2026

Love Thy Neighbor:

The Role of Vaccines in Community Care

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Acknowledgement

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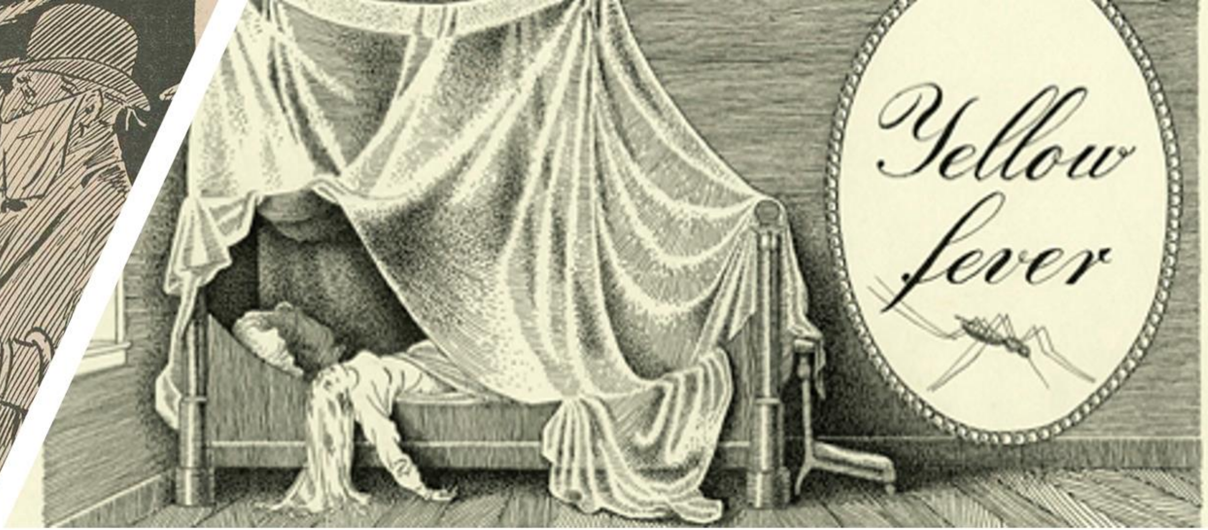
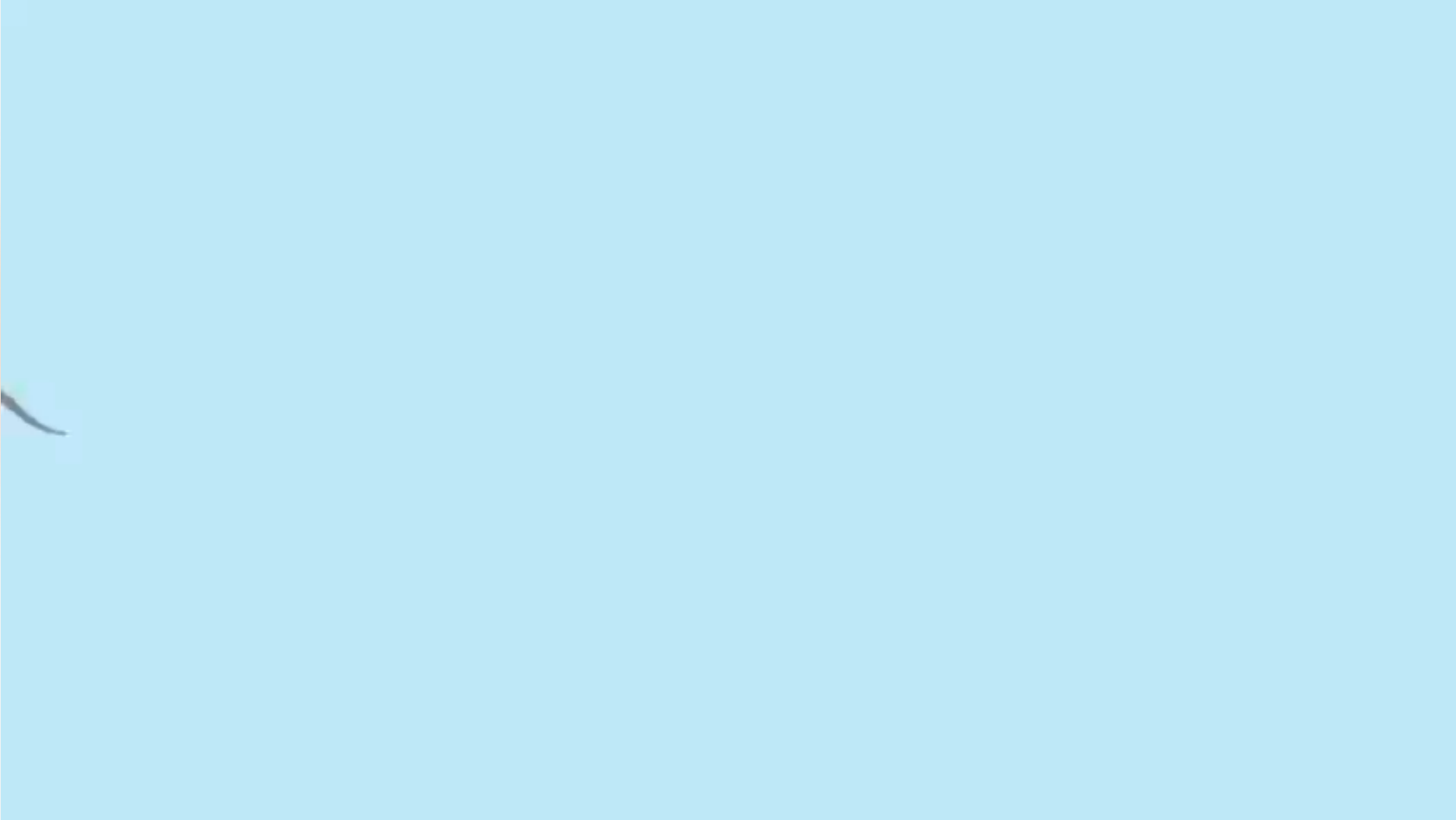

