2021
Annual Report

ARIZONA
Poison and Drug
Information Center

1-800-222-1222

Arizona Poison and Drug Information Center

www.azpoison.com

A Year's Overview

Welcome to the 2021 Arizona Poison and Drug Information Center (AzPDIC) Annual Report. This report summarizes the activities of the AzPDIC during our 67th year of service.

The year 2021 saw a continuation of the COVID-19 pandemic, and introduced many new vaccine and treatment questions and concerns. To support these efforts, the AzPDIC continued to operate the COVID-19 Helpline, available 24/7 to providers and the public across Arizona.

In addition, the AzPDIC continued to provide immediate treatment recommendations to the public and healthcare providers. Calls are always answered 24/7 by specially trained pharmacists.

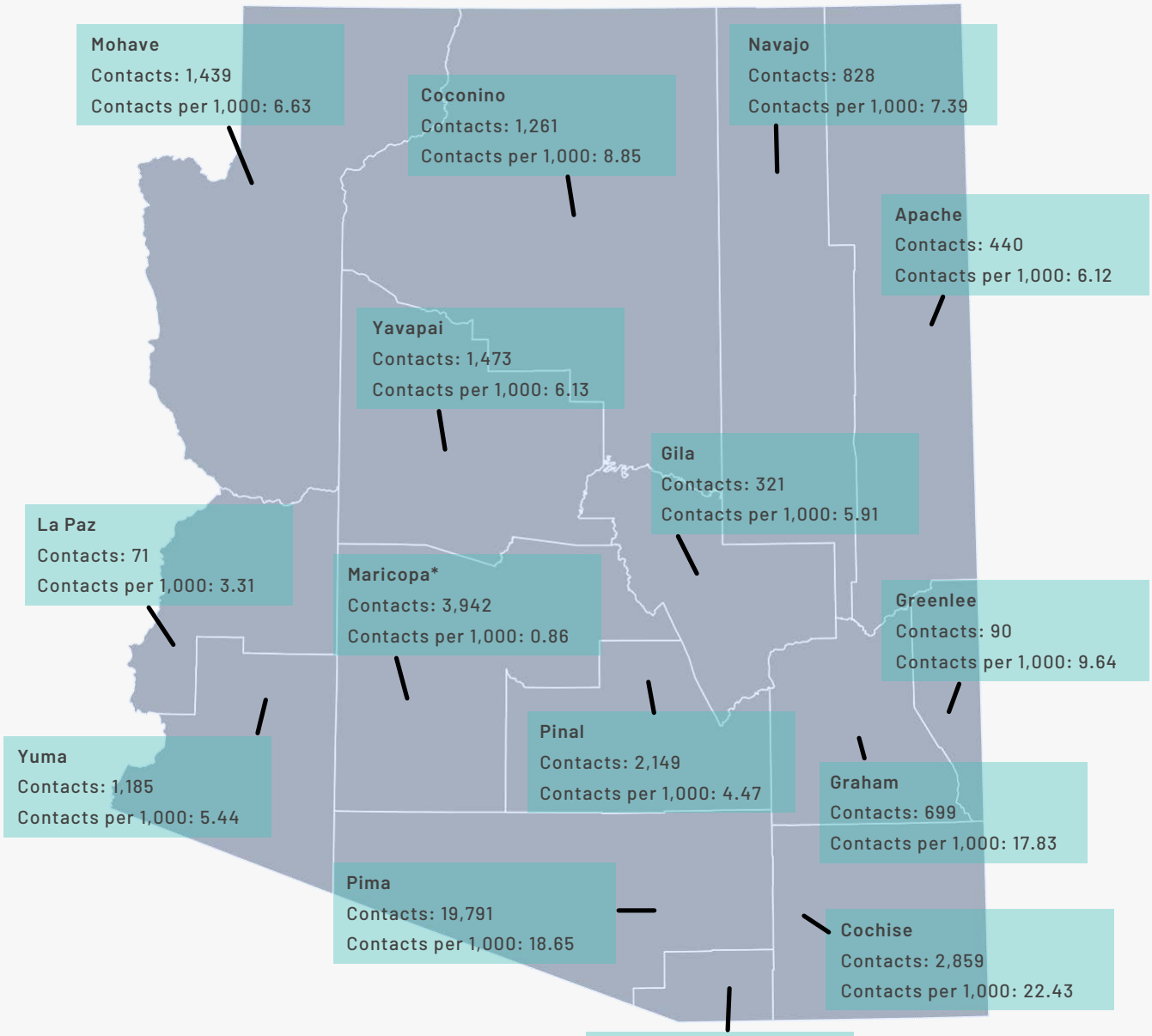
Director's Note

The year 2021 was another year full of change and uncertainty as we once again tried to establish a new normal. One thing that remained the same was the Arizona Poison and Drug Information Center's commitment to keep Arizonans safe. We achieved this through community outreach and education to prevent poisonings and a free, 24/7 service for hospitals and the public to consult if poisonings did happen. All this adds up to a system that optimizes care and saves millions of dollars annually in unnecessary hospital costs for patients, their insurance companies, and the state. More importantly, we save Arizonans the stress of how to navigate such a worrisome time which is truly invaluable.

