Morbidity and Mortality Weekly Report

Notes from the Field

Subacute Sclerosing Panencephalitis Death — Oregon, 2015

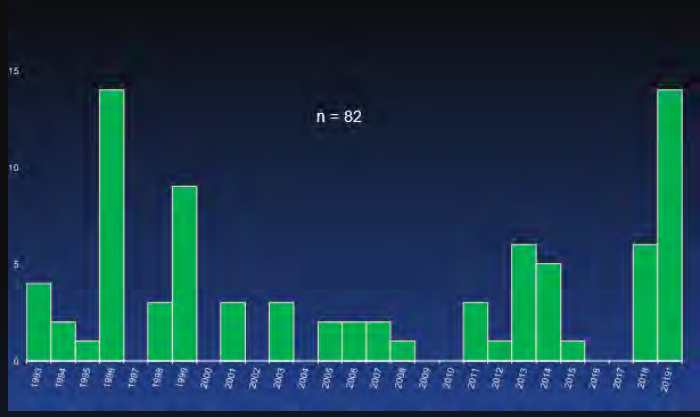
Juventila Liko, MD[1]; Judith A. Guzman-Cornfil, DO[2]; Paul R. Cieslak, MD[3]

In 2015, the Oregon Health Authority was notified of the death of a boy with subacute sclerosing panencephalitis (SSPE), a rare and fatal complication of measles. The patient, aged 14 years, had reportedly been vaccinated against measles in the Philippines at age 8 months. However, the patient contracted measles at age 1 year while still in the Philippines. He had been well until 2012, when his neurodegenerative symptoms began. After the diagnosis of SSPE was made, the patient remained in home hospice care until his death. Investigators from the Oregon Health Authority and the Oregon Health and Science University reviewed the patient's medical records and interviewed the parents. Vaccination against measles can prevent not only acute measles and its complications, but also SSPE.

Investigators learned that, in 2012, at age 11 years, the boy, who was previously healthy and developmentally normal, had been admitted to a tertiary care children's hospital in Oregon with severe, progressive encephalopathy. Before the onset of his neurologic illness, the patient had been a straight-A, fifth-grade student who played soccer and basketball. The symptoms began approximately 4 months before the hospital admission, when the patient began to struggle with homework, drop utensils, and doze off during meals, eventually progressing to falling asleep while walking. During the subsequent month, his mother reported that he was less alert and sometimes seemed confused. He experienced myoclonic jerks and involuntary hand and arm movements, which became increasingly frequent before his hospital admission, he began to shuffle and walk on his toes; he eventually refused to walk. He cried continuously, became increasingly aggressive, and began sleeping for longer periods. Although he was responsive at that time, his speech became difficult to understand; eventually he could say only a few words. A few days before hospital admission, he experienced worsening spasticity and rapid decline in mental status; he became incontinent and was unable to eat or drink. He did not fix on or follow objects, and he no longer appeared to recognize his family members' faces or voices.

Upon admission to the hospital in 2012, he had abnormal movements of the arms and legs, was unresponsive to questions, and unable to follow commands. He withdrew to touch and pain but evidenced spasticity and marked rigidity. All immunologic studies were normal. The EEG during this admission showed moderate, diffuse background slowing and disorganization, with multiple spikes and sharp waves, characteristic of SSPE. His serum measles IgG level was markedly elevated at >11.00 index value (IV) (positive ≥1.10 IV), and his cerebrospinal fluid (CSF) measles IgG level was >10.00 IV (positive ≥0.89 IV). Serum measles IgM was negative. The CSF measles IgG was confirmed at CDC's measles virus laboratory (titer = 1:40,960), and a diagnosis of SSPE was made. Because no specific therapy was available, the patient was discharged after 14 days and died in home hospice care 43 months later, in 2015.

