Maryland Dept. of Health

Navy TB Control

14 March 2019

Center for TB Control and Prevention Annual Conference

USU
Uniformed Services University

Robert Lipsitz
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Background

Uniformed Services University

Objectives

1) Discuss ‘how do we do it’ in the usual (clinic) and the unique medical environments in the US Navy (i.e. Recruit Medicine)

2) Talk for 20-25, questions for 5-10

Conflict of Interest Statement

The content, views and opinions expressed here are the presenter's and do not necessarily reflect the those of the US Navy, USU, or DoD.

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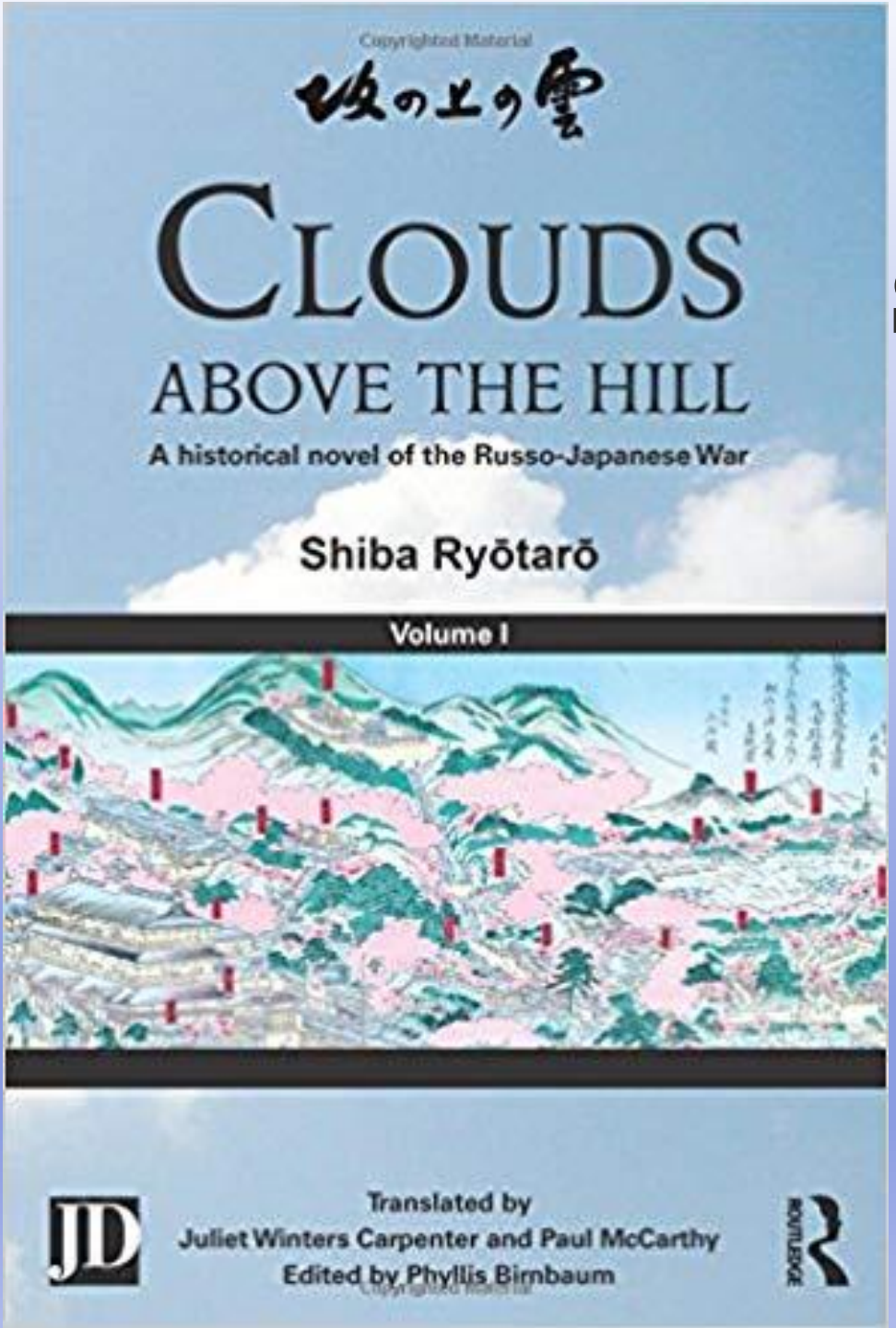
And…
I declare that I have no proprietary, financial, professional, or other interest of any nature in any product, service and/or company that could be construed as influencing the position presented in, or the review of, this presentation.



