

# Appendix A: Disease-Specific Chapters

Chapter: Plague

Revised January, 2012

## Plague

- Communicable
- Virulent

### Health Protection and Promotion Act, Section 1 (1)

Health Protection and Promotion Act:  
Ontario Regulation 558/91 – Specification of Communicable Diseases

Health Protection and Promotion Act:  
Ontario Regulation 559/91 – Specification of Reportable Diseases

<b>1) Aetiologic Agent:</b>	<p>The causative agent of Plague is <i>Yersinia pestis</i> (<i>Y. pestis</i>), a gram negative coccobacillus (1, 2).</p> <p>Aerosolized plague is a potential bioterrorism weapon.</p>
<b>2) Case Definition:</b>	
Surveillance Case definition	<a href="#">See Appendix B</a>
Outbreak Case Definition	<p>The outbreak case definition varies with the outbreak under investigation. Consideration should be given to the following when establishing an outbreak case definition:</p> <ol style="list-style-type: none"><li>1. Clinical, laboratory and/or epidemiological criteria</li><li>2. The time frame for occurrence;</li><li>3. The geographic location(s) or place(s) where cases live or became ill/exposed, and</li><li>4. Special attributes of cases (e.g. age, underlying conditions) and/or the aetiologic agent.</li></ol> <p>Cases may be classified by levels of probability (i.e. confirmed, probable and/or suspect).</p>
<b>3) Identification:</b>	
Clinical Presentation	<p>Clinical illness is characterized by fever, chills, headache, malaise, prostration, and leukocytosis manifesting in one or more of the three main forms of plague in humans: (1,2)</p> <ol style="list-style-type: none"><li>1) Bubonic plague: The most common form of human plague, resulting from a flea bite. It presents as acute lymphadenitis in lymph nodes that drain the site of a fleabite (forms a bubo) and occurs more often in inguinal nodes and less commonly in axillary and cervical nodes. Lymph nodes become swollen and tender and may suppurate; fever is present.</li><li>2) Septicemic plague: All forms of plague, including those without</li></ol>

	<p>lymphadenopathy may progress to septicemic plague with dissemination by the bloodstream to diverse parts of the body</p> <p>3) Pneumonic plague: An infection of the lungs caused by the plague bacillus.</p> <p>Secondary involvement of the lungs results in pneumonia; mediastinitis or pleural effusion may develop. Secondary pneumonic plague is of special significance, since respiratory droplets may serve as the source of person-to-person transfer with resultant primary pneumonic or pharyngeal plague (1).</p> <p>Untreated bubonic plague has a fatality rate of 50% (1); pneumonic and septicemic plagues are fatal if not treated (1).</p>
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Diagnosis	<a href="#">See Appendix B</a>
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#### 4) Epidemiology:

Occurrence	Plague is endemic in Africa, South America, Western USA, Asia, and South Eastern Europe (1). Plague transmission in Canada is extremely rare. The last reported cases occurred in 1924 (3).
Reservoir	Wild rodents, such as ground squirrels, rabbits and hares, wild carnivores and domestic cats (1).
Modes of Transmission	<p>Bubonic: Bite from an infected flea, which is the most common mode of transmission, or by handling tissues of an infected animal (2).</p> <p>Pneumonic: Inhalation of droplets or contact with sputum from an infected person or animal (2).</p> <p>Note: Septicemic plague: All forms of plague may progress to septicemic plague.</p>
Incubation Period	From 1-7 days for bubonic plague and 1-4 days for primary plague pneumonia (1).
Period of Communicability	<p>Bubonic plague is not usually transmitted directly; pneumonic plague can be highly communicable under appropriate climatic conditions (1).</p> <p>Fleas may remain infective for months (1).</p>
Susceptibility and Resistance	Susceptibility is general and immunity after recovery is relative and may not protect against a large infective dose (1).

#### 5) Reporting Requirements:

To Local Board of Health	Confirmed and suspected cases shall be reported to the medical officer of health by persons required to do so under the <i>Health Protection and Promotion Act</i> , R.S.O. 1990.
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To Public Health Division (PHD)	<p>Report only case classifications specified in the case definition to PHD using the integrated Public Health Information System (iPHIS), or any other method specified by the Ministry <b>within one (1) business day of receipt of initial notification</b> as per <i>iPHIS Bulletin</i> Number 17: Timely Entry of Cases (4).</p> <p>The minimum data elements to be reported for each case is specified in the following sources:</p> <ul style="list-style-type: none"> <li>• <i>Ontario Regulation 569</i> (Reports) under the Health Protection and Promotion Act (HPPA);</li> <li>• The disease-specific User Guides published by the Ministry, and</li> <li>• Bulletins and directives issued by the Ministry.</li> </ul>
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### 6) Prevention and Control Measures:

