



**12<sup>th</sup> Annual Conference  
International Union Against Tuberculosis and Lung Disease  
North American Region**

**Bahia Hotel Resort  
San Diego, CA, Canada  
February 28 – March 1, 2008**

## Abstract Committee

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University of California in San Diego  
San Diego, CA, USA

## **2008 Travel Grant Awardees**

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### **North American Region Travel Grant Awards**

#### **Challenges of Contact Investigations for Tuberculosis Cases Diagnosed Post Mortem**

Monica Pecha, MPH

Public Health Seattle and King County Tuberculosis Program  
Seattle, WA, USA

#### **Tuberculosis Recurrence in British Columbia, Canada Over a Period of 17 Years**

AKM Moniruzzaman, MBBS, MSc

University of British Columbia  
Vancouver, BC, Canada

Barbara Beattie, RN, BScN

Government of Nunavut Department of Health and Social Sciences  
Iqaluit, Nunavut, Canada

Vanessa Molinari, BScN

Toronto Public Health  
Toronto, Ontario, Canada

## 2008 Travel Grant Awardees

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### International Travel Grant Awards

**CD14 C\_(159) Polymorphism is a Risk Factor for Development of Pulmonary Tuberculosis**

Guillermo Caballero-Olin, MD, MPH  
Instituto Mexicano del Seguro Social  
Monterrey, Nuevo Leon, Mexico

**Clinical Outcome of a Standardized Treatment in Patients with Multidrug Resistant Tuberculosis**

Dina Martinez Mendoza, MD  
National Institute of Respiratory Diseases  
Mexico, Distrito Federal, Mexico

**Certification of Microscopes: A Strategy to Improve the Quality of the Diagnosis in the Network of Laboratories of Tuberculosis de Bolivia Administration**

Milton Magne, Masters Degree Candidate  
Ministry of Health-National Reference Laboratory of National Control Program

**Determination of the Transmissibility of Resistant Bacteria to Antituberculosis Medications: A Descriptive Study of Contacts**

Milton Magne, Masters Degree Candidate  
Ministry of Health-National Reference Laboratory of National Control Program

**Development of a Culturally Sensitive DOTS Training Manual for Guyana**

Nicola Melville, RN, BScN  
Ministry of Health (Chest Clinic), Guyana  
Georgetown, Demerara, Guyana

**Indirect Patients' Cost for Tuberculosis Diagnosis in Brazil**

Caroline Silveira Santos Cyriaco, NR  
Universidade Federal do Estado RJ (UNI-RIO), RJ-TB Scientific League  
Nilopolis, Rio de Janeiro, Brazil

**Management of Tuberculosis in Haitian Prisons Challenges in the Biggest Facility (Port-au-Prince)**

Jean-Pierre Elie, MD  
National Penitentiary Administration  
Petion Ville, Port-au-Prince, Haiti

**Missed Opportunities for Prevention and Treatment of Tuberculosis in the Dominican Republic**

Eddy Perez Then, MD, MPH  
National Research Center on Maternal and Child Health  
Santo Domingo, Dominican Republic

**Operational Research on Tuberculosis at Sao Paulo State, Brazil**

Valdir de Souza Pinto, Physiotherapist  
Ministry of Sao Paulo  
Sao Paulo, Brazil

**Preliminary Evaluation of HSTB Medium for Susceptibility Testing to First-and Second-Line Antituberculosis Agents**

Beatriz Eugenia Ferro Ramos, Microbiologist  
Centro Internacional de Entrenamiento e Investigaciones Medicas (CIDEIM)  
Cali, Colombia

## 2008 Travel Grant Awardees

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### International Travel Grant Awards

**Resultados del Tratamiento de la Tuberculosis (TB) con el Regimen de 8 Meses Durante 8 Anos (1998-2005) en Santa Cruz (SCZ), Bolivia**

Tomas Gonzales, MDKuratorium  
Tuberkulose in der Welt/Cruz Roja  
Boliviana, Filial Santa CruzSanta Cruz,  
Andres Ibanez, Bolivia

**Tuberculosis Active Case Finding in Health Units: Perception of the Health Professional**

Maria Cecilia Vieira Santos Ribeiro, RN,  
MSc  
Sao Paulo State's Tuberculosis Control  
Program  
Sao Paulo, Brazil

Antonio Coyoc, RHN  
Mnistry of Health, Government of  
Belize  
Belize

Claudine Munyarigoga, Occupational  
Health  
United Nations Stabilisation Mission in  
Haiti (MINUSTAH)  
Petion Ville, Port-au-Prince, Haiti

Miguel Angel Salazar Lezama, MD  
National Insitute of Respiratory  
Diseases  
Mexico, Distrito Federal, Mexico

Nicholas Scott, CMT  
Ezra Long Lab Victoria Hospital  
Castries, St. Lucia

Ricardo Steffen, BSc  
F.T.E. Souza Marques School of  
Medicine/RJ-TB Scientific League  
Rio de Janeiro, Brazil

**Use of the Genotype MTBDRPlus Assay for the Rapid Detection of Resistance to Isoniazid and Rifampicin in Mycobacterium Tuberculosis Isolates from the Caribbean**

Shirematee Baboolal, BHSC, M.Phil  
Univeristy of West Indies/Carribbean  
Epidemiology Centre  
Port of Spain, Trinidad and Tobago

**Tuberculosis Cases that Participated in the Treatment at C.S. Fertisa Area 2 in the Year 2002 to 2006**

Eulalia Abad-Cabrera, RN  
Ministerio Salud Publica Centro Salud  
Fertisa Area  
Guayaquil, Guayas, Ecuador

Christine Curry, MD  
Loyola University Chicago, Zanmi  
Lasante  
Forest Park, IL, USA

### For Oral Presentation

**Laryngeal Tuberculosis – a Study of Twelve Case Studies at the StateWorkers Hospital (HSE), Rio de Janeiro, Brazil**

Silvana Romano, MA  
Hospital dos Servidores do Estado RJ  
Brazil\_HSE (State Workers Hospital)  
Rio De Janeiro, Brazil

**Ultra-Potent Regimens with Rifapentine Yield Stable Cure by 3 Months in a Murine Model of TB**

Ian Rosenthal, PhD  
Johns Hopkins University  
Baltimore, MD, USA

**Using Molecular Typing of Tuberculosis to Assess Recent Transmission Among Homeless and Drug Users in California, 2004-2006**

Martin Cilnis, MPH, MS  
California Department of Public Health/TB Control Branch  
Richmond, CA, USA

**Tuberculosis Recurrence in British Columbia, Canada over a Period of 17 Years**

Akm Moniruzzaman, MBBS, MSc  
Department of Health Care and Epidemiology/UBC  
Vancouver, BC, Canada

**Drug-Resistant TB in Foreign-Born TB Cases in the US: Should the Drug-Resistance Profile of the Country of Origin Guide Treatment Decisions in the US?**

Alison Taylor, MPH  
Centers for Disease Control and Prevention  
Atlanta, GA, USA

**Prospective Study of Diabetes and Quality of Blood Glucose Control among Tuberculosis Patients**

Blanca Restrepo, PhD  
University of Texas Health Science Center Houston  
School of Public Health  
Brownsville, TX, USA

**Assessing Use of the Binational Health Card for Tuberculosis among Patients in the San Diego-Tijuana Border Region**

Alicia Riley, BA  
Stanford University  
Stanford, CA, USA

**Management of Tuberculosis in Haitian Prisons Challenges in the Biggest Facility (Port-au-Prince)**

Jean Pierre Elie, MD  
National Penitentiary  
Port-au-Prince, Haiti

**Social Mobilization Support the DOTS Strategy in the TB Collaborative Binational Plan between Haiti and the Dominican Republic: A Cross Border Initiative**

William Duke, MD, MPH  
Family Health International  
Santo Domingo, Dominican Republic

**TUBERCULOSIS CASES THAT INGRESARON TO TREATMENT C.S. FERTISA AREA 2 IN THE YEAR 2002 TO 2006**  
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**12<sup>th</sup> Annual Conference**  
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## **TUBERCULOSIS CASES THAT INGRESARON TO TREATMENT C.S. FERTISA AREA 2 IN THE YEAR 2002 TO 2006**

### **Author**

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Guayas, Ecuador

Was conducted a study on 111 patients who participated in the program for applying the TB DOTS strategy which account for 64.9% are male, with an average age of 33.9 years introducing 53.15% any economic activity, followed by 35.14% as sellers mobile, the 81.98% of patients treaties were new cases being only 7.20% per failure or relapse, the 83.78% of patients had positive TB type BK getting treatment at the end of the 68.47% of the patients cured, while 8.11% were failures.

### **Conclusion**

In relation to the epidemiology is the expectation that give us the DOTS strategy shows that we can help our population especially in my area where work conjunction with the health team that already sensitized to the difficulty of the fight against TB.

In our country shows great contrasts, presents different realities affecting some social sectors more than others, the truth is that TB is closely linked to people living in dismal conditions as a little food, room, hygiene, and so on.

They do not represent a good quality of life that can have a family, others are unemployed living in greater contact with the illness and death, the ability of defending his agency is usually diminished and this is a fertile ground for the disease.

Of these social groups with no prospect of change in the short run is bad for health, we have developed strategies to improve food and nutrition as educating the family and the community at large by expanding the voluntary participation of community in the DOTS.

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**ENHANCED SELF-ADMINISTERED THERAPY (ESAT) FOR IMPROVING CONTACT LTBI TREATMENT COMPLETION PILOT PROJECT: 1st YEAR PRELIMINARY RESULTS**

**Author**

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**Background**

Completion of treatment of contacts and other high risk patients with Latent Tuberculosis Infection (LTBI) is one of the priorities of tuberculosis (TB) control and elimination. Historically, Houston has provided Directly Observed Therapy (DOT) for LTBI to a large number of high-risk contacts, with an overall completion rate of 80% (vs. 20% on self-administered therapy). However, ongoing resource reductions have made it more difficult to continue to provide the same level of DOT for LTBI services. The purpose of this project was to determine the effectiveness of a new program in maintaining or improving current LTBI treatment completion rates.

**Methods**

Patients were enrolled in clinic and educated and dispensed calendars, pill boxes, and a one month supply of self-medication. Patients were telephoned weekly by Public Health Investigators (PHIs) to discuss side effects (verbal toxicity check), compliance, pill box and calendar usage and to assess the patients' knowledge of TB transmission, TB infection vs. disease, medication name, dosage and duration of treatment. The questions were reassessed at each encounter until the client could offer correct response. Monthly PHI field visits were conducted, including medication delivery and toxicity and compliance checks (pill count and calendar collection). Telephone interviews of randomly selected patients were conducted the week of April 9, 2007 to assess patients' satisfaction and perceived utility of the program.

**Results**

Between May 22, 2006 and May 31, 2007, a total of 287 clients had been enrolled. One was later excluded due to unrelated death. Of the remaining 286, as of October 31, 2007, 150 (52.3%) had completed therapy and 101 (35.2%) clients were actively participating. An additional 39 active adult participants (13.6%) had completed 6-8+ months of INH. This gives a minimum completion rate of 65.9%. Only 35 (12.2%) of the 286 clients had dropped out of the program. Of these, 3 were converted to DOT (1 still on treatment), 1 (0.3%) requested self-medication only, 9 (3.1%) moved out of the jurisdiction, 10 (3.5%) had medication stopped by the medical provider due to side effects, 7 (2.4%) declined further treatment for LTBI and asked to be removed from ESAT, and 5 (1.7%) were lost to follow-up. On survey, 40% of patients did not think they would have returned to clinic every month to refill their medicine.

**Conclusion**

Weekly telephone follow-up, monthly field visits, educational reinforcement and use of patient reminders for taking medicine are useful strategies in aiding patients to complete LTBI treatment. Up to 40% of the patients may have failed treatment on traditional self-administered therapy due to the inconvenience of returning to the clinic monthly. Based on preliminary results, patients were very satisfied with the ESAT program, and compliance and completion of treatment appear to be at least as good as DOT.

**SPEAKING ENGLISH AS A PREDICTOR FOR TREATMENT  
ADHERENCE FOR LATENT TUBERCULOSIS INFECTIONS  
(LTBI) AMONG ASIAN IMMIGRANTS IN A PUBLIC HEALTH  
CLINIC SETTING, 1994-1998**

**Authors**

**Arai SR**, White MC. University of California San Francisco, USA

**Background**

This historic cohort study evaluated the treatment outcomes of Asian immigrants who received prophylactic treatment for latent TB infections (LTBI) at a municipal public health clinic. Asian immigrants from TB endemic countries are particularly at high risk for reactivation, yet, little is known about the factors that influence their drug adherence.

**Methods**

Electronic clinic medical records from 1994 to 1998 were reviewed to identify 4,547 eligible subjects on LTBI prophylaxis therapy from China, the Philippines and Southeast Asia (SEA). Completion was determined by final clinical evaluation. Multivariate logistic regression was performed to identify significant predictors for treatment adherence.

**Results**

A total of 3,576 (82.6%) immigrants completed six months of prophylaxis treatment. Of the three Asian groups, Chinese immigrants had the shortest U.S. residency (mean 2.98 ± 5.9 yrs) and (75.6%) did not speak English. Filipinos had the longest U.S. residency (mean 5.28± 8.0 yrs) and the majority (91.5%) spoke English. Controlling for U.S. residency, the immigrants' countries of origin and speaking English were significant predictors of treatment completion. Newly arriving Chinese immigrants who did not speak English were 1.3 times (AOR 1.3, 95% CI, 1.06-1.67, *p* = .014) more likely to complete the LTBI treatment. In contrast, Asian immigrants who spoke English were 42% (AOR .417, 95% CI, .333-.524) *less likely* to complete treatment.

**Conclusion**

These findings are counter-intuitive, but we suggest immigrants, who speak English and may appear to be more acculturated, may require more drug monitoring for adherence than the recently arrived non-English speaking immigrant from China.

## **EXTENSIVELY DRUG-RESISTANT (XDR) TUBERCULOSIS (TB) DATA UPDATE, UNITED STATES, 1993-2007**

### **Authors**

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### **Background**

In response to Congress, the CDC, in June, 2007, issued an urgent request to state TB programs to send the most recent incidence and outcome data on XDR TB cases reported from January, 1993 to June, 2007.

### **Methods**

XDR TB case data were collected for patients treated by the TB program. Current treatment status and additional outcomes not routinely collected in the National TB Surveillance System (NTSS) were requested.

### **Results**

Forty-eight cases of XDR TB by initial drug susceptibility test (DST) results and 33 cases by final DST results were identified, including 2 cases previously unreported. Seven additional cases were reported that were treated by a TB program but were not residents of that jurisdiction, and therefore not previously counted. Among the 48 resident cases identified on initial DST results, 2 (4%) were dead and 46 (96%) were alive at diagnosis. Among cases alive at diagnosis, 6 (13%) were on active treatment, 16 (35%) completed treatment, 16 (35%) died during therapy, and 8 (17%) stopped treatment due to intolerance, were lost, or moved. Median time to death from start of therapy was 45 days. Median treatment time was 727 days for cases completing treatment.

### **Conclusion**

Data collected for the NTSS are not sufficient for XDR TB surveillance. A supplemental registry is being implemented to collect additional outcome data and DST results on MDR and XDR TB cases (regardless of count status). The supplemental registry is part of a national plan for enhanced response to MDR/XDR TB in the United States.

## **ENSEÑANZA DE LA TUBERCULOSIS EN ESCUELAS Y FACULTADES DE ENFERMERÍA DE MÉXICO**

### **Autores**

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### **Antecedentes**

México, cuenta con 32 estados y una población de 106 millones de habitantes  
15 mil casos de TB Pulmonar por año, y tasa: 14X 100 000 habitantes  
En 2002 La UICTER (La Unión) propuso desarrollar una Encuesta sobre la Enseñanza de la Tuberculosis en Facultades de Enfermería de América Latina y El Caribe. En 2004, la Organización Panamericana de la Salud realizó reunión sobre enseñanza de la TB en Facultades de Salud de Bolivia, Brasil, Chile, Colombia, El Salvador, México, Perú, República Dominicana y Uruguay.  
En 2005 México aplicó la encuesta a través de la Red TAES de Enfermería en Tuberculosis, a Directoras y Profesoras de escuelas de enfermería

### **Metodología**

- Entrevista con autoridades de facultades o escuelas de enfermería
- Distribución de encuestas en escuelas participantes
- 26 estados con 45 escuelas y facultades de enfermería encuestadas

### **Resultados**

- Más de 80% de escuelas basan sus clases teóricas en diálogos y talleres
- 65% desarrollan prácticas de TB en centros de salud y 48% en hospitales públicos
- 22% no realiza enseñanza sobre guías y normas de TB
- 82% han revisado la Norma oficial de TB.
- 71% conocen sobre la vacunación con BCG
- 57.7%. conocen sobre quimioprofilaxis en TB
- 56% desarrollan la búsqueda de casos de TB
- 24% han administrado tratamiento: supervisado, 2% autoadministrado y 35.5 ambos

### **Conclusiones**

- Es necesario incorporar en la currícula de escuelas y facultades de enfermería el contenido del Programa de Tuberculosis para que los alumnos otorguen atención de calidad a pacientes con TB al egresar de la academia e ingresar a laborar a las instituciones de salud.

## **USE OF THE GENOTYPE MTBDRPLUS ASSAY FOR THE RAPID DETECTION OF RESISTANCE TO ISONIAZID AND RIFAMPICIN IN MYCOBACTERIUM TUBERCULOSIS ISOLATES FROM THE CARRIBEAN**

### **Authors**

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### **Objectives**

To evaluate the MTBDRplus genotype assay for the rapid detection of resistance to isoniazid and rifampicin in MTB isolates.

### **Methods**

A combination of several TB cultures and clinical specimens were tested for drug resistance to Isoniazid (INH) and Rifampicin (RIF) using the “gold standard” BACTEC 460 TB system (BD) and a newer molecular based genotyping method, MTBDRplus (Hain Lifesciences). A total of 48 cultures/clinical specimens were tested including pure viable cultures (23), contaminated cultures (9), non-viable cultures (13) and direct clinical specimens (3).

### **Results**

All 3 clinical specimens were sensitive to both to INH and RIF using the MTBDRplus assay. Of the 3 specimens, 2 grew in culture subsequently and were sensitive to both drugs. The contaminated and non-viable cultures were tested only with the MTBDRplus assay. All 22 cultures were identified as MTB and 2 (9.1%) showed resistance to RIF. All 23 cultures that showed resistance were tested using both methods and when the results were compared, the MTBDRplus assay was 100% in agreement with that of the BACTEC 460 system for RIF resistance, however for INH resistance, the results were very disappointing with only 33% agreement between both assays.