Saka no Ue no Kumo

After coughing blood
I lie in my sickbed
nothing to do-
reading Motoyoshi's poems
is cause enough for joy

-Masaoka Shiki

Knock out the normal

WRNMMC – screen new hires, varies between Two Step Testing and IGRA

TB Risk Assessment is conducted annually, low risk facility

We offer LTBI care with 3 basic options:

RIF x 4 Mo

INH x 9 Mo

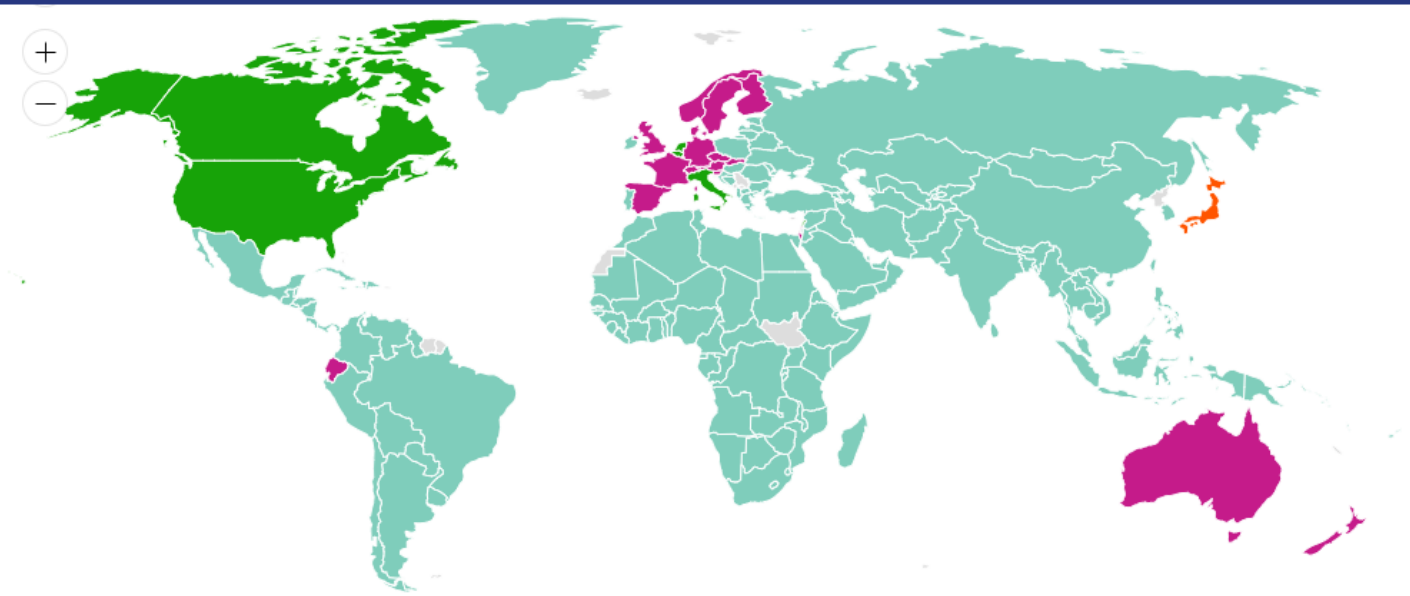
DOT (transition to SAT) x 12 weeks

Provide education on the pros and cons of each and the patient decides what works best for them

What do we find useful

THE BCG WORLD ATLAS 2nd Edition

HOME ABOUT IN THE PRESS CONTRIBUTE TEAM



JS map by amCharts

Current national BCG vaccination policy for all
Past national BCG vaccination policy for all
BCG reccommendation only for specific groups
Selected country
No data available

Welcome to the updated BCG Atlas!

> Updated in 2017 <

This interactive map provides detailed information on current and past BCG vaccination policies and practices for over 180 countries.

Click on the map or choose/type in a country below:

Select a country

http://www.bcgatlas.org/

Japan

Last updated in 2011

Region	East Asia & Pacific
TB Incidence (per 100 000 per year) *†	17
TB Incidence (Count) *‡	21000
Income group (World Bank)	High income
Current BCG vaccination?	Yes
BCG Recommendation Type	Current national BCG vaccination policy for all
Which year was vaccination introduced?	1942-1951
Timing of 1st BCG?	After birth, within 1 yr
Multiple BCG?	No

* Data from WHO Statistical Information System for the year 2015

† Estimated number of new TB cases per 100 000 population in 2015. All forms of TB are included, including cases in people with HIV

‡ Estimated number of new TB cases in the population in 2015. All forms of TB are included, including cases in people with HIV.

Multiple BCG in the past?	Yes
Timing of old BCG #2	6-13 yrs (every year if TST negative)
Year booster BCG stopped	2003
BCG Strain	Tokyo 172, Japan BCG Laboratory
Is TST done post BCG?	No
Year of BCG coverage estimate	2006
BCG coverage (%)	98.10%
Year of changes to BCG schedule	1942, 1948, 1967, 1974 & 2005
Details of changes	1942: Introduced to primary school graduates, 1948: If TST is negative BCG is repeated every year from ages 0-18 yrs, 1967: Intradermal method was replaced with nulti-puncture method, 1974: Change age of first vaccination to within 4 yrs & Restrict revaccination to primary school and junior school entrants who are TST negative (age of 7 and 13, if negative of TST.). 2005: Restrict to those aged less than 6 months, without preceeding TST
Are there special groups that receive BCG?	No
Datasource	Questionnaire

