

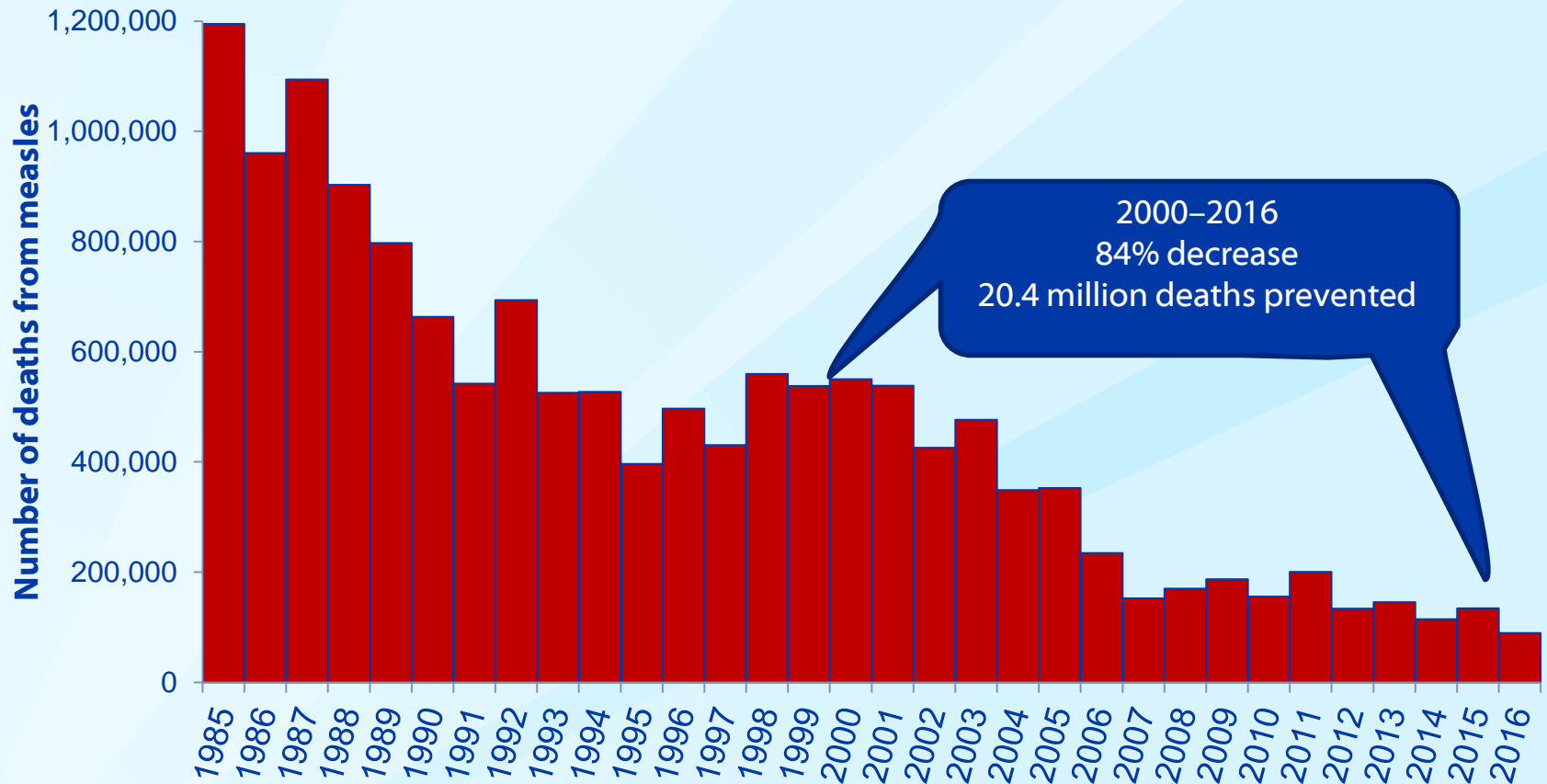
Measles Data and Statistics

Last updated 02/16/2018

Global Measles Burden

- Measles is still commonly transmitted (endemic or large outbreaks) worldwide, including some countries in Europe, Asia, the Pacific, and Africa.
- Measles remains a leading cause of vaccine-preventable infant mortality.
- Great progress has been made towards measles elimination
- From 2000-2016*:
 - Reported measles incidence decreased 87%, from 145 to 19 cases per million persons
 - Annual estimated measles deaths decreased 84% (20.4 million deaths prevented)

Number of Lives Saved by Measles Vaccine Globally



U.S. Measles Burden: Before 1963 Vaccine Development*

- Each year, measles caused an estimated 3 to 4 million cases
 - Close to 500,000 cases were reported annually to CDC, resulting in:
 - 48,000 hospitalizations
 - 4,000 cases with encephalitis (brain swelling)
 - 450 to 500 deaths

