Pertussis Report
April 20, 2015

California experienced a pertussis epidemic in 2014. Pertussis is cyclical and peaks every 3-5 years as the numbers of susceptible persons in the population increases due to waning of immunity following both vaccination and disease. The last epidemic in California occurred in 2010, however, the overall incidence of pertussis has increased since the 1990s. One reason for the increase is the use of acellular pertussis vaccines, which cause fewer reactions than the whole-cell vaccines that preceded them, but do not protect as long. Young infants are at greatest risk of hospitalization and death from pertussis, therefore pregnant women are encouraged to receive pertussis vaccine (Tdap) during the 3rd trimester of every pregnancy. Pertussis antibodies are transferred from vaccinated mothers to their infants and will help protect them until they are old enough to be vaccinated. The primary DTaP vaccine series is essential for reducing severe disease in young infants and should not be delayed. DTaP can be given to infants at an accelerated schedule with the first dose given as early as 6 weeks of age. Even one dose of DTaP may offer some protection against severe pertussis disease in infants.

- **1,674 cases with onset in 2015** have been reported to CDPH.
  - More than 300 cases were reported occurring in each of the months of January, February and March. While this is lower than the peak in May 2014, it remains above the interepidemic levels seen in 2013.
  - 54 cases have been hospitalized; 14 (26%) of these required intensive care
    - 41 (76%) of hospitalized patients were infants <4 months of age.
  - One death has been reported in an infant that was <3 weeks of age at the time of disease onset.

- **11,168 cases with onset in 2014** have been reported to CDPH for a state rate of 29.2 cases per 100,000 population (Table 1, Figure 1-3). Data for 2014 are still preliminary.
  - 428 cases have been hospitalized; 102 (24%) of these required intensive care.
    - 256 (60%) of hospitalized patients were infants <4 months of age.
  - Three deaths with disease onset in 2014 have been reported; all were infants who were < 5 weeks old at time of disease onset.
    - Two additional deaths occurring in 2014 but with disease onset in 2013 have been reported. These cases will be attributed to 2013. Both infants were <2 months of age at disease onset.
  - Of the 250 (54%) cases <4 months of age whose mothers vaccination history was available, 44 (18%) reported receiving Tdap during the third trimester of pregnancy between 27-36 weeks gestation, as is recommended by ACIP and ACOG.
  - The majority of cases with known age have occurred in infants and children <18 years of age (9,396; 89%) and the peak ages are <1 year and 15 years old (Figure 4).
    - 715 (8%) of pediatric cases were infants <6 months of age.
    - 6,046 (64%) of pediatric cases were children/adolescents 7-16 years of age.
    - Among 8,215 (87%) of pediatric cases with vaccination history information, 806 (10%) had never received any doses of pertussis-containing vaccine.
  - Overall pertussis rates are highest for infants <1 year of age and older children and adolescents and teens 10-17 years of age. Rates by race/ethnicity are highest for Hispanic and African American infants <1 year of age and White, non-Hispanic adolescents and teens aged 10-17 years of age (Figure 5).

Table 1. Pertussis cases and rate* by year of onset and local health jurisdiction -- California, 2010-2015**