2015. All forms of TB are included, including cases in people with HIV.

The occasionally interesting

Quantiferon Tuberculosis

Order # 190104-09933 (NNMC Bethesda)

Filler # 190107 NLQ 933 (NNMC Bethesda)

Status: Final

Ordering Provider: CHERN, ANDY

Priority: ROUTINE

Date Ordered: 04 Jan 2019 1035

Date Resulted: 09 Jan 2019 0821

COLLECT_SAMPLE: BLOOD

RESULT COMMENT(S):

TEST NAME RESULT ALERT UOM PERFORMED AT

QuantiFERON Criteria COMMENT 01

The QuantiFERON-TB Gold Plus result is determined by subtracting the Nil value from either TB antigen (Ag) tube. The mitogen tube serves as a control for the test.

QuantiFERON TB1 Ag Value 0.02 IU/mL 01

QuantiFERON TB2 Ag Value 0.02 IU/mL 01

QuantiFERON Nil Value 0.02 IU/mL 01

QuantiFERON Mitogen Value 0.10 IU/mL 01

QuantiFERON-TB Gold Plus NOTE [A] 01

NOTE: Indeterminate

Reference Range: Negative

Mitogen (positive control) gave low response.

This may indicate anergy or immune suppression. Early draws and extended transit time may also result in low positive control and indeterminate results.

The specimen received for QuantiFERON testing was incubated by the ordering institution. Specific procedures outlined in our Directory of Services and in the package insert for the QuantiFERON Gold (In Tube) test must be followed to enable for proper stimulation of cells for the production of interferon gamma.

ALERT/ABNORMAL FLAG LEGEND:

L= Below Low Normal, H= Above High Normal, LL= Alert Low

HH= Alert High, <= Panic Low, >= Panic High, A= Abnormal

Specimen:	Blood	Collected:	07 Jan 2019 0856
Results:		Final report	

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Reference Range: Negative

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QuantiFERON-TB Gold Plus NOTE [A] 01

NOTE: Indeterminate NOT Intermediate

Reference Range: Negative

The low IGRA, what do we do

Challenges with QuantiFERON-TB Gold Assay for Large-Scale, Routine Screening of U.S. Healthcare Workers

Madeline L. Slater[1], Gary Welland[2], Madhukar Pai[3], Julie Parsonnet[1], and Niaz Banaei[1,4,5]

[1]Department of Medicine and [4]Department of Pathology, Stanford University School of Medicine, Stanford, California; [2]Infection Control and Epidemiology, Stanford University Medical Center, Stanford, California; [3]Department of Epidemiology, Biostatistics and Occupational Health, McGill University, Montreal, Canada; and [5]Clinical Microbiology Laboratory, Stanford University Medical Center, Palo Alto, California

Objectives: To evaluate the short-term reproducibility of QuantiFERON-TB Gold In-Tube (QFT) in a large cohort of HCWs and to define a QFT cutoff yielding a conversion rate equivalent to historical TST rates.
Methods: We retrospectively evaluated the QFT results from HCWs with two or more QFT tests performed between June 2008 and July 2010 at an academic institution. Outcome measures were proportions of reproducibility, quantitative results, and conversion rates with alternate QFT cutoffs.
Measurements and Main Results: A total of 9,153 HCWs with two or more QFT tests were included in the analysis. Of 8,227 individuals with a negative result, 4.4% (n = 361) converted their QFT result over 2 years. A total of 261 (72.3%) of the HCWs with conversions underwent repeat short-term testing after the first positive result with 64.8% reverting (n = 169). An IFN-γ cutoff of 5.3 IU/ml or higher (manufacturer's cutoff is ≥0.35 IU/ml) yielded a conversion rate of 0.4%, equal to our institution's historical TST conversion rate.
Conclusions: The manufacturer's definition of QFT conversion results in an inflated conversion rate that is incompatible with our low-risk setting. A significantly higher QFT cutoff value is needed to match the historical TST conversion rate. Nonreproducible conversions in most converters suggested false-positive results.

Keywords: interferon-γ release assay; QuantiFERON; healthcare workers; reproducibility of results

Despite the all-time low incidence of tuberculosis (TB) in the United States, large numbers of U.S. healthcare workers (HCWs) are screened routinely for latent TB infection (LTBI) (1, 2). IFN-γ release assays (IGRAs), such as the QuantiFERON-TB Gold In-Tube (Qiagen/Cellestis, Carnegie, Australia) test (QFT), are increasingly replacing the tuberculin skin test (TST) for occupational screening (3, 4). More than 70 U.S. medical institutions have adopted the QFT assay to serially test hundreds of thousands of hospital employees each year (5). In principle, the QFT has equivalent sensitivity compared with the TST, with improved specificity in bacille Calmette-Guérin vaccinated individuals and individuals with nontuberculous mycobacterial infection (6, 7). Additionally, the QFT improves the logistics and economics of TB screening because, unlike the TST, it does not require trained readers, a return visit, or baseline two-step testing for annual screening (7).

