PRE-DEPARTURE TSTs

ARE THEY NECESSARY FOR ALL STUDENTS TRAVELING ABROAD?

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BARNARD COLLEGE

#1 OBJECTIVE

Discuss TB on a Global Scale and How it Affects the U.S.

Objective #1 Discussion

- TB – Global Perspective
- Review the Institute of International Education 2013 Open Doors Report
- Identify moderate and high risk countries for TB based on WHO guidelines
- Identify at risk populations

Global TB

- Each year, nearly 9 million people around the world become sick with TB
- The majority of cases worldwide in 2012 were in South-East Asia (29%), African (27%), and Western Pacific (19%) regions
- India and China alone accounted for 26% and 12% of total cases, respectively
- In 2012, 8.6 million people fell ill with TB and 1.3 million died from it, including 320,000 among people who were HIV positive
- In 2012, there were an estimated 450,000 new cases of multidrug resistant TB

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- TB is the leading killer of people who are HIV infected

TB HAS NO BOUNDARIES

We

Are

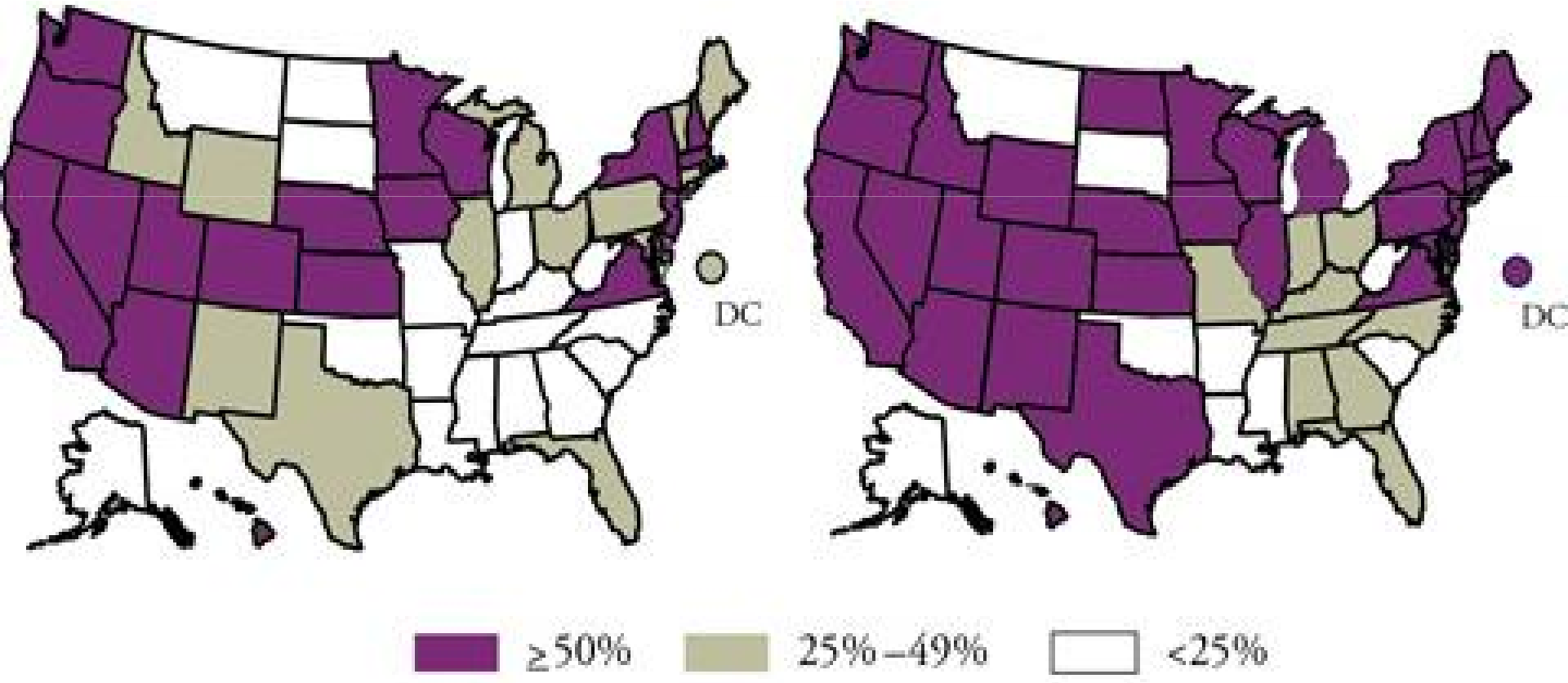
All

Connected

The Global Challenge

- In 2013, a total of 65% of reported TB cases in the United States occurred among foreign-born persons
- The case rate among foreign-born persons (15.6 cases per 100,000 population) in 2013 was 13 times higher than among U.S.-born persons (1.2 cases per 100,000)
- The number of states with at least 50% of TB cases occurring among foreign-born persons has increased from 21 states in 2000 to 33 states and the District of Columbia in 2010

Percentage of TB Cases Among Foreign-born Persons, United States*



*Updated as of July 21, 2011.