The patient's clinical characteristics, typical EEG pattern, and elevated CSF measles antibody level are all consistent with SSPE (*1*,*2*), a progressive neurodegenerative disease associated with persistent measles virus infection in the central nervous

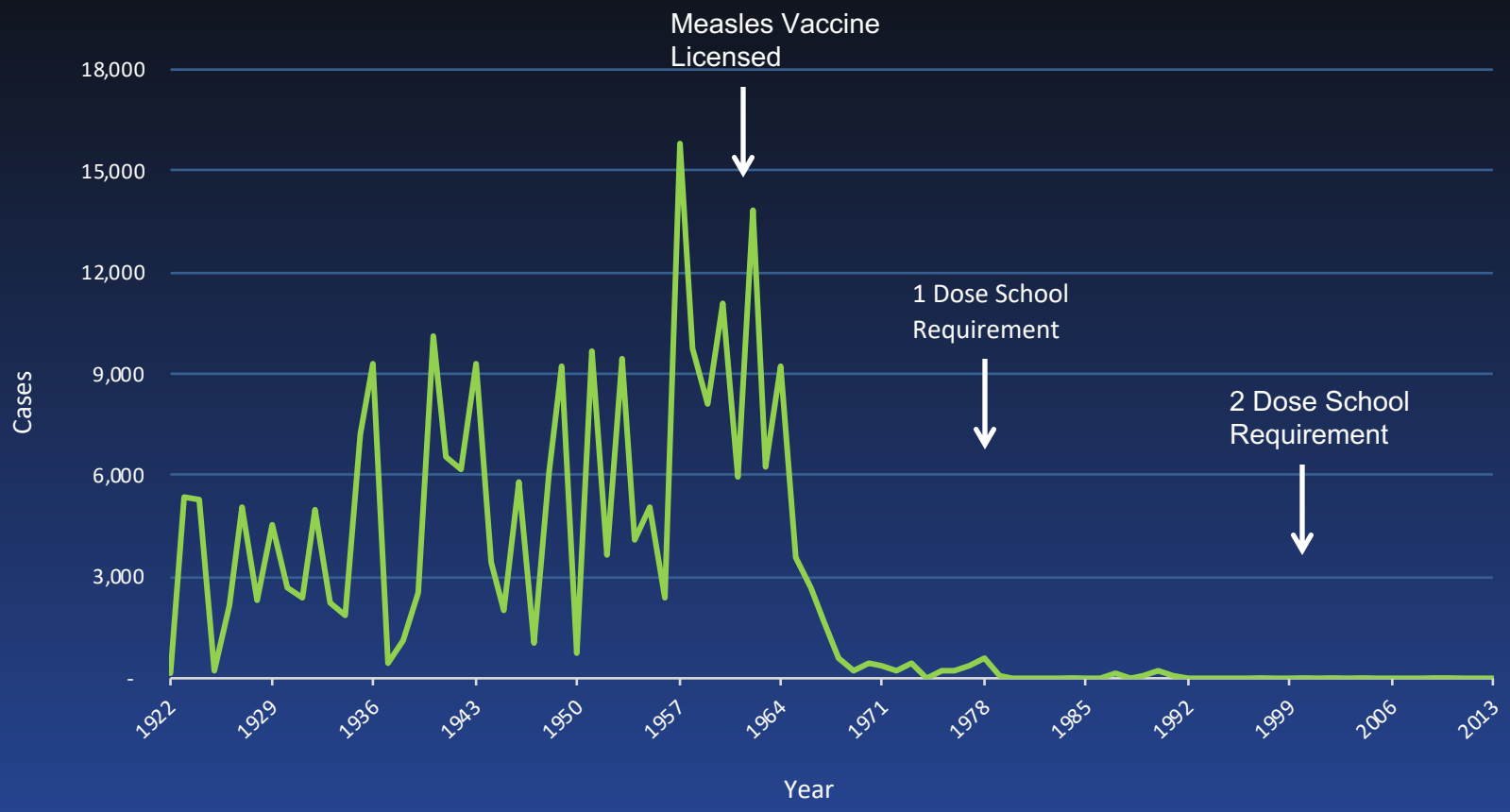


Measles Update
June 2019
Juventila Liko

Oregon measles cases by county, 2019

County	Confirmed Cases
Clackamas	1
Columbia	1
Marion	2
Multnomah	10
Total	**14**

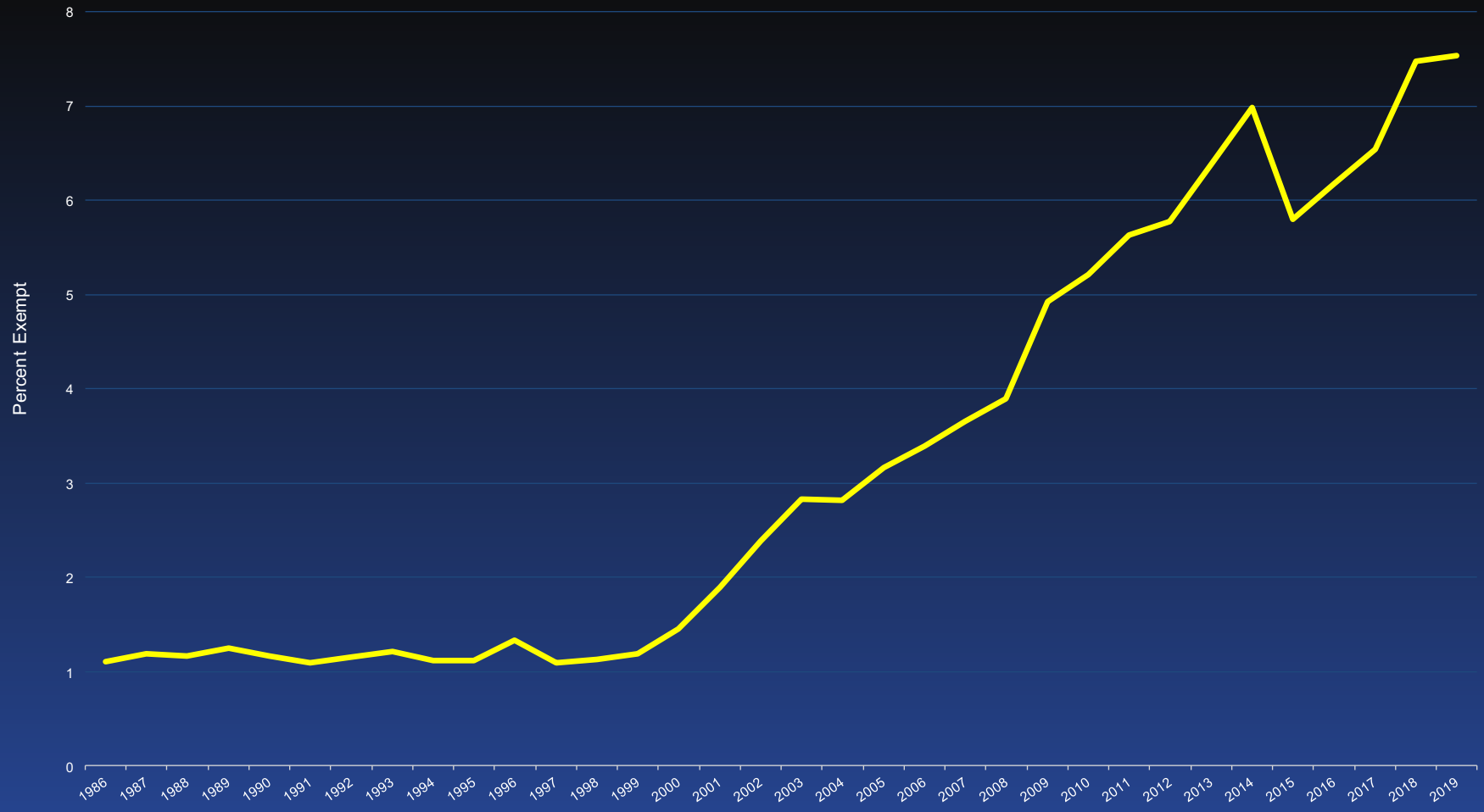
Reported Measles Cases, Oregon, 1922-2013



