

# PRIMARY AMEBIC MENINGOENCEPHALITIS

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# HISTORY OF PUBLIC HEALTH

- In 1798, United States Congress established the Marine-Hospital Service.
  - Dedicated to the care of ill and disabled seamen in the U.S. Merchant Marine, U.S. Coast Guard and other federal beneficiaries.
- In 1798, John Adams signed **The Act for the Relief of Sick and Disabled Seamen** now referred to as the Public Health Service.

# HISTORY OF PUBLIC HEALTH

- Influenza Pandemic of 1918
  - Infected 500 million people
  - 600,000 people died
  - Worker's Health – Division of Industrial Hygiene
  - High rate of TB, poor sanitation, lead poisoning, and radiation

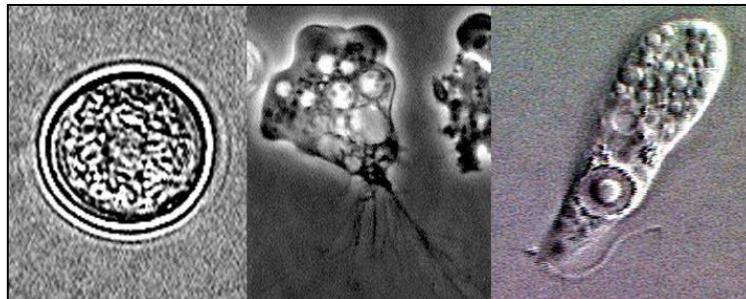


# CURRENT PUBLIC HEALTH FUNCTIONS

- Monitor health status
- Diagnose and investigate health problems
- Inform, educate, and empower people
- Mobilize community partnerships
- Develop policies and plans
- Enforce laws
- Link people to needed health services
- Assure a competent work force
- Evaluate effectiveness
- Research

# NAEGLERIA FOWLERI

- Thermophilic, free-living amoeba
  - Can survive up to 113 °F/45 °C
- In 1962, identified by Fowler as the cause of primary amoebic meningoencephalitis (PAM) in Australia
- Only *Naegleria* species associated with PAM
  - Infects animals (e.g., cattle)
- 300-400 cases identified worldwide
- Evidence of cases occurring back to 1937



# *NAEGLERIA FOWLERI*

- Symptoms

- Sore throat, severe frontal headache, hallucinations, nausea, vomiting, high fever, stiff neck, anorexia, altered mental status, seizures, progresses rapidly to coma and death. Autopsy demonstrates acute hemorrhagic necrosis of olfactory bulbs and cerebral cortex.

- Incubation

- 2-7 days or as long as 2 weeks following exposure

- Duration

- Death usually occurs within 10 days of onset, typically in 3-7 days

# ENVIRONMENTS WHERE *NAEGLERIA FOWLERI* CAN BE FOUND

- Soil
- Lakes and ponds
- Natural hot springs
- Cooling tower waters
- Poorly maintained swimming pools
- Hot tubs
- Well water
- Distribution system water
- Water holding tanks
- Sediments



The sign features a green background with a yellow border. At the top center is a small illustration of an orange with a green leaf. Below the illustration, the text "Swim at your own risk" is written in white, with "Nade a su propio riesgo" underneath in a smaller font. The sign is divided into two columns of text, each with four numbered items. The left column is in English and the right column is in Spanish. At the bottom of each column, the respective agency name is listed: "Orange County Parks & Recreation Division" on the left and "División de Parques y Recreo del Condado de Orange" on the right.

**Swim at your own risk**  
Nade a su propio riesgo

- 1. Be water safe.**
  - Experienced swimmers only.
  - Never enter the water if a storm is in the area.
  - Supervise children and always swim with a partner.
  - Seek prompt medical attention if you become ill after swimming.
- 2. No Diving**
  - Diving in shallow water can cause permanent injury or death.
- 3. Warm water warning:**
  - Bacteria and other harmful organisms such as amoeba thrive in warm water.
  - Wear nose clips or hold your nose when jumping or swimming to reduce your risk.
- 4. Avoid feeding or contact with wildlife.**

Orange County Parks & Recreation Division

- 1. Tenga precaución en el agua.**
  - Nadadores con experiencia solamente.
  - Nunca entre al agua si hay una tormenta en el área.
  - Siempre supervise los niños y nade acompañado.
  - Procure atención médica de inmediato si se enferma después de nadar.
- 2. No Zambullirse.**
  - Zambullirse en aguas poco profundas puede causar daños permanentes o la muerte.
- 3. Aviso sobre aguas calientes.**
  - Bacterias y otros organismos dañinos tales como la ameba crecen en aguas calientes.
  - Utilice un sujetador de nariz o sujete su nariz cuando esté brincando o nadando para reducir su riesgo.
- 4. Evite alimentar o tener contacto con la fauna.**