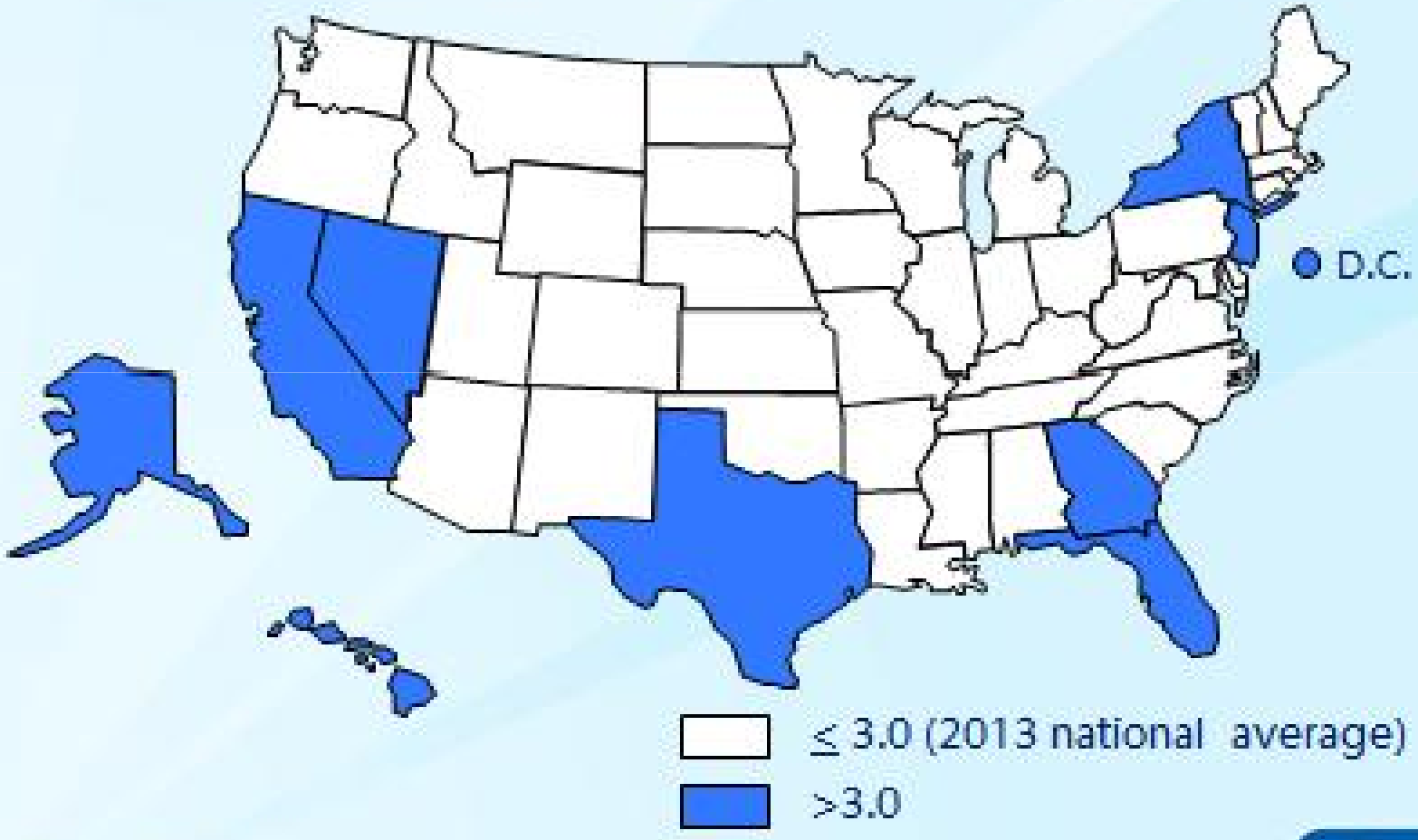
TB Time Line

- 1900s-TB killed one out of every seven people living in the United States and Europe
- Starting in the 1940s, scientists discovered the first of several medicines now used to treat TB
- TB slowly began to decrease in the United States
- In the 1970s and early 1980s, the country let its guard down and TB control efforts were neglected
- The trend toward elimination was reversed and the nation experienced a resurgence of TB, with a 20% increase in TB cases reported between 1985 and 1992

U.S. Back on Track

- The nation's mobilization of additional resources in the 1990s has paid off
- We are now at an all-time low in reported TB cases, with 18 consecutive years of decline
- A total of 9,582 TB cases (a rate of 3.0 cases per 100,000 population) were reported in the United States in 2013
- Both the number of TB cases reported and the case rate decreased; this represents a 3.6% and 4.3% decline, respectively, compared to 2012

TB Case Rates,* United States, 2013



*Cases per 100,000.

Reported TB Cases
United States, 1982–2013*

*Updated as of June 11, 2014.

CDC

NEW YORK TB STATS

- Between 2011 and 2012, tuberculosis (TB) morbidity decreased in New York State
- The 2012 total of 866 cases (651 cases in New York City, 215 cases in the remainder of New York State) represents a 4.8 percent decrease from the 910 cases reported in 2011
- New York State was Sixth nationally with an incidence rate of 4.4 per 100,000 population in 2012; this rate is influenced by New York City, which had a TB case rate of 8.0 per/100,000 population
- In contrast, New York State (exclusive of New York City) reported an incidence rate of 1.9 per /100,000 population
- The national average for 2012 was 3.2 per /100,000 population

NEW YORK TB STATS

- Asians, Hispanics, and blacks had higher rates of TB compared to whites, both in New York City and the rest of the state

- Statewide, including New York City, the proportion of cases contributed by foreign-born individuals increased slightly from 77.7 percent in 2011 to 80.5 percent (697 cases) in 2012 with people born in China contributing the greatest number of foreign-born TB cases (107)

- In New York State (exclusive of New York City), people born in India contributed the greatest number of TB cases (20)

TB

IMPACT ON A COLLEGE CAMPUS

Importance of a TB Control Program

- TB is caused by Mycobacterium tuberculosis (M.tb) via airborne transmission spread from person to person through air when coughing, sneezing, shouting, speaking and singing
- The close confines of classrooms and dormitories make the college campus an environment where tuberculosis germs can spread quickly
- Delays in diagnosis increase the potential for transmission, particularly in a congregate setting such as a college campus
- Promoting a tuberculosis control program on a campus and in the surrounding medical community gives physicians and health-care providers an awareness about tuberculosis as a potential diagnosis, an important intervention in controlling the spread of disease

High Risk Student Groups on a College Campus

- Study Abroad Student
- Student traveling abroad for leisure or volunteer work
- International Student

Institute of International Education (IIE)

About the Open Doors Report

- The *Open Doors Report on International Educational Exchange* is published by the Institute of International Education, the leading not-for-profit educational and cultural exchange organization in the United States
- IIE has conducted an **annual statistical survey** of campuses regarding the **international students** in the United States since 1919, and with support from the U.S. Department of State's Bureau of Educational and Cultural Affairs since the early 1970s
- The census is based on a survey of approximately 3,000 accredited U.S. institutions
- *Open Doors* also conducts and reports on separate **surveys** on **U.S. students studying abroad** for academic credit (since 1985), and on international scholars at U.S. universities and international students enrolled in pre-academic Intensive English Programs

