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Unit 1: TB Today – A Global Emergency Activity 2: Map Activity Sheet

Description:

Students are asked to consider prevalence rates of TB in various countries and to reflect upon why Canada does not have a high-burden of tuberculosis infection. They are required to identify various countries on a global map.

Time:

Exhibition review: 20 minutes

Discussion: 10-15 minutes

Map colouring/analysis: 45 minutes

Objectives:

- To establish a basic understanding of the global prevalence of TB and how it varies across nations and continents;
- To find links between our situation and that of other countries;
- To understand that TB is still an epidemic illness but rates of infection are slowly improving across the globe.

Curriculum Links:

This activity is meant to allow students to be introduced to key concepts in geography, data collection and management, and basic comparison analysis.

Social Studies - Canada and World Connections	Knowledge and Understanding	Identify services provided by the federal, provincial/territorial, and municipal governments
	Map, Globe and Graphic Skills	Construct and read a variety of maps, graphs, diagrams, and/or models to display and interpret information for specific purposes
Mathematics – Data Management and Probability	Data Relationships	Read, interpret, and draw conclusions from primary data and from secondary data presented in charts, tables and graphics
Reading	1. Reading for Meaning	1.6 extend understanding of texts by connecting the ideas in them to their own knowledge, experience, and insights, to other familiar texts, and to the world around them

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		1.8 make judgments and draw conclusions about the ideas and information in texts and cite stated or implied evidence from the text to support their views
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Materials:

- Online exhibition [Fighting for Breath: Stopping the TB epidemic:](http://museumofhealthcare.ca/explore/exhiits/breath/)
<http://museumofhealthcare.ca/explore/exhiits/breath/>
- Coloured pencils
- Atlas or internet (optional)

Procedure:

1. Ask students to read through the exhibition section TB Today.
2. Briefly discuss key themes of TB today: what countries are considered high-burden, why Canada is not high-burden, preventative measures and screening processes that Canadian officials undertake for immigrants
3. Ask each student to colour in the 22 high-burden countries listed in the map provided.
4. What trends do they notice in the map? What continents show the highest prevalence rate? Lowest? Why is Canada not on the list based on the previous discussion?

Background Information

TB Today: A Global Emergency

Tuberculosis is an illness many people might associate with the past. It is commonly perceived as a disease that reached its peak in the nineteenth and early twentieth centuries but declined with the discovery of antibiotic medications in the 1950s. Although for many parts of the world this is true, tuberculosis has not been **eradicated**; in fact, much of the world is experiencing epidemic rates of tuberculosis. In this era of globalization this trend should concern us all.

TB is often called a ‘social disease’, one that occurs most frequently among groups of people from defined socio-economic positions. Primarily a disease spread by air-borne droplets of bacteria, TB is transmitted most easily between people in frequent contact with each other in relatively confined spaces; over-crowded and poorly-ventilated living spaces, frequently associated with the **economically marginalized**, exacerbate TB transmission. Likewise, poor diet decreases overall health and increases the chance that the immune system will be unable to fight off a TB infection. Lack of access to health-care can lead to delayed diagnosis and inconsistent treatment, which enable the disease to continue to spread.

Such conditions exist not only in the so-called ‘developing world’. TB is both a global and a national concern.

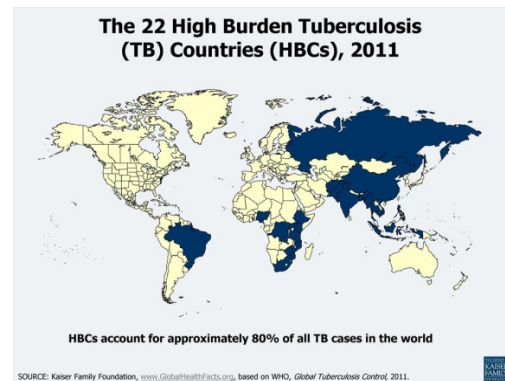
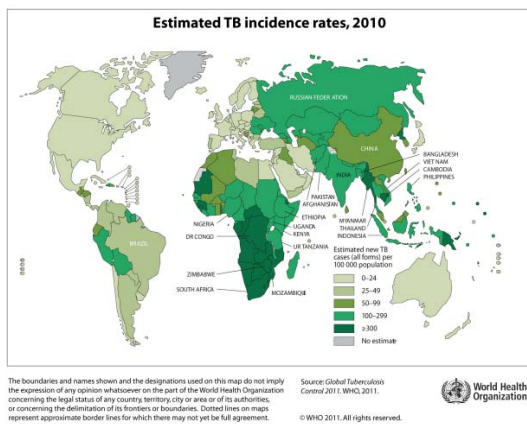
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- A Global Perspective

It is estimated that one third of the world's population has been infected with tuberculosis. In 2010, 8.8 million people were diagnosed with tuberculosis. Even though 95% of drug-susceptible TB cases can be cured with appropriate therapy, approximately 3,800 people die from TB each day - a total of 1.4 million people in 2010. The mortality rate of TB has declined since the 1990s, but it remains too high to tolerate. The health care **infrastructure** and drug supply mechanisms in place around the world are not meeting the needs of the sick.