División de Parques y Recreo del Condado de Orange

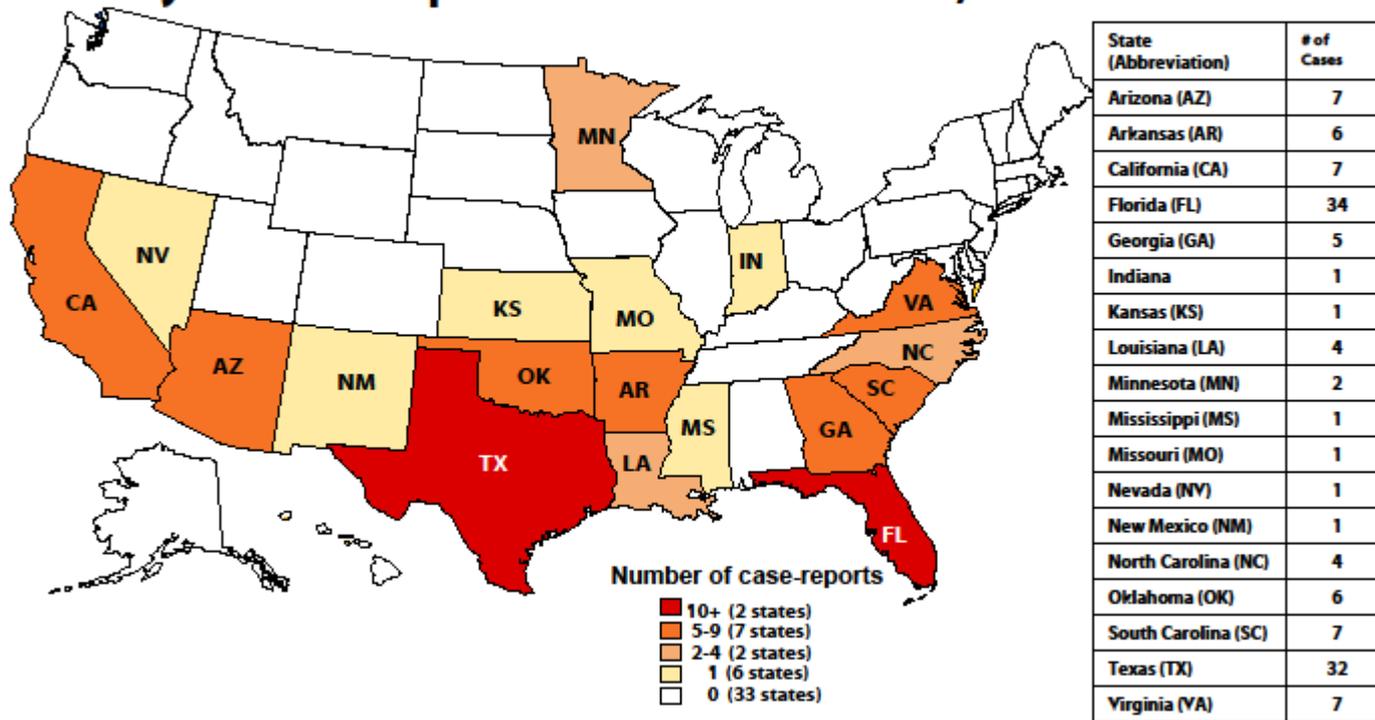
# *PAM PREVENTION*

- Measures that **might** reduce risk of infection by lowering the chance of contaminated water going up the nose include:
  - Avoid water-related activities in bodies of warm, freshwater, hot springs, and thermally-polluted water such as water around power plants.
  - Avoid water-related activities in warm freshwater during periods of high water temperature and low water volume.

# PAM PREVENTION

- Recreational water users should assume there is always a low level of risk associated with entering all warm fresh water in southern tier states.
- Because the location and number of ameba in the water can vary a lot over time, posting signs is unlikely to be an effective way to prevent infections.
- Posting signs on only some fresh water bodies might create a misconception that bodies of water that are not posted are *Naegleria*-free.

## Number of Case-reports of Primary Amebic Meningoencephalitis Caused by *Naegleria fowleri* (N=132) by State of Exposure\*— United States, 1962–2013

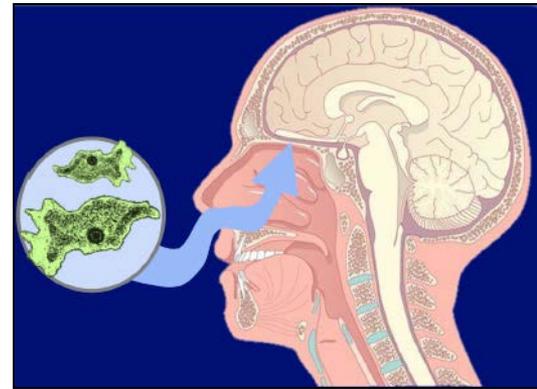


- State of exposure unknown for 4 cases.
- Does not include one case from USVI.



# PRIMARY AMEBIC MENINGOENCEPHALITIS (PAM)

- Rare and serious brain infection
  - 132 cases in U.S. since 1962
  - Fatal: only 3 known U.S. survivors
- Exposure to death in ~10 days
- Most infections associated with swimming in lakes and rivers
  - Water containing *N. fowleri* goes up nose to brain
- All infections in southern tier states in U.S. until 2010



# *PUBLIC HEALTH MESSAGING*

- Interviews
- Press Release
- Social Media
- Reverse 211 in Seminole County Public Schools
- School Board meeting – April 7th
- Proclamation from city of Sanford –April 27th



Smelski Proclamation Ceremony

QUESTIONS?

# THANK YOU!

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