IIE 2013 OPEN DOORS REPORT

- The number of U.S. students studying abroad increased by three percent to an all-time high of **more than 283,000**, with more U.S. students traveling to **China** and **Latin America**
- The number of international students at colleges and universities in the United States increased by seven percent to a record high of 819,644 students in the 2012/13 academic year
- The top three places of origin are **China**, **India**, and **South Korea** and now represent 49 percent of the total number of international students in the United States

U.S. Students Studying Abroad

- Total Number of U.S. Study Abroad Students Enrolled Through Institutions in New York State
  - 2010/11: 23,916
  - 2011/12: 24,646

- Women comprised 64% of U.S. Study Abroad Students in 2011/1

HOST REGIONS OF U.S. STUDY ABROAD STUDENTS, 2010/11 & 2011/12
PERCENT OF U.S. STUDY ABROAD STUDENTS

Host Region	2010/11	2011/12
Africa*	4.3	4.5
Asia	11.7	12.4
Europe	54.6	53.3
Latin America	14.6	15.8
Middle East*	2.6	2.5
North America	0.5	0.6
Oceania	4.8	4.5
Antarctica	0.0	0.0
Multiple Destinations	6.8	6.4
Total	273,996	283,332

* North Africa was moved from the Africa category to the Middle East category in 2010/11.

Institute of International Education. (2013). "Host Regions of U.S. Study Abroad Students, 2000/01-2011/12." *Open Doors Report on International Educational Exchange*. Retrieved from http://www.iie.org/opendoors

TOP 25 DESTINATIONS OF U.S. STUDY ABROAD STUDENTS, 2010/11 - 2011/12

Rank	Destination	2010/11	2011/12	% of Total	% Change
	WORLD TOTAL	273,996	283,332	100.0	3.4
1	United Kingdom	33,182	34,660	12.2	4.5
2	Italy	30,361	29,645	10.5	-2.4
3	Spain	25,965	26,480	9.3	2.0
4	France	17,019	17,168	6.1	0.9
5	**China**	**14,596**	**14,887**	**5.3**	**2.0**
6	Germany	9,018	9,370	3.3	3.9
7	Australia	9,736	9,324	3.3	-4.2
8	Costa Rica	7,230	7,900	2.8	9.3
9	Ireland	7,007	7,640	2.7	9.0
10	Japan	4,134	5,283	1.9	27.8
11	**Argentina**	**4,589**	**4,763**	**1.7**	**3.8**
12	**India**	**4,345**	**4,593**	**1.6**	**5.7**
13	**South Africa**	**4,337**	**4,540**	**1.6**	**4.7**
14	**Brazil**	**3,485**	**4,060**	**1.4**	**16.5**
15	**Mexico**	**4,167**	**3,815**	**1.3**	**-8.4**
16	**Ecuador**	**3,107**	**3,572**	**1.3**	**15.0**
17	Czech Republic	3,291	3,477	1.2	5.7
18	Israel	3,441	3,189	1.1	-7.3
19	Chile	3,280	3,064	1.1	-6.6
20	New Zealand	2,900	2,969	1.0	2.4
21	Denmark	2,478	2,876	1.0	16.1
22	Greece	3,428	2,701	1.0	-21.2
23	South Korea	2,487	2,695	1.0	8.4
24	**Peru**	**2,448**	**2,680**	0.9	**9.5**
25	Austria	2,736	2,657	0.9	-2.9

Institute of International Education. (2013). "Top 25 Destinations of U.S. Study Abroad Students, 2010/11 -2011/12." *Open Doors Report on International Educational Exchange*. Retrieved from http://www.iie.org/opendoors

INSTITUTIONS WITH THE HIGHEST NUMBER OF FOREIGN STUDENTS

Institution	City	Total
New York University	New York	9,362
Columbia University	New York	8,797
SUNY University at Buffalo	Buffalo	5,804
Cornell University	Ithaca	4,891
SUNY Stony Brook University	Stony Brook	4,122

INSTITUTE OF INTERNATIONAL EDUCATION -Educational Exchange Data from *Open Doors 2013*

LEADING PLACES OF ORIGIN FOR FOREIGN STUDENTS IN N.Y. STATE

Rank	Place of Origin	% Total
1	China	28.2
2	India	12.5
3	South Korea	12.2
4	Canada	6.5
5	Taiwan	2.5

INSTITUTE OF INTERNATIONAL EDUCATION -Educational Exchange Data from *Open Doors 2013*

WHO Global Health Observatory TB Incidence 2012

- Lists countries with TB Incidence rates of greater or equal to 20 cases per 100,000 population
- Includes countries with moderate to high risk TB burden
- Updated regularly when new incidence rates are published by WHO, usually every one to two years
- ACHA -Tool for Institutional Use

WHO 2010: Top 22 TB High Burden Countries

Account for 81% of all estimated cases worldwide

Afghanistan
Bangladesh
Brazil
Cambodia
China
DR Congo
Ethiopia
India
Indonesia
Kenya
Mozambique
Myanmar
Nigeria
Pakistan
Philippines
Russian Federation
South Africa
Thailand
Uganda
UR Tanzania
Viet Nam
Zimbabwe

Five Countries with Largest Number of Incident Cases in 2010

- **India**: 2.0 million-2.5 million
- **China**: 0.9 million-1.2 million
- **South Africa**: 0.40 million-0.59 million
- **Indonesia**: 0.37million-0.54 million
- **Pakistan**: 0.33 million-0.48 million

<u>2010</u>

- **India** alone accounted for an estimated 26% of all TB cases worldwide
- **China** and *India* combined accounted for 38% of all TB cases worldwide

