	2					Ethanol	99 mg/dL in blood (unspecified) @ 0 h (pe)
1360ph	36 y F				U	Unk	Int-A	2		
		Cocaine	1	1						
		Escitalopram	2	2						
		Bupropion	3	3						
		Alprazolam	4	4						
		Ethanol	5	5					Ethanol	39 mg/dL in blood (unspecified) @ unknown
		Ethanol	6	6						
1361pai	36 y M				A	Unk	Int-A	1		
		Heroin	1	1					Morphine (free)	10 mcg/L in blood (unspecified) @ autopsy
		Fentanyl	2	2					Fentanyl	0.072 mg/L in blood (unspecified) @ autopsy
		Cocaine	3	3					Benzoyllecognine	0.8 mg/L in blood (unspecified) @ autopsy
		Cocaine	3	3					Cocaine	3.1 mg/L in blood (unspecified) @ autopsy
		Ethanol	4	4					Ethanol	0.16% in blood (unspecified) @ autopsy
		Ethanol	4	4					Ethanol	0.21% in vitreous @ autopsy
		Ethanol	4	4					Ethanol	0.26% in urine (quantitative only) @ autopsy
1362pha	36 y M				A	Ingst	Int-U	1		
		Methamphetamine	1	1					Amphetamine	0.2 mg/L in serum @ 1 h (pe)

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
1363h	36 y M	Methamphetamine	1	1					Methamphetamine	3.06 mg/L in serum @ 1 h (pe)
		Clonazepam	2	2						
		Amphetamine/ dextroamphetamine	1	1	A	Ingst + Inhal	Int-A	2		
		Heroin	2	2						
		Marijuana	3	3						
1364	36 y M	Cocaine	4	4						
1365p	36 y M	Methamphetamine	1	1	U	Unk	Unk	1		
1366p	36 y M	Heroin	1	1	U	Unk	Int-A	2		
1367pha	36 y F	Heroin	1	1	A	Par	Int-A	2		
		Droperidol/fentanyl	2	2	U	Unk	Unk	1		
									Norfentanyl	0.001 mg/L in blood (unspecified) @ unknown
		Droperidol/fentanyl	2	2					Fentanyl	0.007 mg/L in blood (unspecified) @ unknown
		Acetyl fentanyl	3	3					Acetyl fentanyl	0.001 mg/L in blood (unspecified) @ unknown
1368pa	36 y M				U	Ingst + Par	Int-A	1		
		Heroin	1	1						
		Clonazepam	2	2						
		Cocaine	3	3						
		Dextromethorphan	4	4						
1369ph	36 y M	Doxylamine	5	5						
1370pha	37 y M	Cocaine	1	1	U	Ingst	Unk	2		
		Cocaine	1	1	U	Ingst + Unk	Int-A	2		
		Street drug	2	2						
1371ha	37 y M	Ethanol	3	3					Ethanol	26 mg/dL in blood (unspecified) @ 1 h (pe)
					A	Ingst	Unk	2		
1372h	37 y F	Cocaine	1	1	U	Ingst	Unk	2		
1373	37 y M	Cocaine	1	1					Benzoyllecognine	385 ng/mL in blood (unspecified) @ unknown
		Drug, unknown	2	1						
		Amphetamine	1	1	U	Ingst + Unk	Int-S	2		
		Cocaine	2	2						
		Marijuana	3	3						
1374pa	37 y F				A	Ingst + Par	Int-A	1		
		Heroin	1	1					Fentanyl	18.1 ng/mL in blood (unspecified) @ autopsy
		Heroin	1	1					Morphine	63.7 ng/mL in blood (unspecified) @ autopsy
		Hydrocodone	2	2					Hydrocodone	26.1 ng/mL in blood (unspecified) @ autopsy
		Drug, unknown	3	3					7-aminoclonazepam	12.1 ng/mL in blood (unspecified) @ autopsy
		Drug, unknown	3	3					Amphetamine	140 ng/mL in blood (unspecified) @ autopsy
		Drug, unknown	3	3					THC (tetrahydrocannabinol)	3.5 ng/mL in blood (unspecified) @ autopsy
		Drug, unknown	3	3					Methamphetamine	915 ng/mL in blood (unspecified) @ autopsy
1375ph	37 y M				A	Ingst + Par	Int-A	1		
1376h	38 y F	Heroin	1	1						
		Ethanol	2	2						
1377pha	38 y M	Heroin	1	1	A	Par	Int-A	3		
		Cocaine	1	1	A	Ingst	Int-A	1	Cocaine	0.21 mg/dL In Gastric (stomach content) @ autopsy

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
		Ethanol	2	2					Ethanol	127 mg/dL in blood (unspecified) @ 30 m (pe)
1378pha	38 y M				A/C	Inhal + Par	Unk	2		
		Cocaine	1	1						
		Ethanol	2	2					Ethanol	0.123 g/dL in blood (unspecified) @ 1 h (pe)
1379pa	38 y M				A	Par	Int-A	1		
		Heroin	1	1						
1380h	38 y M				A	Ingst	Unk	1		
		Cocaine	1	1						
1381p	38 y M				A/C	Unk	Int-A	1		
		Heroin	1	1						
1382a	39 y F				A	Ingst + Unk	Int-A	1		
		Methamphetamine	1	1						
		Heroin	2	2						
		Potassium chloride	3	3						
		Diazepam	4	4					Diazepam	35 ng/mL in plasma @ unknown
		Acetaminophen/hydrocodone	5	5					Hydrocodone	27 ng/mL in plasma @ unknown
1383pi	39 y M				A	Unk	Int-A	1		
		Heroin	1	1						
1384h	39 y M				A	Unk	Int-M	1		
		Amphetamine (hallucinogenic)	2	1						
		Cocaine	1	1						
		Methylenedioxymethamphetamine (MDMA)	3	2						
1385pha	39 y M				U	Unk	Unk	1		
		Heroin	1	1						
		Carfentanil	2	2						
		Cocaine	3	3						
									Benzoyllecognine	1193 ng/mL in whole blood @ autopsy
1386pa	39 y F				A	Par	Int-A	1		
		Heroin	1	1					Morphine (free)	38 mcg/mL in blood (unspecified) @ autopsy
		Amitriptyline	2	2					Amitriptyline	0.3 mg/L in blood (unspecified) @ autopsy
		Nortriptyline	3	3					Nortriptyline	0.2 mg/L in blood (unspecified) @ autopsy
		Trazodone	4	4					Trazodone	0.2 mg/L in blood (unspecified) @ autopsy
1387h	39 y M				U	Ingst	Int-M	2		
		Methamphetamine	1	1						
1388pa	40 y M				A	Unk	Int-A	1		
		Heroin	1	1						
		Alprazolam	2	2						
		Methadone	3	3					Methadone	0.6 mg/L in blood (unspecified) @ autopsy
		Methadone	3	3					Methadone	0.8 mg/L in blood (unspecified) @ autopsy
		Amphetamine	4	4					Amphetamine	0.6 mg/L in blood (unspecified) @ autopsy
1389p	40 y M				A	Par	Int-A	2		
		Heroin	1	1						
1390ph	40 y M				U	Unk	Int-A	2		
		Cocaine	1	1						
		Hydrocodone	2	2						
		Marijuana	3	3						
		Ethanol	4	4						
1391ph	41 y M				A	Ingst	Int-A	1		
		Cocaine	1	1						
		Diphenhydramine	2	2						
		Ethanol	3	3						
1392ha	41 y M				U	Ingst + Inhal	Int-A	2		
		Amphetamine (hallucinogenic)	1	1						
		Ethanol	2	2					Ethanol	112 mg/dL in serum @ unknown
1393pa	42 y F				A/C	Par	Int-A	1		

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
1394ph	42 y F	Heroin	1	1	A	Inhal	Int-A	1	Cocaine	0.599 mcg/mL in urine (quantitative only) @ unknown
		Cocaine	2	2						
		Cocaine	1	1						
1395pha	44 y F	Cocaine	1	1	U	Unk	Unk	1		
		Drug, unknown	2	2						
1396p	44 y F	Heroin	1	1	A	Par	Unk	2		
1397h	44 y M	Methylphenidate	1	1	A	Ingst + Par	Int-S	3		
		Lisdexamfetamine	2	2						
		Hydrocodone	3	3						
1398p	45 y M	Cocaine	1	1	A	Ingst	Int-U	2		
1399p	46 y M	Heroin	1	1	A	Par	Int-A	2		
1400pa	46 y M	THC homolog, K2	1	1	U	Ingst + Inhal	Int-A	1		
		Citalopram	2	2					Citalopram	810 ng/mL in blood (unspecified) @ autopsy
		Propranolol	3	3					Propranolol	432 ng/mL in blood (unspecified) @ autopsy
		Benzodiazepine	4	4					7-Aminoclonazepam	288 ng/mL in blood (unspecified) @ autopsy
		Benzodiazepine	4	4					Clonazepam	7.5 ng/mL in blood (unspecified) @ autopsy
		Ethanol	5	5					Ethanol	0.122 g/dL in blood (unspecified) @ autopsy
		Marijuana	6	6					Carboxy-thc	3.6 ng/mL in blood (unspecified) @ autopsy
1401	46 y F	Heroin	1	1	A	Inhal	Int-A	3		
1402h	47 y F	Methamphetamine	1	1	A	Ingst	Int-M	1		
1403h	47 y M	Cocaine	1	1	A	Ingst	Int-S	2		
		Benzodiazepine	2	2						
[1404pha]	48 y M	Cocaine	1	1	A	Ingst + Aspir	Int-U	1	Cocaine	0.79 mg/L in blood (unspecified) @ 10 m (pe)
		Cocaine	1	1					Benzoyllecognine	3.55 mg/L in blood (unspecified) @ 10 m (pe)
		Tropacocaine	2	2						
		Levamisole	3	3						
		Ethanol	4	4						
1405ph	49 y M	Heroin	1	1	A/C	Unk	Int-A	1		
		Ethanol	2	2						
1406h	49 y F	Cocaine	1	1	A	Unk	Int-A	2		
		Benzodiazepine	2	2						
1407p	49 y F	Heroin	1	1	A	Ingst + Aspir	Int-A	2		
1408pa	49 y M	Heroin	1	1	A	Unk	Int-A	1	Morphine (free)	50 mcg/L in blood (unspecified) @ autopsy
		Fentanyl	2	2					Fentanyl	0.001 mg/L in blood (unspecified) @ autopsy
		Ethanol	3	3					Ethanol	0.07% (wt/vol) in blood (unspecified) @ autopsy
		Ethanol	3	3					Ethanol	0.07% (wt/vol) in vitreous @ autopsy
		Ethanol	3	3					Ethanol	0.08% (wt/vol) in urine (quantitative only) @ autopsy
1409pha	49 y M	Heroin	1	1	U	Par	Unk	1	Codeine (free)	11 ng/mL in blood (unspecified) @ unknown

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
1410h	49 y M	Heroin	1	1	U	Unk	Int-A	2	Morphine (free)	160 ng/mL in blood (unspecified) @ unknown
		Heroin	1	1					6-Monoacetyl morphine	5.8 ng/mL in blood (unspecified) @ unknown
		Cocaine	1	1						
1411h	50 y M	Hydrocodone	2	2	A	Unk	Int-A	2		
		Heroin	1	1						
1412pha	50 y M	Methadone	2	2	U	Unk	Unk	1		
		Benzodiazepine	3	3						
		Lisdexamfetamine	1	1					Amphetamine	29 ng/mL in blood (unspecified) @ 1 h (pe)
		Clonazepam	2	2					7-Aminoclonazepam	36 ng/mL in blood (unspecified) @ 1 h (pe)
		Cocaine	3	3					Benzoyllecognine	1915 ng/mL in blood (unspecified) @ 1 h (pe)
		Cocaine	3	3					Cocaine	55 ng/mL in blood (unspecified) @ 1 h (pe)
		Hydrocodone	4	4					Hydrocodone	31 ng/mL in blood (unspecified) @ 1 h (pe)
		Cyclobenzaprine	5	5					Cyclobenzaprine	13 ng/mL in blood (unspecified) @ 1 h (pe)
		Hydrocodone	6	6						
		Pregabalin	7	7					Pregabalin	10 ng/mL in blood (unspecified) @ 1 h (pe)
1413ph	50 y M	Fentanyl	8	8	A	Ingst + Par	Int-A	2	Fentanyl	1.5 ng/mL in blood (unspecified) @ 1 h (pe)
		Heroin	1	1						
		Methadone	2	2					Methadone	36 ng/mL in blood (unspecified) @ unknown
		Ethanol	3	3					Ethanol	81 mg/dL in blood (unspecified) @ unknown
1414pa	51 y F				A	Ingst	Int-S	1		
		Heroin	1	1						
		Quetiapine	2	2						
1415pai	53 y M	Alprazolam	3	3	A	Par	Int-A	1		
		Cocaine	1	1						
		Heroin	2	2					Morphine	50 ng/mL in blood (unspecified) @ autopsy
1416ph	55 y F	Heroin	1	1	A	Unk	Int-A	3		
1417p	55 y F	Heroin	1	1	A	Inhal	Int-A	1		
1418ha	56 y M				A	Unk	Int-A	2		
		Cocaine	1	1						
1419pai	56 y M	Levamisole	2	2	A	Par	Int-A	1		
		Cocaine	1	1						
		Methadone	2	2					Methadone	0.72 mcg/mL in blood (unspecified) @ autopsy
		Diazepam	3	3					Diazepam	466 ng/mL in blood (unspecified) @ autopsy
		Diazepam	3	3					Nordiazepam	467 ng/mL in blood (unspecified) @ autopsy
		Diazepam	3	3					Temazepam	65 ng/mL in blood (unspecified) @ autopsy
1420pa	57 y M				A	Par	Int-A	1		
		Heroin	1	1						
		Fentanyl	2	2					Fentanyl	0.018 mg/L in blood (unspecified) @ autopsy
1421p	57 y M	Doxylamine	3	3	A	Ingst + Unk	Int-A	1	Doxylamine	0.05 mg/L in blood (unspecified) @ autopsy
		Heroin	1	1					6-Monoacetyl morphine	11 ng/mL In unknown @ unknown
		Cocaine	2	2						

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time	
1422pai	57 y M	Ethanol	3	3	A/C	Ingst + Unk	Int-A	1	Ethanol	175 mg/dL in serum @ unknown	
		Cocaine	1	1					Cocaethylene	0.08 mcg/mL in blood (unspecified) @ autopsy	
		Heroin	2	2					Ethanol	0.18 mg/L in blood (unspecified) @ autopsy	
		Ethanol	3	3							Ethanol
1423	57 y M				A	Ingst	Int-M	1			
1424p	58 y M	Methamphetamine	1	1	A	Ingst + Unk	Unk	3			
		Heroin	1	1							
		Ethanol	2	2							
1425h	59 y M				U	Ingst	Int-S	2			
		Methamphetamine	1	1							
1426pha	61 y F				A/C	Ingst + Unk	Int-A	1			
		Heroin	1	1					Morphine	220 ng/mL in blood (unspecified) @ autopsy	
		Heroin	1	1					6-Monoacetylmorphine	56 ng/mL in blood (unspecified) @ autopsy	
		Heroin	1	1					Codeine	9.3 ng/mL in blood (unspecified) @ autopsy	
		Alprazolam	2	2					Alprazolam	51 ng/mL in blood (unspecified) @ autopsy	
		Ethanol	3	3					Ethanol	121 mg/dL in blood (unspecified) @ autopsy	
		Cocaine	4	4					Cocaethylene	29 ng/mL in blood (unspecified) @ autopsy	
		Cocaine	4	4					Benzoyllecognine	460 ng/mL in blood (unspecified) @ autopsy	
1427ph	63 y M				U	Ingst + Par	Unk	2			
		Heroin	1	1							
		Ethanol	2	2							
1428ha	64 y M				U	Ingst	Int-U	2			
		Heroin	1	1							
		Acetaminophen/oxycodone	2	2							
		Ethanol	3	3							
1429p	65 y M				A	Par	Int-A	1			
		Heroin	1	1							
1430h	69 y M				A	Inhal	Int-A	2			
		Heroin	1	1							
		Naloxone	2	2							
1431ph	69 y M				A	Inhal	Int-M	2			
		Heroin	1	1							
		Naloxone	2	2							
1432pa	9 m F				U	Unk	Unk	2			
		Cocaine	1	1					Benzoyllecognine	5246 ng/mL in blood (unspecified) @ autopsy	
		Cocaine	1	1					Cocaine	6092 ng/mL in blood (unspecified) @ autopsy	
		Levamisole	2	2							
1433phai	12 m F	Heroin	1	1	A	Ingst	Unk	1	6-Monoacetylmorphine	1900 ng/mL In Gastric (stomach content) @ autopsy	
		Heroin	1	1					Morphine (free)	300 ng/mL in whole blood @ autopsy	
		Heroin	1	1					6-Monoacetyl morphine	5.4 ng/mL in whole blood @ autopsy	
		Heroin	1	1					Morphine (free)	6900 ng/mL In Gastric (stomach content) @ autopsy	
		Codeine	2	2					Codeine (free)	26 ng/mL in whole blood @ autopsy	
		Codeine	2	2					Morphine (free)	300 ng/mL in whole blood @ autopsy	
		Codeine	2	2					Morphine (free)	6900 ng/mL In Gastric (stomach content) @ autopsy	
1434pi	Unknown				U	Unk	Unk	2			

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
1435	adult (>=20 yrs) M	Heroin	1	1						
		Drug, unknown	2	2						
	Unknown adult (>=20 yrs) M				A	Unk	Int-A	2		
1436	Unknown adult (>=20 yrs) M	Heroin	1	1	A	Ingst	Int-A	2		
		Cocaine	1	1						
		Hydrocodone	2	2						
1437p	Unknown adult (>=20 yrs) M				U	Unk	Int-A	1		
1438pi	Unknown adult (>=20 yrs) F	Heroin	1	1	A/C	Par	Int-A	1		
1439pi	Unknown adult (>=20 yrs) F	Heroin	1	1	A	Unk	Int-U	2		
1440pai	Unknown age M	Cocaine	1	1	U	Unk	Int-A	1		
		Cocaine	1	1					Benzoyllecognine	1090 ng/mL in blood (unspecified) @ autopsy
		Cocaine	1	1					Cocaine	139 ng/mL in blood (unspecified) @ autopsy
		Cocaine	1	1					Benzoyllecognine	57343 ng/mL in urine (quantitative only) @ autopsy
		Cocaine	1	1					Cocaethylene	66.9 ng/mL in blood (unspecified) @ autopsy
		Ethanol	2	2					Ethanol	47 mg/dL in blood (unspecified) @ autopsy
		Ethanol	2	2					Ethanol	96 mg/dL in urine (quantitative only) @ autopsy
1441p	Unknown age U	Pedicularis striata	3	3	U	Par	Int-A	2		
1442phi	Unknown age U	Heroin	1	1	A	Inhal	Int-A	2		
1443p	Unknown age F	Cocaine	1	1	A	Par	Int-A	1		
		Heroin	1	1						
See also case 1, 2, 10, 40, 46, 72, 163, 172, 231, 272, 311, 313, 315, 319, 329, 331, 332, 337, 341, 344, 346, 347, 359, 365, 377, 378, 380, 398, 401, 404, 408, 409, 420, 424, 426, 430, 435, 443, 445, 461, 480, 484, 487, 520, 522, 523, 532, 569, 588, 625, 632, 731, 756, 765, 774, 787, 790, 794, 829, 832, 878, 922, 974, 976, 994, 996, 1032, 1047, 1130, 1182, 1186, 1212, 1213, 1215, 1223, 1235, 1236, 1244, 1446, 1452, 1478, 1479										
Topical preparations										
[1444]	32 y M				A	Ingst	Unk	1		
		Camphor	1	1						
		Ethanol	2	2						
[1445h]	42 y F	Cantharidin	1	1	A	Ingst	AR-D	2		
Unknown drug										
1446	18 y M				A	Unk	Int-S	2		
		Drug, unknown	1	1						
		Cocaine	2	2						
1447ph	18 y M				A/C	Ingst + Inhal	Int-A	2		
		Drug, unknown	1	1						
1448ph	20 y M				U	Unk	Unk	2		
		Drug, unknown	1	1						

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
1449h	22 y M				A	Ingst	Int-U	2		
		Drug, unknown	2	1						
		Mushroom	1	1						
1450a	22 y M				A	Ingst + Inhal	Int-U	3		
		Heroin	1	1						
		Tizanidine	2	2						
1451p	23 y F				U	Unk	Int-A	2		
		Drug, unknown	1	1						
1452h	24 y M				U	Unk	Int-A	2		
		Drug, unknown	1	1						
		Marijuana	2	2						
1453ha	25 y M				A	Ingst	Int-S	2		
		Drug, unknown	1	1						
1454p	26 y F				A	Par	Unt-O	2		
		Drug, unknown	1	1						
1455ph	27 y M				U	Unk	Int-U	2		
		Drug, unknown	1	1						
		Benzodiazepine	2	2						
		Ethanol	3	3					Ethanol	289 mg/dL in blood (unspecified) @ unknown
1456h	27 y M				A/C	Ingst	Int-S	2		
		Drug, unknown	1	1						
		Acetaminophen	2	2					Acetaminophen	13.3 mcg/mL in blood (unspecified) @ unknown
1457pha	27 y F				A	Unk	Int-S	3		
		Drug, unknown	1	1						
		Ketamine	2	2					Ketamine	0.59 mcg/mL in blood (unspecified) @ autopsy
1458p	27 y M				U	Ingst	Unt-G	2		
		Drug, unknown	1	1						
1459	28 y M				A	Ingst	Int-S	1		
		Drug, unknown	1	1						
		Zolpidem	2	2						
		Gabapentin	3	3						
		Naproxen	4	4						
1460phi	30 y M				A	Par	Int-A	2		
		Drug, unknown	1	1						
1461ph	31 y M				A	Ingst	Int-A	2		
		Drug, unknown	1	1						
1462pa	31 y M				A	Ingst	Unk	1		
		Drug, unknown	1	1						
1463ph	31 y M				U	Unk	Int-A	2		
		Drug, unknown	1	1						
1464p	31 y M				A	Unk	Int-A	2		
		Drug, unknown	1	1						
1465pa	34 y M				A	Ingst + Inhal	Int-A	1		
		Drug, unknown	1	1						
		Alprazolam	2	2						
		Duloxetine	3	3						
		Gabapentin	4	4						
		Ethanol (non-beverage)	5	5					Ethanol	0.06% in blood (unspecified) @ autopsy
		Fentanyl	6	6					Fentanyl	0.007 mg/L in blood (unspecified) @ autopsy
1466p	35 y M				A	Ingst	Int-U	2		
		Drug, unknown	1	1						
1467h	35 y M				A	Ingst	Int-S	2		
		Drug, unknown	1	1						
1468h	36 y F				U	Unk	Int-A	2		
		Drug, unknown	1	1						
1469a	36 y F				U	Ingst	Int-S	1		
		Drug, unknown	1	1					Diphenhydramine	1859 ng/mL in blood (unspecified) @ autopsy
		Drug, unknown	1	1					Promethazine	32.2 ng/mL in blood (unspecified) @ autopsy
		Drug, unknown	1	1					Metoprolol	43.3 ng/mL in blood (unspecified) @ autopsy
		Acetaminophen	2	2						
1470p	37 y M				U	Unk	Unk	2		
		Drug, unknown	1	1						
1471ph	38 y M				U	Ingst	Unk	2		
		Drug, unknown	1	1						
		Gabapentin	2	2						

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
1472pa	38 y F	Hydroxyzine	3	3						
		Drug, unknown	1	1	A	Unk	Unk	2		
1473p	38 y F	Drug, unknown	1	1	U	Unk	Unk	1	Hydrocodone	25.7 ng/mL in blood (unspecified) @ unknown
		Drug, unknown	1	1					Hydrocodone	4511 ng/mL in urine (quantitative only) @ unknown
		Drug, unknown	1	1					Hydromorphone	552 ng/mL in urine (quantitative only) @ unknown
1474ph	39 y F	Drug, unknown	1	1	A	Ingst	Unk	2		
1475	40 y F	Drug, unknown	1	1	A	Ingst	Int-S	2		
		Acetaminophen	2	2					Acetaminophen	102 mcg/mL in blood (unspecified) @ unknown
1476	41 y M	Drug, unknown	1	1	A	Ingst	Int-S	2		
		Acetaminophen/butalbital/caffeine	2	2					Acetaminophen	91 mcg/mL in serum @ unknown
1477h	42 y F	Drug, unknown	1	1	U	Ingst	Int-S	2	Acetaminophen	113 mcg/mL in serum @ unknown
		Drug, unknown	1	1					Salicylate	6.9 mg/dL in serum @ unknown
		Drug, unknown	1	1					Iron	78 mcg/mL in serum @ unknown
		Acetaminophen	2	2						
1478ph	46 y F	Drug, unknown	1	1	A	Ingst	Int-S	1		
		Heroin	2	2						
1479ph	47 y F	Drug, unknown	1	1	A	Unk	Unk	2		
		Methamphetamine	2	1						
1480ph	48 y M	Drug, unknown	1	1	A	Ingst	Unk	2		
		Ethanol	2	2					Ethanol	271 mg/dL in plasma @ unknown
		Hydrocodone	3	3						
1481i	49 y F	Drug, unknown	1	1	A	Ingst	Int-U	2		
1482ph	49 y F	Drug, unknown	1	1	A/C	Ingst	Int-S	3		
1483pa	49 y F	Drug, unknown	1	1	U	Ingst	Int-S	2		
1484	56 y M	Drug, unknown	1	1	A	Ingst	Int-S	1		
1485pha	59 y F	Drug, unknown	1	1	A	Unk	Unk	2		
		Acetaminophen	2	2						
1486	59 y M	Drug, unknown	1	1	A	Ingst	Int-U	3		
		Ethanol	2	2					Ethanol	193 mg/dL in whole blood @ unknown
1487p	61 y F	Drug, unknown	1	1	U	Ingst	Unk	2		
1488h	63 y M	Drug, unknown	1	1	A	Ingst	Int-S	2		
1489h	73 y F	Drug, unknown	1	1	C	Ingst	Int-S	2		
		Acetaminophen/codeine	2	2					Acetaminophen	10 mcg/mL in serum @ unknown
1490ph	86 y M	Drug, unknown	1	1	A/C	Ingst	Int-S	2		
		Nifedipine (extended release)	2	2						
1491ph	Unknown adult (>=20 yrs) M	Drug, unknown	1	1	U	Unk	Unk	3		

(continued)

Table 21. Listing of fatal nonpharmaceutical and pharmaceutical exposures – Continued

Annual Report ID	Age	Substances	Substance Rank	Cause Rank	Chronicity	Route	Reason	RCF	Analyte	Blood Concentration @ Time
See also case 8, 17, 19, 32, 94, 114, 373, 380, 409, 421, 454, 456, 460, 472, 502, 506, 533, 537, 554, 585, 587, 594, 651, 659, 687, 723, 738, 780, 808, 823, 848, 851, 854, 866, 896, 1052, 1057, 1126, 1204, 1232, 1277, 1290, 1339, 1372, 1374, 1395, 1434										
Veterinary drugs										
[1492pa]	25 y M				A	Ingst	Int-S	1		
		Pentobarbital/phenytoin	1	1					Pentobarbital	130 mg/L in blood (unspecified) @ autopsy
		Pentobarbital/phenytoin	1	1					Phenytoin	3.4 mg/L in blood (unspecified) @ autopsy
		Pentobarbital/phenytoin	1	1					Phenytoin	7.5 mg/mL in blood (unspecified) @ 1 h (pe)
		Ethanol	2	2					Ethanol	167 mg/dL in blood (unspecified) @ 1 h (pe)

Listing of 1493 (1415 direct +78 indirect) fatalities classified as RCF category =1 – undoubtedly responsible, 2 – probably responsible, or 3 – contributory).

Annual Report ID: bracketed [case number]=narrative provided for this case in [Appendix C](#) i = indirect case; identified through other sources (news feeds, medical examiner data, or other) about which no inquiry to the PC was made; p: prehospital cardiac and/or respiratory arrest; h: hospital records reviewed; a: autopsy report reviewed.

Age gender: y: years; m: months; d: days; F: female; M: male; F: female; Pregnant: pregnant; U: unknown.

Chronicity: C: chronic exposure; A: acute exposure; A/C: acute on chronic; U: unknown.

Route: Aspir: aspiration (with ingestion); B-S: bite/sting; Derm: dermal; Ingst: ingestion; Inhal: inhalation/nasal; Oc: ocular; Ot: Otic; Oth: other; Par: parenteral; Rec: rectal; Unk: unknown; Vag: vaginal.

Reason: AR-D: adverse reaction – drug; AR-F: AR – food; AR-O: AR – other; Int-A: intentional – abuse; Int-M: Int – misuse; Int-S: Int – suspected suicide; Int-U: Int – unknown; Oth-C: other – contamination/tampering; Oth-M: Oth – malicious; Oth-W: Oth – withdrawal; Unk: unknown reason; Unt-B: unintentional – bite/sting; Unt-E: Unt – environmental; Unt-F: Unt – food poisoning; Unt-G: Unt – general; Unt-M: Unt – misuse; Unt-O: Unt – occupational; Unt-T: Unt – therapeutic error; Unt-U : Unt – unknown

RCF (Relative Contribution to Fatality): 1 – undoubtedly responsible, 2 – probably responsible, 3 – contributory. Provided by the RPC for Indirect cases and the AAPCC Fatality Review Team for the direct (non-indirect) cases.

Table 22(A). Demographic profile of SINGLE SUBSTANCE Nonpharmaceuticals exposure cases by generic category

	No. of Case Mentions	No. of Single Exposures	Age				Reason				Outcome										
			<=5	6-12	13-19	>=20	Unknown Child	Unknown Adult	Unknown Age	Unint	Int	Other	Adv Rxn	Treated in Health Care Facility	None	Minor	Moderate	Major	Death		
Non-Pharmaceuticals	Adhesives/glues																				
	Miscellaneous adhesives/glues	4562	4506	2182	358	237	1395	9	289	36	4339	107	27	23	1246	676	891	148	1	0	
	Cyanoacrylates (superglues, etc.)	594	531	144	17	22	289	2	51	6	502	12	4	10	165	75	132	33	1	0	
	Epoxy	1093	956	597	227	57	54	6	15	0	891	57	6	1	34	129	44	2	0	0	
	Non-toxic adhesives/glues (white glue, paper glue, etc.)	259	246	126	14	16	73	1	12	4	228	11	0	7	43	60	42	9	0	0	
	Toluene/xylene (adhesives only)	3618	3383	1643	324	159	984	12	231	30	3140	143	29	61	607	607	511	91	3	0	
	Unknown types of adhesive, glue, cement or paste	10126	9622	4692	940	491	2795	30	598	76	9100	330	66	102	2095	1547	1620	283	5	0	
	Alcohols																				
	Miscellaneous alcohols	53885	7802	1849	197	1047	4060	10	495	144	2513	4593	309	190	3749	926	1731	1122	229	9	
	Ethanol (beverages)	3457	2324	1480	96	94	570	5	65	14	1995	277	24	17	349	434	204	91	9	1	
	Ethanol (non-beverage, non-rubbing)	115	88	40	9	5	31	0	3	0	80	4	0	1	26	16	19	1	2	0	
	Higher alcohols (butanol, amyl alcohol, propanols, etc.)	3088	2633	1091	134	126	1116	4	146	16	1977	580	31	17	769	488	494	232	28	1	
	Isopropanol (excluding rubbing alcohols and cleaning agents)	647	526	107	17	30	326	1	40	5	430	63	13	1	248	122	86	36	13	11	
	Methanol (excluding automotive products and cleaning agents)	207	190	124	8	11	38	0	7	2	178	7	0	4	28	41	11	5	0	1	
	Other types of alcohol	817	239	52	4	21	137	1	21	3	104	107	1	5	121	19	52	34	10	2	
	Unknown types of alcohol																				
	Rubbing alcohols	9	8	2	0	0	5	0	1	0	0	8	0	0	0	4	0	0	0	0	
	Rubbing alcohols: ethanol with methyl salicylate																				
	Rubbing alcohols: ethanol without methyl salicylate	184	175	115	4	10	42	0	4	0	0	155	16	1	0	27	45	25	3	0	0
	Rubbing alcohols: isopropanol with methyl salicylate	243	227	163	6	2	48	0	7	1	207	18	0	0	55	88	32	7	0	0	
	Rubbing alcohols: isopropanol without methyl salicylate	8830	8023	4515	265	346	2525	11	314	47	6720	1166	61	32	1723	1584	1260	389	30	1	
	Rubbing alcohols: unknown	72	54	24	4	2	23	0	1	0	45	9	0	0	18	11	11	5	0	0	
	Category total:	71554	22289	9562	744	1694	8921	32	1104	232	14,412	6840	440	267	7113	3778	3925	1925	321	26	
	Arts/crafts/office supplies																				
	Miscellaneous arts/crafts/office supplies	3335	3217	2463	256	89	345	8	54	2	3129	66	5	15	110	433	149	11	0	0	
Artist paints (non-water color)	1578	1545	1313	129	32	59	6	3	3	1514	27	1	3	29	211	11	1	0	0		
Artist paints (water color)	1979	1942	1800	73	27	30	6	3	3	1918	16	4	2	46	268	63	0	0	0		
Chalks	2237	2188	1857	179	58	68	6	18	2	2157	27	0	2	101	220	90	7	0	0		
Clays	1951	1887	1561	169	45	88	11	12	1	1846	32	1	3	48	194	41	1	0	0		
Crayons	112	110	41	24	13	26	1	5	0	102	6	1	1	8	20	16	1	0	0		
Glazes	104	96	50	9	6	19	0	11	1	86	9	0	1	12	20	6	1	0	0		
Office supplies: miscellaneous	6460	6124	4523	704	240	488	17	141	11	5883	187	19	24	213	851	243	19	1	0		
Other types of arts/crafts/writing products																					
Pencils	1264	1213	522	497	97	64	8	19	6	1070	115	17	4	58	132	56	2	0	0		
Pens or inks	8545	8301	5518	1635	670	333	20	105	20	7761	426	36	62	271	1014	224	11	0	0		
Typewriter correction fluids	588	574	363	89	50	50	3	15	4	536	27	5	2	46	124	41	4	0	0		
Unknown types of arts/crafts/writing products	127	122	85	16	6	10	1	3	1	118	3	1	0	4	34	6	0	0	0		
Category total:	28280	27319	20096	3780	1333	1580	87	389	54	26,120	941	90	119	946	3521	946	58	1	0		
Automotive/aircraft/boat products																					
Automotive products	898	834	231	14	42	475	2	66	4	792	33	4	1	297	170	206	48	2	0		
Automotive products: brake fluids	6374	5783	495	191	489	4014	13	478	103	4823	726	146	12	2285	1113	934	448	124	7		
Automotive products: ethylene glycol (including antifreeze)	134	119	34	7	9	60	0	9	0	105	12	1	1	51	32	12	1	0	1		
Automotive products: glycol and methanol mixtures																					
Automotive products: hydrocarbons (transmission fluids, power steering fluids, etc.)	1978	1879	658	60	119	900	3	124	15	1774	65	20	10	574	420	573	95	3	0		

Continued

(continued)



Table 22(A). Demographic profile of SINGLE SUBSTANCE Nonpharmaceuticals exposure cases by generic category – Continued

	No. of Case Mentions	No. of Single Exposures	Age						Reason			Outcome							
			<=5	6-12	13-19	>=20	Unknown Child	Unknown Adult	Unknown Age	Unit	Int	Other	Adv Rxn	Treated in Health Care Facility	None	Minor	Moderate	Major	Death
Automotive products: methanol (dry gas, windshield washing solutions, etc.)	1206	1122	187	40	91	664	2	124	14	989	103	15	2	366	263	254	43	7	4
Automotive products: other glycols	160	151	52	6	9	69	0	15	0	134	8	7	1	41	34	23	3	3	0
Miscellaneous automotive/aircraft/boat products	16	13	7	1	1	4	0	0	0	10	2	1	0	4	1	0	1	0	0
Automotive/aircraft/boat products: non-toxic	1408	1356	521	63	84	581	3	97	7	1301	17	15	20	410	263	357	99	2	0
Automotive/aircraft/boat products: other	201	190	45	8	10	107	1	13	6	162	16	8	1	92	34	53	17	1	3
Automotive/aircraft/boat products: unknown	12,375	11,447	2230	390	854	6874	24	926	149	10,090	982	217	48	4120	2330	2412	755	142	15
Batteries																			
Disc batteries	474	471	292	64	18	81	2	13	1	451	14	1	3	345	247	44	10	0	0
Disc batteries: alkaline (MNO2)	186	137	72	14	9	36	0	5	1	106	15	1	11	124	34	29	32	9	3
Disc batteries: lithium	6	6	3	1	0	2	0	0	0	5	0	1	0	3	4	0	0	1	0
Disc batteries: mercuric oxide	5	5	1	1	0	3	0	0	0	5	0	0	0	2	2	0	0	0	0
Disc batteries: nickel cadmium	5	5	2	1	0	3	0	1	0	5	0	0	0	3	2	0	0	0	0
Disc batteries: other	36	35	19	3	2	10	1	1	0	33	1	1	0	23	18	5	0	0	0
Disc batteries: silver oxide	2702	2638	1712	311	67	468	15	61	4	2513	90	13	9	1914	1269	122	40	15	1
Disc batteries: unknown	235	229	62	13	0	150	0	3	1	225	3	1	0	120	160	8	0	0	0
Disc batteries: zinc-air																			
Miscellaneous batteries	628	614	47	15	27	411	33	70	11	601	8	3	2	172	67	152	48	0	0
Automotive/aircraft/boat batteries	247	226	37	13	31	120	0	23	2	208	9	7	2	58	40	35	17	0	0
Other types of battery	5370	5230	3215	532	259	959	21	220	24	4697	435	56	19	1010	1375	511	85	3	0
Penlight/flashlight/dry cell batteries	59	55	21	4	2	27	0	1	0	52	2	1	0	7	12	7	0	0	0
Unknown types of battery	9953	9651	5483	972	415	2268	71	398	44	8901	577	85	46	3781	3230	913	232	28	4
Category total:																			
Bites and envenomations																			
Aquatic	520	516	12	19	54	384	0	41	6	502	7	0	7	238	10	166	81	1	0
Fish stings	210	208	20	48	21	95	2	16	6	206	0	1	1	49	1	53	33	0	0
Jellyfish and other coelenterate stings	283	272	140	20	19	76	1	13	3	254	8	6	4	48	44	37	7	0	0
Other or unknown marine animal bites and/or envenomations																			
Exotic snakes	30	30	1	8	5	15	0	1	0	30	0	0	0	21	0	10	5	1	0
Exotic snakes: non-poisonous	50	50	2	4	5	34	0	3	2	48	0	1	1	37	1	13	15	5	0
Exotic snakes: poisonous																			
Insects	618	578	164	61	32	267	0	48	6	547	5	22	4	63	20	168	29	1	0
Ant or fire ant bites	3446	3348	633	315	161	1881	10	307	41	3343	0	0	5	556	24	1173	269	11	3
Bee, wasp, or hornet stings	1609	1599	414	226	144	705	4	92	14	1576	8	1	10	283	43	589	68	0	0
Caterpillars	619	611	133	48	29	364	0	30	7	600	3	6	2	90	27	209	31	0	0
Centipede or millipede bites	930	178	34	8	9	83	1	38	5	171	0	0	7	35	4	47	8	0	0
Mosquito bites	5060	4879	1088	322	298	2568	29	522	52	4706	13	105	39	852	189	1051	286	4	0
Other insect bites and/or stings	13,670	13,645	1508	1443	1117	9021	5	393	158	13,642	0	0	0	1469	81	8925	622	22	0
Scorpion stings	719	695	187	76	32	297	7	87	9	693	0	1	1	137	36	96	11	1	0
Tick bites																			
Mammals	590	587	84	57	52	282	14	84	14	578	1	1	1	367	125	67	2	0	0
Bat bites	581	575	36	49	43	372	5	60	10	573	0	0	2	385	6	218	31	0	0
Cat bites	2295	2289	306	449	230	1168	9	102	25	2289	0	0	0	1799	23	1052	157	5	0
Dog bites	11	11	0	1	1	8	0	0	0	11	0	0	0	8	0	2	1	0	0
Fox bites	14	13	2	1	0	8	0	2	0	12	0	1	0	7	0	5	1	0	0
Human bites	646	640	58	77	63	346	9	65	22	619	0	4	4	344	60	142	18	0	0
Other mammal bites	136	136	7	13	17	80	1	18	1	134	0	1	0	77	16	34	8	0	0
Raccoon bites	840	821	202	119	67	333	8	83	9	779	3	30	5	264	45	199	12	0	0
Rodent or lagomorph bites (squirrels, rats, mice, gerbils, hamsters, rabbits, etc.)																			
Skunk bites	16	15	2	1	1	6	0	2	3	15	0	0	0	11	0	3	0	0	0
Miscellaneous bites and envenomations																			

(continued)

Table 22(A). Demographic profile of SINGLE SUBSTANCE Nonpharmaceuticals exposure cases by generic category – Continued