U.S. Measles Burden: Current*

- **Measles was declared eliminated from the United States in 2000 thanks to a highly effective vaccination program and other control measures.**
- **However, measles remains present in many other countries and can be brought into the United States by unvaccinated travelers (Americans or foreign visitors).**
 - This can result in outbreaks that are costly to control.
- **Since 2000, the annual number of reported measles cases ranged from 37 people in 2004 to 667 people in 2014.**
- **The last measles death in the United States occurred in 2015.**

Slide 5 Notes

- **Measles elimination is a global problem. Elimination means absence of continuous measles transmission for greater than 12 months.**

Rates of Measles Severity and Complications in the U.S.*

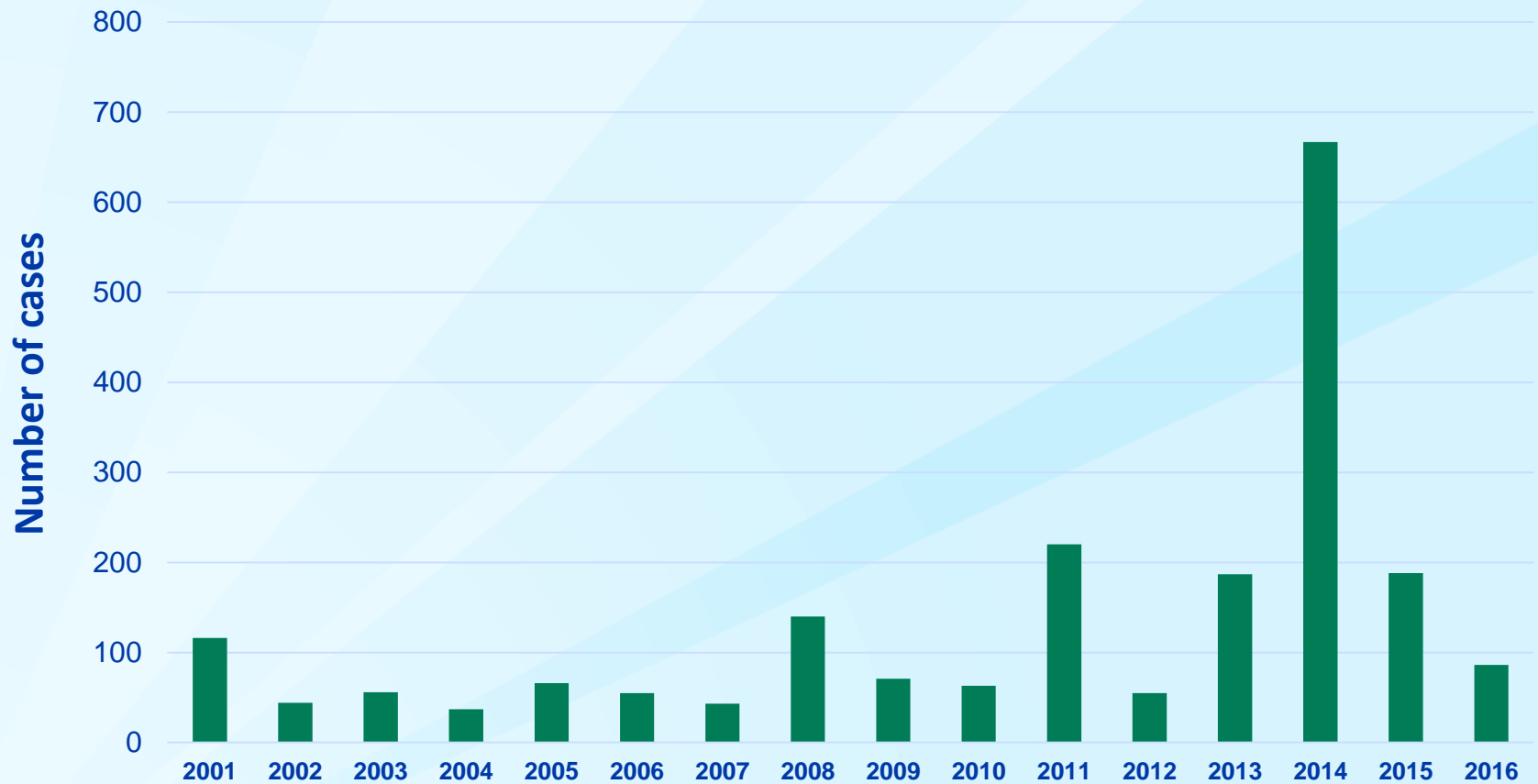
Hospitalization	1 out of 4 cases
Encephalitis (inflammation of the brain)	1 per 1,000 cases
Death	1-2 per 1,000 cases

