

Notification Timeline:

From Lab/Practitioner to Public Health: Immediate.

From Public Health to Ministry of Health: Within 2 weeks.

Public Health Follow-up Timeline: Immediate.

Public Health Purpose for Notification of Pertussis (adapted from British Columbia Center for Disease Control [2017])

- To minimize mortality and serious morbidity from pertussis in young children through contact tracing;
- To track epidemiology trends of pertussis in Saskatchewan including risk factors and distribution;
- To identify locations where increased transmission of pertussis may be occurring in order to inform other interventions;
- To monitor the effectiveness of prevention and control measures;
- To plan expansion or introduction of future immunization programs;
- To provide timely clinical care including diagnosis and treatment using current, evidence-based guidelines;
- To make timely and evidence informed actions on outbreaks; and
- To inform the public and medical community about pertussis.

Surveillance Case Definition¹ (Public Health Agency of Canada, May 2008)

Confirmed Case	<p>Laboratory confirmation of infection:</p> <ul style="list-style-type: none"> • isolation of <i>Bordetella pertussis</i> (e.g. from a culture) from an appropriate clinical specimen <p>OR</p> <ul style="list-style-type: none"> • detection of <i>B. pertussis</i> DNA (e.g NAAT or PCR) from an appropriate clinical specimen AND one or more of the following: <ul style="list-style-type: none"> ○ cough lasting 2 weeks or longer ○ paroxysmal cough of any duration ○ cough with inspiratory "whoop" ○ cough ending in vomiting or gagging, or associated with apnea. <p>OR</p>
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¹ Surveillance case definitions ensure uniform reporting to allow comparability of surveillance data. The definition is not intended to be used for clinical or laboratory diagnosis or management of cases.

	Epidemiologic link to a laboratory-confirmed case AND one or more of the following for which there is no other known cause: <ul style="list-style-type: none"> ○ paroxysmal cough of any duration ○ cough with inspiratory "whoop" ○ cough ending in vomiting or gagging, or associated with apnea.
Probable Case	Cough lasting 2 weeks or longer in the absence of appropriate laboratory tests and not epidemiologically linked to a laboratory-confirmed case AND one or more of the following, with no other known cause: <ul style="list-style-type: none"> ● paroxysmal cough of any duration ● cough with inspiratory "whoop" ● cough ending in vomiting or gagging, or associated with apnea.
Suspect Case	One or more of the following, with no other known cause: <ul style="list-style-type: none"> ● paroxysmal cough of any duration ● cough with inspiratory "whoop" ● cough ending in vomiting or gagging, or associated with apnea.
Public health follow-up of probable and suspect cases should be considered based on the epidemiology of pertussis in the community and the involvement of vulnerable populations.	

Epidemiology and Occurrence

Pertussis is a cyclical disease which peaks at 4 to 5 year intervals (see Figure 1).

Infants are the most vulnerable and are often infected by older siblings, parents or caregivers. Figure 2 shows the rates of pertussis in infants relative to children 1-19 years of age.

- An adolescent pertussis vaccine (Tdap) was introduced to students in Grade 8 in 2003. This widened the gap in the rate of illness in these age groups; the gap was narrowed following the implementation of a Tdap program for all adults in 2010, especially parents and caregivers of infants, in an effort to reduce the risk to these vulnerable infants.
- In October 2017, it was recommended that all pregnant women be offered Tdap in the third trimester irrespective of prior Tdap receipt.
- The waning of immunity conferred by pertussis vaccine in infancy was reflected in an increase of incidence in 2015 to 2017, mainly among the 10-14 year old cohort.