	2010¶		2011¶		2012¶		2013¶		2014**		2015**	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
CALIFORNIA	9159	24.5	3016	8.0	1023	2.7	2537	6.6	11168	29.2	1674	4.4
ALAMEDA	423	30.2	206	14.6	62	4.4	124	8.6	364	25.1	87	6.0
City of Berkeley‡	13	11.5	3	2.6	6	5.2	13	11.3	56	48.6	4	3.5
ALPINE	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
AMADOR	4	10.6	11	29.5	1	2.7	2	5.5	1	2.8	0	0.0
BUTTE	32	14.5	16	7.3	3	1.4	33	14.9	33	14.9	3	1.4
CALAVERAS	9	19.8	5	11.1	0	0.0	2	4.4	17	37.3	0	0.0
COLUSA	11	51.2	1	4.7	0	0.0	0	0.0	0	0.0	4	18.5
CONTRA COSTA	205	19.5	114	10.7	24	2.2	69	6.4	477	44.1	101	9.3
DEL NORTE	16	56.1	0	0.0	0	0.0	0	0.0	2	7.2	0	0.0
EL DORADO	54	29.8	11	6.1	3	1.6	4	2.2	36	19.6	6	3.3
FRESNO	550	59.0	58	6.2	16	1.7	44	4.6	391	40.8	8	0.8
GLENN	1	3.6	1	3.5	0	0.0	0	0.0	1	3.5	2	7.1
HUMBOLDT	58	43.1	15	11.1	1	0.7	5	3.7	148	109.8	35	26.0
IMPERIAL	9	5.1	3	1.7	8	4.5	3	1.7	10	5.6	5	2.8
INYO	8	43.2	0	0.0	1	5.3	0	0.0	0	0.0	0	0.0
KERN	376	44.7	49	5.8	2	0.2	31	3.6	163	18.8	74	8.5
KINGS	26	17.0	7	4.6	0	0.0	2	1.3	16	10.6	3	2.0
LAKE	5	7.7	3	4.7	2	3.1	3	4.7	3	4.7	1	1.6
LASSEN	1	2.8	0	0.0	0	0.0	0	0.0	5	15.3	0	0.0
LOS ANGELES	1303	14.1	612	6.6	209	2.2	342	3.6	1964	20.9	424	4.5
City of Long Beach‡	68	14.7	17	3.7	4	0.9	16	3.4	183	39.3	20	4.3
City of Pasadena‡	24	17.5	15	10.8	1	0.7	2	1.4	22	15.8	1	0.7
MADERA	120	79.3	8	5.3	0	0.0	10	6.5	47	30.7	1	0.7
MARIN	351	138.9	26	10.2	5	2.0	184	71.9	274	107.1	23	9.0
MARIPOSA	10	55.0	1	5.6	0	0.0	0	0.0	0	0.0	0	0.0
MENDOCINO	27	30.7	3	3.4	0	0.0	6	6.8	10	11.3	1	1.1
MERCED	131	51.2	27	10.4	0	0.0	1	0.4	9	3.4	6	2.3
MODOC	0	0.0	0	0.0	0	0.0	0	0.0	6	64.7	0	0.0
MONO	18	126.4	2	14.0	21	146.1	2	14.1	0	0.0	0	0.0
MONTEREY	132	31.7	38	9.0	17	4.0	49	11.5	128	30.1	24	5.7
NAPA	25	18.3	11	8.0	6	4.3	13	9.3	138	99.2	9	6.5
NEVADA	23	23.3	2	2.0	5	5.1	70	71.5	16	16.3	1	1.0
ORANGE	499	16.5	142	4.7	73	2.4	113	3.6	449	14.5	47	1.5
PLACER	80	22.8	19	5.3	11	3.1	86	23.6	122	33.4	14	3.8
PLUMAS	2	10.0	4	20.1	0	0.0	1	5.2	1	5.2	0	0.0
RIVERSIDE	467	21.3	166	7.5	46	2.0	80	3.5	462	20.4	88	3.9
SACRAMENTO	175	12.3	69	4.8	35	2.4	70	4.8	448	30.9	112	7.7
SAN BENITO	7	12.7	3	5.4	1	1.8	1	1.7	11	19.2	3	5.2
SAN BERNARDINO	182	8.9	115	5.6	54	2.6	39	1.9	205	9.9	37	1.8
SAN DIEGO	1140	36.7	398	12.7	162	5.1	408	12.8	2016	63.4	200	6.3
SAN FRANCISCO	141	17.5	70	8.6	30	3.6	59	7.1	128	15.4	12	1.4
SAN JOAQUIN	84	12.2	27	3.9	15	2.1	26	3.7	216	30.7	35	5.0
SAN LUIS OBISPO	371	137.5	15	5.6	14	5.2	17	6.3	45	16.6	3	1.1
SAN MATEO	191	26.5	58	8.0	23	3.1	104	14.0	129	17.4	9	1.2
SANTA BARBARA	66	15.6	18	4.2	11	2.6	28	6.5	120	27.8	29	6.7
SANTA CLARA	478	26.8	176	9.7	45	2.5	254	13.7	538	29.0	56	3.0
SANTA CRUZ	87	33.1	22	8.3	13	4.8	54	19.9	165	60.8	24	8.8
SHASTA	32	18.0	27	15.2	2	1.1	7	3.9	33	18.5	11	6.2
SIERRA	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
SISKIYOU	10	22.3	0	0.0	2	4.4	5	11.1	7	15.5	3	6.6
SOLANO	40	9.7	12	2.9	10	2.4	15	3.5	144	34.0	17	4.0
SONOMA	246	50.8	116	23.8	18	3.7	51	10.4	704	143.0	13	2.6
STANISLAUS	159	30.9	43	8.3	11	2.1	16	3.0	92	17.4	26	4.9
SUTTER	5	5.3	1	1.1	0	0.0	2	2.1	8	8.2	2	2.1
TEHAMA	10	15.8	1	1.6	0	0.0	0	0.0	38	59.9	3	4.7
TRINITY	0	0.0	0	0.0	0	0.0	0	0.0	6	44.6	4	29.8
TULARE	230	51.9	77	17.2	27	6.0	25	5.5	37	8.1	34	7.5
TUOLUMNE	32	58.0	4	7.3	1	1.8	2	3.7	16	29.5	2	3.7
VENTURA	372	45.1	163	19.6	15	1.8	36	4.3	351	41.8	16	1.9
YOLO	17	8.4	5	2.5	6	2.9	4	1.9	147	71.3	30	14.5
YUBA	3	4.1	0	0.0	1	1.4	4	5.5	10	13.6	1	1.4