No. of Case Mentions	No. of Single Exposures	Age							Reason			Outcome						
		<=5	6-12	13-19	>=20	Unknown Child	Unknown Adult	Unknown Age	Unint	Int	Other	Adv Rxn	Treated in Health Care Facility	None	Minor	Moderate	Major	Death
Other or unknown animal bites	250	245	22	31	19	135	0	32	239	4	0	0	91	9	82	29	1	0
Other or unknown reptile bites	341	335	145	45	30	87	3	20	319	5	3	5	67	40	96	15	0	0
Unknown types of insect or spider bite and/or envenomation	2350	2290	593	150	118	1135	6	201	2264	4	12	7	346	57	567	119	1	0
Miscellaneous snake bites and envenomations																		
Unknown or known non-poisonous snake bites	680	672	48	105	90	392	1	31	670	1	0	1	415	36	344	46	2	0
Unknown types of snake envenomation	1830	1811	112	209	191	1237	0	47	1808	1	0	0	1620	45	807	566	34	1
Snakes																		
Copperhead envenomations	2048	2019	70	171	163	1587	1	22	2015	4	0	0	1962	16	580	1250	32	0
Coral envenomations	73	69	3	2	5	56	0	2	69	0	0	0	62	4	29	18	2	0
Cottonmouth envenomations	242	239	11	17	21	187	0	1	238	1	0	0	225	2	93	114	5	0
Rattlesnake envenomations	804	790	31	47	61	630	0	16	784	2	1	3	747	14	184	393	78	1
Unknown crotalid envenomations	994	975	58	76	85	738	0	14	968	2	2	2	923	12	234	530	77	2
Spiders																		
Black widow spider bites and/or envenomations	1330	1318	100	61	95	984	0	75	1315	1	0	2	662	38	378	290	5	0
Brown recluse spider bites and/or envenomations	1166	1156	105	70	87	737	3	142	1147	3	2	1	469	15	280	217	14	0
Other necrotizing spider bites and/or envenomations	86	85	17	10	5	46	0	6	85	0	0	0	21	3	21	6	0	0
Other spider bites and/or envenomations	3280	3245	357	189	230	2095	6	335	3228	6	5	1	716	79	851	256	2	0
Tarantula bites and/or envenomations	44	44	3	5	2	31	0	2	43	0	0	1	14	0	14	2	0	0
Category total: Building and construction products	48,411	46,989	6708	4553	3602	28,470	124	2955	46,520	82	205	116	15,480	1125	18,819	5546	304	7
Insulation																		
Asbestos	315	272	39	14	19	136	7	51	269	0	1	2	53	47	16	1	1	0
Fiberglass	461	435	194	30	26	146	1	34	407	13	4	8	77	55	70	14	0	0
Other types of insulation	100	91	34	6	1	37	0	13	87	2	1	1	24	9	20	3	0	0
Unknown types of insulation	450	422	262	23	18	90	1	26	409	8	0	2	43	74	41	3	1	0
Urea or formaldehyde insulations	10	8	6	0	0	2	0	0	8	0	0	0	1	4	1	0	0	0
Miscellaneous building and construction products																		
Caulking compounds and construction putties	2458	2375	1623	98	49	443	27	117	2312	36	2	23	177	495	143	26	1	0
Cement or concrete (excluding glues)	1155	1099	345	26	43	601	3	77	1069	18	1	6	449	151	235	185	9	0
Other types of building or construction products	2179	1997	1001	82	66	686	11	134	1931	32	9	19	391	384	327	88	5	0
Soldering flux	171	166	55	4	15	76	1	10	159	4	0	3	49	34	40	16	0	0
Unknown types of building or construction products	99	97	20	2	1	36	1	33	96	0	0	1	22	13	32	5	0	0
Category total: Chemicals	7398	6962	3579	285	238	2253	52	495	6747	113	18	65	1286	1266	925	341	17	0
Acids																		
Hydrochloric acid	1790	1468	73	36	178	1008	4	143	1378	41	18	18	575	150	510	165	14	2
Hydrofluoric acid	681	598	19	7	24	492	0	39	567	17	5	3	479	83	234	119	6	2
Other types of acid	4651	3944	534	189	269	2389	6	505	3732	98	50	40	1444	514	1144	434	26	0
Unknown types of acid	151	126	7	2	10	92	0	13	115	2	5	3	74	7	30	31	1	0
Miscellaneous chemicals																		
Acetone (excluding nail polish removers)	1425	1220	434	51	76	530	1	80	1114	55	30	6	355	189	295	53	4	0
Alkalis (excluding cleaning agents, bleaches, batteries, and detergents)	3840	3403	582	107	286	2014	12	367	3192	90	46	38	1712	325	1021	587	57	1
Ammonia (excluding cleaning agents)	2861	1992	428	97	122	1150	6	167	1857	70	31	22	729	259	585	178	12	1
Borates or boric acid (excluding topical and pesticides)	3875	3467	1693	302	140	1111	1	199	3212	143	62	39	515	648	289	43	1	1
Chlorates (excluding matches)	28	24	8	1	4	10	0	1	23	0	0	0	8	3	7	1	0	0
(continued)																		

(continued)



Table 22(A). Demographic profile of SINGLE SUBSTANCE Nonpharmaceuticals exposure cases by generic category – Continued

	No. of Case Mentions	No. of Single Exposures	Age				Reason				Outcome								
			<=5	6-12	13-19	>=20	Unknown Child	Unknown Adult	Unknown Age	Unit	Int	Other	Adv Rxn	Treated in Health Care Facility	None	Minor	Moderate	Major	Death
and fireworks)	268	198	10	1	4	136	2	40	5	135	17	34	1	132	51	42	17	7	6
Cyanides (excluding rodenticides)	4	4	1	0	0	3	0	0	0	4	0	0	0	1	0	1	0	0	0
Dioxins	711	542	46	6	26	424	0	36	4	303	179	15	0	387	78	72	93	72	10
Ethylene glycol (excluding automotive, aircraft, or boat products)	679	600	54	26	66	356	1	94	3	539	25	13	22	234	62	172	45	3	0
Formaldehyde or formalin	319	276	73	4	9	162	0	25	3	266	6	2	0	140	42	92	30	1	0
Ketones	154	139	27	13	9	77	0	10	3	135	3	1	0	56	17	33	15	2	0
Methylene chloride (excluding paint strippers)	971	898	272	215	111	241	4	50	5	740	132	8	10	211	178	133	36	5	2
Nitrates and nitrites (excluding medications and substances of abuse)	12,018	10,492	4067	811	636	4020	40	787	131	9538	389	150	351	2333	1610	1985	474	37	0
Other chemicals	733	555	217	26	26	247	1	33	5	483	26	10	26	152	97	85	22	2	0
Other glycols (excluding automotive, aircraft, or boat products)	267	243	21	11	9	153	0	45	4	230	7	0	6	103	50	61	41	1	0
Phenol or cresotes (excluding disinfectants)	34	27	10	3	2	9	0	3	0	18	4	2	2	7	4	2	2	1	1
Strychnine (excluding rodenticides)	502	464	114	16	19	250	1	57	7	443	16	1	1	150	45	107	33	2	0
Toluene diisocyanate	3506	3230	638	179	184	1709	21	430	69	2582	103	349	99	1140	343	685	248	16	1
Unknown chemicals	39,468	33,910	9328	2103	2210	16,583	100	3124	462	30,606	1423	832	687	10,937	4755	7585	2667	270	27
Category total:																			
Cleaning substances (household)																			
Automatic dishwasher detergents	1831	1815	1734	11	10	46	0	14	0	1808	1	5	0	109	487	291	7	0	0
Automatic dishwasher detergents: granules (unit dose)	2056	2020	1713	20	25	204	5	51	2	1981	8	24	2	103	432	235	10	1	0
Automatic dishwasher detergents: granules (various containers)	7281	7234	6851	52	35	240	5	44	7	7209	6	15	3	416	1692	1191	43	1	0
Automatic dishwasher detergents: granules with liquids (unit dose)	553	548	493	8	5	33	0	9	0	545	3	0	0	42	147	64	7	0	0
Automatic dishwasher detergents: liquids (unit dose)	1733	1688	1381	17	27	219	3	39	2	1655	12	17	2	138	396	207	27	1	0
Automatic dishwasher detergents: liquids (various containers)	3074	3045	2857	26	17	116	4	24	1	3024	8	8	2	145	810	380	8	1	0
Automatic dishwasher detergents: tablets	970	926	749	26	11	115	0	25	0	911	9	5	0	94	174	157	23	0	1
Automatic dishwasher rinse agents	1955	1929	1645	23	30	189	2	33	7	1891	21	15	1	126	346	225	13	1	0
Other or unknown types of automatic dishwasher detergent																			
Bleaches																			
Bleaches: borates	379	299	103	9	32	123	1	22	9	258	25	4	10	75	56	101	6	0	0
Bleaches: hypochlorite (liquid and dry)	42,025	35,427	13,632	1400	2929	14,776	68	2273	349	31,396	2955	603	293	9702	5053	10,129	1325	41	2
Bleaches: non-hypochlorite	343	276	107	13	21	107	0	26	2	249	17	2	6	64	51	73	9	0	1
Bleaches: other or unknown (household)	570	480	181	21	45	210	1	17	5	411	39	16	11	152	64	130	17	0	0
Cleaners																			
Anionic or nonionic cleansers	2072	1906	1461	41	40	304	4	50	6	1839	45	14	5	141	425	186	21	1	0
Other or unknown types of household cleanser	2826	2489	1564	85	88	616	10	115	11	2331	88	41	14	490	475	413	63	3	0
Disinfectants																			
Disinfectants: hypochlorite (non-bleach products)	2591	2213	950	84	107	886	6	162	18	2071	91	25	16	567	310	545	88	4	0
Disinfectants: other or unknown	6237	5852	3409	372	272	1460	16	275	48	5387	259	83	106	671	1129	1054	85	3	1
Disinfectants: phenol	743	713	448	71	29	133	0	28	4	655	46	10	1	88	152	100	12	0	0
Disinfectants: pine oil	3926	3417	1858	118	123	1135	8	156	19	3184	166	36	18	643	817	642	62	4	1
Drain cleaners																			
Drain cleaners: acids	139	113	17	6	3	68	1	17	1	99	4	4	4	34	23	22	16	1	0

continued

(continued)

Table 22(A). Demographic profile of SINGLE SUBSTANCE Nonpharmaceuticals exposure cases by generic category – Continued

No. of Case Mentions	No. of Single Exposures	Age										Reason					Outcome				
		<=5	6-12	13-19	>=20	Unknown Child	Unknown Adult	Unknown Age	Unit	Int	Other	Adv Bsn	Treated in Health Care Facility	None	Minor	Moderate	Major	Death			
2771	2366	362	47	101	1556	1	269	30	2202	105	12	36	718	332	640	265	34	7			
29	17	2	0	0	14	0	1	0	13	4	0	0	8	0	0	4	1	1			
850	654	88	20	28	406	1	90	21	591	39	14	5	186	74	148	55	5	0			
498	370	30	18	15	263	0	39	5	352	13	1	4	136	27	104	76	3	0			
32	29	24	0	1	4	0	0	0	27	1	1	0	4	7	1	0	0	0			
109	108	92	3	1	11	0	1	0	106	1	1	0	4	19	10	0	0	0			
7	6	0	0	0	1	0	0	0	7	0	0	0	0	1	0	0	0	0			
24	21	17	1	0	2	0	1	0	18	1	0	1	2	4	1	0	0	0			
15	12	7	0	2	2	0	0	1	11	1	0	0	4	4	1	1	0	0			
902	817	594	25	21	151	1	23	2	783	24	5	4	97	170	99	4	1	0			
5	5	4	0	0	0	0	1	0	5	0	0	0	1	1	3	0	0	0			
686	667	557	21	22	57	1	6	3	645	9	3	8	29	117	31	2	0	0			
1564	1398	1092	45	43	180	2	29	7	1313	66	13	2	127	312	164	14	1	0			
105	92	52	2	7	25	0	6	0	83	8	0	1	11	25	11	3	0	0			
1338	1393	953	71	76	235	2	44	12	1297	72	19	2	151	323	158	14	0	0			
1619	1438	965	80	86	253	3	46	5	1310	105	11	6	191	270	188	18	0	0			
5548	4875	3044	238	125	1192	9	252	15	4622	97	114	28	398	578	839	57	4	1			
2306	1976	1141	87	57	590	4	90	7	1861	44	57	12	139	181	284	15	1	0			
68	61	28	3	2	26	0	2	0	59	0	1	0	17	10	19	3	0	0			
35	30	17	3	2	8	0	0	0	28	0	1	1	4	6	8	0	0	0			
384	355	257	24	4	61	0	7	2	343	7	4	1	37	93	60	4	0	0			
1351	1281	1073	42	30	103	5	27	1	1241	16	17	6	112	271	145	14	0	0			
51	47	27	3	4	11	0	2	0	45	0	2	0	3	10	7	0	0	0			
315	304	243	6	5	43	0	7	0	294	6	3	1	48	90	71	5	0	0			
2646	2509	1877	81	75	392	3	76	5	2405	67	17	12	368	475	492	35	4	0			
308	301	272	10	4	13	1	0	1	297	1	1	2	118	59	123	9	2	0			
12,816	12,474	11,260	520	150	441	24	67	12	12,323	112	12	18	5009	2445	5662	692	16	0			
7706	7408	5663	224	219	1089	5	189	19	7138	196	44	16	1407	1276	1814	191	8	0			
241	226	144	11	12	43	1	13	2	211	12	2	1	65	39	61	8	0	0			
150	135	93	2	4	25	0	11	0	124	4	1	6	22	24	16	8	0	0			
197	189	169	1	2	14	0	2	1	187	2	0	0	16	34	38	5	0	0			

(continued)



Table 22(A). Demographic profile of SINGLE SUBSTANCE Nonpharmaceuticals exposure cases by generic category – Continued

	No. of Case Mentions	No. of Single Exposures	Age					Reason				Outcome								
			<=5	6-12	13-19	>=20	Unknown Child	Unknown Adult	Unknown Age	Unit	Int	Other	Adv Rxn	Treated in Health Care Facility	None	Minor	Moderate	Major	Death	
removers: aerosol or spray solvent based	243	230	189	4	5	24	1		7	0	225	3	1	1	26	34	49	4	0	0
Laundry prewash/stain removers: aerosol or spray surfactant based	84	81	62	0	2	15	0	2		0	79	1	0	1	5	9	8	2	0	0
Laundry prewash/stain removers: dry surfactant based	248	241	187	8	5	34	0	0	7	0	237	0	1	2	31	69	36	5	0	0
Laundry prewash/stain removers: liquid solvent based	1598	1535	1318	28	28	130	3	27	1	1497	30	4	3	3	150	284	265	21	0	0
Laundry prewash/stain removers: liquid surfactant based	1957	1862	1420	36	35	312	1	54	4	1822	14	10	15	189	347	314	33	0	0	0
Laundry prewash/stain removers: other or unknown	31	29	25	0	0	3	0	1	0	28	1	0	0	5	5	9	0	0	0	0
Laundry prewash/stain removers: other or unknown solvent based																				
Laundry prewash/stain removers: other or unknown surfactant based	44	42	33	1	1	7	0	0	0	42	0	0	0	2	7	8	0	0	0	0
Miscellaneous cleaners																				
Miscellaneous cleaning agents: acids	1193	1023	412	29	33	456	0	82	11	954	31	19	16	240	197	250	43	1	0	0
Miscellaneous cleaning agents: alkalis	7275	6466	3822	209	245	1822	12	320	36	6102	248	78	26	1313	1241	1288	266	13	2	2
Miscellaneous cleaning agents: anionics or nonionics	5051	4583	2958	171	159	1094	18	169	14	4310	170	56	35	655	783	724	76	2	0	0
Miscellaneous cleaning agents: cationics	2642	2449	1295	107	137	749	23	128	10	2263	122	30	24	453	453	457	77	0	0	0
Miscellaneous cleaning agents: ethanol (excluding automotive products)	527	489	350	27	13	83	0	14	2	470	14	2	1	40	111	61	5	0	0	0
Miscellaneous cleaning agents: glycols (excluding automotive products)	443	399	228	15	21	112	0	21	2	369	19	6	3	73	77	64	6	0	0	0
Miscellaneous cleaning agents: isopropanol (excluding automotive products and glass)	1736	1635	1001	167	99	297	3	63	5	1535	67	22	7	143	278	209	16	2	0	0
Miscellaneous cleaning agents: methanol (excluding automotive products)	29	27	15	0	0	10	0	2	0	26	1	0	0	11	9	7	1	0	0	0
Miscellaneous cleaning agents: other or unknown household cleaning agents	4956	4575	2689	247	209	1141	11	234	44	4241	201	79	35	891	1017	891	128	6	1	0
Miscellaneous cleaning agents: phenol (excluding disinfectants)	10	10	5	0	0	4	0	1	0	10	0	0	0	1	4	0	1	0	0	0
Miscellaneous cleaning substances (household)																				
Ammonia cleaners (all purpose)	736	559	176	29	29	265	2	54	4	524	20	9	5	110	95	155	27	1	0	0
Carpet, upholstery, leather, or vinyl cleaners	3278	3084	2190	96	81	598	6	103	10	2981	50	27	22	361	555	476	34	1	0	0
Hydrofluoric acid or bifluoride wheel cleaners	67	66	11	1	6	46	0	2	0	65	1	0	0	50	5	31	12	2	0	0
Starches, fabric finishes, or sizing	233	213	169	13	2	22	0	7	0	209	3	1	0	10	55	14	0	0	0	0
Oven cleaners																				
Oven cleaners: acids	8	8	0	1	0	6	0	1	0	8	0	0	0	3	1	3	0	0	0	0
Oven cleaners: alkalis	1935	1864	278	63	157	1143	15	191	17	1705	38	88	32	693	177	547	229	14	0	0
Oven cleaners: detergent types	10	7	3	0	0	4	0	0	0	7	0	0	0	4	3	0	2	0	0	0
Oven cleaners: other or unknown	258	245	45	8	9	150	0	30	3	221	3	14	7	89	26	73	20	1	0	0
Rust removers																				
Rust removers: acids other than hydrofluoric acid types	359	299	99	7	8	155	0	30	0	275	12	7	4	76	70	74	21	0	0	0
Rust removers: alkalis	10	9	1	0	1	5	0	1	1	8	1	0	0	7	1	2	1	1	0	0
Rust removers: anionics or nonionics	1	1	1	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0
Rust removers: hydrofluoric acid	228	217	27	8	0	165	0	15	2	202	11	1	1	97	52	66	30	1	0	0
Rust removers: other or unknown	157	133	28	1	5	84	0	13	2	125	6	0	2	28	18	40	9	0	0	0

(continued)

(continued)

Table 22(A). Demographic profile of SINGLE SUBSTANCE Nonpharmaceuticals exposure cases by generic category – Continued

	No. of Case Mentions	No. of Single Exposures	Age					Reason			Outcome								
			<=5	6-12	13-19	>=20	Unknown Child	Unknown Adult	Unknown Age	Unint	Int	Other	Adv Rxn	Treated in Health Care Facility	None	Minor	Moderate	Major	Death
Spot removers/dry cleaning agents	121	114	81	2	2	23	0	6	0	111	2	0	1	12	20	16	1	0	0
Spot removers/dry cleaning agents: anionics or nonionics	93	85	59	2	1	21	1	0	1	81	1	1	2	7	14	13	2	0	0
Spot removers/dry cleaning agents: glycols	45	44	31	1	2	9	0	1	0	43	0	0	1	3	7	5	1	0	0
Spot removers/dry cleaning agents: isopropanol	23	20	14	0	0	6	0	0	0	20	0	0	0	3	5	5	0	0	0
Spot removers/dry cleaning agents: other halogenated hydrocarbon containing products	375	356	209	7	19	108	1	10	2	350	4	2	0	82	82	69	12	1	0
Spot removers/dry cleaning agents: other hydrocarbon and/or non-halogenated containing	104	97	71	2	3	18	0	3	0	93	4	0	0	19	20	8	1	0	0
Spot removers/dry cleaning agents: other or unknown	9	8	6	0	0	1	0	1	0	8	0	0	0	2	4	0	1	0	0
Spot removers/dry cleaning agents: perchloroethylene																			
Toilet bowl cleaners	2794	2258	1265	57	92	694	3	130	17	2148	91	10	6	460	595	557	88	8	1
Toilet bowl cleaners: acids	4456	4158	3366	61	83	515	8	109	16	4067	79	3	7	527	1254	595	48	3	1
Toilet bowl cleaners: alkalis	3640	3410	2957	59	48	273	4	62	7	3351	40	6	10	328	833	287	27	0	0
Toilet bowl cleaners: other or unknown																			
Wall/floor/file cleaners	1565	1315	823	36	50	343	1	57	5	1232	49	11	17	226	310	250	42	3	1
Wall/floor/file/all-purpose cleaning agents: acids	6511	5899	3843	170	238	1405	15	208	20	5559	218	55	59	1117	1156	1417	199	7	0
Wall/floor/file/all-purpose cleaning agents: alkalis	8596	7683	4862	261	282	1982	8	252	36	7263	275	97	26	1266	1628	1102	119	6	1
Wall/floor/file/all-purpose cleaning agents: anionics or nonionics	2339	2083	1371	83	95	444	4	78	8	1939	102	24	13	290	366	413	35	0	1
Wall/floor/file/all-purpose cleaning agents: cationics	302	277	210	8	5	41	1	10	2	265	4	2	6	20	55	38	3	0	0
Wall/floor/file/all-purpose cleaning agents: ethanol	891	807	610	19	19	129	1	28	1	787	14	3	1	84	178	98	5	1	0
Wall/floor/file/all-purpose cleaning agents: glycols	435	403	320	17	6	50	0	9	1	385	10	5	2	25	97	56	2	0	0
Wall/floor/file/all-purpose cleaning agents: isopropanol	1	1	0	0	0	1	0	0	0	1	0	0	0	0	1	0	0	0	0
Wall/floor/file/all-purpose cleaning agents: methanol	1577	1474	1004	44	48	314	4	52	8	1387	56	19	11	241	298	253	29	1	0
Wall/floor/file/all-purpose cleaning agents: other or unknown	195,404	176,828	111,445	6096	7230	43,504	343	7276	934	166,476	6832	1976	1072	33,700	33,223	38,650	5025	217	23
Category total:																			
Cosmetics/personal care products																			
Dental care products																			
False teeth cleaning agents	2436	2415	309	35	46	1830	1	182	12	2331	38	13	26	111	362	181	13	0	0
Other dental care products (excluding fluoride supplements)	1550	1506	553	98	89	627	1	126	12	1361	45	3	90	142	219	166	21	0	0
Toothpastes (with fluoride)	17,337	16,931	14,886	509	271	1026	12	203	24	16,492	196	48	181	300	2895	865	32	0	0
Toothpastes (without fluoride)	1741	1673	1443	35	33	125	4	31	2	1628	13	5	27	27	214	79	4	1	0
Hair care products																			
Curl activators	52	47	36	1	2	6	1	1	0	45	0	0	2	6	12	4	0	0	0
Hair coloring agents (excluding peroxides)	2210	2126	1052	41	111	771	3	127	21	1856	33	10	223	421	368	395	85	4	0
Hair oils	550	534	486	8	7	25	1	7	0	528	4	0	2	80	110	47	8	1	0
Hair relaxers (with other alkalines)	209	209	148	7	5	44	0	5	0	201	1	0	7	95	38	75	17	2	0
Hair relaxers (with other non-alkalines)	51	49	37	0	0	12	0	0	0	48	0	0	1	13	15	10	1	0	0
Hair relaxers (with sodium hydroxide)	399	393	269	8	13	85	0	14	4	371	4	1	16	194	74	116	45	3	0
Hair rinses, conditioners, relaxers	2130	1973	1677	60	49	146	0	39	2	1908	45	4	16	151	398	185	17	1	0
Hair sprays	1333	1187	782	55	65	240	3	36	6	1037	126	11	8	166	238	167	25	2	0
Other hair care products (excluding peroxides)	2811	2702	2004	95	110	389	3	92	9	2548	55	6	91	374	496	380	61	5	0
Permanent wave solutions	155	151	82	1	2	49	0	15	2	141	2	1	7	56	30	44	11	1	0

(continued)

(continued)



Table 22(A). Demographic profile of SINGLE SUBSTANCE Nonpharmaceuticals exposure cases by generic category – Continued

	No. of Case Mentions	No. of Single Exposures	Age					Reason				Outcome							
			<=5	6-12	13-19	>=20	Unknown Child	Unknown Adult	Unknown Age	Unit	Int	Other	Adv Rxn	Treated in Health Care Facility	None	Minor	Moderate	Major	Death
Shampoos	5825	5494	4119	283	188	750	10	126	18	5222	167	19	78	501	667	926	70	3	0
Hand sanitizers	20,531	19,949	15,625	1656	589	1816	21	221	21	18,211	1397	274	14	1588	5120	1458	248	20	1
Hand sanitizers: ethanol based	184	179	141	13	4	18	0	1	2	162	15	1	0	11	51	12	2	0	0
Hand sanitizers: non-alcohol based	1865	1826	1465	148	57	128	8	18	2	1754	56	14	1	88	361	106	9	0	0
Hand sanitizers: unknown	651	602	346	105	41	92	4	12	2	490	79	28	0	96	119	85	17	1	0
Miscellaneous cosmetics/personal care products																			
Baby oils	1578	1535	1405	17	20	80	1	11	1	1514	10	2	5	127	315	141	13	0	0
Bath oils and/or bubble baths	2715	2637	2347	133	26	99	6	23	3	2581	29	2	22	120	416	234	7	0	0
Creams, lotions, and make-up	21,839	21,035	17,395	646	461	2024	34	388	87	20,165	244	55	543	681	2788	1126	73	2	0
Deodorants	16,597	16,360	14,665	369	449	716	15	133	13	15,850	279	25	189	538	2172	1032	44	0	1
Depilatories	694	668	211	24	91	268	2	61	11	452	50	7	157	163	81	164	51	2	0
Douches	56	56	37	3	1	11	0	4	0	52	1	0	3	5	12	12	1	0	0
Eye products	1478	1420	1187	43	39	119	0	30	2	1376	11	2	28	67	195	87	17	2	0
Lipsticks and lip balms (with camphor)	875	863	754	42	16	32	1	14	4	842	13	2	6	19	129	37	4	0	0
Lipsticks and lip balms (without camphor)	5174	5029	4465	149	65	239	12	59	40	4706	35	4	281	95	588	360	21	0	0
Perfumes, colognes, and aftershaves	8586	8281	6617	475	371	624	41	138	15	7796	320	126	23	739	1696	1461	54	0	0
Peroxides	6923	6437	2123	272	375	3059	6	537	65	5886	283	44	199	1129	778	1418	238	10	1
Powders made of material other than talc	1773	1737	1536	56	24	98	3	16	4	1685	26	16	8	113	279	304	18	1	0
Powders made of talc	2042	1998	1470	79	59	138	6	40	206	1726	46	212	10	245	537	342	26	0	0
Soaps (bar, hand or complexion)	13,487	12,771	9257	640	421	2071	26	312	44	12,110	393	73	170	812	1,511	1660	103	3	0
Suntan and/or sunscreen products	8960	8831	7712	426	151	430	17	80	15	8629	49	28	124	293	1145	893	39	0	0
Mouthwashes																			
Mouthwashes: ethanol containing	6320	5700	1645	493	392	2733	3	402	32	4630	990	28	25	941	801	586	216	15	2
Mouthwashes: fluoride containing	5471	5415	3690	1010	97	540	2	72	4	5337	59	8	10	83	926	143	3	0	0
Mouthwashes: non ethanol containing	1661	1606	700	156	66	570	3	107	4	1511	66	1	23	64	270	92	9	0	0
Mouthwashes: unknown	207	180	57	13	7	83	1	17	2	152	21	1	4	26	27	16	2	1	0
Nail products																			
Acrylic nail adhesives	932	919	335	161	106	281	4	27	5	881	28	1	6	412	111	258	61	1	0
Acrylic nail primers	211	202	171	3	3	18	0	7	0	200	0	0	2	68	37	49	14	1	0
Acrylic nail removers	12	10	6	0	0	4	0	0	0	10	0	0	0	4	1	4	1	0	0
Miscellaneous nail products	696	675	479	22	14	130	0	26	4	653	7	2	12	123	139	126	15	0	0
Nail polish removers (acetone containing)	2058	2011	1391	99	99	361	4	55	2	1917	67	21	2	245	468	285	25	1	0
Nail polishes	7094	6866	6058	246	150	340	12	53	7	6720	103	19	17	487	1190	691	20	2	0
Other nail polish removers	727	705	538	32	33	82	0	19	1	670	25	6	4	67	187	84	6	0	0
Unknown nail polish removers	6410	6172	4293	325	325	1006	6	199	18	5918	179	44	10	817	1233	914	38	0	0
Category total:	186,596	180,065	136,004	9092	5543	24,335	277	4086	728	170,303	5610	1167	2673	12,903	29,819	17,820	1805	85	5
Deodorizers																			
Air freshener																			
Air fresheners: aerosols	2129	2055	1395	156	66	344	8	78	8	1935	71	24	19	182	379	327	21	0	0
Air fresheners: liquids	8975	8873	7788	260	142	551	13	110	9	8713	90	53	13	624	1746	1159	51	2	0
Air fresheners: solids	2776	2754	2465	86	28	148	7	18	2	2714	21	10	7	208	527	211	8	0	0
Air fresheners: unknown form	1796	1770	1487	64	28	161	2	26	2	1732	24	7	6	144	350	220	10	0	0
Miscellaneous deodorizers																			
Diaper pail deodorizers (excluding moth repellants)	13	13	12	0	0	1	0	0	0	13	0	0	0	0	3	0	0	0	0
Other types of deodorizer (not for personal use)	5463	5237	3778	220	161	905	14	147	12	5039	131	32	31	546	1069	719	53	2	3
Toilet bowl deodorizers	508	500	430	9	5	47	1	6	2	491	5	0	2	62	119	32	2	0	0
Unknown types of deodorizer (not for personal use)	69	64	43	5	1	12	1	0	2	62	1	0	1	16	8	13	0	0	0
Category total:	21,729	21,266	17,398	800	431	2169	46	385	37	20,699	343	126	79	1782	4201	2681	145	4	3
Dyes																			
Miscellaneous dyes																			
Dyes: chlorate containing	1	1	1	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0
Dyes: fabrics	295	284	199	25	11	40	1	7	1	268	7	2	7	21	62	13	0	0	0
Dyes: foods (including Easter egg)	788	723	584	67	23	39	3	7	0	695	20	0	6	16	101	35	5	0	0
(continued)																			

(continued)



Table 22(A). Demographic profile of SINGLE SUBSTANCE Nonpharmaceuticals exposure cases by generic category – Continued

No. of Case Mentions	No. of Single Exposures	Age					Reason			Outcome								
		<=5	6-12	13-19	>=20	Unknown Child	Unknown Adult	Unknown Age	Unit	Int	Other	Adv Rxn	Treated in Health Care Facility	None	Minor	Moderate	Major	Death
Dyes: leathers	59	47	3	1	5	0	3	0	59	0	0	0	5	20	4	0	0	0
Dyes: other	408	375	158	66	78	59	12	1	342	16	1	15	45	69	32	5	1	0
Dyes: unknown	98	59	35	2	4	13	5	0	51	4	0	4	9	14	5	0	0	0
Category total:	1649	1501	1024	163	117	156	34	2	1416	47	3	32	97	266	89	10	1	0
Essential oils																		
Miscellaneous essential oil																		
Cinnamon oil	615	546	359	56	26	81	18	2	445	63	1	35	64	47	181	15	0	0
Clove oil	582	528	359	12	8	124	3	3	490	13	1	23	113	114	133	16	1	0
Eucalyptus oil	1282	1151	714	48	22	326	2	38	1079	24	3	41	231	294	185	14	0	0
Miscellaneous essential oils	13,382	12,754	9690	480	213	1897	37	388	12,111	225	41	356	926	2506	2105	124	3	0
Pennyroyal oil	26	25	8	1	2	13	1	1	16	4	1	4	11	3	5	1	1	0
Tea tree oil	4222	3993	2134	159	149	1281	5	249	3647	169	20	141	490	976	429	36	3	0
Category total:	20,109	18,997	13,264	756	420	3722	716	600	17,788	498	67	600	1835	3940	3038	206	8	0
Fertilizers																		
Miscellaneous fertilizers																		
Household plant foods (generally for indoor plants)	1451	780	112	33	396	16	63	7	1344	26	30	3	84	256	55	4	0	0
Other types of fertilizer	1437	1295	813	102	291	5	54	8	1263	13	8	11	91	260	71	19	2	0
Outdoor fertilizers	1867	1754	1109	106	39	415	2	80	1693	30	15	15	139	359	115	11	0	0
Plant hormones	38	31	1	1	14	0	1	3	29	0	0	2	4	8	5	2	0	0
Unknown types of fertilizer	113	103	45	16	3	30	1	6	99	1	0	1	13	27	10	3	0	0
Category total:	4906	4590	2759	336	98	1146	204	23	4428	70	53	32	331	910	256	39	2	0
Fire extinguishers																		
Miscellaneous fire extinguisher																		
Miscellaneous fire extinguishers	2585	2534	197	417	263	1073	240	247	2109	74	312	19	635	438	599	101	0	0
Category total:	2585	2534	197	417	263	1073	240	247	2109	74	312	19	635	438	599	101	0	0
Foreign bodies/toys/miscellaneous																		
Miscellaneous foreign bodies/toys/miscellaneous																		
Ashes	372	331	252	9	5	31	29	4	327	0	3	0	8	42	21	0	0	0
Bubble blowing solutions	3532	3484	3199	180	30	52	13	0	3448	27	4	2	139	433	510	15	1	0
Charcoals	604	507	389	16	14	68	14	5	470	15	3	16	45	87	24	4	0	0
Christmas ornaments	276	272	209	15	4	32	7	1	268	3	0	1	26	59	17	0	0	0
Coins	3587	3516	2841	574	29	52	9	2	3447	51	9	3	1173	832	327	38	1	0
Descendants	20,168	20,019	16,713	1192	363	1302	322	50	19,609	277	111	8	958	2446	173	11	0	0
Feces/urine	5631	4851	3873	138	109	536	15	164	4702	25	103	15	182	662	133	10	2	0
Glass	4682	4599	1075	303	255	1845	63	976	4452	36	70	27	297	675	195	11	0	0
Glow products	16,916	16,887	12,878	3186	370	298	89	19	16,649	209	9	14	728	1801	3051	46	0	0
Incense (punk)	217	210	165	4	5	29	6	1	202	6	1	1	17	34	21	4	0	0
Other types of foreign body, toy, or miscellaneous substance	24,624	23,332	15,865	2473	769	3046	956	114	22,164	637	334	151	1972	3819	1107	115	9	0
Oxygen absorbers	578	573	238	134	46	112	36	6	495	39	37	1	31	101	19	0	0	0
Soil	2302	2030	1366	94	54	380	120	12	1916	41	17	45	168	267	171	18	0	1
Toys	6972	6839	5432	1030	155	158	49	2	6688	119	20	10	447	992	424	11	1	0
Unknown types of foreign body, toy, or miscellaneous substance	1347	1295	900	180	45	105	39	11	1215	35	17	6	116	209	65	5	1	0
Thermometers																		
Thermometers: mercury	1096	1080	224	134	72	351	246	40	1052	11	11	3	73	205	8	2	0	0
Thermometers: other	683	670	205	102	50	197	99	9	648	12	6	2	36	143	25	1	0	0
Thermometers: unknown	173	172	40	19	7	79	24	3	172	0	0	0	16	12	3	0	0	0
Category total:	93,760	90,667	65,864	9783	2382	8673	3198	377	87,924	1543	755	305	6432	12,819	6294	291	15	1
Fumes/gases/vapors																		
Miscellaneous fumes/gases/vapors																		
Carbon dioxide	406	380	27	49	52	205	43	3	339	25	1	7	91	64	83	17	1	3
Carbon monoxide	13,620	12,239	1656	1049	795	6671	1671	281	11,779	315	22	23	5786	2577	3214	1357	190	48
Chloramine gas	1969	1843	70	35	102	1367	7	19	1756	81	0	3	326	217	555	172	1	0
Chlorine gas	4070	3845	286	291	252	2430	447	111	3650	135	16	35	1175	267	1344	551	10	2
Chlorine gas (when household acid is mixed with hypochlorite)	2266	2178	86	58	112	1597	303	18	2072	95	5	6	498	303	807	225	5	0
Hydrogen sulfide (sewer gas)	792	670	60	35	18	429	102	25	658	8	2	0	308	77	183	79	3	8
Methane and natural gas	4875	4530	948	359	237	2181	675	83	4490	11	10	8	909	1179	849	121	2	0
Other types of fume, gas, or vapor	1611	1341	152	84	144	717	212	23	1229	59	18	32	331	215	342	79	6	0
Polymer fume fever	10	10	0	0	0	6	4	0	9	1	0	0	0	0	2	0	0	0
Simple asphyxiants	2522	2305	274	210	311	1164	303	27	2065	200	10	11	685	446	560	176	9	5
Unknown types of fume, gas, or vapor	2091	1996	114	64	77	972	710	46	1916	24	36	8	407	461	390	114	2	1
Category total:	34,232	31,337	3673	2234	2100	17,739	4713	636	29,963	954	120	133	10,516	5806	8329	2891	229	67
Heavy metals																		

(continued)



Table 22(A). Demographic profile of SINGLE SUBSTANCE Nonpharmaceuticals exposure cases by generic category – Continued

	No. of Case Mentions	No. of Single Exposures	Age				Reason				Outcome								
			<=5	6-12	13-19	>=20	Unknown Child	Unknown Adult	Unknown Age	Unit	Int	Other	Adv Rxn	Treated in Health Care Facility	None	Minor	Moderate	Major	Death
Miscellaneous heavy metals	797	716	381	41	27	203	5	54	5	672	15	18	8	50	85	37	4	0	0
Aluminum	906	794	172	47	24	433	4	99	15	500	12	130	24	398	133	60	40	4	3
Arsenic (excluding pesticides)	27	18	1	0	8	8	0	1	0	15	0	0	3	4	3	6	0	0	0
Barium, soluble salts	70	42	2	2	0	35	0	3	0	30	0	0	4	23	7	4	5	0	0
Cadmium	657	545	76	44	142	230	2	41	10	472	30	17	20	179	67	168	31	0	1
Copper	18	16	8	2	0	4	0	2	0	15	0	0	1	1	4	1	0	0	0
Fireplace flame colors	4	3	1	0	0	2	0	0	0	1	0	0	1	1	0	0	0	0	0
Gold	2678	2412	1188	216	87	671	13	218	19	2222	50	46	17	1133	666	132	71	8	0
Lead	55	43	2	1	7	21	0	10	2	34	3	0	1	23	4	4	1	0	0
Manganese	145	128	8	8	10	76	0	24	2	90	5	9	18	42	26	10	3	1	1
Mercury (other)	1190	1126	90	87	67	553	34	265	30	960	32	50	46	300	288	48	22	4	1
Mercury, elemental (excluding thermometer)	311	276	9	2	26	211	1	25	2	263	3	2	8	104	13	80	39	1	0
Metal fume fever	3445	2247	864	136	109	932	14	174	18	1802	173	38	205	469	352	235	61	9	3
Other types of heavy metal	35	29	2	2	1	16	3	4	1	13	0	8	2	17	5	3	2	1	0
Thallium	75	66	3	1	2	37	7	15	1	40	1	8	4	31	4	7	3	0	0
Unknown types of heavy metal	Category total:	8461	2807	589	510	3432	83	935	105	7129	324	327	361	2775	1657	795	282	28	9
Hydrocarbons																			
Miscellaneous hydrocarbons	81	61	3	1	1	52	0	4	0	57	1	2	1	32	7	22	4	0	0
Benzene	37	36	4	6	4	18	0	4	0	35	0	0	1	10	17	4	4	0	0
Carbon tetrachloride	688	654	101	16	33	431	1	63	9	586	53	10	2	187	82	192	36	2	0
Diesel fuels	4827	4563	319	246	377	2997	10	560	54	3457	997	65	23	1803	689	1161	525	30	18
Freon and other propellants	9370	8993	1890	532	714	4857	23	885	92	8336	615	84	15	2152	1216	2866	313	7	0
Gasolines	731	682	318	32	29	247	2	49	5	624	39	12	4	235	104	167	54	3	0
Kerosenes	1176	1160	782	56	29	247	7	93	4	1124	25	8	2	375	271	296	94	15	0
Lamp oils	2064	1940	1085	49	98	592	6	35	17	1802	82	40	9	706	400	548	126	10	0
Lighter fluids and/or naphtha	3622	3283	1832	147	129	988	12	161	14	3141	68	56	10	612	862	518	64	3	0
Lubricating oils and/or motor oils																			
Mineral seal oil	19	18	9	1	0	6	0	2	0	17	0	0	1	2	0	4	1	0	0
Mineral spirits	1534	1385	433	52	69	720	3	99	9	1275	73	20	10	514	226	422	96	8	0
Other types of halogenated hydrocarbon	188	170	32	7	11	103	0	17	0	157	11	0	2	68	28	50	16	2	0
Other types of hydrocarbon	3992	3642	1744	145	168	1353	5	202	25	3390	151	54	33	955	744	772	167	10	1
Toluene and/or xylene (excluding adhesives)	628	512	58	12	21	359	2	55	5	471	18	13	7	245	50	200	55	4	0
Turpentine	312	276	63	16	20	146	0	29	2	220	38	7	9	89	43	66	12	0	0
Unknown types of hydrocarbon	497	432	148	15	27	201	3	33	5	370	43	7	8	164	83	93	37	3	2
Category total:	29,766	27,807	8821	1333	1730	13,317	74	2291	241	24,962	2214	378	137	8149	4822	7381	1604	97	21
Industrial cleaners																			
Miscellaneous industrial cleaners	2198	2046	141	72	152	1387	12	256	26	1854	146	24	17	649	201	671	147	7	1
Industrial cleaner: disinfectants	1543	1427	403	50	94	749	2	117	12	1310	43	49	17	542	204	445	121	10	1
Industrial cleaner: other or unknown	1713	1493	385	30	73	863	0	126	16	1382	55	38	14	494	207	429	122	5	1
Industrial cleaners: acids	2761	2562	494	51	181	1608	8	194	26	2405	88	43	17	1309	301	850	426	21	3
Industrial cleaners: alkalis	629	540	248	33	32	189	4	33	1	499	27	5	7	156	92	123	20	1	0
Industrial cleaners: anionics or nonionics	688	632	94	21	54	395	3	63	2	550	62	13	4	242	58	209	37	3	0
Category total:	9532	8700	1765	257	586	5191	29	789	83	8000	421	172	76	3392	1063	2727	873	47	6
Infectious and toxin-mediated diseases																			
Botulinum toxins																			
Botulism	269	249	48	6	5	165	0	21	4	129	30	5	75	116	34	14	27	21	0
Ichthyosarcotoxins																			
Ciguatera poisoning	143	141	4	4	4	112	0	14	3	122	0	0	19	74	2	36	43	2	0
Ciguatera fish poisoning	16	16	1	0	1	11	0	2	1	12	0	0	4	3	1	2	0	0	0
Other types of seafood poisoning	238	228	6	9	16	159	0	36	2	186	5	1	34	78	8	69	44	2	0
Paralytic shellfish poisoning	123	116	5	6	5	77	0	18	5	96	4	1	12	29	2	26	17	1	0
Scombroid fish poisoning	175	165	10	3	6	121	0	25	0	130	1	2	32	43	6	34	33	1	0
Tetrodotoxin poisoning	146	144	36	22	13	64	0	9	0	127	7	3	6	21	30	15	5	1	0
Infectious diseases																			
Bacterial diseases	581	538	104	48	30	276	4	66	10	468	3	27	39	86	48	94	38	0	0
Fungal diseases	2494	2436	706	227	170	1074	6	240	13	2157	3	150	123	73	299	116	11	1	0
Other types of bacterial food poisoning (salmonella, shigella, vibrio, staphylococcus, streptococcus, etc.)	89	83	14	6	10	42	0	11	0	80	0	1	1	10	9	9	19	0	0

