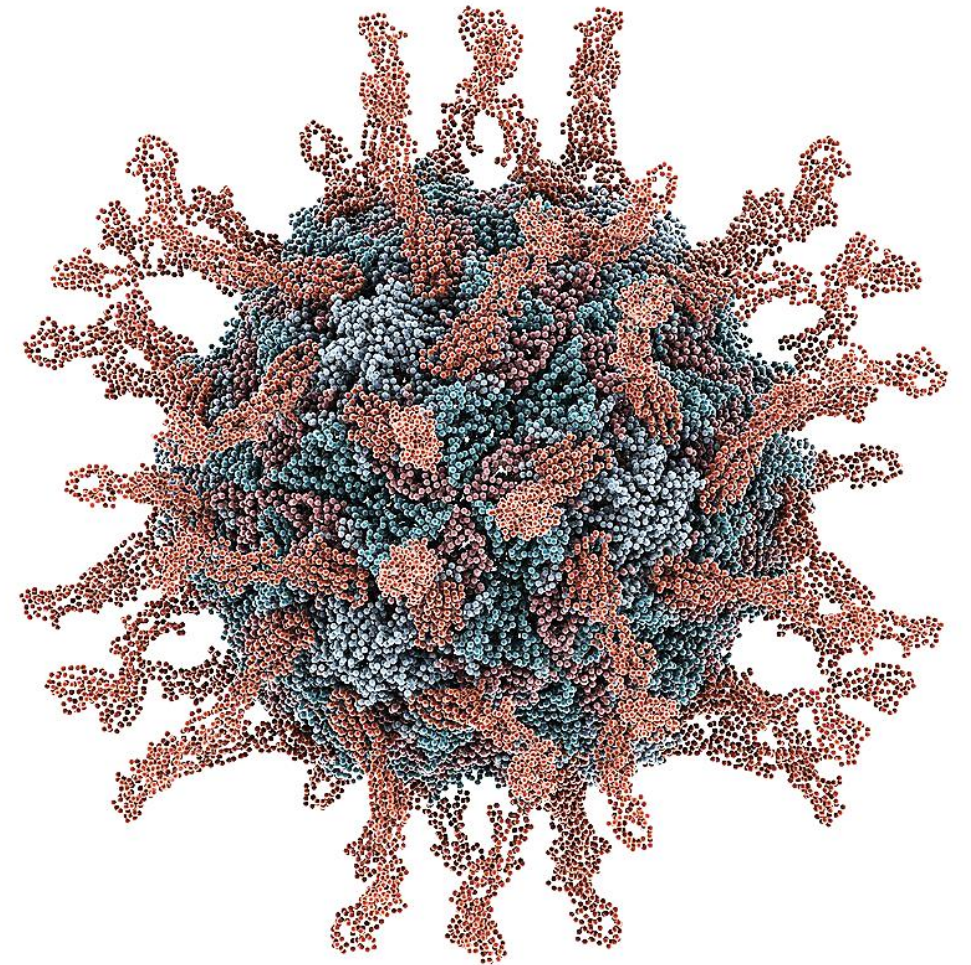


# *Polio*

*(Poliomyelitis)*

*(AKA Infantile Paralysis)*



Presented by:

**Nelson Avery, MD**

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# *Dr. Avery's Background*

## **1996-2009:**

- Professor at the **University of Texas Medical Branch** in Galveston.
- Director of Employee Health for its 13,000 employees, including the Level 4 **National Laboratory**.
  - Developed protocols for decontamination, treatment and hospitalization / isolation for laboratory employees exposed to infectious or chemical agents.

# Polio Arrived in the US

- **1894**: First case of Polio in the US.
- **1950s**: Polio became epidemic in the 20<sup>th</sup> century and peaked in the 1950s.
- Cases increasingly appeared...
  - in late summer (peak in August),
  - in urban areas with better hygiene,
  - and mostly in males, <6 years old.

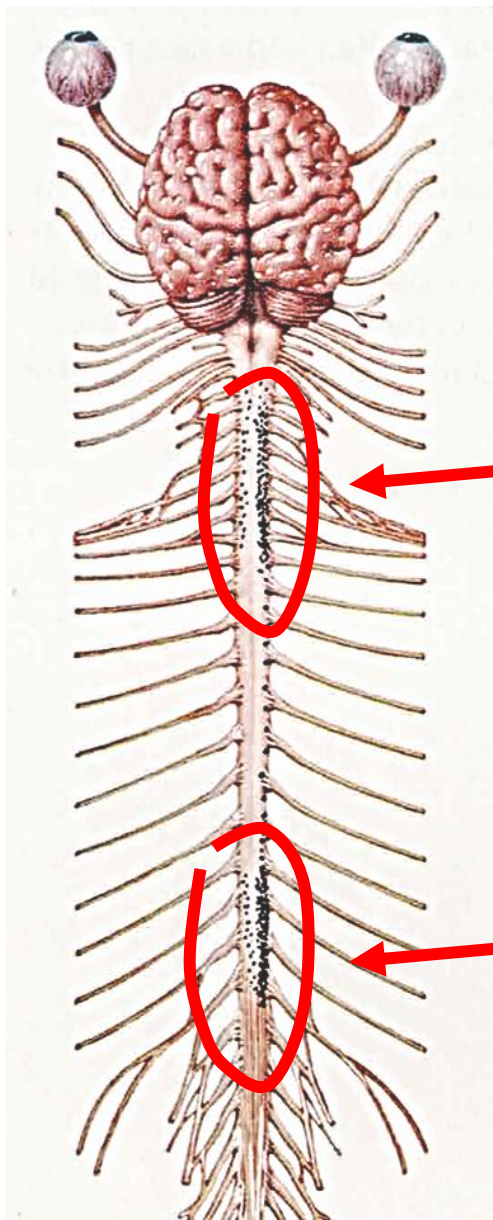


Who had greater risk?