### **Conclusions**

The MTBDRplus assay is an easy, rapid and cost effective test for the detection of resistance to Rifampicin in cultures and clinical specimens. Although the result for INH resistance was a bit disappointing, this assay can still be used as RIF resistance is a surrogate marker for multidrug resistance.

## INVESTIGATION OF AN *M. TUBERCULOSIS* GENOTYPE CLUSTER — DETROIT, MICHIGAN, 2007

### Authors

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### Background

In 12/2004, a 29-year-old woman was diagnosed with smear-positive, cavitary, pulmonary pan-susceptible tuberculosis (TB). Treatment interruption led to her recurrent TB disease in 2005. Five cases with matching genotypes were identified during 08/2006–04/2007 in Detroit, Michigan. An investigation was conducted to determine whether this genotype cluster represented an outbreak and to prevent further transmission.

### Methods

We reviewed records of all 6 patients and interviewed 4 of 5 living patients to determine their contacts, activities, and locations while contagious. *Mycobacterium tuberculosis* isolates were genotyped using standard molecular methods (i.e., spacer oligonucleotide typing, restriction fragment length polymorphism, and mycobacterial interspersed repetitive units).

### Results

All 6 patients were U.S.-born; 1 was HIV-infected; 4, including the index, reported cocaine use, and 5 did not receive consistent directly observed therapy (DOT). Repeated interruptions in the index patient's treatment resulted in an infectious period >1,000 days, and she subsequently developed multidrug-resistant TB. Secondary cases occurred in one of her social contacts and two family members, including her mother who died from TB meningitis. Of the 71 contacts identified, 64(90%) required further evaluation. Thirty-six (51%) were high priority and 35(49%) were medium priority according to CDC contact investigation guidelines.

### Conclusions

The index patient's prolonged infectious period resulted in an outbreak with  $\geq 3$  epidemiologically linked secondary cases. Other factors that contributed to the outbreak were cocaine use and inconsistent DOT. Complete treatment of the index patient's initial TB episode, thorough contact investigations, and enforced DOT for all patients could have prevented morbidity and mortality in this outbreak.

**Key words:** pulmonary tuberculosis, *Mycobacterium tuberculosis*, outbreak, molecular epidemiology

**12<sup>th</sup> Annual Conference**  
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## **BEST PRACTICES IN TB CONTROL; A WEB-BASED SERIES ADDRESSING CHALLENGES IN THE PREVENTION AND CONTROL OF TUBERCULOSIS**

### **Authors**

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### **Background**

Our 2006 regional training needs assessment identified many TB program challenges, including concerns that rural and low incidence area issues are seldom addressed. Since these challenges had been successfully dealt with by several programs in our region, a “Best Practices” series of seminars was developed to facilitate sharing strategies regionally. A web-based format was used, based on audience guidance, including time, length, and users’ technology.

### **Methods**

Two 90-minute seminars – *Working with Substance Users and Homeless Populations* and *What Works Best in Rural and Low-Incidence Settings* – were driven by regional experiences. The third 105-minute seminar, *Legal Interventions in TB Control*, was expanded nationwide. Participants pre-registered via a site coordinator, and their information was used by the presenters to tailor lectures and case studies.

### **Results**

Chronologically, 118, 94, and 262 sites participated in the 3 seminars with an estimated 676 people total. Evaluation results showed that over 90% of respondents (n=494) indicated that course objectives were almost always/frequently (5-point scale) met and time was well spent, and that they would apply aspects of the seminars at work. Based on the information provided, 61% of respondents would seek additional information on the topics presented, and 10% would additionally change their practice. Faculty were rated excellent/good (4-point scale) in over 90% of responses.

### **Conclusion**

Web-based seminars are a useful tool to enhance staff’s ability to address challenges through sharing approaches with successful outcomes collected from the target audience. They are easily accessible and incur little expense (except time) by the participant.

## ASSOCIATE VARIABLES TO DRUGS RESISTANT TUBERCULOSIS IN A UNIVERSITY HOSPITAL

### Authors

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### Background

The infection by *M. tuberculosis* (TB) is the second cause commonest of death by infectious disease, adding the extension of drugs resistant strains.

### Objective

To describe the characteristics of the patients with tuberculosis drugs resistant, during period 1997-2007, in a University Hospital. To analyze the variables associated to resistance in the studied population.

### Methods

Analysis of clinical histories of the patients with TB during the last ten years.

### Results

Of 512 patients with diagnosis of tuberculosis, 25 (4.88%) showed some degree of drugs resistant, 9 (1.76%) fulfilled the multidrug resistant definition. The most frequent monoresistance went to Isoniazid (32%). The age average was of 35.3 +/- 16.4 years. A 52% were of feminine sex. A 68% corresponded to original treatment. A 44% were foreign born. The frequency of comorbidities was 12% alcoholism, 8% diabetes mellitus, 8% HIV status. Pulmonary localization was found in 92%. Comparing characteristic of the group TB drugs resistant with group TB sensible, we observed staining for acid-fast bacilli positive in 76% vs. 34.5% (OR: 5.9; IC95%: 2.31-15; p=0.00054), previous treatment 32% vs. 5.95% (OR: 7.7; IC95%: 3-19.4; p=0.00012) and foreign born in 44% vs. 24.8% (OR 2.37; IC95%: 1.05-5.3; p= 0.033), respectively.

### Conclusions

The drug resistant was lower than the reported at national level. The associate variables significantly to resistance were the previous treatment, staining for acid-fast bacilli positive and foreign nationality.

## **INTERNATIONAL ASPECTS OF TUBERCULOSIS (TB) CONTACT INVESTIGATIONS INVOLVING AIR TRAVEL**

### **Authors**

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### **Background**

The Centers for Disease Control and Prevention's Division of Global Migration and Quarantine (DGMQ) uses the 2006 World Health Organization guidelines "Tuberculosis and Air Travel" when initiating contact investigations involving air travel. Increasingly, these investigations include international public health partners.

### **Methods**

After being notified of a traveler with infectious TB on an inbound flight  $\geq 8$  hours, DGMQ collects locator information for passenger contacts seated within two rows of the index case. Data for passengers with a U.S. address are securely provided to health departments in the passenger's state of residence. Data for passengers with foreign addresses are faxed to their respective ministries of health or U.S.-based embassy. For outbound flights, DGMQ notifies the destination country, which may result in a joint investigation. If the health department reports that the index case has close contacts in another country, DGMQ helps to notify the respective public health authorities.

### **Results**

From June through October 2007, DGMQ was involved in 63 TB (inbound and outbound) flight investigations. In 48 of these flights, 130 foreign nationals were identified as contacts, for which DGMQ notified 29 countries. DGMQ collaborated with 12 countries on 18 outbound flight investigations and notified 6 countries regarding foreign close contacts of 7 cases.

### **Conclusion**

Many persons with infectious TB travel internationally on commercial airlines, demonstrating the need to strengthen communication among international partners to prevent the spread of TB by air travel.

## MULTINATIONAL INVESTIGATION OF A TRAVELER WITH SUSPECTED EXTENSIVELY DRUG-RESISTANT TUBERCULOSIS—2007

### Authors

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### Background

In May 2007, a United States citizen with smear-negative, culture-positive, untreated extensively drug-resistant pulmonary tuberculosis (XDR TB) based on preliminary testing (later confirmed multidrug-resistant TB [MDR TB]) traveled on two international flights. WHO guidelines recommend contact investigation initiation for flights of  $\geq 8$  hours duration for smear- or culture-positive MDR TB patients not on adequate anti-tuberculosis therapy.

### Methods

To determine the extent of *Mycobacterium tuberculosis* transmission, we conducted a contact investigation among close contacts, healthcare workers (HCWs), and airline passengers who were seated within two rows of the traveler with TB.

### Results

Among 26 close contacts, 24 (92%) had initial negative tuberculin skin test (TST) results. Among 10 HCWs, 9 (90%) had baseline negative TST results. One close contact and one HCW had prior positive TST results; one close contact had an initial positive TST result. All had negative clinical evaluations and chest radiographs. There were no TST conversions indicative of recent *M. tuberculosis* transmission among 24 (100%) close contacts or 9 (100%) HCWs. Among 72 passengers, 54 (75%) were evaluated in the U.S. or Canada. Thirty-one (57%) had initial negative TST results (single test  $< 5$  mm in U.S., 2-step testing  $< 10$  mm in Canada); none had TST conversions on second-round testing. Twenty-one (39%) passengers had prior latent TB infection, and two (4%) had a single negative TST result after  $\geq 8$  weeks.

### Conclusion

This MDR TB contact investigation did not demonstrate evidence of *M. tuberculosis* transmission from an asymptomatic, smear-negative patient to close contacts, HCWs, or airline passengers.

## **HEADING: TUBERCULOSIS CONTACT INVESTIGATION IN A RENAL DIALYSIS CENTER, 2006**

### **Authors**

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### **Background**

Infection with *Mycobacterium tuberculosis* has a higher likelihood of progressing to active tuberculosis (TB) among people with chronic renal failure due to the immunocompromised status associated with this condition and related illnesses. In July 2006, an outpatient renal dialysis center client in California contracted pulmonary TB, exposing more than 100 patients, employees, and caregivers at the facility.

### **Methods**

The local public health agency conducted a screening of exposed contacts in August. TB disease was defined as clinical signs or symptoms consistent with TB and bacteriologic confirmation. Latent TB infection was defined as a positive TST result ( $\geq 5$  mm induration), exclusion of TB disease by chest radiograph or sputum culture, and medical evaluation. TST result data was then stratified by shift and shift time among the patient contacts to determine whether transmission occurred.

### **Results**

A total of 134 contacts were identified; 85 (71%) dialysis center patients, 37 (26%) employees, and 12 (8%) caregivers. 73 (86%) patient contacts received a chest radiograph. Of these, 6 (8%) were abnormal suggestive of TB. Employees and caregivers who obtained chest radiographs showed no evidence of active TB disease.

The index case was dialyzed on the 2<sup>nd</sup> of two shifts, but occasionally dialyzed during the 1<sup>st</sup> shift. Patients exposed during the 2<sup>nd</sup> shift demonstrated a risk ratio = 4.22 [p=0.09] of having a positive TST result. Further stratification of the 2<sup>nd</sup> shift by time revealed no TST positive nor active TB disease contacts.

### **Conclusion**

Overall, the number of fully screened patient contacts totaled 74 (87%). There were no new confirmed active TB cases. These findings highlight the need for TB screening and treatment of TB infection for all *high-risk* health care employees and patients.

## CD14 C(-159)T POLYMORPHISM IS A RISK FACTOR FOR DEVELOPMENT OF PULMONARY TUBERCULOSIS

### Authors

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### Background

Neither the expression of CD14 and Toll-like receptor 4 (TLR4) on monocytes' surface nor the mutations CD14\_159TT and TLR4 Asp299Gly have yet been evaluated as risk factors for development of pulmonary tuberculosis (TB) in the Mexican population.

### Methods

Level of membrane CD14 (mCD14) and membrane TLR4 (mTLR4) were determined by flow cytometry, in 104 patients with pulmonary TB (before and after treatment), 67 household contacts, and 114 healthy control subjects. Genotype/allele frequencies in CD14 -159 and TLR4 Asp299Gly were obtained by polymerase chain reaction–restriction-fragment length polymorphism. Levels of soluble CD14 (sCD14) in sera were quantified by ELISA.

### Results

Higher levels of mCD14/sCD14 and mTLR4 were observed in the patients and the household contacts than in the control subjects ( $P < .05$ ) and decreased in the patients after the infection was resolved. The frequency of the CD14\_159TT genotype was higher in the patients than in the control subjects (35.6% vs. 12.3%, respectively). Patients who were homozygous for allele T of the CD14 promoter gene had a significantly higher risk for development of pulmonary TB, with an odds ratio of 2.267 (95% confidence interval, 1.5%–3.3%). Levels of sCD14 or mCD14 were not associated with the CD14\_159TT genotype ( $P < .05$ ).

### Conclusions

No association between TLR4 Asp299Gly and pulmonary TB was found. CD14\_159TT is a risk factor for development of pulmonary TB, whereas mCD14/sCD14 and mTLR4 are possible biomarkers for the prognosis for TB disease.

**Clinical Trial Protocol ID:** SA1168-05.

**IDENTIFICATION OF TB - MDR IN DEFAULT CASES  
ANTITUBERCULOSIS TREATMENT IN BOLIVIA, A REPORT  
FROM 2003 TO 2006**

**Authors**

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**Introduction**

In Bolivia the tuberculosis is still being a problem of public health, and a challenge the control of the pathology according to the established norms.

The National Network of Laboratories of Tuberculosis makes diagnosis and follow of treatment of patients through bacteriological methods, such as the resistance and sensibility tests in cases epidemiologically important as: default,, failures and relapses. Results of cultures are analyzed of 138 cases of patients that abandoned the treatment, in the administration 2003 to the administration in 2006, that represent 14% of the total of notified cases of abandonment in Santa Cruz, Chuquisaca, La Paz and Cochabamba patient corresponding: 30 to 2003, 27 patients to 2004, 31 patients at 2005, 50 to 2006.

**Methods**

Cultures of Mycobacterium tuberculosis were received, in Lowenstein Jensen medium tubes, of departmental laboratories that make cultivation, being carried out the test of sensibility and resistance to INH, RFP, SM and EMB in the National Laboratory of reference using the proportions of Canetti and Rist method, in cases notified according to the form of application of resistance determination and sensibility in all the identified cases as abandonment.

**Results** Of 138 identified cases from the year 2003 at the 2006, 100 cases are susceptible (72,4%), 38 (27%) cases present any to one or more antituberculosis drugs, having being identified 15 cases (10.8%) as MDR cases, inside all the cases classified as abandonment.

**Conclusions**

From the year 2003 in only 14% of the default cases has been requested resistance determination and sensibility, having being established that the treatment abandonment conditions the establishment of multiresistance identified in 10,8%, for what should strengthen the pursuit of patients in treatment to avoid abandonment's and to reduce the MDR.

## **IDENTIFICATION OF TB - MDR IN FAILURE CASES TO ANTITUBERCULOSIS TREATMENT IN BOLIVIA, REPORT ADMINISTRATION 2003 TO 2006**

### **Authors**

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### **Introduction**

The Tuberculosis actually in Bolivia, is a pathology that shows important rates of incidence inside of Latin America region, the epidemic control of the illness is applied at national level, being important in the surveillance the cases notified as Failure. In Bolivia according to the study of cohort of the year 2003 at the 2006, 137 patients have been notified with therapeutic failure, having received the National Laboratory 236 cultures for to identify resistance levels to antituberculosis drugs.

### **Material and Methods**

The primary culture was made of patient with suspicion of therapeutic failure by culture in Lowenstein Jensen medium, in Departmental Laboratories that make cultivation, being carried out the test of sensibility and resistance to INH, RFP, SM and EMB in the National Laboratory of Reference by means of the method of the proportions of Canetti and Rist. Carried out a retrospective analysis of the registration of the National Laboratory of Reference of Tuberculosis of Bolivia of the tests of sensibility and resistance from 2003 to 2006.

### **Results**

We analyzed 236 cases, of those, 112 (47.4%) are susceptible and 124 cases (52.5%) they are resistant to any antituberculosis drug. Being 80 the identified cases with MDR, corresponding to different regions of Bolivia.

### **Conclusions**

The patients that are qualified as therapeutic Failure constitute an important group in the surveillance and Control of the Tuberculosis disease, to be those that are constituted in factor of transmission risk in the community and a challenge for the Tuberculosis Control Program that should strengthen the prescription surveillance, administration and execution of the treatment besides identifying causes possible of therapeutic failure in the communities to diminish the rate of failures in the regular notification and the appearance of new cases MDR.

## **IDENTIFICATION OF THE SITUATION OF THE RESISTANCE IN RELAPSES IN BOLIVIA, A REPORT: ADMINISTRATIONS 2003 TO 2006**

### **Authors**

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### **Introduction**

The tuberculosis in Bolivia is an illness that constitutes a serious problem of public health, the treatment with antituberculosis drugs is made in the whole country, being an important activity the notification of cases and the identification of patients that correspond to relapses that are patient that they present positive bacteriology after having concluded the treatment outline.

### **Methodology**

Primary culture was carried out in Lowenstein Jensen, in departmental laboratories that make cultivation, being carried out the test of sensibility and resistance to INH, RFP, SM and EMB in the National Laboratory of reference using the method of the proportions of Canetti and Rist, in cases of relapse.

A retrospective analysis of the cases was carried out, in the registrations of the National Laboratory of Reference of Tuberculosis of Bolivia from the administrations 2003 to 2006.

### **Results**

Of the 290 cases of relapse, they were the following results: 181 cases (62%) susceptible and 109 cases (37%) had some resistance degree to antituberculosis drugs, being identified 35 cases MDR in cases of relapse corresponding to 12%.

### **Conclusions**

The National Tuberculosis Control Programme must to develop strategies to follow up the application of standard procedures in the epidemiological surveillance in each region, causes possible of therapeutic failure in the communities to diminish the rate of failures in the regular notification and the appearance of new cases MDR.

## **HEALTH EDUCATION: A STRATEGY TO MINIMIZE TREATMENT ABANDON IN THE TUBERCULOSIS TREATMENT**

### **Authors**

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### **Background**

Tuberculosis (TB) is still a serious problem for the Public Health in Brazil. The strategy of implanting of a program of Health Education directed towards all TB patients is an alternative to minimize this reality. To identify those social-demographic and behavioral factors which caused influence in the patients to abandon the TB treatment in order to implement a program of Health Education in the Oswaldo Cruz Foundation (FIOCRUZ).

### **Methods**

July 1999 to December 2006 was analyzed 456 patients. From 83 patients that abandoned TB treatment. The analysis of the interview was based in the technique of the Collective Subject Discussion of the Subject, just 17 patients were returned, being 14 co-infected by TB/HIV. We used a qualitative method with support of quantitative methods.

### **Results**

The motives of treatment abandon: taking the anti-TB therapy when fasting, the amount of pills and capsules and side effects of medications, these complaints increase due to the addition of antiretroviral. We have implanted the attendance of adherence for patients who are direct by TB ambulatory physicians. In addition we are undertaking activities in the waiting as patients wait for the attendance, opening space for dialogue between technical and popular knowledge.

### **Conclusion**

We have observed also the patient's satisfaction in taking part in the educational strategies through dialogue with the health professional. However, these activities have been a constant challenge, due to the social and economic complexity.