(continued)

Table 22(A). Demographic profile of SINGLE SUBSTANCE Nonpharmaceuticals exposure cases by generic category – Continued

	No. of Case Mentions	No. of Single Exposures	Age					Reason				Outcome							
			<=5	6-12	13-19	>=20	Unknown Child	Unknown Adult	Unknown Age	Unit	Int	Other	Adv Rxn	Treated in Health Care Facility	None	Minor	Moderate	Major	Death
Parasitic diseases	22	20	5	1	0	9	0	5	0	17	0	2	1	5	1	2	1	0	0
Unknown types of bacterial food poisoning	258	254	25	15	14	178	0	20	2	248	0	2	3	15	1	28	4	0	0
Unknown types of suspected food poisoning	12,007	11,772	1852	724	804	6808	81	1357	146	10,989	29	163	558	1246	610	2015	512	5	1
Viral diseases	756	145	18	7	6	78	2	30	4	128	1	7	4	59	13	16	4	6	0
Category total: Information calls	17,317	16,307	2834	1078	1084	9174	93	1854	190	14,889	83	364	911	1858	1064	2476	758	40	1
Food information calls	7542	5726	2951	451	230	1614	20	417	43	4734	280	330	350	563	776	738	113	6	0
Information calls about food products, additives or supplements	6086	5955	1379	570	353	2823	42	725	63	5459	21	181	276	267	560	475	127	0	0
Information calls about possibly spoiled foods	13,628	11,681	4330	1021	583	4437	62	1142	106	10,193	301	511	626	830	1336	1213	240	6	0
Category total: Lacrimators																			
Miscellaneous lacrimators	2868	2843	595	603	434	886	27	252	46	2307	91	309	24	673	60	1373	112	4	0
Lacrimators: capsicum defense sprays	554	541	105	95	100	162	2	67	10	386	15	116	8	146	33	268	40	1	0
Lacrimators: CN (chloroacetophenone)	27	20	4	4	6	5	0	1	0	14	0	0	0	5	5	4	3	0	0
Lacrimators: CS (O-chlorobenzylidene malonitrile)	69	24	1	1	0	18	0	4	0	23	0	0	1	8	1	8	0	0	0
Lacrimators: other	127	116	8	24	7	35	30	8	4	97	1	13	3	74	14	68	3	0	0
Lacrimators: unknown	3645	3544	713	727	547	1106	59	332	60	2827	107	438	36	906	113	1721	158	5	0
Category total: Matches/fireworks/explosives																			
Miscellaneous matches/fireworks/explosives	159	151	85	19	10	30	0	7	0	140	6	2	2	49	32	34	7	0	0
Explosives	852	843	731	54	14	38	0	5	1	832	6	3	1	95	270	66	8	1	2
Fireworks	419	415	375	5	5	18	2	8	2	404	7	3	0	10	94	5	0	0	0
Matches	83	81	51	15	2	11	0	2	0	75	3	2	0	10	21	14	4	0	0
Other types of match, firework, or explosive																			
Unknown types of match, firework, or explosive	11	11	7	1	0	2	0	0	1	11	0	0	0	1	3	0	1	0	0
Category total: Miscellaneous foods	1524	1501	1249	94	31	99	2	22	4	1462	22	10	3	165	420	119	20	1	2
Foods																			
Capsicum peppers	2418	2343	525	253	389	899	42	215	20	1778	157	46	355	216	52	996	99	0	0
Food additives	455	396	130	36	49	127	1	44	9	292	18	3	80	58	59	46	17	0	0
Food products	8293	7604	3735	565	355	2165	39	618	127	6207	209	183	972	552	913	646	164	8	0
Monosodium glutamate (MSG)	1	1	0	0	0	1	0	0	0	1	0	0	0	1	0	0	1	0	0
Other adverse reactions to food	1353	1279	226	91	100	616	6	220	20	570	20	62	617	229	51	224	126	7	0
Category total: Mushrooms	12,520	11,623	4616	945	893	3808	88	1097	176	8848	404	294	2024	1056	1075	1912	407	15	0
Miscellaneous mushrooms																			
Group 1 mushrooms:	72	61	16	1	6	34	0	4	0	36	17	1	7	45	11	10	5	12	1
cyclopeptides																			
Group 1A mushrooms:	8	7	1	1	0	5	0	0	0	4	0	0	1	5	3	2	0	0	0
orellanine																			
Group 2 mushrooms: muscimol (ibotenic acid)	45	37	4	6	0	25	0	2	0	14	14	1	5	29	8	8	13	2	0
Group 3 mushrooms: monomethylhydrazine (MMH)	39	33	0	5	0	24	0	4	0	19	1	0	12	14	13	8	6	0	0
Group 4 mushrooms: muscarine and histamine	29	26	1	2	0	22	0	1	0	15	4	0	7	16	2	12	5	0	0
Group 5 mushrooms: opine	6	4	2	0	0	2	0	0	0	4	0	0	0	0	2	0	0	0	0
Group 6 mushrooms: hallucinogenics (psilocybin and psilocin)	503	338	18	3	111	183	1	10	12	37	291	4	5	252	21	64	155	3	1
Group 7 mushrooms: gastro-intestinal irritants	241	223	56	23	4	130	0	7	3	157	38	1	27	113	34	102	31	0	0
Mushrooms: miscellaneous, non-toxic	117	93	32	5	4	45	1	6	0	61	6	0	26	24	27	25	3	0	0
Mushrooms: other potentially toxic	130	108	33	13	9	47	0	4	2	75	11	0	22	34	24	28	6	6	0
Mushrooms: unknown	5231	5049	3226	464	258	960	13	92	36	4286	552	4	183	1643	2070	681	254	16	0
Category total: Other/unknown nondrug substances	6421	5979	3389	523	392	1477	15	130	53	4708	934	11	295	2175	2215	940	478	39	2
(continued)																			

(continued)



Table 22(A). Demographic profile of SINGLE SUBSTANCE Nonpharmaceuticals exposure cases by generic category – Continued

	No. of Case Mentions	No. of Single Exposures	Age					Reason			Outcome								
			<=5	6-12	13-19	>=20	Unknown Child	Unknown Adult	Unknown Age	Unit	Int	Other	Adv Rxn	Treated in Health Care Facility	None	Minor	Moderate	Major	Death
Miscellaneous other/unknown non-drug substances	25,055	22,934	10,982	2060	936	6713	152	1710	381	20,647	747	668	655	3417	4641	4006	537	25	3
Other non-drug substances	4705	4416	1136	260	227	2065	15	600	113	2888	148	815	198	1483	437	641	253	44	3
Unknown substances unlikely to be drug products																			
Category total:	29,760	27,350	12,118	2320	1163	8778	167	2310	494	23,535	895	1483	853	4900	5078	4647	790	69	6
Paints and stripping agents																			
Miscellaneous paints and stripping agents	468	430	192	22	9	167	1	36	3	413	4	4	9	90	63	71	19	0	0
Other types of paint, varnish, or lacquer	5129	4822	3185	219	120	1011	11	253	23	4673	83	12	39	535	704	403	72	3	0
Unknown types of paint, varnish, or lacquer	1013	923	253	64	38	429	23	107	9	872	6	26	17	152	124	204	41	1	0
Varnishes and lacquers																			
Paints	13	11	2	1	2	5	0	1	0	10	0	1	0	5	1	2	0	0	0
Anti-algae paints	34	32	2	0	2	18	0	10	0	29	0	0	3	8	5	4	2	0	0
Anti-corrosion paints	2045	1907	569	181	126	810	5	192	24	1732	108	11	52	394	257	421	89	8	0
Oil-base paints	2679	2604	1987	94	59	367	10	79	8	2549	22	5	23	200	387	168	19	0	0
Water base paints (acrylic, latex, etc.)																			
Wood stains	679	639	258	20	21	259	3	71	7	606	11	1	21	77	121	115	17	1	0
Stripping agents	347	330	43	8	23	220	2	34	0	310	15	0	3	140	19	114	48	5	0
Methylene chloride stripping agents	505	458	105	9	13	278	1	42	10	442	9	0	5	177	46	128	72	4	0
Other types of stripping agent	89	82	5	1	5	55	0	13	3	78	2	0	2	37	8	31	6	0	0
Unknown types of stripping agent																			
Category total:	13,001	12,238	6601	619	418	3619	56	838	87	11,714	260	60	174	1815	1735	1661	385	22	0
Pesticides																			
Fumigants																			
Aluminum phosphide	106	98	2	1	2	74	3	14	2	80	2	11	4	56	34	22	18	0	1
Methyl bromide	37	28	1	0	0	24	0	2	1	24	0	2	1	10	6	5	5	0	0
Other fumigants	35	32	3	2	22	0	0	2	0	32	0	0	0	8	6	6	4	0	0
Sulfuryl fluoride	318	266	36	25	12	169	5	19	5	242	7	6	10	41	38	43	5	0	0
Unknown fumigants	97	85	10	8	6	50	0	10	1	77	6	1	1	26	6	18	8	0	1
Fungicides (non-medicinal)																			
Carbamate fungicides	79	54	17	0	2	31	0	3	1	52	1	1	0	17	11	14	3	0	0
Copper compound fungicides	90	86	9	1	1	55	0	17	3	82	1	0	3	13	13	19	4	0	0
Other types of non-medicinal fungicide	537	427	106	14	7	238	3	50	9	392	15	7	10	90	94	89	14	1	0
Other/unknown type of non-medicinal fungicide	1	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
Phthalimide fungicides	34	22	11	1	0	8	0	2	0	20	0	1	1	2	3	4	0	0	0
Unknown types of non-medicinal fungicide	35	27	5	3	0	19	0	0	0	24	0	0	3	9	6	6	1	0	0
Wood preservatives																			
Herbicides (including algaecides, defoliants, desiccants, plant growth regulators)	138	133	18	9	2	82	1	14	7	129	1	0	3	31	9	28	8	0	0
Carbamate herbicides (excluding metam sodium)																			
Chlorophenoxy herbicides	1717	1518	360	61	39	865	8	163	22	1445	18	11	33	261	343	288	48	2	0
Diquat	447	401	97	13	9	236	1	40	5	382	8	2	8	59	118	74	11	2	0
Glyphosate	3181	2894	660	125	80	1656	3	346	24	2722	59	39	69	513	625	665	68	3	3
Other types of herbicide	1323	1080	230	48	32	650	4	104	12	1034	16	2	25	231	208	250	33	3	2
Paraquat	100	73	4	1	4	56	0	7	1	62	6	3	0	46	6	16	12	1	1
Paraquat and diquat combinations	1	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Triazine herbicides	164	135	24	8	3	84	0	13	3	132	0	0	3	27	23	40	5	0	0
Unknown types of herbicide	451	380	88	39	10	203	2	35	3	359	3	8	6	98	63	79	13	3	1
Urea herbicides	41	33	10	4	1	14	0	3	1	31	1	0	1	8	7	5	0	0	0
Insecticides (including insect growth regulators, molluscicides, nematocides)																			
Carbamate insecticides alone	1356	1262	416	48	38	604	4	137	15	1150	57	26	21	279	272	184	50	2	1
Carbamate insecticides in combination with other insecticides	152	142	22	8	5	86	0	20	1	125	7	5	5	28	19	31	2	1	1
Chlorinated hydrocarbon insecticides alone	170	154	56	11	2	68	3	13	1	135	9	4	4	34	28	24	2	2	0

(continued)

Table 22(A). Demographic profile of SINGLE SUBSTANCE Nonpharmaceuticals exposure cases by generic category – Continued

	No. of Case Mentions	No. of Single Exposures	Age							Reason					Outcome				
			<=5	6-12	13-19	>=20	Age			Unint	Int	Other	Adv Rxn	Treated in Health Care Facility	None	Minor	Moderate	Major	Death
							Unknown Child	Unknown Adult	Unknown Age										
Chlorinated hydrocarbon insecticides in combination with other insecticides	203	195	47	13	11	104	0	17	3	181	8	2	4	43	27	46	9	0	0
Insect growth regulators	206	128	57	8	9	46	0	6	2	123	2	1	1	14	20	11	1	0	0
Metalddehyde	26	25	8	1	1	15	0	0	0	23	2	0	0	7	6	5	0	0	0
Nicotine (excluding tobacco products)	28	24	12	1	3	7	0	1	0	23	0	0	1	7	5	7	0	0	0
Organophosphate insecticides alone	2201	1994	582	91	61	1026	4	204	26	1807	103	23	47	560	470	389	113	17	1
Organophosphate insecticides in combination with carbamate insecticides	57	47	15	2	6	21	0	3	0	46	0	1	0	14	10	9	2	0	0
Organophosphate insecticides in combination with non-carbamate insecticides	527	490	94	17	48	272	0	48	11	466	14	1	9	100	49	129	32	2	0
Other types of insecticide	9214	8583	4283	368	181	2993	13	631	114	8198	113	60	192	845	1638	911	118	3	0
Piperonyl butoxide & pyrethrins (without carbamate or O.P.)	1	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
Pyrethrins	6079	5743	1790	413	236	2480	15	558	251	5267	175	39	247	1124	860	1474	265	4	0
Pyrethroids	22,796	21,470	5262	989	832	11,842	53	2170	322	19,602	754	236	816	3752	3111	5594	823	34	2
Rotenone	42	40	8	3	1	25	0	3	0	38	2	0	0	5	10	5	2	0	0
Unknown types of insecticide	4923	4431	1026	210	161	2313	42	577	102	3889	145	168	168	1210	501	907	223	7	2
Veterinary insecticide/pesticide product (for pets-flea collars, etc.)	1	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Miscellaneous pesticides	53	20	7	0	0	12	0	1	0	18	0	1	1	5	4	2	0	0	0
Arsenic pesticides	7256	7164	6294	151	49	526	19	102	23	7065	56	26	9	549	1491	201	21	0	0
Borates and/or boric acid pesticides (excluding other uses)	4	4	0	0	0	4	0	0	0	4	0	0	0	2	0	0	0	0	0
Metam sodium	4	4	0	0	0	4	0	0	0	4	0	0	0	2	0	0	0	0	0
Repellents	423	410	104	54	14	194	3	38	3	381	8	10	11	59	60	99	9	0	0
Animal repellents	3990	3904	2028	521	192	939	11	187	26	3558	84	53	195	375	548	1098	73	2	0
Insect repellents with DEET	1470	1420	1017	89	33	238	5	31	7	1359	17	8	34	83	226	225	14	0	0
Insect repellents without DEET	1265	1250	816	69	21	240	13	75	16	1205	37	2	6	239	453	99	17	3	0
Naphthalene moth repellants (excluding deodorizing products)	2	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
Other types of moth repellent	120	120	73	2	0	37	0	7	1	114	4	2	0	20	35	10	1	0	0
Paradichlorobenzene moth repellants (excluding deodorizing products)	181	174	94	8	3	55	0	11	3	154	4	6	9	28	22	26	8	1	0
Unknown types of insect repellent	2008	1964	1047	92	38	538	16	209	24	1845	75	14	22	326	453	187	29	1	0
Unknown types of moth repellent																			
Rodenticides	2	2	0	0	1	1	0	0	0	1	1	0	0	1	0	1	0	0	0
ANTU (1-naphthalenylthiourea)	1150	1087	816	31	6	171	6	41	16	1013	45	18	6	480	462	28	7	2	0
Bromethalin rodenticides	7	7	5	0	0	2	0	0	0	6	0	0	1	5	2	0	0	0	0
Cholecalciferol rodenticides	1	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Cyanide rodenticides	5662	5453	4463	118	61	627	16	132	36	5198	164	53	14	1471	1456	101	13	5	0
Long-acting anticoagulant rodenticides	511	492	325	33	3	103	1	24	3	470	18	2	1	96	101	33	13	1	0
Other types of rodenticide	2	2	2	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
PNU (n-3-pyridylmethyl-n-1-p-nitrophenyl urea)	44	41	1	2	0	27	0	9	2	18	9	11	0	20	11	6	2	0	1
Strychnine rodenticides	1576	1330	861	37	17	306	12	66	31	1133	109	59	13	500	334	54	15	0	0
Unknown types of rodenticide	150	146	107	1	3	31	0	4	0	134	11	1	0	47	47	5	1	0	0
Warfarin type anticoagulant rodenticides	76	64	23	2	0	35	1	2	1	54	5	2	2	28	23	12	2	0	0
Zinc phosphide rodenticides	82,882	77,573	33,458	3758	2249	30,533	262	6173	1140	72,144	2182	929	2020	13,905	14,376	13,585	2128	102	17
Category total:																			
Photographic products																			
Miscellaneous photographic products	87	72	20	1	15	30	0	6	0	69	0	0	3	16	15	11	5	0	0
Developers, fixing baths, stop baths	184	167	114	6	11	24	1	11	0	157	4	1	4	11	28	13	1	0	0
Other types of photographic product	4	4	4	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0
Photographic coating fluids	5	4	2	0	0	2	0	0	0	4	0	0	0	0	0	0	0	0	0
Unknown types of photographic product																			

(continued)



Table 22(A). Demographic profile of SINGLE SUBSTANCE Nonpharmaceuticals exposure cases by generic category – Continued

	No. of Case Mentions	No. of Single Exposures	Age							Reason			Outcome						
			<=5	6-12	13-19	>=20	Unknown Child	Unknown Adult	Unknown Age	Unit	Int	Other	Adv Rtn	Treated in Health Care Facility	None	Minor	Moderate	Major	Death
Category total:	280	247	140	7	26	56	1	17	0	234	4	1	7	27	43	24	6	0	0
Plants																			
Miscellaneous plants																			
Plants: amygdalin and/or cyanogenic glycosides	4153	4062	2107	496	156	1046	10	219	28	3677	185	33	156	277	849	165	21	0	0
Plants: anticholinergics	549	509	294	32	26	128	1	23	5	402	78	5	14	132	125	47	49	3	0
Plants: cardiac glycosides (excluding drugs)	1566	1529	855	187	50	361	1	67	8	1392	113	0	20	241	383	104	34	5	4
Plants: colchicine	21	21	15	3	0	3	0	0	0	21	0	0	0	2	8	1	0	0	0
Plants: depressants	181	137	80	16	1	33	1	6	0	111	18	1	7	17	24	7	6	0	0
Plants: gastrointestinal irritants (excluding oxalate containing plants)	7012	6720	4688	661	163	981	9	196	22	6218	276	14	197	505	1271	615	80	1	1
Plants: hallucinogenics (code as street drug unless plant part involved)	832	631	78	13	106	391	1	33	9	184	361	24	53	407	64	121	180	25	1
Plants: nicotine (excluding tobacco products)	163	154	70	24	8	45	0	7	0	127	23	0	3	37	38	40	9	0	0
Plants: non-toxic	4937	4517	2938	641	126	604	16	177	15	4031	192	23	260	296	569	394	52	1	0
Plants: other toxic types	4879	4607	3156	505	124	653	26	125	13	4182	242	9	155	517	1046	355	92	12	0
Plants: oxalates	5033	4965	3567	616	156	497	20	96	18	4573	312	11	63	376	952	995	61	0	0
Plants: skin irritants (excluding oxalate containing plants)	6009	5620	2051	533	340	2119	21	508	48	5054	187	25	332	944	500	947	313	4	1
Plants: solanine	1585	1553	982	115	36	325	4	82	9	1425	44	1	82	105	402	98	15	1	0
Plants: stimulants	350	327	75	34	15	167	0	34	2	272	36	1	17	52	79	26	12	2	0
Plants: totalbumins	230	215	85	16	17	73	0	23	1	168	34	6	5	81	57	23	11	1	1
Plants: unknown toxic types or unknown if toxic	10,116	9583	6524	1238	229	1222	58	269	43	8934	381	30	214	775	1756	790	116	8	3
Category total:	47,616	45,150	27,565	5130	1553	8648	168	1865	221	40,771	2482	183	1578	4764	8123	4728	1051	63	11
Polishes and waxes																			
Miscellaneous polishes and waxes	368	341	174	6	13	120	3	24	1	327	6	2	6	74	58	74	6	0	0
Floor waxes, polishes, or sealers	1501	1450	1206	37	21	151	2	31	2	1404	30	15	1	133	416	180	11	1	0
Furniture polishes	2062	1987	1457	70	41	344	6	60	9	1921	27	15	24	219	418	208	34	3	0
Miscellaneous polishes and waxes (excluding mineral seal oils)																			
Category total:	3931	3778	2837	113	75	615	11	115	12	3652	63	32	31	426	892	462	51	4	0
Radiation																			
Ionizing radiation																			
Gamma radiation	9	8	0	0	0	6	0	1	1	6	0	1	1	7	6	0	0	0	0
Ionizing radiation: type unknown	43	43	1	1	2	25	1	12	1	31	0	3	9	18	3	2	1	0	0
Radon	104	86	19	10	4	35	0	18	0	83	0	1	1	28	20	2	0	0	0
Specific nonpharmaceutical radionuclides	64	56	7	3	2	28	0	10	6	46	3	4	2	27	14	2	2	1	0
X-ray radiation	11	11	0	0	1	5	0	5	0	3	2	0	4	6	1	2	1	0	0
Miscellaneous radiation																			
Nonpharmaceutical radiation: type unknown	2	2	0	0	0	1	0	1	0	1	0	0	0	1	0	0	0	0	0
Non-ionizing radiation																			
Extremely low-frequency radiation	6	6	0	0	0	6	0	0	0	6	0	0	0	6	2	2	1	0	0
Infrared radiation	4	4	2	0	0	2	0	0	0	4	0	0	0	1	1	0	0	0	0
Microwave radiation	29	28	1	0	3	12	0	10	2	26	0	2	0	2	3	4	0	0	0
Non-ionizing radiation: type unknown	8	6	0	0	0	5	0	1	0	5	0	0	0	2	1	0	0	0	0
Radio frequency radiation	8	8	0	0	0	8	0	0	0	6	0	0	1	6	1	0	0	0	0
Ultraviolet radiation	11	10	0	0	3	6	0	1	0	8	0	0	2	3	1	2	2	0	0
Visible light radiation (lasers)	7	7	2	1	0	1	0	3	0	6	0	1	0	0	0	1	0	0	0
Category total:	306	275	32	15	15	140	1	62	10	231	5	12	20	107	53	17	7	1	0
Sporting equipment																			
Miscellaneous sporting equipment																			
Fishing baits	38	36	28	4	1	2	0	1	0	35	1	0	0	0	7	1	0	0	0
Fishing products, miscellaneous	15	15	12	1	0	2	0	0	0	15	0	0	0	1	2	1	0	0	0
Golf products, miscellaneous	2	2	1	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0
Gun bluing compounds	33	30	16	0	1	11	0	1	1	30	0	0	0	10	12	9	1	1	0
Hunting products, miscellaneous	393	378	150	19	128	60	1	18	2	355	11	8	3	76	199	26	6	0	0
Other types of sporting equipment	12	11	4	1	3	3	0	0	0	10	0	1	0	3	8	0	0	0	0
(continued)																			

(continued)

Table 22(A). Demographic profile of SINGLE SUBSTANCE Nonpharmaceuticals exposure cases by generic category – Continued

	No. of Case Mentions	No. of Single Exposures	Age					Reason				Outcome							
			<=5	6-12	13-19	>=20	Unknown Child	Unknown Adult	Unknown Age	Unint	Int	Other	Adv Rxn	Treated in Health Care Facility	None	Minor	Moderate	Major	Death
Unknown types of sporting equipment	4	4	1	0	1	1	0	1	2	0	1	1	1	1	1	0	1	0	0
Category total:	497	476	212	25	134	80	1	21	3	449	12	10	4	91	229	37	8	1	0
Swimming pool/aquarium																			
Miscellaneous swimming pool/aquarium																			
Algidides	1036	996	307	99	54	454	5	71	6	962	20	2	9	210	117	293	95	2	0
Aquarium products, miscellaneous	1082	1030	788	62	27	127	2	23	1	992	17	13	3	90	244	47	8	1	0
Bromine shock treatments	63	60	26	6	4	16	0	6	2	60	0	0	0	10	14	23	0	1	0
Chlorine shock treatments	2784	2679	470	379	184	1355	30	215	46	2563	53	11	50	754	155	1014	283	3	0
Other types of swimming pool or aquarium product	1338	1270	344	186	81	554	8	83	14	1201	26	5	35	250	154	444	84	1	0
Swimming pool and aquarium test kits	103	90	48	13	14	11	0	3	1	86	3	1	0	13	31	9	3	0	0
Category total:	6406	6125	1983	745	364	2517	45	401	70	5864	119	32	97	1327	715	1830	473	8	0
Tobacco/nicotine/cigarette products																			
E-cigarettes: nicotine containing	276	264	174	3	23	57	1	5	1	239	14	1	10	105	82	54	8	1	0
E-cigarettes: nicotine device flavor unknown	116	115	91	0	5	17	0	2	0	104	5	2	3	41	51	24	5	0	0
E-cigarettes: nicotine device with added flavors	1297	1267	900	31	58	238	0	36	4	1162	53	8	39	490	458	232	47	4	0
Without added flavors																			
E-cigarettes: nicotine liquid flavor unknown	642	623	466	10	26	98	3	17	3	591	21	2	8	238	256	140	15	2	0
E-cigarettes: nicotine liquid with added flavors	382	377	312	9	7	46	0	2	1	364	10	2	1	132	194	80	11	0	0
E-cigarettes: nicotine liquid without added flavors	188	181	132	0	8	30	0	8	3	172	7	1	1	69	73	34	2	0	0
Miscellaneous tobacco products																			
Chewing tobacco	1388	1357	1220	26	31	74	1	4	1	1321	25	4	6	341	419	361	30	0	0
Cigarettes	6871	6699	6331	51	42	222	13	33	7	6563	73	27	31	862	2191	951	55	1	0
Cigars	158	148	114	0	6	23	1	4	1	128	11	1	7	24	32	30	6	0	0
Dissolvable tobacco	8	8	6	0	0	2	0	0	0	8	0	0	0	3	2	3	1	0	0
Filter tips only (i.e. Butts)	50	48	41	1	0	5	0	1	0	47	1	0	0	5	21	10	0	0	0
Other types of tobacco product	144	133	86	3	8	31	1	4	1	109	19	1	3	38	30	31	8	1	0
Snuff	507	493	427	11	8	38	1	8	0	470	14	4	4	105	14	137	22	1	0
Unknown types of tobacco product	1695	1606	1058	66	57	359	3	57	6	1374	129	13	77	517	448	321	65	0	0
Category total:	13,722	13,319	11,358	211	279	1240	22	181	28	12,652	382	66	190	2970	4388	2408	275	10	0
Waterproofers/sealants																			
Miscellaneous waterproofers/sealants																			
Waterproofers/sealants: aerosols	168	165	84	6	10	57	0	8	0	157	3	0	5	41	37	43	10	1	0
Waterproofers/sealants: liquids	82	79	43	4	3	24	0	5	0	76	2	0	1	19	17	15	6	0	0
Waterproofers/sealants: solids	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Waterproofers/sealants: unknown form	27	24	9	1	0	11	0	1	2	23	1	0	0	4	4	4	1	0	0
Category total:	278	268	136	11	13	92	0	14	2	256	6	0	6	64	58	62	17	1	0
Weapons of mass destruction																			
Miscellaneous weapons of mass destruction																			
Anthrax	2	2	0	0	0	0	0	2	0	1	0	1	0	1	0	0	0	0	0
Nerve gases	2	2	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0
Other biological weapons	2	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Other chemical weapons	14	13	0	0	1	9	0	3	0	12	0	0	1	10	1	5	1	0	0
Other suspicious powders	192	169	40	4	13	83	3	21	5	120	16	28	2	71	22	36	12	0	0
Other suspicious substances (non-powder)	2089	1937	454	99	109	906	15	308	46	1194	98	366	59	799	218	347	172	40	3
Suspicious powders in envelope or package	54	50	12	0	3	30	0	5	0	28	7	13	0	28	13	11	3	1	0
Category total:	2355	2174	507	103	126	1030	18	339	51	1357	121	409	62	909	255	399	188	41	3
Non-pharmaceuticals total:	1,094,335	980,550	540,777	63,068	42,192	271,650	3249	51,769	7845	909,479	38,600	12,254	15,906	166,600	162,684	164,045	32,519	2249	256



Table 22(B). Demographic profile of SINGLE SUBSTANCE Pharmaceuticals exposure cases by generic category

	No. of Case Mentions	No. of Single Exposures	Age					Reason					Outcome								
			<=5	6-12	13-19	>=20	Unknown	Child	Adult	Unknown	Age	Unint	Int	Other	Adv Rxn	Treated in Health Care Facility	None	Minor	Moderate	Major	Death
Analgesics																					
Acetaminophen Alone																					
Acetaminophen alone, adult	37,084	24,005	6492	1034	5699	10,025	8	622	125	11,865	11,550	25	298	14,191	6567	3577	2038	513	57		
Acetaminophen alone, pediatric	21,095	19,426	17,787	1338	117	143	22	12	7	19,134	204	4	57	2614	4160	283	46	6	1		
Acetaminophen alone, unknown if adult or pediatric	9956	5986	1906	255	1263	2359	7	147	49	3063	2715	4	86	3566	1596	812	583	161	34		
Acetaminophen combinations with other drugs, adult																					
Acetaminophen in combination with other drugs, adult	6218	3537	951	92	1179	1233	0	71	11	1389	2016	10	84	2342	932	926	454	42	1		
Acetaminophen combinations with other drugs, pediatric																					
Acetaminophen in combination with other drugs, pediatric	36	31	28	3	0	0	0	0	0	31	0	0	0	5	4	3	0	0	0		
Acetaminophen with codeine																					
Acetaminophen with codeine	4109	1919	302	80	321	1105	1	98	12	817	892	3	171	1091	474	405	166	16	1		
Acetaminophen with diphenhydramine	7221	4218	716	92	812	2461	2	107	28	1330	2760	2	75	2990	870	1030	834	109	5		
Acetaminophen with hydrocodone																					
Acetaminophen with hydrocodone	17,801	7780	1271	223	842	5059	5	324	56	3601	3588	20	419	4325	1905	1600	759	167	22		
Acetaminophen with other narcotics or narcotic analogs	476	226	32	3	31	150	0	10	0	104	107	0	8	140	50	38	31	9	3		
Acetaminophen with oxycodone																					
Acetaminophen with oxycodone	8893	3931	644	67	370	2641	2	180	27	1711	1881	20	236	2402	957	866	481	103	10		
Acetaminophen with propoxyphene	78	34	6	1	7	19	0	1	0	15	16	1	1	27	10	10	5	0	0		
Acetylsalicylic acid alone																					
Acetylsalicylic acid alone, adult formulations	5288	2990	1305	162	532	938	0	44	9	1709	1201	1	56	1568	772	401	445	26	5		
Acetylsalicylic acid alone, pediatric formulations	549	324	230	21	32	37	0	3	1	259	57	1	5	111	78	21	14	1	0		
Acetylsalicylic acid alone, unknown if adult or pediatric formulations	12,045	5925	1928	257	1191	2402	4	111	32	2774	2851	7	116	3691	1310	978	1182	128	17		
Acetylsalicylic acid combinations with other drugs, adult																					
Acetylsalicylic acid in combination with other drugs, adult formulations	1234	793	262	40	75	392	0	21	3	456	283	1	36	382	156	125	122	16	0		
Acetylsalicylic acid with carisoprodol																					
Acetylsalicylic acid with carisoprodol	12	9	2	0	1	5	0	1	0	3	6	0	0	6	2	2	3	0	0		
Acetylsalicylic acid with codeine																					
Acetylsalicylic acid with codeine	43	24	3	0	2	19	0	0	0	6	15	0	1	20	1	9	6	1	0		
Acetylsalicylic acid with other narcotics or narcotic analogs	9	5	0	0	1	4	0	0	0	0	5	0	0	5	2	1	1	0	0		
Acetylsalicylic acid with oxycodone																					
Acetylsalicylic acid with oxycodone	10	4	1	0	1	2	0	0	0	1	3	0	0	3	1	1	0	0	0		
Miscellaneous analgesics																					
Non-aspirin salicylates (excluding topicals and/or gastrointestinal drugs)	211	163	104	8	11	36	0	4	0	136	18	0	8	43	48	18	5	0	0		
Other analgesics																					
Other analgesics	896	626	251	20	70	264	0	19	2	397	200	0	28	249	124	120	83	5	0		
Phenacetin	3	3	2	0	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0		
Phenazopyridine	1003	806	528	26	38	192	1	18	3	701	57	0	47	177	239	72	30	4	0		
Salicylamide	3	3	1	0	0	2	0	0	0	2	1	0	0	1	0	1	1	0	0		
Unknown analgesics	202	84	22	3	22	32	0	3	2	31	50	0	2	57	18	15	10	3	0		
Nonsteroidal antiinflammatory drugs																					
Colchicine	386	253	46	5	3	185	0	13	1	191	30	0	28	140	57	61	24	7	5		
Cyclooxygenase-2 inhibitors	740	397	139	13	14	202	0	28	1	344	29	1	21	56	87	17	5	0	0		
Ibuprofen	81,179	62,284	42,208	3452	7640	8022	62	732	168	50,393	11,109	18	595	13,599	14,137	3914	952	58	3		
Ibuprofen with diphenhydramine	2854	1791	396	51	340	941	0	48	15	838	915	1	21	980	357	358	248	19	0		
Ibuprofen with hydrocodone	125	65	15	1	4	40	0	5	0	35	25	0	4	34	18	17	9	0	0		
Indomethacin	483	266	72	9	23	141	0	19	2	175	61	0	26	86	64	41	11	0	0		
Ketoprofen	40	25	13	1	4	7	0	0	0	20	3	0	2	7	6	1	0	0	0		
Naproxen	13,702	8006	2584	281	1882	2911	8	274	66	4691	2992	7	279	3182	2086	1072	240	11	1		
Other types of nonsteroidal antiinflammatory drug	7526	4106	1462	209	237	1903	6	262	27	3350	555	10	176	925	982	349	67	5	0		
Unknown types of nonsteroidal antiinflammatory drug																					
Unknown types of nonsteroidal antiinflammatory drug	12	4	3	0	0	1	0	0	0	4	0	0	0	1	1	0	0	0	0		
Opioids																					
Alfentanil	1	1	0	0	0	1	0	0	0	0	1	0	0	1	0	0	0	1	0		
Buprenorphine	3732	2160	1004	30	68	891	4	119	44	1292	612	56	160	1622	335	654	431	35	5		
Butorphanol	56	31	5	1	0	21	0	2	2	20	7	0	3	18	6	12	4	0	0		
Codine	1753	1236	448	162	120	450	3	46	7	983	201	1	44	332	329	168	38	3	0		
(continued)																					

(continued)

Table 22(B). Demographic profile of SINGLE SUBSTANCE Pharmaceuticals exposure cases by generic category – Continued

	No. of Case Mentions	No. of Single Exposures	Age							Reason				Outcome								
			<=5	6-12	13-19	>=20	Unknown Child	Unknown Adult	Unknown Age	Unint	Int	Other	Adv Rxn	Treated in Health Care Facility	None	Minor	Moderate	Major	Death			
Dihydrocodeine	3	1																				
Fentanyl	1409	681	46	3	21	560	1						1	408	20	61	506	91	119	171	86	0
Hydrocodone alone or in combination (excluding combination products with acetaminophen, acetylsalicylic acid, or ibuprofen)	1826	832	179	38	54	470	0						510	229	7	57	333	173	162	53	9	2
Hydromorphone	1389	601	56	14	26	459	1						289	245	7	41	348	100	133	79	25	0
Levorphanol	1	0	0	0	0	0	0						0	0	0	0	0	0	0	0	0	0
Meperidine	106	43	4	2	1	32	0						17	12	0	11	24	4	12	4	4	0
Methadone	2906	1217	196	19	46	871	0						469	582	40	68	982	154	233	329	150	8
Morphine	3222	1507	204	12	63	1115	1						814	562	11	88	896	322	287	227	68	6
Naluphine	11	5	0	0	0	4	0						0	0	1	4	4	0	1	3	0	0
Other or unknown narcotics	2212	846	73	9	49	666	0						134	535	72	43	703	42	131	268	197	9
Oxycodone alone or in combination (excluding combination products with acetaminophen or acetylsalicylic acid)	8100	3640	658	144	262	2317	4						1932	1426	44	160	2077	763	828	469	126	8
Oxymorphone	508	220	19	3	9	180	1						93	116	3	3	150	44	41	53	12	2
Pentazocine	32	17	3	0	1	12	0						7	5	0	5	8	4	5	1	0	0
Propoxyphene	20	5	1	0	0	3	0						3	0	0	1	2	1	0	2	0	0
Sufentanil	3	0	0	0	0	0	0						0	0	0	0	0	0	0	0	0	0
Tapentadol	334	191	23	1	9	144	0						114	56	2	13	112	40	48	21	6	0
Tramadol	12,108	5712	1091	152	593	3627	2						2526	2793	30	290	3770	1431	1352	891	134	3
Other acetaminophen and acetylsalicylic acid combinations																						
Acetaminophen and acetylsalicylic acid with other ingredients	7030	4617	1789	139	1160	1422	4						2463	1989	3	129	2307	1133	911	461	13	0
Acetaminophen and acetylsalicylic acid without other ingredients	202	118	33	4	11	66	0						55	55	0	6	74	21	19	31	1	0
Serotonin 5-HT 1B,1D receptor agonists																						
Serotonin 5-HT 1B,1D receptor agonists: other or unknown	228	125	54	7	15	46	0						94	17	1	12	37	42	15	8	0	0
Serotonin 5-HT 1B,1D receptor agonists: sumatriptan	730	400	112	29	62	181	0						248	86	1	63	179	108	67	30	3	0
Category total:	289,444	184,255	87,710	8516	25,334	57,413	149						121,807	56,132	435	4148	73,501	43,214	22,342	12,429	2283	217
Anesthetics																						
Inhalation anesthetics																						
Nitrous oxide	204	142	13	21	8	91	1						47	68	3	21	87	14	30	35	6	0
Other types of inhalation anesthetic	73	56	0	2	2	44	0						41	7	4	3	38	5	23	4	1	0
Unknown types of inhalation anesthetic	1	0	0	0	0	0	0						0	0	0	0	0	0	0	0	0	0
Local and/or topical anesthetics																						
Dibucaine	15	15	12	0	0	3	0						14	0	1	0	2	4	1	0	0	0
Lidocaine	1585	1370	553	79	73	570	2						1125	82	2	149	305	304	167	71	13	4
Other or unknown local and/or topical anesthetic	3539	3305	2104	129	125	796	4						2944	113	13	226	500	931	323	72	19	1
Miscellaneous anesthetics																						
Ketamine and analogs	260	140	15	7	14	94	0						37	75	6	17	121	8	44	42	12	0
Other types of anesthetic	33	26	12	1	3	10	0						22	2	0	2	7	3	7	0	1	0
Unknown types of anesthetic	7	4	2	1	0	0	0						1	0	0	3	2	0	0	0	0	0
Category total:	5717	5058	2711	240	225	1608	7						4231	347	29	421	1062	1269	595	224	52	5
Anticholinergic drugs																						
Miscellaneous anticholinergic drugs																						
Anticholinergic drugs (excluding cough and cold preparations, and plants)	8595	6231	248	69	97	5056	5						5731	311	12	147	682	853	239	173	20	1
Category total:	8595	6231	248	69	97	5056	5						5731	311	12	147	682	853	239	173	20	1
Anticoagulants																						
Miscellaneous anticoagulants																						
Glycoprotein IIa/IIb inhibitors	5	5	0	0	0	4	0						4	0	0	1	5	1	2	0	1	0
Heparins	285	231	21	5	3	163	0						175	30	0	25	99	42	24	22	2	1
Other antiplatelets	2857	1058	224	16	6	733	0						1002	30	0	25	151	239	25	9	1	0
Other types of anticoagulant	3480	2057	315	16	14	1532	3						1833	112	0	105	470	459	59	64	18	2
Unknown types of anticoagulant	11	8	2	1	1	2	1						5	2	0	1	2	1	0	0	0	0
Warfarin (excluding rodenticides)	3025	1532	284	18	22	1116	2						1326	150	0	46	440	260	53	102	11	0

(continued)

(continued)



Table 22(B). Demographic profile of SINGLE SUBSTANCE Pharmaceuticals exposure cases by generic category – Continued