Yellow
fever


THE APPEARANCE AFTER DEATH OF A VICTIM TO THE INDIAN
WHO DIED AT SUNDERLAND

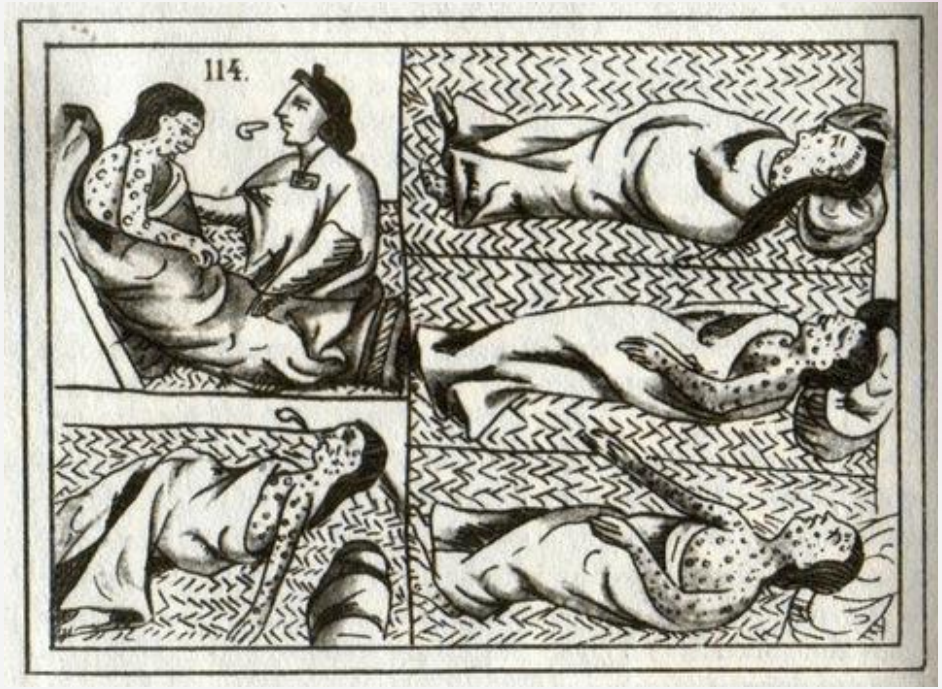


Edward Jenner: The Father of Vaccination

- Recognizes cowpox not only protected against smallpox, but could be transmitted intentionally to give protection
- May 1796: Jenner uses matter from fresh cowpox lesions of dairymaid, Sarah Nelms (pictured), to inoculate 8-year-old James Phipps
    - James develops a mild fever and loses appetite, but recovers within a few weeks
- Jenner inoculates James again, this time with smallpox
    - No disease develops, and Jenner concludes the protection was complete
- This would lay the foundation for vaccination, which quickly spread as treatment throughout England and most European countries

Smallpox Immunity & Treatment

- It was common knowledge that survivors of smallpox had immunity to the disease
- Survivors were documented in 430 B.C. from those caring for persons with smallpox, playing a crucial role in treatment as they possessed natural immunity



Key Historical Milestones

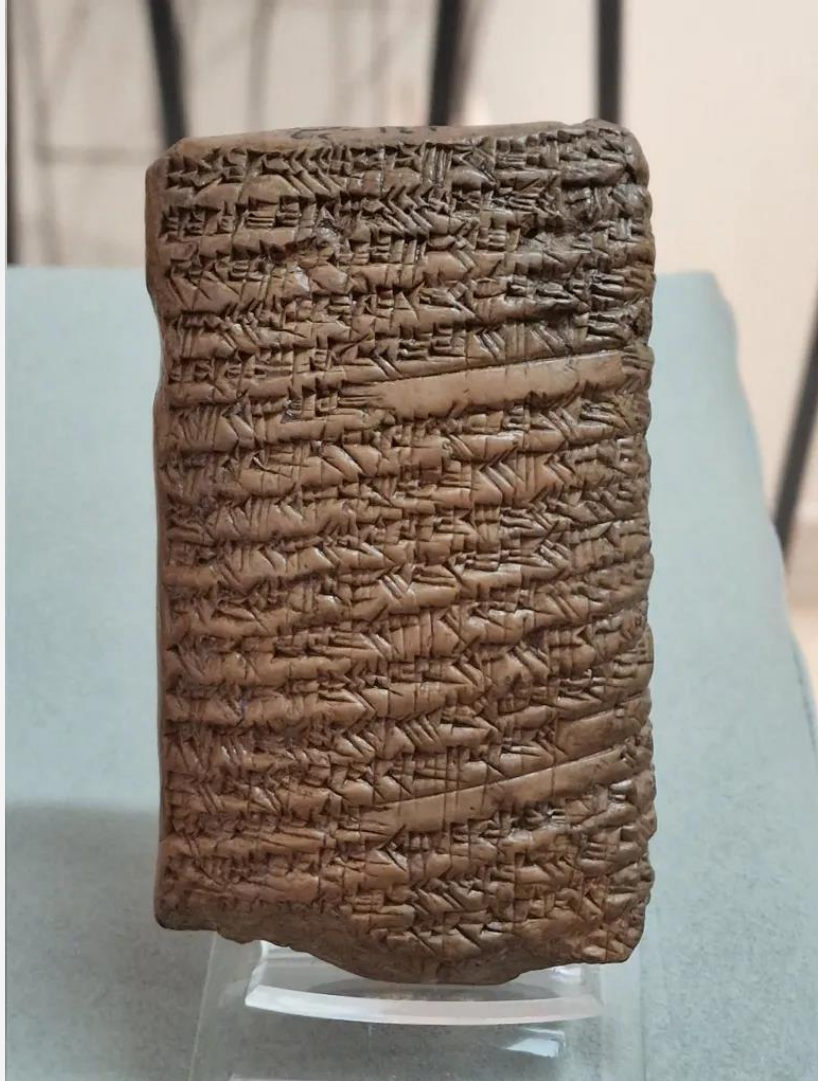
Era	Location	Milestone
c. 1000 CE	China	Traditional origin during the Song Dynasty (insufflation).
1549 CE	China	Earliest published description of variolation in a medical text.
16th-17th century **1670 CE**	India & Middle East Ottoman Empire	Variolation in Ayurvedic texts Circassian traders introduce variolation to the Turkish court.
1700 CE	London	The Royal Society receives the first reports of Chinese insufflation.
1721 CE	England / USA	Lady Mary Wortley Montagu (UK) and Cotton Mather (Boston) popularize the practice in the West.