However, in practice, QFT results have proved more dynamic in serial testing than anticipated (8, 9). Early adopters of the QFT assay for occupational screening are now reporting major concerns with interpretation of the high conversion and reversion rates using the manufacturer's recommended cutoff of simple negative to positive change (10–13). This cutoff has not been rigorously validated in serial testing of HCWs.

The CDC published guidelines in 2005 indicating that the QFT may be used in all circumstances in which a TST is recommended, including serial screening in HCWs (14). The 2010 guideline update restates this recommendation but cautions against "a greater risk of test conversion due to false-positive IGRA results" in low-risk HCWs (2). This statement highlights the need for a more accurate definition of QFT conversion in serial testing.

In 2008, the Stanford University Medical Center (SUMC) replaced TST with QFT for annual TB screening of more than 10,000 employees. We retrospectively evaluated the rates of conversion and the reproducibility with short-term testing and determined the QFT cutoff yielding a conversion rate approximating our historical TST conversion rates.

institutions, there are limited data on the reproducibility of IGRA results in this population.

What This Study Adds to the Field

In the largest study of serial IGRA testing in healthcare workers to date, we found that most QuantiFERON-TB Gold In-Tube test result conversions were nonreproducible on repeat testing within 60 days. Using our historical tuberculin skin test conversion rate as a benchmark, the QuantiFERON-TB Gold In-Tube cutoff would need to be increased by more than 10-fold to yield an equivalent conversion rate. Conversions in this low-risk population should be interpreted with caution.

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Author Contributions: Study conception, M.L.S., J.P., and N.B. Initial manuscript draft, M.L.S., M.P., and N.B. Data analysis, G.W. and M.L.S. Editing and revisions of manuscript, M.L.S., M.P., J.P., and N.B. Laboratory procedures, N.B.

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NAVY TB SCREENING

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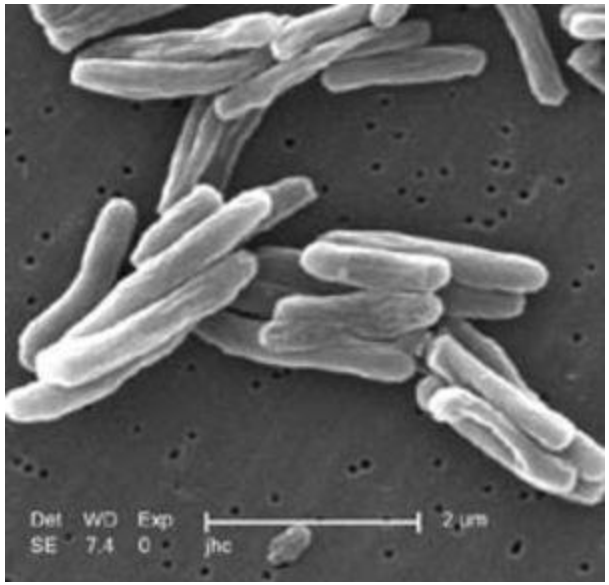
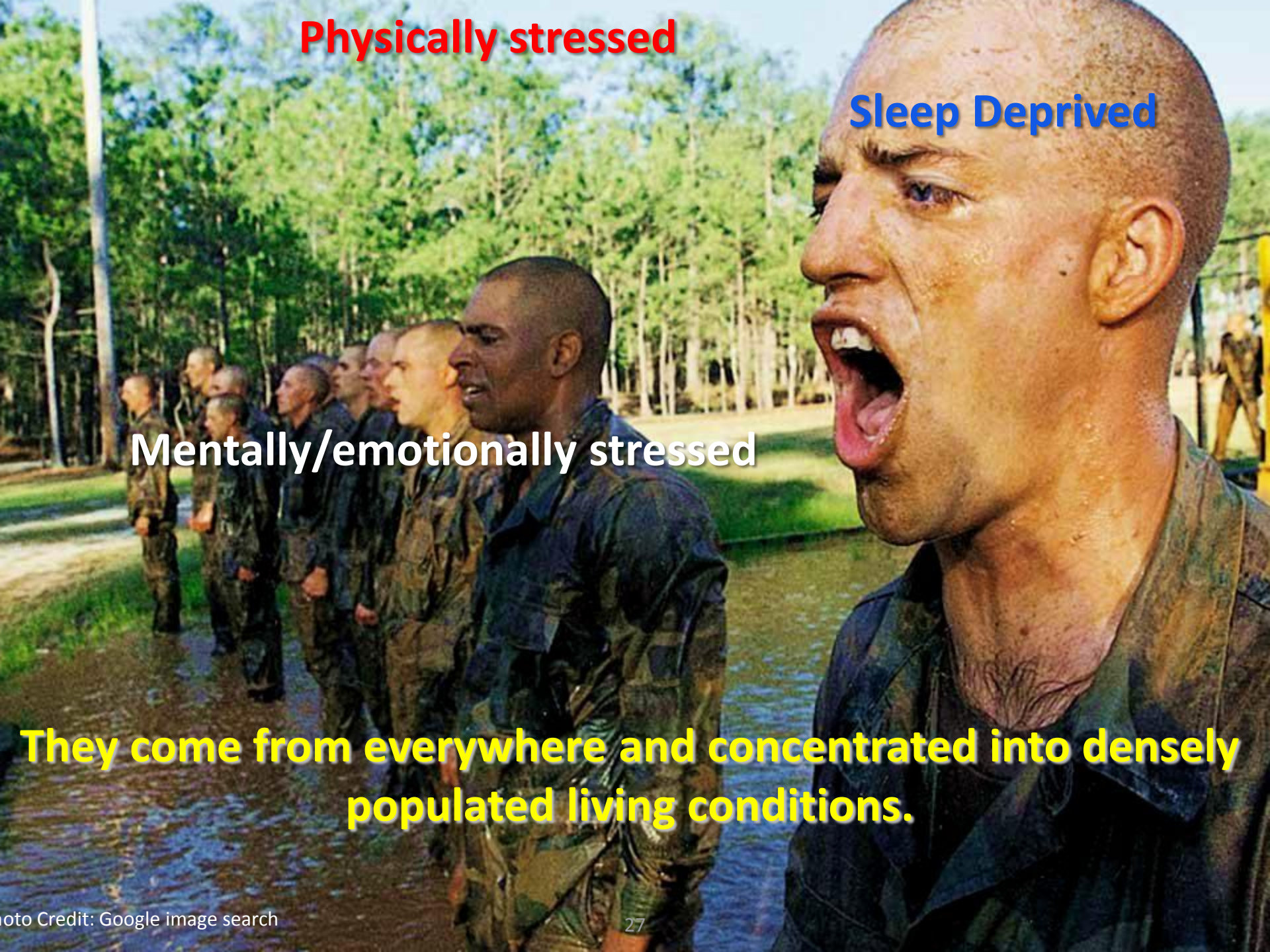