## **REPRESENTACIÓN SOCIAL DE LA ENFERMEDAD PULMONAR POR MNT Y TB UNAM SDEI.PTID.05.4**

### **Autores**

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### **Antecedentes**

Es un estudio de corte antropológico que pretende analizar las representaciones socioculturales que la población demandante de cuidado a la enfermedad pulmonar por MNT y TB construye ante la enfermedad, el padecimiento y la muerte, así como los sistemas de autoatención y de cuidado a los que recurre. El estudio de las representaciones sociales de la enfermedad y de la salud en grupos culturales específicos, nos permite conocer el tipo de creencias que se manejan en contextos sociales concretos y las actitudes que determinarán el comportamiento de los individuos de esos grupos sobre la búsqueda del bienestar individual y colectivo.

### **Objetivo**

El presente estudio pretende contribuir al conocimiento de la enfermedad pulmonar por MNT y tuberculosis, mediante la construcción y significados culturales que adquieren estos padecimientos entre las personas enfermas.

### **Material y Metodos**

Estudio cualitativo en dos etapas. La primera consiste en entrevistar con una guía de entrevista a los pacientes MNT detectados por el INER, 44 pacientes en 9 Estados de la República, que se parearon con pacientes de TB pulmonar y conviviente sano, y la segunda etapa consistirá en escoger casos tipo para entrevista a profundidad.

### **Resultados**

De la muestra hemos entrevistado 10 personas, 6 TB y 4 MNT, cuyas edades fluctúan entre 23 y 62 años Con contacto de varios años con el sistema de salud, que en general piensan que la enfermedad es un castigo. Los pacientes MNT recibieron Tx de tuberculosis, y son estigmatizadas como TB, No trabajan por su enfermedad y dependen de la familia. La mayoría tiene el apoyo del grupo familiar. En general refieren haber respirado polvo o sustancias que les afectaron los pulmones, o que el trabajo era pesado, que cargaban cosas muy pesadas lo cual los debilitó y adquirieron la enfermedad, o por beber agua cruda de pozo.

### **Conclusión**

La mayoría percibe a la enfermedad como debilidad, dependencia, malestar y castigo.

## DIRECT COSTS OF TUBERCULOSIS FOR PATIENTS' AND THEIR FAMILIES IN BRAZIL

### Authors

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### Background

Brazil provides free care for tuberculosis since the 60s'. In DOTS facilities, travel and meal tickets are also offered. Since tuberculosis usually affects the poorest, we aimed to evaluate costs incurred by patients and their families in DOTS units in Rio de Janeiro state.

### Methods

We interviewed 102 patients with bacteriologically confirmed pulmonary tuberculosis in the 4<sup>th</sup>-12<sup>th</sup> week of treatment in 10 facilities. Costs incurred by patients and their families and family income were evaluated.

### Results

Patients were 35 (18-75) year-old; 62% were male, family income was <US\$200 (21%), US\$200-US\$399(24%), US\$400-US\$600 (18%), and >US\$600 (27%). Costs are displayed below. Thirty-five (34%) patients declared family income decrease (33 tuberculosis-related), 4 declared income increase (3 tuberculosis-related) with government-allowance.

<b>Costs (U\$)</b>	<b>Median (range)</b>	<b>Mean (95%CI)</b>
Food	55.6 (8.3-833.6)	77.6 (52.6-102.6)
Transportation	13.3 (0-351.3)	28.4 (15.6-41.2)
Medication (non-supplied)	0 (0-261.1)	15.5 (6.3-24.6)
Tests	0 (0-140)	6 (0.5-11.6)
Consultations	0 (0-86.1)	2.4 (-0.4-5.1)
Paid help	0 (0-100)	1.3 (-0.7-3.7)
<b>Total</b>	<b>94.4 (17.8-1140.3)</b>	<b>132.1 (95.5-168.8)</b>

### Conclusions

One third of Brazilian tuberculosis patients lose income. Despite free diagnosis, treatment and incentives, DOTS patients and their families commit a considerable part of their income for treatment with food and travel. Costs with different supervised treatment schedules should be evaluated. More widespread healthcare facilities are needed to reduce travel costs.

**12<sup>th</sup> Annual Conference**  
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## **THE NATIONAL TUBERCULOSIS CURRICULUM CONSORTIUM 2008**

### **Authors**

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### **Background**

The NTCC was established in 2003 by the NIH-NHLBI to improve knowledge of tuberculosis in health professions students in the USA. This multi-disciplinary collaborative project includes 36 faculty in 26 universities.

### **Methods**

The NTCC's core is a comprehensive website (<http://ntcc.ucsd.edu>) developed and improved throughout the project. Access is free-of-charge to teachers, students, and the public. The NTCC informs potential users through meeting presentations, publications and newsletters, and optimization of internet search engine strategies.

### **Results**

By 11/07, the website includes: TB competencies for 8 disciplines; 15 case descriptions akin to comprehensive medical records; 15 computerized cases; 87 images/videos; 94 questions/answers/teaching points and a few PowerPoint presentations. The website provides user-friendly options such as assigning computerized cases for completion outside of class and e-mailing responses to the instructor. Other NTCC products can be easily integrated into classroom activities. Over the next six months, scripts and teaching materials will be developed for several standardized patient cases, along with other new products.

### **Conclusion**

NTCC products are developed using technologies that appeal to young learners. Based on data from several surveys by the NTCC and others, there is need for improvement in knowledge, skills, and confidence among students assigned the care of patients with latent tuberculosis infection or active TB disease. The NTCC website provides innovative ways to address these learning needs.

## INDIRECT PATIENTS' COSTS FOR TUBERCULOSIS DIAGNOSIS IN BRAZIL

### Authors

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### Background

In studies of cost-effectiveness, patients' indirect costs are seldom considered. The aim of this study was to evaluate time spent in health care facilities and travels for the diagnosis of tuberculosis.

### Methods

We interviewed 102 patients in 10 healthcare DOTS facilities in Rio de Janeiro State (tuberculosis incidence rate=100/100,000 inhabitants). Patients with bacteriologically confirmed pulmonary tuberculosis in the 4<sup>th</sup>-12<sup>th</sup> week of treatment were included. Time spent for travel, waiting and consultation during pre-diagnostic and diagnostic visits was observed.

### Results

Patients were 35 (18-75) year-old; 62% were male. Table below displays time spent.

Time spent	Median (range)	Mean ( $\pm$ SD)	95%CI
Total (hours)	10.6 (0.75-51.1)	11.8 ( $\pm$ 8.9)	9.9-13.5
Total pre-diagnostic (hours)	4.2 (0-32.1)	6.7 ( $\pm$ 6.9)	5.2-8
Total diagnostic (hours)	3 (0-29)	5.1 ( $\pm$ 5.3)	4-6.1
Waiting/visit (hours)	0.7 (0-15)	1.6 ( $\pm$ 2.1)	1.2-2.1
Traveling/total (hours)	0.5 (0-4)	0.7 ( $\pm$ 0.5)	0.5-0.8
Consultation/total ( <b>minutes</b> )	11.8 (2.5-54)	14.4 ( $\pm$ 9.1)	12.4-16.3
Hospitalization before diagnosis (days, n=18)	11.5 (1-90)	21.2 ( $\pm$ 26.1)	8.2-34.2

### Conclusions

In average, patients lose a large amount of time traveling and waiting for consultations before tuberculosis diagnosis is obtained. This is in addition to lost days of work because of illness, hospitalization and post-diagnosis visits. Scheduled consultations should reduce waiting time, with the additional benefit of reducing transmission risk. More widespread healthcare facilities are needed in the state.

## **NATIONAL LUNG HEALTH FRAMEWORK**

### **Authors**

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### **Background**

The National Lung Health Framework is an action plan that is being developed by and for a range of stakeholders. Its coordinated approach to the prevention and management of respiratory diseases (including tuberculosis) will have a significant impact on lung health in Canada.

### **Methodology**

The Framework is being developed over two years. Phase One (2006-7) combined research and a multi-stakeholder process to identify a vision and key goals. Phase Two (2007-8) will continue data collection and stakeholder engagement to refine and prioritize the Framework's strategies and activities. Research includes an asset-gap analysis and a cost-risk-benefit analysis. 450 stakeholders from a range of sectors (including governments; industry; health care; research; patients; and the voluntary sector) have been involved as key informants, and through workshops. Additional stakeholders will be consulted in winter 2007/8.

### **Results**

The Framework structure is grounded in four strategic areas: Prevention and Public Awareness; Disease Detection and Awareness; Infrastructure; and Research, Surveillance and Knowledge Transfer. The plan will reflect a broad understanding of respiratory disease, including infectious and chronic respiratory disease, and primary and secondary prevention strategies.

### **Conclusions**

Some of the expected outcomes for stakeholders working in the field of asthma include:

- A clear picture of the problems and current solutions related to lung disease.
- The promotion of lung health and disease prevention.
- Improved access to best practices and coordinated care.
- Increased practical applications of research.
- Tools to address the needs of at-risk populations.

## **THE ROLE OF TRANSLATING RESEARCH INTO PRACTICE IN TUBERCULOSIS ELIMINATION**

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### **Background**

With dwindling numbers of Tuberculosis (TB) cases and insufficient TB control resources, research is critical to accelerate progress towards TB elimination. However, many front-line TB control workers are either unaware of novel research findings or uncertain how to apply them to routine practice. This was the impetus for Tuberculosis Epidemiologic Studies Consortium (TBESC) researchers to form the Translating Research into Practice (TRiP) workgroup.

### **Methods**

Through TRiP, TBESC researchers partner with Centers for Disease Control and Prevention (CDC) staff, TB control leaders and field workers, TB education/training professionals, and others to determine how to translate TBESC research findings into applicable TB control practices. TRiP reviews completed studies to identify findings relevant to TB control practice and determine how to effectively develop tools or training materials for dissemination.

### **Results**

The first study translated by TRiP was “Models for Incorporating HIV Counselling, Testing and Referral into TB Contact Investigations.” A summary of study methodology and findings was disseminated at national TB conferences to demonstrate that efforts to increase HIV testing among TB cases and contacts were feasible, effective, and inexpensive. With input from TRiP, a “Dear Colleague” letter highlighting study findings and identifying resources to facilitate HIV testing of TB patients was written and co-signed by the Directors of CDC’s TB and HIV divisions, and a fact sheet for HIV screening in TB settings was developed for CDC’s website.

### **Conclusion**

By focusing on practical applications of research findings and collaborating with TB control partners, TBESC research and implementation can have a greater impact on TB elimination.

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**COLLABORATION BETWEEN THE TB LABORATORY AND THE TB PROGRAMME LEADS TO EXCELLENCE IN PUBLIC HEALTH AND PATIENT OUTCOMES**

**Authors**

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**Background**

The Ontario Public Health Tuberculosis (TB) and Mycobacteriology laboratory provides “Fast Track” testing for the Ontario provincial public health TB control program to ensure optimal support for TB case investigation and surveillance activities. The Ministry of Health and Long-Term Care’s (MOHLTC) TB control program is decentralized in Ontario. The Ministry TB control program supports Ontario’s 36 Boards of Health by establishing provincial standards and providing guidance and assistance with complex cases and outbreak management. Communication and collaboration has been optimized between the two services to ensure appropriate information is rapidly available for both services; this allows for appropriate laboratory testing and case/contact investigations, as well as measures that lead to continuous improvement in services.

**Method**

Recent cases/clusters of TB were reviewed. Selected case/cluster investigations are presented to demonstrate results of laboratory and provincial TB program collaboration and methods used for improved communication.

**Results**

TB lab/TB program successes examples include:

<b>Laboratory Input</b>	<b>TB Program Input</b>	<b>Positive Outcome</b>
Positive smear and culture results from new TB patients faxed immediately to TB Program	Program tracks patients and assists in follow-up with health unit	New TB cases are followed-up and tracked as rapidly and effectively as possible
Rapid molecular typing of MTB isolates by request of program	Program ensures immediate follow-up of potential clusters/outbreaks	Allows appropriate intervention to prevent TB transmission and initiates outbreak management

**Conclusion**

Close collaboration and communication between TB programs and laboratories provides excellence in service both for public health issues and for optimal patient outcomes.

## **DISCORDANT RESULTS IN LABORATORY TESTS FOR SUSCEPTIBILITY TO PYRAZINAMIDE IN ISOLATES OF *MYCOBACTERIUM TUBERCULOSIS***

### **Authors**

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### **Background**

Pyrazinamide (PZA) is an important antimicrobial used in the treatment of tuberculosis (TB). Laboratory testing to detect resistance to PZA in clinical isolates of *M. tuberculosis* (MTB) has been problematic due to the requirement for using low pH media in order to replicate intracellular conditions. We report discordant results between the BACTEC radiometric method (BT460), the “gold standard”, and the replacement method BACTEC MGIT 960 (BT960), (Becton-Dickinson, Baltimore, MD).

### **Method**

The BT960 method was implemented in our laboratory in 2006. All first isolates of MTB cases (approx. 650/year), are tested for susceptibility to first-line drugs, including PZA. All PZA resistant isolates of MTB that showed resistance with the BT960 were retested with the BT460. When results were discordant between systems isolates were tested for pyrazinamidase activity and mutations in the *pncA* gene.

### **Results**

In a 20 month period there were 43 PZA resistant isolates by the BT960. Repeat testing with the BT460 confirmed PZA resistance in 19 isolates (44%) and were discordant for 24 isolates (56%) All discordant isolates that were susceptible by the BT460 were positive for pyrazinamidase and no mutations were found in analysis of the *pncA* gene.

### **Conclusion**

The presence of pyrazinamidase and the absence of *pncA* mutations in a strain of MTB strongly support a PZA susceptible result. This concurs with results from the BT460 for the same strains. False resistant results from the BT960 system would result in major errors and may lead to improper patient treatment. Laboratories should perform confirmatory testing on all PZA resistant isolates if determined by the BT960.

## **CONTINUITY AND COMPLETION OF ANTI-TUBERCULOSIS TREATMENT FOR UNITED STATES IMMIGRATION AND CUSTOMS ENFORCEMENT (ICE) DETAINEES: KEY OUTCOMES**

### **Authors**

**Cheng J**<sup>1</sup>, Fike A<sup>2</sup>, Moser K<sup>3</sup>, Laserson K<sup>4</sup>, Colorado A<sup>3</sup>, Zuroweste E<sup>5</sup>, Garcia D<sup>5</sup>, Schneider D<sup>2</sup>. <sup>1</sup>STG International, Washington, D.C.; <sup>2</sup>U.S. Immigration and Customs Enforcement, Washington, D.C.; <sup>3</sup>San Diego County Health Department, San Diego, CA; <sup>4</sup>Centers for Disease Control and Prevention, Atlanta, GA; <sup>5</sup>Migrant Clinicians Network, Austin, TX, USA

### **Background**

In 2002, the Advisory Council for the Elimination of Tuberculosis (ACET) issued recommendations to address continuity and completion of tuberculosis (TB) therapy for U.S. Immigration and Customs Enforcement (ICE) detainees. In response to these recommendations, an interagency workgroup was established, which developed protocols for international referrals and continuity of care for ICE detainees who may be deported before treatment completion.

### **Methods**

This evaluation includes data combined from four sources: ICE/Epidemiology Program, Migrant Clinicians Network/TBNet, CureTB, and the Binational Card Project. All TB patients in ICE custody and reported to the ICE Epidemiology Program between January 1, 2004 to July 31, 2006 were assessed for key outcomes.

### **Preliminary Results**

During the evaluation period, 396 active TB patients were reported; of these, 208 (52.5%) were culture positive. A total of 333 (84.1%) active TB patients were enrolled in an international TB referral program. Patients originated from 28 countries, most frequently from Honduras (129; 32.6%), Mexico (123; 31.0%), Guatemala (56; 14.1%), and El Salvador (23; 5.8%). Of the active TB patients, 332 (79.4%) were repatriated; of those, 289 (80.0%) were enrolled in a referral program. Of the repatriated and enrolled, 168 (58.1%) completed treatment, 53 (18.3%) were lost to follow-up, 27 (9.3%) refused or stopped treatment, 10 (3.5%) continue treatment, 18 (6.2%) were not recommended treatment, 6 (2.1%) had other outcomes, and 13 (4.5%) had no reported outcome.

### **Conclusion**

This evaluation provides baseline outcome information and supports the importance of coordination between domestic and foreign public health entities for this high risk population.

**QUALITATIVE EVALUATION OF THE UNITED STATES  
IMMIGRATION AND CUSTOMS ENFORCEMENT  
TUBERCULOSIS CONTINUITY OF CARE PROGRAM**

**Authors**

**Cheng J**<sup>1</sup>, Fike A<sup>2</sup>, Moser K<sup>3</sup>, Laserson K<sup>4</sup>, Colorado A<sup>3</sup>, Zuroweste E<sup>5</sup>, Garcia D<sup>5</sup>, Schneider D<sup>2</sup>. <sup>1</sup>STG International, Washington, D.C.; <sup>2</sup>U.S. Immigration and Customs Enforcement, Washington, D.C.; <sup>3</sup>San Diego County Health Department, San Diego, CA; <sup>4</sup>Centers for Disease Control and Prevention, Atlanta, GA; <sup>5</sup>Migrant Clinicians Network, Austin, TX, USA.

**Background**

In 2002, the Advisory Council for the Elimination of Tuberculosis issued recommendations to address continuity and completion of tuberculosis (TB) therapy for U.S. Immigration and Customs Enforcement (ICE) detainees. In response to these recommendations, an interagency workgroup was established. This workgroup developed protocols for international referrals and continuity of care for ICE detainees who may be deported before TB treatment completion.

**Methods**

Sixty four individuals from nine stakeholder groups were given a standardized telephone interview in English or Spanish to explore their perspectives on the program. All interviews were recorded, transcribed, and analyzed to assess strengths and weaknesses in the program's logic model and identify barriers to continuity of care and treatment completion. NVivo7 was used to support data analysis.

**Preliminary Results**

Several common themes were identified among the stakeholder groups. Most TB patients are started on treatment in a timely manner. ICE detainees' high mobility increases concern for patients being lost to follow-up. The complexity of the program and high staff turnover impedes agencies' ability to institutionalize policies and procedures addressing this population. Health departments and medical staff reported having difficulty communicating with ICE regarding patients' expected deportation date. Foreign national tuberculosis programs reported that the program's referrals and advance notification of arrival improve their ability to locate patients and manage their care appropriately upon return.

**Conclusion**

The key findings of this evaluation will be used to improve program management and communication among the stakeholders with the goal of increasing TB treatment completion rates for ICE detainees.

## USING MOLECULAR TYPING OF TUBERCULOSIS TO ASSESS RECENT TRANSMISSION AMONG HOMELESS AND DRUG USERS IN CALIFORNIA, 2004-2006

### Authors

**Cilnis M.**, Flood J, Elms W, Shaw T, Watt J. California Department of Public Health, Tuberculosis Control Branch, Richmond, CA, USA

### Background

The incidence of tuberculosis in the U.S. has declined; however, transmission continues to occur, particularly in populations where control activities are difficult, including homeless persons and drug users. Molecular typing (genotyping) of tuberculosis isolates has been used to evaluate case clustering and make inferences about population level transmission.

