



Adolescent health brief

Economic and Social Impact of Pertussis Among Adolescents in San Diego County



Aiden K. Varan, M.P.H.^{a,b,c,*}, Kathleen H. Harriman, Ph.D., M.P.H., R.N.^d, Kathleen Winter, M.P.H.^d,
 Melissa D. Thun, R.N.^b, and Eric C. McDonald, M.D., M.P.H.^b

^a CDC/CSTE Applied Epidemiology Fellowship, Atlanta, Georgia

^b County of San Diego Health and Human Services Agency, San Diego, California

^c Division of Global Migration and Quarantine, Centers for Disease Control and Prevention, San Diego, California

^d California Department of Public Health, Richmond, California

Article history: Received August 10, 2015; Accepted October 19, 2015

Keywords: Pertussis; Adolescent; Cost of illness; Health care utilization; Absenteeism; Immunization; San Diego

 A B S T R A C T

Purpose: During recent pertussis epidemics, adolescents have experienced a large burden of disease. We assessed the impact of pertussis among San Diego adolescents and their households.

Methods: Parents of pertussis patients aged 13–17 years were surveyed about health care utilization, missed work and school, and other factors. Costs of medical visits, medication use, and lost wages were estimated.

Results: The parents of 53 (of 108 [49%]) eligible 2013 pertussis patients were interviewed; 51 (96%) of these patients previously received tetanus, diphtheria, and acellular pertussis vaccine. Medical visits included primary care (81%), urgent care (11%), and emergency department (9%); all patients received antibiotics. Forty-seven households (89%) received a post-exposure prophylaxis recommendation, and five (9%) reported ≥ 1 unpaid parental leave day. Thirty-eight patients (72%) missed ≥ 1 school day (mean = 5.4 days). Societal costs were estimated at \$315.15 per household and \$236,047.35 in San Diego during 2013–2014.

Conclusions: Even among vaccinated adolescents, pertussis can result in considerable societal costs.

Published by Elsevier Inc. on behalf of Society for Adolescent Health and Medicine.

IMPLICATIONS AND CONTRIBUTION

This study provides the first economic impact assessment of pertussis among adolescents since a booster vaccine was licensed in 2005. Among patients aged 13–17 years with confirmed or probable pertussis during 2013–2014, estimated societal costs of health care, medications, and missed wages exceeded \$300 per household and \$230,000 across San Diego.

Pertussis has resurged in recent years [1]. Although pertussis incidence and disease severity are greatest among infants [1], the burden among adolescents is substantial. Based on two cohorts from 1998 to 2003, societal costs of adolescent pertussis were estimated at \$397 per case [2].

Conflicts of Interest: No authors have any financial conflicts to disclose.

Disclaimer: The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of CDC.

* Address correspondence to: Aiden K. Varan, M.P.H., Division of Global Migration and Quarantine, Centers for Disease Control and Prevention, 3851 Rosecrans Street, Suite Y15, San Diego, CA 92110.

E-mail address: vv15@cdc.gov (A.K. Varan).

Tetanus, diphtheria, and acellular pertussis vaccine (Tdap) was licensed in 2005 and mandated for all students entering seventh grade in California in 2011. Pertussis incidence among adolescents has increased despite high Tdap vaccination coverage [3,4]. After receipt of Tdap, pertussis immunity is initially high but wanes within 2–4 years [3,5]. In San Diego County, California, during the 2013–2014 pertussis epidemic, 749 (40%) of 1,873 reported confirmed and probable cases were aged 13–17 years (County of San Diego Health and Human Services Agency, unpublished data). We assessed the contemporary societal and economic impact of pertussis among San Diego adolescents.

Methods

Sample

Eligible patients had illnesses that met confirmed or probable pertussis case criteria [6] and were San Diego residents aged 13–17 years at the time of symptom onset. To capture school-associated impact, onset dates were restricted to September 1–December 31, 2013.

Survey

Parents (or other caregivers) of eligible patients were contacted via telephone during May–October, 2014 (≥ 3 call attempts) and invited to complete an interview in English or Spanish. Questions included symptom duration, medical visits, medication use, and missed work, school, and sports activities. Demographic, vaccination status, and laboratory testing data were obtained from California Department of Public Health case reports.