All Navy Accessions are Tested

Boot Camp 101

Recruits - highly susceptible population!

Photo by: Cpl. Justin J. Shemanski
Photo ID: 200582584648 08/22/2005



oto Credit: Google image search

…And they go to ships

2 - West Elevation
A preserved grove of mature oak trees at the southwest corner of the site provides a picturesque setting for the barracks.

Hard Study

Hard Work

Hard Living

Navy Recruit Training 101

Training Schedule:

P week: -In-processing (ex. P-4)

T weeks: -Training (ex. 5-2)

Recruit Immunization Schedule at BHC1523

Vaccine	Number of Doses	Day of Administration
Twinrix (Age 18 and older)	2	P-4, 5-2
Hepatitis A (Age 17)	2	P-4, 5-2
Hepatitis B (Age 17)	2	P-4, 5-2
Varicella	2	P-4, 5-2
MMR	1	P-4
Menactra	1	P-4
Tetanus (TetDipPertussis)	1	P-4
Influenza (Seasonal)	1	P-4
Polio	1	5-2
Gardisil (Optional)	1	5-2
Yellow Fever	1	5-2
Typhoid Fever	1	5-2

Notes:

1. Some Recruits bring a shot record to recruit training and are exempt from some vaccinations.
2. Bicillin is administered on P-4 day; periodically a second dose is administered on 5-2 day.
3. TST is administered on P-1 day.
4. Varicella immunity is titered. Only a small percentage of Recruits require varicella vaccination.
5. Measles, Rubella, HEP A and HEP B immunities are titered.
6. TF and YF vaccine administered to Recruits expected to report to the fleet when vaccine is available and not in a national shortage status.