The lifesaving work this center does is not possible without the expertise and dedication from our specially trained pharmacists, physicians, and health educators. To them, I owe my deepest gratitude and appreciation.

Thank you,
Dr. Steven Dudley, PharmD DABAT

Human Exposures by County



*Calls to poison centers are routed by area code. Service crossover between Arizona's two poison centers often occurs. Banner Poison and Drug Infromation Center serves Maricopa County.

Total contacts: 87,217

Total contacts include exposures (all species), information requests, follow-up contacts, and calls originating from states outside of Arizona answered by the AzPDIC.

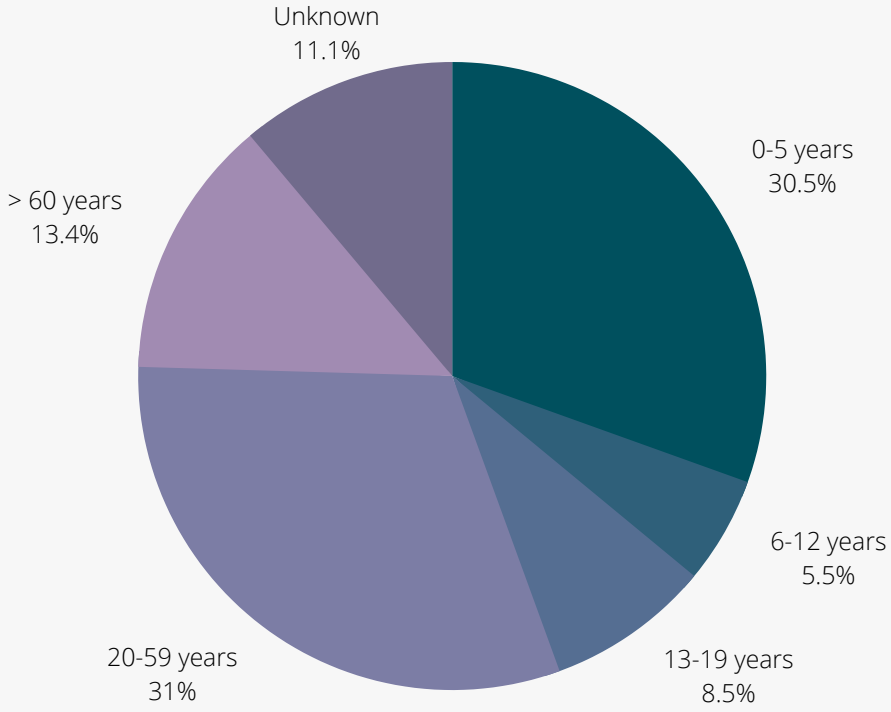
Exposure contacts: 18,552
Information requests: 23,049
Follow-up contacts: 44,356
Out-of-state contacts: 1,260

By Age

Children 0-5 years accounted for 30.5% of human exposures in 2021. which is a 0.7% increase from 2020.