Pictured: Lady Mary Wortley Montagu

Earliest Example of Common Science Sense

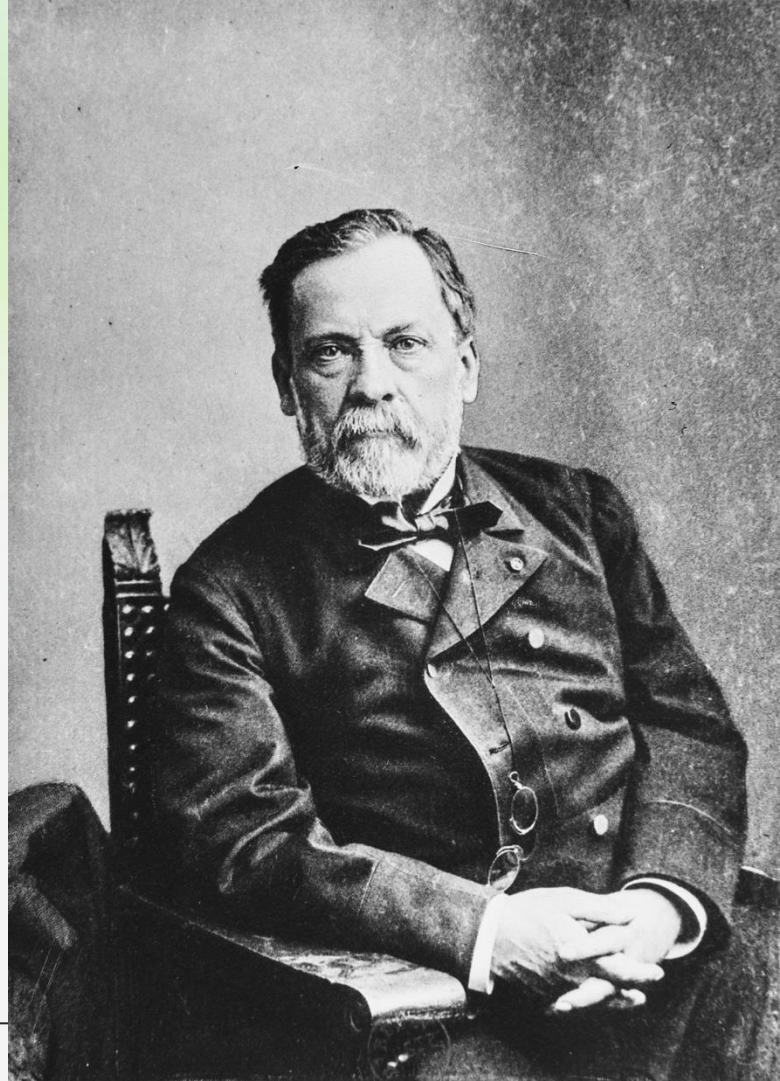
Rabies

The Codex of Eshnunna in Mesopotamia (1930 BCE) serves as the first written record of rabies, instructing rabid dog owners to prevent bites.



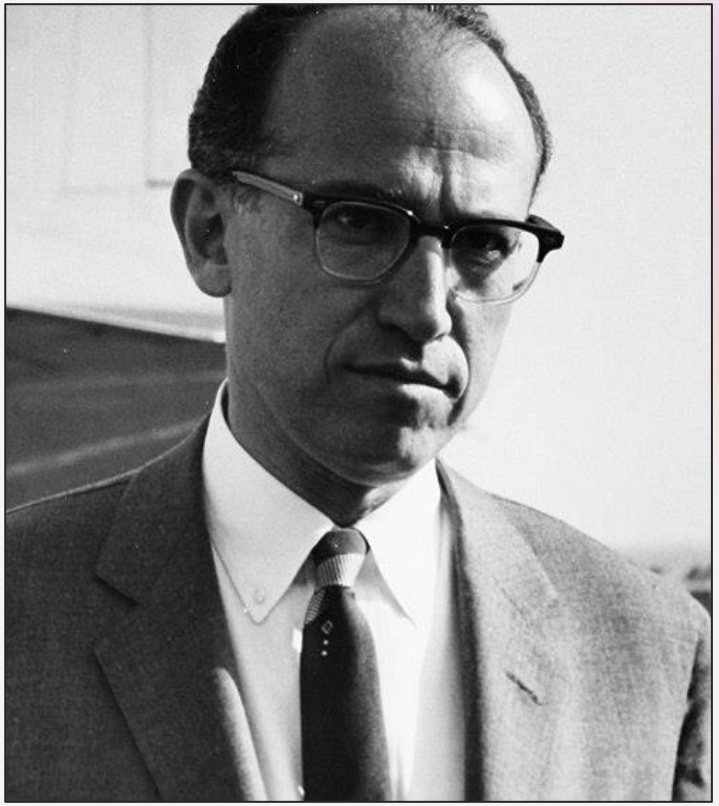
Louis Pasteur:
The Father of Laboratory-Produced Vaccines & Immunology

- Helped establish germ theory, laying the groundwork for microbiology
- Developed laboratory-produced vaccines
    - Inoculated chickens with attenuated form of cholera and demonstrated they were resistant to the fully virulent strain
- Developed vaccines for cholera, anthrax, and rabies



Jonas Salk:
An Altruistic Hero to Many

- Salk pursued a vaccine based on killed poliovirus
- His vaccine underwent one of the largest clinical trials in history, with close to 2 million children, known as the “Polio Pioneers”
- On April 12, 1955, the vaccine was deemed both safe and effective
- Salk famously declined to patent the vaccine, stating “Could you patent the sun?”



Reported polio cases and deaths, United States, 1910 to 2023

The reported figures include both wild- and vaccine-derived poliovirus infections that occurred indigenously and as imported cases.

Our World in Data

Table | Line | Bar

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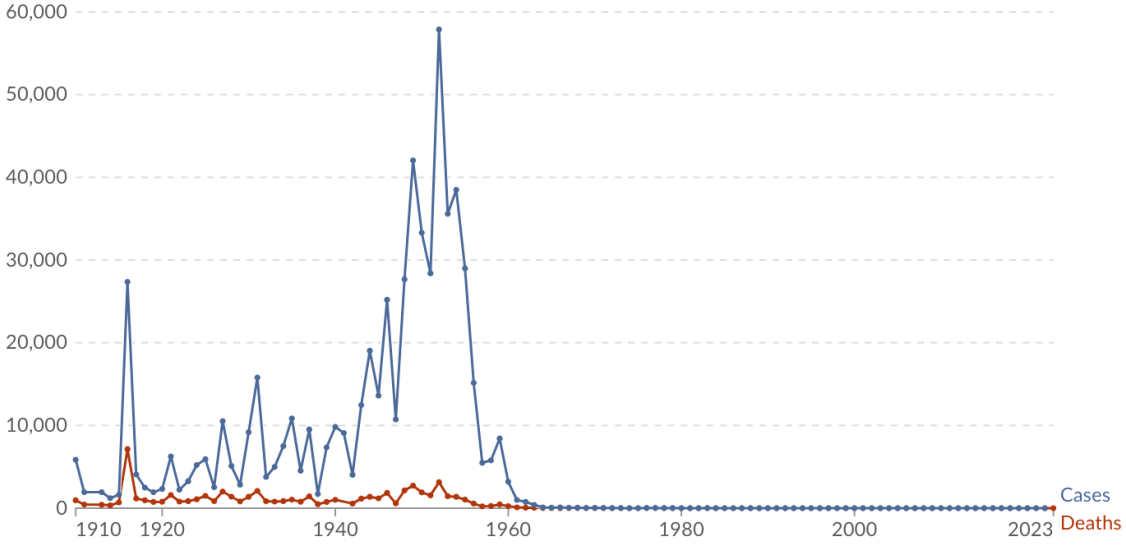


1910 2023

Data source: Public Health Reports (1942); United States Census Bureau (1945); Centers for Disease Control and Prevention (2023) – Learn more about this data

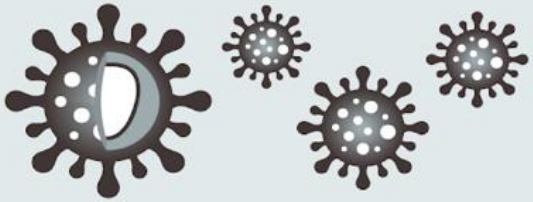
Note: Only cases and deaths from acute polio infections are included.