P-0 Night Arrival

P-1 TST, blood tests, PE's/M&Ws Health

P-3 TST read, +dental, opto evals

P-4 Vaccinations/Bicillin

5-2 Dose #2 vaccines, deployment vaccines

Note: 5-2 divides 1st and 2nd half of training

Prevalence

Most countries in Africa, Asia, and Latin America are high-prevalence countries

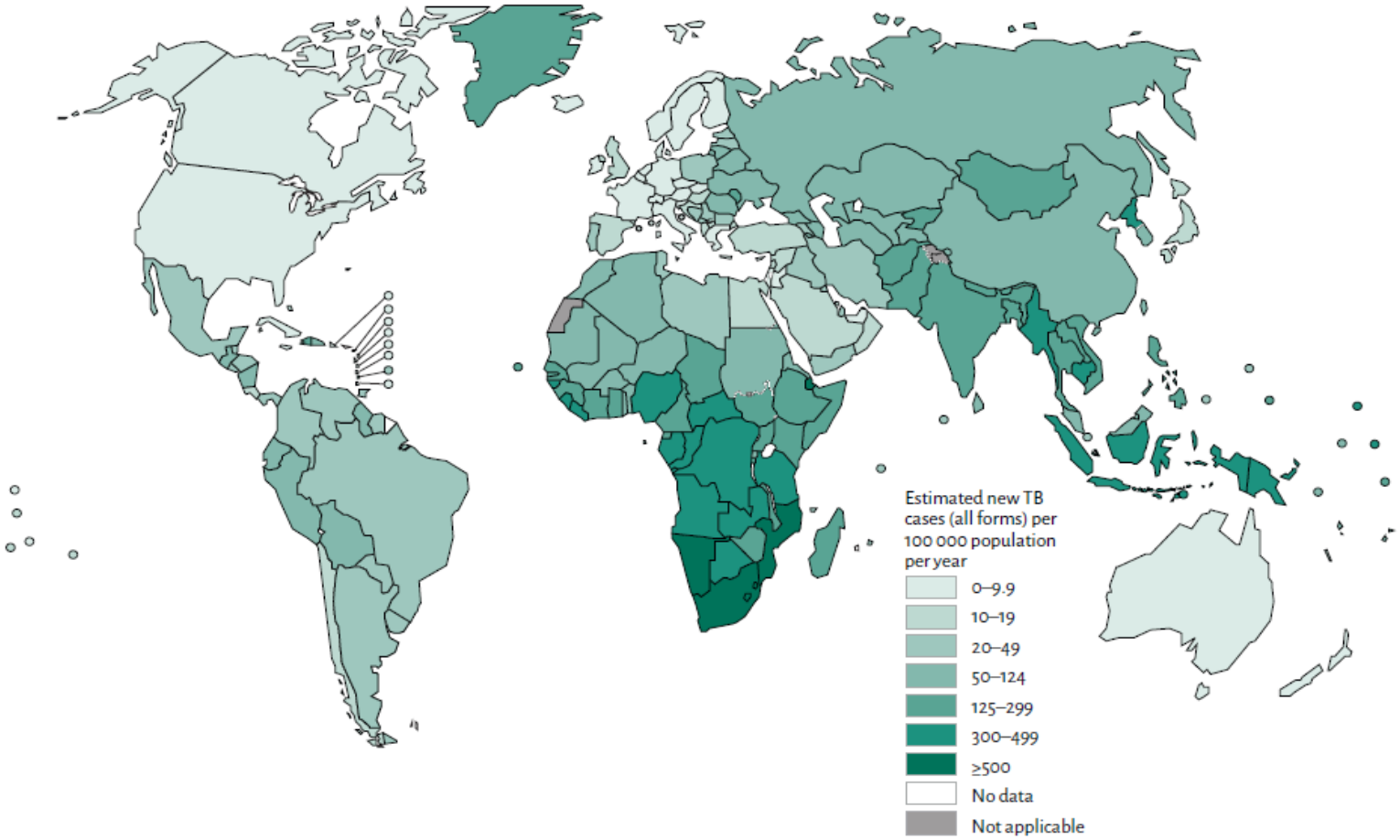
Generally assume Canukus is low prevalence