Source: ACDP archived data

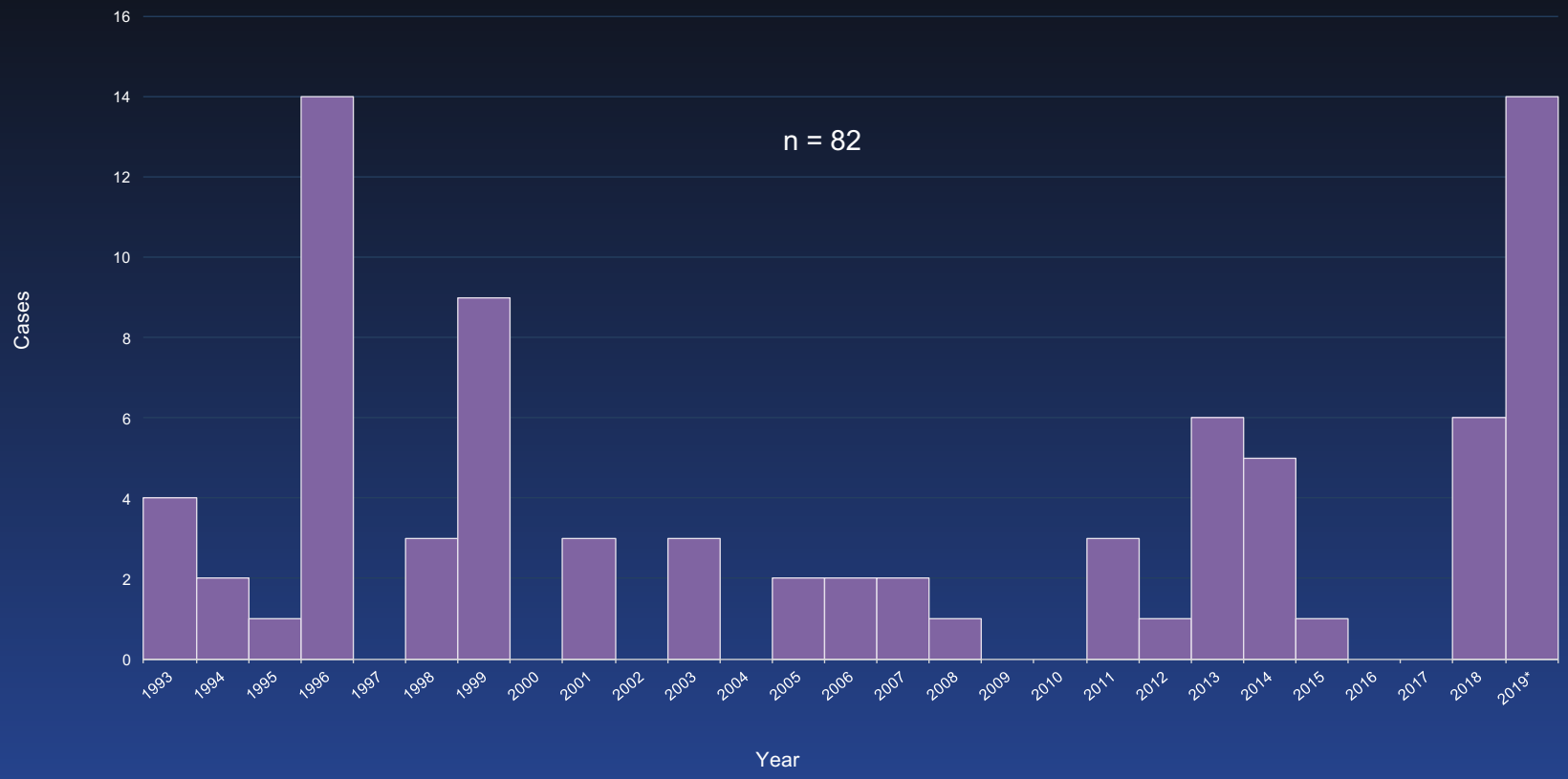
Overall, 96% of K – 12 students are vaccinated against measles.

Oregon Kindergarten Nonmedical Exemption Rates



Includes 1st grade through 2006

Oregon has had an average of 3 measles cases per year since 1993



*data as of 1 Feb 2019

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Total	**14**

Median age: 8.5 years (range: 6 m to 46 years)

93% of cases are outbreak-related

All but 1 case unvaccinated or no documentation of vaccination

30 Dec 2018 – 4 Feb 2019

Oregon public health response to measles

- Activated Incident Management Team
- Coordinate with out-of-state colleagues and Oregon local public health authorities
- Guidance re: case investigation, contact follow-up, testing, isolation.
- Recommendations to providers
- Communication materials for public, including translations
- Testing at Oregon State Public Health Lab

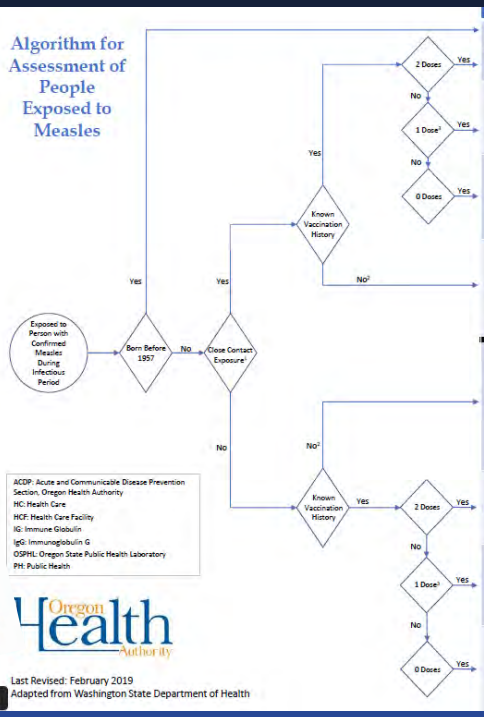
PUBLIC HEALTH DIVISION
Acute and Communicable Disease Prevention