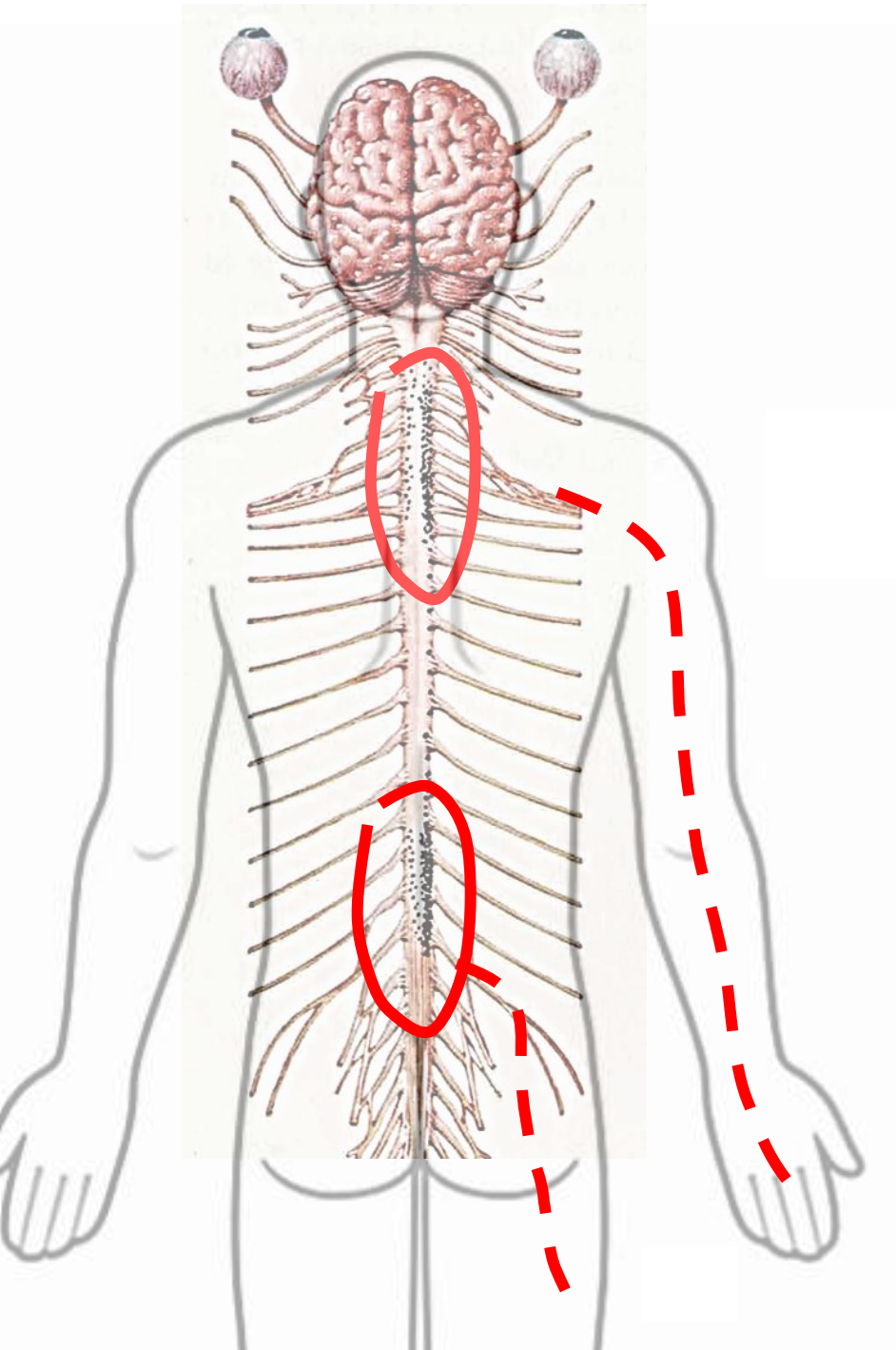


# Polio

- Immunity to polio in early childhood was acquired by playing outdoors in dirt. Polio virus exposure came through contact with feces, contaminated food or water, unwashed hands.
- In **>99%**, it produced a **non-paralytic** infection, with headache and nausea.
- In **<1%**, it caused **paralysis**. Death occurs secondary to not being able to breathe.