Persons at Higher Risk for Exposure to and/or Infection with M. tuberculosis

- Close contacts of persons known or suspected to have active TB disease
- Foreign-born persons from areas that have a high incidence of active TB disease (e.g., Africa, Asia, Eastern Europe, Latin America, and Russia)
- Persons who visit areas with a high prevalence of TB disease, especially if visits are frequent or prolonged
- Residents and employees of high-risk congregate settings (e.g., correctional facilities, long-term care facilities, and homeless shelters)
- Health-care workers who serve clients who are at increased risk for active TB disease
- Populations defined locally as having an increased incidence of latent M. tuberculosis infection or active TB disease, possibly including medically underserved, low-income populations, or persons who abuse drugs or alcohol
- Infants, children, and adolescents exposed to adults who are at increased risk for latent tuberculosis infection or active TB disease

Persons at Increased Risk for Progression of LTBI to TB Disease

- Persons infected with HIV
- Children younger than 5 years of age
- **Persons who were recently infected with M. tuberculosis (within the past 2 years)**
- **Persons with a history of untreated or inadequately treated TB disease,** including persons with fibrotic changes on chest radiograph consistent with prior TB disease
- Persons who are receiving immunosuppressive therapy such as tumor necrosis factor-alpha (TNF) antagonists, systemic corticosteroids equivalent to/greater than 15 mg of prednisone per day, or immunosuppressive drug therapy following organ transplantation
- Persons with silicosis, **diabetes mellitus**, chronic renal failure, leukemia, or cancer of the head, neck, or lung
- Persons who have had a gastrectomy or jejunoileal bypass
- **Persons who weigh less than 90% of their ideal body weight**
- **Cigarette smokers and persons who abuse drugs and/or alcohol**
- Populations defined locally as having an increased incidence of disease due to

#2 OBJECTIVE

Discuss the Use of an Effective TB Screening Tool

Latent Tuberculosis Infection (LTBI)

- An infection in which TB germs remain in tissues for years (walled off) without producing symptoms or radiographic evidence, "sleeping" TB germ can "awaken" and turn to active TB when immune systems breaks down
- A person with LTBI has a 10% lifetime risk of developing active TB; that risk increases in the presence of certain medical conditions such as HIV and diabetes
- At least 50% of this risk occurs within first 1-2 years after infection, and the remainder of risk occurs during total lifespan
- Usually, students who have a positive TST or IGRA, a normal chest x-ray and no signs and symptoms of TB will be diagnosed with LTBI

Purpose of a TB Screening Tool

- It is the first step in the screening process to **identify** any students who indicate a possible risk factor for exposure to TB infection or disease (e.g., recent travel to high risk TB country, foreign born international student from high burden TB country)

- Those students identified as high risk utilizing a TB Risk Assessment Questionnaire will then be directed to:
  - **Test:** with a TST or IGRA , this testing procedure aids in diagnosing <u>LTBI</u>
  - **Secondary Testing:** Chest X- ray if + TST or + IGRA
  - Medical Exam/ LTBI treatment offered

Targeted Tuberculin Testing for LTBI

- Strategic component of tuberculosis (TB) control that identifies persons at high risk for developing TB who would benefit by treatment of LTBI, if detected

- Persons with increased risk for developing TB include those who have had recent infection with *Mycobacterium tuberculosis* and those who have clinical conditions that are associated with an increased risk for progression of LTBI to active TB

Objective #2 Discussion

- Differentiate initial screening vs. secondary screening tests
- List determining risk factors
- Define "recent" travel and "homeland"
- Define "prevalence" and "incidence"
- Discuss ACHA's recommendations on a TB screening tool
- Review WHO recommendations

Initial Screening Test

- Screening refers to the process of identifying persons at high risk for TB infection and disease

- Initial screening: The first screening test, examination or other procedure applied in the population eligible for screening

- Options for the initial screening include screening for symptoms:
  - screening either for cough lasting for longer than 2 weeks, or screening for any symptom compatible with TB, including cough of any duration, hemoptysis, weight loss, fever or night sweats

Secondary Screening Test

- Secondary screening: A second screening test, examination or other procedure applied to persons whose results were positive during the initial screen

- Chest radiography can be used as a second screen to improve the pretest probability of the subsequent diagnostic test, and to reduce the number of people who need to undergo further diagnostic evaluation

Definition Review

- **Incidence**: number of new and relapse cases of TB in a given time period, usually one year
- **Prevalence**: the number of cases of TB at a given point in time
- **Risk groups**: any group of people in which the prevalence or incidence of TB is significantly higher than in the general population
- **"Recent"** travel: < 2 years
- **"Past"** travel: > 2 years

Define "Homeland" in Relation to VFRs

CURRENT DEFINITION

- The Centers for Disease Control (CDC)'s ''Health Information for International Travel 2010'' (the Yellow Book) defines a VFR as ''an immigrant, ethnically and racially distinct from the majority population of the country of residence (a higher-income country), who returns to his or her homeland (lower-income country) to visit friends or relatives

- The International Travel and Health Book of the World Health Organization (WHO) also defines VFRs as immigrants traveling to their place of origin

Proposal For More Inclusive Definition

International Society of Travel Medicine Committee

Propose that a VFR should be anyone traveling for the purpose of visiting a friend or a relative (regardless of the traveler's immigrant status or ethnicity) and that there is ''an epidemiological risk gradient'' between their current location and the travel destination

Determining Risk Factors

- Close Contacts
- Recently converted (2 year)
- Immigration <5 years from country with high rates of TB
- >1 month stay in areas with high TB rates
- Residents & employees of high risk congregate settings (hospital, nursing home, prison, homeless shelter)
- Children < 5 years of age exposed to adults in high risk categories

ACHA Guidelines April 2014

TB Screening and Targeted Testing of College and University Students

- Screening all Incoming Student Population
- International Student from high risk TB country should be tested (TST or IGRA)
- Targeting those at increased risk for TB testing
- Reviewing appropriate follow up care for students diagnosed with LTBI or TB disease

WHO Recommendations

Systematic Screening for Active TB 2013

- *KEY PRINCIPLE*

  - Indiscriminate mass screening should be avoided

  - The prioritization of risk groups for screening should be based on
    assessments made for each risk group of the potential benefits and harms, the feasibility of the initiative, the acceptability of the approach, the number needed to screen, and
    the cost effectiveness of screening