Figure 1: Rates of Pertussis disease showing its cyclical nature, 1990 - 2017

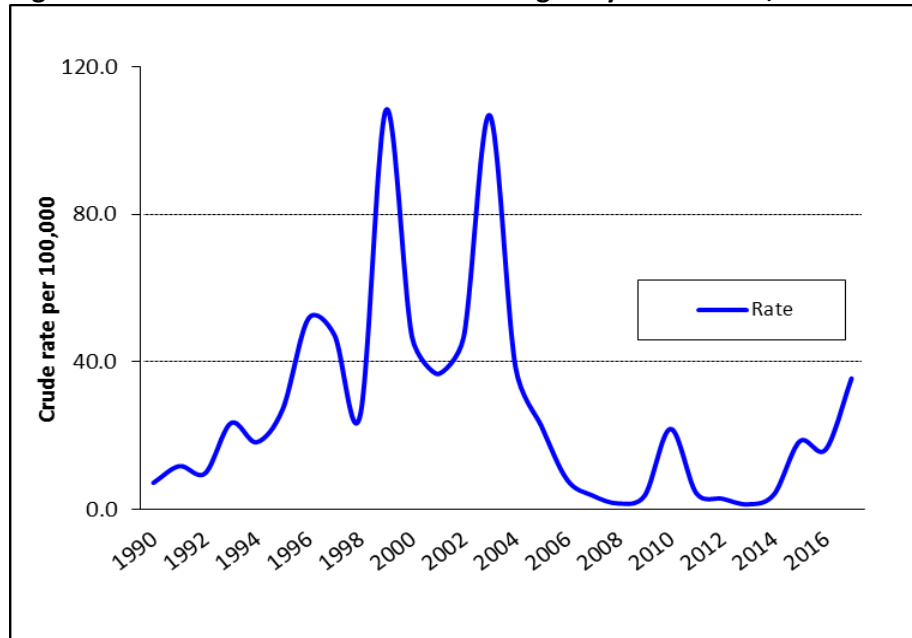
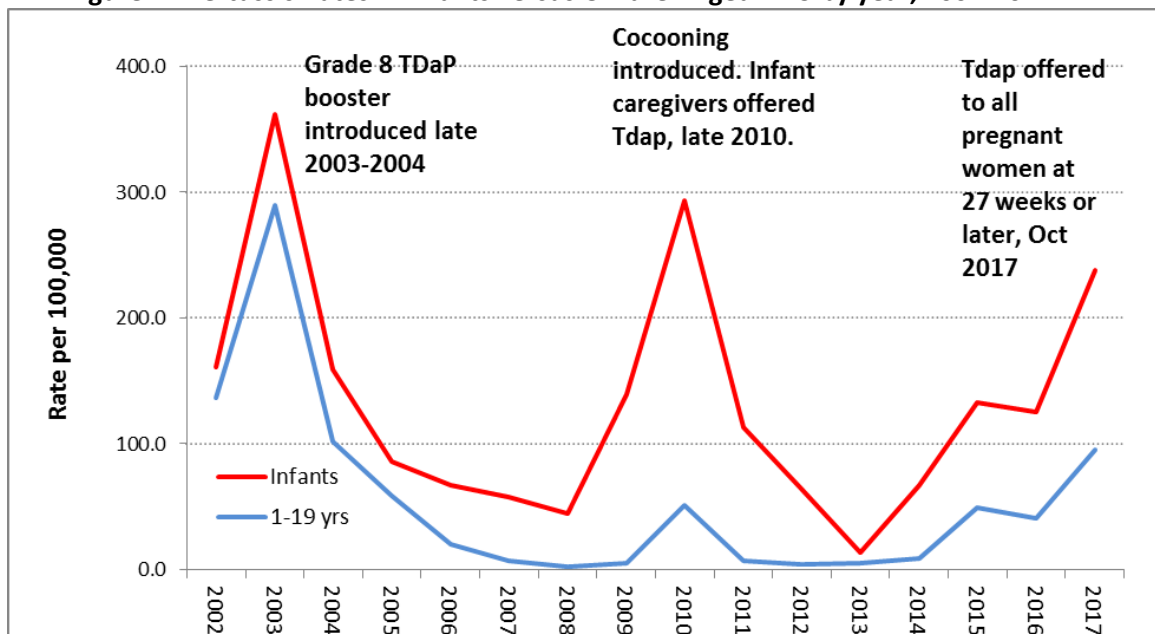


Figure 2: Pertussis Rates in Infants versus Children Aged 1-19 by year, 2002-2017



Additional Background Information

Causative Agent

Bordetella pertussis.

Symptoms

Catarrhal Stage: starts with mild respiratory symptoms of cough, rhinorrhea and possible fever.

Paroxysmal Stage: paroxysms of cough characterized by inspiratory whoop and vomiting after cough.

Convalescent Stage: gradual recovery with cough lasting 1-2 months or longer.

Infants less than 6 months can have an atypical presentation with short catarrhal stage, gagging, gasping or apnea as prominent early manifestations, absence of whoop and prolonged convalescence.

Complications among infants include pneumonia, seizures, encephalopathy and death. Complications in adolescents and adults include syncope, sleep disturbance, incontinence, rib fracture and pneumonia.

Reservoir/Source

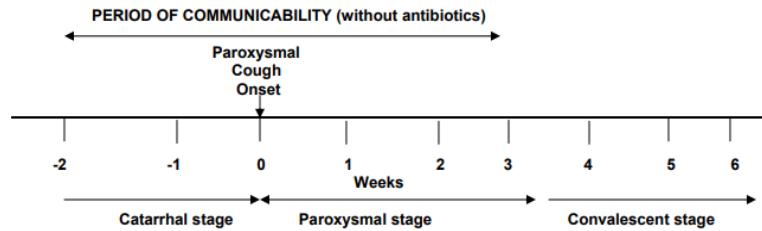
Humans.

Incubation Period

6-20 days (average 9-10 days).

Period of Communicability

- Highly communicable in the early catarrhal stage and the beginning of the paroxysmal stage (first 2 weeks).
- Communicability decreases after the catarrhal and paroxysmal stages and becomes negligible 3 weeks after onset of symptoms.
- Case is no longer contagious after completing 5 days of treatment.



Mode of Transmission

Person-to-person by direct contact with discharges from respiratory secretions via aerosolized droplet.

Specimen Collection and Transport

Nasopharyngeal swab in Regan Lowe transport medium. See the Saskatchewan Disease Control Laboratory Compendium for further details at <https://rrpl-testviewer.ehealthsask.ca/>

Public Health Investigation

I. Case

Refer to [Attachment – Pertussis Data Collection Worksheet](#) to assist.

History

- Key elements to inquire about include:
 - Immunization history of case.
 - Onset of illness and treatment (with what and when) – to determine incubation period and period of communicability which helps to identify the possible source and contacts to be followed.
 - Travel history may be of significance in contact tracing.
 - Underlying medical conditions and severity of illness (e.g. if hospitalization was required).
 - Current health status of household contacts (are contacts symptomatic?).
 - Identify contacts (refer to [Table 2 – Definitions of Contacts](#)) paying particular attention to vulnerable contacts (infants and women in the third trimester).
 - Occupational considerations exist for health care settings – see [Special Considerations for Cases and Contacts in the Health Care Setting](#)

Public Health Interventions

Assessment

- Assess for contacts paying particular attention to vulnerable contacts as per Table 2.

Communication

- Letters can be sent to classrooms and other group settings where individual contact tracing is not required (i.e. involving school age and adults where there are no vulnerable contacts) to inform them of the exposure, symptom monitoring and when to seek medical attention (see Sample letter).

Education

- All cases should be provided disease information as well as information on prevention and control measures including period of communicability and avoiding contact with vulnerable individuals.