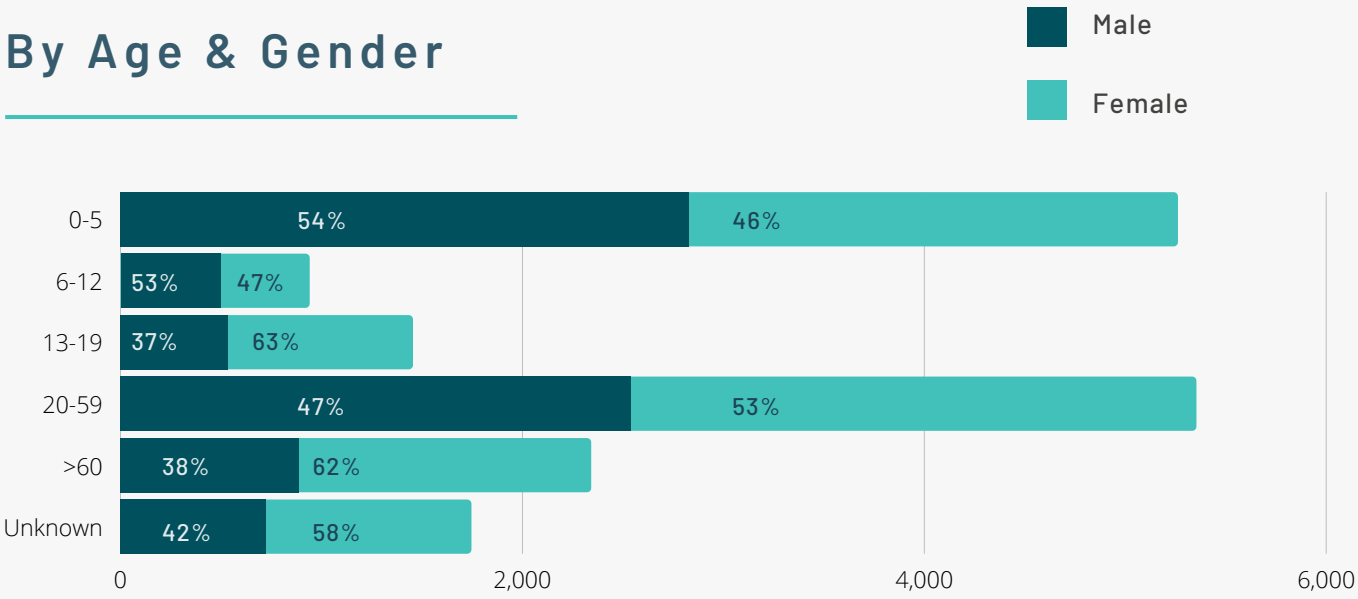
Adults ages 20-59 were the second largest group of exposure cases, at 31%.

Adults ages 60 or above were slightly over 13% of cases.



Human Exposures

By Age & Gender



A male predominance was found among cases involving children 0-5 years and children 6-12 years. This gender distribution was reversed in all other age groups, with females comprising the majority of reported exposures.

EXPOSURE STATISTICS

RESIDENCE
64% (11,099 CONTACTS)

HEALTH CARE FACILITY
27% (4,721 CONTACTS)

WORKPLACE
0.7% (114 CONTACTS)

SCHOOL
0.7% (124 CONTACTS)

OTHER/UNKNOWN
8% (1,403 CONTACTS)

CALLER SITE

Of the 17,461 human exposure cases reported, 64% of contacts originated from a residence (own or other). Another 27% of contacts were made from a health care facility.

Beyond residences, exposures occurred in the workplace (0.7%) and schools (0.7%).

Health care facilities include hospitals, doctor's offices, urgent care centers, clinics, and others.

Other sites include public areas, restaurants, and more.

In 2021, there were 17,461 human exposure cases reported to the AzPDIC. Exposure cases peaked in August and September.

SUBSTANCES INVOLVED IN POISONINGS

The tables below list the most common substances involved in human exposures reported to the AzPDIC in 2021. A patient may be exposed to more than one substance in a poisoning or overdose case.

The top drug substance involved in human exposures was analgesics, followed by antidepressants and antihistamines. The top non-drug substance involved in human exposures was bites and stings, followed by household cleaning substances and cosmetics or personal care products.

Top 10 Drug Substances	No.	%
Analgesics	2,196	12.56
Antidepressants	1,123	6.43
Antihistamines	975	5.58
Sedative/hypnotic/ antipsychotic	883	5.06
Cardiovascular drugs	867	4.96
Dietary supplements/ herbals/homeopathic	624	3.57
Anticonvulsants	558	3.20
Stimulants and street drugs	529	3.02
Hormone and hormone antagonists	469	2.69
Antimicrobials	376	2.15

Top 10 Non-Drug Substances	No.	%
Bites and stings	1,711	9.80
Cleaning substances (household)	1,242	7.11
Cosmetics/personal care products	1,013	5.80
Alcohols	713	4.08
Foreign bodies/toys/misc	529	3.03
Infectious and toxin-mediated diseases	420	2.41
Chemicals	419	2.39
Plants	396	2.26
Pesticides	389	2.23
Fumes/gases/ vapors	321	1.84

SUBSTANCES INVOLVED IN POISONINGS

The tables below list the most common substances involved in human exposures stratified by age. These tables show the differences between substance categories involved in pediatric and adolescent exposures.

The most common substances involved in pediatric exposures were household cleaning substances, cosmetic/personal care products, and analgesics. The most common substances involved in adolescent exposure were bites/stings, analgesics, and antihistamines.