OurWorldinData.org/polio | CC BY


Immune cell

FOUR WAYS TO MAKE A VACCINE

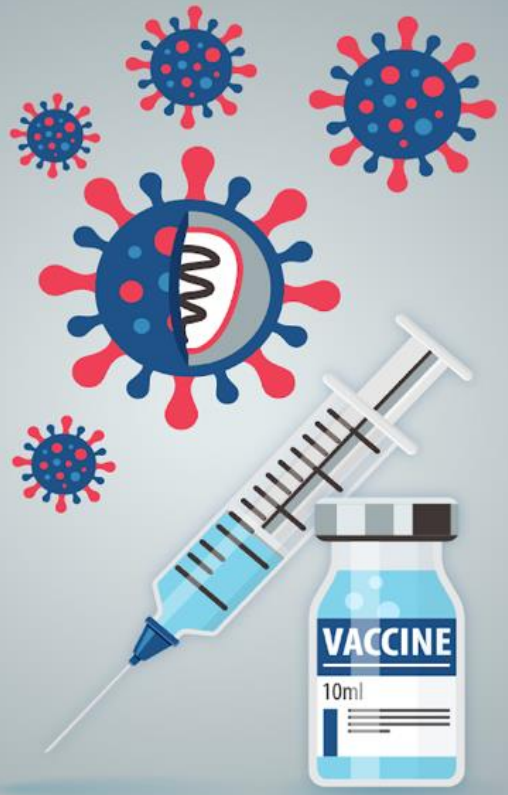
INACTIVATED VACCINES



Use a killed virus to trigger an immune response.

ATTENUATED VACCINES

Use a weakened virus to trigger the immune response.

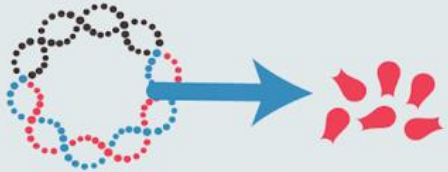


The University of Arizona Health Sciences

SUBUNIT VACCINES

Use only a portion of a virus to teach the immune system to recognize the whole virus.

NUCLEIC ACID VACCINES



Use virus DNA or RNA to enable human cells to manufacture portions of a virus to trigger the immune response.

Vaccines: Training your immune system to protect you from deadly germs without the whole ‘suffering and dying part’.

-Ali S Khan

02

Vaccines are Medical Miracles


WORLD HEALTH ORGANIZATION
SMALLPOX
ZERO
26.10.79








The 8 Wonders of the Modern World

Pop Quiz!

In the last 50 years, how many lives has vaccination saved, globally?

A. 67 million
B. 99 million
C. 132 million
D. 154 million

That’s the equivalent of 6 lives every minute!

Immunization is the single greatest contribution of any health intervention, ensuring babies not only reach their 1st birthday, but continue living healthy lives.

World Health Organization

Diseases Alleviated by Vaccines

- Diphtheria
- Haemophilus influenzae type B
- Hepatitis B
- Japanese encephalitis
- Measles
- Meningitis A
- Pertussis
- Invasive pneumococcal disease
- Polio
- Rotavirus
- Rubella
- Tetanus
- Tuberculosis
- Yellow fever

Over the past 50 years, vaccinations against these 14 diseases has directly contributed to reducing infant deaths by 40% globally, and by more than 50% in the African region.

Vaccine-preventable diseases in the US

Shown is the reduction of cases and deaths after the introduction of the vaccine

Our World in Data

Data source: Roush and Murphy (2007) - Historical comparisons of morbidity and mortality for vaccine-preventable diseases in the United States. In The Journal of the American Medical Association, 298, 18, 2155--2163.

OurWorldinData.org – Research and data to make progress against the world's largest problems.

Health & Economic Benefits of Routine Childhood Immunizations

TABLE 1. Estimated number of illnesses, hospitalizations, and deaths prevented by routine childhood immunization against selected vaccine-preventable diseases in 30 cohorts of children — United States, 1994–2023

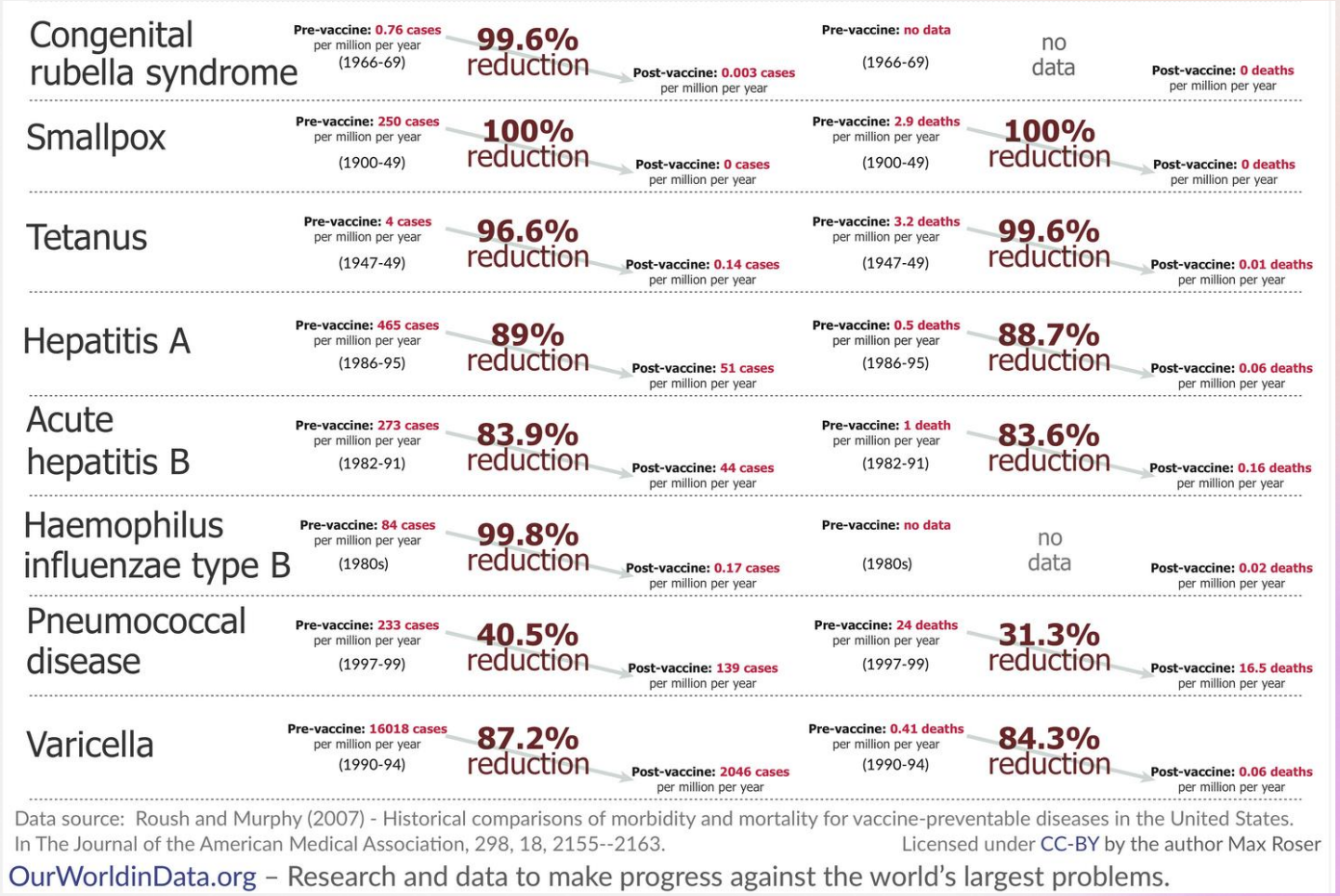
Vaccine-preventable disease	Illnesses prevented (x 1,000)	Hospitalizations prevented (x 1,000)	Deaths prevented (x 1,000)
Diphtheria	7,528	7,528	752.8
Tetanus	5	5	0.7
Pertussis	80,738	3,646	28.4
Haemophilus influenzae type b	536	495	20.3
Polio	1,847	786	21.9
Measles	104,984	13,172	85.0
Mumps	63,355	2,020	0.3
Rubella	54,225	199	0.4
Congenital rubella syndrome	17	26	1.9
Hepatitis B	6,061	940	90.1
Varicella*	106,270	272	1.9
Hepatitis A*	4,048	78	1.5
Pneumococcus-related diseases*,†	47,804	1,969	123.2
Rotavirus*	30,265	819	0.4
Total	**507,683**	**31,955**	**1,128.8**