Oregon Health Authority

Measles

Investigative Guidelines

November 2018



Risk Assessment	Prophylaxis	Recommendations	Symptom Watch	Work/School Exclusion	Quarantine at Home	Testing at OSPHL
Presumed immune	None	No recommendations or restrictions	Yes: Discuss date of exposure and symptom watch times.	None unless symptoms develop	No	If rash develops
93% effective	MMR within 72 hours of exposure	Second MMR recommended if needed per ACIP recommendations even if >72 hours after exposure (but MMR within 72 hours preferred)	Yes: Discuss date of exposure and symptom watch times. Explain what to do if symptoms arise: i.e., stay home, call PH/HC provider before going to HCF. Counsel on adverse events[3]	None unless symptoms develop or in a high-risk setting/ occupation[3]	No	If rash develops
Susceptible!	MMR within 72 hours of exposure or consider IG (if indicated[1]) within 6 days of exposure[2] (not both)	MMR recommended even if MMR not given within 72 hours of exposure[3]	Yes: Discuss date of exposure and symptom watch times. Consider active monitoring if possible, with check-in every 1-3 days. Explain what to do if symptoms arise. i.e., stay home, call PH/HC provider before going to HCF. Counsel on adverse events[3]	Yes[3] until 21 days after exposure, whether or not given MMR or IG[3].	Yes[3] and no non-immune visitors	If symptoms develop, discuss with ACDP Epi
Presume susceptible	MMR within 72 hours of exposure or consider IG (if indicated[1]) within 6 days of exposure[2] (not both)	If asymptomatic, encourage IgG titer and then give a dose of MMR through HC provider (in special situations PH can support