### Methods

We analyzed genotyping and surveillance data. A case was considered clustered if it had an isolate with matching spoligo- and MIRU-type to another California isolate in the study period. Common strains, for which clustering may not be associated with recent transmission, were excluded.

### Results

Approximately 10% (885/8669) of reported cases were either homeless and/or drug users (H/DU). Of 2848 genotyped cases, H/DU cases were more likely to cluster than cases without risk factors (78% vs. 59%,  $p < 0.001$ ). Among H/DU cases, 180/328 (55%) were U.S.-born. The proportion of clustering was higher in U.S.-born H/DU cases compared to U.S.-born cases without risk factors (84% vs. 72%,  $p = 0.01$ ) and in foreign-born H/DU cases compared to foreign-born persons without risk factors (70% and 57%,  $p = 0.003$ ). The 10 largest clusters were responsible for 88 H/DU cases (27%). Investigation of these clusters has confirmed substantial recent transmission.

### Conclusion

Cases that were homeless and/or drug users were more likely to cluster than those without any risk factors, even when stratified by country of origin. This suggests that transmission of *M. tuberculosis* is more intense in these groups than in the general California population. Additional strategies to control transmission in these populations are needed.

## **VITAMIN D DEFICIENCY IN THE PEDIATRIC TB CLINIC IN WINNIPEG, MANITOBA**

### **Author**

**Consunji-Araneta R.** University of Manitoba, Winnipeg, Manitoba, Canada

### **Background**

Vitamin D (VD) plays an important role in inflammatory/immune reactions and may be critical in the human tuberculosis (TB) response. With the increased prevalence of TB in the aboriginal (A) population, especially those residing in Northern Manitoba (NM) we sought to identify how frequently children seen in the TB Clinic were VD deficient (VDD).

### **Methods**

VD levels were drawn (as part of routine baseline blood work as per clinic protocol) from patients referred to the TB clinic for contact investigation, school/immigration screening or treatment of primary/pulmonary disease from July 1, 2006 to August 31, 2007. The normal reference value used was 75-250nmol/L (25-75nmol/L - VD insufficient [VDI], <25nmol/L - VDD).

### **Results**

Two hundred four patients (87% A) had blood levels drawn during the 14 month period. Two hundred twenty specimen were processed - 25% VDD, 60% VDI and 15% with normal VD. Twenty eight percent of A patients residing in NM were VDD. Twenty eight percent of children <4 years of age had normal VD while 50% of those >15 y were VDD. Timing of blood draw (season) did not affect the distribution of levels. Twenty two percent of children with latent TB infection (LTBI), 47% of patients with primary disease and 57% with pulmonary disease were VDD.

### **Conclusion**

VDD is common in A children with TB. What role/contribution genetics, diet and environment play require further study.

## **A COMMUNITY RESEARCH ADVISORY GROUP: VOICES OF THOSE AFFECTED BY TUBERCULOSIS**

### **Authors**

Reves R<sup>1</sup>, Wingfield CR<sup>2</sup>, **Crespin F**<sup>3</sup>, Lee C<sup>4</sup>, Tuberculosis Trials Consortium<sup>5</sup>. <sup>1</sup>Denver Metro Tuberculosis Clinic, Denver, CO; <sup>2</sup>Treatment Action Group, New York, NY; <sup>3</sup>San Francisco General Hospital, San Francisco, CA; <sup>4</sup>Harlem Hospital Center, New York, NY; <sup>5</sup>Centers for Disease Control and Prevention, Atlanta, GA, USA.

### **Background**

Community participation in tuberculosis (TB) research is vital to ensure that priorities of those affected by TB are addressed. In order to facilitate community participation, a Community Research Advisory Group (CRAG) was developed through a partnership between the CDC-funded TB Trials Consortium (TBTC) and the Treatment Action Group (TAG), a community-based AIDS research and policy think-tank.

### **Methods**

In 2007, the TBTC solicited nominations from its international and domestic sites; 13 CRAG members were selected. Members have personal or professional experience with latent or active TB; and/or HIV; and/or live or work in high TB burden settings.

### **Results**

CRAG members have reviewed basic research concepts, clinical trial design, and research ethics. They have engaged in advocacy for TB research and developed their mission statement, “to enhance the value and impact of TBTC’s research for the benefit of TB affected communities.” They conduct monthly conference calls and twice yearly meetings during which they add to their knowledge of science literacy and discuss their objectives, TBTC past and pending studies, and domestic and global advocacy.

### **Conclusion**

TBTC and TAG have collaborated to develop CRAG, a multi-national, traditionally underrepresented group that has begun engaging in TB clinical research processes.

## **APROVECHAMIENTO DE CAPACITACION EN TUBERCULOSI PARA PERSONAL DE SALUD EN MEXICO**

### **Autor**

**Cruz A.** México Tuberculosis Program, Distrito Federal, México

### **Introducción**

La capacitación efectiva en tuberculosis (TB) es básica para control. En México, el programa nacional coordina anualmente un curso de actualización, invitando a expertos en prevención, tratamiento y control. Sin embargo, no se ha hecho análisis coherente de resultados e implicaciones para la enseñanza-aprendizaje. Se muestran resultados del XI curso realizado el 25-29 de Julio de 2007.

### **Métodos**

Se realizó un estudio transversal, descriptivo, observacional, comparativo, con datos de evaluación pre y post curso, y del cambio en el desempeño.

### **Resultados**

En general: mejoraron 7 unidades entre evaluaciones pre y post. 265, 74.6% de 355, presentaron ambos exámenes, constituyendo la base del análisis y mejorando 7.43 unidades. Por género: Predomino el masculino (66%) mejorando en 6 y en 7 unidades el femenino. Profesionistas: Mayor presencia y desempeño de médicos y enfermeras, en 13 categorías. Aun, biólogos y trabajadores sociales tuvieron mayor mejoría. Profesionistas con posgrado: 24.2% del total, destaco la presencia de salubristas, epidemiólogos y médicos familiares (22,12 y 17). Mejoraron 5.92 unidades. Los maestros en ciencias obtuvieron mejor desempeño (86), aunque mejor diferencia pre-post los doctorados y enfermeras salubristas, con 11 unidades. Por estado: Mejores resultados en Campeche, Oaxaca y Tamaulipas; Por región geográfica, se encontraron menores resultados en centro y noroeste.

### **Conclusión**

Aun con avances modestos, todos los participantes alcanzaron calificación postevaluativa mínima aprobatoria y se han definido áreas de oportunidad: la capacitación y el análisis se consideran útiles para mejorar la enseñanza en TB.

## **PROVIDER PARTNERSHIPS IN TUBERCULOSIS PREVENTION: A WASHINGTON STATE PILOT PROJECT**

### **Authors**

**Davis S**<sup>1</sup>, McBrien S<sup>2</sup>. <sup>1</sup>Washington State Department of Health, Olympia; <sup>2</sup>Tacoma-Pierce County Health Department, Tacoma, WA, USA

### **Background**

As observed at local, state and national levels, foreign-born communities of Pierce County, Washington continue to experience a persistent, disproportional risk of active tuberculosis (TB) disease—where in 2005, foreign-born residents represented an estimated 9% of the overall population while accounting for 59% of active TB cases.

### **Methods**

Using data from 1995 through 2005, foreign-born communities were ranked by country of origin according to disease burden. TPCHD staff selected health care providers serving most at-risk communities as candidates for partnership. Program activities continue to focus on providing partners with training and tools promoting targeted testing and treatment of LTBI consistent with CDC guidelines and patient completion of successful treatment. Principal long-term outcomes include increased rates of appropriate targeted testing, improved provider compliance with treatment guidelines, and increased rates of completion for LTBI treatment.

### **Results**

Four physicians serving Asian communities have entered into program partnership. Partners have completed training on LTBI testing and treatment and a baseline assessment of related awareness and clinical knowledge. Tools for clinical documentation of outcomes and patient education materials have been revised or developed, and are currently being piloted by program partners.

### **Conclusions**

Partners voice encouraging enthusiasm for program objectives and activities, although notable challenges have been identified. Among the most persistent of these includes our partners' concerns over the anticipated burden of providing potentially uncompensated care over the extended course of LTBI treatment. Furthermore, within foreign-born communities frequently bearing past histories and current experience of notable hardship—concerns for disease prevention are overlooked.

## **IMPLEMENTING QUANTIFERON GOLD IN A CORRECTIONAL SETTING**

### **Authors**

**de Funiak A**, Zawitz C. Cermak Health Services, Cook County Department of Corrections (CCDOC), Chicago, USA

### **Background**

Latent Tuberculosis infection (LTBI) is an ongoing problem within the correctional population in the United States. Previous LTBI screening using the TST was cumbersome, required multiple visits and had potential interpretation bias. In 2004, CCDOC implemented Quantiferon (QFT) in an effort to resolve challenges associated with the TST. The refined QFT-Gold (QFT-G) was implemented in 2006. It was hypothesized that using Quantiferon would result in more universal access to screening and eliminate interpretation bias.

### **Methods**

A total of 9,630 detainees have been tested since January 1, 2003. During their annual exam, detainees were screened for LTBI. In 2003, 2,432 detainees were tested using the TST test on two separate visits. In 2004-05, 4,072 detainees were tested using the original QFT; 2006-07, 3,126 detainees were tested with QFT-G.

### **Results**

As hypothesized, implementation of the Quantiferon tests resulted in more universal screening and reduced staff utilization. In addition, percent of positive tests decreased with QFT-G when compared to original QFT. In 2003, 113 detainees tested positive (4.6%) using TST; 2004-05, 571 tested positive (14.0%); 2006-07, 218 tested positive (7.0%).

### **Conclusion**

CCDOC experience has shown that the QFT-G is a useful tool for detection of LTBI in a high-risk population, and superior to the TST test in implementation and interpretation. CCDOC has found that as QFT has been refined, the number of detainees screened has increased while false positives have decreased. This is consistent with our hypothesis that access to screening increased while interpretation bias is eliminated with QFT testing.

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## **VIRGINIA TUBERCULOSIS SUMMIT: A MODEL OF INNOVATION AND COLLABORATION**

### **Authors**

**DeBiasi D**<sup>1</sup>, Wegener D<sup>2</sup>. <sup>1</sup>American Lung Association of Virginia, Richmond, Virginia;  
<sup>2</sup>Southeastern National Tuberculosis Center, Gainesville, Florida, USA

### **Background**

Successful tuberculosis (TB) control in Virginia (VA) and throughout North America depends upon the collaboration of public and nonpublic partners. On November 1 -2, 2007, the first Virginia Tuberculosis Summit was held to draw stakeholders together to create a greater sense of ownership for TB prevention and control in VA.

### **Methods**

Participants (N=35) represented diverse perspectives including: county and state TB programs and labs, VA Senate and House of Delegates, medical schools, CDC, Hospital Association, Department of Corrections, and Council of Churches.

In concert with the Summit theme, “You can’t solve a problem in the same state of consciousness in which it was created,” participants engaged in activities of movement and song to access the benefits of humor, joy and appreciation. David Ashkin, MD, led participants on a passionate journey of global, domestic and regional TB issues and remedies to provide context. Facilitated by consultants, the group identified obstacles to greater success, generated partnership opportunities and created initial plans for actions to be taken after the Summit.

### **Results**

Summit action outcomes were grouped in three areas: legislation/funding, communications/awareness, and diagnosis/disease management with participants giving commitments and accountabilities for follow through.

### **Conclusion**

This Summit, the first of its kind, is a model for pursuing and establishing the collaboration and innovation necessary to meet the challenges of TB control and prevention.

## **CROSS-BORDER MOBILITY INFLUENCES TUBERCULOSIS DIAGNOSIS AMONG INJECTION DRUG USERS IN TIJUANA, MEXICO**

### **Author**

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### **Background**

Nearly half of tuberculosis (TB) cases in San Diego, CA occur among individuals born in Mexico. We explored the relationship between TB and migration among injection drug users (IDUs) in the border city of Tijuana, Mexico.

### **Methods**

IDUs in Tijuana were recruited into a prospective cohort study from 2006-2007 and underwent interviewer-administered surveys and testing for HIV antibody and latent TB infection using the QuantiFERON-Gold InTube® (QFT) assay. Logistic regression was used to identify factors associated with a self-reported lifetime diagnosis of active TB.

### **Results**

Of 1,060 participants enrolled, 103 (10%) reported a history of active TB, and of these, 80% were diagnosed in the U.S. In multivariate analysis, history of travel to the U.S. (OR=3.7, 95%CI 1.6,8.7) was independently associated with a history of active TB, along with history of incarceration (OR=2.3, 95%CI 1.2,4.2), knowing another individual with TB (OR=1.6, 95%CI 1.0,2.4), years of education (OR=1.1 per year, 95%CI 1.0,1.2), years injecting drugs (OR=1.03 per year, 95%CI 1.01,1.05), and being interviewed at a site furthest from the border (OR=3.4, 95%CI 1.1,10.0). Among IDUs who report taking anti-TB medication (93%), treatment was prematurely stopped in 15% of cases, with 28% citing deportation from the U.S. as the primary reason.

### **Conclusion**

Mobility and migration are important in the identification and treatment of TB cases in the U.S.-Mexico border region. Strengthening capacity on both sides of the border to identify and monitor patients with TB is a priority.

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**PARTICIPACION DE LA SOCIEDAD CIVIL CMLL (CONSEJO MUNDIAL DE LUCHA LIBRE) EN EL INCREMENTO DE LA DETECCION ENTRE EL PERSONAL DE SALUD DE LA JURISDICCION SANITARIA VENUSTIANO CARRANZA**

**Autor**

**Delgado A.**, Secretaria de Salud Servicios de Salud Pública en Distrito Federal, México

El número de sintomáticos respiratorios estudiados solo llega al 80 % y detecta el 50 % de los casos, la otra mitad procede del área hospitalaria de 2do y 3er nivel con enfermedad avanzada, ameritando una temporada de internamiento hospitalario, posteriormente refieren a la Unidad de Salud para continuación de tratamiento o fallecen.

JSVC población de 447.459 habitantes, 40 casos de Tb en promedio y de 2 a 3 defunciones por año, incidencia 9 casos por c/100.000 hbts. Subregistro de hasta el 15 %, el 70 % de los casos notificados por la Secretaria de Salud. Alto riesgo de población con pobreza, escolaridad: primaria en el 40 % de los casos, ocupación: 30% empleados, 22 % hogar, 22 % estudiantes y 17 % desempleados. El 16 % de los casos coinfectado con VIH/SIDA., 12 % con diabetes mellitus.

La Tb es causa de ausentismo laboral y escolar, en muchas ocasiones la perdida de empleo.

Estudio preexperimental, descriptivo

**Objetivos**

Incrementar la detección de sintomáticos respiratorios.

Incrementar el diagnóstico oportuno de casos en el primer nivel de atención.

Resultados se incremento al 113 % la detección de sintomáticos respiratorios

La participación de profesionales de la lucha libre famosos en el país ha colaborado para estimular en el personal de salud la detección de sintomáticos respiratorios para diagnóstico de Tb.

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## **COST-EFFECTIVENESS OF INTERFERON- $\gamma$ RELEASE ASSAYS VS TUBERCULIN SKIN TESTS IN HEALTHCARE WORKERS**

### **Authors**

**dePerio M**, Tsevat J, Roselle G, Kralovic S, Eckman M. University of Cincinnati, Cincinnati VA Medical Center, Cincinnati, OH, USA

### **Background**

Compared with tuberculin skin tests (TSTs), interferon- $\gamma$  release assays (IGRAs) require only one visit and are not affected by prior BCG vaccination. We compared the cost-effectiveness of 4 strategies for detecting latent tuberculosis infection (LTBI) in new VA healthcare workers (HCWs): QuantiFERON<sup>®</sup>-TB Gold (QFT-G), QuantiFERON-TB<sup>®</sup> Gold In-Tube (QFT-GIT), T-SPOT.TB (TSPOT), and TST.

### **Methods**

We constructed a Markov state transition decision analytic model, using the societal perspective and lifetime horizon, to compare the strategies for 35-year-old HCWs with or without prior BCG vaccination. Direct costs, costs of missed work time, and probabilities were based on manufacturers' data, national VA data, and published literature. We calculated incremental costs per quality-adjusted life year (QALY) gained, with standard discounting. We performed sensitivity analyses over wide input parameter ranges.

### **Results**

QFT-G and QFT-GIT were more effective and less costly than TST for both cohorts. For non-BCG-vaccinated HCWs, TSPOT was most effective but most costly. Its incremental cost-effectiveness ratio (ICER) compared with QFT-GIT was \$305,271/QALY. For BCG-vaccinated HCWs, all IGRA strategies were more effective and less costly than TST, but TSPOT was the most costly and least effective IGRA strategy. The ICER of QFT-G compared with QFT-GIT was \$86,049/QALY.

### **Conclusion**

QFT-G and QFT-GIT are clinically and economically worthwhile alternatives to TST and should be considered in screening non-BCG and BCG-vaccinated HCWs for LTBI.

## **GENDER AND THE ROLE OF PRIVATE SECTOR IN TUBERCULOSIS CASE-FINDING – SAO PAULO STATE – BRAZIL**

**Author**  
**Dos Santos JM**

Better knowledge of how do people searches health-care has a fundamental importance for planning and straighten tuberculosis case-finding. Male and female frequently differ in this matter.

### **Background**

Brazilian public health system covers all citizens without charges. However, many people have private insurance.

### **Methods**

Based on routine TB surveillance data, type of health facility that discovered the TB cases was analyzed by gender for new cases of the year 2006.

University facilities were analyzed separately because of their admission criteria is different from the others.

From 15756 notified cases, data were available in 14251 (90.4%).

### **Results**

TB male cases were 9474 and female 4777 cases. From them, 7098 (75%) and 3180(67%) were found at public health institutions, respectively. Private sector accounted for 1479 (16%) and 1097 (20%), while university facilities were responsible for 857 (9%) and 500 (10%).

### **Conclusion**

Both male and female TB cases probably are missed at private facilities, as they account for a substantial proportion of health care. University facilities play a relatively small role in detecting TB cases in this area.

TB cases in man were more likely to be discovered at the private sector than in women, although both genders had greatest proportion found at public health sector. Further research is needed to clarify whether these differences occur for patients cultural or social reasons, or are due to distinct perceptions from health personnel.

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## **PARTNERING TO PROMOTE SMOKING CESSATION**

### **Authors**

**Draffin Jones A.**, Gibson M., O'Brian Broderick J. Manitoba Tobacco Reduction Alliance Inc. (MANTRA), Winnipeg, Canada

### **Background**

The purpose of this project was to test the MANTRA Integrated Tobacco Cessation Framework Triage Model.