* Varicella vaccine for 1996–2023 cohorts, hepatitis A vaccine for 2006–2023, pneumococcal conjugate vaccine for 2001–2023, and rotavirus vaccine fo
† Includes invasive pneumococcal disease, otitis media, and pneumonia.

TABLE 2. Lifetime health and economic outcomes in 30 cohorts of children — United States, 1994–2023

Outcome	All children born 1994–2023
Total illnesses prevented (x 1,000)	**507,683**
Total hospitalizations prevented (x 1,000)	**31,955**
Total deaths prevented (x 1,000)	**1,129**
Direct cost of immunization (billion, $)	240
Societal cost of immunization (billion, $)	268
Benefits in direct costs (billion, $)	780
Benefits in societal costs (billion, $)	2,931
Direct net savings (billion, $)	540
Societal net savings (billion, $)	2,663
Payer benefit-cost ratio*	3.3
Societal benefit-cost ratio†	10.9

* Payer benefit-cost ratio = benefits in direct costs / direct cost of immunization.
† Societal benefit-cost ratio = benefits in societal costs / societal cost of immunization.



Data source: Roush and Murphy (2007) - Historical comparisons of morbidity and mortality for vaccine-preventable diseases in the United States. In The Journal of the American Medical Association, 298, 18, 2155--2163.

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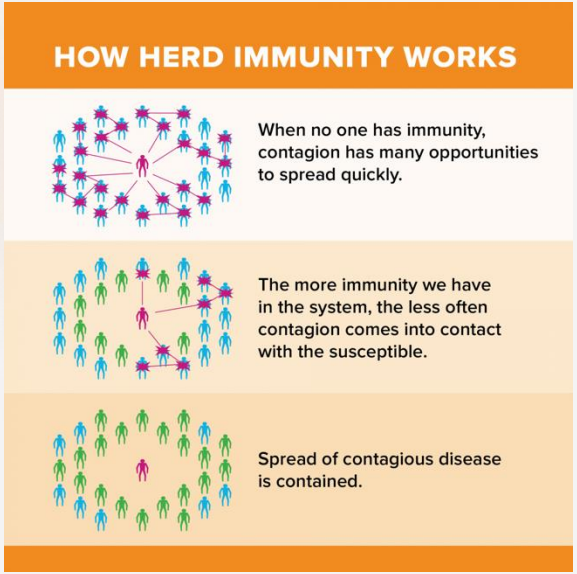
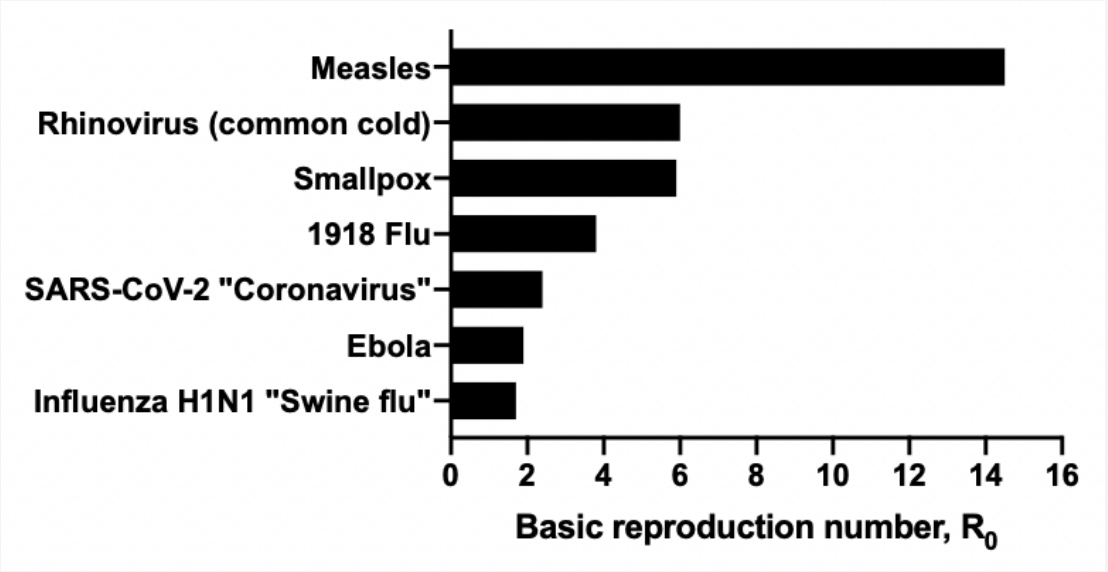
03

Protecting Our Communities

The Importance of Herd Immunity






PBS

CIDRAP

South Carolina measles outbreak hits 876 with 29 new cases

News brief | February 3, 2026

Stephanie Soucheray, MA

SHARE

Aleksandr Zyablitskiy / iStock

Today the South Carolina Department of Public Health (DPH) said the state's outbreak total is now 876, after adding 29 more cases since January 30 in an outbreak report.

"DPH has also confirmed a case of measles in a Sumter County resident. At this point in the investigation, it is not yet clear whether this new case is linked to the Upstate outbreak centered around Spartanburg County or if the case may have been exposed where measles is occurring in other locations," **DPH said in its report**.