Analysis

We used the 2012 Red Book (Truven Health Analytics, Ann Arbor, MI) to identify pertussis management medications. To estimate clinical, laboratory, and prescription costs, we pooled 2010–2012 MarketScan data (Truven Health Analytics) for outpatient pertussis clinical consultations. Lost wages were estimated from 2013 Department of Labor data [7]. To assess societal costs, we applied cost estimates to per-household averages for health care utilization, prescription medications, and lost wages. Missing responses for health care, medications, or missed activities were assigned a zero value.

Statistical analyses were performed using SAS 9.3 (SAS Institute, Cary, NC). Bivariate comparisons were performed using Mantel–Haenszel exact chi-square tests assessed at $\alpha = .05$. This study was reviewed by the Committee for the Protection of Human Subjects, California Health and Human Services Agency, and deemed exempt from review.

Results

Among 108 eligible households, 63 were reached: 53 (49%) parents/caregivers agreed to participate and 10 refused. More participating than nonparticipating eligible households had female pertussis cases (66% vs. 40%; $p = .008$), but no significant differences in case classification, age, race/ethnicity, or Tdap vaccination were detected ($p > .05$).

Patient demographic features are presented in Table 1. The patients attended 29 San Diego schools. Median interval from symptom onset to interview was 9.3 months (range: 5.6–12.4 months). All patients had recovered from illness at the time of interview, except three with lingering cough. No patients had ever previously been diagnosed with pertussis. Fifty-one (96%) patients had previously received Tdap; one unvaccinated patient had a medical vaccination exemption. Among Tdap-vaccinated patients, median interval from vaccination to symptom onset was 3.3 years (range: 1.3–8.9 years). All except two (96%) patients had ≥ 4 doses of diphtheria, tetanus toxoids, and acellular pertussis vaccine during childhood: one received only three diphtheria, tetanus toxoids, and acellular pertussis vaccine doses and one had a medical vaccination exemption.

Table 1

Demographic features, vaccination history, missed activities, and household leave among participating households with an adolescent pertussis patient,^a San Diego County

Variables ^b	n (%)
Participating households	53 (100)
Adolescent case	
Female gender	35 (66)
Age at symptom onset (years)	
13	13 (25)
14	13 (25)
15	15 (28)
16	10 (19)
17	2 (4)
Race/ethnicity (n = 45)	
White non-Hispanic	29 (64)
White Hispanic	13 (29)
Asian non-Hispanic	3 (7)
Born in United States (n = 51)	
Yes	50 (98)
No	1 (2)
Health insurance provider (n = 51)	
Employer provided or private insurance	43 (84)
Medicaid	7 (14)
Other	1 (2)
Received Tdap	51 (94)
Received ≥ 4 doses of DTaP	51 (94)
Pertussis case classification	
Confirmed	50 (94)
Probable	3 (6)
Reported symptom duration (months; n = 48)	
<1	12 (25)
1–2	13 (27)
3–4	16 (33)
>4	7 (15)
Missed school (days)	
None	15 (28)
1–5	23 (43)
6–10	11 (21)
>10	4 (8)
Missed sports activities (days)	
None or did not participate in any sports	25 (47)
1–7	11 (21)
8–30	10 (19)
>30	7 (13)
Household	
Interviewee	
Mother	46 (87)
Father	6 (11)
Other household caregiver	1 (2)
Interview language	
English	50 (94)
Spanish	3 (6)
Time spent on medical appointments for case (hours; n = 51)	
<2	13 (25)
2–5	21 (41)
6–10	16 (31)
>10	1 (2)
Household leave to care for case ^c (days)	
None	36 (68)
1–3	11 (21)
>3	6 (11)

DTaP = diphtheria, tetanus toxoids, and acellular pertussis vaccine; Tdap = tetanus, diphtheria, and acellular pertussis vaccine.

^a Case definitions for confirmed or probable pertussis illness as per 2010 Council of State and Territorial Epidemiologists criteria [6].

^b n = 53 respondents unless otherwise specified because of missing values.

^c Includes sick leave, personal/holiday leave, and unpaid leave among parents or other household caregivers.

Forty-three patients (81%) had ≥ 1 primary care provider visit (mean = 1.79 visits; range: 0–5 visits) during their pertussis illness. Other consultations included urgent care (6, 11%),

Download English Version:

<https://daneshyari.com/en/article/1078440>

Download Persian Version:

<https://daneshyari.com/article/1078440>

[Daneshyari.com](https://daneshyari.com)