ACHA Sample Screening Tool

- Have you ever had close contact with persons known or suspected to have active TB disease?
- Were you born in a country with high incidence of active TB disease with incidence rates >= 20 cases per 100,000 population (Refer to WHO Global Health Observatory)
- Have you had frequent or prolonged visits to one or more of the countries listed with a high prevalence of TB disease? (Based on countries listed in WHO Global Health Observatory, Tuberculosis Incidence 2012. Countries with incidence rates of ≥20 cases per 100,000)
- Have you been a resident and/or employee of high-risk congregate settings (e.g., correctional facilities, long-term care facilities, and homeless shelters)?
- Have you been a volunteer or health-care worker who served clients who are at increased risk for active TB disease?
- Have you ever been a member of any of the following groups that may have an increased

Next Step is Based on Answers To Screening Questions

- If the student answers **YES** to any of the screening questions then it is required that the student receive TB testing as soon as possible but at least prior to the start of the subsequent semester

- If the answer to all of the above questions is **NO**, no further testing or further action is required

- **Next Step: Clinical Assessment** by Health Care Provider
  - Clinicians should review and verify the information in Part I of questionnaire and persons answering **YES** to any of the questions in first section are candidates for either Mantoux tuberculin skin test (TST) or Interferon Gamma Release Assay (IGRA), unless a previous positive test has been documented

CDC Sample TB Risk Assessment Tool

RISK	FACTOR

1. Recent close or prolonged contact with someone with infectious TB disease?

2. Foreign-born person from or recent traveler to high-prevalence area?

3. Chest radiographs with fibrotic changes suggesting inactive or past TB?

4. HIV infection?

5. Organ transplant recipient?

6. Immunosuppression secondary to use of prednisone (equivalent of ≥15 mg/day for ≥1 month) or other immunosuppressive medication such as TNF-α antagonists ?

7. Injection drug user?

8. Resident or employee of high-risk congregate setting (e.g., prison, long term care facility, hospital, homeless shelter)?

9. Medical conditions associated with risk of progressing to TB disease if infected (e.g., diabetes mellitus, silicosis, cancer of head or neck, Hodgkin's disease, leukemia, and end-stage renal disease, intestinal bypass or gastrectomy, chronic malabsorption syndrome, low body weight [10% or more below ideal for given population]) ?

10. Signs and symptoms of TB?

NYCDOH TB Screening Form

1. Have you ever had a TB skin test?
   - If yes, when was it?
   - What was the result?
   - If positive, do you have the documentation?

2. Did you have a chest x-ray after your skin test?
   - If yes, when?
   - Where was it? (e.g., name of hospital, doctor, clinic)

3. Have you ever been told that you have TB? If so, when:

4. Have you ever been treated for TB infection or TB disease?
   - Which medicines did you take?
   - How long were you on the treatment?

NYCDOH Screening Questionnaire

TB Risk Category

- Medical risk factor (includes contacts to active TB cases)
- Population risk factor
- Administrative (TB test required only for work, school, etc.)

NYCDOH Screening Form

Questions 5-12: Medical Risk Factor

5. Have you ever been told, or suspected, that you were exposed to someone with TB? If yes, when?

6. Have you ever had cancer of the head, neck or lung; leukemia; or lymphoma?

7. Have you ever had an organ or tissue transplant?

8. Are you taking steroids, like prednisone ,chemotherapy or drugs that affect your immune system?

9. Do you have diabetes or high blood sugar?

10. Do you have any of the following symptoms:

cough longer than 2 weeks? Fever, chills, night sweats longer than 2 weeks? Weight loss that was not planned?

11. Do you have renal failure, or are you on kidney dialysis?

Questions 13-18: Population Risk Factor

13. Have you ever injected street drugs?

14. Were you born outside the U.S.? If yes, what country?

15. (If under 18) Has anyone who lives with you moved to the U.S. within the last 5 years? If so, what country?

16. Have you had any visitors from outside the U.S.? When? And where were they from?

17. Have you traveled to any other countries recently? Where and for how long?

18. Have you ever lived or worked in a group setting such as a hospital, nursing home, drug treatment center, homeless shelter, jail, or prison?

#3 Objective

Discuss Barnard College Primary Care Health Service (PCHS) Perspective-

The Student Traveling Abroad

Objective #3 Discussion

- WHO-Identify areas at moderate to high risk for TB
- Review number of Barnard students studying abroad (Study Abroad Department Total 2011/12 & 2012/13)
- Review number of Barnard students traveling to moderate and high risk TB countries - Spring and Fall 2012 and Spring 2013 (seen at PCHS for a travel visit)
- Discuss the recent tubersol national shortage and its impact on distribution

Global Tuberculosis Report, WHO - 2012

- Areas at high risk (incidence > 100 cases per 100,000 population) include most of the countries in Africa, South Asia, and Southeast Asia

- Areas at moderate risk (incidence 25-100 cases per 100,000 population) include most of Eastern Europe, Central Asia, China, Brazil, Colombia, Ecuador, and Guatemala

Risk of TB to Travelers

- For most travelers, the risk of TB infection is low
- Risk increases with the endemicity of TB in the area visited, duration of travel, and activity
- Multidrug-resistant tuberculosis (MDR-TB) presents an extra risk in India, China, Central Asia, Eastern Europe, and Russia

2011/12 The State of Study Abroad at Barnard

ACADEMIC YEAR	FULL YEAR	FALL ONLY	SPRING ONLY	SUMMER	TOTAL (summer not included)	COUNTRIES
2011 - 2012	13	60	136	14	209	35

Total number of students abroad 2011/12: 223

Barnard 2011-2012 Breakdown by Country

Argentina - 7	Czech Republic - 3	Hungary -	Madagascar - 1	Scotland – 8
Australia – 7	Denmark – 11	India – 2	Mexico - 1	Senegal – 1
Bolivia - 3	Dom. Republic - 1	Ireland – 4	Multiple Country- 7	South Africa – 5
Brazil - 2	England – 37	Israel – 4	Norway - 1	Spain – 21
Canada -	France – 42	Italy – 14	Peru - 2	Switzerland- 3
Chile – 3	Germany – 1	Japan – 3	Russia – 3	Syria -
China – 5	Ghana – 1	Jordan - 2	Rwanda - 3	Tanzania - 1