	No. of Case Mentions	No. of Single Exposures	Age					Reason				Outcome								
			<=5	6-12	13-19	>=20	Unknown	Child	Adult	Unknown	Age	Unint	Int	Other	Adv Rxn	Treated in Health Care Facility	None	Minor	Moderate	Major
Category total: Anticonvulsants	9663	4891	846	56	46	3550	6	361	26	4345	324	0	203	1167	1002	163	197	33	3	3
Anticonvulsants: carbamazepine and analogs																				
Carbamazepine	3631	1811	213	57	132	1344	1	51	13	688	824	0	218	1337	304	513	448	54	0	0
Oxcarbazepine	3983	1760	391	225	437	678	1	21	7	972	725	0	49	979	369	485	209	17	0	0
Anticonvulsants: gamma aminobuty-ric acid and analogs																				
Gabapentin	20,064	7024	1149	122	491	4895	0	312	55	3199	3443	30	250	4061	1819	1605	660	80	5	5
Other types of gamma aminobuty-ric acid anticonvulsant	3326	1276	269	25	70	831	1	68	12	608	560	5	73	725	317	289	173	23	1	1
Anticonvulsants: hydantoins																				
Fosphenytoin	10	8	0	0	1	6	0	1	0	2	1	0	5	7	0	1	3	0	0	0
Phenytoin	2461	1584	92	13	33	1397	0	40	9	540	369	0	562	1299	201	471	467	45	5	5
Miscellaneous anticonvulsants																				
Felbamate	61	27	13	3	1	10	0	0	0	27	0	0	0	9	6	3	1	0	0	0
Lamotrigine	10,197	4082	584	204	765	2307	1	206	15	2420	1456	2	164	2071	712	932	573	60	1	0
Levetiracetam	4821	2508	919	310	237	971	3	66	2	2029	415	0	53	737	693	329	83	8	0	0
Other types of anticonvulsant (excluding barbiturates)	970	383	74	35	30	233	0	10	1	294	73	0	13	174	82	75	41	6	0	0
Primidone	361	147	20	6	2	113	0	6	0	107	27	0	10	65	34	37	12	2	0	0
Succinimides	179	131	73	39	8	10	0	1	0	120	7	2	2	28	39	14	3	0	0	0
Topiramate	4749	1720	459	154	363	686	2	46	10	1015	623	3	58	945	526	366	163	8	0	0
Unknown types of anticonvulsant (excluding barbiturates)	6	4	0	0	1	2	0	1	0	0	4	0	0	4	1	0	0	0	0	0
Valproic acid	7763	3060	316	176	381	2083	1	85	18	1270	1215	7	435	2059	655	673	557	71	2	2
Zonisamide	660	319	89	29	38	141	0	19	3	258	44	0	15	93	93	40	9	3	0	0
Category total: Antidepressants	63,242	25,844	4661	1398	2990	15,707	10	933	145	13,549	9786	49	1907	14,593	5851	5833	3402	377	14	14
Antidepressants																				
Lithium salts																				
Lithium	6901	3715	132	63	431	2962	1	107	19	865	1281	11	1334	3163	522	873	1341	157	2	2
Miscellaneous antidepressants																				
Antidepressants: type unknown to consumer	76	22	3	2	4	9	0	3	1	4	14	0	2	16	3	4	3	0	0	0
Bupropion	13,439	6303	748	167	1153	3926	3	265	41	3369	2704	4	139	4096	1286	991	1429	381	9	9
Other types of antidepressant	409	162	13	4	29	107	2	5	2	33	110	5	10	135	33	42	35	5	1	1
Trazodone	20,191	7411	563	207	1610	4766	1	207	57	1800	5417	4	117	5828	1559	2498	1385	76	0	0
Monoamine oxidase inhibitors (MAOI)																				
Isocarboxazid	4	1	0	0	0	1	0	0	0	0	1	0	0	0	1	0	0	0	0	0
Other types of monoamine oxidase inhibitor (MAOI)	85	36	4	0	0	28	0	3	1	28	3	0	5	12	7	4	1	1	0	0
Phenelzine	33	13	0	0	0	13	0	0	0	5	5	0	3	7	1	2	4	0	0	0
Selegiline	45	19	5	0	0	12	0	2	0	16	1	0	2	6	2	2	3	0	0	0
Tranylcypromine	39	19	1	0	0	16	0	2	0	6	7	0	6	15	3	0	9	2	0	0
Selective serotonin reuptake inhibitors (SSRI)																				
Citalopram	8922	3530	868	211	876	1455	0	104	16	1802	1596	9	95	1892	1043	641	408	45	1	1
Escitalopram	8186	3574	637	252	1277	1299	2	88	19	1585	1856	4	110	2089	1038	699	458	12	0	0
Fluoxetine	12,207	4973	841	355	2092	1536	3	103	43	1967	2867	6	97	3126	1702	996	406	25	1	1
Fluvoxamine	468	181	24	14	36	97	1	9	0	101	63	1	15	83	28	34	23	1	0	0
Other types of selective serotonin reuptake inhibitor (SSRI)	4037	1691	388	72	484	699	1	35	12	771	834	5	65	1087	500	393	172	12	0	0
Paroxetine	3738	1474	315	55	269	778	0	50	7	746	649	11	59	780	391	275	145	6	0	0
Sertraline	16,852	8006	1880	493	2783	2631	7	182	30	3657	4037	11	262	4683	2185	1810	962	42	0	0
Serotonin norepinephrine reuptake inhibitors (SNRI)																				
Duloxetine	4951	1714	491	46	201	888	0	80	8	1053	521	15	112	808	475	319	193	6	1	1
Nefazodone	38	20	3	1	0	16	0	0	0	16	2	0	2	4	3	3	0	0	0	0
Other types of serotonin norepinephrine reuptake inhibitor (SNRI)	698	271	79	9	43	126	0	11	3	180	68	3	19	121	76	40	26	2	0	0
Venlafaxine	6487	2532	522	88	369	1444	1	91	17	1376	979	22	131	1492	683	480	384	59	3	3
Tetracyclic antidepressants																				
Maprotiline	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mirtazapine	4621	1472	230	60	213	929	1	34	5	563	836	2	58	983	338	451	173	14	0	0
Tricyclic antidepressants (TCA)																				
Amitriptyline	6019	2704	308	93	475	1746	0	67	15	862	1699	8	73	2089	377	670	765	268	13	13
Anoxapine	13	5	1	0	1	3	0	0	0	2	3	0	0	4	1	1	2	0	0	0
Clomipramine	255	130	18	2	11	91	0	8	0	88	27	0	14	55	33	30	15	3	0	0
Desipramine	59	26	7	0	3	16	0	13	0	13	9	1	2	17	4	4	5	2	1	1
Doxepin	1531	570	43	19	60	426	0	16	6	156	392	0	14	457	73	146	163	44	3	3

(continued)

(continued)

Table 22(B). Demographic profile of SINGLE SUBSTANCE Pharmaceuticals exposure cases by generic category – Continued

	No. of Case Mentions	No. of Single Exposures	Age					Reason			Outcome										
			<=5	6-12	13-19	>=20	Unknown Child	Unknown Adult	Unknown Age	Unint	Int	Other	Adv Rxn	Treated in Health Care Facility	None	Minor	Moderate	Major	Death		
Antidepressants	297	135	35	15	15	67	0	1	2	78	49	0	6	76	32	20	27	4	0		
	114	33	5	1	1	23	0	3	0	13	15	0	4	21	9	4	9	2	0		
	1252	517	61	18	72	350	0	14	2	231	237	3	34	316	91	96	111	22	3		
	505	220	14	7	23	169	0	6	1	43	130	11	18	186	14	40	88	32	1		
	9	5	2	0	0	2	0	1	0	3	1	0	0	4	2	0	0	0	1		
	9	7	2	0	1	4	0	0	0	4	3	0	0	5	1	2	1	0	0		
	28	15	1	0	4	9	0	1	0	2	11	0	0	12	2	3	5	2	0		
	12	3	0	0	0	2	0	0	1	0	2	0	0	3	0	0	0	1	0		
	Category total:	122,532	51,509	8244	2254	12,536	26,646	23	1498	308	21,438	26,429	136	2808	33,671	12,518	11,573	8751	1226	40	
	Antihistamines																				
Miscellaneous antihistamines	8713	6372	4737	260	213	999	8	138	17	6031	247	5	84	502	1368	206	20	1	0		
	27,855	20,319	11,356	1355	2403	4782	16	340	67	14,287	5573	14	312	7801	4476	2990	2362	241	7		
	1364	887	374	55	162	282	0	12	2	492	370	0	21	450	162	165	156	16	0		
	16,446	11,210	5377	746	1673	3161	8	186	59	6964	3953	13	186	4939	2289	1921	1625	165	9		
	53,143	37,045	21,299	4770	3199	6937	27	712	101	31,663	4805	19	449	6890	8555	2638	1043	49	0		
	Category total:	107,521	75,833	43,143	7186	7650	16,161	59	1388	246	59,437	14,948	51	1052	20,582	16,850	7920	5206	472	16	
	Antimicrobials																				
	Anthelmintics	30	28	13	1	0	12	0	2	0	26	2	0	0	5	13	0	0	0	0	
		40	18	3	0	0	15	0	0	0	11	6	0	1	12	5	3	0	0	0	
		1875	1770	962	141	37	514	5	97	14	1622	59	5	81	194	425	149	28	3	0	
220		213	160	13	1	37	0	2	0	198	7	6	1	25	48	14	3	0	0		
25		23	15	1	0	7	0	0	0	23	0	0	0	4	8	2	0	0	0		
Category total:		31,797	25,450	11,763	2408	1572	8322	32	1243	21647	1292	13	2435	3204	4045	1820	371	22	3		
Antibiotics																					
Systemic antibiotic preparations (oral, intravenous, intramuscular)		5670	5446	3857	223	125	963	15	240	23	5256	44	9	133	160	797	235	22	1	0	
		301	202	116	11	12	54	0	8	1	171	17	0	14	27	34	20	1	0	0	
		Category total:	1026	498	71	33	368	2	49	5	914	35	1	76	136	191	76	18	2	0	
	Antifungals																				
	Systemic antifungal preparations (oral, intravenous, intramuscular)	7240	6925	4699	201	113	1596	9	291	16	6662	64	16	179	484	1046	501	42	1	1	
		16	14	5	0	0	6	0	2	1	13	0	0	1	2	1	4	0	0	0	
		Category total:	1276	1026	498	71	33	368	2	49	914	35	1	76	136	191	76	18	2	0	
		Antiparasitics																			
		Antimalarials	828	485	101	24	54	279	1	25	1	395	47	1	36	168	114	52	35	7	0
			1018	640	163	15	50	353	0	53	6	502	50	1	84	103	105	60	11	1	0
36			31	12	3	1	11	0	4	0	25	2	0	4	9	5	4	1	0	0	
Category total:			128	94	20	5	21	43	0	4	55	22	0	14	67	21	14	18	10	0	
Other types of antitubercular			26	10	1	0	1	5	0	3	0	7	2	0	1	4	3	1	0	0	0
			71	42	13	2	5	18	1	2	17	33	8	0	1	17	9	7	2	0	0
	Category total:		1	1	1	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	
	Antivirals																				
	Antituberculars		282	107	25	9	13	56	0	4	0	79	18	1	9	39	28	14	12	0	1
			790	485	88	10	17	314	1	50	5	367	82	3	29	142	103	51	13	3	0
		485	434	164	95	31	124	1	16	3	384	6	0	39	52	8	31	10	1	0	
		Category total:	1497	1106	330	23	49	595	2	100	953	73	1	74	165	215	53	22	2	0	
		Systemic antiviral preparations (oral, intravenous, intramuscular)	135	133	60	10	8	46	1	6	2	127	5	0	1	4	20	11	0	0	0
			Category total:	546	350	122	16	19	178	0	14	292	33	1	23	55	67	26	6	3	0
Category total:			546	350	122	16	19	178	0	14	292	33	1	23	55	67	26	6	3	0	
Category total:			546	350	122	16	19	178	0	14	292	33	1	23	55	67	26	6	3	0	

(continued)

(continued)



Table 22(B). Demographic profile of SINGLE SUBSTANCE Pharmaceuticals exposure cases by generic category – Continued

	No. of Case Mentions	No. of Single Exposures	Age					Reason			Outcome											
			<=5	6-12	13-19	>=20	Unknown	Child	Unknown	Adult	Unknown	Age	Unint	Int	Other	Adv Rxn	Treated in Health Care Facility	None	Minor	Moderate	Major	Death
Miscellaneous antimicrobials	151	143	83	2	4	44	0	0	8	1	5	15	34	22	2	0	0	0	0	0	0	0
Other types of antimicrobial	9	4	0	0	1	2	0	0	1	0	0	2	0	1	0	0	0	0	0	0	0	0
Unknown types of antimicrobial	54,493	45,180	23,274	3284	2167	13,962	70	2224	199	5095	3241	59	1878	3171	620	56	5	5	5	5	5	5
Category total: Antineoplastics																						
Miscellaneous antineoplastics	2290	1759	295	56	69	1189	0	133	17	1585	64	2	101	621	69	12	4	4	4	4	4	4
Antineoplastic drugs	2290	1759	295	56	69	1189	0	133	17	1585	64	2	101	621	69	12	4	4	4	4	4	4
Category total: Asthma therapies																						
Miscellaneous asthma therapies	4606	4121	2472	630	222	671	5	106	15	3512	430	9	155	557	232	6	0	0	0	0	0	0
Albuterol	156	104	13	0	5	82	0	4	0	60	11	0	29	63	27	9	1	1	1	1	1	1
Aminophylline or theophylline	5929	4268	2957	667	154	419	2	65	4	4085	156	0	22	389	64	6	0	0	0	0	0	0
Leukotriene antagonist or inhibitor	4680	4626	2121	1244	222	907	7	120	5	4500	100	7	18	1323	2067	365	1	0	0	0	0	0
Non-selective beta agonists	340	252	78	22	16	116	3	17	0	213	18	1	18	65	20	2	0	0	0	0	0	0
Other asthma therapeutic agents	1105	934	158	107	27	571	1	66	4	797	82	3	48	136	74	4	0	0	0	0	0	0
Terbutaline and other beta-2 agonists	5	1	0	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0
Unknown asthma therapeutic agents	16,821	14,306	7799	2671	646	2766	15	378	31	13,168	797	20	290	2534	724	22	2	2	2	2	2	2
Category total: Cardiovascular drugs																						
Angiotensin converting enzyme inhibitor	9	4	1	0	2	1	0	0	0	2	2	0	0	3	1	0	0	0	0	0	0	0
Angiotensin converting enzyme inhibitor in combination with diuretic	16,522	7078	2869	414	249	3304	2	221	19	6180	773	2	108	2241	280	217	10	0	0	0	0	0
Angiotensin converting enzyme inhibitor, alone																						
Angiotensin receptor blocker	11	6	1	0	0	5	0	0	0	6	0	0	0	0	3	0	0	0	0	0	0	0
Angiotensin receptor blocker in combination with diuretic	8644	3994	903	118	123	2640	0	206	4	3697	241	0	47	809	1253	169	87	5	0	0	0	0
Angiotensin receptor blocker, alone																						
Antihyperlipidemic	1	1	0	0	1	0	0	0	0	0	1	0	0	1	0	1	0	0	0	0	0	0
Antihyperlipidemic combinations (excluding calcium antagonists)	12,126	4491	1686	148	111	2265	4	256	21	4223	157	2	104	511	88	30	2	0	0	0	0	0
Antihyperlipidemic, alone																						
Antihypertensives	5059	2819	815	1144	434	391	3	27	5	2353	361	11	75	1464	914	455	441	17	0	0	0	0
Antihypertensive (excluding diuretics), alone																						
Beta blockers	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Beta blocker in combination with diuretic	26,266	11,010	3076	365	467	6633	0	435	34	9040	1667	5	230	4579	4038	631	1003	111	13	0	0	0
Beta blocker, alone																						
Calcium antagonist	3	2	1	0	0	1	0	0	0	2	0	0	0	2	2	0	0	0	0	0	0	0
Calcium antagonist in combination with angiotensin receptor blocker																						
Calcium antagonist in combination with other drugs	2	1	0	0	0	1	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0
Calcium antagonist, alone	13,345	5493	1268	142	168	3660	3	235	17	4704	595	2	159	2613	361	440	72	26	0	0	0	0
Miscellaneous cardiovascular drugs	4768	1526	253	26	147	1016	0	76	8	1032	418	1	62	593	393	226	161	6	0	0	0	0
Alpha blockers	2128	1205	134	14	15	976	0	63	3	1107	43	1	48	528	433	79	104	19	5	5	5	5
Antiarhythmics	1905	1252	89	10	6	1124	0	21	2	540	58	1	582	975	163	129	496	95	26	26	26	26
Cardiac glycosides	10,497	5351	1760	1315	891	1315	3	61	6	3504	1656	18	106	3858	972	1192	1748	139	0	0	0	0
Clonidine	1228	444	115	10	20	279	0	18	2	357	67	0	18	188	153	62	37	2	0	0	0	0
Hydralazine	839	265	30	1	6	212	0	16	0	232	25	0	8	81	73	32	15	0	0	0	0	0
Long-acting nitrates	1116	647	362	22	16	210	1	30	6	544	78	1	20	241	294	42	19	0	0	0	0	0
Nitroglycerin	16	12	0	0	0	12	0	0	0	6	0	0	5	10	2	0	3	3	0	0	0	0
Nitroprusside	556	228	74	7	4	132	0	10	0	215	10	0	3	60	74	16	13	1	0	0	0	0
Other types of cardiovascular drug	1204	825	300	32	32	405	2	48	6	602	94	8	111	286	196	116	53	6	1	0	0	0
Other types of vasodilator	70	31	10	0	0	16	0	4	1	22	8	0	1	17	5	1	2	0	0	0	0	0
Unknown types of cardiovascular drug																						
Category total: Unknown types of vasodilator	18	14	3	0	0	9	1	1	0	9	1	0	4	6	4	2	3	0	0	0	0	0
Vasopressors	238	191	74	37	7	67	0	6	0	174	7	1	8	81	18	83	25	0	0	0	0	0
Category total:	106,572	46,890	13,824	3805	2699	24,674	19	1734	135	38,552	6262	53	1699	19,148	14,384	3966	4897	488	71	0	0	0

(continued)

(continued)

Table 22(B). Demographic profile of SINGLE SUBSTANCE Pharmaceuticals exposure cases by generic category – Continued

	No. of Case Mentions	No. of Single Exposures	Age				Reason				Outcome								
			<=5	6-12	13-19	>=20	Unknown Child	Unknown Adult	Unknown Age	Unint	Int	Other	Adv Rxn	Treated in Health Care Facility	None	Minor	Moderate	Major	Death
Cold and cough preparations Acetaminophen and acetylsalicylic acid with decongestant and/or antihistamine Acetaminophen and acetylsalicylic acid with antihistamine without opioids Acetaminophen and acetylsalicylic acid with decongestant and antihistamine without opioids Acetaminophen and acetylsalicylic acid with decongestant without opioids Acetaminophen, acetylsalicylic acid, and dextromethorphan with antihistamine Acetaminophen, acetylsalicylic acid, and dextromethorphan with decongestant Acetaminophen, acetylsalicylic acid, and dextromethorphan with decongestant and antihistamine Acetaminophen, acetylsalicylic acid, and opioid with antihistamine Acetaminophen, acetylsalicylic acid, and opioid with decongestant and/or antihistamine Obsolete: acetaminophen and acetylsalicylic acid with decongestant and/or antihistamine combinations without phenylpropanolamine or opioids Obsolete: acetaminophen, acetylsalicylic acid, and dextromethorphan combinations with decongestant and/or antihistamine without phenylpropanolamine Obsolete: acetaminophen, acetylsalicylic acid, and opioid combinations with decongestant and/or antihistamine without phenylpropanolamine Acetaminophen with decongestant and/or antihistamine Acetaminophen and codeine with antihistamine Acetaminophen and codeine with decongestant Acetaminophen and codeine with decongestant and antihistamine Acetaminophen and dextromethorphan with antihistamine Acetaminophen and dextromethorphan with decongestant Acetaminophen and dextromethorphan with decongestant and antihistamine Acetaminophen and other opioid with antihistamine Acetaminophen and other opioid with decongestant and antihistamine Acetaminophen with antihistamine without opioids Acetaminophen with decongestant and antihistamine without opioids	12	3	2	0	0	0	0	0	1	3	0	0	0	0	1	1	0	0	0
	20	13	9	2	0	1	0	1	0	13	0	0	0	3	1	1	1	0	0
	16	8	6	1	0	1	0	0	0	8	0	0	0	0	2	0	0	0	0
	15	11	7	0	2	1	0	1	0	7	4	0	0	4	3	2	0	0	0
	15	11	9	0	2	0	0	0	0	10	1	0	0	3	4	1	1	0	0
	14	11	9	0	0	2	0	0	0	11	0	0	0	5	5	1	0	0	0
	2	2	0	0	0	2	0	0	0	2	0	0	0	0	0	1	0	0	0
	1	1	1	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0
	5	3	2	0	0	0	0	1	0	2	1	0	0	1	1	0	0	0	0
	14	11	6	0	1	4	0	0	0	7	2	0	2	4	0	2	2	0	0
	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1	1	0	1	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0
	2	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
	10	7	6	0	0	1	0	0	0	7	0	0	0	1	4	0	0	0	0
	4757	2325	892	139	469	751	2	58	14	1306	916	3	74	1083	495	415	205	14	0
	3903	2184	1188	172	261	508	2	48	5	1721	342	2	107	508	494	236	58	6	0
	2928	1668	842	151	265	371	1	28	10	1141	452	3	53	610	373	225	109	4	0
	2	2	2	0	0	0	0	0	0	2	0	0	0	0	1	0	0	0	0
	6	2	1	0	1	0	0	0	0	1	1	0	0	2	1	0	1	0	0
551	357	88	16	95	146	1	9	2	127	219	2	6	234	82	81	82	7	0	
978	617	364	74	64	109	0	4	2	503	90	0	22	141	138	49	35	3	0	

(continued)



Table 22(B). Demographic profile of SINGLE SUBSTANCE Pharmaceuticals exposure cases by generic category – Continued

	No. of Case Mentions	No. of Single Exposures	Age						Reason				Outcome						
			<=5	6-12	13-19	>=20	Unknown Child	Unknown Adult	Unknown Age	Unint	Int	Other	Adv Rxn	Treated in Health Care Facility	None	Minor	Moderate	Major	Death
Acetaminophen with decongestant without opioids	1080	621	335	47	66	160	0	10	3	487	82	0	49	119	127	38	22	0	0
Obsolete: acetaminophen and codeine combinations with decongestant and/or antihistamine without phenylpropandamine	10	7	5	1	0	1	0	0	0	6	1	0	0	2	1	1	0	0	0
Obsolete: acetaminophen and dextromethorphan combinations with decongestant and/or antihistamine without phenylpropandamine	54	33	16	1	4	12	0	0	0	22	8	0	3	10	4	7	3	0	0
Obsolete: acetaminophen and other opioid combinations with decongestant and/or antihistamine without phenylpropandamine	7	6	1	2	0	3	0	0	0	3	2	0	0	3	1	1	0	0	0
Obsolete: acetaminophen with decongestant and/or antihistamine combinations without phenylpropandamine or opioids	32	21	7	3	3	8	0	0	0	14	4	0	3	6	3	1	0	0	0
Acetylsalicylic acid with decongestant and/or antihistamine																			
Acetylsalicylic acid and dextromethorphan with antihistamine	10	8	7	1	0	0	0	0	0	8	0	0	0	0	5	0	0	0	0
Acetylsalicylic acid and dextromethorphan with decongestant	7	6	6	0	0	0	0	0	0	6	0	0	0	0	2	0	0	0	0
Acetylsalicylic acid and dextromethorphan with decongestant and antihistamine	28	17	10	4	0	3	0	0	0	15	1	0	1	0	5	1	0	0	0
Acetylsalicylic acid and other opioid with decongestant	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acetylsalicylic acid with antihistamine without opioids	13	11	2	1	3	5	0	0	0	6	5	0	0	6	4	1	3	0	0
Acetylsalicylic acid with decongestant and antihistamine without opioids	153	115	77	14	7	16	0	1	0	101	7	0	7	18	29	6	1	0	0
Acetylsalicylic acid with decongestant without opioids	2	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Obsolete: acetylsalicylic acid and dextromethorphan combinations with decongestant and/or antihistamine without phenylpropandamine	5	5	2	0	1	2	0	0	0	4	1	0	0	2	3	1	0	0	0
Obsolete: acetylsalicylic acid with decongestant and/or antihistamine combinations without phenylpropandamine or opioids	5	4	2	1	1	0	0	0	0	4	0	0	0	0	0	0	0	0	0
Antihistamine and/or decongestant with codeine	82	55	22	7	3	21	0	2	0	43	8	0	3	14	7	3	7	0	0
Antihistamine and decongestant with dextromethorphan	3144	2714	2054	407	97	138	1	14	3	2560	108	0	40	377	706	288	51	2	1
Antihistamine and decongestant with other opioid	17	13	5	1	2	4	0	1	0	9	4	0	0	5	1	1	1	0	0
Antihistamine and decongestant without opioid	4453	3587	2296	532	164	540	1	49	5	3325	170	0	85	540	855	314	79	6	0
Antihistamine with codeine	683	529	155	70	56	232	0	14	2	402	104	0	10	165	124	89	31	3	0
Antihistamine with dextromethorphan	4182	3271	723	254	1018	1229	2	24	21	1196	2010	5	32	2107	493	746	947	40	0
Antihistamine with other opioid	259	209	50	19	17	109	0	10	4	164	41	0	3	82	51	57	17	1	0
Antihistamine without opioid	1845	1151	613	70	118	321	0	24	5	867	253	0	24	421	357	132	66	8	0
Decongestant with codeine	38	25	9	3	4	7	0	2	0	22	3	0	0	9	5	2	0	0	0
Decongestant with dextromethorphan	1855	1462	966	234	78	169	1	11	3	1267	151	1	38	229	326	115	37	3	0
Decongestant with other opioid	40	20	5	3	3	7	0	2	0	12	8	0	0	9	2	2	2	0	0
Decongestant without opioid	4409	3046	1617	208	239	878	5	91	8	2718	211	0	110	462	738	169	78	2	0
Obsolete: antihistamine and/or	11	8	5	0	1	2	0	0	0	8	0	0	0	3	5	0	0	0	0

(continued)

(continued)

Table 22(B). Demographic profile of SINGLE SUBSTANCE Pharmaceuticals exposure cases by generic category – Continued

	No. of Case Mentions	No. of Single Exposures	Age					Reason					Outcome							
			<=5	6-12	13-19	>=20	Unknown	Child	Adult	Unknown	Age	Unint	Int	Other	Adv Rsn	Treated in Health Care Facility	None	Minor	Moderate	Major
decongestant with codeine without phenylpropanolamine Obsolete: antihistamine and/or decongestant with dextromethorphan without phenylpropanolamine	168	126	26	7	26	65	0	2	0	38	84	1	0	91	20	34	37	0	0	0
decongestant with other opiod without phenylpropanolamine Obsolete: antihistamine and/or decongestant with other opiod without phenylpropanolamine	1	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0
decongestant without phenylpropanolamine and opiod Miscellaneous cold and cough preparations	84	73	49	19	0	4	0	1	0	69	3	0	0	9	15	3	1	1	1	0
Acetaminophen in combination with dextromethorphan (without decongestants or antihistamines)	134	84	62	7	7	7	0	1	0	74	8	0	2	20	24	5	6	0	0	0
Cough and cold preparations (not otherwise classified)	2876	2051	1417	118	175	296	2	35	8	1666	322	3	47	440	389	200	97	2	0	0
Dextromethorphan preparations (not otherwise classified)	12,077	9223	3576	1202	1348	2871	4	199	23	6128	2778	12	244	3357	1579	1534	1226	45	1	0
Dextromethorphan with expectorants	429	333	192	41	32	63	0	5	0	258	67	0	8	80	67	40	22	1	0	0
Expectorants without dextromethorphan	1872	1332	611	79	91	458	0	85	8	1191	107	1	32	142	209	34	15	0	0	0
Non-narcotic antitussives excluding dextromethorphan	1667	1139	453	59	124	437	3	55	8	895	168	0	71	449	366	186	45	6	0	0
Obsolete: acetylsalicylic acid in combination with dextromethorphan	4	3	2	1	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0
Obsolete: expectorants or antitussives (without narcotics or narcotic analogs)	31	22	14	3	1	4	0	0	0	21	0	0	1	9	3	2	5	0	0	0
Obsolete: non-acetylsalicylic acid salicylates in combination with dextromethorphan	2	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Obsolete: unknown types of cough and cold preparation	504	258	89	12	59	85	2	9	2	112	123	1	11	149	44	56	37	0	0	0
Non-acetylsalicylic acid salicylates with decongestant and/or antihistamine	3	3	2	0	0	1	0	0	0	2	1	0	0	2	0	2	1	0	0	0
Non-acetylsalicylic acid salicylates and dextromethorphan with antihistamine	7	6	4	2	0	0	0	0	0	6	0	0	0	2	1	0	0	0	0	0
Non-acetylsalicylic acid salicylates and dextromethorphan with decongestant	1	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Non-acetylsalicylic acid salicylates and dextromethorphan with decongestant and antihistamine	1	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Non-acetylsalicylic acid salicylates and opiod with decongestant	2	2	2	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
Non-acetylsalicylic acid salicylates and opiod with decongestant and antihistamine	4	4	4	0	0	0	0	0	0	4	0	0	0	1	3	0	0	0	0	0
Non-acetylsalicylic acid salicylates with antihistamine without opiod	7	6	5	1	0	0	0	0	0	5	0	0	1	0	2	0	0	0	0	0
Non-acetylsalicylic acid salicylates with decongestant and antihistamine without opiod	7	7	4	1	1	1	0	0	0	7	0	0	0	0	1	0	0	0	0	0
Obsolete: non-acetylsalicylic acid salicylates and opiod combinations with decongestant and/or antihistamine without phenylpropanolamine	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

(continued)

(continued)



Table 22(B). Demographic profile of SINGLE SUBSTANCE Pharmaceuticals exposure cases by generic category – Continued

	No. of Case Mentions	No. of Single Exposures	Age					Reason					Outcome								
			<=5	6-12	13-19	>=20	Unknown	Child	Adult	Unknown	Age	Unint	Int	Other	Adv Rxn	Treated in Health Care Facility	None	Minor	Moderate	Major	Death
Obsolete: non-acetylsalicylic acid salicylates with decongestant and/or antihistamine without phenylpropanolamine and opioid	2	2	1	1	0	0	0	0	0	0	2	0	0	0	0	0	0	1	0	0	0
Phenylpropanolamine containing preparations																					
Acetaminophen and phenylpropanolamine combinations with decongestant and/or antihistamine without opioid	59	41	28	4	3	4	0	0	2	0	36	5	0	0	9	15	4	0	0	0	0
Acetaminophen, acetylsalicylic acid, and phenylpropanolamine combinations with decongestant and/or antihistamine without opioid	12	12	4	0	0	8	0	0	0	0	8	3	0	1	4	2	1	1	0	0	0
Acetaminophen, acetylsalicylic acid, phenylpropanolamine, and dextromethorphan combinations with decongestant and/or antihistamine	30	24	14	3	2	5	0	0	0	0	18	6	0	0	6	3	1	2	0	0	0
Acetaminophen, phenylpropanolamine, and codeine combinations with decongestant and/or antihistamine	2	1	0	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0
Acetaminophen, phenylpropanolamine, and dextromethorphan combinations with decongestant and/or antihistamine	37	22	9	0	4	8	0	0	0	1	15	6	0	1	9	4	3	2	1	0	0
Acetaminophen, phenylpropanolamine, and other opioid combinations with decongestant and/or antihistamine	3	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Acetylsalicylic acid and phenylpropanolamine combinations with decongestant and/or antihistamine	23	14	8	1	1	4	0	0	0	0	12	1	0	1	3	2	1	1	1	0	0
Acetylsalicylic acid, phenylpropanolamine, and dextromethorphan combinations with decongestant and/or antihistamine	10	7	2	2	0	3	0	0	0	0	5	1	0	1	2	1	2	0	0	0	0
Antihistamine and/or decongestant with phenylpropanolamine and codeine	6	4	2	0	1	1	0	0	0	0	4	0	0	0	1	1	1	0	0	0	0
Antihistamine and/or decongestant with phenylpropanolamine and dextromethorphan	151	130	90	18	6	13	1	2	0	0	118	9	0	2	21	36	8	4	0	0	0
Antihistamine and/or decongestant with phenylpropanolamine and other opioid	3	3	0	1	0	2	0	0	0	0	3	0	0	0	1	0	3	0	0	0	0
Antihistamine and/or decongestant with phenylpropanolamine without opioid	166	115	79	12	10	12	0	2	0	0	103	10	0	1	23	30	8	3	0	0	0
Non-acetylsalicylic acid salicylates and phenylpropanolamine combinations with decongestant and/or antihistamine without opioid	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other phenylpropanolamine preparations (excluding street drugs and diet aids)	223	200	91	2	2	92	0	13	0	0	198	1	0	1	20	62	2	1	0	0	0
Category total:	56,291	39,435	19,267	4036	4938	10,212	28	816	138	29,151	8915	34	1097	12,038	8341	5121	3345	156	2		
Diagnostic agents																					
Miscellaneous diagnostic agents	332	298	53	6	10	190	0	32	7	259	1	1	37	91	49	47	14	1	2		
Other types of diagnostic agent	9	6	1	0	0	5	0	0	0	4	0	0	2	2	0	0	1	0	0		
Category total:	341	304	54	6	10	195	0	32	7	263	1	1	39	93	49	47	15	1	2		
Dietary supplements/herbals/homeopathic																					

(continued)

(continued)

Table 22(B). Demographic profile of SINGLE SUBSTANCE Pharmaceuticals exposure cases by generic category – Continued

	No. of Case Mentions	No. of Single Exposures	Age				Reason				Outcome								
			<=5	6-12	13-19	>=20	Unknown Child	Unknown Adult	Unknown Age	Unint	Int	Other	Adv Rxn	Treated in Health Care Facility	None	Minor	Moderate	Major	Death
Amino acids																			
Creatine	243	203	112	14	31	40	0	153	21	0	25	34	32	18	7	0	0	0	0
Other amino acid dietary supplements	657	456	260	30	27	126	0	353	42	1	57	96	90	38	12	0	0	0	0
Botanical products																			
Blue cohosh	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Citrus aurantium (single ingredient)	15	5	4	0	0	1	0	5	0	0	0	0	1	0	0	0	0	0	0
Echinacea	143	101	67	16	4	12	1	93	3	0	5	10	25	4	1	0	0	0	0
Ginkgo biloba	100	56	31	2	2	18	0	45	3	0	8	11	10	2	0	0	0	0	0
Ginseng	94	57	28	3	3	19	0	38	5	0	14	20	8	7	5	0	0	0	0
Kava kava	88	48	8	0	6	30	1	16	19	0	12	27	5	10	11	0	0	0	0
Ma huang/ephedra (single ingredient)	20	13	7	0	0	6	0	10	1	0	2	7	4	1	2	0	0	0	0
Multi-botanicals with citrus aurantium	58	44	17	1	6	19	0	20	15	0	9	22	12	10	6	0	0	0	0
Multi-botanicals with ma huang	60	43	25	2	3	10	0	30	10	0	3	18	16	8	5	0	1	0	1
Multi-botanicals without ma huang or citrus aurantium	1661	1329	828	65	77	322	1	1006	110	3	206	326	255	139	71	1	0	0	0
Other single ingredient botanicals	3032	1396	80	80	95	615	4	123	10	1909	6	252	324	416	213	55	6	1	0
St. John's wort	212	138	89	6	14	27	1	109	14	2	13	21	37	4	1	0	0	0	0
Valerian	264	117	50	4	9	44	0	65	31	0	20	47	34	16	3	0	0	0	0
Yohimbe	162	129	13	1	7	100	0	36	31	1	59	75	6	28	43	3	0	0	0
Cultural medicines																			
Asian medicines	138	118	43	10	6	43	7	90	7	2	18	35	26	15	5	3	1	0	0
Ayurvedic medicines	12	9	6	0	0	2	0	8	0	0	1	0	2	2	0	0	0	0	0
Hispanic medicines	7	5	0	0	0	2	0	6	0	0	1	3	2	1	0	0	0	0	0
Other cultural medicines	103	83	42	4	4	30	0	59	7	0	17	27	13	9	7	0	0	0	0
Energy products																			
Energy drinks: caffeine containing (from any source including guarana, kola nut, tea, yerba mate, cocoa, etc.)	1122	893	480	68	142	186	1	590	144	9	147	188	174	163	87	5	0	0	0
Energy drinks: caffeine only (without guarana, kola nut, tea, yerba mate, cocoa, etc.)	972	706	451	54	69	117	0	526	99	1	76	95	151	102	39	1	0	0	0
Energy drinks: ethanol and caffeine containing (from any source including guarana, kola nut, tea, yerba mate, cocoa, etc.)	123	36	10	1	15	8	0	12	19	1	4	15	4	6	6	1	0	0	0
Energy drinks: ethanol and caffeine only (without guarana, kola nut, tea, yerba mate, cocoa, etc.)	4	3	1	0	1	1	0	1	2	0	0	2	1	1	0	0	0	0	0
Energy drinks: ethanol containing without caffeine (from any source)	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Energy drinks: no caffeine (from any source)	37	31	23	3	1	3	0	27	0	0	3	5	9	3	0	0	0	0	0
Energy drinks: unknown	477	342	187	40	44	62	0	241	59	4	37	59	72	53	19	1	0	0	0
Energy products: other	353	276	140	5	23	96	0	175	38	1	61	101	61	56	31	1	0	0	0
Hormonal products																			
Androgen or androgen precursor dietary supplements	123	79	53	2	3	18	0	61	9	0	9	16	15	4	3	0	0	0	0
Glandular dietary supplements	54	39	26	2	0	9	0	33	3	0	3	3	6	1	0	0	0	0	0
Melatonin	24,159	20,443	15,973	2098	1322	891	34	18,373	1870	11	131	2910	4428	2065	70	1	0	0	0
Phytoestrogen dietary supplements	57	46	26	0	3	11	0	33	4	0	9	8	10	2	0	0	0	0	0
Miscellaneous dietary supplements/herbals/homeopathic																			
Homeopathic agents	11,116	10,452	9503	342	86	432	16	10,133	84	8	218	620	1840	251	29	3	0	0	0
Unknown dietary supplements or homeopathic agents	2046	1650	1050	106	51	386	2	1291	121	2	228	329	276	135	80	5	0	0	0
Other dietary supplements																			
Blue-green algae	887	872	144	129	117	318	20	857	1	10	3	114	348	200	17	2	0	0	0
Glucosamine (with or without chondroitin)	528	364	278	4	9	68	0	341	10	0	13	29	76	8	1	0	0	0	0
Other single ingredient non-botanical dietary supplements	1844	1012	683	55	42	194	0	876	65	3	62	118	175	43	16	0	0	0	0
Category total:	50,975	42,523	32,059	3147	2222	4266	88	37,621	2990	65	1726	5715	8640	3618	632	33	3	0	0
Diuretics																			

(continued)

(continued)



Table 22(B). Demographic profile of SINGLE SUBSTANCE Pharmaceuticals exposure cases by generic category – Continued

	No. of Case Mentions	No. of Single Exposures	Age					Reason				Outcome										
			<=5	6-12	13-19	>=20	Unknown	Child	Unknown	Adult	Unknown	Age	Unint	Int	Other	Adv Rxn	Treated in Health Care Facility	None	Minor	Moderate	Major	Death
Miscellaneous diuretics	3347	1086	427	36	29	553	0	0	40	67	12	10,145	993	66	2	23	277	247	115	57	0	0
Furosemide	2482	1021	388	57	62	461	0	0	47	17	2	6	890	82	0	43	216	245	76	25	4	1
Other types of diuretic	4305	1520	610	100	73	672	1	1	58	30	6	13,366	1336	154	1	22	390	423	90	30	1	0
Thiazide	247	90	28	5	1	53	0	0	3	5	0	0	80	7	0	3	25	24	9	4	0	0
Unknown types of diuretic	10,381	3717	1453	198	165	1739	1	1	148	19	3	13	3299	309	3	91	908	939	290	116	5	1
Category total:																						
Electrolytes and minerals																						
Miscellaneous electrolytes and minerals																						
Calcium and calcium salts	11,861	10,407	9278	482	129	429	10	10	67	142	20	34,24	10,145	194	8	51	345	1701	169	21	0	0
Chromium, trivalent	204	176	64	15	3	75	0	0	17	5	2	6	164	5	1	5	17	26	12	0	0	0
Colloidal silver	107	94	38	11	2	37	0	0	5	5	1	54	54	15	2	22	35	18	10	2	0	0
Fluoride (excluding vitamins, hydrofluoric acid, & mouthwashes)	1509	1435	1158	145	30	77	3	3	19	19	3	13,48	1348	15	2	67	64	255	96	7	0	0
Iron and iron salts (excluding vitamins with iron)	5910	4295	2204	119	475	1332	3	3	142	142	20	34,24	3424	581	3	257	1225	999	563	128	5	1
Magnesium and magnesium salts	1681	1313	586	61	40	545	2	2	72	72	7	10,77	1077	98	9	120	189	218	151	21	1	1
Multi-mineral and multi-herbal dietary supplement	833	661	378	28	72	171	1	1	10	10	1	459	459	133	2	64	251	183	88	61	5	0
Multi-mineral dietary supplements	204	149	94	6	8	34	0	0	6	6	1	124	7	0	17	23	33	16	4	0	0	
Other types of electrolyte or mineral	45	33	10	2	1	18	0	0	2	2	0	29	29	1	0	3	6	5	6	0	1	0
Potassium and potassium salts	1226	507	177	9	22	257	1	1	38	38	3	411	411	63	1	31	112	116	32	19	0	1
Selenium and selenium salts	98	65	28	0	5	28	0	0	4	4	0	53	53	3	0	7	12	11	8	2	0	0
Sodium and sodium salts	4611	3774	2147	361	167	905	12	12	155	155	27	32,11	3211	431	21	95	554	738	508	60	1	0
Unknown types of electrolyte or mineral	19	10	5	1	0	3	0	0	1	1	0	9	9	0	0	0	1	3	1	1	0	0
Zinc and zinc salts	1172	1001	533	27	33	342	1	1	52	52	13	842	842	38	0	116	96	118	108	20	1	1
Category total:	29,480	23,920	16,700	1267	987	4253	33	33	590	590	90	21,350	21,350	1584	49	855	2930	4424	1768	354	16	4
Eye/ear/nose/throat preparations																						
Miscellaneous eye/ear/nose/throat preparations																						
Topical steroids for eye/nose/throat	1990	1692	816	285	54	441	3	3	85	85	8	15,85	1585	49	1	56	67	262	118	8	0	0
Nasal preparations																						
Other nasal decongestants or sympathomimetics (excluding tetrahydrozoline)	2096	1991	814	82	120	820	3	3	137	137	15	17,23	1723	97	9	158	269	454	222	46	7	0
Other types of nasal preparation	556	532	331	14	18	136	4	4	28	28	1	503	503	9	1	17	22	64	58	3	0	0
Tetrahydrozoline, nasal preparations	24	24	14	1	0	5	0	0	4	4	0	21	21	2	1	0	7	9	4	1	0	0
Unknown types of nasal preparation	15	14	6	0	0	5	0	0	2	2	1	13	13	0	0	1	2	1	1	1	0	0
Ophthalmic preparations																						
Contact lens products	2234	2185	1047	45	136	826	4	4	119	119	8	2121	2121	28	5	29	447	209	460	88	1	0
Glaucoma medications	381	326	80	6	3	208	1	1	25	25	3	296	296	6	0	24	53	57	35	14	0	0
Other ophthalmic sympathomimetics	1121	1063	667	28	67	226	2	2	66	66	7	919	919	47	65	25	232	405	66	22	2	0
Other types of ophthalmic preparation	2035	1942	1089	64	68	596	5	5	108	108	12	1825	1825	33	17	62	136	316	77	26	0	0
Tetrahydrozoline, ophthalmic preparations	859	832	557	20	32	188	0	0	33	33	2	730	730	26	63	10	192	322	59	16	2	0
Unknown types of ophthalmic preparation	61	51	21	0	7	13	1	1	8	8	1	39	39	2	9	1	15	10	4	3	0	0
Otic preparations																						
Combination products	1171	1158	505	109	45	426	3	3	66	66	4	1144	1144	5	0	9	109	160	316	18	0	0
Other types of otic preparation	2223	2202	701	110	71	1118	5	5	181	181	16	2160	2160	7	0	33	289	221	685	43	0	0
Unknown types of otic preparation	44	43	12	2	2	21	2	2	3	3	1	42	42	0	1	0	10	3	15	3	0	0
Throat preparations																						
Other types of throat preparation	450	425	118	30	49	189	1	1	34	34	4	368	368	35	2	17	49	92	48	7	0	0
Throat lozenges with local anesthetics	275	253	103	13	27	84	0	0	22	22	4	223	223	19	1	7	17	56	17	1	0	0
Throat lozenges without local anesthetics	962	884	705	71	24	62	1	1	20	20	1	825	825	32	0	26	29	161	41	3	0	0
Unknown types of throat preparation	4	4	3	1	0	0	0	0	0	0	0	3	3	1	0	0	0	1	0	0	0	0
Category total:	16,501	15,621	7589	881	723	5364	35	35	941	941	88	14,540	14,540	398	175	475	1945	2803	2226	303	12	0
Gastrointestinal preparations																						
Antacids																						