While tuberculosis cases can be found in most every country of the world, it does not affect them equally. Twenty-two **high burden** countries carry 80% of the cases of TB. The list of high burden countries includes Brazil, India, Cambodia, Kenya, Russia, and South Africa, to name but a few (see image below). The high **incidence rates** in such countries might be linked to high population and high population densities, poverty rates, and/or a lack of health care **infrastructure**.

Although the global **incidence and mortality rates** of TB are now declining, after having peaked in the 1990s, the correlation between tuberculosis and HIV/AIDS and the growing number of drug-resistant cases is of growing concern.



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Estimated burden of TB by Selected Countries

North America	Incidence Rate	South America	Incidence Rate	Middle East	Incidence Rate
Canada	5	Argentina	28	Afghanistan	189
Mexico	17	Chile	19	Iraq	64
United States	4	Costa Rica	14	Israel	5
		Dominican Republic	70	Lebanon	15
Australia	Incidence Rate	Ecuador	68		
Australia	6	Haiti	238		
		Peru	113		
Africa	Incidence Rate	Europe	Incidence Rate	Asia	Incidence Rate
Congo	382	Bosnia & Herzegovina	50	Cambodia	442
Ethiopia	266	Czech Republic	8	China	80
Kenya	314	France	10	India	190
Mozambique	539	Germany	5	Indonesia	189
Namibia	693	Greece	5	Japan	22
Nigeria	136	Hungary	15	Malaysia	83
Sierra Leone	645	Norway	6	Pakistan	231
South Africa	971	Russian Federation	106	Phillipines	280
Swaziland	1257	Switzerland	7	Thailand	137
Zimbabwe	672	United Kingdom	13	Vietnam	200

*Incidence Rate derived from average rate over 2008, 2009 and 2010.

Source: Public Health Agency of Canada, <<http://www.phac-aspc.gc.ca/tbpc-latb/itir-eng.php>>

- A National Perspective: TB in Canada

In Canada, in 2011, the **incidence** of any form of tuberculosis was only 5 per 100,000 according to the World Health Organization (WHO); this rate places Canada within the tier of 24 reporting countries with an **incidence rate** of 5 per 100,000 or less. Roughly 1,600 new cases of TB are reported in Canada each year.

Tuberculosis cases are annually reported across all regions of Canada, but the provinces and their inhabitants are not equally affected by tuberculosis. The majority of TB cases are reported in Ontario, British Columbia, Manitoba, and Quebec. Certain populations are more heavily affected than others, namely the Aboriginal, Inuit and Métis, as well as the foreign-born population, and certain regions have greater incidence of drug-resistance.

- Immigrant screening

65% of active TB cases in Canada occur in foreign-born residents of Canada, though this group makes up only 20% of the population. 80% of the TB cases in Ontario are found among foreign-born residents. The risk of developing active TB is twice as high among

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refugee claimants as among immigrant populations. These disproportionate experiences of TB are due to **endemic** conditions in the sending country, but are also exacerbated by the socio-economic strains that can often accompany immigration or claiming refugee status, such as stress, unemployment, and overcrowding. The risk of these populations developing active TB after migration drops dramatically after one year.

Canada has a well defined screening program for TB in immigrants, refugees, and temporary residents in the country for more than six months on work or study permits. All applicants are screened for active TB before entering the country. They must obtain a chest x-ray, which is reviewed for signs of TB by a physician in the sending country as well as by a physician in Canada or by an Immigration Medical Officer. If the x-ray shows abnormalities, a **sputum culture** is tested. Anyone diagnosed with active tuberculosis must show that they have received treatment and no longer present with positive **bacteria cultures** in order to enter Canada. Those presenting with inactive or **latent TB** infections (approximately 3-5%) are allowed to enter the country but are required to participate in a Post-Landing Surveillance Program. Several scientific studies have shown, though, that adherence to this program is suboptimal, with only 50% completing follow-up examinations and treatment. More work is needed to educate the public about the importance of such medical care and to limit the barriers to access.