### **Method**

MANTRA partnered with Pfizer and Wal-Mart Pharmacies during National Non-Smoking Week 2005 to conduct the project. Media advertisements invited smokers over 18 years of age to phone a provincial “toll-free line” facilitated by a health professional who assessed all respondents for levels of addiction and referred them to appropriate programs and services. The first 200 callers qualifying for Nicotine Replacement Therapy (NRT) under the triage model, and willing to participate in the follow up study were offered 2 weeks supply of Nicoderm, distributed by local Wal-Mart pharmacists.

### **Results**

There were over 1,200 calls to the line in one week. Of the 200 persons qualifying for Nicoderm, 156(99 urban and 64 rural) persons picked up their supply. Results indicate 80.35% who received the Nicoderm made a quit attempt. After 3 months 71% (urban) and 50% (rural) reported they had stopped smoking.

### **Conclusions**

Findings were consistent with the New York State Free NRT Programs which showed 86.8% of smokers enrolled in a program offering a free 2 week supply of nicotine patches made attempts to quit. Enthusiastic callbacks and testimonials to MANTRA demonstrate that providing an integrated approach and an accessible, affordable, effective cessation method to help smokers is a positive step in enabling them to become smoke-free.

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## **SOCIAL MOBILIZATION SUPPORT THE DOTS STRATEGY IN THE TB COLLABORATIVE BINATIONAL PLAN BETWEEN HAITI AND THE DOMINICAN REPUBLIC: A CROSS BORDER INITIATIVE**

### **Authors**

**Duke W<sup>1</sup>**, Sanchez S<sup>1</sup>, De al Rosa JA<sup>1</sup>, Mendez JJ<sup>2</sup>, Rodriguez A<sup>2</sup>, Cordero JJ<sup>2</sup>, D’Meza R<sup>3</sup>  
<sup>1</sup>Family Health International/Proyecto Conecta; <sup>2</sup>TB National Control Programme, Dominican Republic; <sup>3</sup>Directeur du Programme de Lutte Antituberculose, Haiti

### **Background**

In 2005 with financial support from USAID and the technical assistance provided by Family Health International (FHI) TB Social Mobilization were implemented to nine (9) provinces including the cross border area with the coordination between NGO’s and the National TB Control Program including the provincial Health Directorates. In 2006, the Dominican Republic and Haiti initiated a Binational joint plan for TB control with the primary goal to reduce illness, and TB Social Mobilization is one of the main components.

### **Methods**

TB Social Mobilization trained healthcare providers in Creole and Spanish languages about epidemiology and TB control, advocacy and orientation; strategy linkages to support community and TB services; emotional and nutritional support, DOTS strategy follow-up; TB contacts; coinfection TB/HIV/AIDS; stigma and discrimination; and social leadership networks.

### **Results**

Provided support to 165 communities and 90 sugar-mill shanty town called bateyes; 233 communities organizations and groups have been integrated; 21,733 people have been reached; 35,000 educational materials (Creole and Spanish) distributed; 330 health providers and 1,880 community volunteers trained; 1,600 people with respiratory symptoms have been detected through house visits and information and 32% of the general population receiving TB social mobilization including 20% in the cross border provinces.

### **Conclusion**

TB Social Mobilization is an important component in the Binational joint collaboration to decrease the burden of Tuberculosis and should be implemented throughout the entire island. The National TB Programs in both Haiti and DR need to work together and create a close alliance between NGO’s, health promoters and TB services.

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## **INTEGRATING DOT WORKERS INTO EXISTING PUBLIC HEALTH SYSTEMS IN MEXICO**

### **Authors**

**Eder C.**, Lomeli B, Schooley J. Project Concern International, San Diego, California

### **Background**

TB morbidity and mortality in Tijuana and Mexicali together contribute over 80% of TB cases in Baja California (BC). PCI and ISESALUD partnered to launch the *SOLUCION TB* project in 2004. This DOTS and social mobilization program has been initiated in an additional 13 high prevalence Mexican states.

### **Methods**

An external midterm evaluation of the project assessed the progress, constraints and challenges, and guided program expansion, based on lessons learned. Qualitative and quantitative data were gathered through direct observations, focus groups and key interviews of administrators, implementers and beneficiaries.

### **Results**

DOT activities have been integrated into ongoing operations; communication systems improved, and a data system created for project monitoring. Implementation challenges include persistence of long-standing clinical practices, which interfered with acceptance of DOT guidelines, and resistance of providers to adopt more patient-centered TB control strategies. A treatment success rate of 78.2% was achieved for the first two client cohorts (baseline: 58.4%).

### **Conclusions**

The *SOLUCION TB* project has increased DOT capacity in Tijuana and Mexicali. The model, which promotes the use of specialized community-based TB outreach staff, has been successful in a) developing motivated and knowledgeable outreach staff, b) involving health center teams in case management, and c) addressing educational needs of providers and staff. Strategies developed to address challenges are likely to promote better program outcomes in the original and expanded program sites.

## MANAGEMENT OF TUBERCULOSIS IN HAITIAN PRISONS CHALLENGES IS THE BIGGEST FACILITY (PORT AU PRINCE)

### Author

Élie JP. National Penitentiary Administration, Pétionville, Port au Prince, Haïti

**Population:** 3500 (Three thousand five hundred)  
**Status:** Detainees condemned and not  
**Vital space** 0.6700.meters per person  
**Epidemic ratio:** 3.23/1000, actually ten under treatment  
**Material used:** Tracked symptomatic patients or passive detection  
**Tools used:**

- Irregular visits by low key trained male nurse personnel.
- Previous educational contacts with population: taking into account reluctance, suspicion and rejection linked to religious beliefs, mostly Vodoo.
- Collected specimen dispatched every time to an exterior lab, most of the time, lack of material or human available (vehicle, driver, gas etc....)
- Whenever lab results are positive, detainee has to be driven under armed escort handcuffed to one of the three TB control centres in city: same difficulties as in previous paragraph plus restraining materials: weapons, ammunition, policemen etc....
- Whenever all conditions are met for one or two transport all four prisons are automatically deprived of transportation for the day.

**Methods of treatment:** DOTS with medication provided by centre based on monthly visits. Same ordeal as above plus risk of deterioration or drug resistance; taking into account that HIV and Tb are not taken care of in the same place. It is then twice the ordeal.

**Results:**

- Poor percentage of TB control in Prison of completed treatment.
- Impossible follow up of release prisoners under treatment.
- No possible statistics.
- High morbidity, mortality and transmission rate.

**Conclusion:** Tuberculosis in Haitian prisons remains a major public health threat and challenge. All needs remain critically needed: strategic financial psychosocial, pharmaceutical as well.

## FUNCTIONAL GENOMICS OF MAMMALIAN CELL ENTRY-3 (MCE3) PROTEINS OF *MYCOBACTERIUM TUBERCULOSIS*

### Authors

El-Shazly S<sup>1</sup>, Ahmad S<sup>1</sup>, Mustafa AS<sup>1</sup>, Al-Attiya R<sup>1</sup>, Krajci D<sup>2</sup>. <sup>1</sup>Department of Microbiology; <sup>2</sup>Department of Anatomy, Faculty of Medicine, Kuwait University, Kuwait

### Background

This study demonstrates the expression of Mce3A-F proteins during *in vivo* and *in vitro* growth of *M. tuberculosis* and their role in the internalization of this pathogen by mammalian cells.

### Methods

The *mce3A-F* were cloned, expressed, purified and generated antibodies in rabbits. The purified Mce3A-F proteins were tested for antibody reactivity in sera from TB patients by WB and ELISA. The *in vitro* expression of Mce3A-F proteins from mycobacterial subcellular samples and total RNA was demonstrated by using anti-Mce3 antibodies and RT-PCR, respectively. Fluorescent beads coated with Mce3 preparations were used to study their uptake by HeLa cells using FCM, fluorescence and electron microscopy.

### Results

Majority of the sera of TB patients reacted with Mce3A/E compared to healthy subjects. The mRNA for *mce3A-F* was detected by RT-PCR and anti-Mce3A-F antibodies reacted with Mce3A-F in the cell wall fraction of *in vitro*-grown *M. tuberculosis* cells. Interestingly, Mce3A/E-coated beads were abundantly associated with HeLa cells by FCM. TEM confirmed the internalization of beads coated with Mce3A/E.

### Conclusions

This study showed that Mce3A-F are expressed during natural human infection and *in vitro* growth of *M. tuberculosis*. The internalization of Mce3A/E coated-beads by HeLa cells indicates the pathogen interaction with mammalian cells.

## PRELIMINARY EVALUATION OF HSTB MEDIUM FOR SUSCEPTIBILITY TESTING TO FIRST- AND SECOND-LINE ANTITUBERCULOSIS AGENTS

### Authors

**Ferro BE**<sup>1</sup>, Pérez-Vélez CM<sup>2,3</sup>, Moreira CA<sup>3,4</sup>, Hernández EL<sup>1</sup>, Totten SE<sup>2</sup>, Dang-Ta KC<sup>2</sup>, Graham JJ<sup>2</sup>, Pham V<sup>2</sup>, Heifets LB<sup>2</sup>. <sup>1</sup>Centro Internacional de Entrenamiento e Investigaciones Médicas-CIDEIM, Cali, Colombia; <sup>2</sup>National Jewish Medical and Research Center-NJMRC, Denver, USA; <sup>3</sup>Valle-Colorado Tuberculosis Group, Valle del Cauca, Colombia/Colorado, USA; <sup>4</sup>Gobernación del Valle del Cauca, Cali Colombia

### Background

Proper management of drug-resistant tuberculosis (DR-TB) cases includes early drug susceptibility testing (DST) to prescribe an appropriate regimen and prevent amplification of DR-TB. Many developing countries do not have resources to provide DST to all patients with risk factors for DR-TB. A new mycobacterial culture medium, HSTB, developed at NJMRC, can test up to 13 antituberculosis agents (including pyrazinamide) without the need for a CO<sub>2</sub>-incubator, and may serve as an alternative DST method.

### Methods

To evaluate the utility of HSTB, AFB smear-positive sputa from a sample of patients with risk factors for DR-TB, are being set up for direct DST on HSTB and compared to the proportion method in Middlebrook 7H10/7H11. Time to detection and susceptibility profile are being recorded.

### Results

We have included 15 patients to date. The recovery rate of *Mycobacterium tuberculosis* with HSTB has been 100%, and the time for DST results has been less than 3 weeks. There has been a high concordance with Middlebrook 7H10/7H11.

### Conclusions

HSTB appears to be a promising medium for timely DST, allowing for a turnaround time closer to that obtained with automated liquid media systems—which are not usually affordable in developing countries.

## **THE PUBLIC HEALTH CHALLENGES POSED BY THE NONADHERENT TUBERCULOSIS PATIENT**

### **Authors**

**Gensheimer KF**<sup>1</sup>, Gunston S<sup>1</sup>, Etkind S<sup>2</sup>, Lobato MN<sup>3</sup>. <sup>1</sup>Maine TB Control Program, <sup>2</sup>Massachusetts Department of Public Health; <sup>3</sup>New England TB Consultant, Division of Tuberculosis Elimination, CDC, USA

### **Background**

Practices of isolating infectious TB patients to prevent the transmission of tuberculosis (TB) vary considerably from state to state. Recent cases of TB have dramatically revealed the unevenness of these practices and the controversies surrounding the laws and interpretation of laws intended to protect the public. These cases suggest that both TB programs and the public would benefit from having specific standards and best practices defined to address the complex issues raised in the emerging national discussion on public health powers involving isolation of contagious persons.

### **Methods**

We reviewed the case management of a patient with pulmonary TB who presented special challenges to prevent transmission.

### **Results**

In 2006, a smear positive, drug-resistant case of cavitary TB in a U.S.-born, alcoholic, homeless male was reported. Despite attempts to provide court-ordered treatment for this patient, lack of housing for a patient who was nonadherent to infectious control measures posed challenges to the public health, correctional and public safety community. Maine was fortunate in having the support of the Massachusetts Department of Public Health and the resources provided by the Lemuel Shattuck Hospital to house and complete treatment for this patient.

### **Conclusions**

Interstate collaborations are critical in our collective public health response and suggest that use of a regional isolation and specialized medical TB unit is critical to enhance our use of legal standards and best practices of enforcement powers leading up to an including the isolation of an infectious TB patient.

## **RESULTADOS DEL TRATAMIENTO DE LA TUBERCULOSIS (TB) CON EL REGIMEN DE 8 MESES DURANTE 8 AÑOS (1998-2005) EN SANTA CRUZ (SCZ), BOLIVIA**

### **Autores**

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### **Fondo**

En Bolivia no se pudo garantizar la estrategia DOTS, por este motivo el PNCT decidió aplicar desde el año 1998 un regimen de 8 meses (2HREZ/6HE).

### **Metodos**

6 postas de salud en SCZ envían los sintomáticos respiratorios (SR) al Centro I para su diagnóstico. Se documentan los datos personales, los resultados de las baciloscopías y del tratamiento. Antes de empezar el tratamiento se verifica el domicilio (croquis) de cada uno de los pacientes, facilitando así la búsqueda posterior de los abandonos, para motivarlos a continuar el tratamiento. Los datos se evalúan en EPI6.

### **Resultados**

30-40% de los SR enviados al Centro I están enfermos de TB. De los 3532 enfermos de TB hubieron 2219 casos nuevos con BK pos., que recibieron el tratamiento de 8 meses: 1261 M, 958 F; promedio de edad: 28.5 años. El éxito del tratamiento se mueve alrededor del 86% (92% en el grupo etareo < 15 años, 78% >= 65 años. El riesgo de mortalidad para los pacientes > 55 años es significativamente más alto que en los otros grupos etareos (RR 6.59). Los pacientes de 25-34 y de 35-44 años son los más problemáticos por el alto índice de abandono, más del 10% (n = 83 de 722).

### **Conclusion**

El resultado del tratamiento de 8 meses es satisfactorio en los pacientes más jóvenes. En pacientes a partir de 55 años las defunciones disminuyen el éxito del tratamiento. La tasa de abandono es muy alta en pacientes de 25-44 años por diferentes causas.

## OCCUPATIONAL TUBERCULOSIS IN AN ARGENTINEAN GENERAL HOSPITAL

### Authors

**Gravina E**, Ortiz MC, Latini C, López B, Barrera L, Ritacco V. Hospital Paroissien, INEI ANLIS “Carlos Malbran”, Buenos Aires, Argentina.

### Background

The Hospital Paroissien (320 beds, 900 employees) provides healthcare to an overpopulated, underprivileged Buenos Aires suburb with 1.8 million inhabitants and a tuberculosis (TB) rate of 32/100,000. During the socioeconomic collapse that afflicted Argentina at the beginning of the decade, several healthcare workers (HCW) contracted TB in this hospital. The present study aimed to identify spots for nosocomial TB transmission in such setting.

### Methods

A prospective, non-randomized sequential study was carried out on all confirmed TB cases occurred between 1-May-2002 and 31-October-2005 in Hospital Paroissien. IS6110 RFLP and spoligotyping were performed on all positive TB cultures. BioNumerics 4.6 software was used for genotype comparison.

### Results

Of a total of 316 TB cases occurred in the 3.5 yr study period, 9 affected HCW (mean age 35 ys; 7 female; 5 pulmonary, 3 pleural, 1 lymph node; 2 with predisposing conditions). None had HIV infection or a history of extra-hospital exposure. TB was confirmed by culture in 7 HCW and by histopathology in other 2. Source cases were identified by conventional and molecular tools in 6 of 7 HCW with available TB cultures. The emergency ward was the most likely site of exposure for 2 physicians, 1 policeman and 1 blood collection personnel. Two secretaries acquired infection in the laboratory reception, 2 auxiliary staff in the internal medicine ward and one nurse in the critical care unit. Among HCW of the Hospital Paroissien, TB prevalence resulted nine times higher than in the served community.

### Conclusion

Strict infection control measures should be enforced at the hotspots for TB transmission identified in this healthcare setting.

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**12<sup>th</sup> Annual Conference**  
**IUATLD – North American Region**  
**February 28 – March 1, 2008**

## **IMPLEMENTATION OF DOTS – IN THE PRISONS GUAYAS – EQUATOR 2006 - 2007**

### **Author**

**Gresely L.** Direction Province of Health Guayas / Ministry of Public Health, Ecuador

### **Background**

In GUAYAS we have a prison that surpasses their limit of physical capacity in that of males is above 480% and the pavilion of women 374%, 98% of the cases is lung clinical form and of these 88% of the cases that have BK+, and 28% with load bacillary of (+++), demonstrating the great capacity of existent transferability inside the penitentiary Center.

### **Methodology**

You qualify the whole personnel of the penitentiary center, including private volunteers of freedom (172) in total, cooperation agreement is signed and they are provided material for reception of SR, Dx and Treatment, so she/he carries out monitored, supervisions and evaluation in the year.

### **Results**

4% of captured SR exists of among the consultants, of these to 93% has been examined, and as a result 17% with TB BK+, product of the accumulation and promiscuity in that the PL lives. 12% their entrance condition is for relapse, what reflects probability of TB-MDR in some of these cases.

The pavilions of where they go out the cases with TBBK+ that are above 5%, it indicates us the capacity of dissemination of the bacillus.

### **Conclusions**

To strengthen combined elaboration of action plans  
To make complete commitments of signed agreement.  
To implement recommendations of OPS, in study carried out CAP.

## **PREDICTORS OF QUANTIFERON-TB GOLD® REVERSIONS**

### **Authors**

**Grinsdale J**, Kawamura LM. San Francisco Department of Public Health, TB Control Section, San Francisco, California, USA

### **Background**

The San Francisco TB Control Program uses Quantiferon-TB Gold® for community-based TB screening. Occasionally, repeat testing of persons with history of a positive QFT-G occurs in the community clinic setting.

### **Methods**

Persons with multiple QFT-G tests between March 1, 2005 and July 31, 2007 were identified and classified as a reverter (positive to negative qualitative result) or non-reverter (positive to positive qualitative result). Clinical and demographic information were gathered from TB clinic patient records and clinic electronic medical records.

### **Results**

Forty-four persons retested following a prior positive QFT-G test were identified; 19 (43.2%) classified as reverters and 25 (56.8%) as non-reverters. Reverters and non-reverters were similar with regards to gender (78.9% and 76% male, respectively), age (50 years vs. 53 years, respectively), and time between tests (259 vs. 243 days, respectively). Reverters were more likely to have a nil value of  $>0.7$  IU/ml (26%,  $p>0.001$ ) and to be HIV-positive (53%,  $p=0.01$ ). Reverters were less likely to be foreign-born and to be positive by ESAT-6 alone (15.8% vs. 36% for both findings, not statistically significant). Fourteen of 15 reverters had an ESAT-6 or CFP-10 quantitative decrease of  $\geq 0.35$  IU/ml.