2012/13

The State of Study Abroad at Barnard

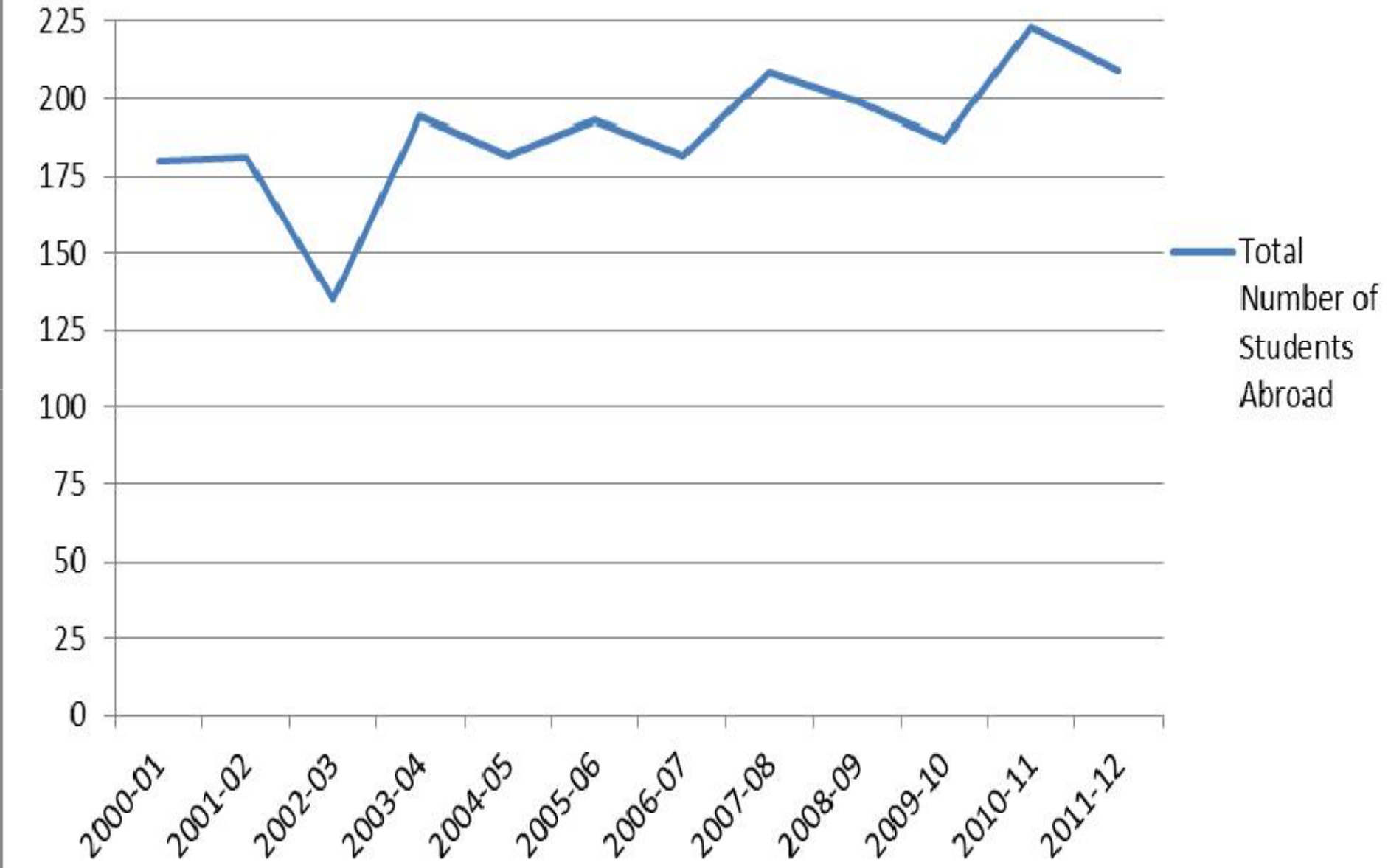
ACADEMIC YEAR	FULL YEAR	FALL ONLY	SPRING ONLY	SUMMER	TOTAL (summer not included)	COUNTRIES
2012 - 2013	14	32	122	47	168	33

Total number of students abroad 2012/13: 215

Barnard 2012-2013 Breakdown by Country

Argentina - 9	Egypt - 1	India - 5	Morocco - 6	Senegal - 4
Australia – 4	England – 27	Ireland - 3	Multiple Country - 7	South Africa - 5
Brazil - 2	France – 27	Israel – 3	Nepal - 1	Switzerland - 1
Chile – 1	Germany – 1	Italy - 11	New Zealand - 2	Taiwan - 1
China – 2	Ghana – 1	Japan - 1	Portugal - 1	Vietnam - 1
Czech Republic – 4	Greece - 1	Jordan - 1	Spain - 21	
Denmark – 7	Guinea - 1	Kenya - 1	Scotland - 5	

Total Students Abroad 2000-2012



Barnard Students Seen at PCHS for a Travel Visit

WHO Moderate and High Risk TB Burden countries > =20 cases/100,000 population

REGION	SPRING 2012	FALL 2012	SPRING 2013
AFRICA	8	16	14
ASIA	24	18	21
EASTERN EUROPE	2	0	3
SOUTH AMERICA	7	8	13
CENTRAL AMERICA	2	10	4
OTHER:			*1
			*MEXICO

MMWR- December 13, 2013 / 62(49);1014-1015

Extent and Effects of Recurrent Shortages of Purified Protein Derivative Tuberculin Skin Test Antigen Solutions- United States, 2013

Nationwide Shortage of Tuberculin Skin Test Antigens: CDC Recommendations for Patient Care and Public Health Practice

Distributed via the CDC Health Alert Network
April 12, 2013, 11:00 a.m. EDT
CDCHAN-00345

Summary

TUBERSOL®, a product of Sanofi Pasteur Limited, is in shortage nationwide until at least the end of May 2013. TUBERSOL® is one of two purified-protein derivative (PPD) tuberculin products that are licensed by the United States Food and Drug Administration (FDA). The manufacturer notified CDC that 50-dose vials of TUBERSOL® are unavailable and that the supplies of 10-dose vials will be limited. This notice advises public health officials, clinicians, and workers in occupational health and infection control about how to adapt to the shortage.