Exclusion

- There is limited evidence supporting the use of exclusion; by the time a person is diagnosed with pertussis, they have likely exposed most of their contacts. Therefore **exclusion is no longer recommended in most situations**; however the consensus was to use exclusion if there are vulnerable individuals involved (see [Table 2 – Definitions of Contacts](#)).
 1. **Cases** should be excluded from school or daycare/preschool **where there are vulnerable persons, for 5 days** after they start the medication, or 21 days from onset of cough if untreated. If there are no vulnerable persons in the school or day care, the case can return to school or daycare/preschool as soon as he/she feels well enough to do so.
 2. **Adult cases** who have **close contact with vulnerable persons at work** should be excluded from work **for 5 days** after they start the medications, or 21 days from onset of cough if untreated. If there are no vulnerable persons in the workplace, the case can return to work as soon as he/she feels well enough to do so.
- When exclusion is recommended, it should continue for 5 days after they start the appropriate medication, or 21 days from onset of cough if untreated or until test results come back negative for pertussis.
- Exclusion is **not recommended in most other situations** as there is limited evidence to support it since a person who has been diagnosed with pertussis may have likely exposed most of their contacts. Please refer to [Special Considerations for Cases and Contacts in the Health Care Setting](#) below for additional recommendations.

Immunization

- Case follow-up should be used as an opportunity to recommend immunizations they are eligible for as per the Saskatchewan Immunization Manual. Infants and children who have recovered from pertussis should complete their pertussis immunization series, as natural infection does not confer life-long immunity (American Academy of Pediatrics, 2015).

Treatment

- Treatment recommendations have been summarized in [Attachment – Pertussis Treatment and Chemoprophylaxis Guidelines](#).

Who Should be Treated

Treatment is recommended for all individuals that are laboratory confirmed, clinically diagnosed and epidemiologically linked to another case, or probable cases (clinically diagnosed) during an outbreak.

1. **All cases** – laboratory confirmed **OR** clinically diagnosed and epidemiologically linked to another case **OR** clinically diagnosed during an outbreak.
2. **All symptomatic household contacts** – the assumption is that these symptomatic people will also have pertussis. *Sometimes symptomatic household contacts may be reluctant to take antibiotics without a confirmed diagnosis. If there are no vulnerable persons in the household, it is acceptable to wait for results of testing.*
3. All other community contacts who are symptomatic should **not** be assumed to have pertussis unless clinical symptoms are very predictive, but should be assessed, tested and treated appropriately.

II. Contacts/Contact Investigation

Close Contact	<ul style="list-style-type: none"> Individuals that have shared respiratory secretions (e.g., kissing) or shared the same confined air space for more than an hour, or have had face-to-face exposure for more than 5 minutes.
Vulnerable Contact	<ul style="list-style-type: none"> Children less than 1 year of age, because they have a higher rate of mortality from pertussis infection. Pregnant women in the third trimester, because if infectious at the time of birth they may pass the infection to their newborn.
Household Contact	<ul style="list-style-type: none"> Household contact is living in the same household as the case including family² day care setting.
Occupational Contact	<ul style="list-style-type: none"> Contact of Health Care Workers (HCW's) oral or nasal mucosa with infected secretions from the pertussis case. OR Sharing the same confined air space (within 2 metres) for more than an hour with the pertussis case, without implementing droplet precautions. OR Having had face-to-face exposure for more than 5 minutes with a pertussis case without implementing droplet precautions.

Public Health Interventions

Assessment

- Assess for symptoms.
- Assess for vulnerable individuals in their household. Recommend chemoprophylaxis as appropriate.

Communication

- Individual follow-up of contacts in larger daycares, classrooms, schools, teams, workplaces, etc., is generally not recommended. These individuals should be informed by letter from public health, advising them to see their physician if they develop symptoms. These persons, if they become symptomatic, should not be assumed to have pertussis but should be assessed, tested and treated appropriately.

² Family day care refers to day cares that are run out of an individual's home to a limited number of children (*The Child Care Act, 2003*).

Education

- All contacts should be provided disease information on symptom monitoring, prevention and control measures including avoiding contact with vulnerable individuals.

Exclusion

- **Symptomatic family daycare contacts** should be excluded from **daycare where there are vulnerable persons**, until they have completed 5 days of appropriate antibiotic or until test results come back negative for pertussis. In other words, if there are no vulnerable persons in the family day care, the symptomatic day care contact can return to day care as soon as he or she feels well enough to do so.
- **Symptomatic contacts** (non-household, non family-daycare) who have been assessed and tested but are not being treated until the test results are back, do not need to be excluded. They should be asked to **avoid close contact with vulnerable persons** until their diagnosis is established.

Immunization

- Immunization status of exposed individuals should be reviewed. Priority should be given to infants, children, and pregnant women in their third trimester.
- Accelerated immunization with the first dose at 6 weeks of age and the second and third doses using minimum intervals may be indicated in case of an outbreak in a defined community. See *Saskatchewan Immunization Manual*³ and discuss with Medical Health Officer.
- Immunizations should be completed for those whose schedules are incomplete.

Testing

- Non-immediate household and non-family day care contacts who are symptomatic should be assessed, tested and treated as appropriate.

³ <http://www.ehealthsask.ca/services/manuals/Pages/SIM.aspx>.

Chemoprophylaxis

Chemoprophylaxis efficacy is related to early implementation and is **unlikely to be of benefit after 21 days** has elapsed since the first contact with a case. **Prophylaxis is generally not recommended for contacts in larger daycares, classrooms, schools, teams, workplaces, etc.** Contacts will be informed, usually by letter from public health, and advised to see their physician/nurse practitioner if they develop symptoms. The letter will inform these contacts that if they become symptomatic they should be assessed, tested and treated appropriately.

