

## TEACHER KEY

### Unit 2: Etiology

#### Activity 3: Assessing the Risks for TB Transmission

##### Description:

Students will read the online exhibition section “Etiology” and complete an activity sheet that asks them to identify the situations/conditions that would be at higher risk for TB transmission and suggest changes that would decrease the risk of the spread of disease.

##### Time:

Exhibition review: 10 minutes

Activity Sheet: 30 minutes + 15 minutes review

##### Objectives:

- To identify environmental, social and behavioural risk factors for TB.
- To apply knowledge of TB risk factors to case studies by explaining how situations might be altered to decrease risk.

##### Curriculum Links:

Reading	1. Reading for Meaning	1.4 demonstrate understanding of a variety of texts by summarizing important ideas and citing supporting details
Understanding Life Systems	1. Relating Science and Technology to Society and the Environment	1.1 assess the effects of social and environmental factors on human health, and propose ways in which individuals can reduce the harmful effects of these factors and take advantage of those that are beneficial

##### Materials:

Online exhibition [Fighting for Breath: Stopping the TB epidemic](http://museumofhealthcare.ca/explore/exhibits/breath/) :

<http://museumofhealthcare.ca/explore/exhibits/breath/>

Handout

##### Procedure:

1. Ask students to read-through the exhibition pages Etiology – A Perfect Breeding Ground. They may also wish to review TB Today.
2. Provide students with the worksheet and ask them to complete it. It is recommended that students have access to the exhibition while completing the work-sheet.
3. Review the work-sheet with the students and clarify any common misconceptions.

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### **Background Info:**

Tuberculosis bacteria thrive and multiply under certain conditions. They prefer dark areas with available oxygen and can survive on the surface of objects or floating in the air for several hours. Direct sunlight will kill the bacteria, though, and breezes will disperse them, decreasing the likelihood that any one person will inhale enough bacteria to become infected.

Living situations where many individuals live close together increase the likelihood of disease transmission. The bacteria are transmitted from person to person most easily in crowded conditions. In many cases in the past whole families were infected with the disease. Areas of high population density, such as cities, are also at higher risk.

Malnutrition and alcoholism can also facilitate the transmission of the disease by weakening an individual's immune response. HIV and AIDS also increase the likelihood of developing active TB, because the weakened immune system is unable to contain the bacteria. If one person is unable to contain the tuberculosis bacteria and they develop an active case, they can spread the bacteria by coughing and sneezing.

Urban cities during the Industrial Revolution provided ripe breeding grounds for tuberculosis. The populations of Britain, Europe, and North America flooded to cities in search of work, increasingly found in poorly ventilated and crowded factories, and living quarters became ever more crowded. As more and more people competed for jobs, their wages decreased. It became very difficult for a large section of the population to feed and house itself. It was in the face of such societal conditions that the **incidence** of tuberculosis increased during the late eighteenth and early nineteenth centuries.

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**Unit 2: Etiology**

**ANSWER SHEET: Assessing the Risks for TB Transmission**

1. Which of the following conditions help the spread of tuberculosis? Check all that apply.

- |                                     |                           |                                     |                |
|-------------------------------------|---------------------------|-------------------------------------|----------------|
| <input checked="" type="checkbox"/> | Crowded living conditions | <input checked="" type="checkbox"/> | Poor nutrition |
| <input type="checkbox"/>            | Access to health care     | <input checked="" type="checkbox"/> | Darkness       |
| <input checked="" type="checkbox"/> | Poorly ventilated areas   | <input checked="" type="checkbox"/> | HIV & AIDS     |
| <input type="checkbox"/>            | Sunshine                  | <input type="checkbox"/>            | Vaccinations   |

2. For each of the following scenarios underline the factors that place the main character at risk of TB infection, and suggest changes that could be made to reduce their risk. Consider both changes made by individuals and that might be made by society.

- a) Bernard moved to the city to find work as a shift-worker. He works ten hour days to save money to send back to his family in the country so that they can afford to keep their farm. It is cheapest for Bernard to share a two-room apartment with five other men, who work different shifts and take turns sleeping in one of the two beds. One of Bernard's roommates announced yesterday that a co-worker was recently diagnosed with TB.

*-crowded living situation the greatest risk; should attempt to find accommodation where bedding is not shared and space is not so cramped  
- should monitor his own health and be tested for TB if any signs and symptoms arise  
- long working hours may exhaust Bernard and weaken his immune system, so he needs to monitor his health carefully*

- b) Perdita lives in Peru with her mother, father, grandmother, uncle, and three siblings. Her father was diagnosed with TB six months ago. He began taking antibiotics, but the trip to the clinic to take his medicine was causing him to miss too much time at work so he stopped taking his pills.

*- crowded living space the greatest risk; should attempt to keep the home well ventilated  
- having a family member with TB is also a great risk and Perdita should encourage her father to start taking his medication again so that he does not pass TB on to her*

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- c) Simon is homeless in Philadelphia. When it is cold outside he stays at shelters, but doesn't like them because there are so many men snoring in one room and he prefers to see the open sky at night. He sometimes meets friends on a street corner to pass around a bottle of alcohol or to share a joint to kill time and have some fun.

*-the construction of more homeless shelters may help minimize the crowded conditions that encourage disease transmission*

*- sharing bottles, cigarettes, needles etc. puts the users at great risk of the transmission of diseases; should use clean glass whenever possible and not share materials that are put in the mouth*

- d) Felicia works in a textile factory. Fifty women work machines on her floor, and only four small windows provide fresh air.

*- improve ventilation in the factory*

- e) Peter was recently diagnosed with HIV. It takes him four hours to travel to the closest medical clinic, and often they are out of medicine when he gets there.

*- control his HIV and stop its development into AIDS, which weakens immune system*

*- improve access to health care and drugs so that people are better able to control their diseases; i.e. need to construct more clinics, have better training programs for locals, improve drug supply and costs*

- f) Mary's sister, who lives in another town, was just diagnosed with TB. Mary suspects that her cough might mean she also has the disease, but she is afraid that her neighbours and friends will stop visiting her if she does have TB so she avoids going to the doctor.

*- stigma of disease and fear of isolation is keeping Mary from being tested; need to educate society further about the ability to treat and control TB so that people are more willing to seek treatment*

3. a) What do you think governments can do better or differently to help stop the spread of tuberculosis?

*Improve access to health care, i.e. need to construct more clinics, have better training programs for locals*

*Improve access to medication*

*Conduct public education programs about the prevention of TB*