*Incidence rate per 100,000 persons

**Includes cases reported to CDPH as of 4/20/2015

¶Data have been updated from previous reports; population denominator data from the Department of Finance have been standardized with 2010 Census data

‡City health jurisdictions not included in county total

Figure 1. Pertussis incidence per 100,000 population, by county – California, 2014*

Legend:
- No reported cases
- Low incidence
- Below statewide average
- Above statewide average
- Substantially above statewide average

*reported to CDPH as of 4/20/2015
Corresponding category ranges: 0; 0.1-2.7; 2.8-29.2; 29.3-60.0; 60.1-143.0

Figure 2. Number and incidence of reported pertussis cases by year of onset -- California, 1945-2015*

*Includes cases reported to CDPH as of 4/20/2015
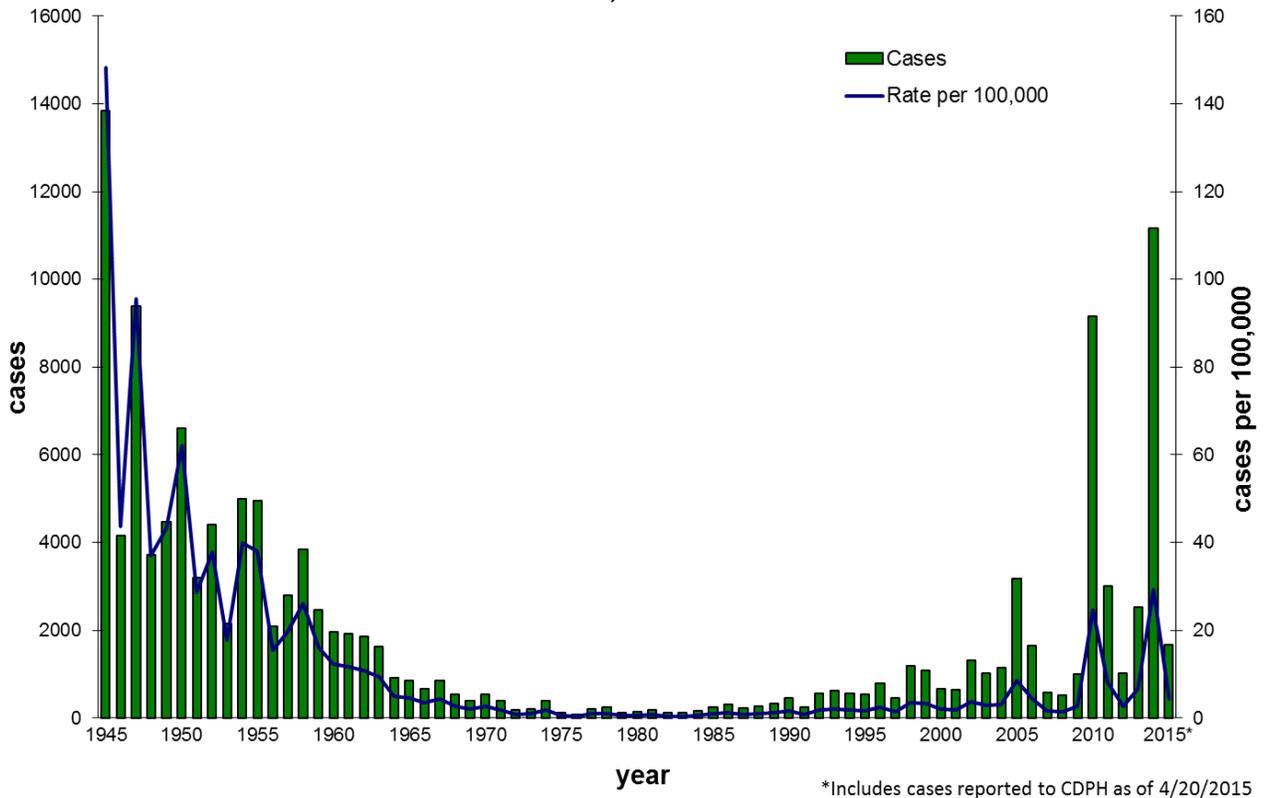
Figure 3. Pertussis cases by month of onset -- California, 2009-2015*