Get CIDRAP updates

Vaccines reduced measles cases across US states

Our World in Data

Data source: Project Tycho (2018); Centers for Disease Control and Prevention (1959–2022)

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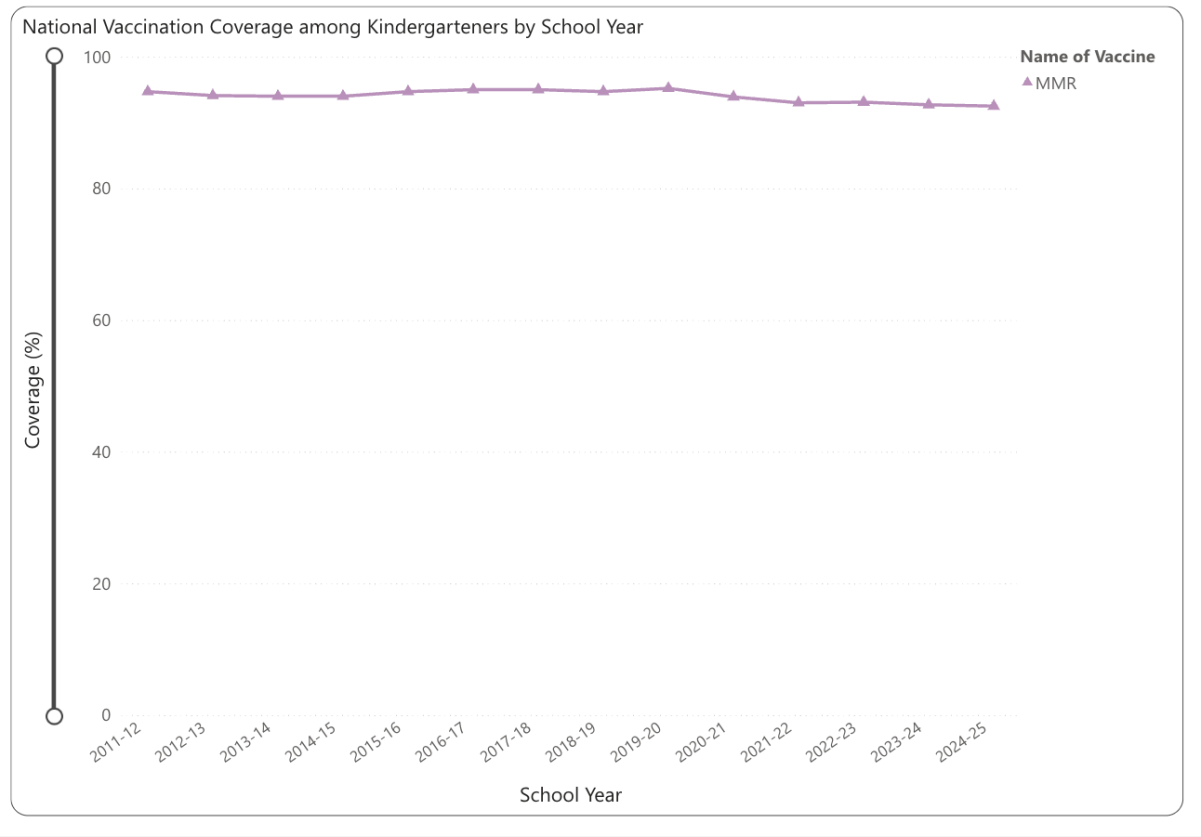
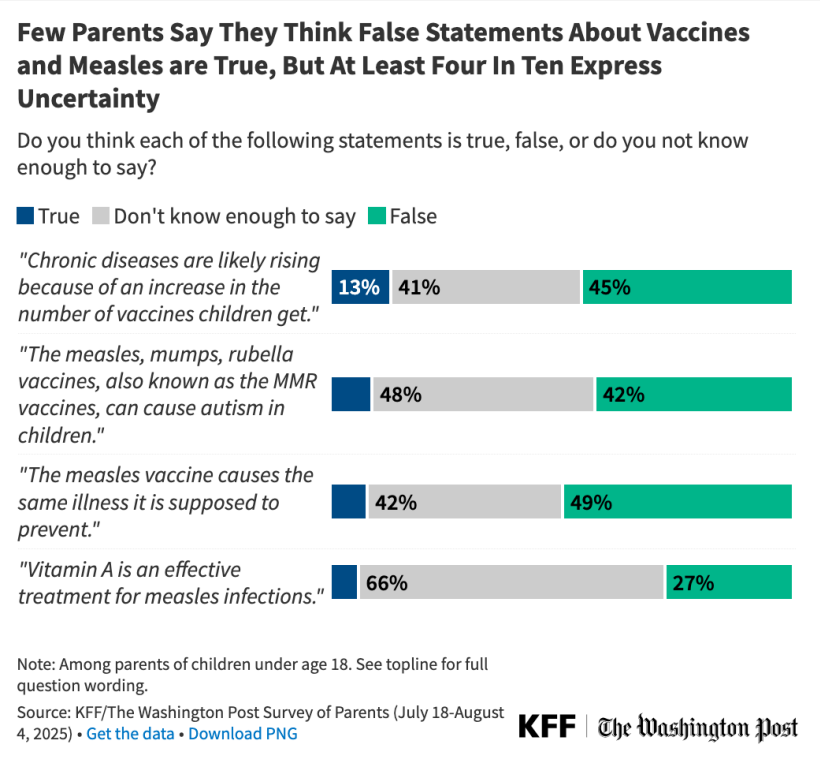
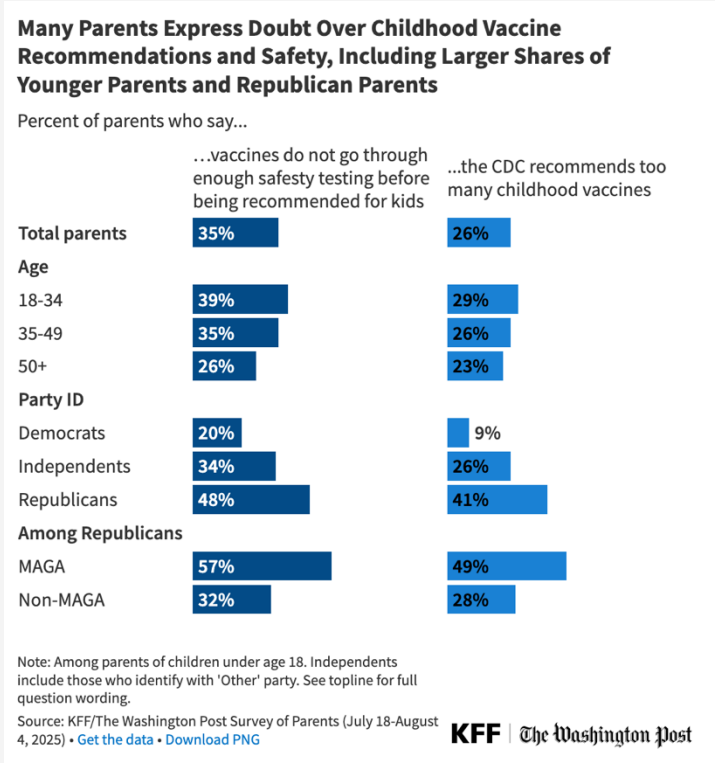