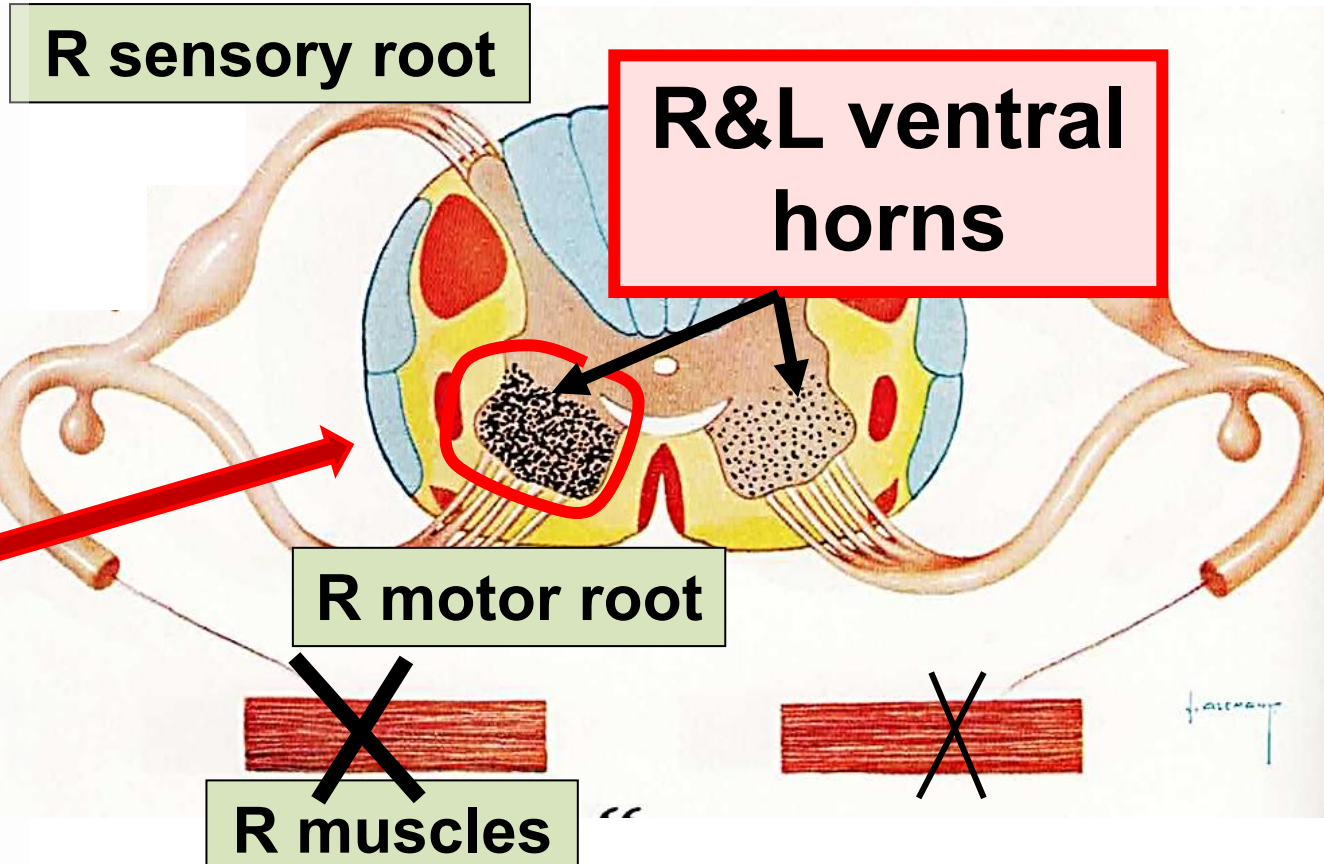
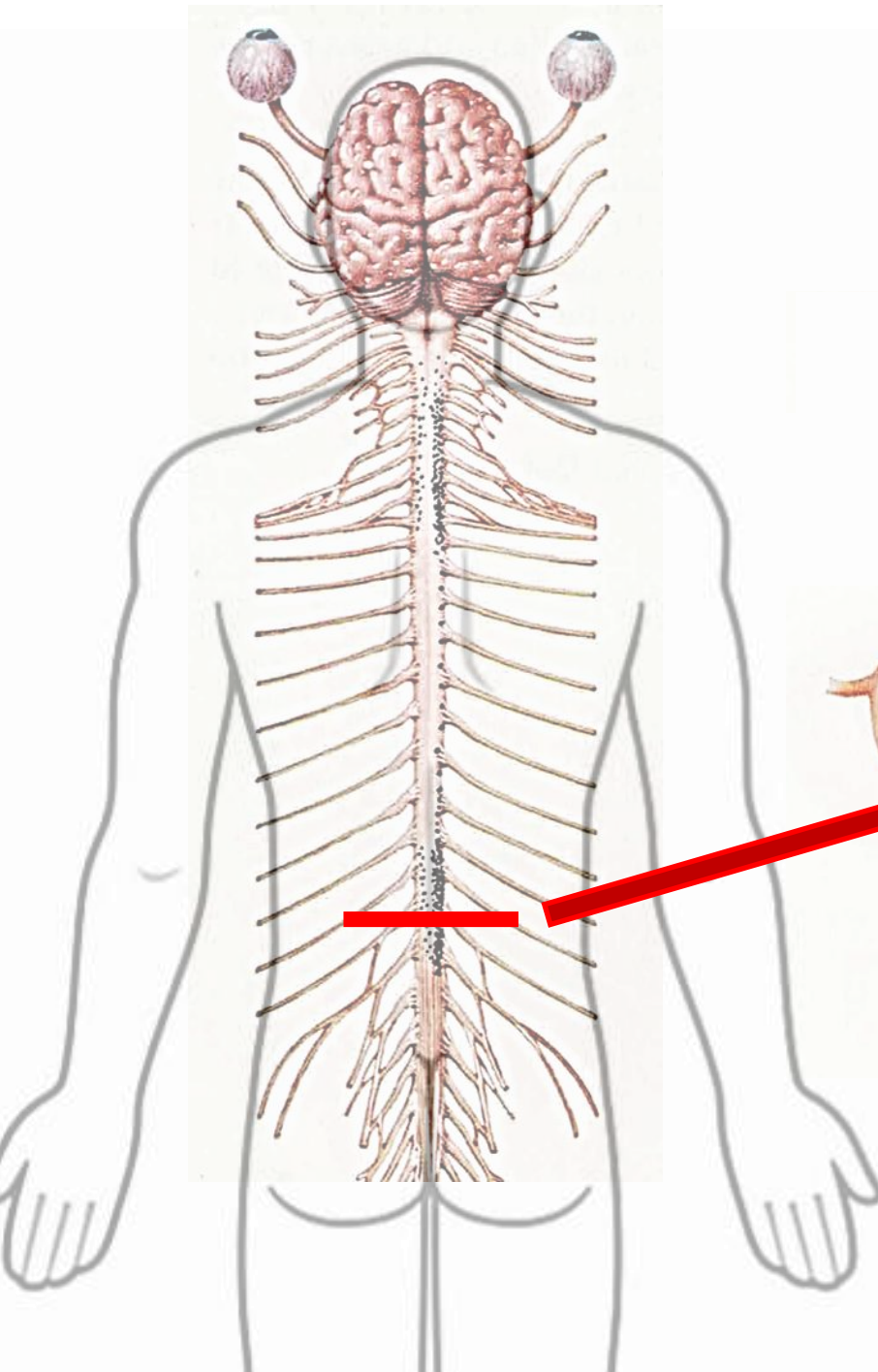