Top 10 Substances Pediatric (0-5 years)	No.	%
Cleaning substances (household)	566	10.67
Cosmetic/personal care products	518	9.73
Analgesics	493	9.26
Dietary supplements/ herbals/homeopathic	404	7.60
Foreign bodies/toys/ miscellaneous	344	6.46
Antihistamines	283	5.32
Topical preparations	248	4.66
Vitamins	221	4.15
Bites/stings	200	3.76
Plants	186	3.49

Top 10 Substances Adolescent (6-12 years)	No.	%
Bites/stings	157	16.34
Analgesics	79	8.22
Antihistamines	78	8.12
Foreign bodies/toys/ miscellaneous	61	6.35
Cosmetic/personal care products	57	5.93
Stimulants and street drugs	49	5.10
Cleaning substances (household)	48	4.99
Dietary supplements/ herbals/homeopathic	47	4.89
Plants	44	4.58
Vitamins	37	3.85

SUBSTANCES INVOLVED IN POISONINGS

The tables below list the most common substances involved in human exposures stratified by age. These tables show the differences between substance categories involved in teenage and adult populations.

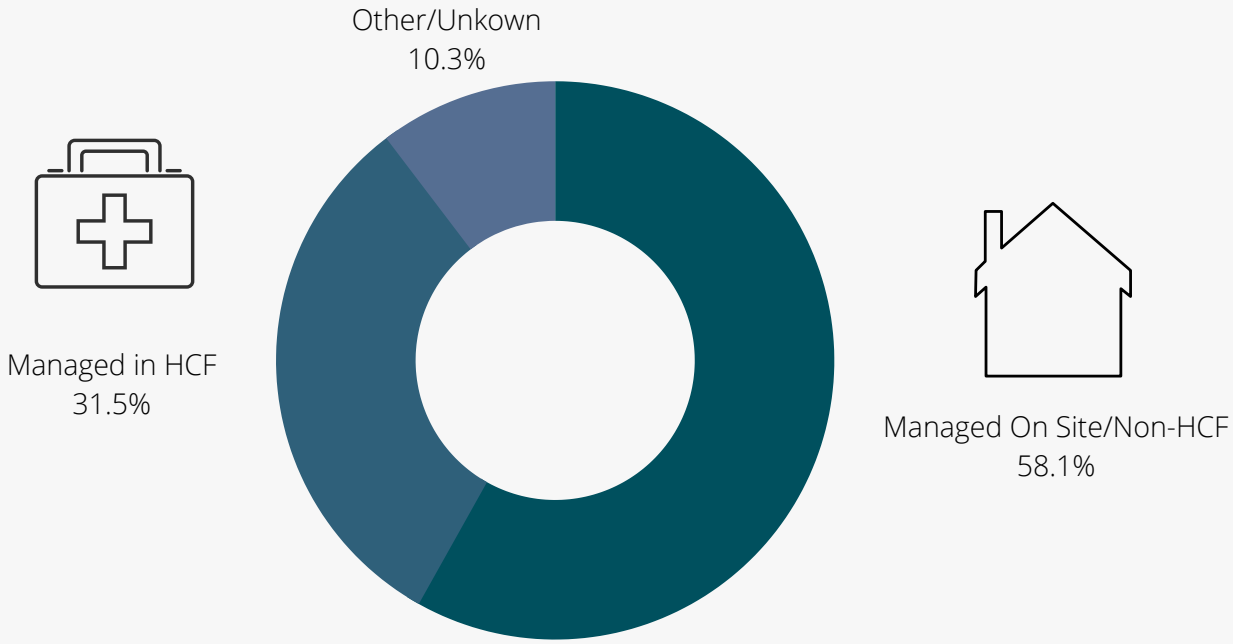
The most common substances involved in teenage exposures were analgesics, antidepressants, and antihistamines. The most common substances involved in adult exposures were bites/stings, analgesics, and antidepressants.

Top 10 Substances Teenage (13-19 years)	No.	%
Analgesics	421	28.52
Antidepressants	218	14.77
Antihistamines	168	11.38
Bites/stings	116	7.86
Sedative/hypnotic/ antipsychotic	113	7.66
Stimulants and street drugs	91	6.17
Cardiovascular drugs	65	4.40
Alcohols	61	4.13
Cleaning substances (household)	52	3.52
Anticonvulsants	50	3.39

Top 10 Substances Adult (>20 years)	No.	%
Bites/stings	1,211	12.78
Analgesics	1,192	12.58
Antidepressants	803	8.47
Sedative/hypnotic/ antipsychotic	712	7.51
Cardiovascular drugs	644	6.80
Alcohols	603	6.36
Cleaning substances (household)	554	5.85
Anticonvulsants	462	4.88
Antihistamines	437	4.61
Cosmetics/ personal care products	401	4.23

Management Site

Managing cases safely at home saves millions of dollars in unnecessary health care costs compared with managing patients in a health care facility (HCF). It also allows for more efficient and effective use of limited health care resources.



