

Pertussis Outbreak Kit

Planning Tools for Responding to Community Outbreaks in Texas



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Table of Contents

PREFACE

- A. Foreword—Associate Commissioner for Disease Control and Prevention
- B. Acknowledgements

INTRODUCTION

- A. Introduction
- B. The Changing Epidemiology of Pertussis in Texas
- C. Materials List
- D. Internet Resource List

PRESENTATIONS

- A. “Conquering Pertussis in Texas”
- B. “Pertussis Surveillance—Training for Public Health Professionals”

SURVEILLANCE GUIDELINES

- A. Texas Department of Health
- B. Centers for Disease Control and Prevention

COMMUNICATION TOOLS

- A. Communications Tools Cover Sheet
- B. Pertussis Fact Sheet (English and Spanish)
- C. Example letter to physicians
- D. Pertussis Press Release—Key Items and Example
- E. Pertussis Tests Handout
- F. Example letter from schools to parents (English and Spanish)
- G. Pertussis Collection Kit Instructions
- H. Laboratory Submission Forms

PERTUSSIS MONOGRAPH

ARTICLES

- A. “Pertussis—United States, 1997-2000,” Morbidity and Mortality Weekly Report.
- B. “Pertussis in Texas,” Disease Prevention News.
- C. Upshot (Immunization Division Newsletter) Articles on Pertussis

PERTUSSIS SURVEILLANCE DATA

- A. State Incidence and Cases Reported
- B. Public Health Region and County

Foreword

The Texas Department of Health has identified an ominous trend in the number of pertussis cases reported in Texas: if reported cases reflect the reality, pertussis is on the rise in Texas. Tragically, this upward trend also includes an increase in the number of infant deaths related to pertussis. Rapid recognition of cases and response to outbreaks are key components to the overall strategy of reducing the transmission of pertussis in our communities and protecting the most vulnerable among us. Physicians, hospitals, local health authorities, school health officials, and the Texas Department of Health must work together to improve pertussis surveillance. The Surveillance and Epidemiology Program has developed this kit to assist you in investigating outbreaks of pertussis. The materials contained in the kit represent an effort to unify the message being communicated to private physicians, school officials, and the general public. It is vital that our response to outbreaks be consistent across Texas, and that we follow procedures established by the federal Centers for Disease Control and Prevention.

I hope that many of you will use this guide to develop outbreak response plans and train surveillance staff. It can also serve as a quick reference guide when you are dealing with a community outbreak. The format allows for addition and deletion of materials so that they can be tailored to each organization's particular needs. Letters, forms, fact sheets, guidelines, and educational materials can be added as desired. Electronic files have been provided for many of the materials so that they may be adapted for local use. We will strive to keep this guide current; and in that regard, we welcome your comments and suggestions.

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Acknowledgements

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INTRODUCTION

Introduction

Pertussis is a highly contagious upper respiratory illness caused by the bacterium *Bordatella pertussis*. The symptoms of pertussis usually occur in stages. It begins with cold-like symptoms including sneezing, cough, coryza, and a low-grade fever. Within 1-2 weeks the cough progresses to uncontrolled paroxysms often followed by an inspiratory whoop, vomiting, or cyanosis. Between coughing spells a person may feel well and coughing spells are usually worse at night. Young infants may experience severe disease with apneic spells but without whooping episodes. Infants with pertussis are more likely to require hospitalization than are older children; it is not uncommon for up to 70% of infants with pertussis to be hospitalized. Morbidity due to pertussis is highest for infants in the first few months of life. Adults, adolescents, and vaccinated children often have milder symptoms that look like bronchitis. Because adults and adolescents play a role as a reservoir for pertussis infection as vaccine-induced immunity fades over time and because symptoms vary, maintaining a high index of suspicion in patients of any age with a prolonged cough illness is important.

The public health strategy to prevent pertussis includes maintaining high DTaP vaccination coverage levels in children. Children should receive four doses of DTaP vaccine by 15 months of age and an additional dose before they start school. The vaccine should only be administered to children seven years of age or younger. If vaccine is unavailable, it is vital to have systems in place to recall children as soon as vaccine inventories are replenished. Education of medical professionals and the public is also a key element in preventing infant deaths and severe illness. Prompt diagnosis and treatment of persons infected with pertussis and chemoprophylaxis of their close contacts (regardless of vaccination history) can reduce transmission. Medical providers must not wait for laboratory confirmation before reporting possible pertussis cases to their local health authority. By Texas law, health care providers must immediately report every *suspected* pertussis case to the Texas Department of Health. The report must include the name, date of birth, sex, race/ethnicity, telephone number, and address of the patient. It also must include the date of disease onset, method of diagnosis, and name of diagnosing physician.