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Unit 1: TB Today – A Global Emergency **ANSWER KEY: Map Activity**

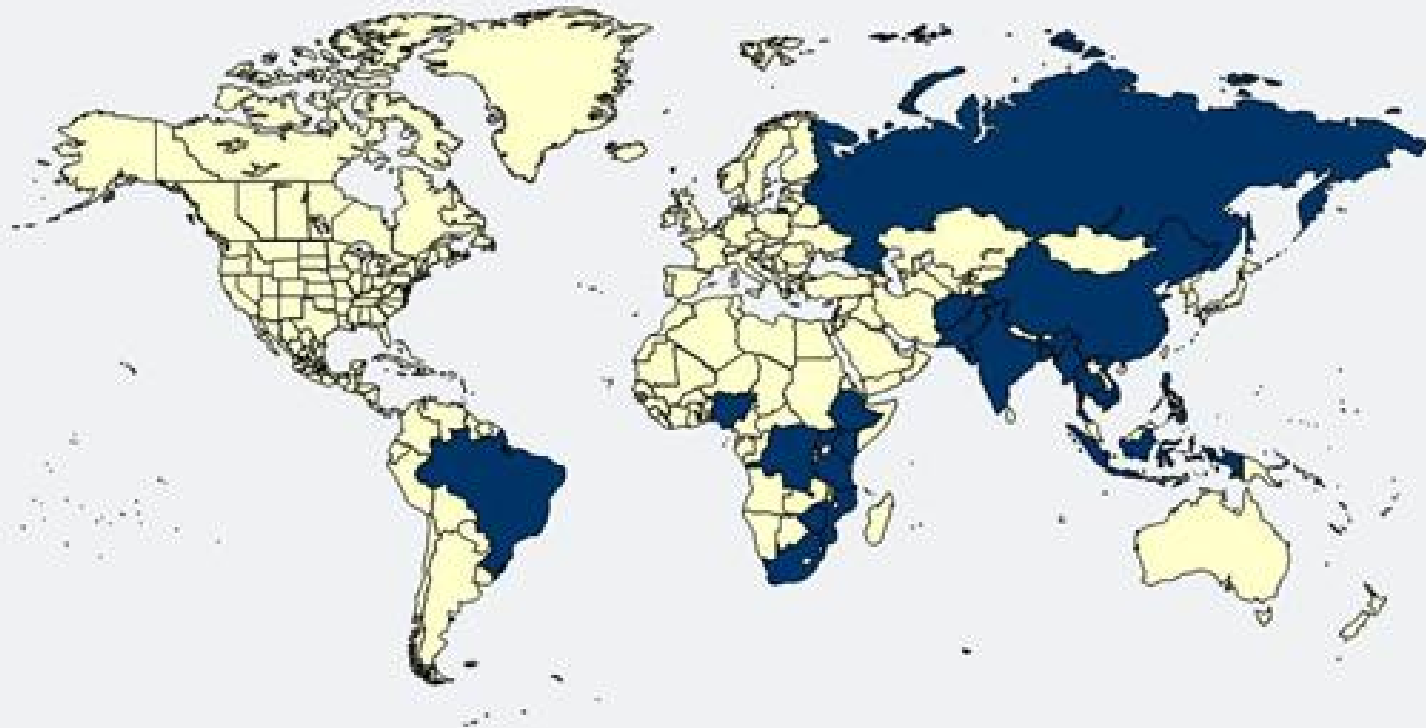
The global prevalence for TB varies across the globe. Some countries are identified as “high-burden” nations because they are predisposed to TB because of high population, poverty rates and/or a lack of health or infrastructure. Twenty-two high burden countries carry 80% of the cases of TB.

1. Colour in the 22 countries with a high burden of TB on the map provided. Consult an atlas if you need to.
 1. India
 2. China
 3. South Africa
 4. Indonesia
 5. Pakistan
 6. Bangladesh
 7. Philippines
 8. D.R. Congo
 9. Ethiopia
 10. Nigeria
 11. Myanmar
 12. Vietnam
 13. Russia
 14. Mozambique
 15. Kenya
 16. Thailand
 17. Brazil
 18. Zimbabwe
 19. Tanzania
 20. Uganda
 21. Cambodia
 22. Afghanistan