MMR Kindergarten Vaccine Coverage

Misinformation & Distrust: A New Kind of Epidemic

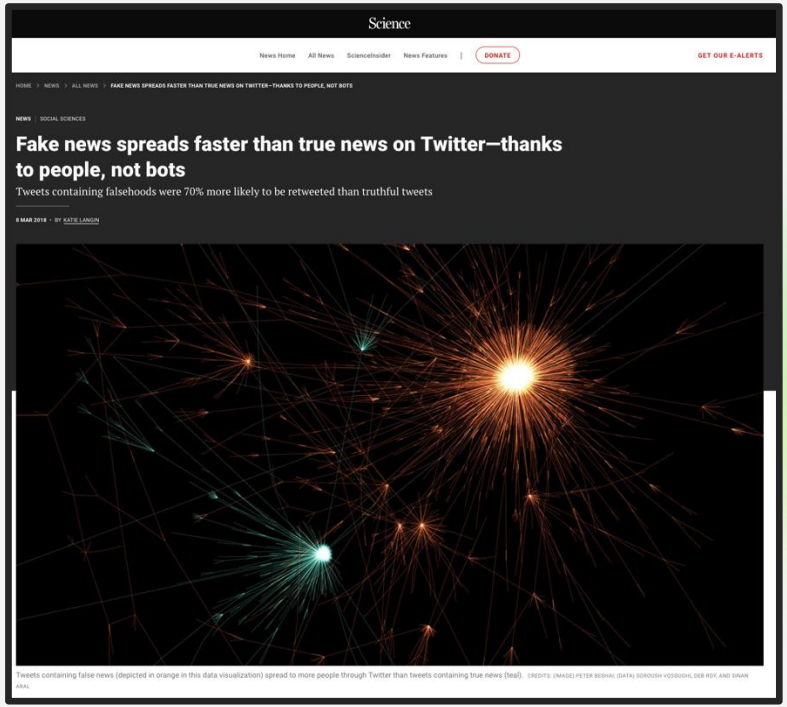




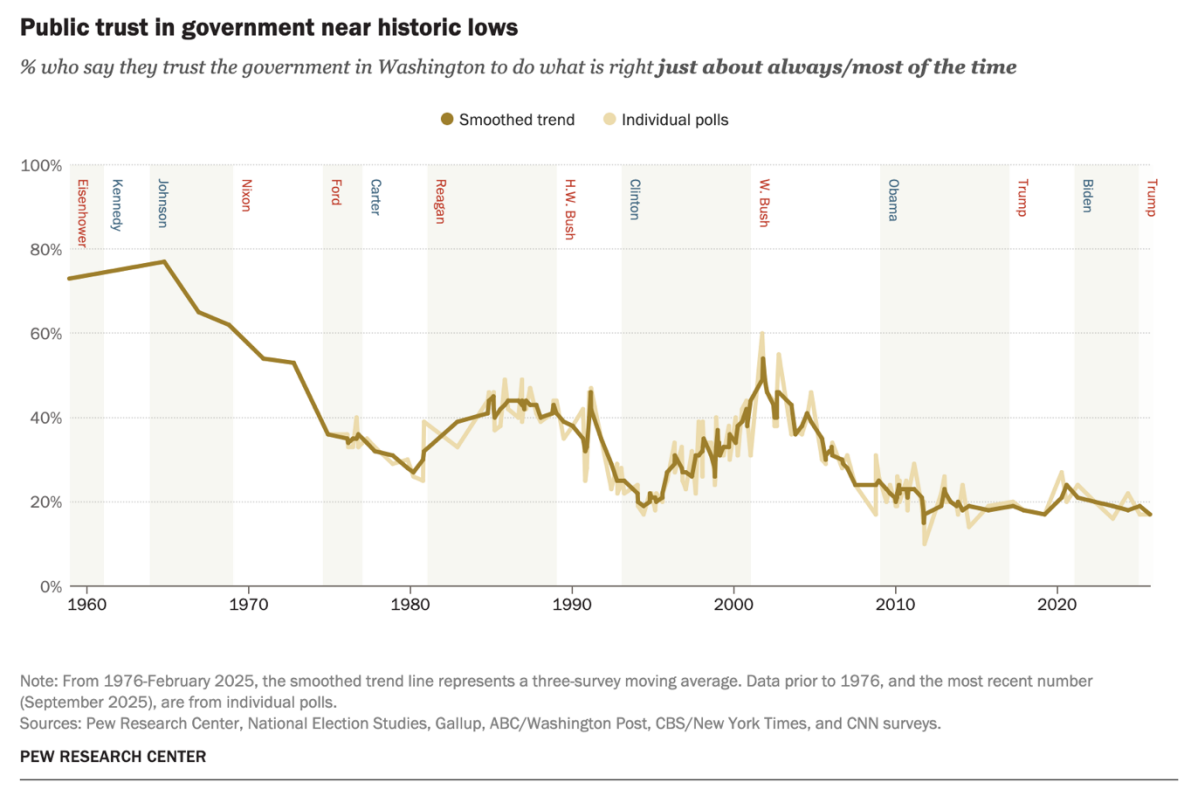
Vaccine misinformation existed well before COVID-19.