Complications are more common in children <5 years and adults >20 years old.

Slide 7 Notes

- **Measles can be a serious in all age groups. However, children younger than 5 years of age and adults older than 20 years of age are more likely to suffer from measles complications.**
- **Common Complications**
 - Common measles complications include ear infections and diarrhea.
 - Ear infections occur in about one out of every 10 children with measles and can result in permanent hearing loss.
 - Diarrhea is reported in less than one out of 10 people with measles.
- **Severe Complications**
 - Some people may suffer from severe complications, such as pneumonia (infection of the lungs) and encephalitis (swelling of the brain). They may need to be hospitalized and could die.
 - As many as one out of every 20 children with measles gets pneumonia, the most common cause of death from measles in young children.
 - About one child out of every 1,000 who get measles will develop encephalitis (swelling of the brain) that can lead to convulsions and can leave the child deaf or with intellectual disability.
 - For every 1,000 children who get measles, one or two will die from it.
- **Long-term Complications**
 - Subacute sclerosing panencephalitis (SSPE) is a very rare, but fatal disease of the central nervous system that results from a measles virus infection acquired earlier in life. SSPE generally develops 7 to 10 years after a person has measles, even though the person seems to have fully recovered from the illness. Since measles was eliminated in 2000, SSPE is rarely reported in the United States.
 - Among people who contracted measles during the resurgence in the United States in 1989 to 1991, 4 to 11 out of every 100,000 were estimated to be at risk for developing SSPE. The risk of developing SSPE may be higher for a person who gets measles before they are two years of age.