***Example:  
spinal cord infection  
with paralysis  
right arm & leg***



***Example:  
spinal cord infection  
with paralysis  
right arm & leg***

# Spinal Cord Pathology



# *Sanitation Factor?*

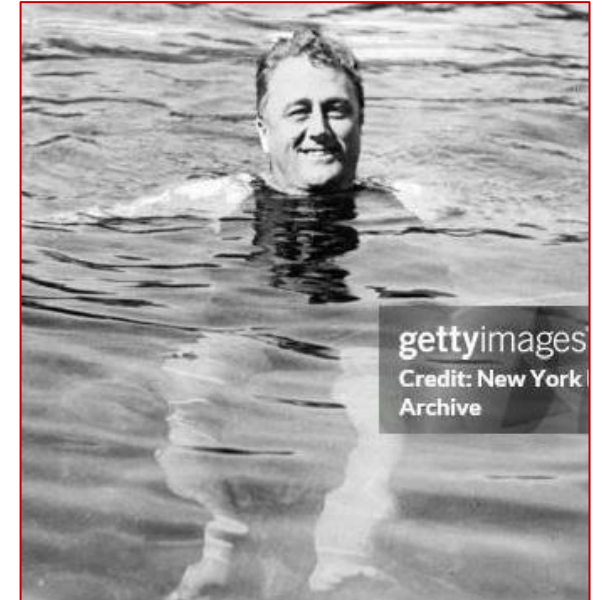
- The most serious outbreaks occurred in the advanced “sanitary” nations of the West.

**Franklin Roosevelt** as a boy lived a sheltered life, and only after he moved into boarding school, he developed multiple infections.

**1921:** Contracted polio at age 39.

# Roosevelt and Polio

- **1924**: He bought **Warm Springs, Georgia** for treatment of his paralysis → nonprofit institution.
- **1932**: Elected **US President**.
- **1938**: Formed the **National Foundation for Infantile Paralysis**. The fundraising theme was called the “**March of Dimes**.”



# Increasing Public Fear

- **1946**: The **March of Dimes** introduced its first posterchild—25,000 polio cases that year.
- **1949**: 42,000 cases.
- **1952**: 58,000 cases, with 3000 dead and 21,000 permanently paralyzed.



# Children in “Iron Lungs”



# Salk: Polio Vaccine Research

- **Dr. Jonas Salk** thought inactivated or killed polio-virus vaccine would work. **1947**: He received seed money from Roosevelt's **National Foundation**.
- **1949 to 1951**: Salk's lab found that all 196 strains fit into 3 distinct types.
- **1951**: Salk discovered that monkey kidney would yield 6000 doses of vaccine per kidney.

# *Salk Convinced the Public*

- **1952**: Salk experimented with killed-virus vaccine on prior polio victims, and it was successful.
- **March 1953**: He went on nation-wide **CBS Radio** to convince the public about his killed-virus vaccine.
- **Nov. 1953**: Salk got permission to proceed with public vaccine trials.

# Salk's Vaccine Trial

- **1954**: Vaccine trial was the largest public health experiment in US history: used injected inactivated polio virus vaccine (IPV).



- **April 12, 1955**: Announced trial results: up to 90% effective.

# Vaccine Licensed / Problems

- **1955**: HEW licensed the Salk vaccine. President Eisenhower proclaimed Salk as a “*benefactor to mankind.*”
- **April 1955**: 600 cases of **vaccine-related polio** occurred—all from contaminated vaccine produced by one facility.



