THE VACCINE WARS
Debunking myths, owning real risks, and courting doubters

By Meredith Wadman and Jia You

**Dwindling diseases**
Vaccines have beaten back infectious diseases. Bubbles represent reported U.S. cases, but not all diseases were notifiable in all years. For example, mumps was not reported until 1968, the year after a vaccine was licensed.

*Chickenpox data were not reported by all states between 1981 and 2003.

**Number of reported cases**
- 700,000
- 100,000
- 10,000
- 1000

**Jonas Salk’s injectable polio vaccine is licensed.**

**1955**
- 1962–1963 A historic rubella epidemic leads to births of 20,000 disabled U.S. babies.
- 1964–1965 New laws allow the U.S. to channel funds to states and localities for vaccination.
- 1965 Pertussis vaccine is part of first DTP childhood vaccine licensed.
- 1964–1965 A historic rubella epidemic leads to births of 20,000 disabled U.S. babies.
- 1971 The first combined “MMR”—measles, mumps, and rubella—vaccine is licensed.

**Mumps**
**Hepatitis A**
**Rubella**
**Chickenpox**
**Measles**
**Hepatitis B**
**Pertussis**
**Polio**
**Diphtheria**

**1947**
- Tetanus toxoid is licensed as part of DT childhood vaccine.

**1949**
- Last U.S. case of smallpox.

**1955**
- Cutter incident: 202 are paralyzed or killed by vaccine with live polio virus in it.

**1960**
- Albert Sabin’s oral polio vaccine is licensed. It uses live, weakened virus.

**1965**
- New laws allow the U.S. to channel funds to states and localities for vaccination.

**1970**
- The first combined “MMR”—measles, mumps, and rubella—vaccine is licensed.
LAST WEEK, PUBLIC HEALTH AUTHORITIES in Minnesota asked more than 200 people to quarantine themselves after 12 cases of measles were diagnosed in less than 2 weeks—all of them in unvaccinated children younger than 6 years. Across the ocean, an unvaccinated 17-year-old Portuguese girl died of measles after the virus invaded her lungs, in the midst of an outbreak there that mirrors surges in cases in Germany, Italy, and Romania.

In 2015, the most recent year for which data are available, just 72% of U.S. toddlers had received seven key vaccines recommended by the Centers for Disease Control and Prevention (CDC), which together protect against 11 potentially deadly diseases. That is actually an improvement from 2011, when the number was 69%; but it also indicates that much work remains to be done, particularly in an environment in which vaccine skeptics have been emboldened, not least by the current occupant of the Oval Office.

As once common diseases of childhood fade from public view, it is understandable that parents’ attention would shift from the fear of disease to concerns about risks of the vaccines themselves. The articles in this issue debunk myths old and new about these risks, while acknowledging the real, rare vaccine injuries that do occur. The data on these pages make clear the power of vaccines to vanquish disease—an impact that far eclipses their minute risks. Identifying the best ways to convince hesitant parents of this calculus in an age of internet-fed misinformation is an ongoing challenge for researchers.