CANUKAS

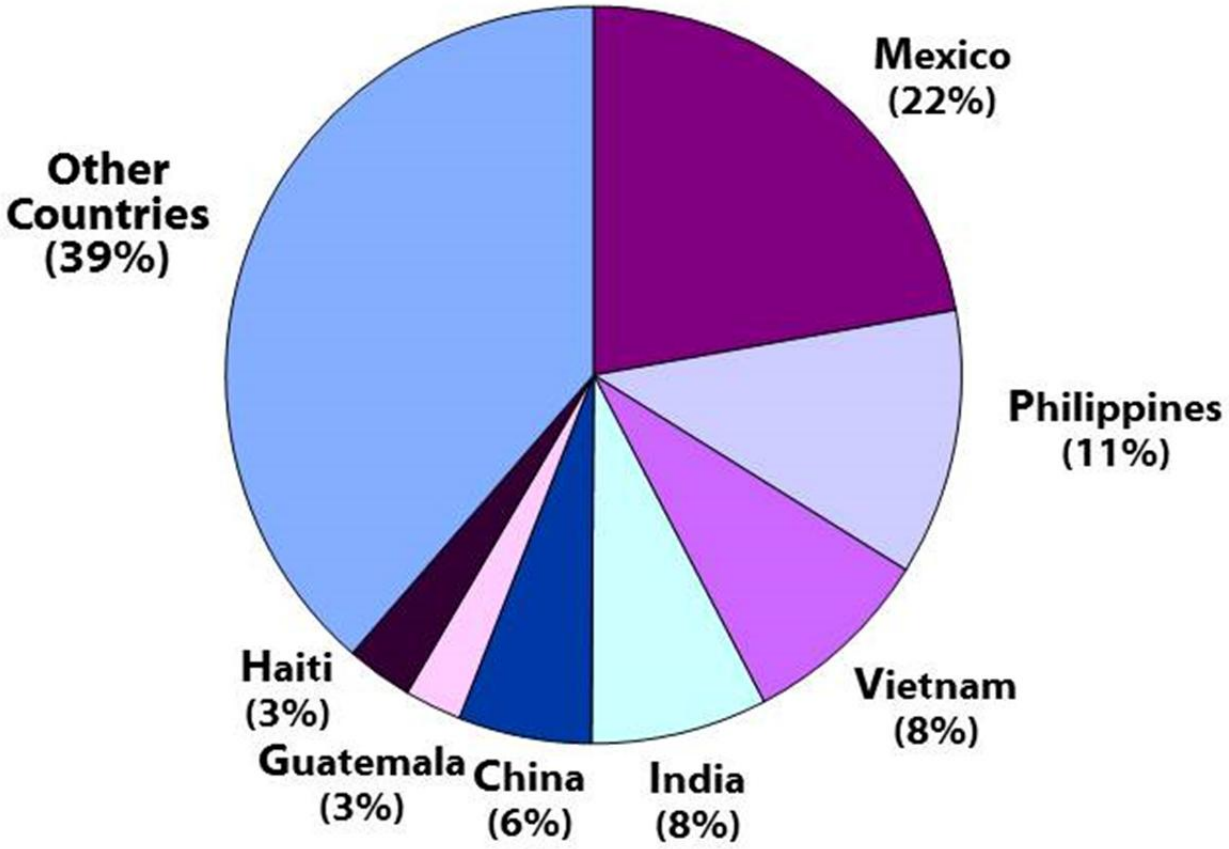
C-A-N-UK-US

FIGURE 2.6

Estimated TB incidence rates, 2014



Countries of Birth of Foreign-born Persons Reported with TB United States, 2011



CDC
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Mycobacterium tuberculosis

World prevalence 2 billion?

8 million new cases annually

1.6 million deaths (latest WHO data)

US peak prevalence 10.2/100k early 1990s

10% of those infected with TB develop active disease,

½ within the first 2 years.