Nationwide Shortage of Tuberculin Skin Test Antigens

CDC Recommendations- any of three general approaches for addressing the shortages of tuberculin skin test antigens:

1. Substitute IGRA blood tests for TSTs. The costs associated with using the blood tests can be greater than the cost of TSTs. The blood tests require phlebotomy, preparation of blood specimens, and specific laboratory services for analysis. Thus, these tests are not available in all practice settings. Clinicians who use the IGRA blood tests should be aware that the criteria for test interpretation are different than the criteria for interpreting TSTs.

2. Allocate TSTs to priority indications, such as TB contact investigations, as determined by public health authorities. This might require deferment of testing some persons. CDC does not recommend testing persons who are not at risk of TB.

3. Substitute APLISOL® for TUBERSOL® for skin testing. In cross-sectional studies, the two products give similar results for most patients. Shortages of APLISOL® are expected to become more widespread, thus limiting the feasibility of this approach.

PCHS Prompted to Conduct QA

Background

- Students who travel abroad to high burden TB countries for greater than 1 month are considered at increased risk for acquiring TB
- Because many authorities recommend administering Pre-Departure TSTs, we at PCHS had adopted this practice during our travel visits for patients going to these high risk countries
- Due to a recent national Tubersol shortage during 2013, PCHS chose to take a closer look at our practice of administering Pre-Departure TSTs to all students traveling to moderate and high risk TB countries
- There is a need to determine if a Pre-Departure TST is necessary in our relatively low-risk population, particularly because our students are all screened with questions regarding their risk for TB prior to matriculation here at Barnard and are tested already if they are found to be at risk

#4 Objective

Explain Clinical Implications for Barnard College Primary Care Health Service (PCHS)

Objective # 4 Discussion

- Review Barnard PCHS data on Pre-Departure TSTs based on students for Spring and Fall 2012 and Spring 2013
- Discuss relevant literature and review whether or not Pre-Departure TSTs are recommended
- Discuss the literature on recommended TB screening programs
- Explain Barnard PCHS conclusion and plan going forward

Barnard College PCHS QA Project

- PCHS conducted a retrospective chart review of the patients who have travelled abroad to moderate and high risk TB areas of the world in the Spring 2012, Fall 2012 and Spring 2013 who have had a Pre-Departure TST
- We assessed the results of chart reviews of patients who were screened for TB exposure and then compared this to the TST results
- We identified any positive TST results that were found and whether a positive or negative TB screening was documented on these patients

Brief Statement of Known or Suspected Problem

Students who are deemed to be low risk for TB by screening with history of exposure may not need to incur the cost and inconvenience of a TST prior to embarking on travel to a moderate or high-risk TB endemic country. Those at higher risk can also be identified by history and then tested as indicated.

Barnard Students Seen at PCHS Traveling to Moderate and High Risk TB Countries

Spring 2012: 36

Fall 2012: 42

Spring 2013: 49

Total : 127 - minus 21= Total 106

Note: 21 students omitted from QA due to limited supply of PPD, no Pre-Departure TSTs administered to these students

QA Data Description

- 106 patients were identified as traveling abroad to TB-endemic areas (students traveling for study abroad, leisure, volunteer work included)
- Out of these patients, 25 were either not screened with a history for potential TB exposure or the screening was incomplete, so these charts were eliminated from this analysis
- The remaining 81 patients were divided into **positive screen** and **negative screen** by history and all were offered a TST
- These resultant groups were further divided into those who tested positive, those who tested negative and those who either did not get tested or did not return for the reading

PCHS Screening Tool Questions

1. History of positive TB test
2. History of prior treatment for TB infection
3. History of abnormal chest x-ray
4. History of BCG vaccination
5. Recent travel to high risk TB country
6. Country of origin identified as high-incidence TB country as indicated by WHO
7. Cough lasting longer than 3 weeks
8. Bloody sputum
9. Shortness of breath
10. Persistent fever
11. Excessive fatigue
12. Unexplained weight loss
13. Night sweats

EVIDENCE OF DATA COLLECTION

Data collected:

- Patients with positive screening history for potential TB exposure
- Patients with negative screening history for potential TB exposure
- TST results

Total: n=81	Positive TST	Negative TST	No/Incomplete TST
Positive TB exposure by history (n=30)	3	13	14
Negative TB exposure by history (n=51)	0	28	23

No/Incomplete TST (37)

Reasons Why TST Not Planted or Incomplete

- No follow up for TST reading
- Recent TST result documented in chart
- Thursday visit, unable to return for reading
- Live Vaccine, need to wait 6 weeks before TST administered

DATA ANALYSIS

- Out of the 44 Pre-Departure TSTs planted, the 3 positive results were all in patients who had a positive TB exposure by history, and only 7% of the total were positive
- This leads us to conclude that we can probably eliminate the practice of screening all patients without regard to their risk prior to their departure
- On the other hand, it reinforces the importance of our screening patients with a history, because we did find that almost 20% of those who were identified to be at risk did have a positive TST

CDC AND ACHA RECOMMENDATIONS ON PRE-DEPARTURE TSTs

CDC: Screen With TST Only High Risk Groups

- Screening with a tuberculin skin test (TST) in a very low-risk population of travelers may result in a false-positive test, leading to unnecessary additional screening or unnecessary treatment

- Using screening tests in very low-prevalence populations will produce more false positives than true positives

When is a Pre-Departure TST Recommended

CDC Recommends

- For travelers who anticipate possible prolonged exposure to TB (such as those who would spend time in hospitals, prisons, or homeless shelters) or those who stay for years in an endemic country should have a 2-step tuberculin skin test (TST) or a single interferon-γ release assay (IGRA), before leaving the United States

- If the Pre-Departure Test result is negative, a single TST or IGRA should be repeated 8-10 weeks after returning from travel

