



## Outbreak 2018-4884 Lane County Community-Wide Pertussis Outbreak

### Background

An increased number of pertussis cases were identified by public health officials of Lane County Health and Human Services (LCHHS) through routine surveillance in April 2018. Routine investigation of these pertussis cases identified a connection to one high school, where case counts met the criterion for a pertussis outbreak. Throughout the month of May and into June, seven additional pertussis outbreaks were confirmed and linked to other Lane County schools. Additional cases were identified in other schools and day-care centers in the community. Due to the widespread distribution of pertussis cases in Lane County, Oregon Health Authority epidemiologists ultimately considered the eight school-related outbreaks as a single community-wide pertussis outbreak in June 2018.

The outbreak was investigated to identify cases and steps were taken to stop transmission; these included minimizing exposures by excluding ill and exposed, unvaccinated and under-vaccinated students in affected schools and identifying and ensuring prophylaxis of high-risk contacts.

### Methods

All Lane County residents who met the pertussis case definitions for a confirmed, presumptive, or suspect case during the outbreak time frame of February 14, 2018, through October 15, 2018, were included. Case criteria were specified by the pertussis investigative guideline:

- Confirmed case: culture-positive and an acute cough illness of any duration; or PCR-positive and a cough illness lasting at least 2 weeks with any of the following: paroxysms of coughing, inspiratory “whoop,” post-tussive vomiting or apnea (for infants only);
- Presumptive case: epidemiologically linked to a case confirmed by either culture or PCR and a cough illness lasting at least 2 weeks with any of the following: paroxysms of coughing, inspiratory “whoop,” post-tussive vomiting or apnea (for infants only); and
- Suspect case: persons with a compatible illness but neither lab confirmed nor a close contact of a confirmed case; persons PCR+ or culture-positive for pertussis, but who do not meet either the confirmed or presumptive case definition; or epidemiologically linked to a case confirmed by either culture or PCR and a cough of any duration with any of the following: paroxysms of coughing, inspiratory “whoop,” post-tussive vomiting or apnea.

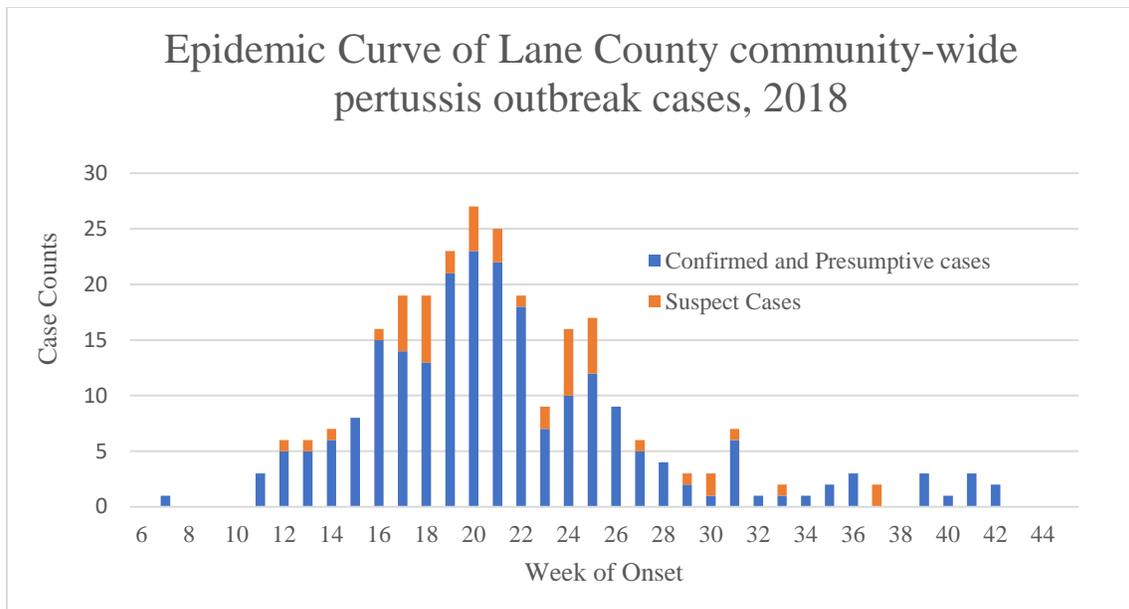
The investigative guideline was followed to interview cases, identify close contacts, identify exposures, check vaccination status, and ensure treatment and isolation of cases and protection of contacts. Unvaccinated and under-vaccinated students in schools with two or more PCR- or culture-positive cases with an epi-link were excluded from school until 21 days after the last potential exposure. Students could return to school if a single

pertussis-containing vaccine dose was received and documented, or if a student had a documented pertussis infection and received 5 days of adequate antibiotic treatment for pertussis.

To notify the public about the outbreaks and the potential for pertussis transmission in the community, LCHHS released letters to the schools and parents, health alerts to providers and healthcare partners, and press releases and media coverage to the public.

### Results

A total of 185 confirmed, 42 presumptive, and 47 suspect pertussis cases were identified. Twenty-one additional individuals were initially identified but did not meet case definitions. Among confirmed and presumptive cases, the median age was 14 (range 0–68) years, and 54% were female. The earliest illness onset was on February 14, 2018, and the latest illness onset was on October 15, 2018 (Figure).



The most common places of identified exposures were school or daycare (43%) and home (26%). The median duration of cough at final interview was 19 (range, 14–91 days) days; 96% of cases received treatment. Four cases were hospitalized, three of which were infants, but no deaths were reported. Five cases were culture-confirmed, and 189 were PCR-positive; cases not tested were epidemiologically linked to confirmed cases. Seventy percent of cases were up-to-date on their vaccinations. A total of 257 contacts were identified; chemoprophylaxis or vaccination was provided according to the investigative guideline.

In total, during the 2017–2018 school year, more than 40 Lane County schools had at least one confirmed or presumptive case. One hundred fifty-six confirmed and presumptive cases attended school or daycare; during the school year these cases were excluded from school and daycare settings until 5 days after starting appropriate treatment. Eight Lane County schools had confirmed outbreaks with students excluded for being exposed but under-vaccinated. From these 8 schools, 169 students were excluded with an option to return to school following adequate vaccination (for exposed, under-vaccinated students) or adequate antibiotic treatment

(for students with pertussis). One hundred thirteen students received adequate vaccination, one student developed illness, and 55 students were excluded for the 21-day duration.

### Conclusions

During this community-wide outbreak, 274 confirmed, presumptive, and suspect pertussis cases were identified among school and daycare attendees and other individuals in the community of Lane County. This is the largest pertussis outbreak documented in Lane County; it lasted for approximately eight months. Most cases were up-to-date on their pertussis vaccination; although DTaP vaccine efficacy is estimated to be  $\geq 80\%$  initially, immunity appears to wane over time. This is similar for Tdap, which is estimated to be approximately 70% effective initially but with immunity also waning over time.

Pertussis is endemic in Oregon, with cyclical incidence peaking every 3–5 years. Pertussis is highly contagious, with symptoms similar to those of other respiratory illnesses. In situations with ongoing community transmission, outbreak control becomes increasingly challenging. It is important that clinicians recognize the clinical signs and symptoms of pertussis, perform the appropriate testing, educate patients on reducing transmission, and report suspected cases to the local health department for timely response and disease control.