### **Conclusions**

A high background nil value ( $>0.7$  IU/ml) may represent a false positive result and HIV infection may lead to fluctuating production of interferon-gamma. Additional analysis of quantitative values, clinical and demographic characteristics are pending.

## **TIME TO RETHINK INITIAL ISOLATION OF TB PATIENTS TO CONTROL TUBERCULOSIS**

### **Author**

**Gupta PC**. Department of Health Services, U.P., India

### **Background**

The WHO defines that tuberculosis "control" is said to be achieved when the prevalence of tuberculosis infection in the general population is of the order of 1% and continues to decrease. However at present, it is about 40% in India. Even after NTP has been in operation since 1962, RNTCP since 1993 and DOTS since 1997, the prevalence of tuberculosis infection is the same as it was before NTP or even before the chemotherapy era.

### **Methods**

In India despite diligent efforts to control TB by efficient chemotherapy, it has remained a persistent scourge and has retained its position in all of its parameters and is the leading cause of death. Eradication of TB has become all the more important because of its relation with the ticking live time-bomb HIV. Why it is not being eradicated? Where are we going wrong?

### **Results**

When a case is detected, intensive anti-tubercular treatment is started but it takes about 3 weeks to become the case non-infectious. In 3 weeks of time he is spreading disease which can be checked by isolating the case for 3 weeks until his sputum becomes non-infectious.

### **Conclusion**

Although it is believed that isolation of a TB case is not required but if we think over it again, then we will come to the conclusion that isolation for a very short time of only 3 weeks is essential. Even the state of art treatment cannot control tuberculosis unless this basic flaw is rectified. The importance and problems of isolation have been discussed in this paper. It has been conclusively shown by mathematical modeling that we can achieve tuberculosis-free India in the next 20 years.

## SCREENING US-BOUND REFUGEES IN THAILAND FOR TUBERCULOSIS USING THE 2007 TB TECHNICAL INSTRUCTIONS

### Authors

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### Background

Over 50% of US tuberculosis (TB) cases are among foreign-born persons. Serial acid fast bacilli (AFB) screening has low sensitivity for detecting active TB, especially among immigration visa applicants, most of whom are asymptomatic. The TB “Technical Instructions” for panel physicians (TB TIs), were revised in 2007 to include mycobacterial culture for applicants with suspected TB and treatment to completion by directly observed therapy. The 2007 TB TIs were first implemented in Thailand in May 2007 by the International Organization for Migration (IOM) for screening a US resettlement of Burmese refugees.

### Methods

We used IOM data to identify refugees suspected of having TB who were screened for US resettlement from April 1 through September 30, 2007. We reviewed laboratory and treatment data for TB patients and compared the proportions of AFB smear and mycobacterial culture results.

### Results

Among 9,899 refugees screened from April 1 to September 30, 2007, there were 1,173 (12%) suspected pulmonary TB cases; 115 (9.8%) were treated for TB. Of the 115 refugees with TB, 11 (9.6%) were on treatment prior to screening. Of the other 104, 19 (18%) were culture and smear positive, 71 (68%) were culture positive and smear negative, 1 (1%) was smear positive and culture negative, and 13 (13%) were culture and smear negative.

### Conclusion

Implementation of the 2007 TB TIs in this population shows that routine sputum mycobacterial culture of refugees and immigrants with suspected TB is feasible and greatly improves the ability to detect TB during initial overseas screening.

## THE INCIDENCE OF SUBJECTS WITH NON-TUBERCULOUS MYCOBACTERIA IN BRITISH COLUMBIA, CANADA 1990-2006.

### Authors

Hernández-Garduño E, Elwood RK. British Columbia Centre for Disease Control, Vancouver British Columbia, Canada

### Background

A recent study showed that the isolation prevalence of Non-tuberculous mycobacteria (NTM) has increased over time in Eastern Canada. Other studies have shown that NTM prevalence varies geographically. A study was undertaken in Vancouver British Columbia (BC), Canada to determine the incidence of subjects with NTM.

### Methods

Culture results were obtained from the Provincial computerized system. Results of all NTM positive cultures from all thoracic samples (81% sputum) recorded from 1990 to 2006 were analyzed in three periods: 1990-1995, 1996-2001 and 2002-2006. Subjects were counted once if they had more than one positive culture with the same NTM species in the same year. Population figures for the study period were obtained from BC Stats website.

### Results

A total of 5,617 positive cultures were identified in 4,295 subjects. NTM species included: avium complex (73.6%), rapid growers (abscessus, chelonae, fortuitum) (12.2%), scotochromogens (8.6%) non-chromogens (2.4%) kansasii (1.7%), and xenopi (1.5%). The total incidence of subjects with NTM was 9.4, 6.6 and 9.7 per 100,000 respectively in the three periods. The correlation analysis between the total count of subjects with positive NTM cultures by year of study (n=17) was not statistically significant ( $r^2=0.38$ ,  $p=0.12$ ).

### Conclusion

The incidence of positive NTM cultures has not changed over time in BC. The introduction of new laboratory techniques and the number of specimens sent at the physician's discretion may have overestimated the isolation prevalence in previous studies. Further studies however are needed to determine the incidence of NTM disease in BC.

## **THE DEVELOPMENT OF A TB PATIENT CARE MANAGEMENT / RESEARCH DATABASE**

### **Authors**

**Howorth P**, Lang J, Gardam M. University Health Network, Toronto Western Hospital Tuberculosis Clinic, Toronto, Canada

### **Background**

The Toronto area is home to 5 million people with an active TB incidence rate of 12.5 / 100,000. The TWH clinic is staffed by 2 full time nurses and 5 physicians and treated 106 cases of active TB and 250 cases of LTBI in 2006. As most cases are complex requiring frequent follow up, a database was developed to facilitate case management and improve linkages with Public Health and other providers. TB therapy lends itself to standardized treatment yet patients treated outside of clinics may not receive appropriate care. This database enables clinic staff to collect standardized data for research and benchmark with published guidelines.

### **Methods**

A multidisciplinary stakeholder consultation determined data requirements. An assessment tool was developed for data collection. Database fields were mapped to mirror the tool and provide predominately pick-lists rather than free text. Stakeholder feedback was solicited before implementation. The database was constructed in SQL server with an Access front end.

### **Results**

The database is linked with hospital information systems and other external databases. Missed visits are flagged, telephone contacts can be logged and reports generated for referring physicians and Public Health. Simultaneous viewer use is possible with a security system that determines user access levels. Benchmarking statistics are available.

### **Conclusion**

Patient care and clinic efficiency have improved with implementation of the database. It is flexible and could be altered for use in other settings alone or with links between multiple sites.

**TRANSMISSION OF TUBERCULOSIS AS WELL AS HIV AND AIDS INFECTIONS IN PUBLIC AND PRIVATE HEALTH FACILITIES IN KENYA**

**Authors**

**Ishepe N. M.C.**, Nkororo A, Sitienei J. Division of Tuberculosis and Leprosy, Nairobi, Kenya

**Introduction:**

Poor infrastructure together with un recommended practices has largely been associated to TB and HIV transmission in health care settings. Congested health facilities do divulge hospital staff at high risk of contracting TB and HIV.

**Objective:**

Identify factors contributing to transmission of TB as well as HIV/AIDS among staff, patients and their relatives in health settings

**Methods**

A structured questionnaire together with hospital registers was applied. 400 subjects who comprised health staff were used as sample size.

**Results**

Despite the level of awareness among hospital staff on TB and HIV and AIDS transmission, limited resources and poor infrastructure has significantly constrained best practices across the health facilities. Nurses, supportive and clinical officers have been found to be at higher risk of contracting infections than other members of hospital staff. 48.1% respondents from medical wards indicated contracting Pulmonary Tuberculosis. Out of 30 health facilities visited only 3 facilities had proper protective gears for their staff handling waste. Needle and sharps pricks were reported at an average of 2:3 and 2:6. Poor disposal of waste was observed from point of generation.

**Conclusion**

Incorporating infection control in a more perspective manner would be quite necessary. There is need to determine best measures in all aspects to scale up the pandemics control associated with poor hospital status.

## **DRUG RESISTANCE PATTERN IN DOTS CATEGORY 2 FAILURE**

### **Author**

**Khippal N.** S.M.S Medical College & Hospital, Jaipur, India

### **Background**

Tuberculosis is a disease of ancient times, which contributes to haunt us even we step into the new millennium. It does not respect anybody & affects both rich & poor.

### **Objectives**

To study drug resistance pattern in dots cat-2 failure patients & to explore the scientific rationale of such pattern.

### **Methods & materials**

192 patients of dots category –2 failures were evaluated for drug resistance pattern reported at hospital for chest & tuberculosis, S.M.S Medical College, Jaipur. Their mycobacterial culture & sensitivity reports were analysed in light of their past history of antitubercular treatment. These patients were put on three different revised regimens i.e. kanamycin (k), isoniazid (h), quinolone (q), ethambutol (e), para amino salicylic acid (p), Pyrazinamide (z).

**In group 1** (KHEPQZ) HERE INJECTION KANAMYCIN IS GIVEN FOR 3 MONTHS ONLY

**In group –2** tab ethionamide(ed) was given in place of pas (KHEQEDZ).

**In group-3** both ethinamide & pas was given (KHEPQEDZ).

Follow up was done monthly and outcome was assessed at the end of 6, 9, 12 & 18 months of chemotherapy. The study was designated to formulate a standardized regimen for these patients and to compare the efficacy of these three different revised regimens.

### **Results**

In mdr –tb cases isoniazid & rifampicin resistance was most common (29.33 %), followed by resistance to streptomycin, isoniazid & rifampicin (14.67 %).

In single drug resistance isoniazid resistance was commonest followed by rifampicin & ethambutol.

At the end of treatment at 18 months most favorable response was seen in group –3, followed by group –1 & group 2, in contrast to best outcome in group –1 at the end of 9 month.

## CONTACT TRACING AND DOPT FOR THE HOMELESS IN MONTREAL

### Authors

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### Background

Contact tracing and prophylaxis for LTBI in the homeless are challenges for TB control programs. In Montreal, we decided to evaluate directly observed preventive therapy (DOPT) as one strategy to increase adherence to treatment of LTBI among contacts. This approach emerged from recent evidence confirming that active transmission continues in this population and from poor results of standard contact tracing program.

### Methods

We developed a pilot project to identify best approaches for contact tracing and follow up of TST contacts of one homeless TB case. We also tested a social network questionnaire to identify pathways of transmission. An outreach nurse was hired to build stronger links with the community and one hospital. Up to 15\$ was offered for TST and medical exam if positive. DOPT (3 months of INH and Rifampin) was administered by hospital nurse or pharmacist for those requiring treatment.

### Results

Of the 41 contacts identified, 22 (53.7%) were reached by letters, 18/22 came for the TST, 17/18 came for the reading and 9/17 were positive. Of those, **9/9 had a medical evaluation** and 6 were offered prophylaxis. **2/6 completed their prophylaxis.**

### Conclusion

This low cost incentive based contact tracing approach is effective considering the high proportion of individuals that went through the whole process from TST first injection to medical exam therefore eliminating active cases. Furthermore, the completion rate with DOPT in our homeless population is significantly higher than with our standard contact tracing and self administered prophylaxis

## THE CLINICAL AND EPIDEMIOLOGICAL CHARACTERISTICS OF *MYCOBACTERIUM TUBERCULOSIS* BEIJING/W FAMILY STRAINS IN A MAJOR IMMIGRANT-RECEIVING PROVINCE OF CANADA

### Authors

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### Background

Tuberculosis due to Beijing/W family strains is of special interest to Canada as 40,000-50,000 immigrants arrive annually from Beijing/W ‘hotspot’ countries. This study will define the clinical and epidemiological characteristics of Beijing/W family strains within Canada.

### Methods

Approximately 1880 initial isolates of *M. tuberculosis* from Alberta from 1990 to 2006 are being Beijing/W typed with PCR-based region-of-difference analysis. Approximately one half of the isolates have been analyzed to date to determine associations between Beijing/W and non-Beijing/W lineage infections and patients’ epidemiological and clinical characteristics.

### Results

Of the 954 isolates genotyped, 274 (28.7%) were of Beijing/W lineage. Beijing/W strains were significantly more likely to be found amongst foreign-born (FB) persons than Canadian-born (CB) persons ( $p < 0.001$ ; OR 4.617, 95% CI 3.110-6.855) and, in the FB, amongst those from the Western Pacific region (FB-WP) ( $p < 0.001$ ; OR 8.183, 95% CI 5.402-12.396) compared to those from other regions. The penetration of Beijing/W strains into CB Aboriginal and non-Aboriginal persons was similar ( $p = 0.479$ ; OR 0.767, 95% CI 0.368-1.600). Beijing/W strains were not significantly associated with age, gender, multi-drug resistance, HIV status or, in the FB-WP, first-line drug resistance.

### Conclusion

There is remarkable consistency between global patterns of Beijing/W strains and the pattern in Canada’s FB persons. Thus far, CB Aboriginal persons are not disproportionately affected by Beijing/W strains compared to CB non-Aboriginal persons. This preliminary data does not suggest hypervirulence of Beijing/W family strains within Canada.

**12<sup>th</sup> Annual Conference**  
**IUATLD – North American Region**  
**February 28 – March 1, 2008**

## **A COMMUNITY RESEARCH ADVISORY GROUP (CRAG): VOICES OF THOSE AFFECTED BY TUBERCULOSIS**

### **Authors**

**Lee C**<sup>1</sup>, Reves R<sup>2</sup>, Crespín F<sup>3</sup>, Wingfield CR<sup>4</sup> and the Tuberculosis Trials Consortium (TBTC) <sup>5</sup>. <sup>1</sup>Harlem Hospital Center, New York; <sup>2</sup>Denver Metro Tuberculosis Clinic, Denver; <sup>3</sup>San Francisco General Hospital TB Clinic; <sup>4</sup>Treatment Action Group, New York; <sup>5</sup>Centers for Disease Control and Prevention, Atlanta, USA

### **Background**

Community participation in tuberculosis (TB) research is vital to ensure that priorities of those affected by TB are addressed. In order to facilitate community participation, CRAG was developed through a partnership between the CDC-funded TBTC and the Treatment Action Group (TAG), a community-based AIDS research and policy think-tank.

### **Methods**

In 2007, the TBTC solicited nominations from its international and domestic sites; 13 CRAG members were selected. Members have personal or professional experience with latent or active TB, and/or HIV, and/or live or work in high TB burden settings.

### **Results**

Members of the TBTC Advocacy and External Relations Committee are providing CRAG members with education about basic research concepts, clinical trial design, and research ethics. CRAG members are engaging in advocacy for TB research and have developed their mission statement, “to enhance the value and impact of TBTC’s research for the benefit of TB affected communities.” They conduct monthly conference calls and twice yearly meetings where they represent their communities in the TBTC’s scientific mission and clinical trials efforts, while growing in experience and science literacy.

### **Conclusion**

TBTC and TAG have collaborated to develop CRAG, a multi-national group that is engaging in TB clinical research processes.

## **REGIONALIZATION OF TUBERCULOSIS PROGRAM ACTIVITIES: A RESPONSE TO SCARCE RESOURCES**

### **Authors**

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### **Background**

In 2005, the 6 New England tuberculosis (TB) control programs started regional collaboration to enhance state-based TB prevention and control activities. The regional plan focuses on 5 collaborative areas to build program capacity: communication, training and education, use of DNA genotyping data, medical consultation, and program evaluation.

### **Methods**

We reviewed the collaborative activities undertaken by the New England TB Consortium. Completion of activities in the regional plan was defined as achievement of the objectives as prioritized by the TB program managers.

### **Results**

The objectives in 4 main areas were achieved. Communication among programs takes place through regular conference calls in which managers prioritize goals and define steps to implement activities. Two educational forums were created: “Eliminating TB Case by Case” and “TB Talk,” a case management conference. Eight presentations in the TB Case Series have reached >400 participants. Additionally, 3 regional conferences have educated >140 health professionals. Program staff analyzed TB cases in the largest genotypic cluster (25 cases in 4 states) in the region. Results of the analysis determined that only one definite instance of TB transmission occurred within a family. A total of 52 medical consultations on difficult cases have taken place between a regionally designated medical officer and providers. Program evaluation has been addressed by individual states, but not on a regional level.

### **Conclusions**

Collaboration through the New England TB Consortium has fulfilled most high-priority objectives specified in the strategic plan.

## **CERTIFICATION OF MICROSCOPERS, A STRATEGY TO IMPROVE THE QUALITY OF THE DIAGNOSIS IN THE NETWORK OF LABORATORIES OF TUBERCULOSIS DE BOLIVIA ADMINISTRATION 2005**

### **Authors**

Camacho M<sup>1</sup>, Magne M<sup>2</sup>. <sup>1</sup>Head National Program of Tuberculosis; <sup>2</sup>National Reference Laboratory of TBC, Bolivia

### **Introduction**

The tuberculosis in our country is one of most infectious illnesses at national level, presenting one of the highest rates of incidence of Latin America. The most accessible laboratory test for diagnostic and control of treatment is the direct smear examination, a method so effective that has not been overcome yet by another method for the qualities that it presents as: simplicity, reproducibility, specificity, low cost, easy to carry out. In Bolivia the permanent monitoring of the personnel of the 486 laboratories that executes the direct smear is made. One of the factors that has caused delays and low quality of results has been the personnel's constant change for ignorance and valuation of its acting, in 2005 year they moved 15% of the Human resources who made direct smear examination. So the NTCP decided to do the certification to qualify their capacity of resolution, in direct smear interpretation, after that to give certainty of efficiency, avoiding its change and to maintain the quality of the method.

### **Methods**

The National Reference Laboratory made a 15 slides panel, and all of the Laboratory Workers was to call to make the theoretical and practice examinations, about f knowledge on the Tuberculosis Control Programme Standard Procedures and the laboratory methods. 118 participated, (24% of the total) of 439 personnel of microscopic method of the Net of Laboratories having approved the theoretical practical test, 117 (99%), received the certificate of efficiency, besides granting to the health service where they work an announcement with the legend: "HERE A QUALIFIED MICROSCOPER WORKS IN THE DIAGNOSE OF TUBERCULOSIS"

### **Results**

After having concluded the first stage of certification of direct smear examination, a year after has been possible to avoid the change of the microscopes and has been avoided damages in the reports of bacilloscopy results in the net of Laboratories of Tuberculosis of Bolivia

### **Conclusions**

To maintain the quality of the services and to avoid the change of human resources that support activities of diagnostic of tuberculosis is a good strategy to develop activities that show the hierarchy and their employees' capacity.