- See [Attachment – Pertussis Treatment and Chemoprophylaxis Guidelines](#).
- Chemoprophylaxis should be offered to the following contacts:
 1. **All symptomatic immediate household contacts** – persons in a family day care setting are considered immediate household contacts. The assumption is that these symptomatic people will also have pertussis.
 2. **Symptomatic vulnerable persons** who have had “close contact” with a case should be started on antibiotics until their diagnosis is established.
 3. **Asymptomatic immediate household contacts**, including family-daycare attendees, where there is a vulnerable person in the household. The vulnerable person being ill does not eliminate the need for chemoprophylaxis of household contacts.
 4. Outside of the immediate household or family day care, offer prophylaxis only **to asymptomatic vulnerable persons** who have had “close contact” with a case.
 5. **Non immediate-household and non family-daycare contacts who are symptomatic** should **not** be assumed to have pertussis unless clinical symptoms are very predictive, but should be assessed, tested and treated appropriately.
- Chemoprophylaxis efficacy is related to early implementation and is unlikely to be of benefit after 21 days has elapsed since the first contact with a case.
- Chemoprophylaxis for all people in larger daycares, classrooms, schools, teams, workplaces, etc., is generally not recommended. These individuals should be informed by letter from public health, advising them to see their physician if they develop symptoms. These persons, if they become symptomatic, should not be assumed to have pertussis but should be assessed, tested and treated appropriately.

Special Consideration for Cases and Contacts in the Health Care Setting

(Ontario Hospital Association, 2015)

Collaboration with Occupational Health/Employee Health is important in appropriate management of health care workers (HCWs). HCWs who do not provide direct patient care, such as housekeeping staff, may be managed as in the community setting. HCWs who do not provide direct patient care, such as housekeeping staff, may be managed as in the community setting. Community contacts who are health care workers should be managed as outlined below.

Prevention is always the primary goal and HCWs should protect themselves and their patients by being vaccinated as per the *Saskatchewan Immunization Manual*⁴ – Chapter 7: Immunization of Special Populations, Section 3.2 Health Care Workers. Status of vaccination with Tdap (tetanus, diphtheria, and acellular pertussis vaccine) should be evaluated for all [HCW contacts](#).

The most effective control of transmission of pertussis in hospital settings includes isolation of the suspected or known case and use of droplet precautions. In addition, the following outlines appropriate management:

Management of Health Care Workers

1. HCWs who are considered **vulnerable contacts**⁵ should be offered chemoprophylaxis.
2. HCWs who are **confirmed cases** of pertussis:
 - Should be referred for appropriate antibiotic treatment.
 - Should be excluded from work until after 5 days of treatment or for 21 days from onset of cough if untreated.

⁴ <http://www.ehealthsask.ca/services/manuals/Pages/SIM.aspx>.

⁵ HCW vulnerable or high risk contacts include:

- pregnant women in their third trimester,
- household contact of infants under 12 months of age or a woman who is in her third trimester of pregnancy; OR
- who may expose these vulnerable patient populations (e.g. hospitalized infants or pregnant women).

-
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3. HCWs who are **symptomatic contacts** to pertussis case:
 - Should be referred for clinical management, which should include laboratory investigation (nasopharyngeal swab) and appropriate antibiotic treatment.
 - Should be excluded from work until after 5 days of treatment **or** for 21 days from onset of cough if untreated, **or** until swab comes back negative for pertussis. A surgical mask is not sufficient for protection of patients and other staff.
 4. HCWs who are **asymptomatic contacts** to pertussis case:
 - Should be given chemoprophylaxis with an appropriate antibiotic if they are **vulnerable or work or live with a vulnerable contact(s)** (American Academy of Pediatrics, 2015).
 - Should be advised of early symptoms of pertussis and be put under surveillance by their employee health nurse.
 - Report development of symptoms to Occupational Health and Safety/Employee Health Department for an individual assessment.
 - Those with no history of an adult dose of Tdap vaccine should be given vaccine.
 - Exclusion of asymptomatic contacts is not indicated.

III. Environment

Child Care Centre/Schools Control Measures

Strict enforcement of infection control measures. Refer to the *Infection Control Manual for Child Care Facilities*.⁶ Notification of parents of children in either of these settings where a case has occurred is important. This can be accomplished via a letter sent through the school or daycare.

Chemoprophylaxis for all people in larger daycares, classrooms, schools, teams, workplaces, etc., is generally not recommended. They should be informed by letter from public health, and advised to see their physician if they develop symptoms. Review immunization histories of childcare attendees.

Health Facilities Control Measures

Strict enforcement of infection control measures. Refer to the Health Authority Infection Control Manual. Refer to [Special Considerations for Cases and Contacts in the Health Care Setting](#) for additional information.

⁶ <http://publications.gov.sk.ca/documents/13/105320-infection-control-manual-child-care-centres.pdf>

IV. Epidemic Measures

- Enhanced surveillance including details about immunization history of case and household contacts.
- Accelerated immunization with the first dose at 6 weeks of age and the second and third doses at 4 week intervals may be indicated at a community level.
- Immunizations should be completed for those whose schedule is incomplete.
- Additional measures may be instituted by the medical health officer to help contain the outbreak.
- As of October 2017, an enhanced outbreak measure is to provide pregnant women at 27 weeks gestation or later, irrespective of prior Tdap receipt, an additional dose of Tdap to offer protection to their newborn until they are eligible to be vaccinated.

Prevention Measures

Refer to the [Respiratory and Direct Contact Introduction and General Considerations](#) section of the manual that highlights topics for client education that should be considered as well as provides information on high-risk groups and activities.

Immunization

Immunize infants, children, pregnant women and adults according to the recommendations in the *Saskatchewan Immunization Manual*.