testing)	Yes: Discuss date of exposure and symptom watch times. Consider active monitoring if possible, with check-in every 1-2 days. Explain what to do if symptoms arise: i.e., stay home, call PH/HC provider before going to HCF. Counsel on adverse events[3]	If titer negative or not done: Yes[3] for 21 days after exposure.[3] If titer positive: no further restrictions; no MMR needed.	Yes, stay home from day 7 after exposure until titer results available. If titer negative or not done: isolate for 21 days after exposure.[3]	If symptoms develop, discuss with ACDP Epi
Presume susceptible	MMR within 72 hours of exposure or consider IG (if indicated[1]) within 6 days of exposure[2] (not both)	If asymptomatic, encourage IgG titer or dose of MMR through HC provider	Yes: Discuss date of exposure and symptom watch times. Explain what to do if symptoms arise: i.e., stay home, call PH/HC provider before going to HCF. Counsel on adverse events[3]	None unless symptoms develop or in a high-risk setting/occupation[3]	No, unless symptoms develop. If symptomatic during the 21 days after exposure, isolate[4] and test for measles if rash develops. If titer positive: no further restrictions. If titer negative or not done: isolate for 21 days after exposure.[3]	If rash develops
Presumed immune	None	No recommendations or restrictions	Yes: Discuss date of exposure and symptom watch times.	None unless symptoms develop.	No	Clinical measles[5]
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Eastbound
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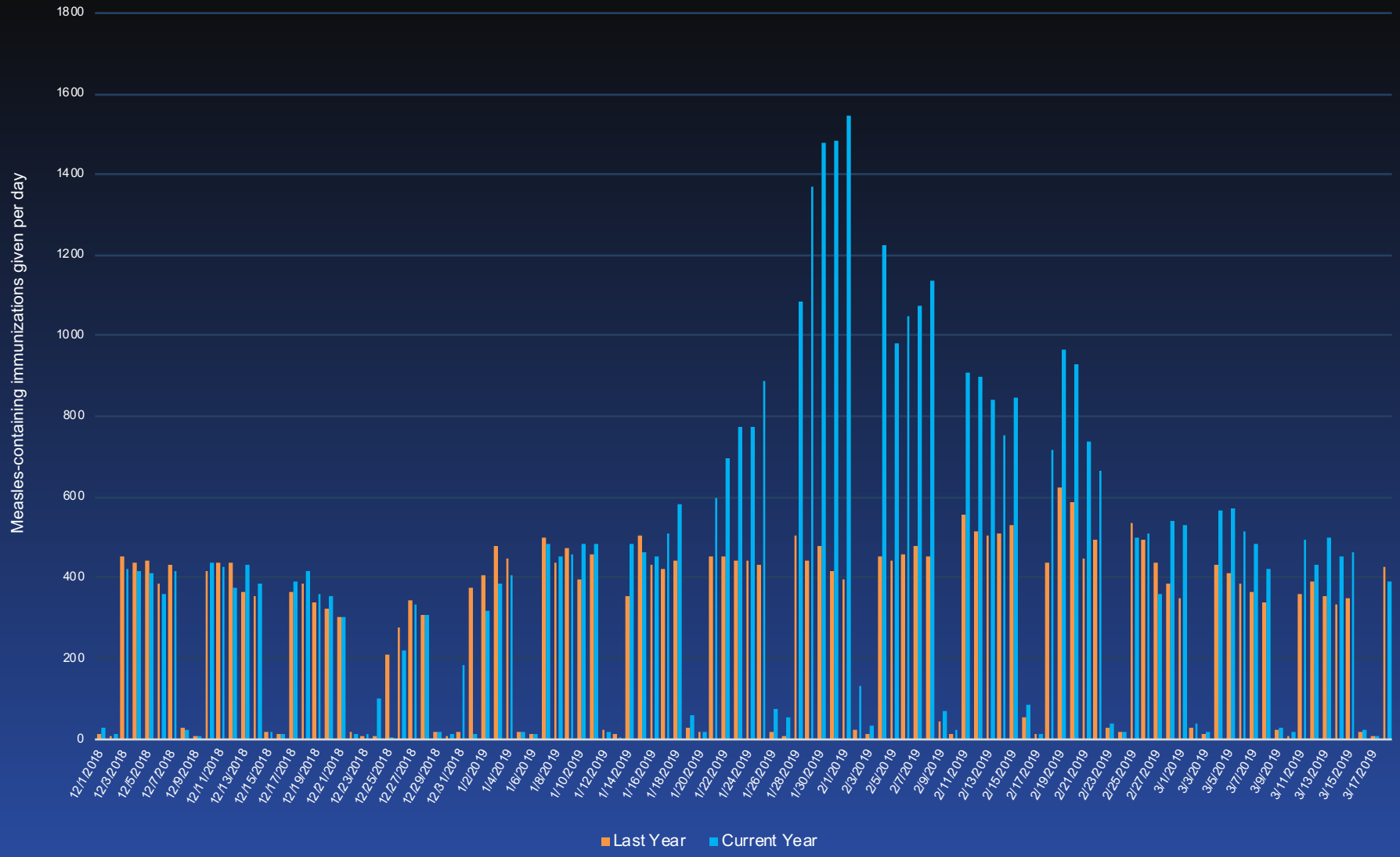
Fundamentals of
Contact Investigation