Pre-Departure 2 Step TST Testing

- Two-step testing is important for travelers who will have potential prolonged or substantial TB exposure
- Indviduals whose baseline TSTs yield a negative result are retested 1-3 weeks after the initial test
- If the second test result is negative, they are considered not infected
- If the second test result is positive, they are classified as having had previous TB infection
- Two-step testing before travel will detect boosting and potentially prevent "false conversions"—positive TST results that appear to indicate infection acquired during travel, but which are really the result of previous TB infection
- The distinction is particularly important if the traveler is going to a country where extensively drug-resistant TB (XDR TB) is present: it would be critical to know whether the person's skin test had been positive before travel

ACHA Recommendations

ACHA TB Task Force- March 2012 FAQ

- Some experts recommend both pre-departure and post-travel testing for travelers who will be in endemic areas for greater than one month, especially if they will have close contact with the local population or work in high-risk settings (health care, refugee camps)
- This would apply to students in many study-abroad programs
- The risk of infection depends on the duration of travel, the level of contact with the local population, and other factors
- Students who travel to areas of the world where tuberculosis is endemic should be considered for screening when they return (post-trip TST 8-10 weeks after leaving TB endemic region)

LTBI Management / Treatment

One may argue:

Confirming TST status before travel would prevent the conclusion that a positive TST after travel was due to recent conversion

While another may argue:

Still same management/recommendations on treating LTBI for both recent conversion or new infection

TB SCREENING PROGRAM

ACHA Guidelines-TB Screening and Targeted Testing of College and University Students (4/2014)

- Screening and targeted testing for tuberculosis (TB) is a key strategy for controlling and preventing infection on college and university campuses
- Early detection provides an opportunity to promote the health of affected individuals through prompt diagnosis and treatment while preventing potential spread to others
- Implementation of a screening and targeted testing program not only addresses this public health concern in campus communities but also contributes to the larger public health goal of reducing the burden of TB in the United States

Heartland National Tuberculosis Center

Model Tuberculosis Prevention Program for College Campuses

- Funded by the Centers for Disease Control and Prevention and is a joint project of the University of Texas Health Science Center at Tyler and the Texas Center for Infectious Disease

- How-to manual that can be used by those on your campus who will be responsible for the practical development and implementation of a tuberculosis screening and testing policy

- Provides guidelines for:
  - TB policy: Risk Screening and Testing
  - LTBI and active TB treatment

Barnard PCHS Conclusion & Plan

Recommended Actions to be Taken

- Revise policy on travel and update TST indications
- No longer test everyone departing for moderate and high risk TB countries, only those who have positive screening utilizing TB Risk Assessment Questionnaire
- Add questions to PCHS current screening tool
- Providers utilize the screening questions to identify patients at risk for TB prior to leaving to moderate and high-risk countries
- EMR template has option for TB screening so it is standardized for all clinicians
- Emphasize Post-Trip TST 8-10 weeks after leaving moderate or high risk TB country (Outreach to Study Abroad Department)
- To allocate resources accordingly and address cost effectiveness of TST: $5 fee imposed
- To prevent students from not following up for TST reading: email reminder and no

QA Additional Findings…

…has lead to discussion on new updates/ recommendations

- Implement new check and balance system so as to assure complete documentation is included when patient indicates history of +TST (e.g., chest x-ray done, LTBI or active TB treatment received)
- Tracking system in place to identify and follow up with students who fail to keep monthly monitoring appointments
- Need for educational handouts (e.g., INH side effects/adverse reactions)
- Refusal of Treatment for LTBI
- Annual Statement for Tuberculin Reactors

Working Towards TB Elimination

Centers for Disease Control and Prevention's Division of Tuberculosis Elimination (DTBE)

- Collaborates with other U.S. Government (USG) agencies, multilateral organizations, NGOs and other governments

- Supports the **WHO Global Plan to Stop TB**, which seeks to halve TB prevalence and mortality by 2015

- USG agencies support this plan by assisting high-burden countries to expand:
  - basic TB control programs
  - invest in research and development initiatives
  - build programs with a focus on reducing TB/HIV co-morbidity
  - preventing and treating multidrug-resistant TB
  - reaching vulnerable populations

WHO Global TB Report 2013

TARGETS ON TRACK

- ✓ Incidence falling slowly: 2015 Millennium Development Goals (MDG) on track
- ✓ Reduction in TB mortality of 45% since 1990
- ✓ 22 million lives saved since 1995
- ✓ 87% cure rate and 56 million patients cured, 1995-2012

5 PRIORITIES FOR ACTION

1. Reaching the "missed" cases (3 million not in the system)
2. Address MDR-TB as crisis
3. Accelerate response to TB/HIV
4. Increase financing to close resource gaps
5. Ensure rapid uptake of innovations

WHO: Global Strategy and Targets for Tuberculosis Prevention, Care and Control after 2015

Global TB Programme

At the 65th World Health Assembly in May 2012, Member States called upon WHO to develop a new post-2015 TB strategy and targets, and present this to Member States at the 67th World Health Assembly in 2014

The Stop TB Strategy

- **Vision:** A **WORLD FREE OF TB**- Zero deaths, disease and suffering due to TB
- **Goal:** End the Global TB Epidemic

WHO Global TB Programme

MILESTONES FOR 2025

- 75% reduction in TB deaths (compared with 2015)
- 50% reduction in TB incidence rate (compared with 2015) (< than 55/100,000)
- No affected families face catastrophic costs due to TB

TARGETS FOR 2035

- 95% reduction in TB deaths (compared with 2015)
- 90% reduction in TB incidence rate (<10/100,000)
- No affected families face catastrophic costs due to TB

Strengthening Surveillance To Reach Goals

- Reasons for **uncertainty** in current estimates of TB **incidence** include use of expert opinion about both the number of cases that are diagnosed but not reported to national surveillance systems and the number of cases that are not diagnosed at all

- Major challenges in estimating TB **mortality** include the lack of **Vital Registration (VR)** systems of sufficient coverage and quality in many countries, notably in Africa and parts of Asia

- Strengthening surveillance in many countries will be required in order to achieve the long-term goal of directly measuring the level of and trends in TB disease burden from routine surveillance data, using notification data to measure TB incidence and **VR** data to measure TB mortality

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