

Overview of the U.S. Vaccination Program

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Ten Great Public Health Achievements, United States, 1900 - 1999

- Vaccination
- Motor-vehicle safety
- Safer workplaces
- Control of infectious diseases
- Decline in deaths from coronary heart disease and stroke
- Safer and healthier foods
- Healthier mothers and babies
- Family planning
- Fluoridation of drinking water
- Recognition of tobacco use as a health hazard

Vaccines Are Cost Effective

Of 310 lifesaving health care sector interventions, immunizations were 6 of the 45 identified cost-saving interventions

*All childhood immunizations were cost-saving

Tengs et al. *Risk Analysis* 1995 15(3): 369-390

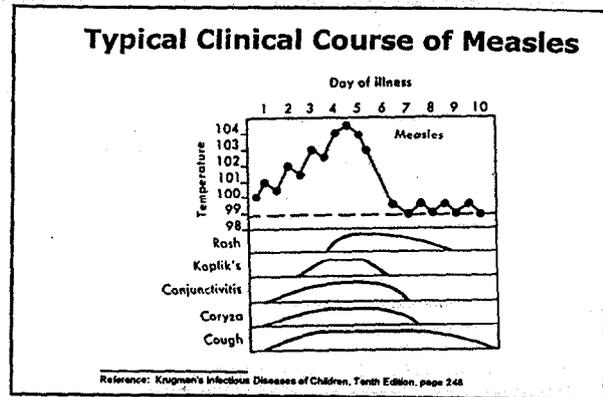
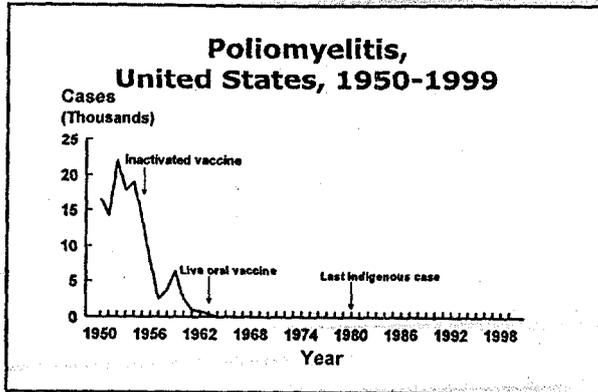
Vaccination Coverage with Individual Vaccines, Children 19-35 Months, NIS, United States, 1999

≥ 3 DTP/DT	96%
≥ 4 DTP/DT	83%
≥ 3 Poliovirus	90%
≥ 1 MCV	92%
≥ 3 Hib	94%
≥ 3 Hepatitis B	88%
≥ 1 Varicella	59%

Comparison of 20th Century Annual Morbidity and Current Morbidity, Vaccine-Preventable Diseases

	20th Century Annual Morbidity	1999 Provisional	Percent Decrease
Diphtheria	175,885	1	100
Measles	503,282	86	100
Mumps	152,209	352	99.8
Pertussis	147,271	6,031	95.9
Polio (paralytic)	16,316	0	100
Rubella	47,745	238	99.5
Congenital Rubella Syndrome	823	8	99.0
Tetanus	1,314	33	97.5
H. influenzae, type b and unknown (<5 yrs)	20,000	163	99.2

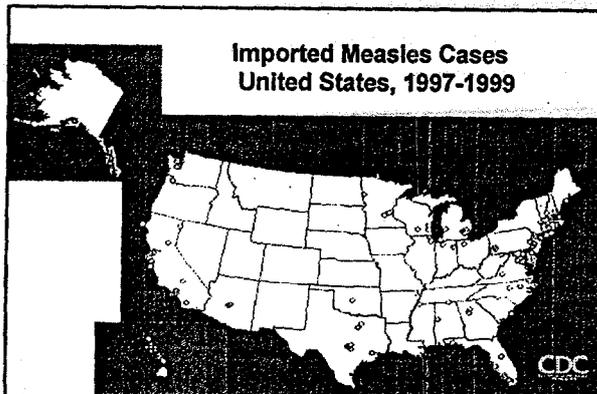
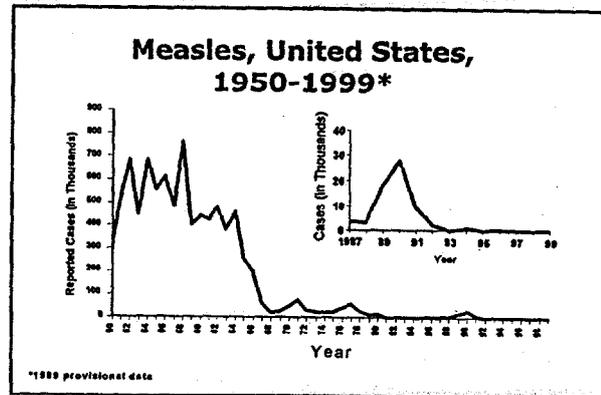




Measles Complications

Condition	Percent reported
Any complication*	29
Diarrhea	8
Otitis media	7
Pneumonia	6
Encephallitis	0.1
Death	0.2
Hospitalization	18

*includes hospitalizations
Based on 1985-1992 surveillance data



Clinical Description of Pertussis (I)

The child possessed of the coughing fit is a pitiful sight, all the more so as the observer is helpless to alleviate or terminate the attack. Each attack consists of 10-30 forceful coughs per spasm, and into each cough the patient appears to concentrate all his energy. He leans forward, or, if standing, stands with legs spread, grasping the nearest object and leaning far forward, tongue protruded to the utmost, saliva and mucus streaming from nose and mouth, eyes bulging with tears streaming, his entire body wracked with the total exertion of each cough.

