
US Splash Pad Waterborne Disease Outbreaks, 1997–2022

Description

Results

Overview of Splash Pad-Related Outbreaks

Between 1997 and 2022, public health authorities across 23 U.S. states and Puerto Rico reported 60 outbreaks linked to splash pads ([Figure 1](#)). These outbreaks occurred in places exclusively featuring splash pads (n=39) and in venues combining splash pads with other recreational water facilities, such as swimming pools and hot tubs (n=21), resulting in 10,611 cases, 152 hospitalizations, 99 ER visits, and no deaths ([Table 1](#)).

Laboratory evidence identified the cause in 52 (87%) of the outbreaks ([Table 2](#)). *Cryptosporidium* was the culprit in 40 (67%) outbreaks, accounting for 9,622 infections and the majority of hospitalizations and ER visits. Notably, *Cryptosporidium hominis* led to the three most severe outbreaks. Other pathogens included *Shigella*, *E. coli* O157:H7, *Campylobacter jejuni*, *Giardia*, norovirus, *Salmonella Newport*, and *Legionella pneumophila*. The vast majority of cases were acute gastrointestinal infections.

A striking 95% of these outbreaks occurred between May and August ([Figure 2](#)), often in community or municipality-run parks ([Figure 3](#)).

Outbreaks Solely Tied to Splash Pads

The focus on splash pad-only outbreaks revealed 39 incidents, with 5,384 cases and considerable medical intervention required. *Cryptosporidium* was noteworthy for causing the lion's share of these outbreaks. Other agents like *Shigella*, *E. coli* O157:H7, and norovirus also featured prominently. A lone outbreak was attributed to chlorine issues.

Data unveiled key contributing factors: splash pads often cater to children in diapers, who might be prone to spreading pathogens. Facility designs lacking adequate disinfection measures and management pitfalls like poor water monitoring were frequently noted. These insights underpin the need for stringent operational protocols to safeguard public health in such recreational settings.

Vocabulary List:

1. **Outbreaks** /'aʊt,breɪks/ (noun): Instances of widespread occurrence of an infectious disease.
2. **Cryptosporidium** /,krɪp.tə.spə'rɪd.i.əm/ (noun): A genus of protozoan parasites known to cause gastrointestinal illness.
3. **Hospitalizations** /,hɒs.pɪ.təl.aɪ'zeɪ.ʃənz/ (noun): The process of admitting a patient to a hospital for treatment.



4. **Transmission** /trænz'mɪʃ.ən/ (noun): The act or process of passing something from one person place or thing to another.
5. **Intervention** /,ɪn.tə'ven.ʃən/ (noun): The action of becoming involved in a difficult situation to improve it.
6. **Pathogens** /'pæθə,dʒɛn/ (noun): Microorganisms that can cause disease.

Comprehension Questions

Multiple Choice

1. What percentage of the outbreaks linked to splash pads occurred in venues combining splash pads with other recreational water facilities?
Option: 34%
Option: 46%
Option: 57%
Option: 65%
2. Which pathogen was responsible for the majority of outbreaks linked to splash pads?
Option: Shigella
Option: Giardia
Option: Cryptosporidium
Option: E. coli O157:H7
3. During which months did a striking 95% of the outbreaks occur?
Option: December to February
Option: March to May
Option: May to August
Option: September to November
4. What type of recreational facilities were often associated with splash pad-only outbreaks?
Option: Amusement parks
Option: Shopping malls
Option: Community or municipality-run parks
Option: Private residences
5. Which pathogen is not mentioned as a cause of outbreaks linked to splash pads?
Option: Norovirus
Option: Legionella pneumophila



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- Option: Salmonella Newport
 - Option: Streptococcus pyogenes

6. What was the primary factor attributed to a lone outbreak related to splash pads?

- Option: Poor water monitoring
- Option: Chlorine issues
- Option: Lack of lifeguards
- Option: Inadequate signages

True-False

- 7. Cryptosporidium was the cause of 67% of the outbreaks linked to splash pads.
- 8. All outbreaks linked to splash pads resulted in deaths.
- 9. Splash pads cater mainly to adults.
- 10. Poor water monitoring was frequently noted as a management pitfall in splash pad outbreaks.
- 11. Children in diapers were identified as potential carriers of pathogens in splash pad environments.
- 12. Norovirus caused the three most severe outbreaks linked to splash pads.

