

# Smallpox Eradication



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# Word Bank

**bioterrorism**

**endemic**

**epidemiology**

**eradicate**

**poxvirus**

**reservoir**

	the regular presence of a disease or infectious agent in a population
	the reduction to zero of an infectious disease's presence in the global host population
	the use of biological agents for the purpose of terrorism
	study of the distribution and control of health-related issues, including diseases
	the habitat in which an infectious agent normally lives, grows, and multiplies
	brick or oval shaped viruses with large double-stranded DNA strands

# Understanding Smallpox

- Smallpox is an infectious disease
  - Caused by variola virus
  - Skin rash beginning on tongue or mouth
  - Fever
  - Passed from person to person
  - Only in humans
- Has serious consequences
  - 3 out of 10 patients die
  - Permanent scarring
  - Some cases of blindness
- Smallpox was **eradicated** in the United States in 1949 through vaccination





## Think About It

1. What resources do you think were required to **eradicate** smallpox from the world?
2. The first smallpox vaccine was introduced in 1796. Why was it almost 200 years before smallpox was **eradicated** from the planet?
3. Why is smallpox considered to be a serious **bioterrorism** threat?

# Smallpox and CDC

- Global smallpox eradication efforts began in 1966
  - Smallpox was still **endemic** in Brazil, West and Central Africa, eastern and southern Africa, much of southern Asia, and Indonesia
- Ring vaccination strategy employed due to limited number of vaccine doses
  - Identify smallpox cases
  - Vaccinate all contacts surrounding those cases
- Last naturally occurring case occurred in 1977
- Smallpox declared globally **eradicated** by the World Health Organization in 1980

# Smallpox and CDC

## Smallpox Vaccinations

- Vaccine uses live vaccinia virus to stimulate an immune response
- Ped-O-Jet (pictured top)
  - Foot-driven vaccine injector
  - Uses pressure instead of needles to push vaccine just under the skin
  - Quick and easy for mass vaccinations
- Bifurcated needle (pictured bottom)
  - Double-pronged needle that holds vaccine between prongs
  - Used to make 15-20 shallow punctures
  - Useful for door-to-door vaccinations or working in remote areas



# Smallpox and CDC

- Understanding culture and religion is an important part of solving outbreaks
- Shapona, Yoruban god of smallpox
  - Given control of earth by his father
  - Grains coming out of the skin (pox) were a sign of his displeasure
  - Decorated with monkey skull, cowrie shells, and a bush porcupine tail
- Shitala Mata, Hindu goddess of smallpox
  - Her spilled grain became smallpox
  - Affected people survived if she used her water pitcher to wash away pox but did not if she used her broom





## Think About It

1. What role does communication play in eradicating a global disease?
2. Why did the tools used for vaccinations change over time?
3. Why must epidemiologists always consider cultural and religious factors when developing plans to stop an outbreak of disease?



# From the Expert



<https://youtu.be/FZY3aHKigDU>



## Think About It

1. Why are vaccines so important in stopping a disease epidemic/pandemic?
2. In the video, Dr. Tedros issued a rallying cry for nations to come together to defeat COVID-19 just as we did to beat smallpox. How do you think we are doing?
3. What training would you suggest for public officials learning to stop outbreaks?

## Call to Action!

1. Solve the Outbreak
2. Write a Field Handbook or Case Study
3. Share Your Findings

Why do you think participation is important?

Give it a  
Try

# Use the Public Health Approach



Surveillance

What is the problem?



Risk Factor  
Identification

What is the cause?



Intervention

What works?



Implementation

How did we do it?

## 1. Solve the Outbreak

- Epidemic Intelligence Service (EIS) investigates disease outbreaks
- Become an EIS disease detective and investigate outbreaks using the Solve the Outbreak game from CDC



Give it a  
Try

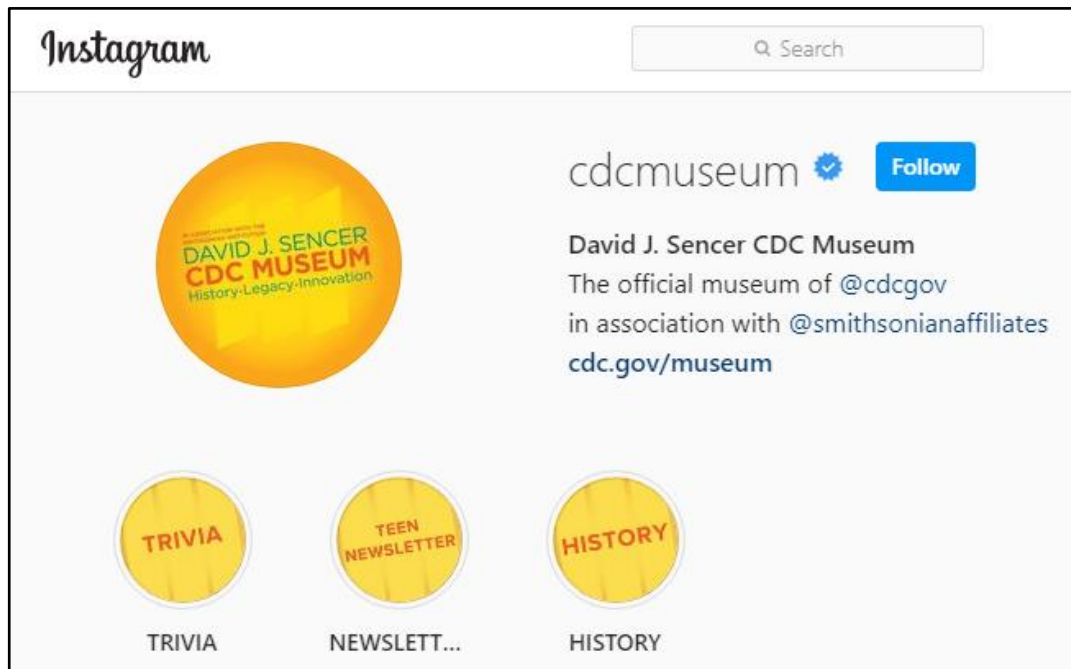
## 2. Write a Field Handbook or Case Study

- Use the public health approach to outbreak investigation
  - Surveillance
  - Risk factor identification
  - Intervention evaluation
  - Implementation
- Summary Option 1: Field guide handbook
  - Summarize the general steps of outbreak case investigation
- Summary Option 2: Case study report
  - Summarize the details of one of the outbreak case

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### 3. Share Your Findings

- Instagram @CDCmuseum



Give it a  
Try



# Questions?