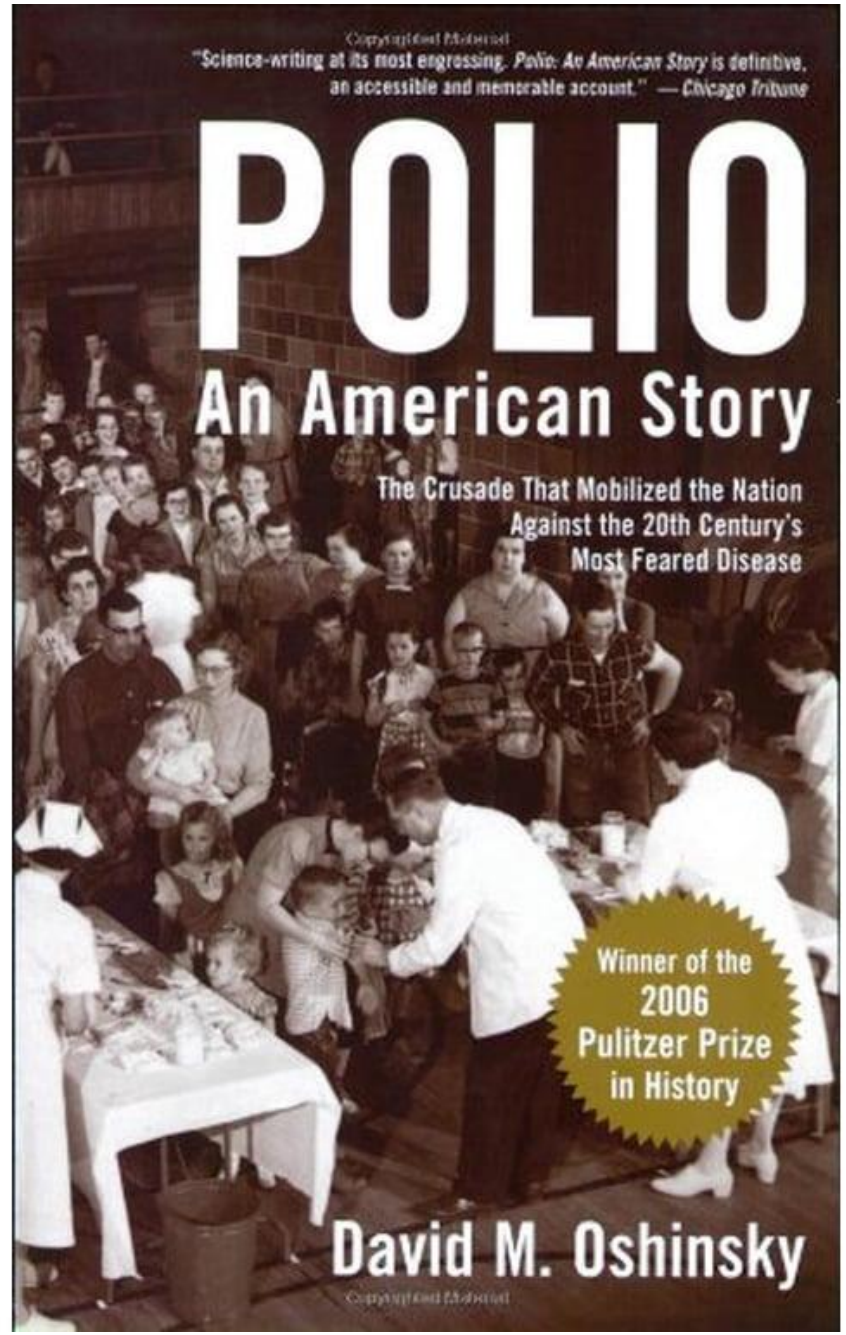
Science Engineering and Transport Group

Polio

5 November 2026

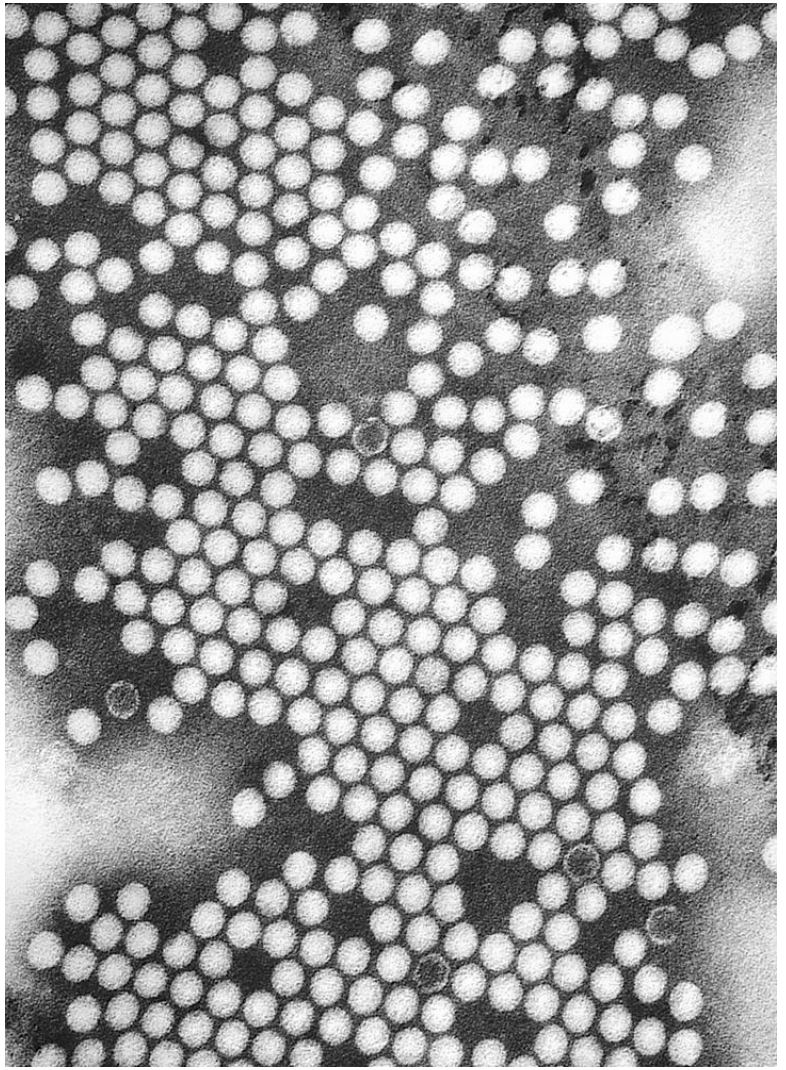
Mary Taylor

Paul Le Blond


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"Science-writing at its most engrossing. *Polio: An American Story* is definitive, an accessible and memorable account." —*Chicago Tribune*