Education

- Education should be provided regarding respiratory etiquette and measures to prevent transmission of pertussis by practising good hand hygiene and not sharing drinking glasses or utensils.
- Educate the public about the disease and the need for active immunization. Immunization information fact sheets can be used to guide discussion.

Revisions

Date	Change
November 2018	<ul style="list-style-type: none"> • Clarified which HCW require chemoprophylaxis.
September 2018	<ul style="list-style-type: none"> • Updated to align with Panorama configuration. • Updated Epidemiology and Occurrence section with 2017 data. • Incorporated incubation and communicability graphic. • Updated Special Considerations for Cases and Contacts in the Health Care Setting based on Ontario Hospital Association 2017 updates. • Updated purpose for notification based on BCCDC objectives of surveillance (2017).
September 2017	<ul style="list-style-type: none"> • Clarified the purpose for notification of cases to public health. • Incorporated an Epidemiology and Occurrence section to the chapter indicating timeframes of when changes were made to pertussis immunization program. • Incorporated reference regarding when public health management should be considered for probable and suspect cases. • Incorporated reference to outbreak measure of enhanced immunization of pregnant women in 3rd trimester. • Incorporated clarification on the use of chemoprophylaxis for health care workers. • Rearranged and updated the style into the new format of the Manual. • References reaffirmed or updated as necessary.

References

American Academy of Pediatrics. (2015). *Red book: 2015 Report of the Committee on Infectious Diseases* (30th ed.). Elk Grove Village, IL: Author.

British Columbia Centre for Disease Control (2017). Objectives of surveillance. BCCDC.

Government of Saskatchewan. (2003). *The Child Care Act*. Regina, SK: Queens Printer Saskatchewan.

Ontario Hospital Association. (2017). *Pertussis surveillance protocol for Ontario hospitals*. Retrieved August, 2018 from [https://www.oha.com/Documents/Pertussis%20Protocol%20October%202017%20\(Iast%20reviewed%20and%20revised%20on%20October%202017\).pdf](https://www.oha.com/Documents/Pertussis%20Protocol%20October%202017%20(Iast%20reviewed%20and%20revised%20on%20October%202017).pdf).

Public Health Agency of Canada. (2002). Infection control guidelines: Prevention and control of occupational infections in health care. *Canada Communicable Disease Report (CCDR), 28S1*, March 2002. Retrieved May, 2018 from <http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/02pdf/28s1e.pdf>.

Public Health Agency of Canada. (2003). National consensus conference on pertussis. *Canada Communicable Disease Report (CCDR), 29S3*, April 2003.

Public Health Agency of Canada. (2008). Case definitions for communicable diseases under national surveillance. *Canada Communicable Disease Report (CCDR), 35S2*, November 2009. Retrieved September, 2017 from http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/09vol35/35s2/Pertus_Coquel-eng.php.

Pertussis Data Collection Worksheet

Panorama QA complete: Yes No
 Initials: _____

Please complete all sections.

Panorama Client ID: _____
 Panorama Investigation ID: _____

A) CLIENT INFORMATION

LHN -> SUBJECT -> CLIENT DETAILS -> PERSONAL INFORMATION

Last Name:	First Name: and Middle Name:	Alternate Name (Goes by):
DOB: YYYY / MM / DD Age: _____	Health Card Province: _____ Health Card Number (PHN): _____	Preferred Communication Method: (specify - i.e. home phone, text): Email Address: <input type="checkbox"/> Work <input type="checkbox"/> Personal
Phone #: <input type="checkbox"/> Primary Home: <input type="checkbox"/> Mobile contact: <input type="checkbox"/> Workplace:		
Place of Employment/School:	Gender: <input type="checkbox"/> Male <input type="checkbox"/> Female <input type="checkbox"/> Other <input type="checkbox"/> Unknown	
Alternate Contact: _____ Relationship: _____ Alt. Contact phone: _____	Address Type: <input type="checkbox"/> No fixed <input type="checkbox"/> Postal Address <input type="checkbox"/> Primary Home <input type="checkbox"/> Temporary <input type="checkbox"/> Legal Land Description Mailing (Postal address): Street Address or FN Community (Primary Home): Address at time of infection if not the same:	

B) INVESTIGATION INFORMATION

LHN-> SUBJECT SUMMARY-> RESPIRATORY & DIRECT CONTACT ENCOUNTER GROUP->CREATE INVESTIGATION

Disease Summary Classification:	Date	Classification:	Date	LAB TEST INFORMATION:
CASE		CONTACT		Date specimen collected:
<input type="checkbox"/> Confirmed	YYYY / MM / DD	<input type="checkbox"/> Contact	YYYY / MM / DD	YYYY / MM / DD
<input type="checkbox"/> Does Not Meet Case	YYYY / MM / DD	<input type="checkbox"/> Not a Contact	YYYY / MM / DD	Specimen type:
<input type="checkbox"/> Person Under Investigation	YYYY / MM / DD	<input type="checkbox"/> Person Under Investigation	YYYY / MM / DD	<input type="checkbox"/> Nasopharyngeal
<input type="checkbox"/> Probable	YYYY / MM / DD			<input type="checkbox"/> Throat
<input type="checkbox"/> Suspect	YYYY / MM / DD			

Disposition:
 FOLLOW UP:

<input type="checkbox"/> In progress	YYYY / MM / DD	<input type="checkbox"/> Complete	YYYY / MM / DD
<input type="checkbox"/> Incomplete - Declined	YYYY / MM / DD	<input type="checkbox"/> Not required	YYYY / MM / DD
<input type="checkbox"/> Incomplete - Lost contact	YYYY / MM / DD	<input type="checkbox"/> Referred - Out of province	YYYY / MM / DD
<input type="checkbox"/> Incomplete - Unable to locate	YYYY / MM / DD	(specify where)	

