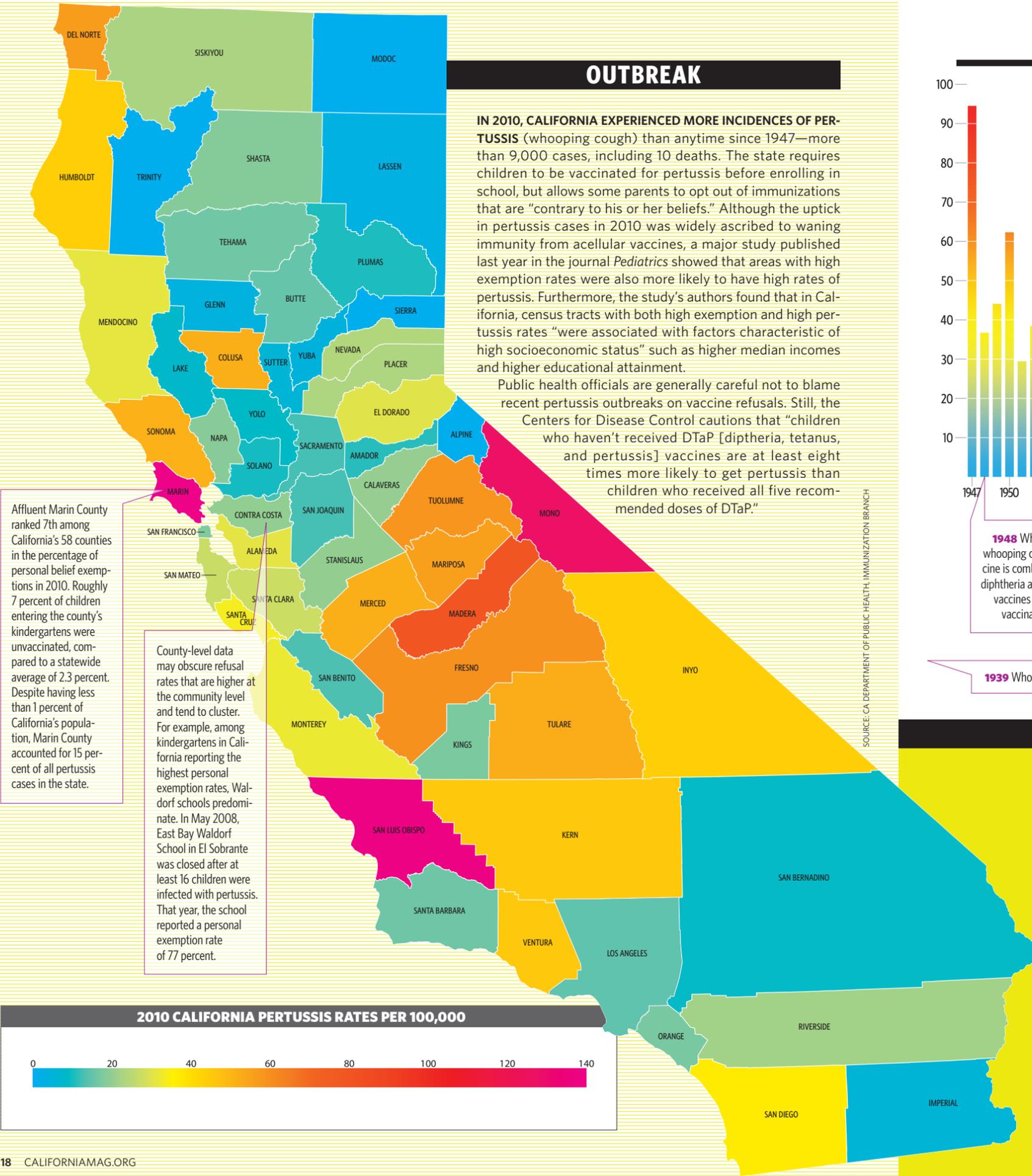


## OUTBREAK

IN 2010, CALIFORNIA EXPERIENCED MORE INCIDENCES OF PERTUSSIS (whooping cough) than anytime since 1947—more than 9,000 cases, including 10 deaths. The state requires children to be vaccinated for pertussis before enrolling in school, but allows some parents to opt out of immunizations that are “contrary to his or her beliefs.” Although the uptick in pertussis cases in 2010 was widely ascribed to waning immunity from acellular vaccines, a major study published last year in the journal *Pediatrics* showed that areas with high exemption rates were also more likely to have high rates of pertussis. Furthermore, the study’s authors found that in California, census tracts with both high exemption and high pertussis rates “were associated with factors characteristic of high socioeconomic status” such as higher median incomes and higher educational attainment.