# *Salk Vaccine Success*

- **Because of contamination incident, few children were vaccinated the rest of **1955** and there were 28,000 cases of polio that year.**
- **When vaccination resumed, polio cases fell in **1956** to 15,000 and in **1957** to 7000.**

# Sabin: Research with Live Vaccine

- **1951**: Dr. Albert Sabin began working on an oral live-polio virus vaccine (OPV).
- **1954-55**: Tested his vaccine on prisoners.
- **1959**: Did a mass trial in the Soviet Union: successfully vaccinated 10 million children.

# *Sabin (OPV) vs. Salk (IPV)*

- **1961**: US replaced Salk **IPV** with the Sabin **OPV** vaccine.

- **1996**: CDC resumed using Salk **IPV** vaccine as a hybrid formula with Sabin **OPV**.

- **2000**: CDC endorsed a full return to just the Salk **IPV** vaccine.

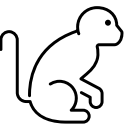
# *Current Polio Vaccination in US*

**US recommendation for children using an injected series of **Salk IPV**:**

- **1<sup>st</sup> & 2<sup>nd</sup> doses at 2 and 4 months old**
- **3<sup>rd</sup> dose from 6 to 18 months old**
- **4<sup>th</sup> dose at 4-6 years old**

# Koprowski's Live Vaccine

- **Dr. Hilary Koprowski** experimented with weakened live-virus vaccine.
- **1950**: Vaccine tested on “feeble-minded” children in the US.
- **1957**: Oral vaccination campaign on children in the Belgian Congo.
  - (used chimp kidneys harvested in the Congo to grow the vaccine!!!)



# *Congo Polio Vaccination → HIV/AIDS?*

The locations of **Koprowski vaccinations** **1957-1960** in the Congo were traced by Edward Hooper (in “*The River*”) to...  
**the earliest known cases of human HIV in the world**