Surveillance by local health authorities is necessary to identify outbreaks early, linking individual cases reported by physicians and other reporters. Once an outbreak is identified, the local health authority will conduct active surveillance by calling schools, emergency rooms, and provider offices to search for additional cases.

Problems associated with pertussis surveillance include difficulty with the timing of specimen acquisition and interpretation of laboratory tests, late administration of and poor compliance with antibiotic prophylaxis, and failure to consider pertussis as a diagnosis for persons who had unexplained severe cough. Adults with pertussis may not be seen by a physician until two to three weeks past onset. This makes recovery of the organism less likely and leads to reliance on epidemiologic information for case classification.

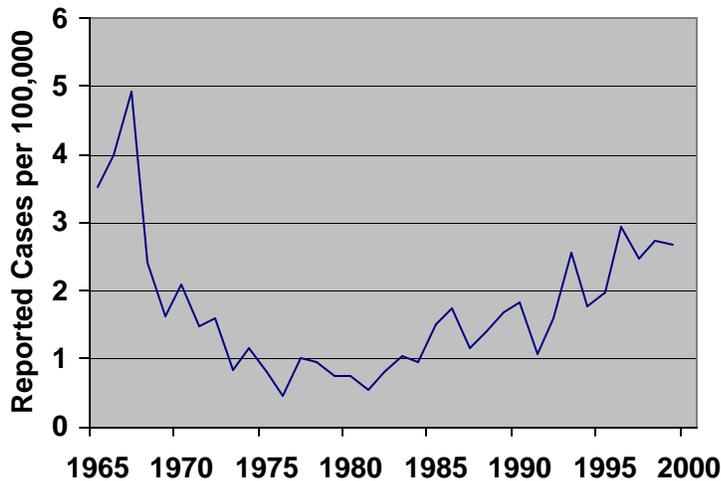
Antibiotic prophylaxis of all household and close contacts can be difficult. Many patients are not diagnosed until after they have passed their most infectious phase of the disease such that antibiotic prophylaxis of their contacts is no longer indicated. In addition, it is difficult to obtain full compliance with two weeks of erythromycin prophylaxis at doses up to two grams a day.

Finally, many health care providers do not consider pertussis as a diagnosis for persons of any age with otherwise unexplained severe cough. Frequently, adult patients and their health care providers express certainty that pertussis is not a likely diagnosis because of the patient's age, the absence of the characteristic "whooping" noise during their coughing fits, or prior vaccination.

The Changing Epidemiology of Pertussis in Texas

In the United States, pertussis incidence decreased from the 1940s, when the pertussis vaccine became widely available, until the mid-1970s. However, since then a general increase in incidence has occurred (figure 1). Pertussis is the only vaccine-preventable disease in which such a trend occurs.

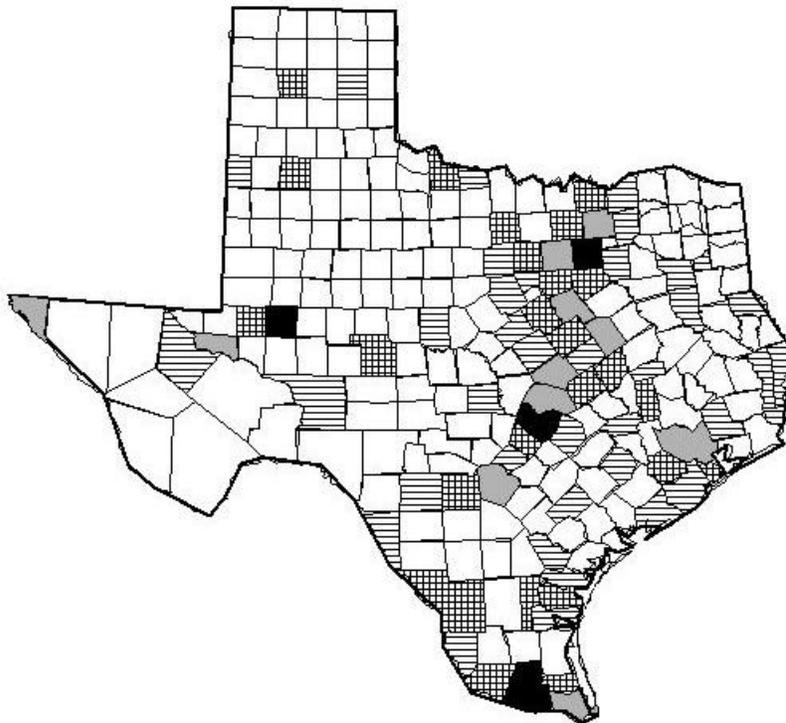
Figure 1. Reported cases of pertussis per 100,000 by year in the United States, 1965-2000. The incidence has generally been increasing since the mid-1970s.