POLIO
An American Story
The Crusade That Mobilized the Nation Against the 20th Century's Most Feared Disease
Winner of the 2006 Pulitzer Prize in History
David M. Oshinsky
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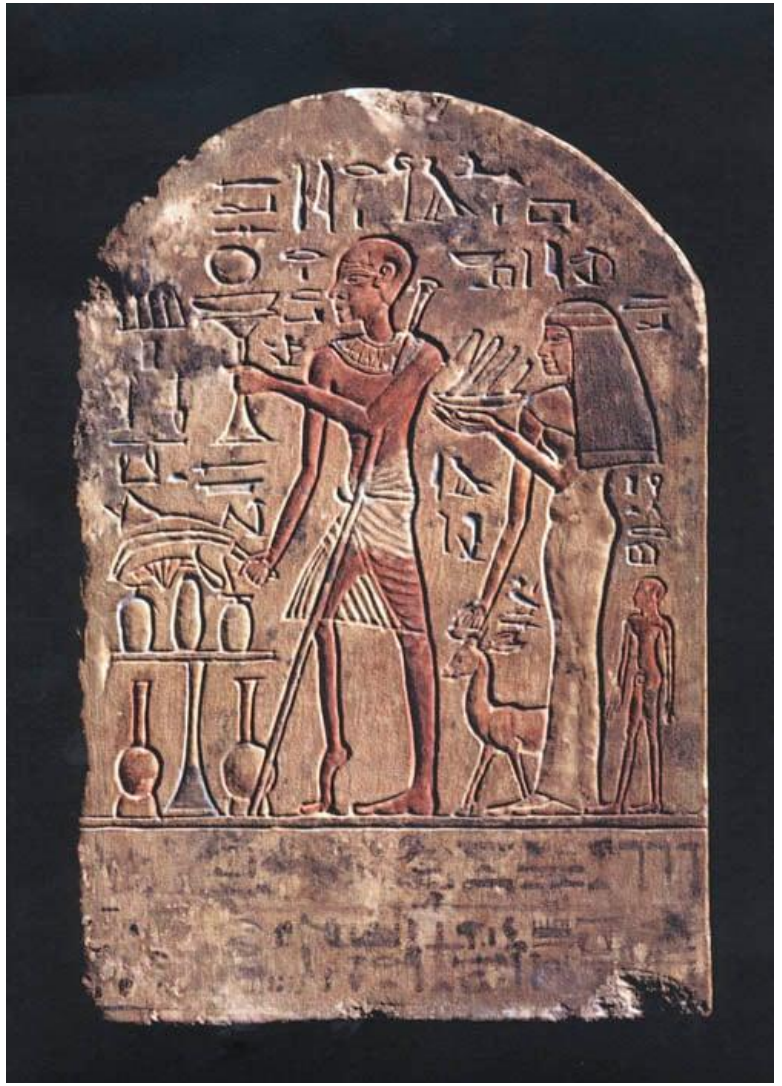
Polio