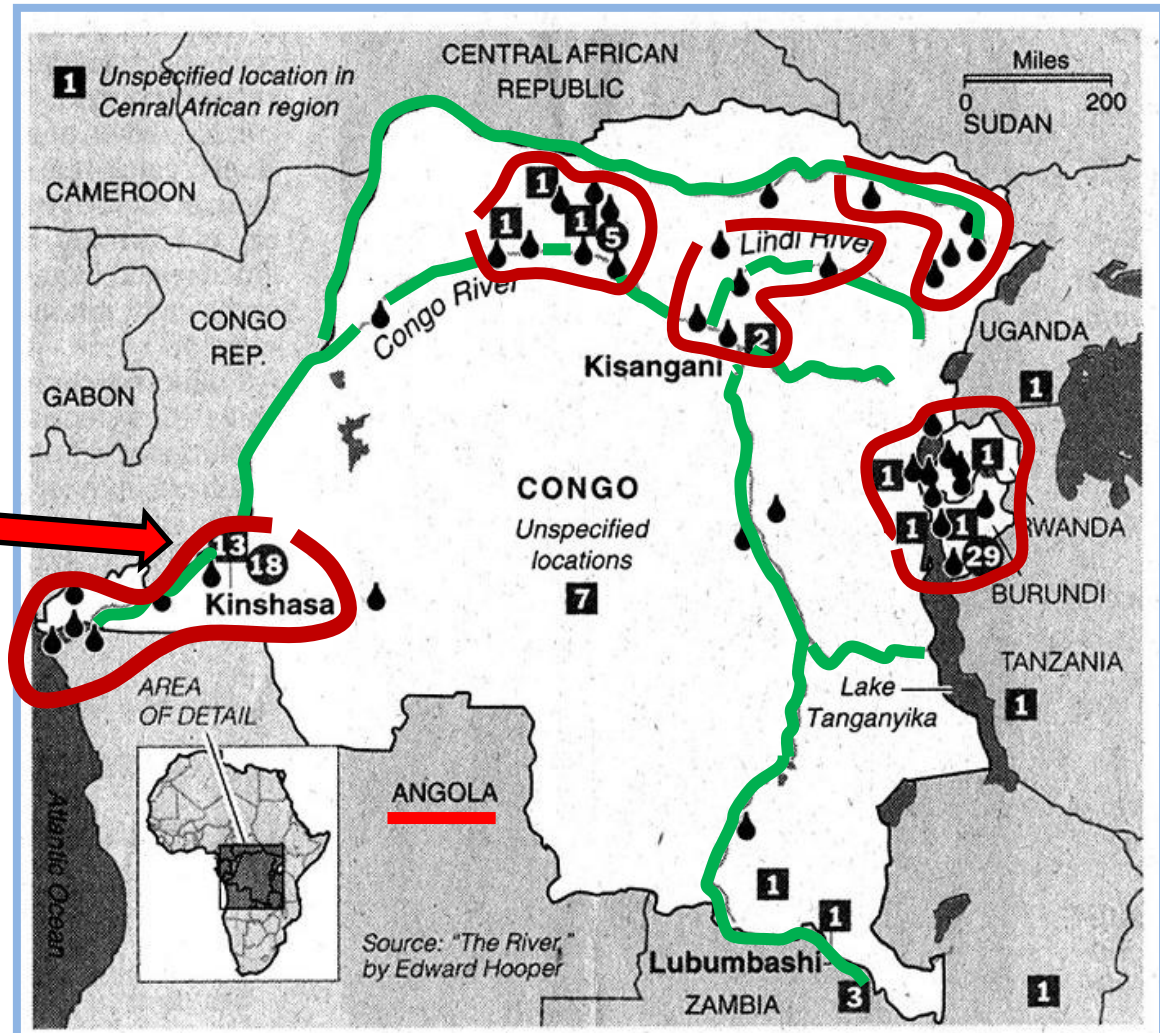
# Early HIV/AIDS Cases in Congo

*Coincided with Polio Vaccine Sites 1957-1960*

The first known case of human **HIV** was in Kinshasa in

**1959**

*just 2 years after the first vaccines*



# HIV/AIDS Came to the United States

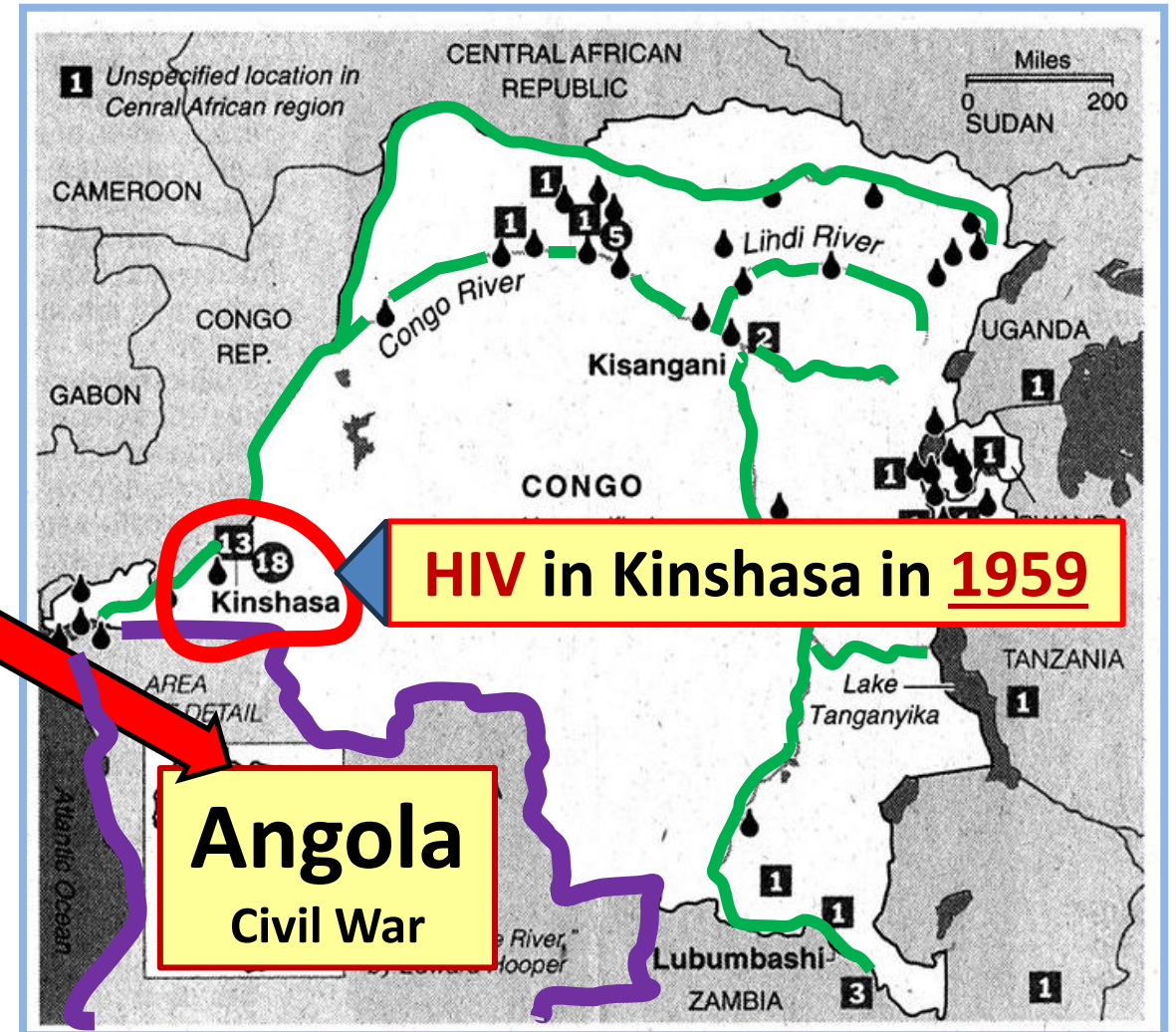
Cuban soldiers  
began fighting  
in Angola in

**1975**



**HIV** into US in

**1981**



# *Rotary & Global Eradication of Polio*

- **1979**: **Rotary International** first polio project in the Philippines.
- **1985**: 40 years ago, **RI** pledged to raise **\$120M** toward immunizing all the world's children.
- **1988**: **WHO**, together with **RI**, launched the **Global Polio Eradication Initiative** to stop wild poliovirus (WPV) transmission. Administered by UNICEF.

# *Global Eradication of Polio*

- **1994**: The Americas were certified as polio-free.
- **2002**: Europe was free of polio.
- **2003**: Muslim clerics in Nigeria led a boycott on vaccination → by **2004**, 64% of all cases of polio in the world occurred in Nigeria.