The number of confirmed and probable cases of pertussis reported to the Texas Department of Health for 2001 is 615. This is the largest number of cases reported in Texas since 1968. The majority of reports came from fewer than twenty of the 254 counties in Texas (figure 2). In 1999 and 2000 there were 152 and 327 cases reported respectively. Over the past nine years, there has been a steady increase in the number of reported cases, building with each three-year cycle (figure 3).

A leading hypothesis for these upward trends is that natural, longer lasting immunity (which resulted from widespread childhood infection in the pre-vaccine era), has been replaced by <12 years of artificial immunity provided by the vaccine. This may also explain a shift to a greater proportion of cases occurring in adolescents and adults (in spite of their vaccination status).

Figure 2. Confirmed and probable cases reported in Texas by county for 2001



-  >30 cases (Dallas, Hidalgo, Midland, Travis)
-  10-30 cases (Bell, Bexar, Cameron, Collin, El Paso, Harris, Hill, Limestone, Tarrant, Ward, Williamson)
-  3-9 cases (Bosque, Denton, Ector, Ellis, Fort Bend, Galveston, Grayson, Grimes, Hale, Hays, Jack, Jim Wells, Johnson, McLennan, Medina, Milam, Nueces, Parker, Potter, Robertson, Starr, Tom Green, Webb, Wilbarger, Willacy)
-  1-2 cases (Bailey, Bastrop, Bee, Brazoria, Brown, Cherokee, Colorado, Comal, Coryell, Crockett, Dewitt, Erath, Falls, Fannin, Gray, Gregg, Hamilton, Hood, Hunt, Jasper, Kaufman, Kleberg, Liberty, Llano, Madison, Matagorda, Maverick, Newton, Orange, Palo Pinto, Reeves, San Patricio, Shelby, Smith, Uvalde, Washington, Wichita, Zapata)

Figure 3. Confirmed and probable cases reported in Texas from 1993 – 2001

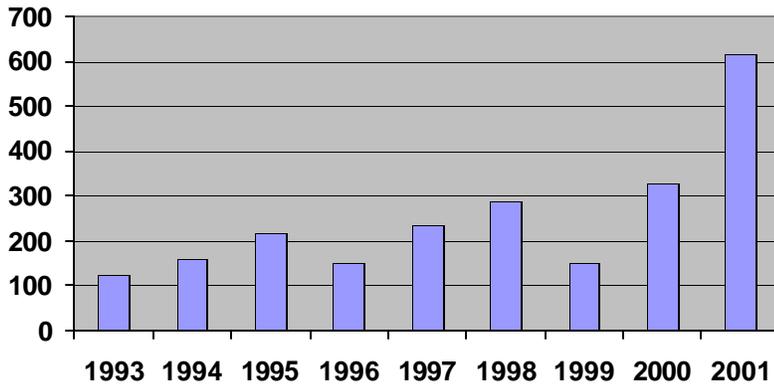
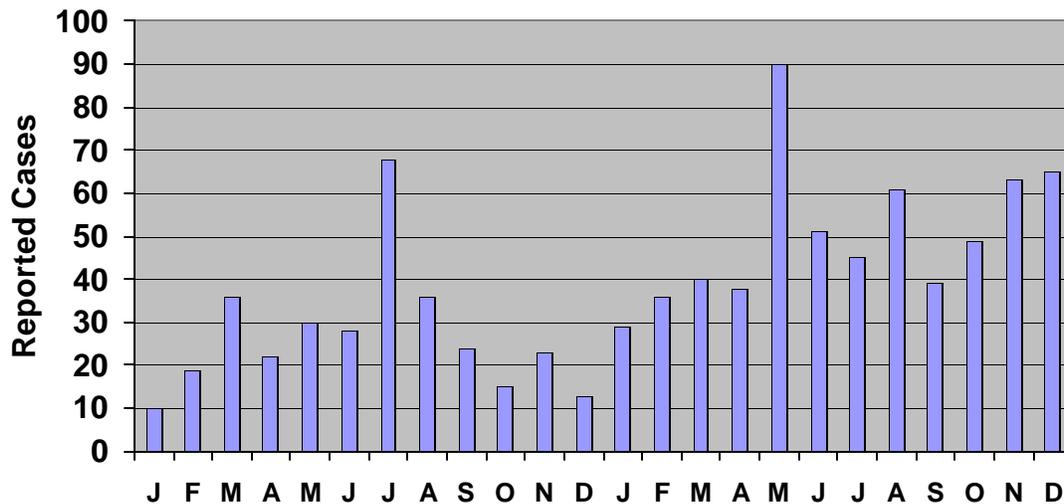