## **DETERMINATION OF THE TRANSMISIBILITY OF RESISTANT BACTERIA TO ANTITUBERCULOSIS MEDICATIONS, A DESCRIPTIVE STUDY OF CONTACTS**

### **Authors**

**Magne M**<sup>1</sup>, Camacho M<sup>2</sup>. <sup>1</sup>National Reference Laboratory; <sup>2</sup>Head of National Tuberculosis Control Program 2006, La Paz, Bolivia

### **Introduction**

Recent Studies refer the transmission of tuberculosis disease with resistance bacteria of patients with tuberculosis disease and some resistance to antituberculosis drugs to contacts that cohabit with them in the same house. In Bolivia 141 patients were identified with resistance to one or more antituberculosis drugs. It was determines to make the visit of each one of them by means of patient residents' domiciliary in five cities of Bolivia: La Paz, Cochabamba, Santa Cruz, Trinidad and Tarija.

### **Material and Methods**

One carries out the visit to their home to patients of La Paz, Cochabamba, Santa Cruz, Trinidad and Tarija., being applied a previously elaborated form. 81 patients (57%) were found of the total of the cases of resistant patients identified, only 42 (21%) patients referred to have symptoms of cough, gathered a sputum sample, being also interrogated the contacts, being obtained 19 samples of patients resistant with clinical symptoms. The samples were cultivated amid Lowenstein Jensen to make the resistance study by means of the method of the proportions of Canetti Rist.

### **Results**

Of the 42 gathered samples 22 (52%) had positive cultivation, of 19 examined contacts two had positive cultivation, one of a patient that presented resistance to two drugs, being resistant to the same two drugs, another contact of patient resistant to four drugs presented positive cultivation and resistance to three drugs. The other contacts went negative to the cultivation.

### **Conclusion**

10% of transmission has settled down of patient with resistant tuberculosis to contacts that cohabit with them. In the present study two contacts developed tuberculosis for the transmission of 22 patients with positive cultivation of resistant stumps to some antituberculosis drug. It becomes urgent the pursuit and study of contacts in patients with lung tuberculosis.

## **NEW RAPID METHOD (NITRATASA) FOR THE DETERMINATION OF THE BACTERIOLOGICAL RESISTANCE TO ANTITUBERCULOSIS MEDICATIONS BOLIVIA 2003**

### **Authors**

**Magne M<sup>1</sup>**, Camacho M<sup>2</sup>. <sup>1</sup>National Network of Laboratories of Tuberculosis, <sup>2</sup>Head of National Tuberculosis Control Program, Bolivia

### **Introduction**

In the last 10-15 years publications have been made of diverse technical ways, for the determination of resistance levels in patients, in whose is required to know the drug resistance. Yet in practice not all of them are possible of being executed in laboratories that make the routine diagnosis of the TB of the countries with scarce human economic resources causing this situation technical limitation regarding the execution of tests of sensibility and resistance. For this reason in the National Laboratory of Tuberculosis of Bolivia the study of the method of the nitrataasa has been made to facilitate the report of results in oportune form with the same sensibility that the method of the proportions of Canetti rist.

### **Material and Methods**

100 cultures of M. tuberculosis were processed in Lowenstein Jensen medium tubes with drug following the method of the proportions of Canetti Rist, sowing three dilutions. In parallel form thesowing is made in tubes of Lowenstein Jensen with drugs plus NO4K in a proportion of 1%, to facilitate the colorimetric reaction of diazotation, the groundwork of the test.

The interpretation is made 45 days later, in the means of cultivation of Lowesntein Jensen without NO4K and 25 days lster in the means of Lowenstein Jensen with NO4K to 1%.

### **Results**

The comparative results of the tubes of Lowenstein Jensen with drug and the tubes of Lowenstein Jensen with added drug of NO4K in the processed 100 sample, presents a sensibility of 66% and a specificity of; 96, 8%

### **Conclusion**

The method of the nitrataasa is useful and it can be applied like an alternative to determine the resistance to antituberculosis treatments for its presentation of high specificity.

**ACHIEVING RESULTS THROUGH THE CHILDHOOD TB PROGRAM – AN EXPERIENCE, CITY OF VALENZUELA, PHILIPPINES, 2007**

**Authors**

**Mapue II MC<sup>1,2</sup>**, Cabral C<sup>1</sup>. <sup>1</sup>City Epidemiology and Surveillance Unit, City Health Office, Valenzuela City; <sup>2</sup>National Task Force on Childhood Tuberculosis, Department of Health, Manila, Philippines

**Background**

Because of existing cases in children, difficulty in the diagnosis, and presence of groups interested on their welfare, the need to implement a tuberculosis control program among children was realized. In 2004, the Health Department issued a Management Guideline for Childhood Tuberculosis Control. Valenzuela City was chosen to initially implement the program prior to its nationwide adoption.

**Methods**

Children within the City were screened using standardized forms from October 1 to December 31, 2006. A tuberculosis disease case was anyone who satisfied the criteria based on the Childhood Tuberculosis Management Guidelines of the Philippines Health Department. Management was based on the Directly-observed Treatment Strategy. Cases were assessed monthly until the end of the treatment.

**Results**

Fifteen thousand children were screened. Six hundred eleven (4%) were classified as tuberculosis disease. Sixty-two percent (380) of adult tuberculosis exposure occurred within the household, mainly (55%) (209) from their parents. Age-group most (43%) (263) affected was the 4-6 year-old group. Majority (55%) (336) were female. Majority (71%) (434) of those affected were well-nourished. Most common (89%) (522) manifestation was loss of appetite. Most frequent (97%) (593) criterion present was positive tuberculin test. Ninety-nine percent (605) initiated treatment. Ninety-six percent (583) was treated successfully.

**Conclusion**

For a successful management of tuberculosis in children, standardized approaches are needed. The engagement of all health providers (including paediatricians and other clinicians) is crucial. Reducing the tuberculosis burden in children entails changing and improving many existing practices, such as those that relate to contact investigations.

## **DIABETES AND TUBERCULOSIS (TB), NATIONAL HEALTH INTERVIEW SURVEY (NHIS) 2000-2005**

### **Author**

**Marks, S.** Centers for Disease Control and Prevention (CDC), Division of Tuberculosis Elimination, Atlanta, Georgia, United States

### **Background**

Diabetes has been reported to be associated with TB disease, as have black and Hispanic race/ethnicity. However, blacks and Hispanics are disproportionately affected by diabetes, which may confound the association with TB. No study has yet analyzed the TB risk factor of diabetes along with race/ethnicity from a national representative sample.

### **Methods**

We analyzed aggregated 2000–2005 data from NHIS, which interviewed annually representative samples of the U.S. population, and present significant (at 99% confidence) crude and adjusted odds ratios for the association of diabetes with history of TB disease, controlling for race/ethnicity and age.

### **Results**

The history of TB was 0.31% or 310 per 100,000 persons; diabetics were more likely than others to report a history of TB, 0.52% vs. 0.29% (crude odds ratio [OR] =1.8, Confidence Interval [CI]: 1.3-2.4). Males (crude OR=1.1, CI: 1.0-1.1), blacks (crude OR=1.5, CI: 1.4-1.6), those aged 45-64 (crude OR=1.9, CI: 1.8-2.0) and aged 65 or over (crude OR=3.8, CI: 3.6-4.1) were more likely to be diabetics and foreign-born persons less likely (crude OR=0.8, CI: 0.8-0.9). From multivariate analysis, diabetics had a 40% increased odds (adjusted OR=1.4, CI:1.0-2.0) of having a history of TB, controlling for being non-Hispanic foreign born (adjusted OR=2.2, CI:1.6-3.2), U.S.-born Hispanic (adjusted OR=2.1, CI:1.4-3.2), age 65 or over (adjusted OR=2.0, CI:1.5-2.6), black (adjusted OR=1.6, CI:1.1-2.4), and being foreign-born Hispanic (adjusted OR=0.5, CI:0.3-1.0).

### **Conclusion**

Even after controlling for race/ethnicity, foreign birth, and age, diabetics had increased odds of reported history of TB.

## **ACTIVE PEDIATRIC TUBERCULOSIS CASES IN MINNESOTA 1995-2006: HOW MANY WERE PREVIOUSLY KNOWN TO HAVE LATENT TB INFECTION (LTBI)?**

### **Authors**

**Maroushek SR**, Stuart C, Tsukayama D. Department of Pediatric Infectious Disease, Hennepin County Medical Center; University of Minnesota Medical School, Health Assessment and Promotion Clinic, Minnesota Department of Health, Minneapolis, MN, USA

### **Background**

Despite declining active TB cases in the US, TB disease remains a problem. In 2001, TB cases in foreign-born (FB) overtook the US-born for the first time. In Minnesota (MN), FB TB was 87% of all TB cases in 2005. With a growing immigrant population, the 2005 active TB case rate for Hennepin County was 2x the US and 2.5x higher than MN rates. These numbers prompted exploration of novel ways to approach TB in the FB.

### **Objective**

Here we review the number of FB TB cases in Hennepin Co that were known to have prior LTBI at initial pediatric immigrant screen and to see how many completed 9 months of isoniazid (INH).

### **Design/Methods**

This is a cohort of FB children diagnosed with active TB in MN from 1/1/95-8/1/06. The active TB cases were referenced back to initial immigrant screen at Hennepin County Public Health Clinic to find previous TB status. Inclusion Criteria included: being FB, 0-21 years of age at initial screen, active TB during the study period. Data included: gender, birth country, TB status on arrival, and years in US to active TB, date and age at initial screen, TST and CXR results, months (mo) of INH. Factors related to TB activation were also recorded (wt, ht, parasites, HIV status).

### **Results**

1251 active TB cases were reported from 1/1/95 to 8/1/06 in Hennepin County. Of the 1251, 142 (11%) had screening in MN and were 0-21 yo. 54% (77/142) were diagnosed with active TB at initial screen, 33% (47/142) had a diagnosis of LTBI, 10% (14/142) had a neg TST at initial screen, 3% (4/142) did not complete the screen. Of the 47% with LTBI, 70% (31/47) were started on INH. Only 10% (3/31) completed 9 mo of INH, with 45% (14/31) taking INH < 6 mo (13/14 taking <3 mo), and 45% (14/31) taking INH >6, <9mo. 21%, 43%, and 67% INH drug resistance was found in those taking <6, 6-9, or ≥ 9 mo respectively.

### **Conclusions**

The majority of TB in the US is now FB. Data here predicts that potentially 30<sup>+</sup>% of active TB cases may have been prevented with earlier aggressive LTBI treatment in FB children. Data also suggests 10% may be anergic at initial screen, questioning a need for repeat TST. Active TB after a full LTBI course is likely to be INH resistant. With declining TB cases overall, is it time to focus our resources on the diagnosis and treatment of the LTBI reservoir?

## A LATENT CLASS META-ANALYSIS OF THE ACCURACY OF DIAGNOSTIC TESTS IN LATENT TUBERCULOSIS INFECTION

### Authors

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### Background

Due to lack of a gold standard, the diagnostic performance of the test used in the detection of latent tuberculosis infection (LTBI) is not well understood. However, statistical methods can be used to estimate the sensitivity and specificity from the studies reporting the 2x2 table of agreement between the tests.

### Methods

We used the random-effects latent-class method proposed by Qu (Biometrics. 1996) for three LTBI diagnostic tests: Tuberculin skin test (TST, 10mm cutoff), Quantiferon-TB gold (QFT-G), and TSPOT-TB. Studies evaluating agreement between the tests which met the inclusion criteria (active TB excluded, HIV prevalence < 5%, prevalence of BCG vaccination reported) were included. Adjustment was made for the effect of BCG on TST.

### Results

Seventeen studies were included. The maximum-likelihood estimates for the sensitivity of QFT-G and TSPOT-TB were 0.648 (95% CI, 0.566-0.724) and 0.686 (95% CI, 0.635 - 0.748), respectively. The specificity of the tests were 0.967 (95% CI, 0.925-0.992) and 0.864 (95% CI, 0.833-0.891), respectively. TST had a sensitivity of 0.659 (95% CI, 0.576-0.740) and specificity of 0.843 (95% CI, 0.625-0.986) in the BCG-negative, and sensitivity of 0.736 (95% CI, 0.641-0.808) and specificity 0.656 (95% CI, 0.504-0.782) in the BCG-positive individuals.

### Conclusion

Statistical methods can help estimate the accuracy of LTBI tests in the absence of a gold standard. While the estimated specificities were close to their estimated values in the literature, the estimates sensitivities were remarkably low, a finding that should be carefully evaluated.

## CLINICAL OUTCOME OF A STANDARDIZED TREATMENT IN PATIENTS WITH MULTIDRUG RESISTANT TUBERCULOSIS

### Authors

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### Objective

To evaluate the treatment outcome with standardized regimen in patients with multidrug-resistant tuberculosis (MDR-TB) and to measure its efficacy and efficiency.

### Methods

Retrospective study with clinical charts of patients with TB-MDR from June 2003 to June 2005. Demographics, history of drugs and clinical, regimen of retreatment and outcome where analyzed.

### Results

Among 55 patients which initiated retreatment, the mean of drug resistance was 3.3. The patients were treated with a median of 4 (4-6) drugs. Adverse effects were reported in 91.7% patients, of them, 93.2% had at least one. Probable cure 66.7%, failure 18.8%, default 6.3%, death 6.3%. In 2.1% the treatment was withdrawal because of severe adverse effects. The efficiency was 58.2% (32/55) and the efficacy was 80% (32/40). The antecedent of contact with a TB patient had greater favorable results that the ones that did not have it [OR: 3.6 (IC95% 0.95-15.19) p=0.03], probably because of the knowledge. The patients from Veracruz had more unfavorable results that the other ones [OR: 6.4 (IC95% 1.46-32.20) p=0.004].

### Conclusion

The results suggest that the standardized retreatment is efficient above those patients who had been treated only with first line drugs and it had efficacy mainly in those patients treated under DOTS/TAES strategy.

## **PUENTES DE ESPERANZA: ONE YEAR EXPERIENCE**

### **Authors**

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### **Background**

Multi-drug resistant tuberculosis (MDR-TB) threatens communities across the globe. In Baja California, resources are inadequate to ensure that MDR-TB patients can be treated and cured. Puentes de Esperanza, a binational program funded by a 3-year grant from the US Agency for International Development, provides for the treatment and management of 10 to 20 MDR-TB patients.

### **Methods**

Patients are referred by physicians in Mexicali and Tijuana. Criteria for enrollment include resistance to at least isoniazid and rifampin, medically/surgically treatable disease and ability to receive directly observed therapy (DOT). Treatment and management occurs in Baja California with consultation from MDR-TB experts through conference calls and the MDR-TB expert network. DOT is provided by promotoras. Certain laboratory tests are provided by the San Diego Public Health Laboratory and other US laboratories.

### **Results**

Eleven patients are currently enrolled; 7/11 (64%) male and 4/11 (36%) female. Mean and median patient age is 42 (range 23-62). All patient's isolates (100%) are resistant to at least three drugs; 6/11 (55%) are resistant to all first-line drugs; 4/11 ((36%) are resistant to at least one second-line drug; 1/11 (9%) meets criteria for XDR-TB. One patient will complete treatment by March, 2008; 3/11 (27%) have culture converted; 8/11 (73%) started treatment recently. No treatment failures or relapses.

### **Conclusion**

Successes include adequate enrollment, excellent patient outcomes and model provider collaboration. Challenges include limited DOT staffing, and assuring access to medications and laboratory/radiographic studies.

**TUBERCULOSIS OF PROSTHETIC KNEE WITH SIMULTANEOUS  
NON-TUBERCULOUS MYCOBACTERIA IN LUNGS: A KNEE-  
JERK REACTION?**

**Authors**

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**Background**

Tuberculosis of knee prosthesis is rare and optimal management is unknown.

**Case**

A 63 year-old woman from India underwent right total knee arthroplasty for osteoarthritis in Mumbai in May 2006. Five months post-operatively, she developed purulent drainage from two ulcers on surgical incision. Cultures were negative, and she was treated with unknown antibiotics. She moved to Portland, Oregon, where exam showed one 3 cm purulent ulcer 10 cm below the medial knee joint line without bony tenderness. She denied fevers, cough, night sweats or weight loss. Cultures revealed acid-fast bacilli identified as *M. tuberculosis* by nucleic acid probe. She received standard 4 drug anti-TB therapy. A chest CT scan showed plate-like opacities in the left lower lung. Sputum revealed 2+ AFB. She was placed in isolation, and her wishes to return to India denied. Sputum cultures subsequently identified *M. abscessus*, *M. chelonae*, and *M. goodii*. After two weeks of anti-TB therapy, and sputum negative for AFB, she traveled to India. Removal of her prosthesis is planned. .

**Conclusion**

NTM, a common environmental contaminant, probably did not represent lung disease but caused a diagnostic challenge preventing this patient from visiting her dying father. Rapid diagnostic tests on sputum are needed for early identification of TB and NTM so as to guide appropriate decision making for isolation, travel, and treatment.

**12<sup>th</sup> Annual Conference**  
**IUATLD – North American Region**  
**February 28 – March 1, 2008**

**TARGETING DIRECTLY OBSERVED THERAPY:  
DEVELOPMENT AND EVALUATION OF A RISK ASSESSMENT  
TOOL FOR TB NURSES IN LONDON, UK**

**Author**

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**Introduction**

TB rates in London, UK are currently rising year on year especially amongst the foreign born and other at risk groups including alcoholics and the homeless. Local services are struggling to cope with the rise in cases. There is not a recommendation for universal directly observed therapy in the UK and resources do not exist to give directly observed therapy to all clients. In London, under 20% of cases currently receive directly observed therapy.

**Method**

In order to identify who would benefit most from directly observed therapy a risk assessment tool has been developed for TB nursing staff in one area of London. This risk assessment tool for directly observed therapy consists of a simple questionnaire for nursing staff and scoring system. Those scoring highly are assigned to directly observed therapy rather than self administered therapy.

**Results**

The risk assessment tool has been used in North East London over the past year and its utility in terms of treatment completion rates has been evaluated by the North East London TB Network. These results will be presented.

**Conclusion**

This will discuss the utility of targeted directly observed therapy in an era of static or falling TB control resources which is very relevant to the situation in North America today.

