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CD Summary

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OUT, DAMNED SPOTS!

To negotiate an alliance with England in 1823, [Hawaiian] *King Kamehameha II and Queen Kamamalu sailed from Honolulu to England. Within weeks of arrival, a press report issued a brief statement, "The King and Queen are said to have caught the measles." Soon the entire royal party was ill with measles, a disease unknown to them. "Within several days of contracting measles, Queen Kamamalu became dangerously ill with pneumonia… The king was brought in by wheelchair to see her and a long embrace has been described…She was aware that she was dying, and doctors indicated that "inflammation of the lungs" was the cause of death." … A silver gilt breast plate read "… Queen of Sandwich Islands, Departed this life in London, on the eighth July 1824, aged 22 years." The other ill-fated plate later read: "Kamehameha 2d, King of the Sandwich Islands, died July 14, 1824, In the 28th Year of his Age…"*[1]

Tragically, measles was not preventable when the royal couple died. But it is now.

However, through September 9 of 2019, 24 cases of measles have been reported in Oregon — our highest tally since 1991. This issue of the *CD Summary* describes the global epidemiology of measles and the vaccination recommendations to eliminate these (damned) spots.

GLOBALIZATION OF MEASLES

In the first six months of 2019, 364,811 cases of measles were reported to the World Health Organization (WHO) — the highest number since 2006. For the same period last year, 129,239 cases were reported. The latest year for which the WHO has death estimates is 2017, with the striking figure of 110,000 measles-related deaths worldwide.[2] The WHO European Region reported 82,596 cases and 72 deaths in 2018.This was three times the total reported in 2017 and 15 times the number of cases reported in 2015.[3] Through June, 89,994 cases and 37 deaths have already been reported this year. Most cases have been from Ukraine, which reported 54,246 cases.[4] Why Ukraine? In 2008, 95% of Ukrainian children had received their second dose of MMR on time. By 2016, the rate had dropped to 31%. Kremlin-supported social media trumpeting discredited theories about MMR, combined with shortages and underfunding, have been blamed for the outbreak.[5] Ukraine's measles vaccination coverage is now increasing but still well below the ~96% needed for community ("herd") immunity to measles.[6]

MEASLES IN THE AMERICAS

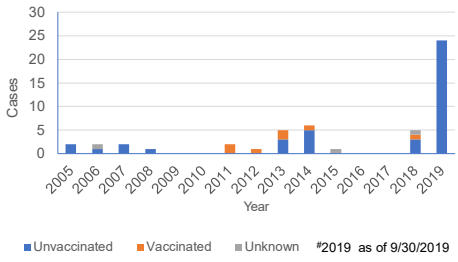
Through August 7, 2019, a total of 2,927 cases of measles and one death have been reported this year in WHO's Region of the Americas. The U.S. has had 40% of the cases, followed by Brazil with 36%.[7] Measles transmission was interrupted in the U.S. in 1993, and it was declared eliminated* here in the year 2000: cases have since been imported, and transmission continued for a few generations, but has not been sustained.[8] However, with 1,241 cases reported this year through September 5 — the highest tally since 1992 — the U.S. is on the cusp of losing "elimination" status.[9] More than 75% of cases have been linked to outbreaks in New York State and City, and most cases have been in unvaccinated people.

* i.e., absence of continuous transmission for >12 months

MEASLES IN OREGON

During 1993–2018, 91 cases have been reported here — an average of 2.6 per year. Of these cases, the median age was 12 years (range, 5 months to 49 years). Complete vaccination data are available since 2005: 79% were unvaccinated, 14% vaccinated, 6% unknown and 1% was too young for the recommended vaccination (Figure). Among those with information available, 98% had vaccine refusal documented (parental refusal, philosophical exemption or religious objection).

Figure. Measles cases by year and vaccination status: Oregon, 2005–2019#



Since 2005, cases have been imported from Asia (11), Europe (5), and Africa (1); the remaining 34 cases were linked to these importations. Ten cases (20%) were hospitalized.