Public health officials are generally careful not to blame recent pertussis outbreaks on vaccine refusals. Still, the Centers for Disease Control cautions that “children who haven’t received DTaP [diphtheria, tetanus, and pertussis] vaccines are at least eight times more likely to get pertussis than children who received all five recommended doses of DTaP.”

SOURCE: CA DEPARTMENT OF PUBLIC HEALTH, IMMUNIZATION BRANCH



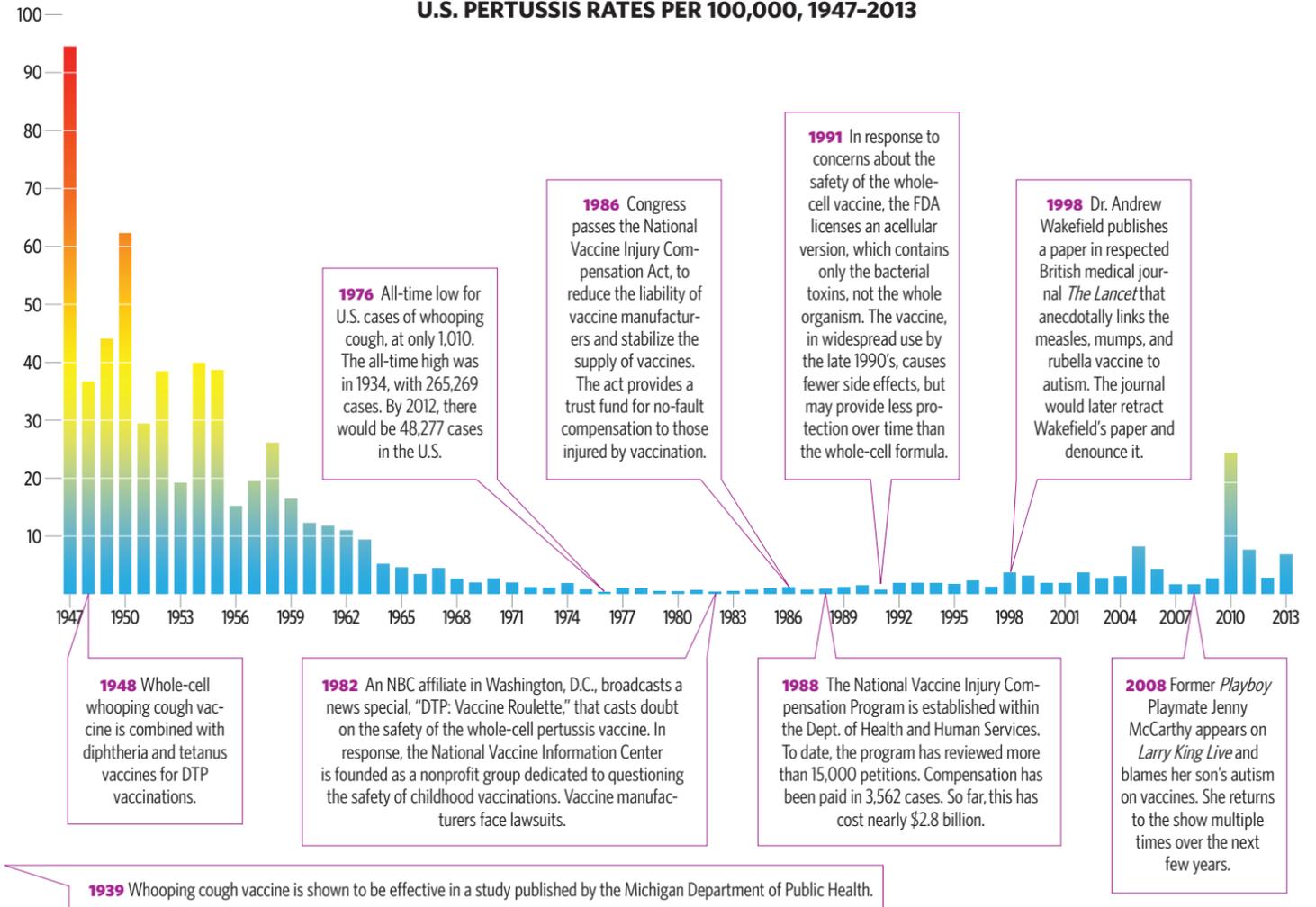
Affluent Marin County ranked 7th among California’s 58 counties in the percentage of personal belief exemptions in 2010. Roughly 7 percent of children entering the county’s kindergartens were unvaccinated, compared to a statewide average of 2.3 percent. Despite having less than 1 percent of California’s population, Marin County accounted for 15 percent of all pertussis cases in the state.