Personal Prevention Measures	<p>Preventative measures (1, 2):</p> <ul style="list-style-type: none"> <li>• Avoid exposure to fleas and take precautions to protect against flea bites by using insect repellents when traveling in endemic areas, and</li> <li>• Control fleas on indoor pets.</li> </ul>
Infection Prevention and Control Strategies	<p>Strategies</p> <ul style="list-style-type: none"> <li>• Use routine practices for hospitalized cases as well as droplet precautions until pneumonia is excluded and appropriate therapy has been initiated; droplet precautions should be continued for 48 hours after initiation of effective treatment in cases with pneumonic plague (2).</li> </ul>
Management of Cases	<p>Investigate cases of plague to determine the source of infection. Refer to Section 5: <i>Reporting Requirements</i> above for relevant data to be collected during case investigation. The following disease-specific information should also be obtained during case management:</p> <ul style="list-style-type: none"> <li>• History of travel in the relevant incubation period;</li> <li>• Exposure to fleas, rodents, wild carnivores or domestic cats;</li> <li>• High risk occupation such as veterinary medicine and trapping, and</li> <li>• Exposure to other potential cases (1).</li> </ul> <p>Treatment is under the direction of the attending health care provider.</p> <p>Provide education about the infection and how it is spread. Advise on the use of insecticides on clothing and luggage of infected persons (1).</p>

<p>Management of Contacts</p>	<p>Contacts are those that have been in the same household or have had face-to-face contact with a case of pneumonic plague (1).</p> <p>Contacts of pneumonic plague:</p> <ul style="list-style-type: none"> <li>• Provide antibiotic prophylaxis and place under surveillance for 7 days; those who refuse prophylaxis should be placed in quarantine with careful surveillance for 7 days (1).</li> </ul> <p>Contacts of bubonic plague are those that have had contact with pus and other fluids from bubos:</p> <ul style="list-style-type: none"> <li>• Apply insecticides to the individual and consider for prophylaxis treatment as above (1).</li> </ul>
<p>Management of Outbreaks</p>	<p>Provide public health management of outbreaks or clusters in order to identify the source of illness, stop the outbreak and limit secondary spread.</p> <p><b>Two or more cases linked in time and place is suggestive of an outbreak</b></p> <p>As per this protocol, outbreak management shall comprise of but not be limited to the following general steps:</p> <ul style="list-style-type: none"> <li>• Confirm diagnosis and verify the outbreak;</li> <li>• Establish an outbreak team;</li> <li>• Develop an outbreak case definition;</li> <li>• Implement prevention and control measures;</li> <li>• Implement and tailor communication and notification plans depending on the scope of the outbreak;</li> <li>• Conduct epidemiological analysis on data collected;</li> <li>• Conduct environmental inspections of implicated premise where applicable;</li> <li>• Coordinate and collect appropriate clinical specimens where applicable;</li> <li>• Prepare a written report, and</li> <li>• Declare the outbreak over in collaboration with the outbreak team.</li> </ul>
<p><b>7) References</b></p>	<p>(1) Heymann D, editor. Control of communicable diseases manual. 18th ed. Washington: American Public Health Association; 2004.</p> <p>(2) Pickering LK, Baker CJ, Long SS, McMillan JA, editors. Red book: 2006 report of the Committee on Infectious Diseases. 27<sup>th</sup> ed. Elk Grove Village, IL: American Academy of Pediatrics; 2006. Section 3, Summaries of infectious diseases; p. 523-5.</p> <p>(3) Notifiable Diseases On-Line [Internet]. Ottawa: Public Health Agency of Canada; 2006. Plague; 2006 Jan 20 [cited 2009 Feb 12]. Available from <a href="http://dsol-smed.hc-sc.gc.ca/dsol-smed/ndis/disease2/plag_e.html">http://dsol-smed.hc-sc.gc.ca/dsol-smed/ndis/disease2/plag_e.html</a>.</p> <p>(4) Ministry of Health and Long-Term Care. Timely entry of cases. iPHIS Bulletin. 2012 January;14.</p>

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**8) Additional Resources**

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Travel Health [Internet]. Ottawa: Public Health Agency of Canada; 2008. Disease information: plaque; 2004 July 23 [cited 2009 Feb 1]. Available from <http://www.phac-aspc.gc.ca/ep-mu/plaque-eng.php>.

Ministry of Health and Long-Term Care. Infectious diseases protocol. Toronto: Queen's Printer for Ontario; 2009. Available from [http://www.health.gov.on.ca/english/providers/program/pubhealth/oph\\_standards/ophs/infdispro.html](http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/infdispro.html) (or as current)

*Health Protection and Promotion Act*, R.S.O. 1990, c. H.7. Available from [http://www.e-laws.gov.on.ca/html/statutes/english/elaws\\_statutes\\_90h07\\_e.htm](http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_90h07_e.htm).

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