US Civ Mil Comparison

-Immigrants are 9.5 x more likely to be a TST reactor then native born

-At RTC its ?X. Cannot calculate as %recruits who are FB not tracked at RTC

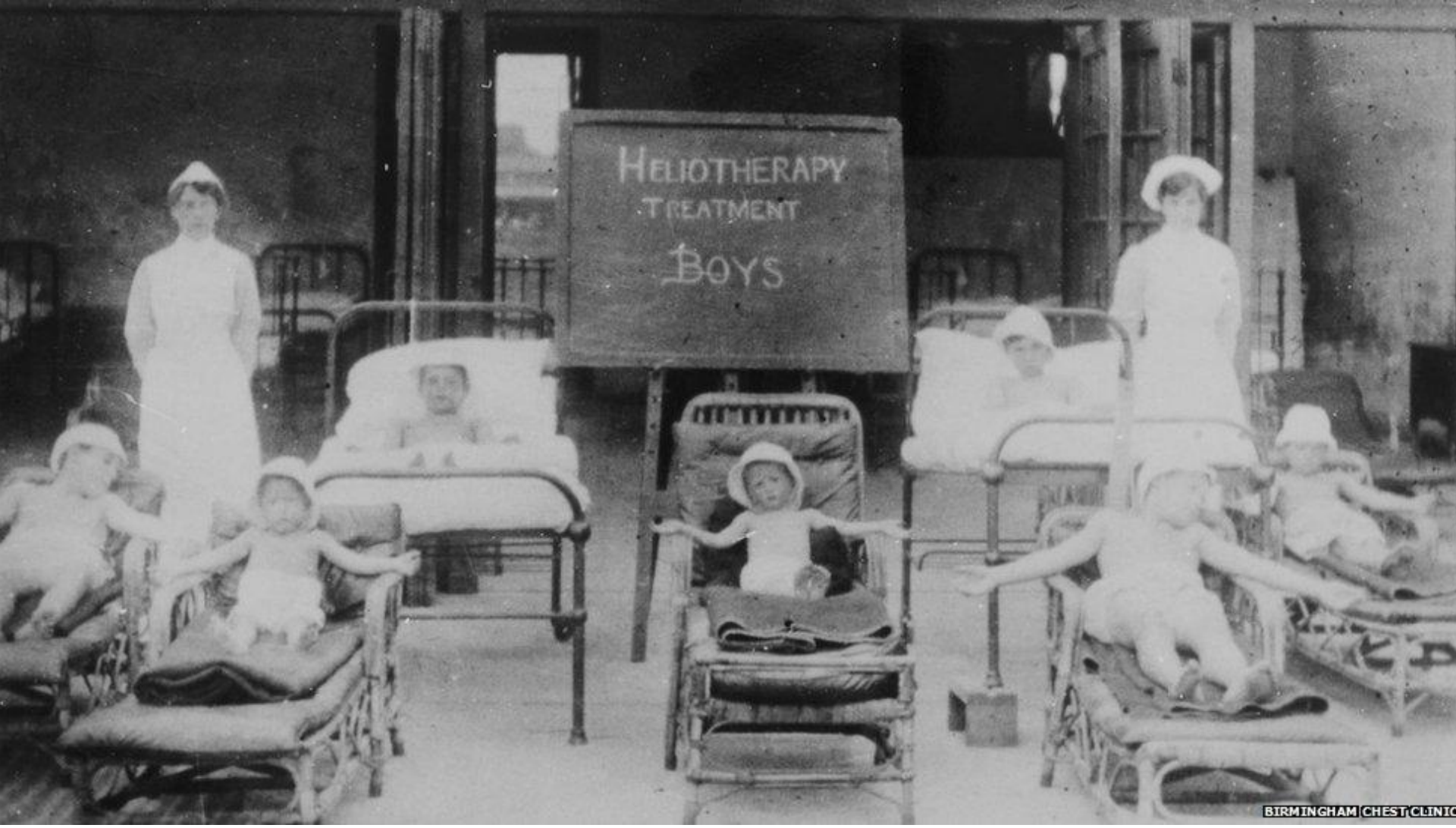
-In US 54% of TST reactors are FB

-At RTC >50% of our reactors are FB


34F
35
36
4
5
35F

Quiz

Listen to your Dentist


HELIOTHERAPY
TREATMENT
BOYS
BIRMINGHAM CHEST CLINIC

Waverly Tuberculosis Hospital in Louisville
Kentucky Cabinet for Health and Family Services

http://www.pauldoolan.com/2010/07/heliotherepy-in-switzerland.html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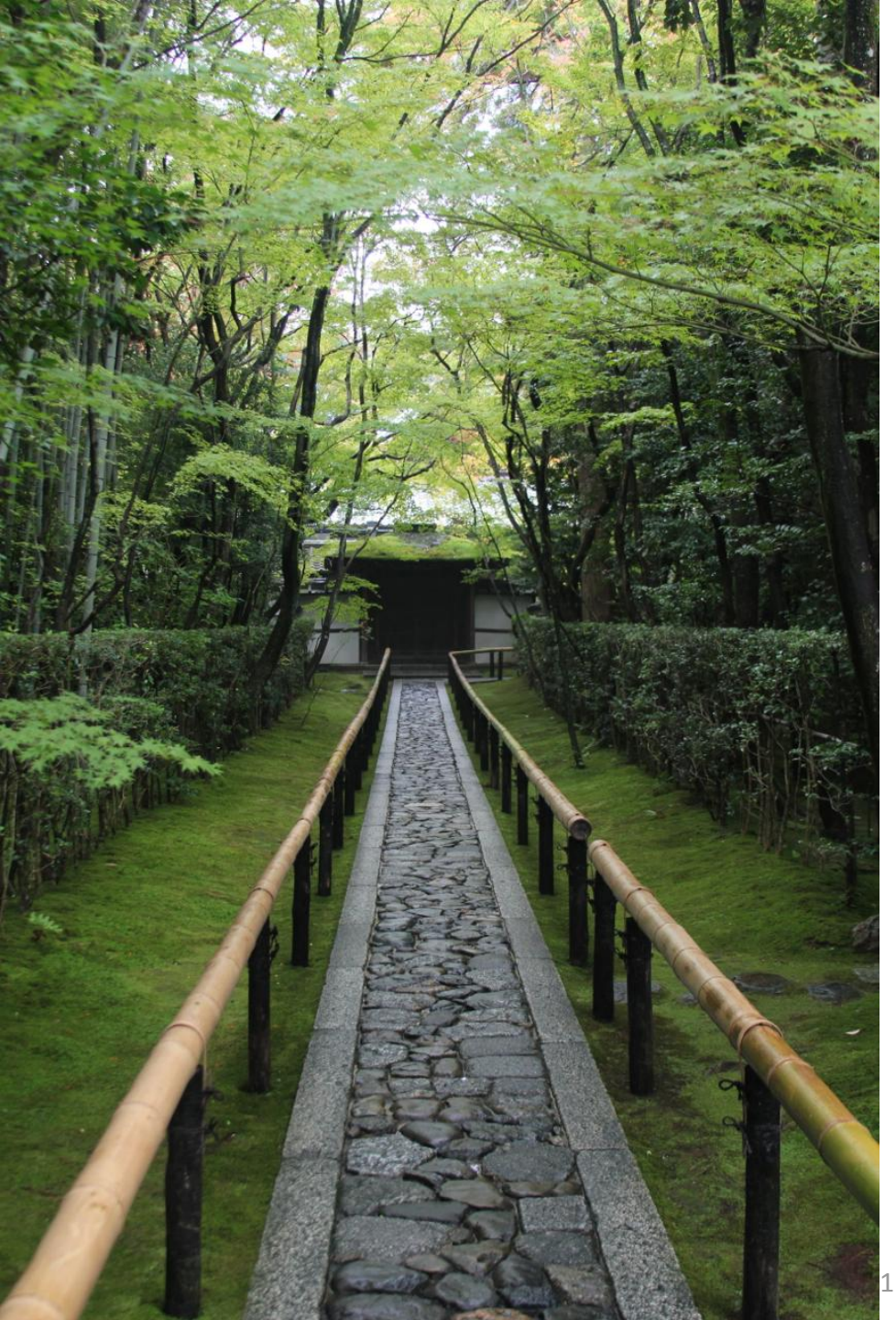

Questions??

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