(continued)

Table 22(B). Demographic profile of SINGLE SUBSTANCE Pharmaceuticals exposure cases by generic category – Continued

	No. of Case Mentions	No. of Single Exposures	Age					Reason					Outcome						
			<=5	6-12	13-19	>=20	Unknown Child	Unknown Adult	Unknown Age	Unint	Int	Other	Adv Rxn	Treated in Health Care Facility	None	Minor	Moderate	Major	Death
Antacids: other types	3903	3608	3184	185	22	174	4	32	7	3505	68	3	30	96	462	37	8	0	0
Antacids: proton pump inhibitors	10,268	4897	2305	181	236	1895	4	249	27	4397	344	1	146	506	917	182	18	1	0
Antacids: salicylate-containing	2509	2225	1735	203	40	211	3	26	7	2050	106	1	61	193	474	61	14	1	1
Antidiarrheals	246	126	36	6	11	68	0	2	3	82	30	1	9	75	37	22	15	4	0
Antidiarrheals: diphenoxylate and atropine containing																			
Antidiarrheals: loperamide	1378	1010	413	28	34	486	0	42	7	628	330	6	36	443	276	103	104	43	1
Antidiarrheals: non-narcotic containing (excluding salicyl containing)	23	16	10	1	1	3	0	1	0	13	2	0	1	1	1	1	0	0	0
Antidiarrheals: paregoric containing	2	2	0	0	0	1	0	1	0	2	0	0	0	1	0	0	0	0	0
Antispasmodics	2957	1336	490	91	129	564	2	48	12	983	239	3	94	497	386	182	114	2	0
Antispasmodics: anticholinergic containing	232	108	13	1	3	82	0	8	1	98	2	0	7	24	23	6	1	0	0
Antispasmodics: other types																			
Miscellaneous gastrointestinal preparations																			
Laxatives	15,343	13,212	9305	732	448	2298	15	371	43	12,036	610	78	462	1290	1841	1317	159	3	0
Other types of gastrointestinal preparation	9858	8237	6502	367	170	996	20	169	13	7720	249	11	235	671	1429	282	61	5	2
Unknown types of gastrointestinal preparation	32	13	9	0	1	3	0	0	0	11	2	0	0	3	3	1	2	0	0
Serotonin 5-HT3 receptor antagonists																			
Serotonin 5-HT3 receptor antagonists: ondansetron	2269	1365	930	99	67	241	0	25	3	1210	97	1	50	377	450	96	31	1	0
Serotonin 5-HT3 receptor antagonists: other or unknown	5	3	1	1	0	1	0	0	0	3	0	0	0	0	1	0	0	0	0
Category total:	49,025	36,158	24,933	1895	1162	7023	48	974	123	32,738	2079	105	1131	4177	6300	2290	527	60	4
Hormones and hormone antagonists																			
Hypoglycemic, combination																			
Hypoglycemic: biguanide combinations (excluding sulfonylurea)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hypoglycemic: sulfonylurea combinations	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hypoglycemic, single agent																			
Hypoglycemics: glucagon-like peptide-1 (GLP-1) receptor agonists	272	241	9	3	2	209	0	16	2	204	8	1	25	55	64	22	20	1	0
Hypoglycemics: other or unknown	668	345	89	10	4	212	1	27	2	308	18	0	19	115	131	18	25	1	1
Insulin	6609	5566	151	89	155	4779	2	359	31	4832	611	9	82	2357	2361	312	902	41	2
Oral hypoglycemics: alpha-glucosidase inhibitors	29	12	12	0	0	0	0	0	0	12	0	0	0	2	6	0	0	0	0
Oral hypoglycemics: biguanides	9393	4223	830	125	305	2723	2	220	18	3374	713	3	105	1200	962	370	236	42	8
Oral hypoglycemics: dipeptidyl peptidase-4 (DPP-4) inhibitors	689	249	84	6	3	142	0	14	0	226	13	0	10	60	92	8	5	1	0
Oral hypoglycemics: meglitinides	42	21	10	1	1	8	0	1	0	16	3	0	2	13	10	1	4	0	0
Oral hypoglycemics: sodium glucose co-transporter 2 inhibitor (SGLT2) inhibitors	334	176	73	1	2	86	0	14	0	156	7	0	12	68	68	4	6	2	0
Oral hypoglycemics: sulfonylureas	3851	1582	677	60	60	740	0	40	5	1295	163	1	96	1183	565	75	449	46	2
Oral hypoglycemics: thiazolidinediones	313	106	45	6	4	45	0	5	1	92	12	0	1	32	41	7	3	0	0
Miscellaneous hormones and hormone antagonists																			
Androgens	469	368	83	9	16	218	0	38	4	265	43	1	56	94	59	49	18	5	0
Corticosteroids	11,756	9674	4251	844	339	3613	13	570	44	8945	199	15	498	655	1356	376	65	2	0
Estrogens	1404	915	508	29	68	277	0	29	4	824	61	2	25	70	157	42	4	0	0
Oral contraceptives	3,946	3203	2092	109	418	471	4	88	21	2692	441	3	61	274	454	178	14	1	0
Other hormone antagonists	619	469	135	24	29	257	0	23	1	438	23	0	8	55	82	22	3	0	0
Other hormones	843	619	198	85	40	243	0	45	8	543	38	0	35	164	156	49	26	1	0
Progestins	1273	1037	548	40	59	330	2	48	10	896	39	1	97	120	165	47	8	1	0
Selective estrogen receptor modulators	289	164	45	5	8	93	0	12	1	153	8	0	2	22	38	8	3	0	0
Thyroid preparations (including synthetics and extracts)	13,616	9108	4500	385	263	3508	8	417	27	8659	332	5	98	1267	1714	137	54	5	0
Unknown hormones or hormone antagonists	17	12	6	0	1	3	0	2	0	8	3	0	1	3	2	1	0	0	0
Category total:	56,434	38,090	14,346	1831	1777	17,957	32	1968	179	33,938	2735	41	1233	7809	8483	1726	1845	149	13
Miscellaneous drugs																			
Other miscellaneous drugs																			

(continued)

(continued)

Table 22(B). Demographic profile of SINGLE SUBSTANCE Pharmaceuticals exposure cases by generic category – Continued

	No. of Case Mentions	No. of Single Exposures	Age						Reason			Outcome							
			<=5	6-12	13-19	>=20	Unknown Child	Unknown Adult	Unknown Age	Unint	Int	Other	Adv Rxn	Treated in Health Care Facility	None	Minor	Moderate	Major	Death
Allopurinol	949	318	142	9	13	136	0	18	0	294	19	0	4	53	96	16	3	0	0
Disulfiram	218	59	7	1	0	45	0	6	0	19	14	1	22	26	8	7	8	1	0
Ergot alkaloids	48	33	15	1	3	12	0	1	1	25	2	0	6	19	7	6	6	0	0
Levo-dopa and related drugs	1358	756	148	6	9	556	0	35	2	679	53	4	14	199	152	99	50	3	0
Neuromuscular blocking agents (succinylcholine, curare, etc.)	27	17	1	0	0	13	0	2	1	11	0	3	2	14	4	2	1	2	0
Nicotine pharmaceuticals	1571	1496	907	168	24	330	2	58	7	1326	72	9	85	303	443	244	29	1	0
Other types of miscellaneous prescription or over the counter drug	15,868	10,197	4099	525	507	4508	12	495	51	8961	572	20	582	2281	2184	1283	422	31	4
Category total: Muscle relaxants	20,039	12,876	5319	710	556	5600	14	615	62	11,315	732	37	715	2895	2894	1657	519	38	4
Miscellaneous muscle relaxants																			
Baclofen	4873	2160	273	69	175	1554	0	74	15	692	1225	31	106	1687	298	472	653	213	3
Carisoprodol (formulated alone)	2925	1180	91	8	50	991	0	34	6	245	876	2	20	987	129	399	325	54	1
Cyclobenzaprine	10,615	4444	1131	266	464	2423	1	128	31	2218	2072	6	78	2756	1017	1079	742	75	4
Metaxalone	459	225	29	2	37	143	0	10	4	127	85	0	10	112	53	42	29	5	0
Methocarbamol	2330	917	139	21	106	599	1	43	8	389	482	0	30	561	225	252	101	12	0
Other types of muscle relaxant	777	330	46	4	30	233	1	13	3	143	164	3	15	211	53	95	64	8	1
Tizanidine	4133	1642	262	36	90	1186	0	54	14	771	769	6	70	1126	257	341	514	43	1
Unknown types of muscle relaxant	245	48	9	0	9	22	2	4	2	11	35	2	0	39	3	13	14	0	0
Category total: Narcotic antagonists	26,357	10,946	1980	406	961	7151	5	360	83	4596	5708	50	329	7479	2035	2693	2442	410	10
Miscellaneous narcotic antagonists																			
Miscellaneous narcotic antagonist	774	330	14	5	16	259	0	27	9	133	74	19	97	186	25	77	70	7	0
Category total: Radiopharmaceuticals	774	330	14	5	16	259	0	27	9	133	74	19	97	186	25	77	70	7	0
Miscellaneous radiopharmaceutical																			
Specific pharmaceutical radionuclides	34	25	3	1	1	15	0	5	0	17	0	0	8	14	2	4	1	0	0
Category total: Sedative/hypnotics/antipsychotics	34	25	3	1	1	15	0	5	0	17	0	0	8	14	2	4	1	0	0
Barbiturates																			
Long acting barbiturates	1540	921	201	36	40	600	0	40	4	664	192	0	36	354	199	137	97	29	1
Short or intermediate acting barbiturates	147	63	2	0	4	46	0	10	1	40	19	0	3	35	8	12	4	3	1
Unknown types of barbiturate																			
Miscellaneous sedative/hypnotics/antipsychotics	25	5	0	0	2	3	0	0	0	0	5	0	0	5	0	1	3	0	0
Atypical antipsychotics																			
Benzdiazepines	43,557	16,774	1743	873	3110	10,432	6	500	110	5547	10,190	39	761	12,676	2913	4980	3873	442	11
Bupropione	74,050	26,868	4619	678	3522	16,810	5	963	271	8250	17,325	347	448	19,925	5207	9694	3469	362	14
Chloral hydrate	5400	1572	239	50	301	918	0	57	7	586	903	1	67	1021	475	422	136	7	0
Ethchlorvynol	14	5	3	2	0	0	0	0	0	4	0	0	1	3	1	1	2	0	0
Glutethimide	6	5	0	0	1	4	0	0	0	0	4	0	0	5	0	4	0	0	0
Glutethimide	1	1	0	0	0	1	0	0	0	0	1	0	0	1	0	0	1	0	0
Meprobamate	20	11	0	0	1	10	0	0	0	1	10	0	0	8	0	3	3	1	0
Methaqualone	7	3	0	0	0	3	0	0	0	0	3	0	0	3	0	0	1	1	0
Other types of sedative/hypnotic/anti-anxiety or anti-psychotic drug	15,053	6151	749	310	516	4306	2	208	60	2321	3556	25	132	4238	946	2245	881	67	2
Phenothiazines																			
Sleep aids over the counter only (excluding diphenhydramine)	4298	1682	172	56	178	1174	0	82	20	681	786	10	172	1195	298	387	440	26	3
Unknown types of sedative/hypnotic/anti-anxiety or anti-psychotic drug	1792	1140	384	17	175	534	1	21	8	487	624	2	12	687	257	220	236	23	0
Category total: Serums, toxoids, vaccines	305	113	7	4	25	62	0	9	6	14	91	1	2	98	17	31	24	0	1
Category total: Stimulants and street drugs	146,215	55,314	8119	2026	7875	34,903	14	1890	487	18,595	33,709	425	1634	40,254	10,321	18,137	9170	961	33
Serums, toxoids, vaccines																			
Miscellaneous serums, toxoids, and vaccines																			
Miscellaneous serums, toxoids and vaccines	1577	1400	269	111	117	742	11	130	20	1084	8	5	299	469	145	292	63	4	0
Category total: Cannabinoids and analogs	1577	1400	269	111	117	742	11	130	20	1084	8	5	299	469	145	292	63	4	0
Stimulants and street drugs																			
Cannabinoids and analogs																			
Ecigarettes: marijuana device flavor unknown	5	4	2	0	2	0	0	0	0	2	2	0	0	2	1	1	0	0	0
Ecigarettes: marijuana device with added flavors	1	1	0	0	0	1	0	0	0	1	0	0	0	0	1	0	0	0	0
Ecigarettes: marijuana liquid flavor	4	4	2	0	0	2	0	0	0	2	2	0	0	3	1	3	0	0	0

(continued)

(continued)

Table 22(B). Demographic profile of SINGLE SUBSTANCE Pharmaceuticals exposure cases by generic category – Continued

	No. of Case Mentions	No. of Single Exposures	Age					Reason				Outcome								
			<=5	6-12	13-19	>=20	Unknown Child	Unknown Adult	Unknown Age	Unint	Int	Other	Adv Rxn	Treated in Health Care Facility	None	Minor	Moderate	Major	Death	
unknown	1	1	0	0	0	1	0	0	0	0	0	1	0	0	1	0	0	1	0	0
E-cigarettes: marijuana liquid with added flavors	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E-cigarettes: marijuana liquid without added flavors	6	5	0	0	3	2	0	0	0	0	0	4	0	1	5	0	4	1	0	0
Marijuana: concentrated extract (including oils and tinctures)	7384	2865	579	163	754	1163	8	137	61	1007	1387	103	249	2022	191	852	733	67	2	2
Marijuana: dried plant	23	19	7	0	2	10	0	0	0	9	5	0	4	12	3	10	2	2	0	0
Marijuana: edible preparation	2	2	1	0	0	1	0	0	0	2	0	0	0	1	0	2	0	0	0	0
Marijuana: oral capsule or pill																				
Marijuana: preparation	7	1	0	0	1	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0
Marijuana: other or unknown preparation																				
Marijuana: pharmaceutical preparation	67	48	11	1	7	28	0	1	0	19	22	1	6	33	2	14	15	2	0	0
Marijuana: topical preparation	1	1	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0
Marijuana: undried plant	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tetrahydrocannabinol (THC) homologs	2703	1857	15	11	479	1210	1	122	19	84	1658	36	18	1717	96	484	750	180	3	3
Diet aids																				
Diet aids: phenylpropanolamine and caffeine combinations	5	3	1	0	0	2	0	0	0	2	1	0	0	2	1	1	1	1	0	0
Diet aids: caffeine combinations																				
Diet aids: phenylpropanolamine only	8	5	3	0	0	2	0	0	0	5	0	0	0	1	1	1	0	0	0	0
Other types of diet aid, over the counter only	169	131	60	5	15	48	0	3	0	79	24	0	28	65	31	26	19	1	0	0
Other types of diet aid, prescription only	25	18	8	0	2	7	0	1	0	10	5	0	3	14	4	4	4	0	0	0
Unknown types of diet aid																				
Miscellaneous stimulants and street drugs	57	36	12	1	7	15	0	1	0	17	10	0	9	16	8	6	6	0	0	0
Amphetamines and related compounds	16,313	10,147	3625	1807	1736	2726	13	179	61	6971	2674	40	293	5324	2592	1755	1716	102	3	3
Amphetamine or butyl nitrites (street drugs)	143	128	26	3	8	69	0	18	4	59	63	3	1	64	9	28	21	3	0	0
Caffeine	3702	2779	1107	88	412	1026	0	127	19	1608	714	14	422	846	459	493	351	16	0	0
Cocaine	5374	1261	72	7	68	993	1	89	31	128	1024	33	16	1079	185	226	363	82	10	10
Ephedrine	149	108	53	2	7	41	0	4	1	79	20	0	6	26	20	11	12	1	0	0
Gamma-hydroxybutyric acid including analogs or precursors	541	351	11	1	20	298	0	17	4	70	220	32	10	296	19	76	130	50	0	0
Hallucinogenic amphetamines	2026	1003	25	6	227	653	2	66	24	68	874	29	13	836	51	219	394	48	8	8
Heroin	7841	4319	20	1	182	3873	0	173	70	131	3974	111	26	3929	349	705	1473	986	56	56
Kratom	1	1	0	0	1	0	0	0	0	0	1	0	0	1	0	0	1	0	0	0
Lysergic acid diethylamide (LSD)	981	575	4	7	333	194	1	15	21	22	526	17	3	505	20	116	310	21	0	0
Mescaline/peyote	61	47	6	2	4	31	1	3	0	28	17	0	2	24	2	16	7	1	0	0
Methamphetamines	6576	3343	222	69	208	2505	4	235	100	533	2597	87	28	2866	402	591	1090	233	12	12
Methylphenidate	9290	6350	1582	2587	1236	867	8	63	7	5140	1028	10	123	2145	1583	964	635	21	0	0
Other hallucinogens	92	58	0	1	14	42	0	1	0	6	51	0	1	53	2	13	32	3	0	0
Other stimulants (excluding amphetamines)	437	249	70	5	17	145	0	8	4	155	64	0	25	118	49	51	41	3	0	0
Other street drugs	585	359	10	5	37	283	0	19	5	29	304	12	2	315	16	54	144	41	2	2
Phencyclidine/hydropyridine (PCP)	604	261	12	8	10	213	0	16	2	33	190	11	1	233	24	60	90	20	4	4
Unknown hallucinogens	9	6	0	0	2	4	0	0	0	0	5	1	0	6	0	0	2	0	0	0
Unknown stimulants or street drugs	227	140	3	2	36	86	0	13	0	10	118	5	2	123	9	22	58	18	4	4
Category total:	65,422	36,486	7549	4782	5830	16,542	39	1311	433	16,311	17,585	545	1292	22,685	6132	6808	8402	1901	104	104
Topical preparations																				
Miscellaneous topical preparations	2086	1993	1087	110	261	425	3	94	13	1830	47	7	106	141	334	220	23	1	0	0
Acne preparations	97	95	28	0	0	53	0	14	0	86	4	1	4	10	19	7	0	1	0	0
Boric acid or borates (as antiseptics, excluding insecticides)	2090	2036	1464	73	26	417	4	49	3	2007	17	2	8	134	273	184	9	0	0	0
Calamine (including all caladryl type products)	10,600	10,371	8759	206	168	1053	12	160	13	10,137	142	21	60	1099	2889	1088	70	10	0	0
Camphor	1358	1336	1060	41	17	191	1	25	1	1306	9	2	18	142	380	167	10	0	0	0
Camphor and methyl salicylate combinations	24,524	24,102	22,753	267	148	760	37	120	17	24,013	45	4	35	436	2963	627	16	0	0	0
Diaper care and rash products	18	17	8	0	1	7	0	1	0	16	0	0	1	2	0	5	0	0	0	0
Hexachlorophene containing																				

(continued)



Table 22(B). Demographic profile of SINGLE SUBSTANCE Pharmaceuticals exposure cases by generic category – Continued

	No. of Case Mentions	No. of Single Exposures	Age					Reason				Outcome										
			<=5	6-12	13-19	>=20	Unknown	Child	Unknown	Adult	Unknown	Age	Unint	Int	Other	Adv Rxn	Treated in Health Care Facility	None	Minor	Moderate	Major	Death
antiseptics Hydrogen peroxide 3% iodine or iodine containing antiseptics Mercury containing antiseptics Methyl salicylate Minoxidil, topical Other types of rubefacient or liniment (excluding camphor and methyl salicylate) Other types of topical antiseptic Podophyllin Silver nitrate Topical steroids (including otc, ophthalmic, and dermal preparations) Topical steroids in combination with antibiotics (including otc, ophthalmic, and dermal preparations) Wart preparations and other keratolytics Category total: Unknown drug	6631 1004	6358 905	2178 216	274 51	341 61	3120 485	7 2	412 86	26 4	6071 752	202 89	24 3	50 57	590 170	702 173	1095 140	64 21	2 0	0 0	2 0	0 0	0 0
	41 6661 167 3909	39 6573 162 3833	24 4736 45 2696	0 279 2 89	0 162 1 76	13 1134 100 792	0 9 0 3	2 240 13 169	0 13 1 8	33 6344 139 3532	3 61 4 26	1 17 0 6	2 139 18 268	12 631 37 200	7 1276 22 606	2 903 20 597	1 34 13 32	0 4 1 1	0 0 1 0	0 4 1 0	0 0 0 0	
	1947 52 103 8730	1893 49 74 8537	1023 19 19 4898	92 5 2 620	91 0 23 170	596 19 20 2332	1 0 1 14	86 4 7 470	4 0 2 33	1768 38 59 8397	64 1 5 49	6 0 0 4	6 10 9 86	45 12 19 189	231 4 12 1067	338 7 12 1067	231 7 19 287	27 4 4 10	1 0 0 0	1 4 4 0	1 0 0 0	1 0 0 0
	865	839	366	58	21	329	2	60	3	805	6	4	4	24	50	91	119	7	0	0	0	0
	1152	1140	649	101	42	280	1	63	4	1070	19	7	43	194	212	180	40	0	1	0	0	1
	72,035	70,352	52,030	2270	1609	12,126	97	2075	145	68,403	793	109	983	4299	11,381	5898	385	21	1	1	1	1
	25,027 25,027	17,066 17,066	4673 4673	698 698	2181 2181	8322 8322	68 68	806 806	318 318	6579 6579	6446 6446	806 806	558 558	558 558	12,612 12,612	3225 3225	2891 2891	3674 3674	1261 1261	131 131	131 131	131 131
	5048 5048	4703 4703	1113 1113	81 81	112 112	2921 2921	5 5	412 412	59 59	4598 4598	52 52	9 9	36 36	455 455	1150 1150	455 455	52 52	7 7	0 0	7 7	0 0	0 0
	768 726	606 520	447 370	52 51	22 26	72 54	0 4	11 11	2 4	552 465	28 34	1 1	25 14	78 72	128 108	29 19	6 5	0 0	0 0	0 0	0 0	0 0
	10 214 10 483	9 176 8 372	8 109 7 277	0 10 0 33	0 8 0 18	1 41 1 39	0 0 0 1	0 7 0 4	0 1 0 0	9 155 8 340	0 7 0 26	0 1 0 1	0 12 0 5	0 19 0 26	0 32 0 76	3 7 3 8	0 0 0 5	0 1 0 1	0 0 0 5	0 0 0 1	0 0 0 0	
82 501 33 833	79 475 33 790	77 452 33 679	1 16 0 91	0 4 0 8	1 1 0 6	0 1 0 1	0 0 0 4	0 1 0 1	78 462 32 759	1 2 0 20	0 5 0 2	0 5 1 2	0 5 0 7	3 35 2 34	11 103 4 119	2 19 1 35	0 2 0 2	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	
88 5241 33	71 4275 26	64 3274 16	4 108 3	0 135 0	3 660 6	0 3 0	0 84 1	0 11 0	70 4060 24	1 151 1	0 3 0	0 59 1	0 403 0	5 938 7	12 179 0	3 13 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	
(continued)																						

(continued)

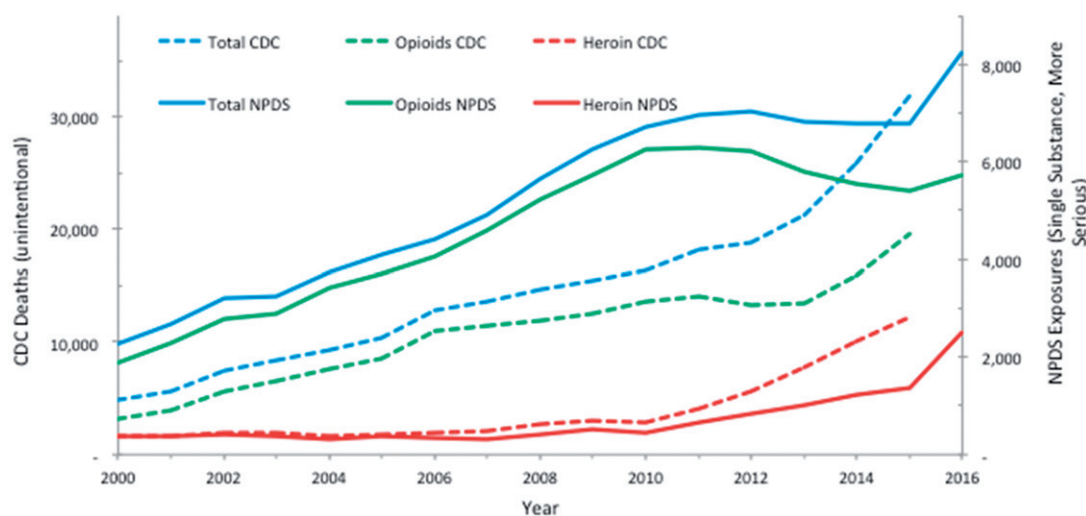


Figure 6. The change over time for NPDS single substance more serious exposures (solid lines) to heroin, non-heroin opioid medications, and the sum (total NPDS). The broken lines show unintentional fatalities reported in CDC WONDER multiple cause of death reports for the same subsets.

heroin, although this cannot be confirmed by these data. The increases in illicit fentanyl-associated deaths represent an emerging and troubling feature of the rise in illicit opioid overdoses that were heretofore presumed to involve only heroin [8,9].

Discussion

The exposure cases and information requests reported by PCs in 2016 do not reflect the full extent of PC efforts, which also include poison prevention activities and public and health care professional education programs.

NPDS exposure data may be considered “numerator data” in the absence of a true denominator, that is, we do not know the number of actual exposures that occur in the population. NPDS data cover only those exposures which are reported to PCs since poison exposures and poisoning deaths are not currently reportable events.

NPDS 2000–2016 call volume data clearly demonstrate a continuing decrease in exposure cases. This decline has been apparent and increasing since mid-2007 and reflects the decreasing use of the PC for less serious exposures. However, in contrast, during this same period, exposures with a more serious outcome (death, major, moderate) and HCF cases have continued a consistent increase. Possible contributors to the declining PC access include: declining US birth rate (especially since exposure rates are much higher in children ≤ 5 years of age), increasing use of text rather than voice communication, and increasing use of and reliance on internet search engines and web resources. To meet our public health goals, PCs will need to understand and meet the public’s twenty-first century communication preferences. We are concerned that failure to respond to these changes may result in a retro-shift with more people seeking medical care at HCFs for exposures that could have been managed at home by a PC. Likewise minor exposures may progress to more serious morbidity and mortality because of incorrect internet information or no telephone management. The net

effect could be more serious poisoning outcomes because fewer people took advantage of PC services, with a resultant increased burden on the national healthcare infrastructure as may be reflected in the increased number of cases managed in a HCF this year.

NPDS statistical analyses indicate that all analgesic exposures including opioids and sedatives are increasing year over year. This trend is shown in Table 17(B) and Figure 4. NPDS data mirror CDC data that demonstrates similar findings [7]. Thus NPDS provides a real-time view of these public health issues without the need for data source extrapolations.

One of the limitations of NPDS data has been the perceived lack of fatality case volume compared with other reporting sources. However, when change over time is studied, NPDS is clearly consistent with other public health fatality analyses. One of the issues leading to this concern is the fact that medical record systems seldom have common output streams. This is particularly apparent with the various electronic medical record systems available. It is important to build a federated approach similar to the one modeled by NPDS to allow data sharing, for example, between hospital emergency departments and other medical record systems, including medical examiner offices, nationwide. Enhancements to NPDS can promote interoperability between NPDS and electronic medical records systems to better trend poison-related morbidity and mortality in the US and internationally.

Summary

Unintentional and intentional exposures continue to be a significant cause of morbidity and mortality in the US. The near real-time, always current status of NPDS represents a national public health resource to collect and monitor US exposure cases and information calls.

Changes in 2016 encounters are shown in Figures 1, 3, and 4, and include:

- Total encounters (all exposure and information calls) decreased by 2.94%.
- All information calls decreased 12.5%, Drug ID calls decreased 29.6%, and human exposures decreased 0.431%.
- HCF information requests increased 0.454% and HCF exposure cases *increased* 3.63% in line with the steady increase since 2000.
- Human exposures with less serious outcomes decreased 0.739% while those with more serious outcomes (moderate, major or death) *increased* 2.89% compared to an overall 4.39% yearly increase since 2000.
- The categories of substance exposures in cases with more serious outcomes increasing most rapidly are: sedative/hypnotics/antipsychotics, followed by analgesics, antidepressants, and cardiovascular drugs.

These data support the continued value of PC expertise and need for specialized medical toxicology information to manage the more severe exposures, despite a decrease in cases involving less severe exposures. Poison centers must consider newer communication approaches that match current public communication patterns in addition to the traditional telephone call.

The continuing mission of NPDS is to provide a nationwide infrastructure for public health surveillance for all types of exposures, public health event identification, resilience, response and situational awareness tracking. NPDS is a model system for the nation and global public health.

Disclaimer

The American Association of Poison Control Centers (AAPCC; <http://www.aapcc.org>) maintains the national database of information logged by the country's regional Poison Centers (PCs) serving all 50 United States, Puerto Rico, and the District of Columbia. Case records in this database are from self-reported calls: they reflect only information provided when the public or healthcare professionals report an actual or potential exposure to a substance (e.g. an ingestion, inhalation, or topical exposure, etc.) or request information/educational materials. Exposures do not necessarily represent a poisoning or overdose. The AAPCC is not able to completely verify the accuracy of every report made to member centers. Additional exposures may go unreported to PCs and data referenced from the AAPCC should not be construed to represent the complete incidence of national exposures to any substance(s).

Disclosure statement

No potential conflict of interest was reported by the authors.

References

- [1] National Poison Data System: Annual reports 1983–2015 [Internet]. Alexandria (VA): American Association of Poison Control Centers. Available at: <http://www.aapcc.org/annual-reports/>
- [2] US Census Bureau: International Data Base (IDB) Mid-Year Population by Single Year Age Groups – Custom Region (American Samoa, Federated States of Micronesia, Guam, Puerto Rico, United States, US Virgin Islands). [cited 2017 Sep 5] Available at: <http://www.census.gov/population/international/data/idb/region.php>.
- [3] American Academy of Clinical Toxicology; European Association of Poisons Centres and Clinical Toxicologists. Position statement: ipecac syrup. *J Toxicol Clin Toxicol*. 1997;35:699–709.
- [4] American Academy of Clinical Toxicology; European Association of Poisons Centres and Clinical Toxicologists. Position paper: ipecac syrup. *J Toxicol Clin Toxicol*. 2004;42:133–143.
- [5] American Academy of Pediatrics Policy Statement. Poison treatment in the home. *Pediatrics*. 2003;112:1182–1185.
- [6] Savel TG, Bronstein A, Duck M, et al. Using secure web services to visualize poison center data for nationwide biosurveillance: a case study. *Online J Public Health Inform*. 2010;2:1–9.
- [7] Centers for Disease Control and Prevention. QuickStats: number of poisoning deaths involving opioid analgesics and other drugs or substances – United States, 1999–2007. *MMWR Morb Mortal Wkly Rep*. 2010;59:1026.
- [8] Centers for Disease Control and Prevention, National Center for Health Statistics. Multiple Cause of Death 1999–2015 on CDC WONDER Online Database, released December; 2016. [cited 2017 Sep 30]. Available at: <http://wonder.cdc.gov/mcd-icd10.html>.
- [9] Rudd RA, Seth P, David F, et al. Increases in drug and opioid-involved overdose deaths – United States, 2010–2015. *MMWR Morb Mortal Wkly Rep*. 2016;65(5051):1445–1452.
- [10] McGraw-Hill's AccessMedicine, Laboratory Values of Clinical Importance (Appendix), Harrison's Principles of Internal Medicine 17e. McGraw-Hill Professional; 2008. Available at: <http://www.accessmedicine.com/>.
- [11] Goldfrank's Toxicologic Emergencies, 10th ed. McGraw-Hill Companies; 2015.
- [12] Dart RC, editor. *Medical Toxicology*, 3rd ed. Philadelphia, Lippincott: Williams & Wilkins; 2004.

Appendix A: Acknowledgments

The compilation of the data presented in this report was supported in part through the US Centers for Disease Control and Prevention AAPCC Cooperative Agreement 1UE1EH001314-01.

The authors wish to express their profound appreciation to the following individuals who assisted in the preparation of the manuscript: Katherine W. Worthen and Laura J. Rivers.

The authors express their sincere gratitude to the staff at the AAPCC Central Office for their support during the preparation of the manuscript: Stephen Kaminski, JD, Executive Director, and the entire staff.

Poison centers (PCs)

We gratefully acknowledge the extensive contributions of each participating PC and the assistance of the many health care providers who provided comprehensive data to the PCs for inclusion in this database. We especially acknowledge the dedicated efforts of the Specialists in Poison Information (SPIs) who meticulously managed and coded 2,710,042 calls made to US PCs in 2016.

As in previous years, the initial review of reported fatalities and development of the narratives and case data for NPDS was the responsibility of the staff at the 55 participating PCs. Many individuals at each center participated in the fatality case preparation. These toxicology professionals and their centers are:

Arizona Poison and Drug Information Center

Keith Boesen, PharmD, CSPI
F. Mazda Shirazi, MS, MD, PhD, FACEP, FAMCT
Nicholas Hurst, MD, MS
Denise Holzman, PharmD, CSPI
Matthew Andrews, PharmD

Arkansas Poison & Drug Information Center

Henry F. Simmons, Jr., MD
 Pamela R. Rossi, PharmD
 Howell Foster, PharmD, DABAT

Banner Poison & Drug Information Center

Daniel Brooks, MD
 Jane Klemens, RN, CSPI
 Rebecca Hilder, RN, CSPI
 Maureen Roland, RN, CSPI
 Belinda Sawyers, RN, CSPI

Blue Ridge Poison Center

Christopher P. Holstege, MD
 Heather A. Borek, MD
 Nathan P. Charlton, MD
 Jennifer R. Horn, BSN
 Joshua D. King, MD
 Justin Rizer, MD

California Poison Control System – Fresno/Madera Division

Richard J. Geller, MD, MPH
 Rais Vohra, MD

California Poison Control System – Sacramento Division

Timothy Albertson, MD, PhD
 Justin Lewis, PharmD, DABAT

California Poison Control System – San Diego Division

Richard F. Clark, MD
 Lee Cantrell, PharmD, DABAT
 Bryan Corbett, MD
 Adam Koch, MD
 Cynthia Koh, MD
 Daniel Lasoff, MD
 Alicia Minns, MD
 Christie Sun, MD

California Poison Control System – San Francisco

Ilene Anderson, PharmD, DABAT
 Sandra Hayashi, PharmD
 Raymond Ho, PharmD, DABAT
 Susan Kim-Katz, PharmD
 Kai Li, MD
 Anita Ma, PharmD
 Beth Manning, PharmD
 Kathryn Meier, PharmD, DABAT
 Kent R. Olson, MD
 Craig Smollin, MD
 Ben Tsutaoka, PharmD, DABAT
 Kathy Vo, MD

Carolinas Poison Center

Michael C. Beuhler, MD
 Anna Rouse Dulaney, PharmD
 Dalia Alwasiyah, MD
 Christine M. Murphy, MD
 Sara K. Lookabill, PharmD
 Matt Stripp, MD
 Kathy Kopec, DO
 William Kerns II, MD

Central Ohio Poison Center

Hannah L. Hays, MD
 Jason Russell, DO
 Marcel J. Casavant, MD, FACEP, FACMT, FAACT

Henry Spiller, MS, DABAT, FAACT
 Kimberly Smitley

Central Texas Poison Center

Ryan Morrissey, MD
 S. David Baker, PharmD, DABAT

Children's Hospital of MI Regional Poison Center

Cynthia Aaron, MD
 Lydia Baltarowich, MD
 Mirjana Dimovska, MD
 Bram Dolcourt, MD
 Matthew Hedge, MD
 Andrew King, MD
 Denise Kolakowski
 Keenan Bora, MD
 Eric Malone, MD
 Luke Bisoski, MD

Cincinnati Drug and Poison Information Center

Shan Yin, MD, MPH
 Sara Pinkston, RN, CSPI
 Deborah Donald, RN, CSPI
 Shannon Staton-Growcock, RN, CSPI

Connecticut Poison Center

Charles McKay, MD, ABMT
 Mary Kay Balboni, RN, CSPI
 Dana Bartlett, MSN, MA, CSPI
 Bernard C. Sangalli, MS, DABAT

Florida/USVI Poison Information Center – Jacksonville

Thomas Kunisaki, MD, FACEP, ACMT

Florida Poison Information Center – Miami

Jeffrey N. Bernstein, MD
 Richard S. Weisman, PharmD

Florida Poison Information Center – Tampa

Tamas Peredy, MD, FAACT, FACMT
 Alfred Aleguas, PharmD, DABAT, FAACT
 Szilvia Boos, PharmD, CSPI
 Aryne Patterson, RN, CSPI
 Maria T. Reyes, RN, CSPI
 Judy Turner, RN, CSPI
 Charisse Webb, RN, CSPI

Georgia Poison Center

Brent W. Morgan, MD
 Robert J. Geller, MD
 Ziad Kazzi, MD
 Stella Wong, DO
 Gaylord P. Lopez, PharmD
 Stephanie Hon, PharmD
 Adam Pomerleau, MD
 Alaina Steck, MD
 Derek Eisnor, MD
 Mehruba Anwar, MD
 Ezaldeen Numur, MD
 Jessica Weiland, MD
 Cynthia Santos, MD
 Lindsay Schaack, PharmD, DABAT
 Sara Miller, PharmD
 Alexandra King, PharmD
 Diane Hindman, MD
 Tharwat El-Zahran, MD
 Samuel A. Ralston, DO

Illinois Poison Center

Michael Wahl, MD
 Sean Bryant, MD

Indiana Poison Center

Gwenn Christianson, MSN, CSPI
 Daniel E. Rusyniak, MD
 James B. Mowry, PharmD

Iowa Poison Control Center

Sue Ringling, RN, CSPI
 Kimberly Zellmer, PharmD, CSPI
 Linda B. Kalin, RN, CSPI
 Edward Bottei, MD

Kentucky Regional Poison Control Center

George M. Bosse, MD
 Ashley N. Webb, MSc, PharmD, DABAT

Louisiana Poison Center

Mark Ryan, PharmD
 Thomas Arnold, MD

Maryland Poison Center

Hong Kim, MD
 Lisa Booze, PharmD, CSPI
 Jacquelyn Goodrich, BSN, CSPI
 Angel Bivens, RPh, CSPI
 Kevin Simmons, BSN, CSPI
 Eric Schuetz, BPharm, CSPI
 Lisa Aukland, PharmD, CSPI
 Michael Hiotis, BPharm, CSPI
 Michael Joines, BPharm, CSPI
 Randall Goldberg, RN, CSPI
 Denise Couch, BSN, CSPI
 Jeanne Wunderer, RPh, CSPI
 Jennifer Malloy, PharmD, CSPI
 Laura Hignutt, PharmD, CSPI
 Christopher Wolff, PharmD, CSPI
 Elizabeth Millwee, RN, CSPI

Minnesota Poison Control System

Deborah L. Anderson, PharmD
 Jon B. Cole, MD
 Samantha Lee, PharmD, DABAT
 Ben Orozco, MD
 David J. Roberts, MD
 Jill Topeff, PharmD, CSPI
 Laurie Willhite, PharmD, CSPI

Mississippi Poison Control Center

Tanya Calcote, RN, CSPI
 Robert Cox MD, PhD, DABT, FACMT

Missouri Poison Center at SSM Health Cardinal Glennon Children's Hospital

Rebecca Tominack, MD
 Theresa Matoushek, PharmD, CSPI

National Capital Poison Center

Cathleen Clancy, MD, FACMT
 Nicole Reid, RN, BA, BSN, MEd, CSPI, DABAT

Nebraska Regional Poison Center

Ronald I. Kirschner, MD

New Jersey Poison Information and Education System

Steven M. Marcus, MD
 Bruce Ruck, PharmD
 Diane P. Calello, MD

New Mexico Poison and Drug Information Center

Steven A. Seifert, MD, FAACT, FACMT
 Brandon J. Warrick, MD
 Susan C. Smolinske, PharmD, DABAT, FAAC

New York City Poison Control Center

Maria Mercurio-Zappala, MS, RPh
 Mark K. Su, MD, MPH
 Denise Fernandez, MD
 Daniel Repplinger, MD
 Elizabeth Hines, MD
 Lindsay Fox, MD
 Morgan Riggan, MD
 Rachel Wightman, MD
 Stephen Alex Harding, MD

North Texas Poison Center

Brett Roth MD, ACMT, FACMT
 Donna Abron, RN, BSN, CSPI
 Anelle Menendez, CSPI
 Melody Gardner, MSN, MHA

Northern New England Poison Center

Karen E. Simone, PharmD, DABAT, FAACT
 Tammi H. Schaeffer, DO, FACEP, FACMT

Oklahoma Poison Control Center

William Banner, Jr., MD, PhD, ABMT

Scott Schaeffer, RPh, DABAT

Oregon Poison Center

Zane Horowitz, MD

Sandra L. Giffin, RN, MS

Palmetto Poison Center

William H. Richardson, MD

Jill E. Michels, PharmD

Lewis S. Hardison, DO

Pittsburgh Poison Center

Michael Lynch, MD

Amanda Korenoski, PharmD, MHA

Puerto Rico Poison Center

José Eric Díaz-Alcalá, MD

Andrés Britt, MD

Elba Hernández, RN

Regional Center for Poison Control and Prevention Serving Massachusetts and Rhode Island

Michele M. Burns, MD, MPH

Rebecca Bruccoleri, MD

Michael S. Toce, MD, MS

Regional Poison Control Center – Children's of Alabama

Justin Arnold, DO, MPH

Erica Liebelt, MD, FACMT

Sherrel Kirkland, RN, CSPI

LaDonna Gaines, RN, CSPI

Janet Fowler, RN, CSPI

Rocky Mountain Poison & Drug Center

Shireen Banerji, PharmD, DABAT

Christopher Hoyte, MD

Carol Hesse RN, CSPI

Regina R. Padilla

Nick Brandehoff, MD

Keith Baker, MD

Michael Marlin, MD

Thomas Nappe, MD

South Texas Poison Center

Cynthia Teter, PharmD

Douglas Cobb, RPh

George Layton, MD

Shawn Varney, MD

C. Lizette Villarreal, MA

Southeast Texas Poison Center

Wayne R. Snodgrass, MD, PhD, FACMT

Jean L. Cleary, PharmD, CSPI

Tennessee Poison Center

Donna Seger, MD

Nena Bowman, PharmD, DABAT

Denese Britt, MS, BSN, CSPI

Texas Panhandle Poison Center

Cristie Johnston, RN, CSPI

Thomas Martin, MD

Jeanie E. Jaramillo, PharmD

The Poison Control Center at the Children's Hospital of Philadelphia

Fred Henretig, MD

Kevin Osterhoudt, MD, MSCE, FAAP, FAACT, FACMT

Jeanette Trella, PharmD, BCPPS

University of Kansas Hospital Poison Control Center

Tama Sawyer, PharmD, DABAT

Stephen Thornton, MD

Upstate NY Poison Center

Brett Cherrington, MD

Jeanna M. Marraffa, PharmD

Christine M. Stork, PharmD

William Eggleston, PharmD

Utah Poison Control Center

B. Zane Horowitz, MD

Kaitlyn M. Brown, PharmD, CSPI

Virginia Poison Center

S. Rutherford Rose, PharmD

Kirk Cumpston, DO

Brandon Wills, DO

Michelle Troendle, MD

Washington Poison Center

Erica L. Liebelt MD

Curtis Elko PharmD

David Serafin

West Texas Regional Poison Center

Hector L. Rivera, RPh, CSPI

Stephen W. Borron, MD, MS, FACEP, FACMT

Salvador H. Baeza, PharmD, DABAT

West Virginia Poison Center

Mike Abesamis, MD

Elizabeth J. Scharman, PharmD, DABAT, BCPS, FAACT

Anthony F. Pizon, MD, ABMT

Wisconsin Poison Center

David D. Gummin, MD

Jillian L. Theobald, MD, PhD

Amy E. Zosel, MD

AAPCC fatality review team

The Lead and Peer review of the 2016 fatalities was carried out by the 47 individuals listed here including 6 who reviewed the pediatric cases [Peds]. The authors and the AAPCC wish to express our appreciation for their volunteerism, dedication, hard work and good will in completing this task in a limited time frame.