# Death of bin Laden

**2011:**

**10 years after 9-11,  
Osama bin Laden  
located in Pakistan by  
DNA extracted from  
vaccine injections  
and then killed by  
US forces.**



## *Since Death of bin Laden in 2011: Polio in Pakistan & Afghanistan*

- **Al Qaeda and Taliban** militants along with **Muslim clerics** instructed against polio vaccination.
- More than 200 polio vaccine staff and police assigned to protect them have been killed.
- **Government officials falsified vaccination records, did not keep the vaccine cold, and used unqualified persons to give the drops.**

# ***Polio in Pakistan and Afghanistan***

- **Parents refused to vaccinate their children—**  
believed that the vaccine would sterilize their children or make them reach puberty earlier, and that the vaccine was made from pig urine.
- After **2020**, conspiracy theories circulated that **polio vaccine contained coronavirus (COVID)**.

# Current Status of Global Eradication of Polio



- **Since 1988**: 99.9% reduction of all new cases.
- **2015**: WPV-2 virus declared eradicated
- **2019**: WPV-3 virus also eradicated.



- **2023-2025**: Only Afghanistan and Pakistan have endemic transmission of wild polio (WPV1), but...

# Next Generation Polio Vaccine



- **2025: Vaccine-derived type 2 polio virus (cVDPV2) now in 10 Muslim countries (in Sub-Saharan Africa and Yemen).**

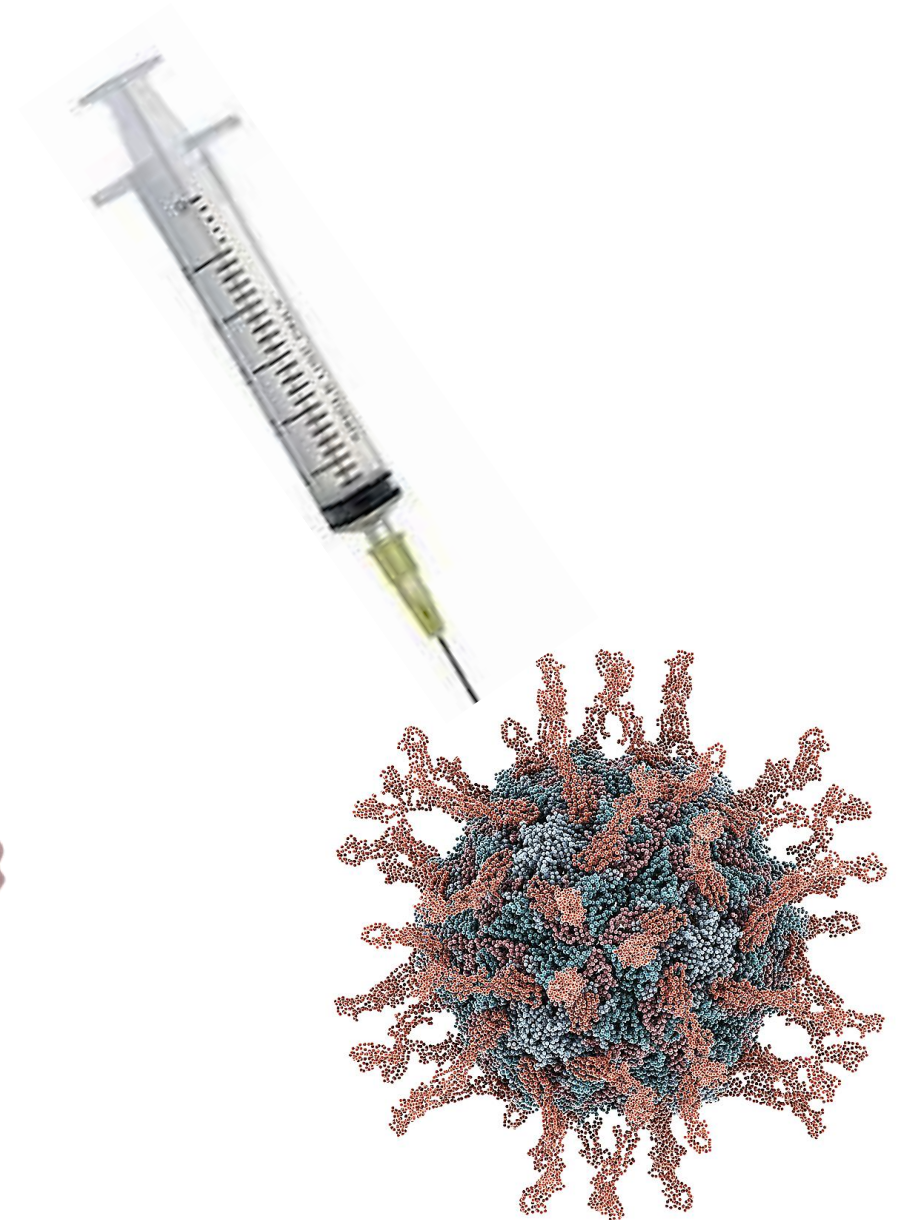
- To help stop the spread of cVDPV2, a newer vaccine (**nOPV2**) is protecting children in under-immunized communities.
  - As of July 2025, **>1.6 billion doses of nOPV2** have been given.