Measles cases, United States, 2001-2016*



*Source: [Morbidity and Mortality Weekly Report \(MMWR\), Notifiable Diseases and Mortality Tables](#)

Slide 9 Notes

- **An outbreak is 3 or more cases. Outbreaks in countries to which Americans often travel can directly contribute to an increase in measles cases in the U.S.**
- **Reasons for an increase in cases some years:**
 - 2015: The United States experienced a large, multi-state measles outbreak linked to an amusement park in California. The outbreak likely started from a traveler who became infected overseas with measles, then visited the amusement park while infectious; however, no source was identified. Analysis by CDC scientists showed that the measles virus type in this outbreak (B3) was the same virus type that caused the large measles outbreak in the Philippines in 2014.
 - 2014: The U.S. experienced 23 measles outbreaks in 2014, including one large outbreak of 383 cases, occurring primarily among unvaccinated Amish communities in Ohio. Many of the cases in the U.S. in 2014 were associated with cases brought in from the Philippines, which experienced a large measles outbreak. For more information see the Measles in the Philippines Travelers' Health Notice.
 - 2013: The U.S. experienced 11 outbreaks in 2013, three of which had more than 20 cases, including an outbreak with 58 cases. For more information see Measles — United States, January 1-August 24, 2013.
 - 2011: In 2011, more than 30 countries in the WHO European Region reported an increase in measles, and France was experiencing a large outbreak. Most of the cases that were brought to the U.S. in 2011 came from France. For more information see Measles — United States, January-May 20, 2011.
 - 2008: The increase in cases in 2008 was the result of spread in communities with groups of unvaccinated people. The U.S. experienced several outbreaks in 2008 including three large outbreaks. For more information see Update: Measles — United States, January–July 2008.

Measles in the United States, 2016*

- **86 cases reported from 19 states; 4 outbreaks**
 - 97% cases import-associated
 - Of the 18 direct importations, 12 were U.S. residents, 6 were foreign visitors
 - 73% were outbreak-related
 - Outbreaks ranged in size from 6 to 32 cases
 - Cases among U.S. residents (N=55)
 - 56% unvaccinated
 - 18% unknown vaccination status
 - 26% vaccinated

U.S. Economic Burden of Measles*

Year	Location	Number of cases (outbreaks)	Estimated public health cost [^]
2011	US	107 (16)	\$2.7-5.3 million
2011	Utah	13 (2)	>\$330,000
2008	California	12 (1)	\$125,000
2008	Arizona	14 (1)	\$800,000 (limited to cost for 2 hospitals to respond to 7 cases in their facilities)
2005	Indiana	34 (1)	\$168,000
2004	Iowa	1	\$142,000

*Sources: www.ncbi.nlm.nih.gov/pubmed/24135574, www.nejm.org/doi/full/10.1056/NEJMoa060775, <http://pediatrics.aappublications.org/content/125/4/747>, <http://jid.oxfordjournals.org/content/early/2011/04/25/infdis.jir115.full>, <http://pediatrics.aappublications.org/content/116/1/e1>

[^]Public health and health care costs expended to control the spread of measles

Slide 12 Notes

A 2008 outbreak in 2 Arizona hospitals with 7 health-care associated infections:

- No electronic vaccination records for healthcare personnel
 - ~15,000 hrs were lost in furloughs (because of exposure, disease, or lack of evidence of immunity)
 - Cost the facilities \$800,000 to respond to 7 cases (e.g., vaccination costs, record reviews, furloughs)
 - The costs related to the AZ outbreak included obtaining evidence of immunity for healthcare workers and providing vaccinations for healthcare workers.
- Measles is due to failure to vaccinate. Case investigations are very resource-intensive.
 - Luckily we have safe and effective vaccines that can prevent much of this burden, and we should not lose sight of the many successes that have been achieved.
 - Modeling estimated that, among children born during 1994– 2013, vaccination will prevent an estimated 322 million illnesses, 21 million hospitalizations, and 732,000 deaths over the course of their lifetimes, at a net savings of \$295 billion in direct costs and \$1.38 trillion in total societal costs.
 - Additional successes include the fact that outbreaks since measles elimination have generally been limited (in both size & number of generations)
 - We have maintained high overall vaccine coverage.
 - We have a very rapid/aggressive public health response to *suspect* cases.
 - Elimination has been achieved & maintained for 15 years.
 - The vaccine works and the disease is recognizable which makes eradication both possible & achievable.