Alexandra King*, PharmD, Georgia Poison Center, Atlanta, GA

Alfred Aleguas Jr†, PharmD, DABAT, FAACT, Florida Poison Information Center, Tampa, FL

Amberly R. Johnson*, PharmD, DABAT, Utah Poison Control Center, Salt Lake City, UT

Anna Rouse Dulaney*, PharmD, DABAT, FAACT, Carolinas Poison Center, Charlotte, NC [Peds]

Annette Lopez, MD, Oregon Poison Center, Portland, OR

Ann-Jeannette Geib, MD, FACEP, FACMT, Rutgers Robert Wood Johnson Medical School, New Brunswick, NJ

Bernard C. Sangalli, MS, DABAT, Connecticut Poison Center, Farmington, CT

Christine Murphy, MD, Carolinas Medical Center, Charlotte, NC [Peds]

Curtis Elko*†, PharmD, CSPI, Washington Poison Center, Seattle, WA

Denese Britt*†, MS, BSN, CSPI, Tennessee Poison Center, Nashville, TN

Diane Calello, MD, FAAP, FACMT, New Jersey Poison Information and Education System, Newark, NJ [Peds]

Ed Bottei*, MD, Iowa Statewide Poison Control Center, Sioux City, IA

Elizabeth Hines, MD, Clinical Fellow, Medical Toxicology, NYU School of Medicine, NY, NY

Elizabeth J. Scharman, PharmD, DABAT, BCPS, FAACT, West Virginia Poison Center, Charlottesville, WV

Frank LoVecchio, DO, Banner Poison and Drug and Information Center, Phoenix, AZ

Gar Chan, MD, FACEM, Launceston General Hospital, Tasmania, Australia

Hannah Hays, MD, Central Ohio Poison Center, Columbus, OH

Hector Rivera, RPh, CSPI, West Texas Regional Poison Center

Henry Spillert, MS, DABAT, FAACT, Central Ohio Poison Center, Columbus OH

Jan Scaglione*, PharmD, DABAT, Cincinnati Drug and Poison Information Center, Cincinnati, OH

Jeffrey S. Fine, MD, NYU School of Medicine/Bellevue Hospital, New York, NY [Peds]

Jennifer Lowry, MD, Division of Clinical Pharmacology, Toxicology, and Therapeutic Innovations, Children's Mercy Hospital, Kansas City, MO [Peds]

Jill E. Michels, PharmD, DABAT, Palmetto Poison Center, Columbia, SC

Justin Lewis, PharmD, ABAT, California Poison Control System-Sacramento, Sacramento, CA

Kaitlyn Brown, PharmD, Utah Poison Control Center, Salt Lake City, UT

Lindsay Schaack*, PharmD, Georgia Poison Center, Atlanta, GA

Maria Mercurio-Zappala, RPh, MS, DABAT, FAACT, New York City Poison Control Center, New York, NY

Mark J. Neavyn, MD, Division of Medical Toxicology, UMass Memorial Medical Center, Worcester, MA
 Mark Su, MD, MPH, FACEP, FACMT, New York City Poison Control Center, New York, NY
 Marlo Murray, PharmD, CSPI, Washington Poison Center, Seattle, WA
 Michael Levine*, MD, Banner Good Samaritan Medical Center, Phoenix, AZ; University of Southern California, Los Angeles, CA
 A Min Kang, MD, University of Arizona College of Medicine – Phoenix; Banner Poison and Drug and Information Center, Phoenix, AZ
 Nathanael McKeown†, DO, Oregon Poison Center, Portland, OR
 Nena Bowman, PharmD, DABAT, Tennessee Poison Center
 Nima Majlesi, DO, Staten Island University Hospital, NY
 Paul Starr, PharmD, DABAT, Sykesville, MD
 Rachel Gorodetsky, PharmD, DABAT, Upstate New York Poison Center, Syracuse, NY
 Rachel Schult, PharmD, DABAT, Upstate New York Poison Center, Syracuse, NY
 Robert Goetz*, PharmD, DABAT, Cincinnati Drug and Poison Information Center, Cincinnati, OH
 Ron Kirschner, MD, Nebraska Regional Poison Center, Omaha, NE
 Salvador Baeza, PharmD, DABAT, West Texas Regional Poison Center, El Paso, TX
 Sara Miller, PharmD, DABAT, Grady Health System, Atlanta, GA
 Sophia Sheikh, MD, Department of Emergency Medicine, University of Florida College of Medicine-Jacksonville, Jacksonville, FL
 Stephanie Hon*, PharmD, DABAT, Georgia Poison Center, Atlanta, GA
 Steven M Marcus, MD, Newark, NJ [Peds]
 Susan Smolinske*†, PharmD, New Mexico Poison Center, Albuquerque, NM
 Timothy Wiegand*, MD, University of Rochester, Medical Center and Strong Memorial Hospital; SUNY Upstate Poison Center

† These reviewers served as associate managers during final review wrap up.

* These reviewers further volunteered to read the top ranked 200 narratives and judged to publish or not publish each.

AAPCC micromedex joint coding group

Chair: Elizabeth J. Scharman, PharmD., DABAT, BCPS, FAACT
 Alvin C. Bronstein, MD, FACEP, FACMT
 Anna Rouse Dulaney, PharmD, DABAT, FAACT
 Sandy Giffin, RN, MS
 Susan C. Smolinske, PharmD

AAPCC rapid coding team

Chair: Alvin C. Bronstein, MD, FACEP, FACMT
 Elizabeth J. Scharman, PharmD, DABAT, BCPS, FAACT
 Jay L. Schauben, PharmD, DABAT, FAACT
 Susan C. Smolinske, PharmD

AAPCC surveillance team

NPDS surveillance anomalies are analyzed daily by a team of 10 medical and clinical toxicologists working across the country in a distributed system. These dedicated professionals interface with the Health Studies Branch, National Center for Environmental Health, Centers for Disease Control and Prevention (HSB/NCEH/CDC) and the PCs on a regular basis to identify anomalies of public health significance and improve NPDS surveillance systems:

Alvin C. Bronstein, MD, FACEP, FACMT – Director
 Alfred Aleguas, PharmD, DABAT
 Douglas J. Borys, PharmD, DABAT
 John Fisher, PharmD, DABAT, FAACT
 Jeanna M. Marraffa, PharmD, DABAT
 Maria Mercurio-Zappala, RPH, MS, DABAT, FAACT
 Henry A. Spiller, MS, DABAT, FAACT
 Richard G. Thomas, Pharm D, DABAT

Regional poison center fatality awards

Each year the AAPCC and the Fatality Review team recognizes several regional PCs for their extra effort in their preparation of fatality reports and prompt responses to reviewer queries during the review process. The awards are presented each year at the North American Congress of Clinical Toxicology Annual meeting.

First Center to Complete all Cases (3 January 2017, 43 cases)
 Oregon Poison Center (Portland)
 Largest Number with Autopsy Reports (56 of 87 cases; 64%)
 Carolinas Poison Center (Charlotte)
 Highest Percentage with Autopsy Reports (73% of 15 cases)
 Oklahoma Poison Control Center (Oklahoma City)
 Largest Number of INDIRECT cases ($n = 13$; 10% of all 2016 cases)
 Central Ohio Poison Center (Columbus)
 Highest Overall Quality of Reports (5.24 out of possible 12 for 29 cases)
 Oklahoma Poison Control Center (Oklahoma City)
 Greatest improvement in Overall Quality of Reports (1.84 increase from last year)
 Tennessee Poison Center (Nashville)
 Most Narratives Published 2016 Annual report (nine of the 69 published narratives)
 Carolinas Poison Center (Charlotte)
 Most Helpful Regional Poison Center Staff (based on survey of AAPCC review team)
 Michael Beuhler MD – Carolinas Poison Center
 Honorable mention
 Debbie Anderson PharmD – Minnesota Poison Control System
 Michele Burns MD – Massachusetts Poison Center
 Maureen Roland RN – Banner Poison & Drug Information Center

Appendix B: Data definitions

Reason for exposure

NPDS classifies all calls as either EXPOSURE (concern about an exposure to a substance) or INFORMATION (no exposed human or animal). A call may provide information about one or more exposed person or animal (receptors).

Specialists in Poison Information (SPIs) coded the reasons for exposure reported by callers to PCs according to the following definitions:

Unintentional general: All unintentional exposures not otherwise defined below.

Environmental: Any passive, non-occupational exposure that results from contamination of air, water, or soil. Environmental exposures are usually caused by manmade contaminants.

Occupational: An exposure that occurs as a direct result of the person being on the job or in the workplace.

Therapeutic error: An unintentional deviation from a proper therapeutic regimen that results in the wrong dose, incorrect route of administration, administration to the wrong person, or administration of the wrong substance. Only exposures to medications or products used as medications are included. Drug interactions resulting from unintentional administration of drugs or foods which are known to interact are also included.

Unintentional misuse: Unintentional, improper or incorrect use of a non-pharmaceutical substance. Unintentional misuse differs from intentional misuse in that the exposure was unplanned or not foreseen by the patient.

Bite/sting: All animal bites and stings, with or without envenomation, are included.

Food poisoning: Suspected or confirmed food poisoning; ingestion of food contaminated with micro-organisms is included.

Unintentional unknown: An exposure determined to be unintentional, but the exact reason is unknown.

Suspected suicidal: An exposure resulting from the inappropriate use of a substance for reasons that are suspected to be self-destructive or manipulative.

Intentional misuse: An exposure resulting from the intentional improper or incorrect use for reasons other than the pursuit of a psychotropic effect.

Intentional abuse: An exposure resulting from the intentional improper or incorrect use where the patient was likely attempting to gain a high, euphoric effect, or some other psychotropic effect, including recreational use of a substance for any effect.

Contaminant/tampering: The patient is an unintentional victim of a substance that has been adulterated (either maliciously or unintentionally) by the introduction of an undesirable substance.

Malicious: Patients who are victims of another person's intent to harm them.

Withdrawal: Inquiry about or experiencing of symptoms from a decline in blood concentration of a pharmaceutical or other substance after discontinuing therapeutic use or abuse of that substance.

Adverse reaction drug: Unwanted effects due to an allergic, hypersensitivity, or idiosyncratic response to the active ingredient(s), inactive ingredient(s) or excipient of a drug, chemical, or other drug substance when the exposure involves the normal, prescribed, labeled or recommended use of the substance.

Adverse reaction food: Unwanted effects due to an allergic, hypersensitivity, or idiosyncratic response to a food substance.

Adverse reaction other: Unwanted effects due to an allergic, hypersensitivity, or idiosyncratic response to a substance other than drug or food.

Unknown reason: Reason for the exposure cannot be determined or no other category is appropriate.

Medical outcome

No effect: The patient did not develop any signs or symptoms as a result of the exposure.

Minor effect: The patient developed some signs or symptoms as a result of the exposure, but they were minimally bothersome and generally resolved rapidly with no residual disability or disfigurement. A minor effect is often limited to the skin or mucus membranes (e.g. self-limited gastrointestinal symptoms, drowsiness, skin irritation, first-degree dermal burn, sinus tachycardia without hypotension, and transient cough).

Moderate effect: The patient exhibited signs or symptoms as a result of the exposure that were more pronounced, more prolonged, or more systemic in nature than minor symptoms. Usually, some form of treatment is indicated. Symptoms were not life-threatening, and the patient had no residual disability or disfigurement (e.g. corneal abrasion, acid-base disturbance, high fever, disorientation, hypotension that is rapidly responsive to treatment, and isolated brief seizures that respond readily to treatment).

Major effect: The patient exhibited signs or symptoms as a result of the exposure that were life-threatening or resulted in significant residual disability or disfigurement (e.g. repeated seizures or status epilepticus, respiratory compromise requiring intubation, ventricular tachycardia with hypotension, cardiac or respiratory arrest, esophageal stricture, and disseminated intravascular coagulation).

Death: The patient died as a result of the exposure or as a direct complication of the exposure.

Not followed, judged as non-toxic exposure: No follow-up calls were made to determine the outcome of the exposure because the substance implicated was non-toxic, the amount implicated was insignificant, or the route of exposure was unlikely to result in a clinical effect.

Not followed, minimal clinical effects possible: No follow-up calls were made to determine the patient's outcome because the exposure was likely to result in only minimal toxicity of a trivial nature. (The patient was expected to experience no more than a minor effect.)

Unable to follow, judged as a potentially toxic exposure: The patient was lost to follow-up, refused follow-up, or was not followed, but the exposure was significant and may have resulted in a moderate, major, or fatal outcome.

Unrelated effect: The exposure was probably not responsible for the effect.

Confirmed non-exposure: This outcome option was coded to designate cases where there was reliable and objective evidence that an exposure initially believed to have occurred actually never occurred (e.g. all

missing pills are later located). All cases coded as confirmed non-exposure are excluded from this report.

Death, indirect report: Death, indirect report are deaths that the poison center acquired from medical examiner or media, but did not manage nor answer any questions about the death.

Relative contribution to fatality (RCF)

The case review team (CRT) includes the author and reviewer from the RPC, The AAPCC lead reviewer, peer reviewer and manager.

The definitions used for the RCF classification were as follows:

1. **Undoubtedly responsible:** In the opinion of the CRT the Clinical Case Evidence establishes beyond a reasonable doubt that the SUBSTANCES actually caused the death.
2. **Probably responsible:** In the opinion of the CRT the Clinical Case Evidence suggests that the SUBSTANCES caused the death, but some reasonable doubt remained.
3. **Contributory:** In the opinion of the CRT the Clinical Case Evidence establishes that the SUBSTANCES contributed to the death, but did not solely cause the death. That is, the SUBSTANCES alone would not have caused the death, but combined with other factors, were partially responsible for the death.
4. **Probably not responsible:** In the opinion of the CRT the Clinical Case Evidence establishes to a reasonable probability, but not conclusively, that the SUBSTANCES associated with the death did not cause the death.
5. **Clearly not responsible:** In the opinion of the CRT the Clinical Case Evidence establishes beyond a reasonable doubt that the SUBSTANCES did not cause this death.
6. **Unknown:** In the opinion of the CRT the Clinical Case Evidence is insufficient to impute or refute a causative relationship for the SUBSTANCES in this death.

Appendix C

Narratives of Selected Cases

Selection of Narratives for Publication. The narratives included in Appendix C were selected for publication in a 3-stage process consisting of qualifying, ranking, and reading. Changes in place since the 2014 report for the selection of the top 200 cases: include all pregnant subjects, include all children (0–2 year old) subjects, increase (double) the weight on the autopsy report, add a weighting for Age of subject (1/age in years), add a weighting for infrequency of substance category (Generic Code).

Qualifying cases were thus age 0–2 year old, Pregnant, or RCF = 1 – undoubtedly responsible, 2 – probably responsible, or 3 – contributory. Fatalities by indirect report were excluded beginning with the 2008 annual report. The ranking was based on Final Case Weighting (FCW).

FCW =

$$f \left[\frac{1}{(\text{num substances in this case})}, \text{WCS}, \frac{1}{\text{age (years)}}, \frac{1}{(\text{num cases in that generic code this year})} \right]$$

where

Weighted case score (WCS) =

$$\begin{aligned} & \text{hospital records} * 8.8 + \text{postmortem} * 15.2 \\ & + \text{blood levels} * 6.9 + \text{quality/completeness} * 6.4 \\ & + \text{novelty/educational value} * 13.2 \end{aligned}$$

WCS scores were normalized (z-score) within each AAPCC reviewer before the final weighting: 25% for each (1/NumSubstances, WCS, 1/Age, 1/NumCodes). The WCS weighting factors were the averages of review team recommendations gathered in 2006.

The top ranked narratives (200 + ties) were each read by individual reviewers who volunteered (see Appendix A) and the two managers (D. A. S. and D. E. B.). Each reader judged each narrative as "publish" or "omit" and all narratives receiving eight or more of 12 publish votes were selected, further edited, cross-reviewed by the two managers and JBM, and published in this report.

Narratives. Narratives of the cases were selected (see Selection of Narratives for Publication, above) from the human fatalities judged related to an exposure as reported to US PCs in 2016. A structured format for narratives was required in the PC preparation of the narratives and was used in the narratives presented. Abbreviations, units, and normal ranges omitted from the narratives are given at the end of this appendix.

Case 41. Acute model racing fuel ingestion: undoubtedly responsible

Scenario/substances: A 16 y/o male ingested model racing fuel and developed persistent emesis overnight. The next day he had a seizure and was transported by EMS to the ED.

Past medical history: Polysubstance abuse, history of abusing medication and drinking racing fuel with friends.

Physical exam: Respiratory failure, seizure, unresponsive with fixed pupils, T 35 °C.

Laboratory/diagnostic findings: ABG-pH <6.72/pCO₂ 24/HCO₃ 2. Repeat ABG-pHs: 7.1 then 7.34. Initial methanol concentration was 175 mg/dL, falling to 12 mg/dL on Day 3. Initial AG ~30, repeat was 42, lactate 12.8, then 2.5, BUN 21, Na 151, Cr 1.49.

Clinical course: In the ED he developed respiratory failure and seized, he was intubated and transferred to a children's hospital. CxR showed a pneumomediastinum. He received several amps of sodium bicarbonate and his pH improved to 7.1. Fomepizole was initiated, and CRRT was started. He was rewarmed and received folic acid and IVFs, he required a dopamine infusion. His neurological status did not improve and he died on Day 5.

Autopsy findings: Cause of Death: methanol toxicity.

Case 65. Acute hymenoptera sting: undoubtedly responsible

Scenario/substances: A 23 y/o male was hiking in the desert when he was stung >600 times by bees. EMS found the patient unresponsive. ACLS resuscitation was initiated after an estimated 40 min down time.

Clinical course: In the ED, CPR and ACLS interventions were continued for asystole. He received epinephrine, methylprednisolone, diphenhydramine, famotidine and IVFs without response. He died <1 h after ED presentation.

Autopsy findings: Not available.

Case 66. Acute rattlesnake bite: undoubtedly responsible

Scenario/substances: A 48 y/o male was bitten on the finger by a Western Diamondback rattlesnake while attempting to relocate the snake. He presented to the ED three days after the envenomation.

Past medical history: History of prior snakebite, allergic reaction to Antivenom (Crotalidae) Polyvalent.

Laboratory/diagnostic findings: In the ED: Hgb <7, INR 2.0, AST 2,026, ALT 2,701, CK 15,000.

Clinical course: In the ED, he received 6 vials of Crotalidae Polyvalent Immune Fab (ovine) with no apparent adverse reaction and was admitted to the ICU. 8 h later he developed hemorrhagic shock requiring vasopressors and 1 unit of PRBC and 2 units of platelets. He developed compartment syndrome of the right arm requiring fasciotomy and a wound vacuum, and antibiotics. He was intubated; renal function declined rapidly and CRRT was initiated. An additional 10 vials of antivenom were administered. Platelets 113, PT 26.3 (INR 2.44), fibrinogen 101, WBC 39.9/Hgb 7.2/Hct 23, AST 5305, ALT 3038, CK 33,000. On Day 2 he became anuric and his LDH, CK and PT/INR continued to rise. He received vasopressors sodium bicarbonate drip, 10 more vials of antivenom, and was transferred to a tertiary care facility. He remained on the ventilator with CRRT. Minimal neurologic activity was noted. He received an additional 10 vials of antivenom, 2 units of PRBCs, 4 units FFP, 10 units cryoprecipitate and 1 unit of platelets. On Day 4 pressor requirements increased, and the envenomated finger was amputated. CRRT and ventilation continued over the next several days. He remained anuric, jaundiced, and exhibited no purposeful movement. Surgery for an acute abdomen revealed a perforated bowel. He died on Day 10.

Autopsy findings: Probable cause of death: multisystem organ failure sequelae of snakebite to right hand. Manner of death: accident

Case 67. Acute envenomation (Crotalidae) bite: undoubtedly responsible

Scenario/substances: A 53 y/o male was bitten in the hand by the decapitated head of a rattlesnake (unknown species) he had just captured and killed. While being airlifted to a HCF, he developed bradycardia, dyspnea and then cardiac arrest.

Physical exam: He achieved ROSC prior to ED arrival. At the tertiary care facility: BP 112/56, HR 82, RR "tachypneic" (on ventilator). He was tremulous, bleeding from multiple sites, and had edema to the bite site.

Laboratory/diagnostic findings: Initial labs: PT 30.9, INR 1.4, platelets 265, fibrinogen 174, d-dimer > 20 mcg/ml, AST 1210, ALT 607.

Clinical course: The patient was transferred to a tertiary care HCF where he was intubated and sedated, anoxic brain injury was suspected. He received 23 vials of Crotalidae Fab antivenom, FFP and cryoprecipitate over his 4-day hospital course. Initial control was achieved with improvement in coagulation parameters and edema, but he failed to improve neurologically. Based on the prognosis, comfort measures were instituted and he died on Day 4.

Autopsy findings: Not performed.

Case 80. Acute ethyl chloride inhalation and ethanol ingestion: undoubtedly responsible

Scenario/substances: A 32 y/o male was found down ~20 min after huffing a chloroethane-containing solvent. EMS found him in PEA and transported him to the ED.

Physical exam: BP 100/76, HR 113, RR 14, O₂ sat 99% on FiO₂ 50%, T 39.4°C; comatose, pupils fixed and dilated, no gag reflex.

Laboratory/diagnostic findings: ABG-pH 7.16/pCO₂ 40.7/HCO₃ 14.3, CK 6999, troponin 0.096. Serum APAP and salicylate not detected.

Clinical course: In the ED he coded, was defibrillated, resuscitated, intubated and placed on a ventilator without sedation. He received IVF and sodium bicarbonate for acidosis. Head CT and MRI showed severe anoxic brain injury; he progressed to herniation. RR decreased and he died less than 24 h after arrival.

Autopsy findings: Toxicology results: (hospital peripheral blood): ethanol 110 mg/dL, chloroethane 31 mcg/mL. Cause of death: drug and alcohol intoxication.

Case 84. Acute sodium metasilicate and ethanol ingestion: undoubtedly responsible

Scenario/substances: A 38 y/o male presented with nausea, vomiting, abdominal pain and bloody oral secretions several h after an intentional ingesting 900 ml bottle of sodium metasilicate solution.

Past medical history: Depression. Medications: tramadol and hydromorphone.

Physical exam: BP 154/102, HR 108, RR 16, O₂ sat 96% on RA. He was talking normally with benign oral and abdominal examinations.

Laboratory/diagnostic findings: ABG-pH 7.25/pCO₂ 43/pO₂ 73/HCO₃ 18.8/BE -8, Na 143/K 3.6/Cl 99/CO₂ 26/BUN 11/Cr 1.1/Glu 194, AG 18, lactate 4.04, Ca 9.9. WBC 35.1/Hgb 20.4/Hct 58.3/platelets 256. Serum APAP and salicylate not detected; serum ethanol 149 mg/dL. EKG: sinus tachycardia.

Clinical course: This patient received IVFs and a proton pump inhibitor. About 6 h later he developed throat pain and hematemesis, with persistent HTN requiring anti-hypertensives. On Day 2 he had a complicated intubation due to upper esophageal swelling, he received steroids and started on TPN. He developed a rigid abdomen and bloody stools. CT showed gastric necrosis and a pleural effusion. Bronchoscopy showed extensive airway necrosis with bleeding and sloughing mucosa. He developed hyperkalemia requiring Ca, insulin and D50W. Acidosis was treated with a bicarbonate infusion. His urine output fluctuated during his hospital stay, HD was begun for oliguria. His Hgb fell; he became febrile and septic. Based on the prognosis, the family opted for institution of comfort measures and he died on Day 8.

Autopsy findings: Cause of death: caustic ingestion.

Case 93. Acute hydrochloric acid ingestion: undoubtedly responsible

Scenario/substances: A 54 y/o male ingested ~0.5 liter of 31.5% muriatic acid (HCl) and cut his neck about 40 min prior to being found by family.

Past medical history: Psychiatric disease, alcohol abuse.

Physical exam: Talking, hoarse voice.

Laboratory/diagnostic findings: No data provided.

Clinical course: He had an emergent cricothyroidectomy in the ED and was then taken OR for concern of perforation. His internal injuries (necrosis of the esophagus, stomach, duodenum, jejunum, pancreas, left lobe of liver and overlying abdominal wall) were judged incompatible with life. He was hypotensive in the OR, made DNR, and died later that day in the ICU.

Autopsy findings: Right-sided neck laceration (3.75-inch) through superficial tissue. Patient's lips were black, dark red/brown fluid drainage. Cause of death: acid chemical ingestion. Manner of death: suicide.

Case 103. Acute cyanide ingestion: undoubtedly responsible

Scenario/substances: A 62 y/o male ingested potassium cyanide during court house proceedings. Police noted "white powder" around his mouth. EMS found him breathing and with a pulse, GCS 3. He arrived in the ED within 20 min.

Past medical history: Prior suicide attempts.

Laboratory/diagnostic findings: ABG-pH 6.8, lactate 17.

Clinical course: In the ED, he was intubated. GCS 3, SBP 70s, bradycardic. He received IVFs, hydroxocobalamin and epinephrine, but developed PEA and died ~40 min after ED arrival.

Autopsy findings: Not available.

Case 107. Acute hydrofluoric acid ingestion: undoubtedly responsible

Scenario/substances: A 71 y/o male accidentally drank 1 oz of hydrofluoric acid at work, 30 min prior to ED arrival. He drank milk, but immediately vomited.

Past medical history: DM.

Laboratory/diagnostic findings: Na 138/K 3.7/Cl 100/CO₂ 22/BUN 25/Cr 0.97/Glu 179, AG 16, Ca 8.3, AST 25, ALT 32. WBC 15.7/Hgb 15.8/Hct 45.1/platelets 284, PT 12.1, INR 0.9, PTT 21.5, ionized Ca 1.01, Mg 1.9.

Clinical course: The patient reported no pain, BP 109/72, HR 122, RR 17, T 36.9 °C. He was given IVFs, Ca, Mg, ondansetron and pantoprazole. He coded and was defibrillated 3 times. He went into VF and received amiodarone and Ca. He woke up and followed commands but then coded again. He was then intubated and placed on a Ca infusion. Mg was normal but ionized Ca was low (1.08). He was transferred to a tertiary care center and placed on HD for 3 hours, but died that evening.

Autopsy findings: Not available.

Case 110. Acute anhydrous ammonia inhalation, ocular, dermal: undoubtedly responsible

Scenario/substances: An 80 y/o male suffered an anhydrous ammonia exposure (inhalational, ocular and dermal) after an ammonia line leaked into the cabin of his tractor. He had dyspnea during private vehicle transport to an ED, arriving 45 min following the exposure.

Past medical history: HTN, glaucoma.

Physical exam: Patient was initially alert and oriented, complaining of dyspnea and dysphagia, he had excessive secretions with conjunctival irritation and constricted pupils. Initial BP 187/112, HR 124, RR 24, T 35.8 °C. Ocular pH: right eye = 7.5–8, left eye 6.5 (post-irrigation). Ecchymosis and erythema of right forearm noted.

Laboratory/diagnostic findings: CBC "normal", K 2.9, Glu 211, BUN 26, Cr 1.3, lactate 4.5, AG 17. ABG-pH 7.34/pCO₂ 40/pO₂ 309/HCO₃ 22. Initial CxR unremarkable.

Clinical course: Patient developed progressive respiratory failure and was intubated and sedated, then transferred to a tertiary care center. He was given IVFs, antibiotics, ascorbic acid and corticosteroids. He initially awoke after sedation wore off, lungs were clear. His head CT and EEG normal. Day 5: bronchoscopy showed erythematous, sloughing mucosa with petechiae; a cryoprobe was used to remove excessive secretions. Day 6: a 2nd bronchoscopy showed healing lesions and thick secretions, which grew *Enterobacter*. The Day 15 bronchoscopy was much improved and he was extubated, but immediately re-intubated. Based on the prognosis, family opted for comfort measure and he died on Day 29.

Autopsy findings: Not available.

Case 119. Bleach (peroxide) ingestion: undoubtedly responsible

Scenario/substances: A 57 y/o male intentionally ingested an unknown amount of household bleach. He had multiple episodes of hematemesis at home.

Past medical history: Diabetes, HTN, depression.

Laboratory/diagnostic findings: After intubation: ABG-pH 7.18/pCO₂ 29/pO₂ 249/HCO₃ 10; Na 158/K 3.8/Cl 122/CO₂ 17/BUN 13/Cr 0.9/Glu 253, AG 19, Ca 4.3, Mg 2.1, lactate 3.9, troponin 0.12. Serum APAP, ethanol and salicylate not detected; UDS was negative. CT of abdomen showed pneumotosis in stomach wall with portal venous gas extending throughout the liver; gastric and bowel distension was seen throughout. Day 2: Na 178/K 2.7/Cl 149/CO₂ 18/BUN 24/Cr 2.0/Glu 317, Ca 6.4, AST 83, ALT 27, lactate 5.6; ABG-pH 7.12; Hgb 10.8/Hct 34.4/platelets 130.

Clinical course: He arrived at the ED 1 h after ingestion and was intubated. BP 106/50, HR 125, RR 14.0, O₂ sat 97% on 100.0 % FiO₂. In the ICU, his mental status was depressed and he had a bloody bowel movement. He received multiple vasopressors and a bicarbonate infusion. On Day 2 he became anuric; albumin and bumetanide were given; hypotension prevented HD. On Day 3 he had repeated seizures, cardiac arrest and died prior to a scheduled gastrectomy.

Autopsy findings: Cause of death: gastric perforation and chemical peritonitis as complications from intentional bleach ingestion. Manner of death: suicide.

Case 124. Acute drain cleaner (hydrochloric acid) ingestion: probably responsible

Scenario/substances: A 64 y/o female drank 4 mouthfuls of a drain cleaner (5–15% hydrochloric acid) and then called EMS 3 h later.

Physical exam: In the ED, she was awake and alert; no oral burns were apparent. BP 131/72, HR 122, RR 40, O₂ sat 97% on room air.

Laboratory/diagnostic findings: VBg-pH 7.03/pCO₂ 21/HCO₃ 5. Serum APAP, ethanol and salicylate not detected.

Clinical course: She was admitted with planned endoscopy, but this was deferred. Within 6 h of presentation she became increasingly tachypneic (RR 70) and hypotensive (70/40) despite high-dose vasopressors. She was intubated. Abdominal CT showed intestinal perforation. Based on the prognosis, the family opted for institution of comfort measures and she died within 24 h of presentation.

Autopsy findings: Not available.

Case 140. Acute hydrogen peroxide ingestion: undoubtedly responsible

Scenario/substances: A 60 y/o female presented after an acute, intentional ingestion of 35% hydrogen peroxide.

Past medical history: Dementia.

Laboratory/diagnostic findings: ABG-pH 7.32/pCO₂ 49/pO₂ 70, K 3.4.

Clinical course: She was transferred to a tertiary care facility. Initial O₂ sat was 91% on 2L, CT showed massive air emboli throughout portal venous system, mediastinal air and esophageal perforation. Patient refused treatments, including surgery and HBO. Healthcare proxy made patient DNR and she died "several" days later.

Autopsy findings: Not available.

Case 147. Acute carbon monoxide inhalation: undoubtedly responsible

Scenario/substances: A 3 y/o male was found inside a home after a house fire. The family had been using the kitchen stove for heat. A smoke detector was not working.

Past medical history: Asthma.

Physical exam: He had soot on his face, nose, hands, arms and legs, and in his nares and mouth. There were no burns.

Autopsy findings: COHb (subclavian blood): >60%. Cause of death: carbon monoxide toxicity due to house fire.

Case 162. Acute helium inhalation: undoubtedly responsible

Scenario/substances: A 26 y/o male was found unconscious in his home, by his father, with a plastic bag tied over his head connected to a helium tank by a hose. EMS found patient asystolic but warm to touch; CPR was initiated.

Laboratory/diagnostic findings: Na 154/K 1.6/Cl 132/HCO₃ 12.0/BUN 7/Cr 0.5/Glu 86, Ca 2.8, AST 111, ALT 114, bilirubin 0.1, ALP 18. Hgb 6.0/Hct 18.0/platelets 15, PT 21.2, PTT 111.3, d-dimer 27,360.

Clinical course: In the ED, he was intubated and given atropine, anti-dysrhythmics, serum alkalization and vasopressors. He briefly had ROSC but remained hypotensive. He developed additional ventricular dysrhythmias, PEA and asystole from which he could not be resuscitated and died.

Autopsy findings: Autopsy not available.

Case 169. Acute carbon dioxide inhalation: undoubtedly responsible

Scenario/substances: A 34 y/o male and his friends were attempting to remove rain water from an underground silo used to store food and survival equipment. He descended a ladder after his friend, who had already entered the silo, became unresponsive. EMS found him in PEA arrest, performed CPR, administered 2 amps of epinephrine and an amp of sodium bicarbonate, and transported him to ED. Testing within the storage container by HazMat crew (>1 h after arrival on scene) was: $O_2 = 8\%$, $CO_2 = 12\%$, hydrogen sulfide not detected.

Laboratory/diagnostic findings: Pre-intubation ABG-pH 6.99/ pCO_2 87/ HCO_3 20. Post-intubation on 100% O_2 : pH 7.21/ pCO_2 46.9. K 2.8, Cr 1.72, AST 244, ALT 258, lactate 7.0, CK 345.

Clinical course: In the ED, he was intubated; pink, frothy sputum observed. BP 90/52, HR 141, RR 22, T 36.4 °C. CxR described as "ground glass appearance" and there was clinical concern for post-emesis aspiration. Patient was transferred for possible ECMO, admitted to ICU and given famotidine, furosemide, sodium nitrite-sodium thiosulfate, midazolam, norepinephrine, vasopressin and sodium bicarbonate. 4 h after arrival he became bradycardic and then coded. He received 100 mg methylene blue, but died 5 h after ED arrival.

Autopsy findings: Cause of death: cardiac arrest, severe hypercarbic/hypoxic respiratory failure, bilateral pulmonary infiltrate.

Case 171. Acute carbon dioxide inhalation: undoubtedly responsible

Scenario/substances: A 34 y/o male and his friends were attempting to remove rain water from an underground silo used to store food and survival equipment. He descended a ladder after the pump stopped working and was found unconscious. EMS resuscitated, intubated, and transported him to the ED. Testing within the storage container by HazMat crew (>1 h after arrival on scene): $O_2 = 8\%$, $CO_2 = 12\%$, hydrogen sulfide not detected.

Physical exam: After resuscitation: BP 148/84, HR 61, RR 22 (ventilated), O_2 sat 100% (40% FiO_2), T 36.7 °C; pupils fixed and dilated.

Laboratory/diagnostic findings: Initial ABG-pH 7.06/ pCO_2 59/ pO_2 96/BE 13, Na 140/K 4.3/ CO_2 19/Cr 1.5/Glu 293. Day 2: Cr 1.4, AST 199, Glu 270, CK 430.

Clinical course: He was admitted to the ICU; head CT was negative for acute injury or edema; CxR was unremarkable. Day 2: BP 183/90, HR 120, EEG showed "poor amplitude" and he had seizure like activity despite midazolam and propofol infusions. He remained comatose with dilated pupils and no spontaneous activity off sedation. On Day 4 he was started on norepinephrine for hypotension. Based on the prognosis, the family opted for institution of comfort measures and he died on Day 6.

Autopsy findings: Cause of death: carbon dioxide poisoning. Manner of death: accidental. Blood and vitreous testing was negative for drugs, no hydrogen sulfide found in body tissue.

Case 192. Acute carbon monoxide inhalation: undoubtedly responsible

Scenario/substances: A 57 y/o male was found unresponsive by his sister in the garage with his motorcycle running. EMS found him pulseless; he was intubated with ACLS, and transported to the ED.

Past medical history: Depression, HTN.

Laboratory/diagnostic findings: Initial COHb 51.6%.

Clinical course: After 26 min of ACLS, there was ROSC. BP 144/90, HR 70, RR 16, T 31.8 °C, lungs clear bilaterally, no spontaneous breaths, GCS 3, hyporeflexic, pupils: 6 mm and fixed. He was judged too unstable for HBO therapy (required a 90-min transfer). Head CT showed severe cerebral edema and herniation. He was declared brain dead the following morning, was extubated and died.

Autopsy findings: Not available.

Case 206. Acute chlorine gas inhalation: probably responsible

Scenario/substances: A 68 y/o male, working on a dairy farm, was exposed to a cloud of chlorine gas while cleaning a pipe. While driving himself to a HCF, he called his wife saying he was having difficulty breathing and then collapsed outside his car. EMS found him pulseless; CPR was initiated with ROSC during Ed transport.

Past medical history: Type II DM, morbid obesity and HTN.

Physical exam: SBP 70s, HR 70s. GCS 3, pupils non-reactive.

ECG with prolonged QTc, CxR showed diffuse edema. Head CT showed no acute disease.

Laboratory/diagnostic findings: Lactate 4.1, troponin 0.32.