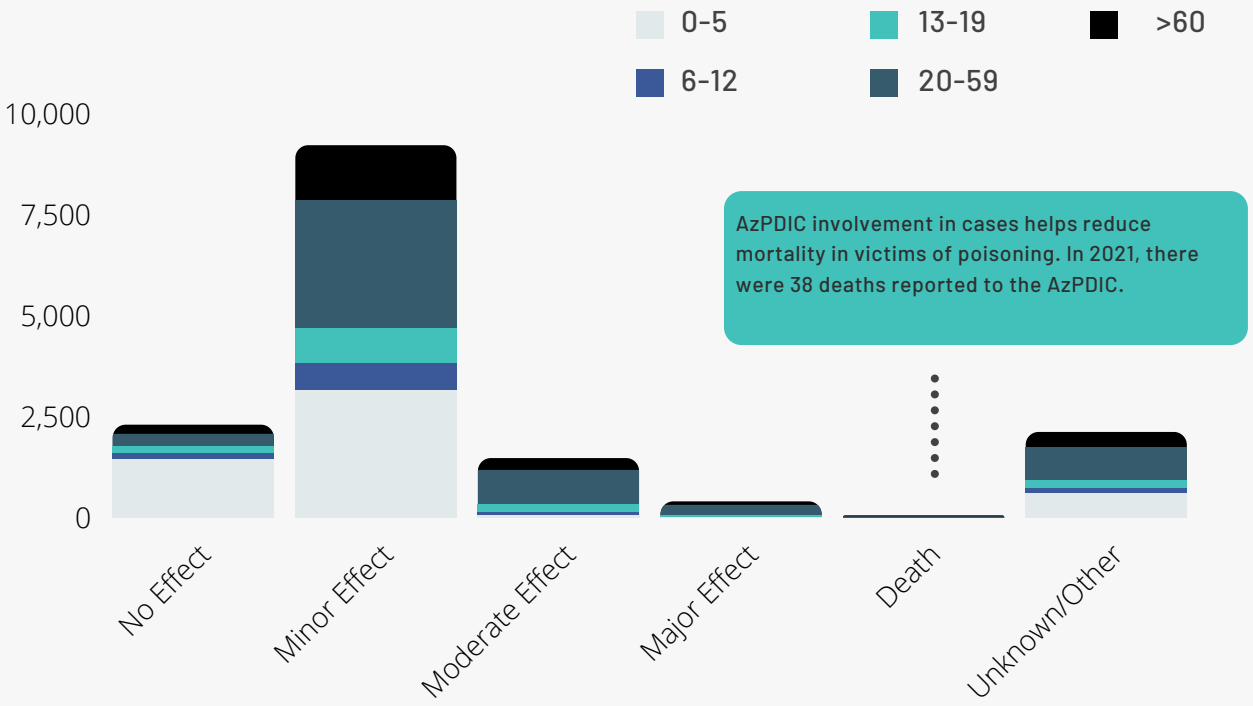
The majority of cases reported to the AzPDIC were managed outside of a HCF (58%), usually at the site of exposure, primarily the patient's own residence.

Of the cases managed in a HFC:

- 62% were treated and released
- 14% were admitted to a critical care unit
- 19% were admitted for psychiatric treatment

The expertise of AzPDIC specialists and toxicologists improved patient care provided by physicians, nurses, and pharmacists at Arizona hospitals.

Medical Outcomes



Cost Savings

In 2021, the AzPDIC kept 62% of home exposure cases at home, saving Arizona an estimated $21.5 million in unnecessary medical expenditures (based on average emergency room visit cost in Arizona).

The AzPDIC Caller Satisfaction Survey supports the cost benefits of poison center utilization. Approximately 25% of survey respondents reported that they would have visited the emergency room if a poison center was not available.

Managing cases safely at home both saves millions of dollars in unnecessary healthcare costs and allows more efficient and effective use of limited healthcare resources.