- Poliomyelitis
  - Polio = grey, Myelos = marrow, itis = inflammation
- Caused by the poliovirus
- 75% of cases are asymptomatic, 0.1-0.5% paralytic
- Paralytic poliomyelitis destroys motor neurons in the spinal chord, brain stem or motor cortex
- Only occurs naturally in humans
- Highly infectious
- Fecal-oral or oral-oral transmission to intestine



Polio in history

- Endemic from antiquity to the nineteenth century
- Epidemic until mid twentieth century – Norway, Sweden, USA
- 1947 UK epidemic 7,800 cases
- 1952 peak year in USA 57,000 cases, 3,000 deaths
- 1988 worldwide cases 350,000
- 2023 worldwide cases 12



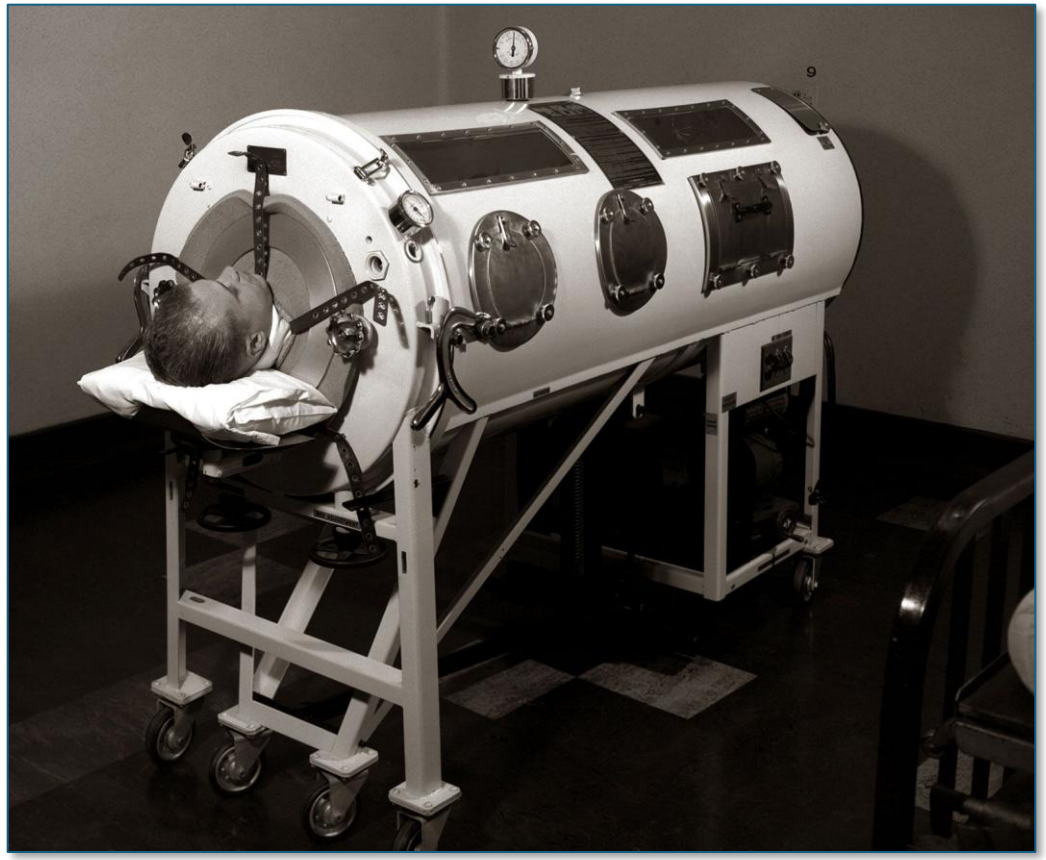
Roosevelt and the National Foundation

- Franklin Delano Roosevelt (1882-1945) – US President 1933-1945
- Diagnosed with Polio in 1921
- Warm Springs, Georgia 1926
- Elected New York Governor 1928
- Elected US President 1932
- Birthday balls 1934
- Founded National Foundation for Infantile Paralysis in 1938
- ‘March of Dimes’



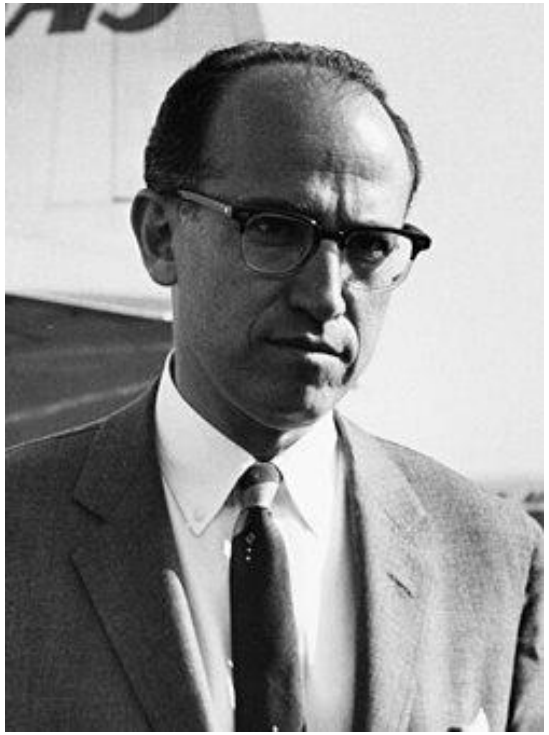
Polio Research

- New York outbreak 1916 in poor immigrant area
- Initial research into pathology and causes, not vaccine
- No effective treatment: physiotherapy, iron lungs
- Research diverted to wartime priorities
- ‘Summer plague’, polio season, open air
- ‘Blind alleys’
  - Poor populations in unsanitary housing
  - Resus monkey testing
  - Quality control in manufacture



Polio Immunization (1)

- 1950 William Hammon University of Pittsburgh purified gamma globulin