Will increase due to reporting delays

*Reported to CDPH as of 4/20/2015; 2014 data still provisional
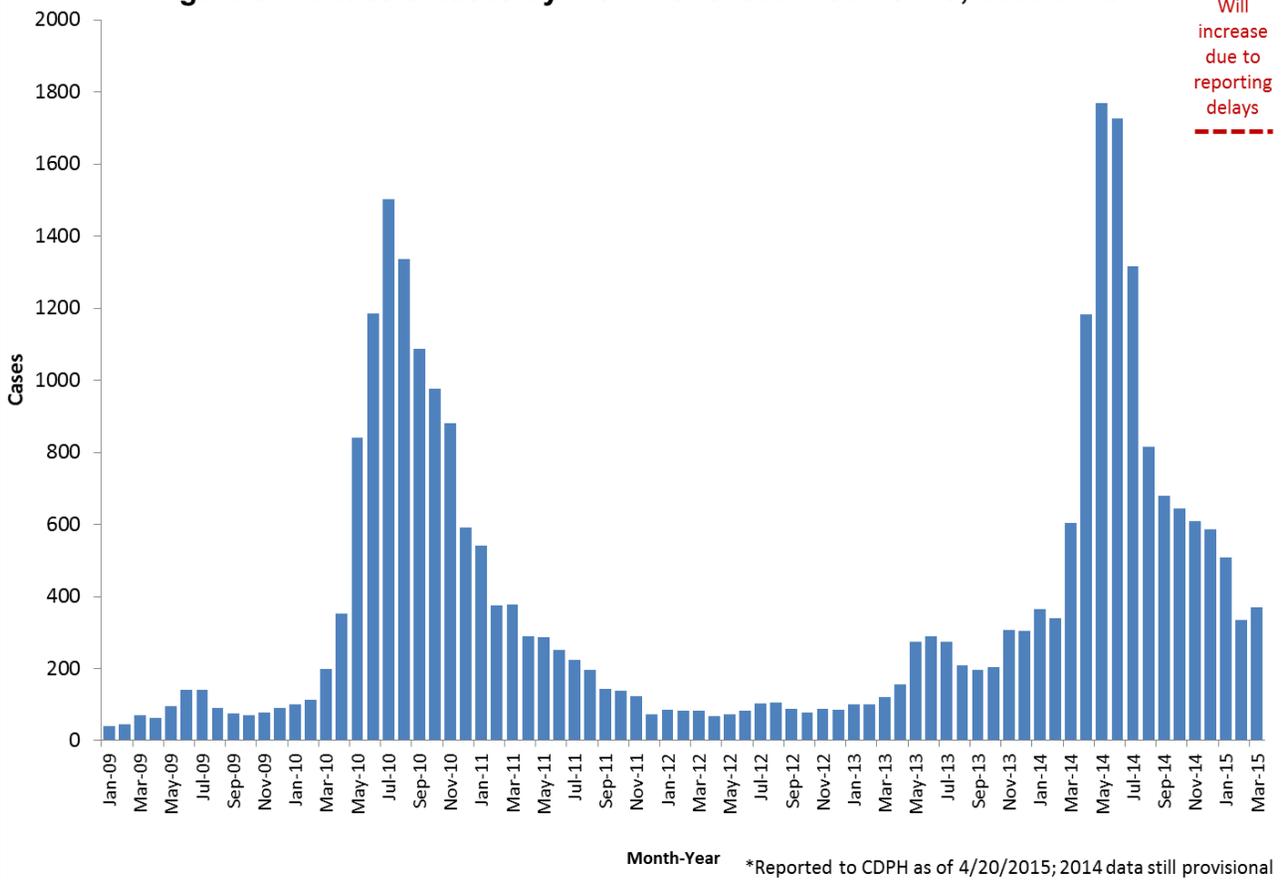
Figure 4. Pediatric pertussis cases by age -- California, 2014*

number of cases

DTaP
DTaP
DTaP ↓
DTaP
Tdap

age (months/years)