Figure 4. Pertussis in Texas by month of onset for 2000-2001



Infants, adolescents, and adults accounted for the majority of cases in 2001 (table 1). Because infants are more likely to have severe complications and be hospitalized, a greater percent of infant cases are identified and reported. Many adult cases are identified as contacts of a confirmed infant case. Middle and high schools are a significant source of pertussis reporting for adolescent cases.

In 2001, laboratory confirmation by culture or PCR was most successful in infants and least successful in adults (table 2). However, laboratory confirmation was rarely attempted for adults because recognition of their illness often occurred >3 weeks after their onset of symptoms. Serological testing is not performed in Texas at this time.

Table 1. Age distribution of cases of pertussis in 2001, Texas

Age Group	Cases	Percent
0-11 months	210	34
1-4	59	10
5-9	44	7
10-14	95	15
15-19	46	8
20+	159	26

Table 2. Percentage of laboratory confirmed cases of pertussis by age in 2001, Texas.

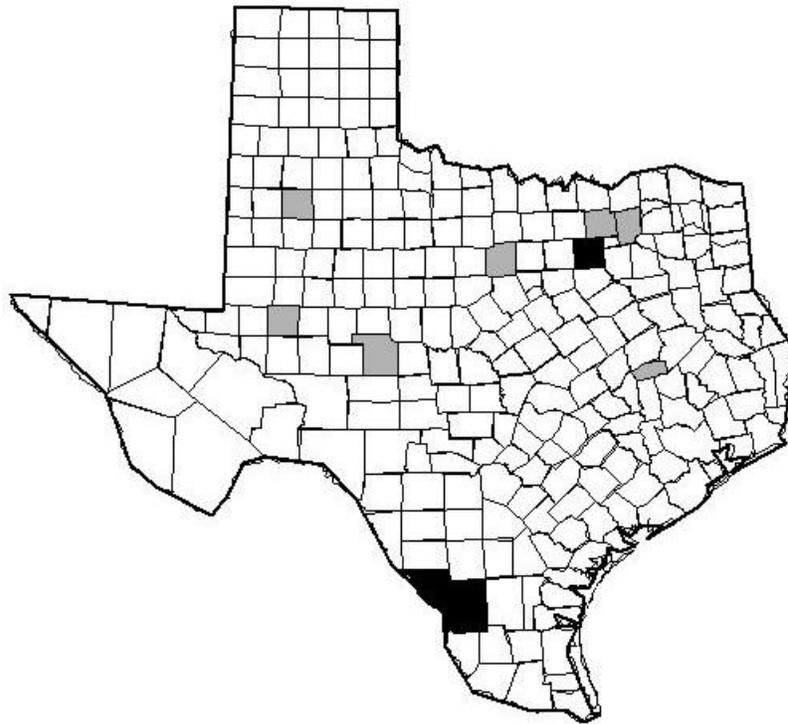
Age Group	Laboratory confirmed cases	Percentage of total in age group
0-11 months	119	57
1-4	8	14
5-9	0	0
10-14	3	3
15-19	4	9
20+	3	2

Included in the 615 cases reported thus far for 2001 are 5 infant deaths (figure 5). Three infant deaths have been reported for 2002, including one set of twins. One infant death was reported in 1999, and two infant deaths were reported for 2000. Ten of the eleven infants who died are Hispanic. In most of these cases, symptomatic close contacts were identified, and often included adult or adolescent household members with onset prior to the infant. Although the incidence for all infants is high, there has been a dramatic increase in pertussis incidence for Hispanic infants since 1999 (table 3).

Table 3. Incidence per 100,000 of pertussis for infants <1 year of age by race/ethnicity in Texas 1999-2001.

