

Pertussis Morbidity in Florida 2003

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Introduction

Pertussis, or whooping cough, is a highly communicable infectious disease caused by the bacterium *Bordetella pertussis*, and is characterized by paroxysms of coughing, an inspiratory “whoop,” and posttussive vomiting. Pertussis is transmitted from person to person via aerosolized droplets produced from a cough or sneeze, or through direct contact with secretions from the respiratory tract of infectious individuals. The majority of reported cases are among children under 5 years of age (many of whom are too young for immunization), but an increasing number of cases have been reported among adolescents and adults in recent years. In the early- to mid-1900’s pertussis was one of the most common childhood diseases and a major cause of childhood mortality in the United States. The introduction of a vaccine in the 1940’s significantly decreased the incidence of pertussis. However, since the early 1980’s the incidence of pertussis has begun to gradually increase with cyclic epidemics occurring every three to four years. Florida reports approximately 49 cases of pertussis a year, with the last epidemic occurring in 1999 with 112 reported cases.

Background

There has been an increase in the number of reported* cases and incidence rates of pertussis in Florida from January 1, 2003 (week 1) through September 13, 2003 (week 37) compared to the same week range for 2000-2002. Fifty-seven culture or PCR confirmed** cases of pertussis have been reported to the Bureau of Epidemiology in 17 Florida counties, a rate increase of 94% from 2002. Eleven counties have reported an increase in pertussis rates compared to 2002 rates, with the highest rates located in the northeast region of the state in Putnam, Clay, and Duval Counties. Data from week range 1-37 indicates a statewide rate of 0.337 per 100,000 persons, a rate similar to the 1999 rate of 0.417 for the same week range, thus indicating a possible cyclic outbreak.

Methods

Demographic information was obtained using Merlin®, the Department of Health’s web-based disease reporting system. A custom line list by week range 1-37 for 2003 provided demographic breakdown of cases regarding gender, age, outbreak status, and daycare status. Further data on vaccination history, geographical distribution, and epidemiological links was acquired by accessing case report forms electronically available in Merlin®.

Results

As indicated in Table 1, 30 (52.63%) of the pertussis cases reported during week range 1-37 occurred in females and 22 (38.60%) occurred in males. Over half, 39 (68.42%), of the reported pertussis cases occurred in children between the ages of 0-4, with 21 cases (36.84%) less than 1 year of age and 18 (31.57%) cases 1-4 years of age.

Vaccination history for children < 2 years (n=33) was examined. Approximately half, 17 (51.51%), of the cases < 2 years occurred in children who had not received any doses of a pertussis-containing vaccine (DTP, DTaP, DTP-Hib, P) prior to illness onset. Ten (30.30%) cases received one dose, 3 (9.09%) cases received two doses, and 1 case (3.03%) received three doses of pertussis-containing vaccine prior to illness onset. The main reason reported on case report forms for not receiving all doses was that the case patient was less than 7 months of age (n=26, 78 %). Two cases (8%) did not receive all

their doses due to parental refusal and no reason or other was reported for 6 (18%) cases. Furthermore, the extended data on case report forms revealed that doses were not consistently received at the recommended 2, 4, 6, and 12-15 month intervals.

Table 1 further demonstrates that only 14 (24.56%) cases were outbreak associated and only 5 cases (8.77%) were reported as daycare attendees. Only 1 case was reported as both outbreak associated and a daycare attendee, and of the 13 adult cases, 7 (53.85%) were outbreak associated. However, investigation of electronic case report forms did reveal a strong geographical outbreak association in the northeast region of the state with 5 (100%), 3 (75%), and 5 (33.33%) cases linked to one zip code in each of Putnam, Clay, and Duval counties, respectively. Electronic case report forms also indicated 21 (87.5%) of the 24 cases in these counties were epidemiologically linked between 7 index cases.

Discussion

Since the last pertussis outbreak in Florida occurred four years ago in 1999, the increase in reported cases in Florida for weeks 1-37 is consistent with the cyclical nature of pertussis outbreaks. As indicated in Figure 1, pertussis trends from 1999 are similar to those observed through week 37 of the current year. Additionally, waning immunity in older children and adults also contributes to the increase in cases in these age groups, as well as contributing to morbidity in younger age groups since infection in older children and adults is often under-reported and under-diagnosed resulting in exposure to unprotected infants.

Although no pertussis-containing vaccine is currently licensed for persons 7 years of age or older, clinical trials are underway to determine if a booster dose of acellular pertussis vaccine administered to older children or adults can reduce the risk of pertussis infection. This may in turn reduce the risk of transmission of pertussis to infants and young children who are not completely vaccinated. Meanwhile, physicians and other medical providers need to include pertussis in the differential diagnosis of coughing illness in persons of all ages, to allow for appropriate diagnosis and prompt treatment of suspected cases.