- 1955 ‘killed virus’ vaccine developed by Jonas Salk at University of Pittsburgh administered by injection
- 1955 ‘live virus’ vaccine developed by Albert Sabin at University of Cincinnatti administered orally



Jonas Salk



Albert Sabin

Polio Immunization (2)

- Initial tests on monkeys
- 1950 first tests in humans – children in residential homes, adults in mental institutions
- Salk vaccine1954 large scale tests in schools – 1.5 million children aged 6-8
- US trials funded by NFIR, not government because of fear of ‘socialized medicine’
- Arguments about placebo and double-blind trials
- 1955 results announced – 60-80% effective
- 1955 Salk vaccine approved and distributed in US

Polio Immunization (3)

- 1956 Salk vaccine available in UK
- 1959 Sabin vaccine test in USSR on 10 million children – results very positive
- 1962 UK switched from injected Salk vaccine to Sabin oral vaccine
- In areas where wild polio eradicated, a few cases are caused by the vaccine
- 2004 UK switched back to live vaccine



Polio Immunization (4)

- No patents because vaccines were not novel, but developments of previous experiments
- Many other researchers
- Bitter rivalry between Salk and Sabin
- Lots of prizes, but no Nobel Prize
- Salk Institute, California



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How Polio vaccine is made

- Virus taken from infected humans
- Initially cultured in cell tissue (monkey liver)
- Now animal-free culture
- Harvested
- Salk vaccine: Inactivated (killed) with formalin
- Sabin vaccine: Weakened
- Quality control
- Continual improvement