REPORTING NOTIFICATION Name of Attending Physician or Nurse:	Location:
Physician/Nurse Phone number:	Date Received (Public Health): YYYY / MM / DD

Type of Reporting Source: Health Care Facility Lab Report Nurse Practitioner Physician Other _____

Pertussis Data Collection Worksheet

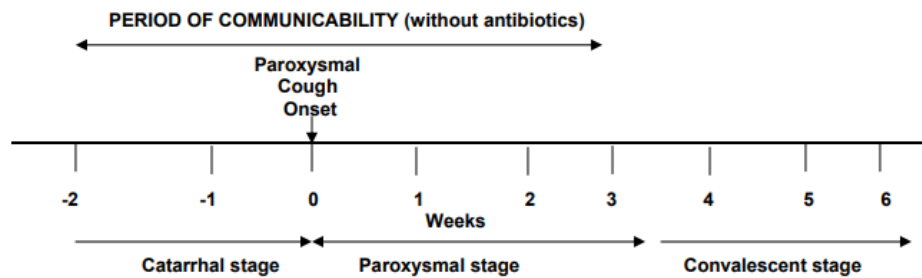
Please complete all sections.

Panorama Client ID: _____
Panorama Investigation ID: _____

C) SIGNS & SYMPTOMS *(Bold text = part of case definition)*

LHN-> INVESTIGATION->SIGNS & SYMPTOMS

Description	No	Yes - Date of onset	Description	No	Yes - Date of onset
Apnea		YYYY / MM / DD	Cough – paroxysmal		YYYY / MM / DD
Coryza or rhinitis		YYYY / MM / DD	Cough – with whoop		YYYY / MM / DD
Cough		YYYY / MM / DD	Cough > 2 weeks		YYYY / MM / DD
Cough – with apnea		YYYY / MM / DD	Gagging - infant		YYYY / MM / DD
Cough – with vomiting		YYYY / MM / DD	Gasping - infant		YYYY / MM / DD



D) INCUBATION AND COMMUNICABILITY

LHN-> INVESTIGATION->INCUBATION & COMMUNICABILITY

Incubation for Case (period for acquisition):	
Earliest Possible Exposure Date: YYYY / MM / DD	Latest Possible Exposure Date: YYYY / MM / DD
<i>Exposure Calculation details:</i>	
Communicability for Case (period for transmission):	
Earliest Possible Communicability Date: YYYY / MM / DD	Latest Possible Communicability Date: YYYY / MM / DD
<i>Communicability Calculation Details:</i>	

E) RISK FACTORS (RF followed by + impact the Immunization Forecaster)

LHN-> SUBJECT->RISK FACTORS

DESCRIPTION	Yes	N –No NA – not asked U - unknown	DESCRIPTION	Yes	N –No NA – not asked U - unknown
Special Population - Pregnancy	YYYY / MM / DD		Setting - Crowded living conditions (>1 person per room excluding bathrooms)		
Contact - Persons with similar symptoms	YYYY / MM / DD		Special Population - Lives in a communal setting		
Contact to a known case (Add'l Info)	YYYY / MM / DD		Travel - Outside of Canada (Add'l Info)	AE/TE YYYY / MM / DD	
Immunocompromised - Related to underlying disease or treatment			Travel - Outside of Saskatchewan, but within Canada (Add'l Info)	AE/TE YYYY / MM / DD	
Maternal Tdap not received between 27 weeks and 2 weeks prior to delivery <i>(For infant cases <1 year)</i>	YYYY / MM / DD				

Pertussis Data Collection Worksheet

Please complete all sections.

Panorama Client ID: _____
Panorama Investigation ID: _____

F) IMMUNIZATION HISTORY INTERPRETATION SUMMARY

LHN -> INVESTIGATION-> IMMUNIZATION HISTORY INTERPRETATION SUMMARY

Interpretation Date: YYYY / MM / DD	
Interpretation of Disease Immunity:	<input type="checkbox"/> IOM - Fully immunized (for age) <input type="checkbox"/> IOM - Partially immunized
<input type="checkbox"/> IOM – Unimmunized <input type="checkbox"/> IOM - Unclear immunization history	Valid doses received: ____ Doses needed: ____
Reason:	<input type="checkbox"/> IOM - Interpretation of history by investigator

G) TREATMENT

LHN -> INVESTIGATION-> MEDICATIONS->MEDICATIONS SUMMARY

Medication (<i>Panorama = Other Meds</i>): _____	
Prescribed by: _____	Started on: YYYY / MM / DD