Clinical Description of Pertussis (II)

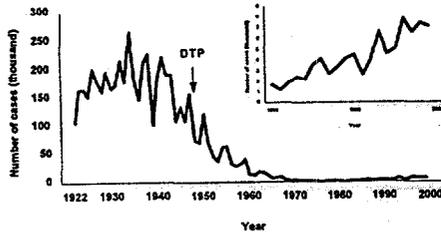
... The coughing continues in a staccato series. The face becomes more and more cyanotic, the neck bulges with venous congestion and still the attack continues. Finally, when it seems certain that death is imminent, a final cough appears to clear offending secretions or mucus from the upper airway and the first opportunity to inspire is offered. With a massive effort, inspiration ensues, air rushes into the lungs against a still narrowed glottis and the characteristic whoop is produced....

Clinical Description of Pertussis (III)

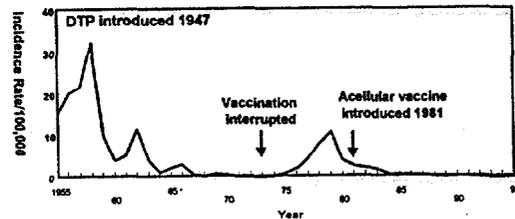
... Apart from the complicating conditions which occur in some patients with pertussis, the major danger from the disease is during severe coughing paroxysms, during which prolonged hypoxia may lead to irreversible changes in the central nervous system or even death. The greatest mortality via this mechanism occurs in infants."

LC Olson
Medicine
1975, 54:427-458

Pertussis Cases, United States, 1922-1999



Pertussis, Japan, 1955-1995



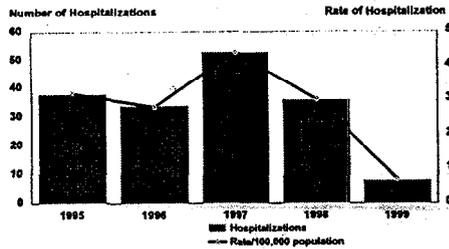
Burden of Disease due to Varicella United States, 1990-1994

- 4 million cases per year
- 11,000 hospital admissions per year
- 105 deaths per year
 - > 1 child per week died of varicella
 - > 1 adult per week died of varicella
- Majority of deaths and hospitalizations occurred among healthy children and adults

Reduction of Varicella Cases by Age, 1995 to 1999

Age	Antelope Valley	West Phila.	Travis County, TX
< 1 year	72.6%	69.4%	82.4%
1-4 years	88.8%	87.0%	88.6%
5-9 years	76.2%	75.2%	77.2%
10-14 years	63.3%	74.1%	74.0%
15-19 years	84.6%	51.3%	81.5%
≥ 20 years	75.2%	71.7%	80.8%
Overall	80.1%	77.5%	84.3%

Varicella Hospitalizations, 1995-1999 Varicella Active Surveillance Project Sites



Clinical Manifestations of Hepatitis A (I)

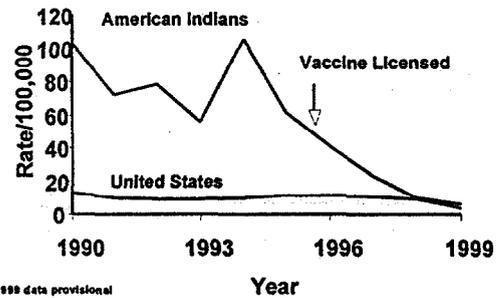
- Fever
- Malaise
- Anorexia
- Nausea
- Abdominal discomfort
- Jaundice

Clinical Manifestations of Hepatitis A (II) (complications)

- Approximately 100 deaths per year
- 10 - 15% relapsing illness up to 6 months
- 11 - 22% hospitalization
- Cost per case - adult \$1,817 - \$2,459
child \$ 433 - \$1,492

TOTAL COST - Approximately \$100 million

Hepatitis A Incidence in American Indians, 1990-1999*



*1999 data provisional

Recommended Childhood Immunization Schedule United States, Forthcoming 2001

Age Vaccine	Birth	1 mo	2 mo	4 mo	6 mo	12 mo	15 mo	18 mo	24 mo	4-6 yrs	11-12 yrs	14-16 yrs
Hepatitis B [†]	Birth											
Diphtheria, Tetanus, Pertussis			DTaP	DTaP	DTaP					DTaP		
H. influenzae type b [†]			HiB	HiB	HiB							
Polio [†]			IPV	IPV						IPV [†]		
Mumps, Measles, Rubella [†]										MMR [†]		
Varicella [†]												
Hepatitis A [†]												
Pneumococcal conjugate			PCV	PCV	PCV							

Summary

- Vaccines are one of the greatest achievements of public health
- Most vaccine-preventable diseases are at or near record low levels
- There is an ever present threat of vaccine-preventable diseases
- The need for maintaining high vaccination coverage levels continues