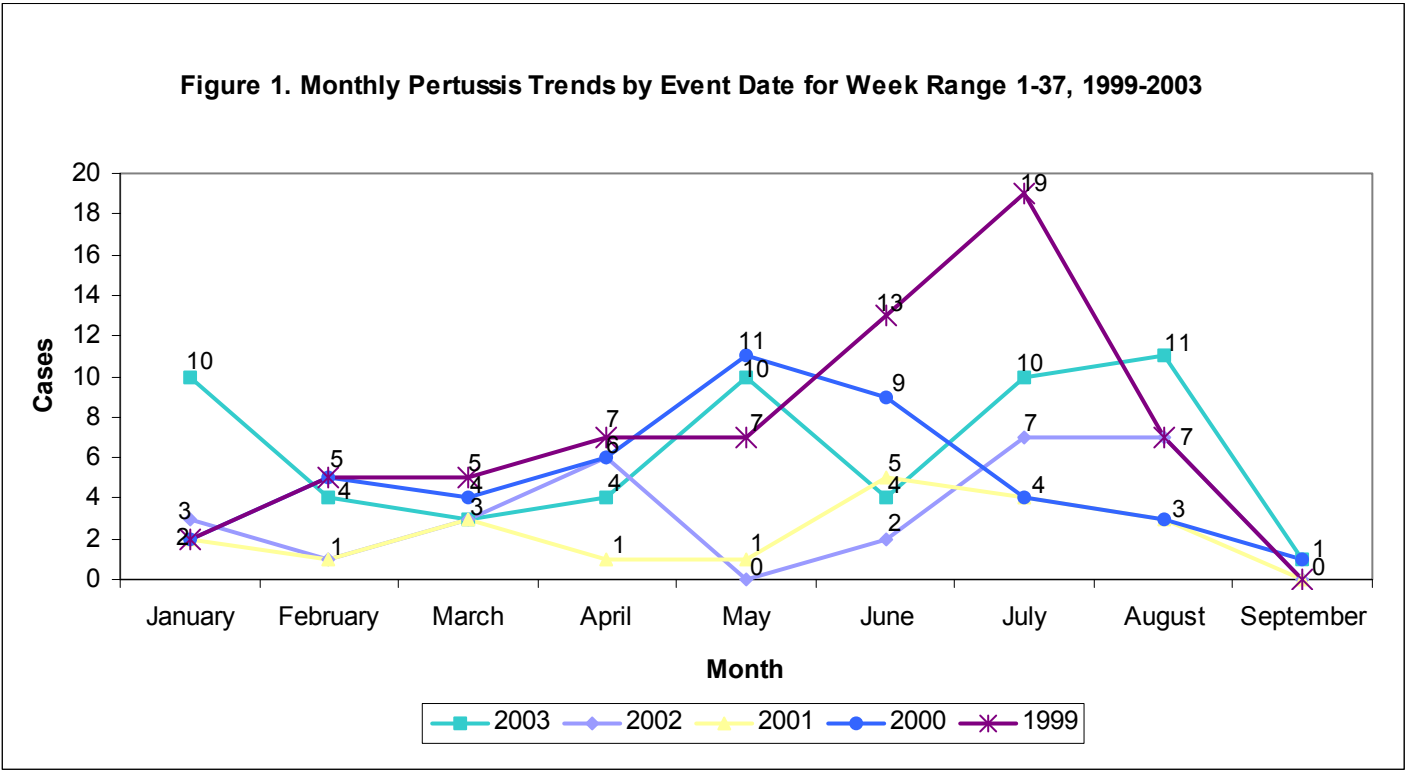
To help ensure prompt reporting of suspected cases, county health departments should alert providers and the public of the pertussis increase. When cases are reported to local health departments, it is imperative for the extended data section in Merlin® to be complete to allow users to obtain a comprehensive analysis of potential outbreaks. Additionally, all counties are funded for the Immunization Registry and can utilize this system to check missing or unknown vaccination history of cases. Finally, it is necessary that laboratory confirmation with isolation of *Bordetella pertussis* from a clinical specimen be completed to verify confirmed cases. Polymerase chain reaction (PCR) should be used in addition to, not as a replacement for, culture because bacterial isolates may be required for evaluation of antimicrobial resistance.

Prompt identification, containment, and treatment of pertussis cases and exposures are essential to stop the disease from developing into a widespread outbreak. If assistance is needed regarding case follow-up or investigation please contact the Bureau of Immunizations for additional field personnel. Any questions regarding the reporting of pertussis cases should be directed to the Bureau of Epidemiology or the Bureau of Immunization.

Table 1. Demographic Distribution of Pertussis Cases Reported to the Florida Department of Health for Week Range 1-37, 2003*

Gender (%)		Age (%)								Vaccination History <2 years (%)					Outbreak (%)			Day Care (%)		
Male	Female	<1	1-4	5-9	10-19	20-29	30-39	40-49	50-59	0 Doses	1 Dose	2 Doses	3 Doses	Unk	Assoc.	Sporadic	Unk	No	Attendee	Unk
22 (38.6)	30 (52.63)	21 (36.84)	18 (31.57)	3 (5.26)	2 (3.51)	6 (10.53)	3 (5.26)	2 (3.51)	2 (3/51)	17 (51.51)	10 (30.30)	3 (9.09)	1 (3.03)	2 (6.06)	14 (24.56)	33 (57.89)	10 (17.54)	46 (78.95)	5 (8.77)	6 (10.53)

*N=56, except for Vaccination History where N=33



*Data depicted for 2003 are considered provisional and subject to change. Reported cases include both “reported” and “not yet reported” cases within the guidelines of the Merlin® reporting system.

** Confirmed under surveillance case definition, probable case definition does not included a laboratory component

Acknowledgements

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References

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