H) INTERVENTION

LHN -> INVESTIGATION->TREATMENT & INTERVENTIONS->INTERVENTION SUMMARY

Intervention Type and Sub Type:				
Assessment:		Immunization:		
<input type="checkbox"/> Assessed for contacts (especially pregnant or < 1 year of age) YYYY / MM / DD Investigator name		<input type="checkbox"/> Eligible immunizations recommended YYYY / MM / DD <input type="checkbox"/> Disease-specific immunization recommended YYYY / MM / DD <input type="checkbox"/> Disease-specific immunization given YYYY / MM / DD Investigator name		
Other Investigation Findings:		Referral:		
<input type="checkbox"/> Investigator Notes <input type="checkbox"/> See Document Management		<input type="checkbox"/> Other (specify) _____ YYYY / MM / DD Investigator name		
Communication:		Testing:		
<input type="checkbox"/> Other communication (see Investigator Notes) YYYY / MM / DD Investigator name <input type="checkbox"/> Letter (See Document Management) YYYY / MM / DD Investigator name		<input type="checkbox"/> Laboratory testing recommended YYYY / MM / DD Investigator name		
General: Investigator name		Treatment:		
<input type="checkbox"/> Disease-Info/Prev-Control YYYY/ MM / DD <input type="checkbox"/> Disease-Info/Prev-Cont/Assess'd for Contacts YYYY/ MM / DD		<input type="checkbox"/> Treatment not recommended YYYY / MM / DD Investigator name		
Education/counseling: Investigator name				
<input type="checkbox"/> Prevention/Control measures YYYY / MM / DD <input type="checkbox"/> Disease information provided YYYY / MM / DD				
Exclusion: Investigator name				
<input type="checkbox"/> Daycare YYYY / MM / DD <input type="checkbox"/> School YYYY / MM / DD		<input type="checkbox"/> Preschool YYYY / MM / DD <input type="checkbox"/> Work YYYY / MM / DD		
Date	Intervention subtype	Comments	Next follow-up Date	Initials
YYYY/MM/DD			YYYY/MM/DD	
YYYY/MM/DD			YYYY/MM/DD	
YYYY/MM/DD			YYYY/MM/DD	
YYYY/MM/DD			YYYY/MM/DD	
YYYY/MM/DD			YYYY/MM/DD	
YYYY/MM/DD			YYYY/MM/DD	
YYYY/MM/DD			YYYY/MM/DD	
YYYY/MM/DD			YYYY/MM/DD	
YYYY/MM/DD			YYYY/MM/DD	

Pertussis Data Collection Worksheet

Please complete all sections.

Panorama Client ID: _____
Panorama Investigation ID: _____

I) OUTCOMES (required for infants <12 months)

LHN-> INVESTIGATION-> OUTCOMES

- | | | | | | |
|---|----------------|---|----------------|--|----------------|
| <input type="checkbox"/> Not yet recovered/recovering | YYYY / MM / DD | <input type="checkbox"/> ICU/intensive medical care | YYYY / MM / DD | <input type="checkbox"/> Hospitalization | YYYY / MM / DD |
| <input type="checkbox"/> Recovered | YYYY / MM / DD | <input type="checkbox"/> Intubation /ventilation | YYYY / MM / DD | <input type="checkbox"/> Unknown | YYYY / MM / DD |
| <input type="checkbox"/> Fatal | YYYY / MM / DD | <input type="checkbox"/> Other _____ | YYYY / MM / DD | | |

Cause of Death: (if Fatal was selected) _____

J) Transmission Events

LHN -> INVESTIGATION-> EXPOSURE SUMMARY -> TRANSMISSION EVENT SUMMARY -> QUICK ENTRY

Transmission Event ID	Exposure Name	Setting type	Date/Time	# of contacts
		<input type="checkbox"/> Congregate/Communal living <input type="checkbox"/> Health Care setting <input type="checkbox"/> Type of community contact <input type="checkbox"/> Household Exposure		
		<input type="checkbox"/> Congregate/Communal living <input type="checkbox"/> Health Care setting <input type="checkbox"/> Type of community contact <input type="checkbox"/> Household Exposure		
		<input type="checkbox"/> Congregate/Communal living <input type="checkbox"/> Health Care setting <input type="checkbox"/> Type of community contact <input type="checkbox"/> Household Exposure		
	Pertussis Contacts – Inv ID# _____	<input type="checkbox"/> Multiple Settings	YYYY / MM / DD to YYYY / MM / DD	

K) TOTAL NUMBER OF CONTACTS

LHN -> INVESTIGATION-> EXPOSURE SUMMARY -> TRANSMISSION EVENT SUMMARY -> TE HYPERLINK -> UNKNOWN/ANONYMOUS CONTACTS

Anonymous contacts: _____ (total number of individuals [including groups that do not require 1:1 follow-up])

Initial Report completed by:		Date initial report completed: YYYY / MMM / DD
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Pertussis

Attachment – Pertussis Investigation Form and Follow-Up

Date Reviewed: May, 2015

Section: 2-140
Page 1 of 6

Please see the following pages for the Pertussis Investigation Form and Follow-Up.

Pertussis Investigation

Confirmed Date: _____ Interview Date: _____
 iPHIS done Date: _____ Onset Date: _____
 Diagnosis: _____ Spec. Site: _____
 Subtype: _____ Spec. Date: _____

Name: _____ Phone (Home): _____ Phone (Work): _____
 Address: _____ DOB: _____ Age: _____
 Sex: M F HSN: _____ Parent's Name (if applicable): _____
 Occupation/School: _____ Date last attended: _____
(if student, name school, grade)

History of Illness (Signs and Symptoms): Include date of onset.

Yes	No	Signs and Symptoms	Date of Onset	Ongoing (Y/N)
<input type="checkbox"/>	<input type="checkbox"/>	Fever		
<input type="checkbox"/>	<input type="checkbox"/>	Runny Nose		
<input type="checkbox"/>	<input type="checkbox"/>	Cough – Dry irritating		
<input type="checkbox"/>	<input type="checkbox"/>	▪ Paroxysms		
<input type="checkbox"/>	<input type="checkbox"/>	▪ Vomiting/gagging		
<input type="checkbox"/>	<input type="checkbox"/>	▪ Whoop		
<input type="checkbox"/>	<input type="checkbox"/>	▪ Disturbed sleep		
<input type="checkbox"/>	<input type="checkbox"/>	Other		

Verbal consent (from client/parent) to release case name to contacts: Yes No

Treatment (Interventions)

Treatment: _____ Date: _____
 Attending Physician: _____ Family Physician: _____

Hospitalization (Outcomes)

Hospitalization: No Yes Admission Date: _____ Name of Hospital: _____ ICU: _____
 Attending Physician: _____ Discharge Date: _____ Date of Death: _____

Immunization (Enter into Notes)

Vaccine	Date	Lot #	Vaccine	Date	Lot #

Source: _____
Comments/Action: _____

Exposures:

Categories: (Select if Applicable)

Crowded Living Conditions:

Number of People living in home: _____ Number of Rooms in home: _____

Definition: Statistics Canada uses the measure of persons per room (PPR) to assess crowding in houses. PPR is calculated by dividing number of persons living in a dwelling by number of rooms. The number of persons per room reflects the household level characteristic of the person. For diseases transmitted through the respiratory route, it is found that the higher the number of persons per room, the greater the risk for transmission within the household.