The Danger of Misinformation

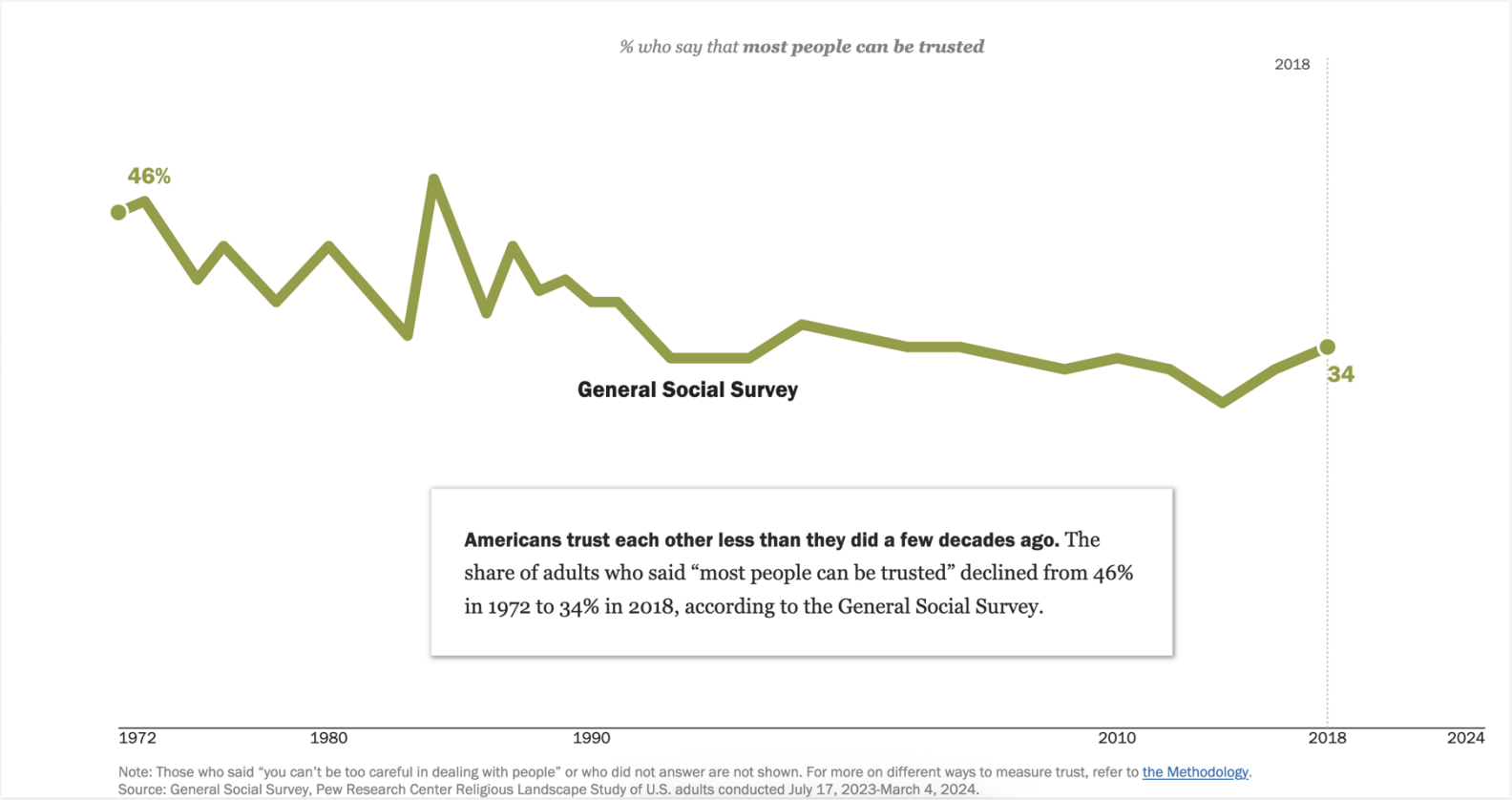
- People are more likely to share misinformation when it aligns with personal identity or social norms
- Social media information is largely unchecked and unverified
- Rapid publication and ‘sharing’ allows ordinary users to distribute information to large audience



Trust in the Government is Dropping



But also in each other!



The Six Core Principles of Crisis Communication

1. Be First
2. Be Right
3. Be Credible
4. Express Empathy
5. Promote Action
6. Show Respect

While these are great techniques, it is not enough without a foundation of **trust and partnership**.

Trusted Voices are the Most Common Form of Information

Pew Research Center

RESEARCH TOPICS | PUBLICATIONS | OUR METHODS | SHORT READS

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SHORT READS | SEPTEMBER 26, 2024

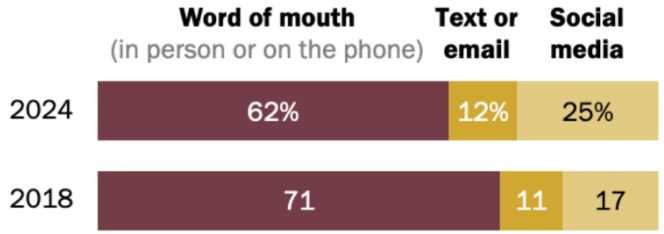
Friends, family and neighbors are Americans' most common source of local news

Add Us On Google

BY ELISA SHEARER

Getting local news from others still primarily happens via word of mouth

Among U.S. adults who get local news from friends, family and neighbors, % who get that news via ...



Note: Respondents who did not answer are not shown.
Source: Pew Research Center survey of U.S. adults conducted Jan. 22-28, 2024.

PEW-KNIGHT INITIATIVE

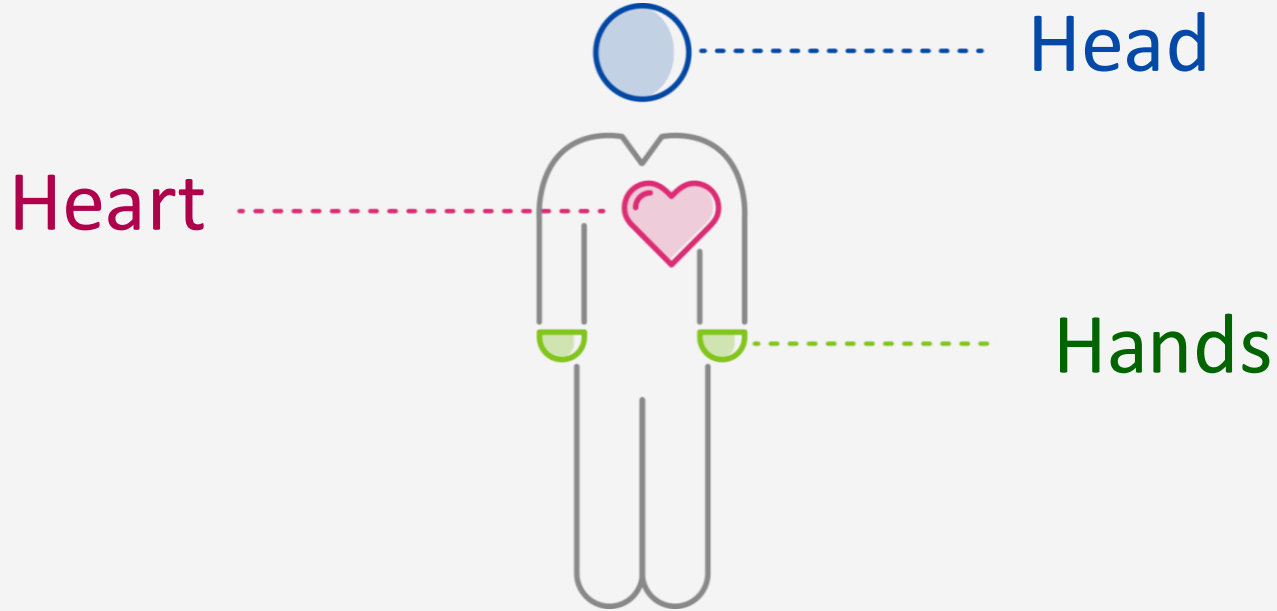
Public Health Systems

Nursing Homes	Community Centers	Public Health Agency	Tribal Health	Elected Officials	Employers
Corrections	Transit	Fire	Water Safety	Laboratories	Hospitals
Doctors	Pharmacists	Community Health Leaders	Schools	Churches	Healthcare Providers
Environmental Health	Media	Philanthropists	Law Enforcement	Businesses	Mental Health Specialists

Expanding Coalitions

- Engaging faith-based organizations as partners in healthcare initiatives can increase vaccine acceptance, optimize limited health resources, and reach underserved populations
- Faith organizations have a trusted, positive influence in their communities
- Deeply-involved in their communities, organizations can address specific community needs

...and you are an invaluable part of the system!



Thanks!

Ali S. Khan, MD, MPH, MBA

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Richard Holland Presidential Chair
Dean, UNMC College of Public Health
Assistant Surgeon General, U.S. Public Health Service (ret.)