Clinical course: In the ED he was intubated, given Mg for QTc prolongation and transferred to a tertiary care center. There, his pupils were equal and reactive and he was following commands. He was started on norepinephrine and dopamine for hypotension. His airway was edematous with yellow fluid, he was treated per ARDS protocol (e.g., paralyzed and placed in prone position). On Day 2 he became more hypotensive and was treated with thrombolytics for suspected pulmonary embolism. Subsequent angiogram showed no PE. He required epinephrine (infusion and push doses), vasopressin and Ca. He became persistently hypoxic despite maximum ventilator support. Based on the prognosis, the family opted for institution of comfort measures and he died on Day 2.

Autopsy findings: Not performed.

Case 221. Acute argon gas inhalation: undoubtedly responsible

Scenario/substances: A 43 y/o male (and a co-worker) apparently hooked their respirator lines to argon, instead of oxygen, while working in a grain bin. The 43 y/o saw his colleague having a seizure, tried to remove him from the bin, but blacked out himself. EMS removed both workers. An on-scene O_2 sensor read 5%.

Clinical course: This patient, who survived the ED, had seizures starting ~4 h after arrival. Head CT showed anoxic brain injury. He received infusions of propofol, lorazepam and levetiracetam. Head CT on Day 5 showed worsening cerebral edema and the patient died on Day 6.

Autopsy findings: Cause of death: simple asphyxia by argon gas. Manner of death: accidental.

Case 230. Acute nickel carbonyl inhalation: probably responsible

Scenario/substances: A 55 y/o male inhaled nickel carbonyl at work.

Past medical history: Colon cancer, s/p colectomy.

Laboratory/diagnostic findings: Serum APAP, ethanol and salicylate not detected.

Clinical course: Patient arrived 1-day post exposure and developed dyspnea. A 24-hr urine nickel concentration was 337.5 mcg/24hr (normal <7). He was started on disulfiram and NAC. On Day 7 he required BiPAP; BP 128/81, HR 90, RR 41. On Day 9: WBC "increased", platelets "dropped", T 38.4 °C. CT chest showed "ground-glass effect" and pulmonary edema. He was started on antibiotics and then BiPAP (O_2 sat 83% on 100% O_2). On Day 12 his O_2 sat dropped into the 70s and he was intubated. On Day 15 his 24-hr urine nickel was 57.8 mcg/24hrs. He was started on ECMO; NAC and disulfiram were continued until Day 26. Day 29: he developed a GI bleed; platelets 26. He slowly deteriorated and died on Day 42.

Autopsy findings: Not available.

Case 232. Acute copper ingestion: undoubtedly responsible

Scenario/substances: A 69 y/o female had an argument with her husband, dissolved 1–2 tablespoons of copper sulfate in water and drank it to end her life. EMS found her sitting on her front porch complaining of abdominal burning with several episodes of blue emesis. She received ondansetron and was transported to the ED.

Past medical history: Schizophrenia, HTN.

Physical exam: BP 114/86, HR 89, RR 21, O_2 sat 92%, T 36.3 °C. Her tongue was blue. She had severe abdominal pain.

Laboratory/diagnostic findings: Na 139/K 4.1/Cl 101/ CO_2 22/BUN 18/Cr 0.98/Glu 129/AG 16, ALT 9, AST 28, ALP 59, bilirubin 1.1, CK 96. WBC 31.4/Hgb 15.5/Hct 48.

Clinical course: Initially vitals were stable and labs unremarkable, but she developed hematemesis in the ED and became hypotensive, tachycardic and her urine output dropped. She developed coffee ground emesis and began to hemorrhage profusely from the rectum. SBP 70s.

She was given IVFs, 2 units of blood, high doses norepinephrine, vasopressin and dopamine. Just prior to HD: Cr 1.4, K 6.5, Ca 7.0, and EKG showed peaked T waves. She was given IV Ca, insulin and dextrose, then intubated. Labs showed severe metabolic acidosis, sodium bicarbonate was initiated. An arterial line showed a BP of 200s/80 and the vasopressors were titrated off. Post-HD: K 6.2, lactate 12.1. Based on the prognosis, the family opted for institution of comfort measures and she died on Day 2.

Case 233. Acute arsenic and BAL exposure: probably responsible

Scenario/substances: A 72 y/o male presented to the ED with complaints of 2 weeks of acute bilateral hearing loss, otalgia and ataxia. His PCP reported an elevated spot urine arsenic of >50 mcg/L. He denied consuming well-water, working with metals, recent seafood consumption or known arsenic exposure.

Past medical history: HTN, tuberculosis with recent INH treatment.

Physical exam: Initial BP 138/76, HR 75, RR 20, T 36.4 °C, O₂ sat 99%. He had an ataxic gait, bilateral hearing loss and otalgia, Mees' line on his fingernails, and keratotic rash on his hands. He was awake, alert and oriented; neurologic exam was normal.

Laboratory/diagnostic findings: Whole blood inorganic arsenic concentration was 27 mcg/L and organic arsenic concentration was 10 mcg/L. Arsenic/Cr ratio was 12 mcg/g Cr (normal <55 mcg/g).

Clinical course: The patient presented to the ED, but left AMA prior to medical evaluation. He returned 3 days later with worsening symptoms. He was admitted to the hospital and BAL was started on Day 1 as DMSA was not available. On Day 2 he became agitated and refused treatment, but remained alert and oriented. He received antipsychotics and benzodiazepines and agreed to treatment with BAL. He was treated with BAL for 5 days. On Day 6 he became hypoxic, hypotensive, confused and developed respiratory failure requiring intubation; CxR showed pneumonia. He was started on sedation and antibiotics. On Day 12 a 24-hour urine for arsenic was undetectable; whole blood arsenic <5 mcg/L. He remained intubated and confused, MRI on Day 19 was unremarkable. He developed AF and tachycardia on Day 21, requiring antihypertensives. He received a tracheostomy on Day 36 and remained confused. Neurology felt the patient had an anoxic brain injury. The patient developed cardiac arrest and died on Day 42.

Autopsy findings: Not available.

Case 234. Acute hydrocarbon ingestion with aspiration: undoubtedly responsible

Scenario/substances: A 17 y/o autistic female was found by her parents with a bottle of kerosene in her hand. EMS was called for repeated emesis, she was tachypneic and hypoxic enroute to the ED.

Past medical history: Autism.

Physical exam: BP 115/79, HR 160, RR 40, T 37.7 °C, O₂ sat 93% on high flow oxygen. She was dyspneic.

Laboratory/diagnostic findings: CxR showed bilateral lower lobe infiltrates consistent with pneumonitis.

Clinical course: Upon PICU arrival she was placed on BiPaP and received multiple breathing treatments without overt improvement. On Day 2 she became agitated and was started on dexmedetomidine, remained tachycardic with hypoxia, and developed a fever. He was weaned off sedation and BiPaP, her O₂ sat was 95% on 40% high flow. On Day 3 she developed dyspnea and hypoxia, CxR showed worsening infiltrates. She was intubated, during OR transport for initiation of ECMO she suffered a cardiac arrest. Despite 1.5 h of resuscitation efforts she died on Day 3.

Autopsy findings: Not available.

Case 253. Fluorinated hydrocarbon inhalation and sertraline ingestion: undoubtedly responsible

Scenario/substances: A 47 y/o male was initially found unresponsive in his car surrounded by >100 containers of a fluorinated hydrocarbon.

Physical exam: BP 137/87, HR 116, RR 20, O₂ sat 100% on room air, T 36.7 °C. He had blisters on his face, right hand and chest.

Laboratory/diagnostic findings: Na 134/K 3.9/Cl 101/CO₂ 19/BUN 20/Cr 1.7/Glu 129, AG 14, CK 3,828. Serum ethanol not detected; UDS negative.

Clinical course: In the ED he reported using up to 40 canisters per day to mimic a method of suicide seen on TV. He suddenly became dusky and diaphoretic, and then asystolic. CPR was initiated with ACLS and ILE, without ROSC, and he died 3 h after ED arrival.

Autopsy findings: Cause of death: difluoroethane toxicity. Manner of death: accident.

Case 259. Acute cleaner (acid) and ethanol ingestion: undoubtedly responsible

Scenario/substances: A 44 y/o male was found with AMS in a ditch with a container of industrial cleaner (hydrofluoric, sulfuric and phosphoric acids). He apparently ingested the product and spilled it over himself. EMS found him covered in diarrhea and emesis; he was decontaminated with Ca gel.

Past medical history: HTN, ethanol abuse, PTSD, depression, prior suicide attempts. Medications: quetiapine, prazosin, mirtazapine, gabapentin, lisinopril and duloxetine.

Physical exam: He was combative, pupils 2 mm, no dermal or oral burns. HR 189, RR 27, T 34.9 °C.

Laboratory/diagnostic findings: ABG-pH 7.12/pCO₂ 49/pO₂ 143/HCO₃ 15; Na 134/K 4.4/Cl 97/CO₂ 17/BUN 18/Cr 1.12/Glu 171, AG 20, Ca 8.2, Mg 2.1, AST 56, ALT 72, bilirubin 1.0, INR 1.18, WBC 25.8/Hct 46/platelets 156. Serum APAP and salicylate not detected. UDS was negative. CxR: patchy right lung opacities consistent with aspiration. ECG: HR 116, QRS 84, QTc 478.

Clinical course: In the ED, stomach contents were aspirated. The patient was intubated due to combative behavior, and started on epinephrine for hypotension. Within 4 h his serum Ca dropped to 5.1 and K increased to 5.7. He had a cardiac arrest and received CPR and ACLS resulting in VF but no ROSC. Bedside ECHO showed no cardiac contractility and he was pronounced dead.

Autopsy findings: Autopsy showed no evidence of gastrointestinal injury. Postmortem femoral blood ethanol 239 mg/dL, ethylene glycol was not detected. Cause of death: ingestion of aluminum cleaner (sulfuric acid, hydrofluoric acid, phosphoric acid, ethylene glycol).

Case 260. Acute ammonium bifluoride ingestion: undoubtedly responsible

Scenario/substances: A 49 y/o female developed abdominal pain after she accidentally drank 1 cup of air conditioner cleaner that had been poured into a sports drink bottle. The cleaner was identified as containing ammonium bifluoride.

Past medical history: Cystic fibrosis, solitary kidney, previous suicide attempts.

Physical exam: Initial BP 86/40, HR 128, RR 26, O₂ sat 94% on room air, T 35.9 °C. The abdomen was soft. Day 2: BP 75/47, HR 94, RR 32, HR 94, O₂ sat 89% on 4 L/min nasal cannula.

Laboratory/diagnostic findings: Initial labs: Na 137/K 6.2/Cl 100/CO₂ 18/BUN 31/Cr 1.9/Glu 200/AG 17, lactate 4.4, AST 61, ALT 47, Ca 5.2, Mg 1.1, serum osm 288. Serum APAP, ethanol and salicylates not detected. ECG: sinus tachycardia, QRS 96, QTc 419. Abdominal X-ray was unremarkable. Ca 2.9 (4 hr after arrival). Day 2: Na 140/K 4.2/Cl 104/BUN 4/Cr 0.6/AG 9, Ca 10, Mg 1.9, Phos 4.5. ECG: HR 74, QRS 74, QTc 435.

Clinical course: In the ED, the patient received IVFs, Ca and Mg, H₂ blocker, antiemetic, and a bicarbonate infusion. 3 hr after arrival, she experienced polymorphic VT and was defibrillated twice, and received 6g IV MgSO₄. In the IUC she had several more episodes of torsades de pointes. Due to concerns about glycolic acid, HD was initiated; she also received lidocaine, isoproterenol and amiodarone. She developed hypotension and received IVFs, bicarbonate infusion and vasopressors. On Day 3 she was intubated for progressive hypoxia. She experienced bradycardic, then cardiac arrest but recovered after intubation, CPR and atropine. She experienced another cardiac arrest and died on Day 3.

Autopsy findings: External exam only.

Case 261. Acute chloramine inhalation/nasal: undoubtedly responsible

Scenario/substances: A 66-y/o male presented with sudden onset of coughing and dyspnea after inhalation of fumes from bleach mixed with ammonia for cleaning his apartment.

Past medical history: Congestive heart failure, CAD s/p stents, HTN, AF, chronic kidney disease, recent chemotherapy (salivary gland tumor) and IDDM.

Physical exam: BP 142/114, HR 130 (irregularly irregular), RR 42, O₂ sat 80% on room air. He was diaphoretic and dyspneic, with shallow respirations and diffuse wheezing.

Laboratory/diagnostic findings: Na 140/K 4.6/Cl 100, CO₂ 30/BUN 36/Cr 2.75/Glu 171, ALP 140, AST 40, ALT 37, Mg 2.6. WBC 11.4/Hgb 16.3/Hct 51/platelets 190. ABG-pH 7.26/pCO₂ 74/pO₂ 212/HCO₃ 33, lactate 2.6 (then 8 on Day 1). Chest X-ray showed pulmonary edema, chest CT suggested ARDS and left basilar atelectasis.

Clinical course: Initially able to walk but shortly after arrival was started on BiPAP. He became agitated and rapidly deteriorated, so he was intubated, sedated and started on prednisone, Mg and bronchodilators. After intubation, he became hypotensive necessitating IVFs and vasopressors. He was started on amiodarone and heparin for rapid AF and elevated troponins. He had a prolonged ICU stay complicated by fevers (requiring antibiotics), hypo and hyperglycemia (requiring D10W and insulin), HTN (requiring antihypertensives), hypoxia (requiring intermittent paralytics) and renal failure with hyperkalemia (requiring HD). He also developed heparin-induced thrombocytopenia with bleeding (treated with argatroban). On Day 11, a tracheostomy was placed due to prolonged intubation and he received platelets. On Day 13 he had a bradycardic arrest that resolved after 2 min of CPR; he was then interactive. On Day 25 he suffered cardiac arrest and died.

Autopsy findings: Cause of death: ARDS due to toxic inhalation pneumonia. Manner of death: accidental.

Case 264. Acute hydrofluoric and sulfuric acid cleaner ingestion: undoubtedly responsible

Scenario/substances: A 87 y/o male accidentally drank a small amount of a cleaner containing hydrofluoric acid and sulfuric acid (pH <1). EMS was called and transported him to the ED.

Physical exam: HR 40s, SBP 180s. Cardiac monitor showed sinus bradycardia with first degree AV block. He had dark-colored vomitus.

Laboratory/diagnostic findings: Na 141/Cl 106/K 3.4/HCO₃ 14/Glu 180/AG 21, Ca 9.6, Cr 1.02, Mg 2.6.

Clinical course: The patient had persistent emesis and complained of chest pain. He was subsequently intubated in the ED prior to transfer to a tertiary care facility. During transport he had cardiac arrest and diverted to a nearby hospital for resuscitation. He was in torsades de pointes, received 3 g Ca chloride, 2 amps of sodium bicarbonate and 2 g of Mg. He had ROSC with an accelerated junctional rhythm, QRS 114 and QTc 445 msec. A bicarbonate infusion was started. Repeat labs: K 4, CO₂ 20, AG 16, ionized Ca 1.44. He again developed torsades and died 6 hr post ingestion.

Autopsy findings: Corrosive upper gastrointestinal injury from ingestion of acidic cleaning solution.

Case 267. Acute cyclopeptide mushroom ingestion: undoubtedly responsible

Scenario/substances: A 84 y/o female was mowing her lawn when she decided to pick mushrooms and eat them. Later, she developed abdominal pain with emesis and presented to a local ED and then transferred to a tertiary care hospital.

Past medical history: AF.

Physical exam: In the ED: BP 80/50, HR 90, RR and O₂ sat "normal" on room air. Confused but following commands, abdomen with diffuse tenderness.

Laboratory/diagnostic findings: ABG-pH 7.0, AST >1000, ALT >1000, INR 5.2, WBC 6.4, Hgb 12.5, platelets 141, lactate 11. Serum APAP, ethanol and salicylate not detected.

Clinical course: Upon arrival to a tertiary care center she was intubated for dyspnea and confusion and required vasopressors and CRRT. Despite these interventions she died on Day 1.

Autopsy findings: Not available.

Case 269. Acute dinitrophenol and energy drink ingestion: undoubtedly responsible

Scenario/substances: A 19 y/o male ingested 10–15 tabs of 250 mg dinitrophenol diet pills, and 2 energy drinks with suicidal intent. EMS brought him to the ED 2 h later.

Past medical history: Mental illness.

Physical exam: Alert but agitated and diaphoretic. BP 112/63, HR 160, RR 32, T (rectal) 38.4 °C.

Laboratory/diagnostic findings: ABG-pH 6.95/pCO₂ >130/pO₂ 345, Na 141/K 4.0/Cl 108/CO₂ 25/Glu 170, AG 8, Ca 9.8, AST 38, ALT 31, ALP 56, lactate 1.5, CK 1197. Serum APAP, ethanol and salicylate not detected. EKG: HR 154, QRS 74, QTc 416. CxR unremarkable.

Clinical course: In the ED, he was intubated and received IVFs, benzodiazepines and cooling measures. While preparing for transfer to a tertiary care center (1.5 h after arrival) he developed VT followed by asystole. He received CPR, bicarbonate, D50W and epinephrine. T(rectal) 40 °C; Glu 338. ECHO revealed no cardiac activity; the patient was pronounced dead ~2 h after ED arrival.

Autopsy findings: Cause of death: complications of probable acute dinitrophenol toxicity. Manner of death: suicide.

Case 272. Acute sulfuryl fluoride, cocaine inhalation: undoubtedly responsible

Scenario/substances: A 24 y/o male was seen coming out of an apartment building recently tented for fumigation. He was suspected of attempted burglary, police found him alert but he became confused, diaphoretic, tachycardic and tachypneic, O₂ sat was "low". The fumigation company confirmed that they used sulfuryl fluoride.

Laboratory/diagnostic findings: Hgb 17.3, Na 146, K 3.9, Cl 105, Glu 239, Cr 1.4, ionized Ca <0.25, Mg 0.8. ABG-pH 7.05/pCO₂ 56/pO₂ 78/HCO₃ 15. Serum APAP, ethanol and salicylate not detected. ECG showed anterior ST elevation in the anterior leads.

Clinical course: In the ED: BP 115/75, HR 110, RR 33, O₂ sat 86% on 100% FiO₂; he was lethargic with dyspnea, pupils midpoint. He was intubated and then had cardiac arrest. He received Ca, Mg, sodium bicarbonate, atropine, epinephrine and amiodarone. He had recurrent pulseless VT and was coded for >30 min without ROSC. He died ~1 hr after arrival.

Autopsy findings: Autopsy showed marked pulmonary edema. Hospital blood was positive for benzoylcegonine 0.17 mg/L. The cause of death: acute sulfuryl fluoride poisoning.

Case 276. Acute paraquat ingestion: undoubtedly responsible

Scenario/substances: A 47 y/o male accidentally ingested a mouthful of paraquat, went to the ED but was then discharged. The following day his clinical condition worsened and he returned to the ED.

Past medical history: None.

Laboratory/diagnostic findings: In the ED (2nd time): HR 104, RR 23, T 37 °C, O₂ sat 89%. He was awake but not alert, pupils equal and reactive to light. He was dyspneic with coarse breath sounds with rhonchi throughout; abdomen was distended and tender. Cr 8.0, AST 231, ALT 223, bilirubin 2.2. After admission: K 4.6, Cr 8.9, BUN 72, WBC 13.2, INR 1.32.

Clinical course: He was transferred to a tertiary care center and admitted to the ICU. He began developing shortness of breath and hemoptysis and subsequently developed liver and renal failure. His CxR showed pulmonary fibrosis, and he was intubated. He was started on dexamethasone, Vitamin C, NAC and cyclophosphamide. HD was initiated but he did not improve, his CxR worsened and was consistent with ARDS. Due to his prognosis, family opted for institution of comfort measures and he died on Day 9.

Autopsy findings: Not performed.

Case 278. Chlorophenoxy herbicide, cleaner (anionic/nonionic), sodium hydroxide, bupropion, sertraline, and trazodone ingestion: undoubtedly responsible

Scenario/substances: A 51 y/o female ingested a chlorophenoxy herbicide, sodium hydroxide drain cleaner, and a household cleaner in a suicide attempt. She became pulseless and apneic during transport to the ED.

Past medical history: Depression, anxiety, hyperlipidemia.

Laboratory/diagnostic findings: ABG-pH 6.9/pCO₂ 70/pO₂ 51, K 5.4/CO₂ 16/Cr 1.35/Glu 197/AG 26, Ca 7.5, bilirubin 0.1, AST 305, ALT 401, lactate 18, WBC 16.8. EKG: QTc 482.

Clinical course: In the ED, she was resuscitated and intubated. BP 52/36, HR 75, O₂ sat 99% on vent. The patient started bleeding from her mouth and had loose stools. She died 1 hr after arrival.

Autopsy findings: Autopsy showed erythematous epiglottis and sloughing esophagus. Multiple pills were found in gastric contents as well as tan/gray caustic floral-smelling fluid. Pulmonary edema with foam in the trachea. Multiple sharp force injuries to the R and L neck which had clean edges and penetrated sternocleidomastoid and thyroid gland; superficial lacerations to wrist. Antemortem blood: chlorophenyl-piperazine 163 ng/ml, bupropion 148 ng/ml, sertraline 542 ng/ml, nortriptyline 375 ng/ml, trazodone 0.54 mcg/ml. Cause of death: acute mixed drug (bupropion, sertraline, trazodone) ingestion with suspected ingestion of caustic agent.

Case 282. Acute carbamate insecticide ingestion: undoubtedly responsible

Scenario/substances: A 72 y/o male drank milk with aldicarb in a suicide attempt and was brought to the ED.

Clinical course: In the ED: BP 200/100, HR 118, RR 12, T 37 °C, O₂ sat 98%. He was obtunded with respiratory depression, was intubated, had a seizure, and then transferred to a tertiary care center. He developed fasciculations, hypotension (53/32) and bradycardia (HR 40). He was started on pralidoxime but remained unresponsive. On Day 2: BP 100/63, HR 40. On Day 3 pralidoxime continued. On Day 4 he developed cholinergic findings. On Day 7 he remained on the ventilator, BP 194/93, HR 130, on atropine drip. On Day 13 he remained unresponsive, on ventilator, on norepinephrine; BP 140/91, HR 95, O₂ sat 100%. On Day 18, he responded to painful stimuli but remained intubated. He died on Day 20.

Autopsy findings: Not available.

Case 285. Acute ricin injection/ingestion: probably responsible

Scenario/substances: An 18 y/o male presented after injecting and ingesting a slurry castor beans and water. He was found wandering the street and was brought to the ED by EMS after an unknown time interval since injection/ingestion.

Laboratory/diagnostic findings: CO₂ 18/BUN 33/Cr 1.9, AST 225, ALP 235, bilirubin 0.9, WBC 22, platelets 125, reticulocyte count "normal", INR 16.2, PTT 250. UDS: negative. Serum APAP, ethanol and salicylate not detected. ABG-pH (after intubation): 7.21.

Clinical course: Exam: In the ED he was initially tachycardic. Despite 3L IVFs, Cr increased to 2.8 and he became anuric. He was transferred to a tertiary care hospital and started on CRRT, epinephrine, norepinephrine, vasopressin, hydrocortisone and antibiotics. He was subsequently intubated and received vitamin K (repeat INR 5.9). Head CT showed cerebral edema consistent with anoxic brain injury. The patient died within 24 h of presentation.

Autopsy findings: Cause of death: ricin poisoning. Postmortem tissue tested positive for ricin metabolite.

Case 286. Acute cardiac glycoside ingestion: undoubtedly responsible

Scenario/substances: A 22 y/o male ate 1 pong-pong tree (*Cerbera odollam*) seed that he had ordered from the internet.

Physical exam: He presented to the ED 8.5 h after the ingestion; alert and interactive. BP 114/54, HR 50.

Laboratory/diagnostic findings: K 5.2, serum digoxin 1.3.

Clinical course: At Hour 10 he developed 2nd degree heart block and was given 5 vials of digoxin Fab fragments. His HR and BP improved temporarily; 30 min later his HR (40s) and BP (104/50) decreased again, he vomited and syncope. He then had cardiac arrest and CPR was started. The code was continued for about 3 h during which he received a total of 20 vials of digoxin Fab fragments, amiodarone, insulin and dextrose, norepinephrine, dopamine, atropine, ILE, 4L of normal saline, and ~15 doses of epinephrine and sodium bicarbonate without ROSC. He died within 12 h of presentation.

Autopsy findings: Not performed.

Case 288. Acute ibogaine ingestion: probably responsible

Scenario/substances: A 26 y/o male was found unresponsive with possible seizure activity 48 h after taking ibogaine to detox from his oxycodone addiction. He was given midazolam by EMS and then found to

be pulseless. He received naloxone, epinephrine and defibrillation with ROSC. He was intubated and transported to the ED.

Past medical history: Polysubstance abuse, ibogaine use.

Physical exam: SP 50/palp, HR 60, RR 16 (on vent), O₂ sat 98% on 100% FiO₂, T 36 °C. Pupils fixed and dilated. Exam of heart, lungs and abdomen unremarkable. No spontaneous movements; no response to pain.

Laboratory/diagnostic findings: ABG-pH 7.37/pCO₂ 64/HCO₃ 29, Na 156/K 4.5/Cl 84/CO₂ 29/BUN 94.0/Cr 7/Glu 152/AG 46, AS 80, ALT 80, INR 1.5, Hgb 17.0, Hct 52. Serum APAP, ethanol and salicylate not detected. CxR unremarkable; ECG: HR 65, QRS 98, QTc 536.

Clinical course: In the ED, he had another cardiac arrest treated with epinephrine, sodium bicarbonate and IVFs, again with ROSC. Exact time that patient was pulseless was not clear but appeared to be prolonged. The patient was transferred to a tertiary care center. The patient's hemodynamics stabilized and kidney function improved. However, the patient was declared brain dead. Based on the prognosis, the family opted for institution of comfort measures and he died on Day 14.

Autopsy findings: Not performed.

Case 289. Acute cardiac glycoside ingestion: undoubtedly responsible

Scenario/substances: A 30 y/o male ordered pong-pong tree (*Cerbera odollam*; aka the Suicide Tree) seeds from the internet and ate them. He then called EMS, reported the ingestion and was transported to the ED.

Past medical history: Schizophrenia.

Physical exam: In the ED, he was alert and talking; HR 37.

Laboratory/diagnostic findings: Initial K 10.

Clinical course: He received Ca chloride and gluconate, sodium bicarbonate, insulin and digoxin Fab fragments for hyperkalemia. His HR improved, he was transferred to a tertiary care facility, and admitted to the ICU 4 h after initial presentation. He remained awake and interactive; pupils 7 mm and reactive. EKG showed irregular AF with pauses, QRS 72, QTc 368. His HR ranged between 20 and 90; SBP 101. He was started on a dopamine drip and HD. At Hour 15: HR ~100, SBP 90s (on dopamine). He had a run of VT and received 10 vials of digoxin Fab fragments. At Hour 21 he went into cardiac arrest (K 3.8), received 4 additional vials of digoxin Fab fragments and ACLS resuscitation for 1 h without ROSC.

Autopsy findings: Not performed.

Case 297. Acute methadone ingestion: undoubtedly responsible

Scenario/substances: A 2 y/o female was seen drinking an unknown liquid from a stray plastic bottle. The next day she was lethargic, later that day her parents found her unresponsive with labored breathing, and transported her to the ED.

Physical exam: The child arrived to the ED in cardiac arrest, pupils were fixed and dilated.

Laboratory/diagnostic findings: Initial Glu 35.

ABG-pH 6.5, lactate 17, AG 28. UDS was positive for methadone. Head CT was consistent with anoxic brain injury.

Clinical course: In the ED, she was intubated, received PALS CPR, epinephrine, dextrose, calcium and sodium bicarbonate with ROSC. In the PICU a naloxone infusion was started, urine was noted to contain many unspecified crystals. Her vital signs normalized but her pupils remained fixed at 7 mm. She had no response to stimuli (no cough or gag reflex) and her EEG was flat. Serum methadone levels were sent: Day 1 = 78 ng/mL, Day 3 = 81 ng/mL, Day 6 = 93 ng/mL, Day 7 = 46 ng/mL. The parents subsequently disclosed that the plastic container contained methadone. She was determined to be brain dead on Day 10 and she died on Day 11 with organ donation.

Autopsy findings: Full report was not available. Case was determined to be a homicide.

Case 299. Acute-on-chronic APAP ingestion: contributory

Scenario/substances: A 3 y/o male, with an upper respiratory infection, was receiving alternating doses of ibuprofen and APAP every 4 h for 5 days. Calculations showed his daily APAP dose of 42–105 mg/kg/day. Parents brought him to the ED for nausea, vomiting and diarrhea.

Past medical history: Medications: A children's combination medication [chlorpheniramine (1 mg), dextromethorphan (5 mg), phenylephrine 2.5 mg], and APAP (160 mg) in each 5 mL and ibuprofen.

Physical exam: He was initially tachypneic and in respiratory distress with abdominal tenderness, but later became lethargic and unresponsive. BP 106/66, HR 123, RR 54, T 36.8 °C.

Laboratory/diagnostic findings: ABG-pH 7.35/pCO₂ 41/pO₂ 67; Na 137/K 4.2/Cl 103/CO₂ 10/BUN 7/Cr 0.8/Glu 168, AG 14, AST 4869, ALT 3887, bilirubin 4.2, INR 6.7, ammonia 62 (peak 245). Serum APAP 29.8 (unknown time since last ingestion); repeat APAP 15. Serum salicylate and ethanol not detected. In the ED, CxR showed multilobar right sided pneumonia; abdominal CT showed hepatomegaly.

Clinical course: He was admitted and treated with antibiotics. Subsequent tests showed acute liver failure and elevated APAP level so he was transferred to a pediatric liver transplant center. He arrived with a GCS 7; he was intubated, received IV NAC and antibiotics for pneumonia and sepsis. He also received hypertonic saline, rifaximin, vitamin K, FFP and CRRT. Hepatitis serology, CMV and EBV were negative; copper and ceruloplasmin were normal. The child's encephalopathy continued to worsen. He became hypotensive and required epinephrine and norepinephrine. ECMO was considered but not done due to coagulopathy. He had a PEA cardiac arrest, failed to respond to ACLS interventions, and died within 24 h of hospital arrival. APAP-induced acute liver failure was believed contributory to child's death, in addition to a pneumonia with sepsis.

Autopsy findings: Report stated that death was from hepatic failure and pneumonia.

Case 301. Acute fentanyl (transdermal) ingestion: undoubtedly responsible

Scenario/substances: A 12 y/o female became unresponsive after chewing fentanyl patches on a dare. Police initiated CPR at her home prior to ED transport.

Past medical history: Healthy, no known medications.

Laboratory/diagnostic findings: lactate 6.6, VBG-pH 7.14, HCO₃ 15, AG 17.

Clinical course: Upon ED arrival, she was bradycardic and then lost pulses. She was intubated, received CPR, epinephrine and naloxone with ROSC. BP 130/80, HR 150–170, GCS 3, pupils fixed and dilated. On Day 2 she remained unresponsive and developed a fever, antibiotics were started for presumed aspiration. On Day 4 she was declared brain dead. Based on the prognosis, comfort measures were instituted and she died on Day 4.

Autopsy findings: Antemortem blood norfentanyl 2 ng/ml, fentanyl 15 ng/ml. Urine: norfentanyl 581 ng/ml, fentanyl 107 ng/ml. Cause of death: acute fentanyl intoxication.

Case 304. Acute tramadol ingestion: undoubtedly responsible

Scenario/substances: A 13 y/o male was found unresponsive and dyspneic by his parents. EMS found him in cardiac arrest, he was intubated and resuscitated prior to ED arrival.

Past medical history: No known prescription medications.

Physical exam: BP 124/89, HR 136, RR 20, O₂ sat 90% on 100% O₂ via ventilator. Pupils were fixed and dilated, no spontaneous neurological activity.

Laboratory/diagnostic findings: VBG pH 7.19/pCO₂ 34/pO₂ 33/HCO₃ 14, Na 147/K 3.3/Cl 111/CO₂ 14/BUN 12/Cr 2.3/Glu 385, AG 22. UDS was positive for methadone. Serum APAP, ethanol and salicylate were not detected. ECG: HR 134, QRS 89, QTc 445. CT brain showed cerebral edema. EEG showed slow waveforms with infrequent bursts consistent with uncal herniation. 10 hours after arrival: Na 156/K 4.2/Cl 121/CO₂ 20/BUN 20/Cr 2.5/Glu 145, AST 489, ALT 927, lactate 12, troponin 1.16.

Clinical course: In the ICU, the patient received several vasopressors, bicarbonate and K supplementation. Off sedation he demonstrated no spontaneous neurological activity; clinical evaluation established brain death. Based on the prognosis, the family opted for institution of comfort measures and he died on Day 2.

Autopsy findings: Antemortem blood tramadol 0.617 mg/L. The cause of death was pulmonary edema secondary to acute tramadol ingestion.

Case 317. Acute colchicine ingestion: undoubtedly responsible

Scenario/substances: A 20 y/o pregnant female presented to an ED with vomiting and diarrhea, attributed to food poisoning. She was

discharged home but returned to a second ED later the same day with worsening symptoms.

Past medical history: 20-weeks pregnant, seizure disorder. Medications: levetiracetam.

Physical exam: In the 2nd ED she had AMS with dyspnea. She was febrile, tachycardic and tachypneic.

Laboratory/diagnostic findings: Initial Labs: WBC 44.3/Hgb 14.5/Hct 41.0/platelets 299, CO₂ 15, Glu 73, Cr 1.28, Mg 1.3, Ca 8.5, albumin 3.2, AST 294, ALT 27, ALP 338, lactate 3.8, lipase 851. UDS positive for benzodiazepines; uHCG positive. CxR unremarkable. Day 2: ABG-pH 7.31/pCO₂ 22.1/pO₂ 164/HCO₃ 14.3/BE -13.4, WBC 36.3, PT 31.6, AST 379, ALP 348, lactate 3.3, CK 587, lipase 1056. CT scans showed: bilateral lung consolidation, and post-operative abdominal changes. Day 4: Cr 1.49, AST 1523, lactate 8.1, WBC 1.7, Hgb 7, platelets 35, PT 27.7, fibrinogen 196, d-dimer >20. Day 5: APAP and ASA were negative. Day 8: WBC 0.1/Hgb 7.8/platelet 53, PT 19.3, Glu 102, bilirubin 2.6, AST 1280, ALT 295 and lactate 7.8. A colchicine level (sent out on Day 4) subsequently came back after death at 7.2 ug/L.

Clinical course: She was intubated, her SBP dropped into the 40's and norepinephrine was started. An emergent cesarean section was performed, due to fetal distress, but the baby died shortly after delivery. She was then transferred to a tertiary care center and received IVFs, antibiotics and tube feeding. On Day 3 she developed hypotension, renal failure and pancytopenia, requiring multiple vasopressors, HD and blood transfusion. On Day 4 she developed blanching erythema of the trunk and arms; she was given filgrastim, amphotericin, antibiotics, hydrocortisone and IV immunoglobulin. Cultures were negative. When the family was asked about access to colchicine, a family member discovered pills missing from their prescription. On Day 9 she required norepinephrine, vasopressin and phenylephrine infusions for increasing hypotension. Based on the prognosis, the family opted for institution of comfort measures and she died on Day 10.

Autopsy findings: Not available.

Case 324. Acute APAP ingestion: undoubtedly responsible

Scenario/substances: A 21 y/o pregnant female presented to an ED with nausea and abdominal pain 2 days after a reported argument with her boyfriend.

Past medical history: 5 weeks pregnant with abnormal bleeding, cystitis.

Laboratory/diagnostic findings: WBC 5.9, platelets 15, PT 35.1, aPTT 40.6, INR 3.34, AST 960, ALT 900. UDS was negative; urine HCG positive. Repeat labs (12 h later):

ABG-pH 7.06/CO₂ 59/pO₂ 53/HCO₃ 16/BE -12.7. Na 155/K 3.7/CO₂ 23/BUN 10/Cr 1.12/Glu 507, AG 28, WBC 20.4/Hgb 6.3/Hct 20.3/platelets 58. PT >120, AST 4904, ALT 3292, bilirubin 0.8, ammonia 131, lactate 18.7. Serum salicylate not detected; serum APAP 52 mcg/mL (unknown time since last ingestion). EKG: sinus tachycardia, QRS 87, QTc 386.

Clinical course: She was admitted with suspected cholecystitis, but during OR preparations developed hypotensive and tachycardic (HR 140s). She was intubated and started on phenylephrine and sodium bicarbonate infusions. Her serum APAP then resulted (52 mcg/mL) and NAC was started. Pelvic ultrasound showed gestational sac without fetal pole or yolk sac. Norepinephrine was started for hypotension and she was transferred to a tertiary care center. En route she became hypoxic (O₂ sat 17% on 100% FIO₂) and was comatose on arrival with dilated, fixed pupils. She became bradycardic and progressed to PEA; she had ROSC after being coded for 10 min. Sodium bicarbonate, mannitol, blood transfusion, inhaled nitric oxide, epinephrine and vasopressin were started; NAC and phenylephrine continued. She continued to deteriorate and died on Day 2.

Autopsy findings: Hospital blood tested positive for: morphine 36 ng/mL, midazolam 30 ng/mL, positive (qualitative only) for APAP. Cause of death: toxic effects of APAP. Manner of death: suicide.

Case 341. U-47700, caffeine, levamisole, nicotine, alprazolam, cocaine, cocaine, marijuana and benzodiazepine ingestion/snorting: undoubtedly responsible

Scenario/substances: A 25 y/o male was found in asystole (unknown down time) after snorting an unknown powder. A friend reported it as

being U-47700. The patient was intubated by EMS with CPR, and received naloxone (22 mg without effect), IVFs and vasopressors with ROSC.

Past medical history: Anxiety, ADHD, polysubstance abuse and previous drug overdoses.

Laboratory/diagnostic findings: ABG-pH 7.1/pCO₂ 59/pO₂ 368/HCO₃ 18.3, Na 144/K 2.6/Cl 112/CO₂ 18/BUN 16/Cr 1.68/Glu 196/AG 14, lactate 4.8, Ca 6.4, Mg 1.2, Phos 4.9, troponin 0.776, CPK 278, WBC 18.5. Serum APAP and ethanol not detected, salicylates 2.9 mg/dL. UDS: positive for cocaine, benzodiazepines and marijuana. ECG: QRS 124, QTc 614.

Clinical course: In the ED the patient was intubated and unresponsive with fixed dilated pupils. BP 60s/palp, HR 132, T 33 °C (after cooling). Post cardiac arrest cooling was initiated, sodium bicarbonate and naloxone infusions were started. He remained unresponsive without sedation. Head CT showed complete sulcal effacement with diffuse cerebral edema. On Day 4, the patient was rewarmed, EEG showed no brain activity. He developed diabetes insipidus, hyperkalemia and AKI. Based on the prognosis, comfort measures were instituted and he died on Day 4 with organ donation.

Autopsy findings: No autopsy was performed. Antemortem urine: positive for alprazolam, caffeine, cocaine (and metabolite), levamisole, nicotine, and U-47700. Antemortem blood (collected Day 1): alprazolam 0.11 mg/L, benzoylcegonine 0.026 mg/L and U-47700 0.18 mg/L. Cause of death: anoxic brain injury due to cardiac arrest from cocaine, alprazolam and U-47700. Manner of death: accidental.

Case 669. Acute salicylate ingestion: undoubtedly responsible

Scenario/substances: A 71 y/o male presented to the ED ~8 h after an intentional ingestion of #100 tablets of 325 mg salicylate tablets.

Past medical history: Aortic stenosis, HTN, s/p CABG, chronic kidney disease.

Physical exam: Awake, but drowsy, complaining of tinnitus, nausea and vomiting. BP 138/68, HR 110, RR 28, O₂ sat 94% on 5L O₂.

Laboratory/diagnostic findings: ABG-pH 7.48/pO₂ 63/pCO₂ <20/HCO₃ 11/BE -10; BUN 29, Cr 2.3, WBC 22.4, lactate 1.8. Serum APAP and ethanol not detected; salicylate 67.5 mg/dL.

Clinical course: He was initially treated with 2 amps of sodium bicarbonate and placed on a bicarbonate infusion. He developed progressive pulmonary edema and became somnolent, tachypneic and hyperpnic. BiPAP was initiated, but the salicylate level rose. He was transferred to a tertiary care center for HD, but became asystolic during transport. The patient received ACLS, multiple amps of sodium bicarbonate and epinephrine without ROSC. The patient died ~6 h after initial ED presentation.

Autopsy findings: None available.

Case 720. Acute salicylate ingestion: undoubtedly responsible

Scenario/substances: A 13 m/o male was staying at a family member's home when the father returned and found him vomiting with odd behavior, and an empty aspirin bottle.

Physical exam: The child was lethargic, pupils 4 mm, HR 150, RR 40, T 36.7 °C, O₂ sat 99% on room air.

Laboratory/diagnostic findings: ABG-pH 7.24, K 4.9, Glu 137; salicylate concentration "too high to quantify".

Clinical course: When the child arrived in the ED he had a generalized tonic-clonic seizure. He was transferred to a tertiary care center. On arrival, pH 6.9/pCO₂ 114/BE -6, Ca 6.7, Glu 43, WBC 35, salicylate 94 mg/dL. He was intubated and received dextrose and bicarbonate boluses. Shortly after intubation he rapidly deteriorated and became asystolic. Despite CPR and ALCS the child died.

Autopsy findings: Not available.

Case 722. Acute buprenorphine/naloxone (sublingual film) ingestion: undoubtedly responsible

Scenario/substances: A 15 m/o female was found with a buprenorphine/naloxone film wrapper in her mouth. Her mother removed it and took her to the ED where she remained asymptomatic for 4 hr. UDS was negative for opiates and she was discharged. She was found at home, 5 h later, in cardiac arrest. EMS began CPR and transported to the ED.

Laboratory/diagnostic findings: Repeat UDS was negative.