Rooms refer to all rooms within a dwelling excluding bathrooms, halls, vestibules and rooms used solely for business purposes. This statistic is not sensitive to the size of the house or the rooms, or to the composition of the household.

Household Contact

Were other household members symptomatic or have a confirmed pertussis diagnosis No Yes
(explain situation in the Comments box)

Close Contact with Confirmed Case (Other than household): No Yes

Additional Information (enter in Notes):

- Does child have any underlying medical conditions?
- Add dates that case (2 months-19 years) received pertussis immunization.
- Age and immunization status of mother and/or caregivers.
- Pertussis immunization status of the infant's siblings and other children in the household.
- Other community (neighbourhood) members coughing or confirmed pertussis? Did the case visit a community (neighbourhood) where pertussis may have been circulating (ie. First Nations Community).

Consent given to use case's name Yes No

Contacts

Other – extended family, visitors

Name Address Phone #	DOB	Occ./ School/ Gr	Imm. up-to- date Y/N	Date last Contac t	Symptoms			Spec. Taken			Treated		
					Y/N	Onset Date	S & S	Y/ N	Date	Result	Y/N	Date	Prescrip.
Comments:													
Comments:													
Comments:													
Comments:													
Comments:													

Special Events, Activities, Groups, Clubs

Name of Club/Event Address, Phone #	Contact Person		Date last contact	Attendanc e #	Comments/Action
	Name	Phone #			

Name of Club/Event Address, Phone #	Contact Person		Date last contact	Attendanc e #	Comments/Action
	Name	Phone #			

Name of Club/Event Address, Phone #	Contact Person		Date last contact	Attendanc e #	Comments/Action
	Name	Phone #			

Signature: _____

Contacts

Household

Name	DOB	Occupation School/Gr	Imm. up-to- date Y/N	Symptoms			Spec. Taken			Treated		
				Y/N	Onset Date	S & S	Y/ N	Date	Result	Y/N	Date	Prescrip.
Comments												

School

School	Grade	Teacher	Last Exposure Date	Comments

Drug ¹	Dosage	Comments
Azithromycin	<p>Infants <6 months: 10 mg/kg/day orally for 5 days.</p> <p>Children (>= 6 months to 50 kg): 10 mg/kg/day (to a maximum of 500 mg) orally on the first day followed by 5mg/kg/day (to a maximum of 250 mg) once a day for the next 4 days (5 days total).</p> <p>Adults (50 kg and over): 500 mg orally on the first day followed by 250 mg daily for the next 4 days (5 days total).</p>	<p>Preferred antibiotic for infants under 1 month of age.</p> <p>Azithromycin is likely safe in pregnancy. No teratogenicity in humans or animals (Rx Files, 2013).</p>
Clarithromycin	<p>Children (up to 33 kg): 15 mg/kg/day provided in a divided dose bid for 7 days (not to exceed maximum of adult dose).</p> <p>Adults (33 kg and over): 250-500 mg po bid for 7 days</p>	<p>Clarithromycin should not be used in pregnancy except where no alternative therapy is appropriate (eCPS, 2015)</p>
Erythromycin	<p>Children (up to 25 kg): Erythromycin estolate: 40 mg/kg/day (to maximum of 1 g per day) provided in a divided dose tid for 7 days. The estolate is a liquid preparation, only used for children or people with difficulty swallowing.</p> <p>Adults : Erythromycin 250 mg qid for 7 days (to maximum of 1 g per day). Some experts recommend 2 g daily in divided doses, for example:</p> <p>a) The Anti-infective Guidelines for Community Acquired Infections: 2001, recommends 1-2 g po daily in divided doses.</p> <p>b) b) The Sanford Guide to Antimicrobial Therapy, 2002, recommends 500 mg qid po.</p>	<p>When prescribing erythromycin prophylactically for neonates one should consider that there have been reports of infantile hypertrophic pyloric stenosis (IHPS) associated with its use as pertussis prophylaxis for newborns. The risk of IHPS after treatment with azithromycin and clarithromycin is unknown.</p> <p>Erythromycin estolate is contraindicated in individuals with existing liver disease or dysfunction, and in pregnancy (CPS, 2010).</p>

Prescribers of macrolide antibiotics for infants <2 months of age on should monitor for signs and symptoms of pyloric stenosis.

For those who are allergic to macrolides, the following may be used although its efficacy is not proven:

1. Children: trimethoprim 8mg/kg/day-sulfamethoxazole 40mg/kg/day for 10 days.
2. Adults: 2 tabs bid or 1 double strength (DS) tab bid.

¹ Refer to the product monograph and/or the current version of the CPS before prescribing medications.

References

Jensen, B., Regier, L. D., (Ed.) (2013). *Rx files, Drug Comparison Charts* (9th ed.). Saskatoon, SK: Saskatoon Health Region.

Canadian Pharmacists Association. (2015). *Online Compendium of pharmaceuticals and specialties (eCPS): The Canadian drug reference for health professionals*. Ottawa, Canada: Author.

Heymann, D. L., (Ed.). (2015). *Control of Communicable Diseases Manual* (20th ed.). Washington, DC: American Public Health Association.