County-level data may obscure refusal rates that are higher at the community level and tend to cluster. For example, among kindergartens in California reporting the highest personal exemption rates, Waldorf schools predominate. In May 2008, East Bay Waldorf School in El Sobrante was closed after at least 16 children were infected with pertussis. That year, the school reported a personal exemption rate of 77 percent.

2010 CALIFORNIA PERTUSSIS RATES PER 100,000



## U.S. PERTUSSIS RATES PER 100,000, 1947-2013



**1948** Whole-cell whooping cough vaccine is combined with diphtheria and tetanus vaccines for DTP vaccinations.

**1976** All-time low for U.S. cases of whooping cough, at only 1,010. The all-time high was in 1934, with 265,269 cases. By 2012, there would be 48,277 cases in the U.S.

**1986** Congress passes the National Vaccine Injury Compensation Act, to reduce the liability of vaccine manufacturers and stabilize the supply of vaccines. The act provides a trust fund for no-fault compensation to those injured by vaccination.

**1991** In response to concerns about the safety of the whole-cell vaccine, the FDA licenses an acellular version, which contains only the bacterial toxins, not the whole organism. The vaccine, in widespread use by the late 1990’s, causes fewer side effects, but may provide less protection over time than the whole-cell formula.

**1998** Dr. Andrew Wakefield publishes a paper in respected British medical journal *The Lancet* that anecdotally links the measles, mumps, and rubella vaccine to autism. The journal would later retract Wakefield’s paper and denounce it.

**1939** Whooping cough vaccine is shown to be effective in a study published by the Michigan Department of Public Health.

**1982** An NBC affiliate in Washington, D.C., broadcasts a news special, “DTP: Vaccine Roulette,” that casts doubt on the safety of the whole-cell pertussis vaccine. In response, the National Vaccine Information Center is founded as a nonprofit group dedicated to questioning the safety of childhood vaccinations. Vaccine manufacturers face lawsuits.

**1988** The National Vaccine Injury Compensation Program is established within the Dept. of Health and Human Services. To date, the program has reviewed more than 15,000 petitions. Compensation has been paid in 3,562 cases. So far, this has cost nearly \$2.8 billion.

**2008** Former *Playboy* Playmate Jenny McCarthy appears on *Larry King Live* and blames her son’s autism on vaccines. She returns to the show multiple times over the next few years.

## FEAR ITSELF

**ARGUABLY THE GREATEST TRIUMPH OF MODERN MEDICINE** has been the development of vaccines.

Smallpox—killer of untold millions and blinder of millions more—has been eradicated from the globe, save for a few samples locked in icy vaults. Polio has been stamped out in all but a handful of countries. Measles, mumps, whooping cough—these are no longer common childhood ailments in the developed world. All thanks to vaccinations.

And yet, from the outset, there has been public resistance to vaccines. Edward Jenner’s smallpox vaccine, first administered in 1796, was greeted with both joy and fear. The fearful minority grew after England made smallpox vaccinations

compulsory in the 19th century. And the United States got its own anti-vaccination society in 1879. By the middle of the 20th century, public opposition to vaccines had waned as vaccination campaigns achieved great success. Today, that opposition is resurgent.

The origins of the modern antivaccination movement in this country may be traced to a 1982 broadcast by the NBC affiliate in Washington, D.C., of a television special entitled “Vaccine Roulette.” The show cast doubt on the safety of pertussis (whooping cough) vaccination—even though scientific studies did not bear out the broadcast’s conclusions. Another milestone was the 1998 publication of a study in *The Lancet*, a respected

British medical journal, that anecdotally linked the measles, mumps, and rubella (MMR) vaccine to autism cases. *The Lancet* has since withdrawn and renounced that study, but it continues to ignite fear about vaccines. Currently, the de facto spokesperson for the “antivax” movement may be former *Playboy* Playmate and current talk-show host Jenny McCarthy, who in 2008 blamed her child’s autism on vaccination.

A 2011 Reuters survey found that 1 in 5 Americans believed autism was linked to vaccines. To date, no such link has been found in scientific studies.

—Brendan Buhler