Source:

http://facts.kff.org/upload/jpg/large/The_22_High_Burden_TB_Countries_2012.jpg

The 22 High Burden Tuberculosis (TB) Countries (HBCs), 2012



HBCs account for approximately 80% of all TB cases in the world

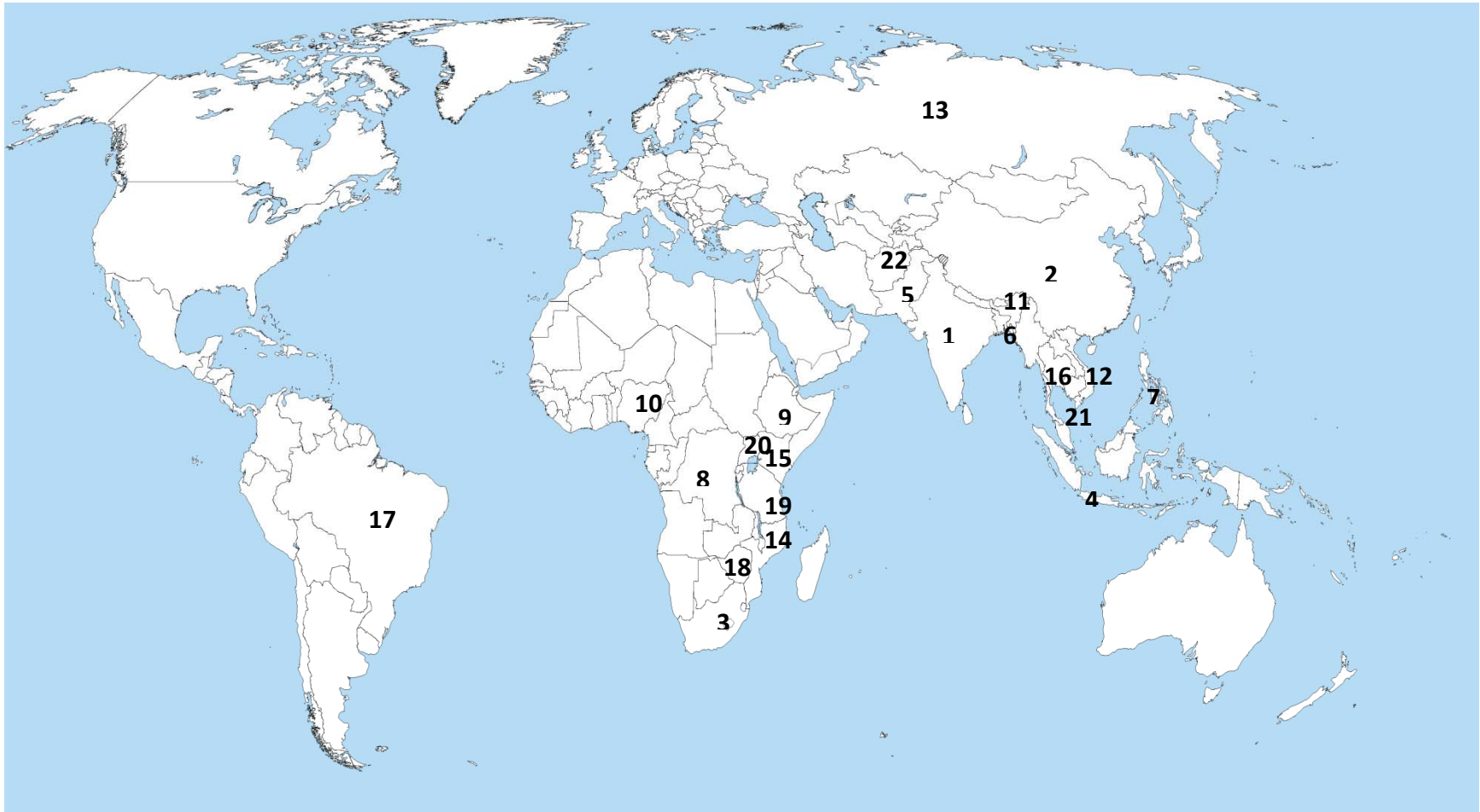
SOURCE: Kaiser Family Foundation, www.GlobalHealthFacts.org, based on WHO, *Global Tuberculosis Report*, 2012.



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2. Do you notice any trends in the map you have created? Where are the high-burden countries concentrated? What continents do not have any countries coloured in?

Students should be able to note the following:

- *A concentration of prevalence in Asia and Eastern Africa*
- *A lack of concentration in North America, Europe and Australia*

3. Why, based on what you know about TB, do you think Canada is not on the list of high burden countries?

Students should be able to demonstrate an understanding of the social factors that contribute to the spread of TB, including crowding, diet, and access to health care, and connect these issues to Canada's low TB incidence rate. They should be able to identify that Canada possesses a screening process for immigrants.