Race/Ethnicity	Incidence		
	1999	2000	2001
White	24.3	30.0	34.4
Black	27.1	54.1	48.3
Hispanic	22.3	65.8	83.0
All	24.9	49.3	59.8

Figure 5. Location by county of infant deaths related to pertussis, 1999 - April, 2002



- 2 Infant Deaths (Dallas, Webb)
- 1 Infant Death (Collin, Hunt, Lubbock, Midland, Madison, Palo Pinto, Tom Green)

Changes in reporting practices may account for some of the increase in reported cases, but corresponding increases in infant deaths and the number of laboratory-confirmed and hospitalized cases provide strong evidence of a resurgence of pertussis in communities across Texas. It is also important to remember that most diseases are under-reported. There are almost certainly areas of Texas with higher levels of pertussis morbidity than might be suggested by reporting data. Through education of public health professionals, physicians, hospital personnel, and school officials, more cases of pertussis will be identified in the future. The success of these educational efforts will be measured by a reduction in the number of deaths and hospitalizations, an increased percentage of laboratory confirmed cases, a reduction in the number of secondary or contact cases, and ultimately a decrease in the number of pertussis cases reported for Texas.

Pertussis Outbreak Kit Materials List

Item	TDH Stock Number	Electronic File	Description
Pertussis Fact Sheet—English/Spanish	11-11424	√	Targeted at general public for general use and as attachment to school letters, etc. Reading level 7 th to 8 th grade.
School Parent Notification Letter—English/Spanish	11-11452	√	Targeted at parents with children attending school with reported cases of pertussis. Reading level 7 th to 8 th grade.
Physician Letter	NA	√	Used to inform physicians of community outbreaks.
Pertussis Press Release	NA	√	Example press release with key points.
Pertussis Collection Kit Instructions	NA	√	Detailed instructions on how to take specimen and submit it for testing.
Pertussis Collection Kit Form	NA	√	Example form to be used if the provider does not already have a G-1a.
Pertussis Testing	NA	√	Similar to instructions handout but emphasizes interpretation of laboratory tests. Designed as an attachment to physician letter.
Pertussis Sound File 1	NA	√	
Pertussis Sound File 2	NA	√	
Pertussis Sound File 3	NA	√	
Resources on the Internet	NA	√	Links to helpful sites on the internet.
Conquering Pertussis Slideshow	NA	√	Slideshow to inform and educate medical professionals about pertussis.
Pertussis Surveillance Training Slideshow	NA	√	Slideshow to inform and educate public health professional about pertussis and pertussis surveillance.
MMWR Article	NA		Article on national pertussis trends.
DPN Article	NA		Article on pertussis in Texas.
Uphshotcopies	NA	√	Several articles focusing on pertussis in Texas.

NOTE: Whenever using pictures or sound files, please give proper credit to source. Sources for both the pictures and sound files are included in the slide shows.

Pertussis Articles

MMWR

“Pertussis - United States 1997 – 2000”, 2/1/02, p 73 - 76 (print 1 – 4)
<http://www.cdc.gov/mmwr/PDF/wk/mm5104.pdf>

DPN

“Pertussis in Texas”, 6/30/01, p 1-5
<http://www.tdh.state.tx.us/phpep/dpn/issues/dpn61n16.pdf>

Upshot

1. “One Family’s Battle with Pertussis”, Fall 2001 -
<http://www.tdh.state.tx.us/immunize/uparch/f01fampe.htm>
2. “Battle to Control Pertussis Outbreak”, Summer 2001 -
<http://www.tdh.state.tx.us/immunize/uparch/s01outbk.htm>
3. “Dallas Area Pertussis Outbreak” -
<http://www.tdh.state.tx.us/immunize/uparch/sp00pert.htm>
4. “Pertussis Spreading Throughout Texas” -
<http://www.tdh.state.tx.us/immunize/uparch/f00pertx.htm>

Surveillance Guidelines

TDH

TDH *Vaccine-Preventable Disease Surveillance Guidelines*,
see Pertussis Chapter updated 2/21/02 -
<http://www.tdh.state.tx.us/immunize/docs/guide2000.pdf>

CDC

CDC *Guidelines for the Control of Pertussis Outbreaks* -
<http://www.cdc.gov/nip/publications/pertussis/guide.htm>

Websites

1. Dr J's Whooping Cough Information - <http://www.whoopingcough.net/index.html>
2. Washington State Health Department Pertussis Monograph -
<http://www.doh.wa.gov/Publicat/pertussi.pdf>
3. *Pertussis*, University of Wisconsin-Madison Bacteriology Department -
<http://www.bact.wisc.edu/Bact330/lecturebpertussis>