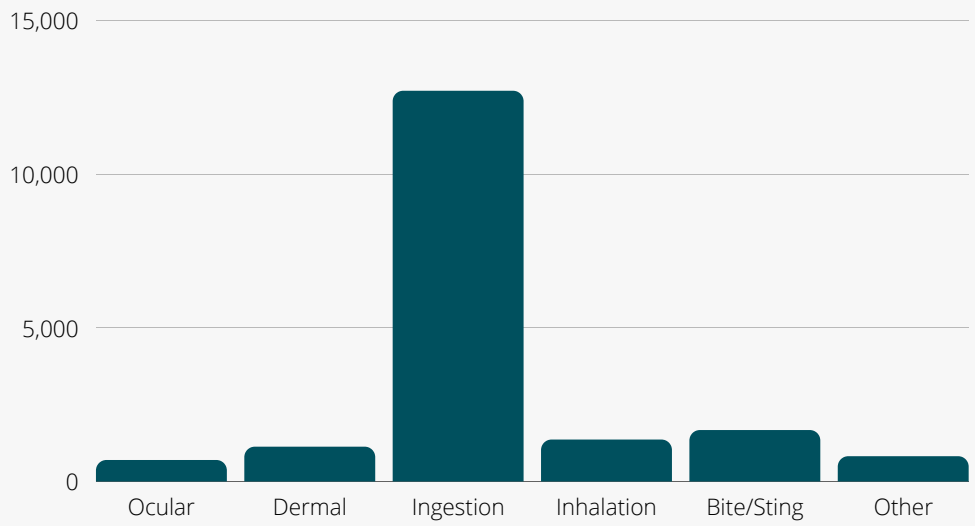
Circumstance

UNINTENTIONAL 72% (12,543)	**UNINTENTIONAL EXPOSURES:** • general misuse of products • occupational (workplace) • environmental	 • bites/stings • therapeutic errors • food poisoning
INTENTIONAL 20% (3,490)	**INTENTIONAL EXPOSURES:** • misuse • abuse • suicide attempts	
ADVERSE REACTION 5.0% (886)	**ADVERSE REACTIONS TO:** • drugs • food • other substances	
OTHER/ UNKNOWN 3.0% (542)	**OTHER/UNKNOWN REASONS:** • malicious • contaminant/tampering • withdrawal	

The reason category for most human exposures was unintentional (72%), including: unintentional general (42%), bite/sting (10%), and therapeutic error (12%). Intentional exposures accounted for 20% of human exposures. Suicidal intent was suspected in 14% of cases.

Route of Exposure

Ingestion was the route of exposure in 73% of cases, followed by bite/sting (10%), inhalation (8%), and dermal (6%) routes.

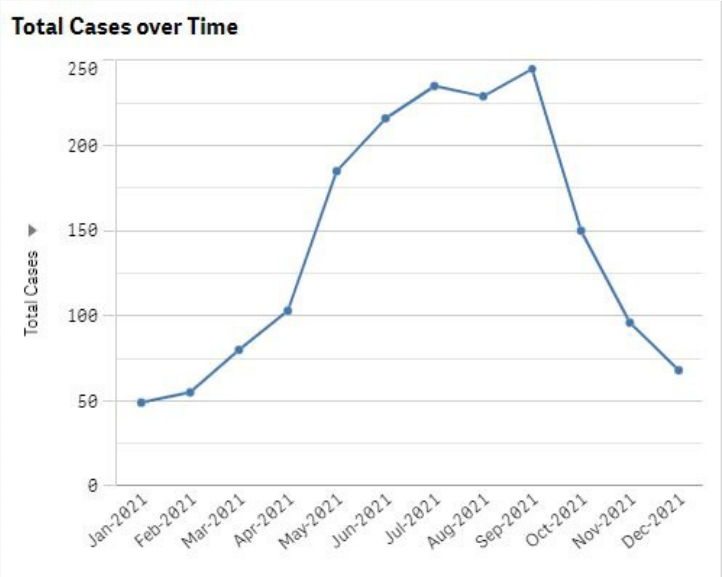


BITES & STINGS

Bites and stings were the second most common exposure in Arizona in 2021. Arizona is known as the venomous creature capital of the United States, with the most diversity in venomous species.

Most bites and stings are unintentional (97%) and can be managed on site (66%). However, all rattlesnake bites require hospital evaluation. Outcomes for bites and stings are typically good, with only 3% resulting in a major effect (symptoms that are life-threatening or resulted in significant residual disability).

In 2021, bite/sting exposure cases were reported in more women (52%) than men (47%). Bite/sting cases were most frequently reported from the following counties: Pima (52%), Pinal (12%), and Cochise (7%).



The graph above displays bite/sting exposures cases over time. Bite/sting exposures (contacts) were highest in late spring and summer and lowest in the winter. The months with the most exposure cases were July and September.