Crisis and Emergency Risk Communication (CERC)
Current Hazards
Get Involved
Get Prepared
Media Center
Resources for Partners
Health Alert Network (HAN)
Medical Countermeasures
Crisis and Emergency Risk Communication (CERC)
During public health emergencies, the Oregon Health Authority's Public Health Division (OHA-PHD) works with local and tribal health authorities to make sure all Oregonians get health and safety information that is timely and accurate. We help develop outreach materials in a variety of formats (websites, social media, print, radio, television) and we provide our partners with training and technical assistance in crisis and emergency risk communication (CERC).
CERC Toolkits
In order to view PDF files in languages other than English, install the free Font Pack for Acrobat Reader.
Airborne Disease Prevention
Contact-Droplet Disease Outbreaks


Resources for the Public
Resources for Healthcare Providers
Resources for Local Public Health Authorities
Resources for Schools and Child Care Facilities

Measles Immunization for Oregon Residents by Day, All-Ages, Current Year Compared to Last Year, as of Mar 19th, 2019



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https://www.cdc.gov/mmwr/volumes/65/wr/mm6501a3.htm

Oregon Health Authority

Subacute sclerosing panencephalitis (SSPE)

Previously healthy school-aged child born in Asia and admitted with progressive and severe encephalopathy.

4 months prior, began nodding off while doing homework, started having difficulty with math (previously math whiz) and having shoulder shrugs. Continued getting worse: child would start falling asleep while walking and then would trip.

3 months prior, started having involuntary hand/arm movements, jerking every 20 min. Hand movement started increasing every 5 min, still playful and with a good sense of humor. Missed 3 weeks of school and required a home tutor.

2 months prior, Behavior changed: turning lights on and off frequently, going back and forth to bathroom, could not sit still, repeatedly asked questions, frequent falls and began to get aggressive. Could no longer be tutored.

1 month prior, started to shuffle and walking on tip-toes, started crying continuously and began to get angry with the family, refused to walk and slept a lot and able to say only a few words. Started using diapers.

Subacute sclerosing panencephalitis (SSPE)

Admission month, progressive degeneration of mental status, making abnormal movements of arms and legs, looking around but not tracking, occasionally crying out, not responsive to questions, not following commands, withdraw to touch and pain. Unresponsive, spastic and rigid.

EEG: abnormal with multiple spikes and sharp waves.

Lumbar puncture: highly positive measles IgG in CSF.

This is consistent with SSPE: clinical characteristics, typical EEG and elevated CSF measles antibody.

Treatment: palliative

Prevention: vaccination

Prognosis: Poor outcome. Hospice care arranged. Died 43 months later.

SSPE: Risk in the US?

- SSPE is a 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.

- The risk of developing SSPE may be higher for a person who gets measles before they are 2 years of age.

- Recent California study: the incidence of SSPE was 1/1367 for children <5 years, and 1/609 for children <12 months at time of measles disease (CID; 2017).

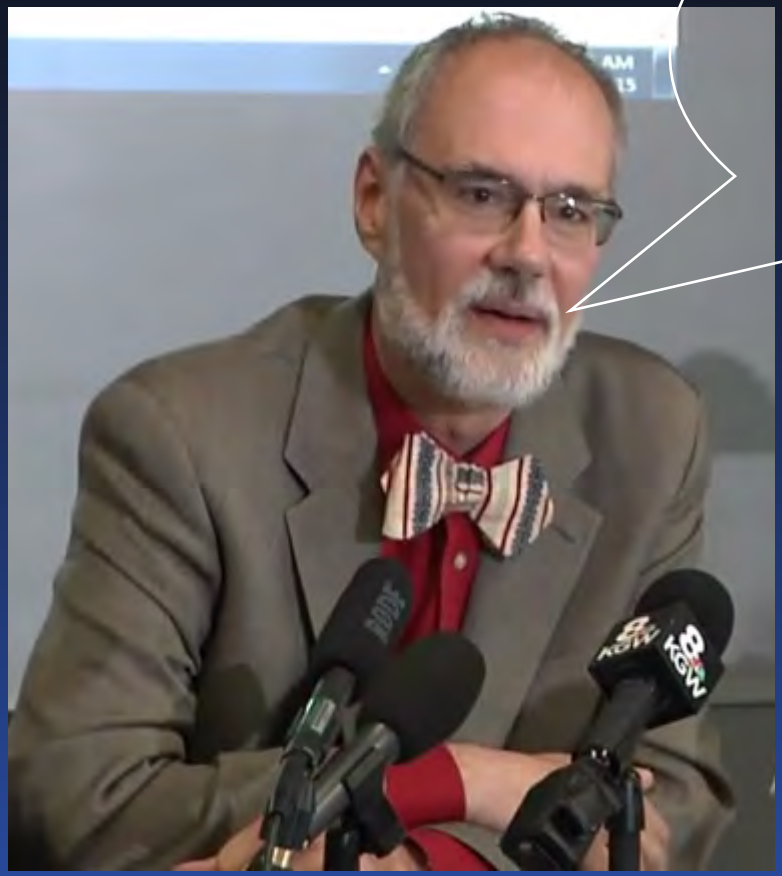
Impact of Two Measles Cases in 2007

- Hospital
  - ICS
  - $100,000
- LHD
  - ICS
  - $50,000
- State
  - ICS
  - $20,000

The International Outbreak Museum

Oregon Health Authority

This highlights the need to maintain very high vaccine coverage



And if we can achieve that, we will have done a far, far better thing than....well, than a lot of other things we might've done.

Thank You