Polio Global Eradication Initiative













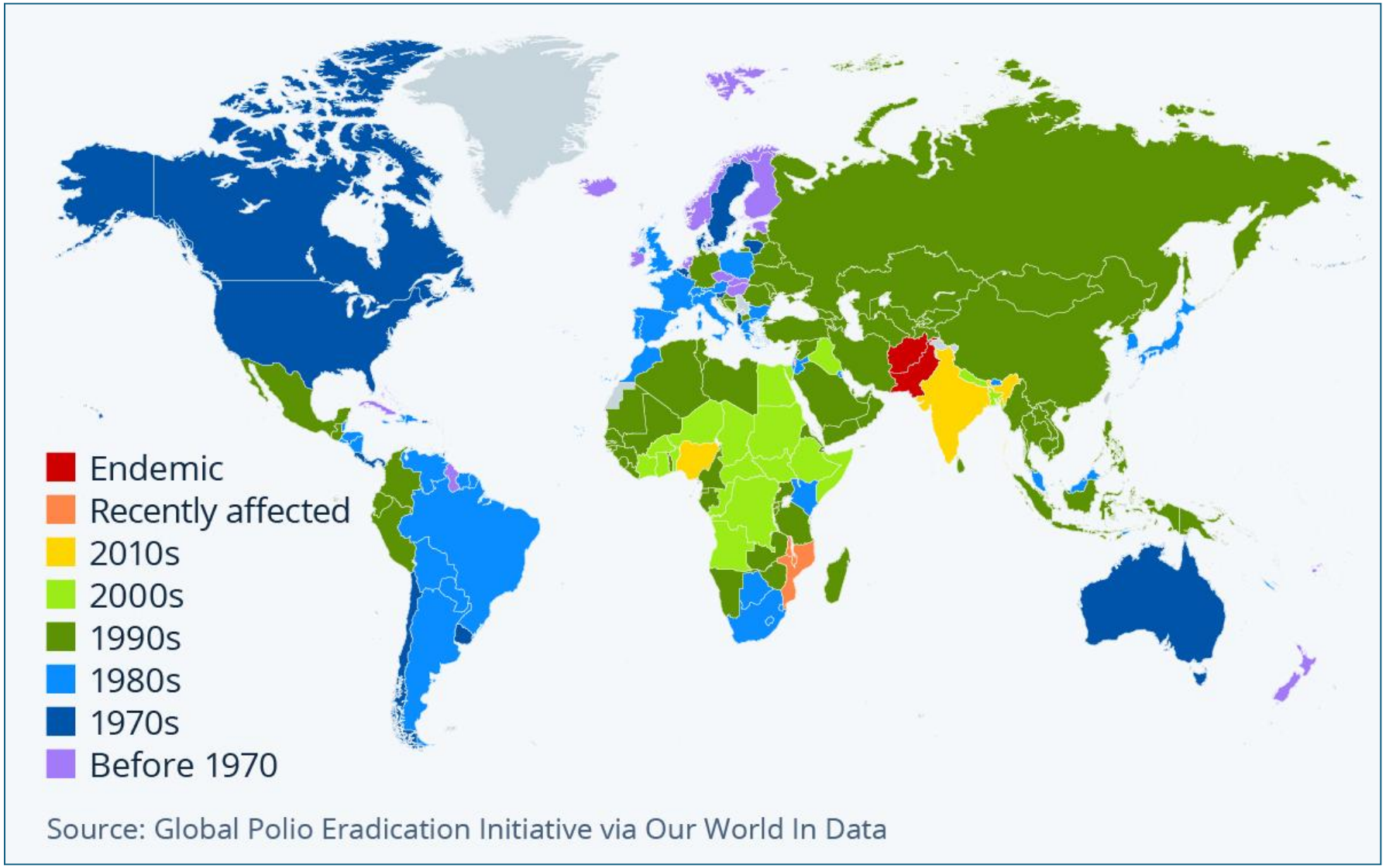


Rotary International PolioPlus

- Rotary 1.2 million members in 170 countries
- PolioPlus Established 1985
- Members have contributed more than $2.7 billion
- Member of Heathrow Airport Rotary Club 1985-1999
- Fundraising events



Polio geography



Polio vaccination worldwide