*Reported to CDPH as of 4/20/2015
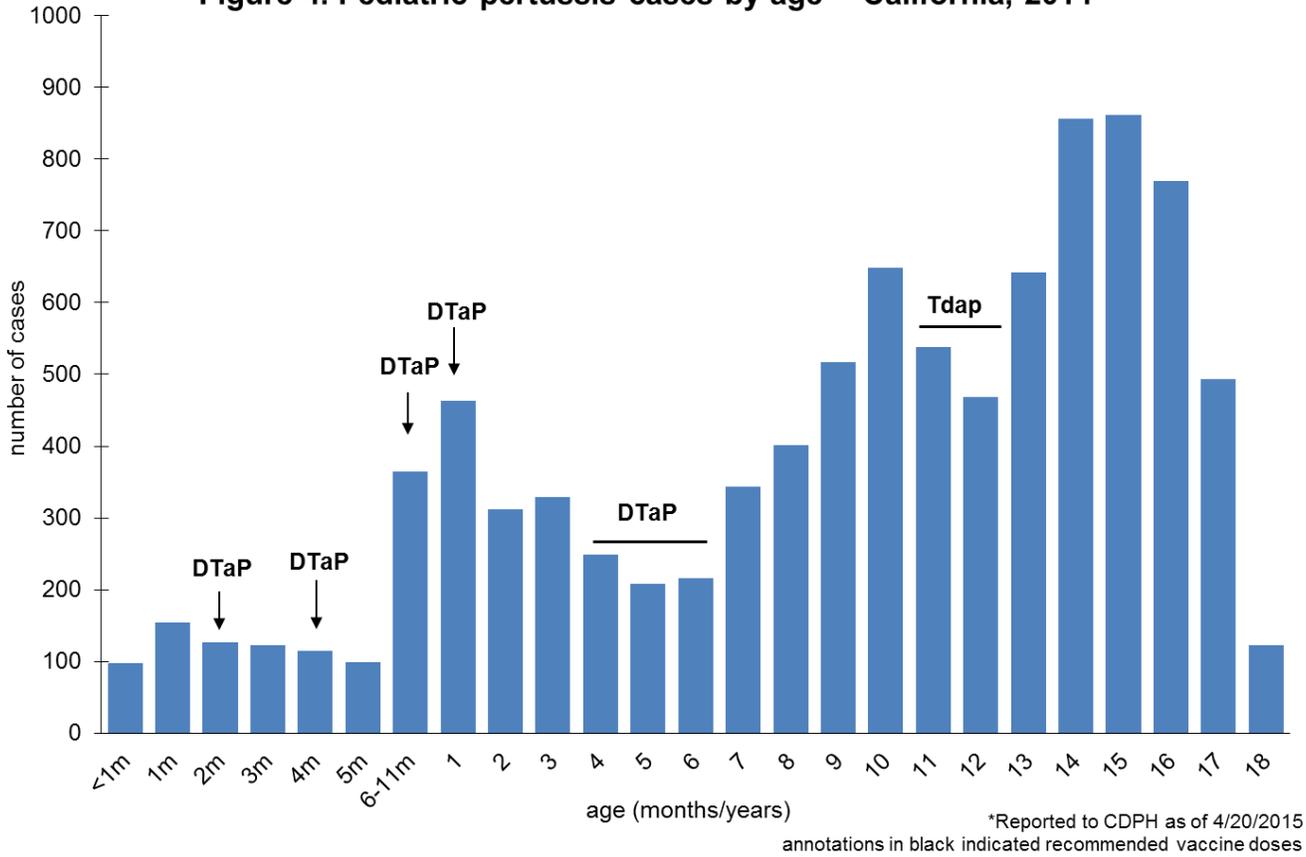annotations in black indicated recommended vaccine doses

Figure 5. Pertussis rates by age and race/ethnicity -- California, 2014*

rate by race/ethnicity per 100,000

overall rate per 100,000

- White, non-Hispanic
- Hispanic, all races
- Black, non-Hispanic
- Asian/Pacific Islander
- All race/ethnicities

205.4
73.2
44.4
83.8
128.8
4.7
3.0
2.5

age (years)

*Reported to CDPH as of 4/20/2015