Rattlesnake Bites: 160

Scorpion Stings: 923

Gila Monster Bites: 1

Black Widow Bites: 53

Brown Spider Bites: 8

Bees/Wasps/Hornet Stings: 88

Centipede/Millipede Bites: 26

Ant or Fire Ant Bites: 15

Sonoran Desert Toad:

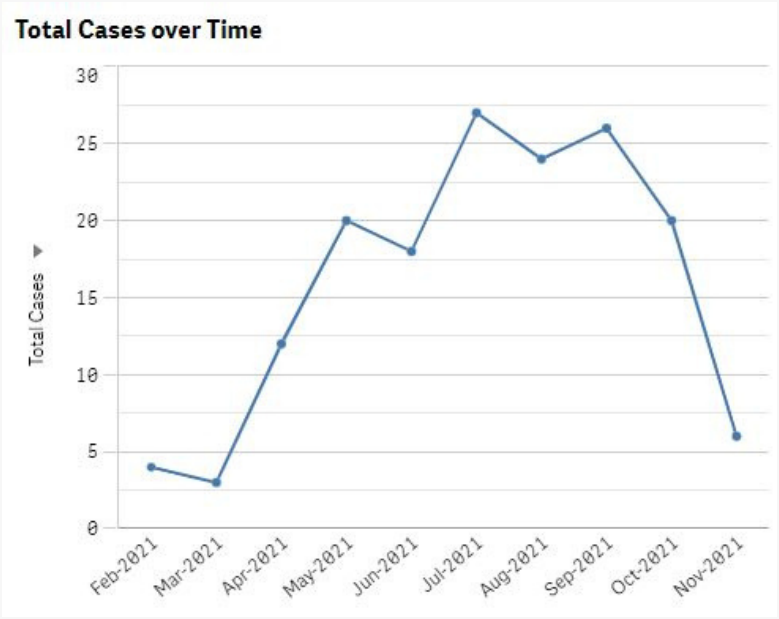
- 30 animal exposure cases
- 5 human exposure cases

The top bite/sting exposure reported to the AzPDIC was scorpion stings. The majority (81%) of scorpion stings were managed at home with AzPDIC guidance.

Rattlesnake Bites

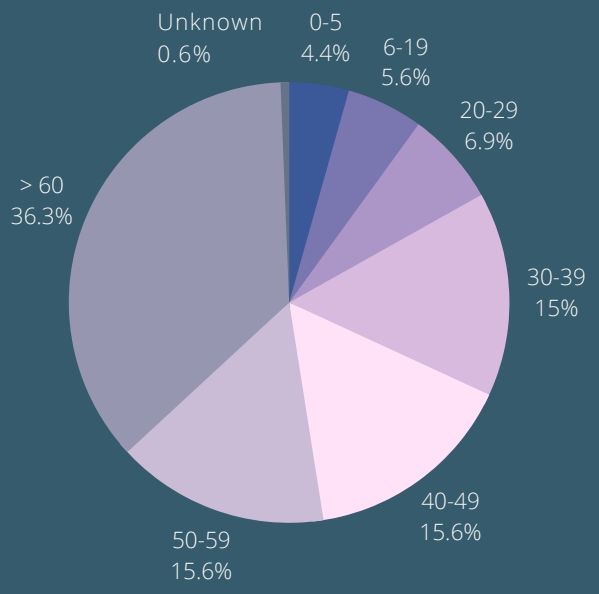
BITES BY MONTH AND AGE

The AzPDIC specializes in treating envenomations, including rattlesnake bites. Please note that in each case the patient initially presented to the hospital with a rattlesnake bite.



The AzPDIC helped manage 160 rattlesnake envenomation cases in 2021. Rattlesnake bites decreased 5% from 2020 to 2021. Most rattlesnake bite victims (71%) were bitten at or near their own residence. There was a male predominance in rattlesnake envenomation cases, accounting for 68% of bites in 2021.

As seen in the graph above, rattlesnake cases peaked twice in 2021 in both July and September. Temperature, human activity, and rattlesnake courtship behavior all factor into peak bite season.



The majority of rattlesnake bites reported to the AzPDIC occurred in patients over 60 years of age. In the past, rattlesnake bite patients were typically young and handling the snake. Today, the age of patients is increasing and most bites are unintentional.

Rattlesnake bites in older adults increased 1.3% between 2020 and 2021.