# *Rotary & The Gates Foundation*

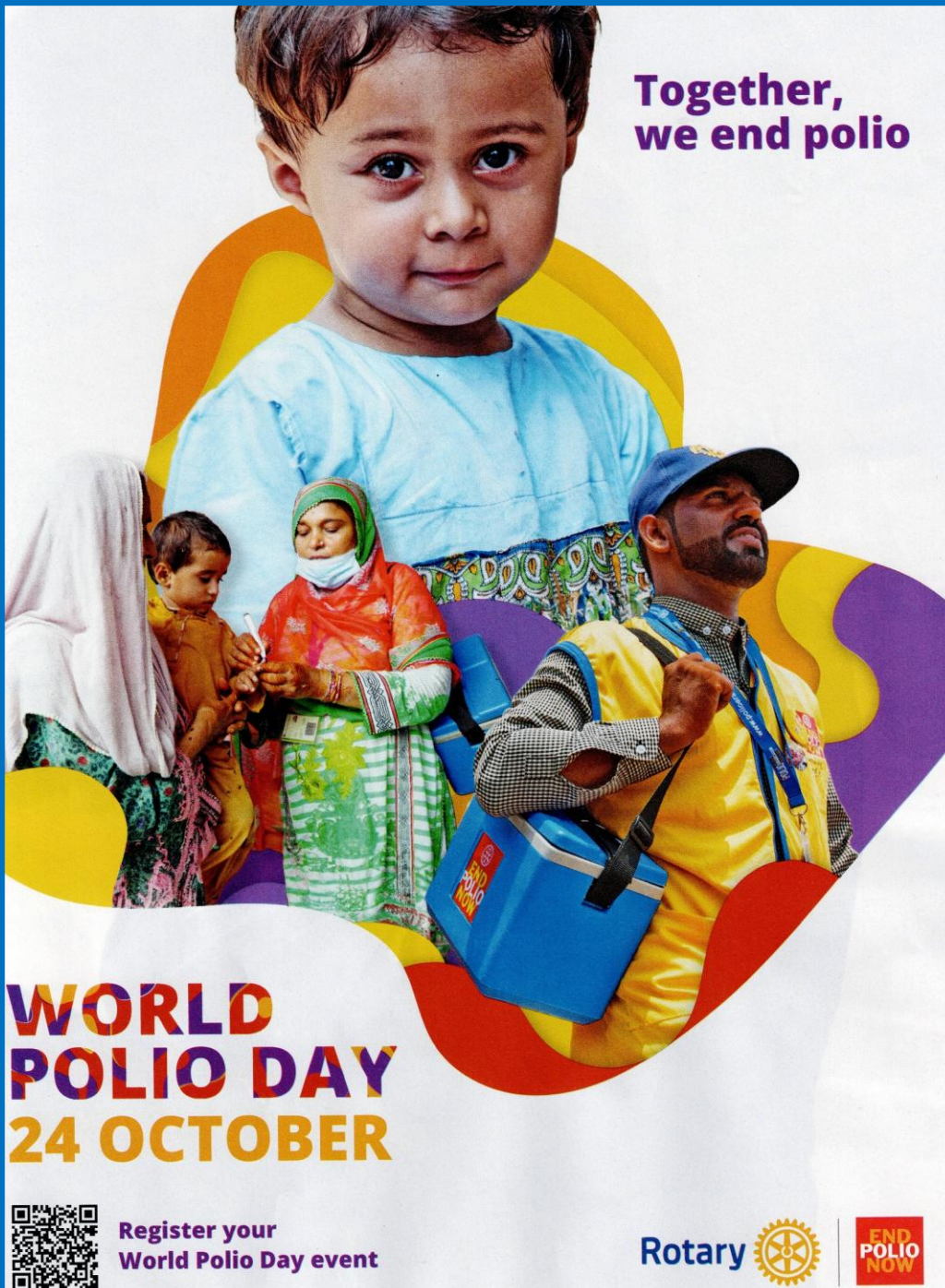
- **June 2025**: **Rotary** and **The Gates Foundation** extended their partnership for polio eradication for another 3 years.
- **Rotary** will raise **\$50 million** per year, matched by **Gates Foundation** at 2-to-1, for a total commitment of **\$450 million**.



**Since 1985**  
**Rotary International**  
**has raised**  
**>\$2.9 billion**  
**for polio eradication.**





***Rotary  
International  
& World  
Polio Day***



Together,  
we end polio

**WORLD  
POLIO DAY  
24 OCTOBER**

Register your  
World Polio Day event

Rotary  

The poster features a young child in a light blue shirt at the top, looking directly at the camera. Below the child, a woman in a colorful sari and a headscarf is administering a vaccine to a small child. To the right, a health worker in a yellow uniform and blue cap is carrying a blue cooler bag. The background is white with large, colorful, abstract shapes in orange, yellow, purple, and red.

# *Final Comments on Dr. Jonas Salk*

- Salk refused to patent his **IPV** vaccine.  
Forbes estimated he would have earned **\$7 Billion** in royalties if he had patented it.

**“Could you patent the sun?”**

**“Our greatest responsibility is to be good ancestors.”**

# *References:*

- ❖ ***Polio, An American Story* by David M. Oshinsky (2005)**
- ❖ ***Wikipedia: Polio Eradication* (6-16-2025)**
- ❖ ***Rotary International: Polio Global Eradication Initiative* (6-22-2025)**