Gap-Fill

- 13. The outbreaks linked to splash pads resulted in a total of _____ cases.
- 15. The vast majority of cases linked to splash pads were due to _____ infections.
- 16. 95% of the splash pad-related outbreaks occurred between May and _____.
- 17. _____ was responsible for causing the lion's share of splash pad-only outbreaks.
- 18. Insights from the data underpinned the need for stringent operational protocols to safeguard public health in splash pad _____ settings.



Answer

Multiple Choice: 1. 35% 2. Cryptosporidium 3. May to August 4. Community or municipality-run parks
5. Streptococcus pyogenes 6. Chlorine issues

True-False: 7. True 8. False 9. False 10. True 11. True 12. False

Gap-Fill: 13. 10,611 15. acute gastrointestinal 16. August 17. Cryptosporidium 18. recreational

Vocabulary quizzes

Multiple Choice (Select the Correct answer for each question.)

1. What does the term "mandate" refer to?

- Option: A. A formal order or commission to do something.
- Option: B. A type of tropical fruit.
- Option: C. A musical instrument.
- Option: D. A scientific theory.

2. What can cause sudden increases in the number of cases of a specific disease?

- Option: A. Outbreaks
- Option: B. Endemics
- Option: C. Vaccines
- Option: D. Quarantines

3. Which of the following helps maintain a healthy balance of gut bacteria?

- Option: A. Probiotics
- Option: B. Antibiotics
- Option: C. Analgesics
- Option: D. Antihistamines

4. What term refers to the monitoring of behavior activities or other changing information for the purpose of influencing managing directing or protecting?

- Option: A. Surveillance
- Option: B. Interference
- Option: C. Censorship
- Option: D. Repression

5. How is a pathogen spread from one host to another?

- Option: A. Transmission
- Option: B. Creation
- Option: C. Isolation



Option: D. Absorption

6. Which branch of medicine deals with disorders of the nervous system?

Option: A. Neurology

Option: B. Gynecology

Option: C. Dermatology

Option: D. Radiology

7. Which term describes a peaceful and calm environment?

Option: A. Serene

Option: B. Chaotic

Option: C. Dynamic

Option: D. Energetic

8. What medical condition is characterized by high blood pressure?

Option: A. Hypertension

Option: B. Hypotension

Option: C. Hyperthermia

Option: D. Hypoglycemia

9. What is the process of removing moisture from something?

Option: A. Desiccation

Option: B. Hydration

Option: C. Evaporation

Option: D. Sublimation

10. What term is used for a magical or medicinal potion?

Option: A. Elixir

Option: B. Poison

Option: C. Concoction

Option: D. Tonic

Gap-Fill (Fill in the blanks with the correct word from the vocabulary list.)

11. It is important to _____ monitor the situation to prevent any security breaches.

12. The illness was caused by the parasite known as _____.

13. Doctors identified harmful _____ in the patient's blood sample.

14. The teacher warned the students not to consume _____ amounts of sugar.



15. High levels of pollution are a _____ to respiratory problems.
16. Aquatic organisms have adapted to survive in varying levels of _____ in the water.
17. Her remarkable _____ allowed her to recover quickly from setbacks.
18. Processed foods often contain high levels of _____.
19. While on vacation she enjoyed _____ in delicious local cuisine.
20. The increase in COVID-19 cases led to a rise in _____ in the region.

Matching Sentences (Match each definition to the correct word from the vocabulary list.)

21. The rapid spread of the virus was to health officials.
22. The government decided to implement an to control the escalating crime rates.
23. Planting trees is a way of the effects of climate change.
24. The study focused on the children's development and problem-solving skills.
25. The geologist studied the of sediments in the riverbed.
26. Conservation efforts aim to protect diverse around the world.
27. The pool water quickly disappeared due to under the scorching sun.
28. The detective found the fingerprint on the murder weapon.
29. Eating leafy greens can provide essential nutrients like for proper muscle function.
30. The process of removes moisture from wet surfaces.

Answer

Multiple Choice: 1. A. A formal order or commission to do something. 2. A. Outbreaks 3. A. Probiotics
4. A. Surveillance 5. A. Transmission 6. A. Neurology 7. A. Serene 8. A. Hypertension 9. A. Desiccation 10. A. Elixir

Gap-Fill: 11. vigilantly 12. cryptosporidium 13. pathogens 14. excessive 15. precursor 16. salinity 17. resilience 18. sodium 19. indulging 20. hospitalizations

Matching sentence: 1. alarming



2. intervention 3. mitigating 4. cognitive 5. deposition 6. ecosystems 7. evaporation 8. matching 9. magnesium 10. evaporation

CATEGORY

1. Health - LEVEL4

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