Public Education

OUR FOCUS

1. Increase public awareness of potentially dangerous substances in everyday life.

2. Help prevent poisonings from occurring by developing and encouraging poison prevention skills.

3. Highlight the expertise of the staff at the AzPDIC and its many valuable services.

OUTREACH STATISTICS

46 events in 3 counties attended by over 6,800 people

5 health fairs

41 presentations/programs (22 held virtually)

Over 10,000 pieces of educational materials distributed

PROGRAM HIGHLIGHT: CHERRY AVENUE PARKS & REC

The AzPDIC engages in a wide variety of public education and outreach. One special opportunity arose to teach children at a summer break camp hosted by a local Parks and Recreation center about poison prevention and bites and stings.

In the first presentation, children learned what a poison was, differentiated between safe and unsafe items in the house, and roleplayed different ways to prevent poisonings with their fellow campers.

The second presentation focused on bites and stings, and children got the opportunity to see various creepy crawly creatures in person. The reptile curator for the AzPDIC assisted in bringing Gila monsters, rattlesnakes, scorpions, a Sonoran Desert Toad, and a gopher snake. Both presentations were huge successes!

RESEARCH HIGHLIGHTS

The AzPDIC is a site for training healthcare professionals, including pharmacy students and residents, medical students and residents, nurses, military personnel, and others.

Publications/Posters

Chelsea Ausman , Elizabeth Grossart , Farshad "Mazda" Shirazi and Geoffrey Smelski. Reactive hypoglycemia during treatment of sulfonylurea overdose. Poster presented at Annual North American Congress of Clinical Toxicology 2021, October 16-18; Webinar

Reem Alsultan, Jennifer Cohen, Sooraj Kumar and Geoffrey Smelski. Congenital Methemoglobinemia. Poster presented at Annual North American Congress of Clinical Toxicology 2021, October 16-18; Webinar

Sarah Denise Holzman, Jaiva Larsen, Ramandeep Kaur, Geoffrey Smelski, Steven Dudley & Farshad Mazda Shirazi (2021): Death by hand sanitizer: syndemic methanol poisoning in the age of COVID-19, Clinical Toxicology, DOI: 10.1080/15563650.2021.1895202

B. Z. Wilson, J. Larsen, G. Smelski, S. Dudley & F. M. Shirazi (2021): Use of Crotalidae equine immune F(ab')2 antivenom for treatment of an Agkistrodon envenomation, Clinical Toxicology, DOI: 10.1080/15563650.2021.1892718

Clinical Education Topics

Poison center clinical education topics included, but were not limited to:

- Seasonal snake behavior
- Hymenoptera envenomation
- Boric acid
- Anticholinergics and physostigmine
- Digoxin and Digifab
- Serotonin syndrome and cyproheptadine/dantrolene
- Toxic alcohol and fomepizole/vitamins
- Biological and chemical weapons
- Methylmercury developmental toxicity
- APAP and NAC
- Opioid toxidrome and Narcan

Media Highlights

61 posts on Facebook with a page reach of 4,469

44 posts on Instagram, with a reach of 1,292

More than 54,680 people visited the AzPDIC website, yielding approximately 96,094 page views. The top three most visited pages included information on breastfeeding, scorpions, and poisonous plants.

In 2021, the AzPDIC and/or staff appeared in the media, including newspaper articles, podcasts, and TV/radio interview at least 30 times. Topics included rattlesnake safety, Ivermectin poisoning, and spring cleaning.

532

followers on Instagram, an increase of 19% from 2020.

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@AzPDIC

A Facebook content post advertising the launch of the Chat About MAT podcast series, in partnership with Blue Cross Blue Shield of Arizona, reached over 600 people.

The most popular Instagram post was a video of venom collection from an adult Gila monster, reaching over 380 people with a total of 36 likes.

2021 ACHIEVEMENTS

National Recognition from the American Association of Poison Control Centers (AAPCC)

The AzPDIC is proud to have received national recognition through two awards from the AAPCC:

1. Greatest Improvement in Overall Quality of Reports
2. Highest Overall Quality of Reports.

Resource for COVID-19

The AzPDIC continued to be a COVID-19 resource for physicians and the public. We provided therapy assistance, including a treatment locater for callers, and helped keep patients out of overcrowded hospitals.

News From the Pit

The Clinical Education Director of the AzPDIC, Geoffrey Smelski, created the first ever issue of News From the Pit, a monthly newsletter that focuses on all things envenomation related, in November 2021.

In 2019, the AzPDIC began a massive internal review dating back to 1999 of every rattlesnake envenomation case we were consulted on. Currently, there are more than 20 research projects in various stages of development as a result of this review. The goal of the newsletter is to stimulate conversation, spread awareness, and discuss challenges with everything from avoiding snake encounters to managing a life-threatening envenomation.

Access the newsletter: News From the Pit

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