Clinical course: In the ED, she was intubated and received naloxone and epinephrine. CPR was continued for 1 h but she died without ROSC.

Autopsy findings: Postmortem urine: positive for buprenorphine, caffeine, theobromine and APAP. Postmortem blood: buprenorphine 5.6 ng/mL, norbuprenorphine 6.8 ng/mL. Vitreous fluid: Na 142/K 13/Cl 127/BUN 12/Cr 1.2/Glu 36, Ca 1.6, Mg 1.1, lactate 20. Cause of death: acute buprenorphine intoxication.

Case 725. Acute lidocaine parenteral: undoubtedly responsible

Scenario/substances: A 55 y/o female, getting placement of an interosseous line, inadvertently received 40 mL of 2% lidocaine IO and had respiratory depression, hypotension and then cardiac arrest.

Physical exam: Altered mentation with respiratory depression (requiring intubation). Initial BP 50/30, then VT and asystole. Bright red blood from ETT and broken rib, presumed punctured lung.

Clinical course: Patient received 250 mL of ILE with ROSC. Her BP dropped again (49/23), CPR resumed and IVFs, Ca, sodium bicarbonate and more ILE given. Despite resuscitation efforts the patient died about 1 hour after initial event.

Autopsy findings: Not available.

Case 743. Valproic acid ingestion: undoubtedly responsible

Scenario/substances: A 46 y/o female was brought to the ED in a coma following an overdose of an unknown drug.

Past medical history: Previous psychiatric admissions, medications included levothyroxine, paliperidone and benztropine.

Physical exam: Obtunded. SBP 100, HR 110, O₂ sat 98% on room air.

Laboratory/diagnostic findings: BUN 5, Cr 0.6, Glu 89, Mg 1.9, AST and ALT "normal", WBC 3.3. Serum APAP, ethanol and salicylate not detected. ECG: QTc 584. Valproic acid 311 mg/L (Day 4) then 195 (Day 5). Ammonia: 315 (Day 4).

Clinical course: In the ED she was intubated for airway protection and received IVFs and norepinephrine for hypotension. On Day 4 it was discovered that she overdosed on valproic acid and she remained unresponsive and had a seizure. She was given benzodiazepines and started on CRRT (Day 5) when her elevated VPA and hyperammonemia were first recognized. An EEG showed diffuse slowing without seizure activity. On Day 6 L-carnitine and lactulose were started; she was made DNR. She remained comatose with spastic movements despite down trending ammonia and valproic acid levels. She would open her eyes and had spastic movements, but did not follow commands. Day 9 she developed a fever, ammonia of 37, valproic acid <10. Based on the prognosis, comfort measures were instituted and she died on Day 12.

Autopsy findings: Not available.

Case 755. Acute amitriptyline ingestion: undoubtedly responsible

Scenario/substances: A 2 y/o male was found unresponsive, seizing with an empty bottle of amitriptyline. Family called EMS, who gave him intranasal midazolam without response.

Physical exam: BP 70/30, HR 104, RR 24, O₂ sat 98% on room air, T 36.4 °C.

Laboratory/diagnostic findings: ABG-pH 7.1. Serum APAP, ethanol and salicylate not detected, UDS was negative. ECG: HR 104, QRS 160, QTc 552. Blood amitriptyline 373 ng/mL, nortriptyline 80 ng/mL.

Clinical course: The patient was transferred to the pediatric tertiary care center where he had status epilepticus for 45 min. He was intubated and given benzodiazepines, levetiracetam and phenytoin before the seizures stopped. His 2nd EKG showed a wide QRS and prominent R in aVr. He developed VT and received IVFs and sodium bicarbonate with improvement in this rhythm and BP. His EEG was unremarkable but MRI showed bilateral infarcts. Based on the prognosis, the family opted for institution of comfort measures and he died on Day 19.

Autopsy findings: Not done.

Case 900. Acute diphenhydramine ingestion: undoubtedly responsible

Scenario/substances: An 8 m/o male was found cyanotic by his babysitter in a bouncy seat. EMS found muscular rigidity consistent with rigor, began ACLS and transported him to the ED. The babysitter admitted to giving the child 50 mg of diphenhydramine for "fussiness".

Clinical course: ROSC was not achieved by the time of arrival and the patient was pronounced dead in the ED. He underwent organ donation.

Autopsy findings: No evidence of natural disease or congenital anomaly. Vitreous fluid: Na 136/K 27/Cl 130/BUN 14/Cr 0.8/Glu 102, Mg 1.2,

lactate 36. Postmortem urine: positive for diphenhydramine. Postmortem blood: diphenhydramine 8.5 mcg/ml, ethanol not detected. Cause of death: acute intoxication by diphenhydramine. Manner of death: homicide.

Case 904. Chronic antineoplastic drug parenteral: contributory

Scenario/substances: A 59 y/o male presented to ED for evaluation of hematomas, 23 days after his first infusion of imetelstat (experimental telomerase inhibitor treatment; FDA phase 2 trial) for chronic myelofibrosis. He developed a hematoma on his back, 18 days prior, and then had a second drug infusion and second hematoma 4 days prior to ED arrival.

Past medical history: Chronic myelofibrosis, gout, HTN, leukocytosis, chronic renal insufficiency, thrombocytosis and splenomegaly. Medications: allopurinol, ibuprofen, famotidine, prednisone and hydroxyzine.

Physical exam: He was alert, in moderate distress from hematoma pain. Initial BP 115/74, HR 99, RR 18, T 37 °C. A grapefruit-sized hematoma on his left scapula, large crescent-shaped hematoma medial to his right scapula, and large right flank ecchymosis. His splenomegaly (~12 cm below the costal margin) was unchanged from baseline, and icteric sclera.

Laboratory/diagnostic findings: Initial labs 12 h prior to ED evaluation: WBC 287 (baseline 260), Hgb 8.8 (baseline 10), platelets 65 (previous value 75), INR of 1.1, fibrinogen 346, d-dimer 3.32, factor VIII assay 593% (normal 50–150%), ristocetin cofactor 347% (normal 50–150%), factor VIII related antigen 406% (normal 50–150%). Na 131/K 5.2/CI 102/BUN 21/Cr 0.83, Ca 8.7, total bilirubin 1.8, alkaline phosphatase 428, ALT 55, AST 71. At ED arrival: WBC 316/Hgb 9.0/platelets 100, INR 1.3, fibrinogen 265, Na 132/K 5.0/CI 102/BUN 31/Cr 1.0/Glu 169, LDH 1363.

Clinical course: Chest X-ray showed no intrathoracic process. Overnight the patient complained of new abdominal pain. On Day 2 he became confused then unresponsive with weak pulses, CPR was initiated. He was intubated for hypoxia and had central and arterial lines placed. ABG-pH <6.78/pCO₂ 26/pO₂ 273. Repeat WBC 427/Hgb 5.0/platelets 196, INR 3.0, Na 127/K 7.0/CI 97, HCO₃ 5/BUN 45/Cr 2.53/Glu 84, Ca 9.9, LDH 5686, AST 198, ALT 93. He was given sodium bicarbonate (boluses and infusion), insulin, D50W, Ca and blood products. He received norepinephrine, for hypotension, without improvement and then became hypothermic. Due to his prognosis the family opted for comfort measures and he died 18 h after ED presentation.

Autopsy findings: Not available.

Case 905. Acute-on-chronic methotrexate ingestion: undoubtedly responsible

Scenario/substances: A 28 y/o male presented to the hospital with a diffuse, blistering rash due to an adverse drug event from a therapeutic (dosing) error involving methotrexate. He had mistakenly taking methotrexate 10 mg daily (for 10 days) instead of weekly (as prescribed). He presented 3 days after the last dose.

Physical exam: Diffuse, erythematous rash with areas of large blisters, excoriated scabbed areas and buccal lesions, involving 45% TBSA.

Laboratory/diagnostic findings: Labs on presentation: d-dimer 4811. Day 2: ABG-pH 7.31/pCO₂ 46/pO₂ 125/HCO₃ 22, WBC <0.1/Hgb 7.9/Hct 23.6/platelets 11, INR 1.3, fibrinogen 441. Day 3: WBC <0.1/Hgb 7.4/Hct 22.3/platelets 11, erythrocytes 2.39, BUN 41, Cr 1.16. Day 5: Hct 23, RBC 2.61, BUN 40, Cr 1.04, HCO₃ 30. Day 7: WBC <0.2/Hgb 8.8/Hct 27.7/platelets <5, erythrocytes 2.9, Cr 0.95.

Clinical course: The patient was intubated for severe pain and itching, and given leucovorin 25 mg/m² for 2 doses, it was stopped after the methotrexate concentration was undetectable. The leucovorin was restarted at 10 mg/m² q6h when it was realized that the laboratory level of detection for methotrexate was 0.05 mmol/L. Urine was alkalinized with sodium bicarbonate, and vancomycin was started. On Day 4 he continued to receive leucovorin, sodium bicarbonate, IVFs, ventilatory support and antibiotics. His skin was blistered and weeping and he had oral bleeding. He received transfused platelets and filgrastim. He was afebrile, HR 85, BP 121/48, RR 12. On Day 6 he developed intermittent AF with elevated troponin, and required vasopressors. On Day 7 he regurgitated tube feeds with bleeding of mucous membranes; more platelets were transfused. On Day 8 he developed 1st degree AV block, hyponatremia and pulmonary edema, and died later that day.

Autopsy findings: Not available.

Case 921. Acute-on-chronic propranolol ingestion: undoubtedly responsible

Scenario/substances: A 36 y/o female was found unresponsive and bradycardic in her car with an empty bottle of propranolol. EMS transported her to the hospital and she became hypotensive and coded in route.

Past medical history: She had been prescribed propranolol.

Physical exam: On arrival to the ED: BP 150/80, HR 62.

Laboratory/diagnostic findings: ECG QRS 128.

Clinical course: On arrival to the healthcare facility the patient received Ca chloride, atropine and sodium bicarbonate followed by a bicarbonate drip. She had pulseless arrest and underwent CPR 3 times while in the ED. She was started on dopamine, norepinephrine, high dose insulin and ILE. BP 95/56, HR 100 on multiple vasopressors. She was intubated and ventilated prior to transfer to a tertiary care center. She was admitted to the ICU and maintained on epinephrine, norepinephrine, high dose insulin, bicarbonate, IVF and ILE. She also received glucagon and isoproterenol. The patient coded for 1 h and was pronounced dead despite resuscitation efforts.

Autopsy findings: Premortem blood propranolol was 5300 ng/mL. Cause of death: suicide by propranolol intoxication.

Case 1014. Acute-on-chronic treprostinil parenteral: undoubtedly responsible

Scenario/substances: A 56 y/o female had a cardiac arrest after receiving the wrong infusion rate of treprostinil. Instead of the intended rate of 8 ng/kg/min, she inadvertently received a total of 1.2 mg within 1 hour (20,000 ng/min).

Past medical history: Pulmonary HTN, rheumatoid arthritis and cardiomegaly.

Physical exam: Cardiac arrest, pupils fixed and dilated.

Clinical course: She was resuscitated, but remained hypotensive despite infusion of norepinephrine, epinephrine, vasopressin and methylene blue. On the Day 2: HR 170, BP 120/100 (on 4 vasopressors); pulmonary artery pressure was 104/74. She had a tachydysrhythmia requiring cardioversion and amiodarone. She remained unresponsive and died ~26 hr after the iatrogenic overdose.

Autopsy findings: Immediate Cause: multisystem organ failure due to or as a consequence of cardiogenic shock and treprostinil overdose complicating medical management of severe pulmonary HTN.

Case 1027. Acute-on-chronic metoprolol ingestion: undoubtedly responsible

Scenario/substances: A 60 y/o male took ~100 metoprolol 100 mg tablets.

Past medical history: HTN, diabetes, COPD, chronic kidney disease, schizo-affective disorder with previous suicide attempt.

Physical exam: Lethargic, unable to provide history. HR 60 (then into the 50s), BP 70/50 (then 43/21).

Laboratory/diagnostic findings: Day 1: Glu 320 then 400, 99.

Clinical course: In the ED, he was given several liters of IVFs for bradycardia and hypotension, and then intubated and started on epinephrine, glucagon and Ca. In the ICU he received ILE, and insulin and dextrose infusions. His HR was 60 and SBP in the 110's. Day 2: HR 57, SBP 80–90, he opened his eyes but did not follow commands. Day 3: more alert off sedation; epinephrine, insulin, D10W and glucagon infusions continued. BP 99/51, HR 73, RR 21, O₂ sat 97%. On Day 4 he was transferred to a tertiary care hospital for CRRT. His hemodynamic status deteriorated and he died on Day 4.

Autopsy findings: Antemortem blood metoprolol 55,300 ng/ml, alpha-hydroxymetoprolol 2120 ng/ml. Cause of death: acute metoprolol toxicity. Manner of death: suicide.

Case 1114. Acute-on-chronic digoxin ingestion: undoubtedly responsible

Scenario/substances: A 90 y/o female intentional ingested 80 of her 1.25 mcg digoxin tablets.

Past medical history: Sick sinus syndrome with a pacemaker, breast cancer, depression, DM, HTN, ischemic heart disease. Medications

include: aspirin, carvedilol, furosemide, letrazole, gabapentin, warfarin, and pravastatin, losartan/hydrochlorothiazide, potassium and ranitidine.

Physical exam: The patient was lethargic and "hypotensive", BP 140/60, HR 60.

Laboratory/diagnostic findings: Na 137/K 4.3/Cl 101/CO₂ 30/BUN 18/Cr 1/Glu 190/AG 6, AST 21, ALT 26, bilirubin 0.9. INR 2.66. Serum APAP and salicylate not detected. ECG: paced at 60 with LBBB, QRS 128, QTc 405. Serum digoxin (5 h post ingestion) 24 ng/ml.

Clinical course: About 2.5 h after presentation she received 16 vials of digoxin antibody fragments and IVFs with BP improvement. She had persistent nausea and diarrhea requiring antiemetics and IVFs. On Day 2: K 5.2, she went into cardiac arrest with ROSC after CPR, but died 1 h later.

Autopsy findings: Cause of death: digoxin toxicity with contributions from HTN, atherosclerotic cardiovascular disease and DM. Manner of death: suicide.

Case 1121. Acute-on-chronic propafenone ingestion: undoubtedly responsible

Scenario/substances: A 22 m/o male ingested an unknown amount of propafenone liquid (20 mg/mL).

Past medical history: Delivery at 32 weeks gestation, SVT and orthodromic AV re-entrant tachycardia.

Clinical course: He presented to the ED in cardiac arrest with seizures. He was intubated and had ROSC after ~20 min of resuscitation but went into status epilepticus. He received lorazepam, midazolam, an unknown anticonvulsant and ILE. He had another cardiac arrest during transport to a tertiary care facility and died.

Autopsy findings: Cause of death: acute propafenone toxicity. Manner: accidental.

Case 1131. Acute magnesium sulfate ingestion: undoubtedly responsible

Scenario/substances: A 39 y/o male ingested 6 pounds of magnesium sulfate (Epsom Salts). EMS found the patient unresponsive.

Past medical history: Daily medications included olanzapine, ziprasidone, and risperidone.

Laboratory/diagnostic findings: ABG- pH 7.2/pCO₂ 71/pO₂ 32/HCO₃ 21.2, Na 139/K 7.9/Cl 124/CO₂ 25/BUN 29/Cr 1.3/Glu 198/AG 10, Mg 32.8, AST 26, ALT 34, lactate 3 mg/dL. ECG Normal sinus rhythm with QRS 148, QTc 484.

Clinical course: The patient presented to ED with a GCS 3, he was intubated and placed on a ventilator. He did not require rapid sequence medication for intubation or sedation post intubation. BP 110/56, HR 64, RR via ventilator, T 33.3 °C. There was no corneal reflex, pupils were fixed and dilated. ~2 hours after arrival to the ED, his BP dropped to 84 systolic, HR dropped into the 50's and O₂ sat dropped into the 50s. The patient was given IVFs, naloxone, flumazenil, sodium bicarbonate and started on a dopamine infusion. Sepsis workup was initiated and the patient was started on antibiotics. During transfer to a tertiary care center the patient died.

Autopsy findings: Not performed.

Case 1133. Acute zinc ingestion: undoubtedly responsible

Scenario/substances: A 46 y/o male was transported to a hospital after complaining of shortness of breath and extreme weakness for 1 day.

Past medical history: Medications: dietary supplements, vitamins C and E, zinc and chromium.

Physical exam: In the ED, he was dyspneic and tachypneic. BP 117/54, HR 65, RR 26, T 37 °C, O₂ sat 100% on room air.

Laboratory/diagnostic findings: ABG-pH 6.9/pCO₂ 49, Na 141/K 5.1/Cl 103/HCO₃ 9/BUN 18/Cr 1.2/Glu 134, WBC 2.6/Hgb 2.7/platelets 169, INR 2.2, lipase 887, LFTs "high". UDS was negative.

Clinical course: He had a cardiac arrest ~2 h after ED arrival. He was intubated, received ACLS and IVFs with ROSC. He never regained consciousness, and died 12 h later.

Autopsy findings: Postmortem toxicology (blood): mercury, arsenic and lead were non-toxic. Blood zinc was 16,000 mcg/dL. Cause of death: "multiple organ failure, consequence of zinc toxicity". The manner of death: accidental.

Case 1137. Loperamide ingestion: undoubtedly responsible

Scenario/substances: A 34 y/o male was talking with his mother at home when he "contracted all over", his lips turned blue and passed out. She started CPR; EMS found him in VF. He was defibrillated ×3, given 2 mg of naloxone, 3 vials of epinephrine, intubated, and transported to the ED.

Past medical history: Opioid, marijuana and ethanol abuse. He had stopped using opioids and substituted 200 mg loperamide daily for ~2 yr. Loperamide was stopped 5 days earlier, after a syncopal episode at work. An ED evaluation for that event identified QT prolongation (547 msec) and he was referred to cardiology. Since then, he had multiple episodes of "contracting" (jerky movements, incontinence, vomiting and syncope).

Laboratory/diagnostic findings: ABG-pH 7.38/pCO₂ 32/pO₂ 375/BE -6. Na 138/K 3.6/Cl 110/BUN 10/Cr 0.91/Glu 251, AST 143, ALT 154, bilirubin 1.0, CPK 221, Hgb 13.6, Hct 40, Ca (ionized) 1.14; CxR was unremarkable.

Clinical course: In the ED he was unresponsive, with decorticate posturing, his pupils were unequal and sluggish. BP 93/60, HR 87, T 36.7 °C, O₂ sat 99%. He was incontinent of brown diarrhea. In the ICU, ~6 h later, he remained unresponsive, and received enoxaparin, famotidine, hydralazine, lorazepam, potassium chloride and sodium phosphate. He had multiple episodes of polymorphic VT and was started on isoproterenol and Mg infusions; a cooling protocol was initiated. Head CT was unremarkable. Day 2 on hypothermia: T 36 °C, QTc 592. EEG showed diffuse, nonspecific encephalopathy. Day 4: QTc 415, hypothermia was stopped. Day 5: QTc 469. On Day 6 he exhibited posturing, myoclonus, asymmetric sluggish pupils, and no response to painful stimuli. On Day 9 the patient had a short focal seizure and exhibited posturing with autonomic changes; he was treated with levetiracetam, fentanyl and propofol. On Day 11 MRI suggestive anoxic brain injury; he was started on clonazepam for dysautonomia. On Day 12: QTc 468, he had >25 episodes of "autonomic storm". He would open his eyes but not track, and had no cough or gag. On Day 16, based on the prognosis, he was made comfort measures only. He died on Day 22.

Autopsy findings: Not performed.

Case 1201. Acute benzodiazepine ingestion: probably responsible

Scenario/substances: A 24 y/o male had flubromazepam (designer drug) mailed to him while in a rehabilitation facility. He was found unresponsive with a "half-empty" container of the drug. EMS intubated him during ED transport.

Past medical history: Schizophrenia, alcohol and other substance abuse. Medications: risperidone, alprazolam, zolpidem, propranolol, atomoxetine, disulfiram, lithium, and clozapine.

Laboratory/diagnostic findings: Initial ED presentation: ABG-pH 7.31/pCO₂ 45/pO₂ 102/HCO₃ 22, Glu 112, WBC 23/Hgb 13.2/platelets 237, CPK 2168, liver function tests and UA were "unremarkable", troponin "negative". Serum APAP, ethanol and salicylate not detected. UDS was positive for benzodiazepines. ECG: HR 100 with incomplete RBBB.

Clinical course: Head CT showed a prominent sella, "otherwise normal". Chest X-ray showed pneumonia, he was treated with antibiotics. He had a fever (38.6 °C) on Day 6 and was started on meropenem and fluconazole. He was transferred to a tertiary care center on Day 12. Day 20 (with no response off sedation): Na 150/K 3.5/Cl 107/HCO₃ 32/BUN 16/Cr 0.6, Hgb 10.6, platelets 312. MR brain: bilateral globus pallidus and subcortical white matter changes consistent with anoxic brain injury; EEG showed diffuse slowing with periods of suppression. Flumazenil was given without response. Day 15: tracheostomy and PEG tube placed; levetiracetam started (without reported seizure activity). He received scheduled scopolamine and albuterol/ipratropium via nebulizer. On Day 19 he was non responsive, posturing with painful stimuli, and had fixed, dilated pupils. On Day 21 he was transferred to a hospice facility and died on Day 30.

Autopsy findings: Cause of death: complications of drug overdose. Manner of death: accidental.

Case 1311. Phencyclidine exposure: probably responsible

Scenario/substances: A 26 y/o female was seen exhibiting agitation and bizarre behavior in the street. She suffered a PEA arrest, received naloxone 1.5 mg and 25 min of CPR with ROSC in field.

Past medical history: Phencyclidine abuse.

Physical exam: BP 139/70, HR 103, RR 30, pupils pinpoint, bleeding from several sites, some oozing from mouth, anuric.

Laboratory/diagnostic findings: Na 140/K 8.5/Cl 98/BUN 19/Cr 2.0/AG 36, Ca 8.3, Mg 4.6, Phos 18.1, AST 1160, ALT 627, bilirubin 0.2, INR "elevated", CK 1800, troponin 0.66. Follow up labs K 5.8, AST 1160, ALT 627, CK 6690. Serum APAP, ethanol, methanol, ethylene glycol and salicylate not detected. ECG: wide complex VT with peaked T waves.

Clinical course: In the ED, she received additional naloxone with no response and was intubated. She was hemodynamically unstable, admitted to the ICU with a hypothermia protocol. Despite high doses of epinephrine and norepinephrine, her SBP was ~65. A head CT revealed global hypoxic/ischemic injury. She received insulin and Ca gluconate. She was made DNR due to a suspected internal bleed, was rewarmed and sedation stopped to assess for brainstem activity. Vasopressors were continued along with supportive care, but the patient died on Day 1.

Autopsy findings: Cause of death: acute phencyclidine intoxication, complicated by acute bronchopneumonia and anoxic ischemic encephalopathy with infarctions of the temporal and occipital lobes and basal ganglia. Ante-mortem blood (ED admission) phencyclidine 340 ng/mL.

Case 1404. Acute cocaine, tropacocaine, levamisole and ethanol ingestion, aspiration (with ingestion): undoubtedly responsible

Scenario/substances: A 48 y/o incarcerated male developed agitated delirium and began throwing his body against his cell walls. He was moved to a restraining chair and then became unresponsive and went into cardiac arrest. CPR was initiated with ROSC after 10 minutes. He was intubated by EMS and transported to the ED. He was reported to have been intoxicated with ethanol at the time of arrest.

Past medical history: Arteriosclerotic heart disease, cardiomegaly, history of self-injurious behavior.

Physical exam: Intubated and unresponsive, upper extremity swelling and bruising. BP 88/54, HR 135, RR 28, O₂ sat 92%, T (rectal) 38.9 °C.

Laboratory/diagnostic findings: VBG-pH 6.62/pCO₂ 102/pO₂ 54/HCO₃ 10, Na 142/K 8.4/Cl 105/CO₂ 10/Cr 1.85/Glu 85/AG 27. CK 2431, troponin 0.102. UDS was positive for acetaminophen, cocaine and cocaine metabolite. Serum APAP and salicylate were not detected.

Clinical course: In the ED he remained unresponsive, he was started on propofol, therapeutic hypothermia protocol and norepinephrine. A bedside ECHO showed intact LVEF, EKG was without overt ischemia. In the ICU, he was started on HD for severe acidosis and hyperkalemia. His renal function continued to deteriorate with worsening rhabdomyolysis (CK 32,245). He remained hypotensive and acidotic despite CRRT, multiple vasopressors and bicarbonate infusion. He developed GI bleeding, bowel ischemic bowel and clinical signs of anoxic brain injury. On Day 2 he developed bradyarrhythmia, then asystole and died.

Autopsy findings: Blood cocaine 0.79 mg/L, benzoylcocgonine 3.55 mg/L. Large fragment of plastic and 2 fragments of white, rock-like substance (identified as cocaine, tropacocaine, and levamisole) recovered from gastric contents. Cause of death: cocaine toxicity. Complications: hypoxic-ischemic encephalopathy with cerebral edema and cerebellar tonsillar herniation, acute tubular necrosis, geographic hepatic degeneration and early necrosis, colonic mucosal hemorrhage and necrosis, florid pulmonary congestion and edema.

Case 1444. Acute camphor and ethanol ingestion: undoubtedly responsible

Scenario/substances: A 32 y/o male mixed and ingested a vapor solution (camphor 6.2%, ethanol 78%) with soda.

Physical exam: BP 156/94, HR 103, O₂ sat 100% (intubated on 70% O₂).

Laboratory/diagnostic findings: Na 139/K 4/Cl 102/CO₂ 10/Cr 1.5/Glu 200, AST 44, ALT 89, CK 261. Serum APAP and salicylate not detected, serum ethanol 217 mg/dL, UDS negative. EKG showed sinus tachycardia.

Clinical course: After admission, the patient seized and was given lorazepam, he then went into cardiac arrest. He received CPR, midazolam, intubation and defibrillation (twice) with ROSC. Initial rhythm of narrow complex tachycardia, HR >200. He received IVs, norepinephrine, levetiracetam and valproic acid but remained comatose off sedation. He developed hypertension and received nicardipine. Despite these efforts he died on Day 2.

Autopsy findings: Not available.

Case 1445. Acute cantharidin ingestion: probably responsible

Scenario/substances: A 42 y/o female sought an alternative treatment for her stomach cancer, saw an herbalist who gave her cantharis powder in capsule form (Ban Mao). Shortly after ingestion of a teaspoon of the powder in a soup, she developed abdominal pain, hematemesis, vomiting and diarrhea.

Past medical history: Stage 4 gastric cancer with a biliary stent placement, last chemotherapy 6 weeks PTA.

Physical exam: Upon arrival to the ED BP 70/40, HR 110, tachypneic, O₂ sat 97% on room air. Her mental status was alert and oriented ×3 with no ataxia, motor and sensory intact. She had dried blood in her mouth, cracked lips, and an ulcer on her tongue. Her abdomen was soft with an old ventral hernia easily reducible.

Laboratory/diagnostic findings: Initial VBG-pH 7.32/pCO₂ 29/pO₂ 149, lactate 5.57 (repeat 4.5), Na 137/K 2.9/Cl 99/CO₂ 15/BUN 35/Cr 1.7/Glu 230/AG 23 (not a diabetic), WBC 11/Hgb 12.7/Hct 41.6/platelets 327, INR 4, AST 25, ALT 106, bilirubin 1.5, bilirubin (direct) 0.6, lipase 1,160. UA showed large blood, hyaline casts and large protein. CT (without oral or IV contrast) showed no perforation.

Clinical course: The patient presented to the ED 5 h after ingestion (Hour 5). She became hypotensive and hypoxic by Hour 10. She was intubated and started on IVs and norepinephrine. Her SBP remained in the 80's with a HR of 110. She later received 2 units PRBC and phenylephrine was added. Repeat labs included Na 137/K 3.0/Cl 99/CO₂ 11/BUN 3/Cr 1.74/Glu 29 (200 after D5W)/AG 27, WBC 29.3, Hgb 15, Hct 47.2, platelets 38, fibrinogen 180, AST 378, ALT 141, LDH 1,093. Hemodynamic instability and hemoptysis from endotracheal tube worsened. She received 8 units FFP, 6 units cryoprecipitate and IV immunoglobulin. Her CxR showed a white out left lung, likely due to alveolar hemorrhage. During bronchoscopy the patient became bradycardic, received atropine, and then had a cardiac arrest. She was coded for 10 min without ROSC.

Autopsy findings: Cantharidin and psilocybin were detected in the patient's urine. No formal autopsy done due to patient's religious beliefs.

Case 1492. Acute ethanol, pentobarbital and phenytoin ingestion: undoubtedly responsible

Scenario/substances: A 25 y/o male reported overdosing on a pentobarbital-containing veterinarian product and then became unresponsive. He was found by EMS to be pulseless; ACLS protocol were initiated with ROSC. There was no response to 2 mg of intranasal naloxone.

Physical exam: BP 104/56, HR 105, intubated without spontaneous respiration; pupils dilated and fixed.

Laboratory/diagnostic findings: Serum ethanol was 167 mg/dL; serum APAP and salicylate not detected. Serum phenytoin 7.5 mg/mL. ECG: QRS 96 msec.

Clinical course: In the ED he experienced PEA arrest that responded to ACLS resuscitation. Epinephrine, vasopressin, phenylephrine and norepinephrine were started for hypotension. It was later discovered that he had access to a veterinarian product used for animal euthanasia containing pentobarbital 390 mg/mL and phenytoin 50 mg/mL. Due to severe acidosis, an infusion of sodium bicarbonate was initiated and CRRT was started. On Day 1 he experienced a third cardiac arrest. Based on the prognosis, the family opted for institution of comfort measures and he died on Day 1.

Autopsy findings: Heart blood pentobarbital 130 mg/L, phenytoin 3.4 mg/L. Ethanol and other drugs were not detected. Cause of death: pentobarbital and phenytoin intoxication. Manner of death: suicide.

Abbreviations & normal ranges for narratives. Disclaimer –All laboratories are different and provide their own normal ranges. Units and normal ranges are provided here for general guidance only. These values were taken from Harrison's (10), Goldfrank's (11) or Dart (12).

Typical laboratory panels. ABG-pH/pCO₂/pO₂/HCO₃/BE

Basic metabolic panel: Na/K/Cl/CO₂/BUN/Cr/Glu/AG

Complete blood count: WBC/Hgb/Hct/platelets

ABBREVIATIONS & NORMAL RANGES

~	Approximately; ABG-pH/pCO ₂ /pO ₂ /HCO ₃ /BE;	CI	chloride [102–109] mEq/L;
ABG	arterial blood gases;	CMV	cytomegalovirus;
pH	hydrogen ion concentration [7.38–7.42 mmHg] ;	CNS	central nervous system;
pCO ₂	partial pressure of carbon dioxide [38–42 mmHg] ;	COHb	carboxyhemoglobin (RR <3%);
pO ₂	partial pressure of oxygen [90–100 mmHg] ;	COPD	chronic obstructive pulmonary disease;
HCO ₃	bicarbonate [22–28 mEq/L] ;	CPAP	continuous positive airway pressure;
BE	base excess [±2mEq/L or mmol/L] ;	CPR	cardio pulmonary resuscitation;
ACLS	advanced cardiac life support, protocol for the provision of cardiac resuscitation;	Cr	creatinine [0.5–0.9] mg/dL females [0.6–1.2] males;
ADHD	attention deficit hyperactivity disorder;	CRRT	continuous renal replacement therapy;
AF	atrial fibrillation;	CSF	cerebrospinal fluid;
AG	anion gap Na – (Cl + HCO ₃) [12 ± 4 mEq/L or mmol/L];	CT	computed tomography (CAT scan) ;
AICD	automatic implanted cardiofibrillator;	CVA	cerebrovascular accident;
AKI	acute kidney injury;	CVVH	continuous venovenous hemodiafiltration;
ALP	alkaline phosphatase [13–100] U/L;	CxR	chest radiograph, chest x-ray;
ALT	alanine aminotransferase [7–41] U/L = (SGPT) ;	D10W	10% dextrose in water;
AMA	against medical advice;	D50W	50% dextrose in water;
ammonia	[25–80] mcg/dL [15–47] mmol/L;	D5NS	5% dextrose in normal saline;
amp	ampoule;	D5W	5% dextrose in water;
amphetamines	one or more of the products (6-APB, bath salts, plant food, Bliss, Ivory Wave, Purple Wave, Vanilla Sky, et al) or chemicals (3,4 methylenedioxypyrovalerone [MDPV], 6-(2-aminopropyl)benzofuran [6-APB], butylone, desoxypipradrol [2-DPMP], ethylone, flephedrone, naphyrone, mephedrone, methylenedioxypyrovalerone, methylone, methcathinone, etc.) ;	Day	when capitalized;
(hallucinogenic)		Day	hospital day, i.e. days since admission to the initial hospital admission for this exposure;
AMS	altered mental status;	DIC	disseminated intravascular coagulation;
APAP	acetaminophen (acetyl- <i>para</i> -aminophenol), therapeutic [10–20] mcg/mL;	DM	diabetes mellitus;
APLS	advanced pediatric life support, protocol for the provision of cardiac resuscitation;	DNI	do not intubate;
aPTT	activated partial thromboplastin time [30–40] s;	DNR	do not resuscitate;
ARDS	acute respiratory distress syndrome;	Dx	diagnosis;
AST	Aspartate aminotransferase [12–38] U/L = (SGOT);	ECG	electrocardiogram (EKG), leads = I, II, III, aVR, aVL, aVF, V1, V2, V3, V4, V5, V6;
AV block	atrio-ventricular block;	ECHO	echocardiogram;
BAL	British anti-Lewisite;	ECMO	extracorporeal membrane oxygenation;
BE	base excess: base excess [±2mEq/L or mmol/L];	ED	emergency department, in these narratives refers to the initial health care facility;
bicarbonate	[22–26] mmol/L;	EDDP	principal methadone metabolite, 2-ethylidene-1,5-dimethyl-3,3-diphenylpyrrolidine;
bili (direct)	direct bilirubin [0.1, 0.4] mg/dL;	EEG	electroencephalogram;
bili (indirect)	indirect bilirubin [0.2, 0.9] mg/dL;	ELISA	enzyme-linked immunosorbent assay;
bilirubin	total [0.3–1.3] mg/dL;	EMS	emergency medical services, paramedics, the first responders;
BiPAP	bilevel positive airway pressure, pressure support with 2 levels of continuous positive airway pressure;	ETT	endotracheal tube;
BLQ	below the limit of quantitation;	FFP	fresh frozen plasma;
BMI	body mass index;	FiO ₂	fraction of inspired oxygen (%);
BNPT	prohormone with a 76 amino acid N-terminal inactive protein that is cleaved from the molecule to release brain natriuretic peptide. CHF is likely if BNPT >125 pg/mL (<75 y/o), > 450 pg/mL (>75 y/o) ;	g	grams;
body packing	insertion of drugs into body orifices to evade law enforcement;	g/dL	grams per deciliter;
body stuffing	the ingestion of drugs in order to evade law enforcement;	GCS	Glasgow Coma Score, ranges from 3 to 15;
BP	blood pressure, systolic/diastolic (Torr);	GERD	gastroesophageal reflux disease;
BPH	benign prostatic hypertrophy;	GI	gastrointestinal;
BUN	see Urea nitrogen;	Glu	glucose, fasting [75–110] mg/dL;
C	degrees Centigrade;	h	hours;
Ca (ionized)	ionized calcium [4.5–5.6] mg/dL;	HBO	hyperbaric oxygen treatment/therapy;
Ca	calcium [8.7–10.2] mg/dL;	HCF	health care facility;
CABG	coronary artery bypass graft;	HCG	human chorionic gonadotropin test for pregnancy;
CAD	coronary artery disease;	HCO ₃	bicarbonate [22–28 mEq/L] ;
CHF	congestive heart failure;	HCP	health care provider;
CIWA	Clinical Institute Withdrawal Assessment for Alcohol;	Hct	hematocrit [35.4–44.4] females [38.8–46.4] males;
CK	creatinine kinase (CPK), total: [39–238] U/L females [51–294] U/L males;	HD	hemodialysis;
CKMB	MB fraction of CK [0.0–5.5 mcg/L = 0.0–5.5 ng/mL] Fraction of total CK activity [0–0.04: 0–4.0%];	Hgb	hemoglobin [12.0–15.8] g/dL females [13.3–16.2] g/dL males;
		HIV	human immunodeficiency virus;
		Hour	when capitalized;
		Hour	hours since admission or since exposure as specified in the narrative;
		HR	HR, beats per min;
		IABP	intraortic balloon pump;
		ICP	intracranial pressure;
		ICU	intensive care unit;
		IDDM	insulin dependent diabetes mellitus;
		IgE	immunoglobulin E;
		ILE	intravenous lipid emulsion (20%);
		IM	intramuscular;
		INR	international normalized ratio (PT to control) [0.8–1–2];

IO	intraosseous;	PCC	prothrombin complex concentrate;
IU/L	international units per liter;	PCP	primary care provider;
IV	intravenous;	PEA	pulseless electrical activity;
IVF	intravenous fluid(s) ;	PEEP	positive end expiratory pressure;
K	potassium [3.5–5] mEq/L;	Phos	phosphate (phosphorous) [2.5–4.5] mg/dL;
kg	kilogram;	PICU	pediatric intensive care unit;
L	liter;	platelets	platelet count [150–400] × 10 ⁹ /L;
lactate	lactic acid [4.5–14.4] mg/dL arterial, [4.5–19.8] mg/dL venous [0.5–1.6] mmol/L arterial [0.5–2.2] mmol/L venous;	PO	per os (“by mouth” in Latin) ;
LBBB	left bundle branch block on ECG;	Ppm	parts per million;
LFT:	liver function tests;	PR	P-R interval [120–200] msec on the ECG;
LVEF	left ventricular ejection fraction;	PRN	as needed;
m/o	months old;	PT	prothrombin time, INR is preferred, but PT may be used if INR is not available;
MAP	mean arterial pressure;	PTA	Prior to admission;
mcg/dL	micrograms per deciliter;	PTSD	post-traumatic stress disorder;
mcg/L	micrograms per liter;	PTT	partial thromboplastin time [26.3–39.4] s;
mcg/min	micrograms per minute;	PVC	premature ventricular contraction;
mcg/mL	micrograms per milliliter;	QRS	ECG QRS complex duration [60–100] ms;
mcmol/L	micromoles per liter;	QT	Q to T interval on the ECG waveform; varies with HR;
MDA	3,4-methylenedioxymphetamine;	QTc	QT interval corrected for HR, usually QTcB = QT/RR ^{1/2} (Bazett correction) 1–15 y/o [<440] ms, adult male [<430] ms, adult female [<450] ms;
MDMA	methylenedioxymphetamine (ecstasy, molly) ;	RBBB	right bundle branch block on ECG;
ME	medical examiner;	RBC	red blood cell(s) ;
MetHgb	methemoglobin (RR <1%);	ROSC	return of spontaneous circulation;
Mg	magnesium [1.5–2.3] mg/dL;	RPC	regional poison center;
mg	milligrams;	RR	respiratory rate, breaths per minute;
mg/dL	milligrams per deciliter;	s/p	status post;
mg/kg	milligrams per kilogram;	salicylate	aspirin, acetylsalicylic acid, therapeutic [15–30] mg/dL;
mg/L	milligrams per liter;	SBP	systolic blood pressure;
min	minutes;	sec	seconds;
ml	milliliter;	SL	sublingual;
mmol	millimoles;	SVT	supraventricular tachycardia;
mmol/L	millimoles per liter (previously mEq/L) ;	T (oral)	temperature (oral) [36.4, 37.2]°C or;
mmol/L	millimoles per liter;	T (rectal)	temperature (rectal) [36.4, 37.2]°C or;
mosm/kg	milliosmoles per kilogram;	T (tympanic)	temperature (tympanic) [36.4, 37.2]°C;
mosm/L	milliosmoles per liter;	THC	tetrahydrocannabinol;
MRI	magnetic resonance imaging;	THC Homolog	one or more of the products (Blaze, Dawn, herbal incense, K2, Red X, spice, et al) or chemicals (cannabicyclohexanol, CP-47,497, JWH-018, JWH-073, JWH-200, etc.) ;
MRSA	methicillin-resistant <i>Staphylococcus aureus</i> ;	TPN	total parenteral nutrition;
ms	milliseconds;	Tprot	total protein;
Na	sodium [136–146] mEq/L;	troponin	troponin I, normal range [0–0.08] ng/mL, Cut-off for MI >0.04 ng/mL;
NAC	n-acetyl cysteine;	U	units;
Narrative Headers	Scenario/substances: concise narrative of EMS & pre-HCF events Past Medical History: available relevant past medical history. Physical exam: initial physical exam if available Laboratory/diagnostic findings: initial results, give units except for units given in abbreviations Clinical course: concise narrative of HCF & beyond with outcome; Autopsy findings: medical examiner and/or autopsy results;	U/dL	units per deciliter;
NG	nasogastric;	U/L	units per liter;
ng/mL	nanograms per milliliter;	U/mL	units per milliliter;
not detected	analyte below the level of quantitation, negative;	UA	urinalysis;
NPO	nil per os, nothing by mouth;	UDS	urine drug screen;
NRB	non-rebreathing mask for O ₂ delivery;	Urea nitrogen	[6–17] mg/dL;
NS	normal saline;	(BUN)	venous blood gases;
NSTEMI	non-ST segment elevation myocardial infarction;	VBG	ventricular fibrillation;
O ₂ sat	oxygen percent saturation [94–100]% at sea level;	VF	ventricular septal defect;
OG	serum osmol gap = measured serum osmolality – calculated serum osmolality [0 ± 10 mOsmol/kg] ;	VSD	ventricular tachycardia;
OR	operating room;	VT	white blood cell (leukocyte) count [3.54–9.06] 10 ³ /mm ³ ;
Osm	osmole;	WBC	within normal limits;
PALS	pediatric advanced life support;	WNL	year old;
PC	poison center (= PCC, or Poison Control Center) ;	y/o	