In 2015, an Oregon boy died of subacute sclerosing panencephalitis (SSPE), a rare complication of measles. Vaccine is recommended at 12–15 months of age, but the child had been vaccinated at 8 months of age and developed measles at 1 year of age. Studies have shown that measles vaccine strains do not cause SSPE. After being well for a decade, he developed progressive neurologic illness at age 11 and died in home hospice 43 months later.[10]

During school year 2018–2019, 96% of Oregon K–12 students were fully vaccinated against measles.

Unfortunately, thousands of students, many clustered geographically or in close-knit social communities, remain unvaccinated and vulnerable to measles. The Clark County, Washington, outbreak during January–April 2019 (72 cases) and smaller clusters in Oregon demonstrate what happens when measles lands in a poorly vaccinated subpopulation.

PETER PANUM AND MAURICE HILLEMAN

In 1846, Danish physician Peter Panum took advantage of a measles outbreak on the isolated Faroe Islands and described the incubation period, its contagiousness as it leaped from village to village, its lethality even to healthy adults, and the lifelong immunity that followed recovery:

"The isolated situation of the villages, and their limited intercourse with each other, made it possible in many, in fact in most cases, to ascertain where and when the person who first fell ill had been exposed to the infection, and to prove that the contagion could not have affected him either before or after the day stated… In Fuglefjord, on Østerø, on account of my observations, I acquired the reputation of being able to prophesy. On my first arrival there, the daughter of Farmer J. Hansen, churchwarden, had recently had measles… All the other nine persons in the house were feeling well in every respect and expressed the hope that they would escape the disease. I inquired as to what day the exanthem [rash] had appeared on the daughter, asked for the almanac, and pointed to the fourteenth day after that… with the remark that they should make a black line under that date, for I feared that on it measles would show itself on others in the house…As it turned out I was summoned to Fuglefjord again ten days later and was met with the outcry: "What he said was correct! On the day he pointed out the measles broke out, with its red spots, on all nine.""[11]

More than a century later the father of modern vaccines, Dr. Maurice Hilleman, developed the only measles vaccine still in use in the U.S. By the late 1960s Hilleman decided to combine his measles, mumps, and rubella (MMR) vaccines into a single shot.[12] A few decades later a discredited British researcher claimed that Hilleman's MMR caused autism.[12] Vaccination rates dropped, and the United Kingdom lost its elimination status in August 2019.[13] As of March 2019, only 87% of children in England had received both doses of MMR.[14]

DOCS ARE THE KEY

The MMR vaccine is safe and highly effective: one dose affords ~93% protection against measles and two doses ~97%. During 2000–2017, measles vaccination prevented an estimated 21.1 million deaths, making the vaccine one of the best buys in public health.[15] We urge providers to address patients' misunderstandings about the vaccine, to provide a strong recommendation for it, and to document vaccine administration in Oregon's ALERT Immunization Information System. Remember that one dose of MMR is recommended for pre-school children >12 months of age and for persons born during or after 1957; and a second dose, given at least one month after the first, for school-age children and for adults at high risk: healthcare workers, international travelers and students at post-high-school educational institutions. One dose of MMR is also recommended for infants 6–11 months of age before international travel; these infants should still get the two doses after they reach 1 year of age.

EPILOGUE: A PREVENTABLE TRAGEDY

WHO identified vaccine hesitancy as one of the 10 greatest threats to global health.[16] Physicians rather than state bureaucrats† remain the most trusted source of vaccination recommendations. So avoid the guilt suffered by the unvaccinated Lady Macbeth and recommend MMR: you'll prevent spots from afflicting yourself, your patients, and your community, and live to see the end of the drama.

FOR MORE INFORMATION:

- Oregon Health Authority: www.oregon.gov/oha/PH/DISEASESCONDITIONS/DISEASESAZ/Pages/measles.aspx
- Centers for Disease Control and Prevention: www.cdc.gov/measles/cases-outbreaks.html.

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† Present company suspected. -*A. Bunker*

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