Measles Resources from CDC

General information

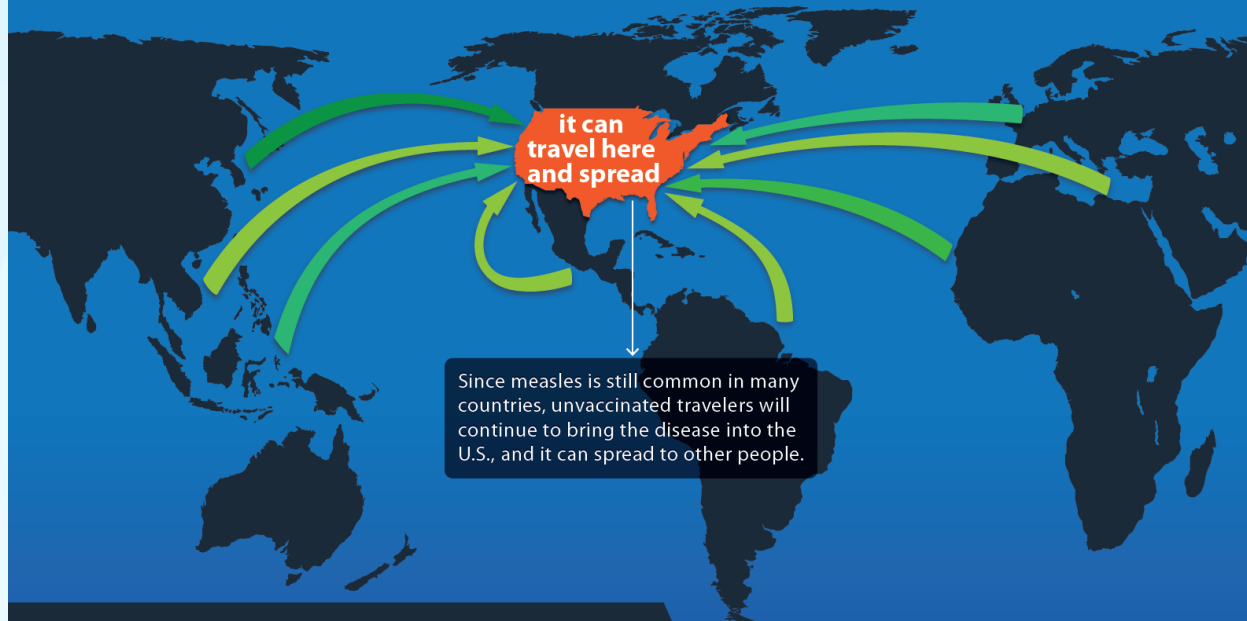
- Measles website: www.cdc.gov/measles
- Measles resources: <http://www.cdc.gov/measles/resources/>
- Feature on measles: www.cdc.gov/features/measles/
- Measles vaccination website:
www.cdc.gov/measles/vaccination.html
- Vaccine schedules: www.cdc.gov/vaccines/schedules/index.html
- For Healthcare Professionals:
www.cdc.gov/measles/hcp/index.html
- Surveillance Manual: www.cdc.gov/vaccines/pubs/surv-manual/chpt07-measles.html

Materials for travelers

- Traveler's health measles page:
wwwnc.cdc.gov/travel/diseases/measles

Get Vaccinated: Prevent and Stop Measles Outbreaks

When measles happens anywhere in the world...



Since measles is still common in many countries, unvaccinated travelers will continue to bring the disease into the U.S., and it can spread to other people.

Make sure you and your family members are up-to-date on your measles-mumps-rubella (MMR) vaccine, including before traveling internationally. Ask your doctor if everyone has received all recommended doses of MMR for best protection against measles.

www.cdc.gov/features/measles/



U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

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Visit: www.cdc.gov | Contact CDC at: 1-800-CDC-INFO or www.cdc.gov/info

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.