## **DEVELOPMENT OF A CULTURALLY SENSITIVE DOTS TRAINING MANUAL FOR GUYANA**

### **Authors**

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### **Background**

The re-emergence of Tuberculosis (TB) in Guyana in the 1990's, has been closely linked to Guyana's HIV epidemic. The Ministry of Health, in its efforts to combat this, revised the National TB Programme featuring the Directly Observed Therapy Short-course (DOTS) strategy. With technical and financial assistance from the CIDA-funded Public Health Strengthening in Guyana project, the DOTS programme began in 2002. In addition to establishing four TB laboratories and developing National Guidelines for TB management, the DOTS programme has been enhanced by the creation of a culturally-sensitive training manual for DOTS workers published in June, 2007.

### **Methods**

This manual was developed to regularise the training curriculum according to internationally accepted standards, through a concerted effort of local, national and international TB consultants. The manual considers both the needs of the National TB programme and the DOTS worker hopefully impacting upon the morbidity and epidemiology of TB in non-HIV and HIV co-infected populations. Pathogenesis, diagnosis, transmission and treatment of TB is presented in simple language with illustrations featuring a planned approach for maximising interactions between patients, their families and DOTS workers. Guidelines are also provided for sputum sampling, infection control, treatment, management, contact investigations and follow-up of both TB infection and active TB. The manual highlights health promotion strategies to improve the wellbeing of patients at both individual and community levels.

### **Results**

This manual is currently being utilised across the country through Guyana's National TB Programme, by DOTS workers and community health workers.

### **Conclusion**

This comprehensive manual can serve as a guide for the training of DOTS workers in any English-speaking developing country, or as an easy reference handbook for other healthcare support workers in regular contact with TB or HIV/TB co-infected patients.

## **TUBERCULOSIS (TB) RECURRENCE IN BRITISH COLUMBIA, CANADA OVER A PERIOD OF 17 YEARS**

### **Authors**

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### **Background**

Recurrent tuberculosis (RTB) remains a significant challenge to global TB control programs. The epidemiology related to TB recurrence is not well characterized for British Columbia (BC) or Canada. We investigated recurrent TB in a population-based cohort in British Columbia (BC), Canada over a period of 17 years.

### **Methods**

We reviewed all TB cases that were recorded by the provincially based BC Division of TB Control (DTB), from 1990 to 2006. A tuberculosis case with documented evidence of prior active TB that became inactive and then represented was defined as recurrent disease. Bivariate comparisons were performed between those who had recurrence and those who had not (new cases) in terms of age, sex, foreign-birth, ethnicity, and marital status.

### **Results**

During the study period, 5430 TB patients were registered with the DTB. Among them, the staging information (either new or recurrent case) was available for 5111 patients. The overall prevalence of recurrence was 9.4% (95% CI: 8.6%, 10.2%). No significant variation in prevalence across calendar years was observed. The median age of the study cohort was 47 (IQR: 31-67) years. Recurrent cases were significantly older (median age, 62 vs. 45 years,  $p < 0.001$ ), more likely to be male (10.9% vs. 7.6%,  $p < 0.001$ ), to be Aboriginal and living with family (14.3% vs. 8.4%,  $p < 0.001$ ). However, there was no significant difference in prevalence between foreign-born and Canadian-born people (9.7% vs. 9.7%,  $p = 0.952$ ).

### **Conclusion**

This study identifies several important socio-demographic characteristics associated with TB recurrence in a large population based cohort. Reasons for these significant differences need to be explored further and appropriate interventions to reduce recurrence should be identified.

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**12<sup>th</sup> Annual Conference  
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**PREVENTION THROUGH PARTNERSHIPS: THE COMMUNITY INITIATIVE  
FOR TUBERCULOSIS EDUCATION (CITE) – MASSACHUSETTS, 2007**

**Authors**

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Note: The findings and conclusions in this presentation have not been formally disseminated by the Centers for Disease Control and Prevention and should not be construed to represent any agency determination or policy.

**Background**

In Massachusetts, the foreign-born population represents >75% of cases and remains the group at highest risk for tuberculosis (TB) disease. The Community Initiative for TB Education (CITE), a collaboration between the Massachusetts Department of Public Health and community partners, was established in October 2006 as a 2-year initiative to address the need for testing and treating latent TB infection (LTBI) in these communities.

**Methods**

The Cambodian community in Lowell, Massachusetts and the Haitian community in Cambridge, Massachusetts were selected as target populations on the basis of elevated rates of TB/LTBI. Partnerships were developed with community groups and health-care providers who serve these communities. Focus groups and key-informant interviews were conducted with community members and health-care providers, respectively, to determine their TB educational needs and solicit recommendations regarding the best ways to educate these communities and their providers.

On the basis of this needs assessment, CITE will develop provider-focused educational interventions and community-focused educational tools and/or activities to address and encourage testing and treatment of LTBI. These tools will be pilot-tested, distributed through existing health education pathways, and evaluated 3 and 6 months post implementation to assess instrument utility.

**Results**

Since July 2007, six focus group sessions (45 participants), along with four key-informant interviews, have been conducted. Haitian community members recommended working with the Haitian media (i.e., radio or TV) in disseminating TB educational messages. Haitian participants also described the complex influence traditional medicine beliefs have on initiating and completing TB treatment. Within the Cambodian community, knowledge of and attitudes toward TB varied between younger and older generations, although both groups recommended conducting TB educational talks at community social events or temples.

Providers serving Haitians and Cambodians said they rely on state TB clinics for educating patients regarding TB/LTBI and were receptive to having Haitian or Cambodian-specific TB educational media exhibited in their waiting rooms.

**Conclusions**

LTBI educational materials for foreign-born populations are often limited to written translations of generic English text. CITE aims to develop culturally and community-specific educational tools and activities in collaboration with community partners. These activities should increase testing for and treatment of LTBI within Haitian and Cambodian communities.

## WHEN AND HOW TO MEASURE THE TUBERCULIN SKIN TEST

### Authors

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### Background

The tuberculin skin test (TST) is used to diagnose latent TB infection; however, there are no standard recommendations on when and how to assess the TST results. Our objective was to determine the best PPD to administer, the ideal time and best method for measuring the induration size.

### Methods

Either 5TU of PPD-S (Tubersol®) or 2TU of PPD-RT23 (Ministry of Health, México) were applied on 78 nurses. The induration was measured at 48h, 72h and 96h by two observers, using either: palpation and ruler; palpation and Vernier caliper; ballpoint pen and ruler; or ballpoint pen and Vernier caliper. The false positive and negative results and reproducibility of the results were also assessed.

### Results

The mean TST size was larger at 72 h (13.4 mm) than at 48 h (11.8 mm) and 96 h (10.1 mm) [ $p < 0.001$ ]. It was also larger with PPD-S (12.8 mm) than with PPD RT23 (10.8 mm) [ $p < 0.001$ ]; and with the ballpoint pen-ruler (12.6 mm) than with the ballpoint pen-Vernier (11.1 mm). The smallest number of false results was at 72 h, with the PPD-S. The ballpoint pen-Vernier method had the best reproducibility.

### Conclusion

The TST should be performed with PPD-S and the response measured at 72 h, preferably with the ballpoint pen-Vernier method.

## **EXTENSIVELY DRUG-RESISTANT TUBERCULOSIS IN COLOMBIA**

### **Authors**

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### **Background**

The incidence rate of TB in Cali is 54/100,000, and the rate of multi-drug-resistant-TB is ~2.4%. The public health service's (PHS) drug susceptibility testing (DST) includes only first-line medications.

### **Methods**

The records of all TB patients with smear-positive pulmonary tuberculosis during the first semester of 2007 were reviewed. The cases of recurrence or treatment failure were identified; of these cases, those who had received two or more treatment courses in the past were examined for risk factors for extensively-drug resistant-TB (XDR-TB). DST was initially done at CIDEIM, and confirmatory DST was carried out at NJMRC using Bactec-460TB, and Middlebrook-7H11 and HSTB agars.

### **Results**

There were 341 cases of smear-positive pulmonary tuberculosis, of which 10 were treatment failures/recurrences. There were 2 cases that had received two or more courses of standard first-line-drug regimens. One of these had received a fluoroquinolone and aminoglycoside in the past. DST of his current isolate revealed resistance to isoniazid, rifampin, all fluoroquinolones and injectables, as well as to pyrazinamide. DST prior to receiving moxifloxacin and amikacin reported resistance to isoniazid and rifampin, but susceptibility to fluoroquinolones and aminoglycosides.

### **Conclusions**

XDR-TB has not been previously reported in Colombia. However, given the limited capacity of the PHS to perform second-line-DST and the routine empiric use of fluoroquinolones and aminoglycosides to treat failures/recurrences, it is likely that there are more undetected cases—even in areas with an intermediate burden of TB and MDR-TB.

**IMPROVING TB DIAGNOSIS AND MANAGEMENT IN SOUTHWEST  
COLOMBIA THROUGH COLLABORATIVE OPERATIONAL RESEARCH:  
THE VALLE-COLORADO TUBERCULOSIS GROUP**

**Authors**

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**Background**

In 2005, the province of Valle del Cauca had a tuberculosis (TB) incidence rate of 38/100.000. The percentage of adult respiratory symptomatic patients (RSPs)—ie, 2 weeks of cough—in the province who were evaluated for TB was 28%. Of the total number of cases diagnosed with TB in the province, only 3% were children, and in the city of Buenaventura only 2% were children. This is a report of an operational research collaboration between the public health department (PHD) of a province in a developing country and an academic medical center (AMC) in a developed country, to improve local TB diagnosis and management through operational research projects.

**Methods**

Observation, review of medical records, statistical analysis of data, and interviews with healthcare professionals (HCPs), were conducted in 5 hospitals to identify key problems. Subsequently, objectives were set, HCPs were trained, a screening tool for TB diagnosis was developed, and a mobile multidisciplinary team was established (Valle-Colorado Tuberculosis Group), to ensure appropriate TB care and further training.

**Results**

The problems identified included: limited TB knowledge of medical staff, poor execution of diagnostic procedures, lack of guidelines for diagnosing TB in children and HIV-infected patients, limited access to TB care, and limited availability of medications. By the end of the first year, HCPs in all 5 hospitals had been trained in TB care, an ambulatory interdisciplinary team was trained to perform diagnostic procedures, a care pathway for TB patients was established, availability of TB medications was ensured, and a diagnostic tool to evaluate childhood TB was piloted. By June 2007, the percentage of adult RSPs in the province who were evaluated for TB was 33%. Of the total number of cases diagnosed with TB in the province, 8% were children, and in the city of Buenaventura 12% were children.

**Conclusion**

TB diagnosis and management can be improved significantly through international collaborations between AMCs in developed countries and PHDs with limited resources in developing countries.

The emphasis on “training trainers” and the successful outcomes thus far have made the effort self-sustaining.

## **INDUCED SPUTUM AS AN ALTERNATIVE SPECIMEN FOR THE MICROBIOLOGIC CONFIRMATION OF PULMONARY TUBERCULOSIS IN CHILDREN FROM A CULTURE THAT DOES NOT ALLOW GASTRIC ASPIRATION**

### **Authors**

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### **Background**

Diagnostics studies using induced sputum have focused on its potentially greater yield for the microbiologic confirmation of pulmonary TB when compared to the gastric aspirate. However, neither of the aforementioned specimen collection methods is medically acceptable in certain cultures, including some Colombian native Indian tribes such as the Dachi Drua Monde. This isolated reservation (located 3 hours from the closest hospital) is currently suffering a TB outbreak with an incidence rate of 2921/100,000—the highest reported in Colombia.

### **Methods**

A case finding study was conducted to diagnose TB in children who were household contacts of smear-positive TB patients. Children were evaluated using the WHO criteria. Microbiologic confirmation was carried out by collecting 2-3 induced sputa or culture (Lowenstein-Jensen media).

### **Results**

Twelve children were found to be household contacts of four AFB-smear-positive index cases. Malnutrition was found in 92% (11/12), a PPD-TST was positive in 64% (7/11), CXRs were abnormal in 33% (4/12), and microbiologic confirmation was attained in 20% (2/10). One of these two patients was without clinical symptoms/signs and had normal radiographs, and the other also had normal radiographs and a negative PPD-TST. Therefore, 50% (6/12) of the contacts met WHO criteria for diagnosis of “probable” and/or “confirmed” active TB disease.

### **Conclusion**

Communities at high risk for TB—including native-Indians in the Americas—pose a challenge to TB controllers. Culturally-sensitive diagnostic approaches, including non-invasive procedures, can dramatically improve early diagnosis and consequently timely care. During this “medical brigade,” a combination of methods allowed for the diagnosis in 50% of the contacts—who otherwise may not have been detected.

## **MONITOR ENHANCED FAMILY DOT**

### **Author**

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### **Background**

While Family Member DOT is controversial it requires less program resources and creates far fewer problems for patients. However, in one study DOT was not actually given 30% of the time.

### **Methods**

Family Member DOT literature and means of improving it were reviewed.

### **Results**

A study in Thailand found Family Member DOT following a short period of clinic DOT to provide statistically superior results than DOT given solely in clinics. Cluster randomized controlled trial in Nepal and Swaziland found it to be as effective as Community Member DOT. In Senegal 88% of patients supervised by family members were cured compared with 77% for all other treatment supervisors.

### **Conclusion**

While Family Member DOT requires fewer resources and may be as successful as DOT given by other supervisors, it is far from ideal. Medication monitors, devices that determine when medication is removed from a container, could be used to identify those families that fail to give medication faithfully. Additional counseling, use of a second supervisor, and longer periods of therapy could be given to poorly compliant families, using the resources not spent giving DOT to all patients leading to more cost effective and patient friendly successful TB treatment programs.

## **PHOTOVOICE METHOD AS A POWERFUL PARTICIPATORY TOOL TO AMPLIFY PERSPECTIVES ON TB THROUGH EMPOWERMENT AND ADVOCACY**

### **Authors**

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### **Background**

The patient's perspective is particularly missing from the literature pertaining to TB, therefore empowering people affected by TB-HIV/AIDS is critical to addressing the high rates of deaths associated with TB among those living with HIV/AIDS

### **Methods**

The paper is organized in two sections: 1) Photovoice method as a Participatory Action Research tool; and 2) TB Photovoice Project as a strategy to amplify and communicate the importance of TB-HIV/AIDS from the perspective of the persons affected by this co-infection across cultural settings

### **Results**

The project findings will offer contributions for augmenting our conceptual understanding of the impact of TB-HIV/AIDS on participants and suggest tools for policy change to improved health and humans services. Participant driven TB prevention and education recommendations for policy makers on both sides of the US-Mexico Border, Brazil, and Thailand documented through photography.

### **Conclusions**

The project facilitates participants' ability to construct from cues in their environments to associate meaning and the need social action. It provides empirical support for the premise that TB-HIV is a stigmatized issue that requires empowerment to affect social action. Through the power of Photovoice participants present their stories and images to one another and ultimately to policy makers fostering health public policy actions.

## **VOICES AND IMAGES OF PERSONS AFFECTED BY TB**

### **Authors**

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### **Background**

Challenges to TB control include incomplete treatment; lack of political support; social stigma; and discrimination of patients. Photovoice is a qualitative methodology used as part of a comprehensive TB advocacy and social mobilization strategy. Photovoice is patient-centered and informs policy makers, health program designers, health workers and the community about TB's impact. US-Mexico Border Health Association and Project Concern International implemented Photovoice in El Paso/Cd. Juarez in 2006 and in Tijuana/Mexicali in 2007.

### **Methods**

Thirty-six participants affected by TB were recruited, trained on Photovoice and given disposable cameras. Over several meetings, participants shared their pictures and stories. Final picture gallery themes were codified and analyzed. Two advisory committees composed of influential decision and policy-makers were formed. Awareness and policy informing activities included presentation of galleries and calls to action for policy makers, media, health workers and others.

### **Results**

Advisory committees embraced the subject of TB and opened doors for participants and program implementers to improve political support for TB control. Results include: participant empowerment; retention of TB funding, secured funds to promote gallery and train health workers in TB. Health worker understanding of TB control and patient interactions improved. A call to action developed by El Paso/CD. Juarez participants will be presented at the TB conference in South Africa.

### **Conclusions**

Photovoice helps humanize Tuberculosis and compellingly informs stakeholders on the daily challenges faced by those affected, resulting in improved awareness and resources for TB programs.

## IS IT POSSIBLE TO CURE TB IN WEEKS INSTEAD OF MONTHS?

### Authors

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### Background

New drugs with new mechanisms of action are sought to shorten the duration of TB treatment. To determine, experimentally, if TB can be cured in  $\leq 4$  wk using existing drug classes, we assessed the dose-ranging sterilizing activity of rifapentine (P) in combination with moxifloxacin (M) and pyrazinamide (Z) (PMZ) in an established mouse model.

### Methods

Beginning 2 weeks after aerosol infection, with  $>7 \log_{10}$ CFU/lung, control mice received 8 weeks daily treatment with rifampin 10mg/kg (R), isoniazid (H) and Z (RHZ) or RMZ. Test mice received PMZ, with P given at 10, 20, 40 or 80mg/kg, M at 100 or 400mg/kg, and Z at 150 or 600mg/kg. Serial lung CFU counts and relapse rates were determined after 4 and 8 weeks of treatment.

### Results

Replacing H with M, R with P, and increasing P doses resulted in successively greater activity, but increasing M and Z doses did not. RHZ- and RMZ-treated mice remained culture-positive at 8 weeks, while PMZ-treated mice were culture-negative after 4-6 weeks. Four weeks treatment with P<sub>10</sub> or P<sub>20</sub>, P<sub>40</sub> and P<sub>80</sub> cured 0%, 20% and 60% of mice, respectively. All mice treated with P<sub>20</sub> or higher were cured in 8 weeks.

### Conclusion

High daily doses of P combined with M and Z have dramatic sterilizing activity in murine TB, with no plateau in activity observed. Although many of the P doses tested are not expected to be safe for humans, these results prove there is no insurmountable biological barrier to curing murine TB in  $\leq 8$  weeks.

## **OUTBREAK OF TUBERCULOSIS AMONG MARSHALL ISLANDERS RESIDING IN WASHINGTON – 2007**

### **Authors**

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### **Background**

From February–November 2007, an outbreak of tuberculosis (TB) was reported among Marshall Islanders residing in Washington. In contrast, during 1992–2006, no cases of TB were reported among Marshallese in the state. Seattle-King and Snohomish Counties began an investigation to identify and treat patients with active TB and their close contacts in the Marshallese community.

### **Methods**

Medical records of TB patients were reviewed; patients and their contacts were interviewed to identify epidemiologic links among Marshallese TB cases within Washington and other states. Genotyping of isolates was performed at California's Public Health Laboratory by using polymerase chain reaction based methods.

### **Results**

Tuberculosis was diagnosed among 14 persons. TB was diagnosed in the Snohomish County index patient in February 2007 and in the Seattle-King County index patient in April 2007. Contact investigation identified 175 persons, of whom 144 were evaluated, and 88 (61%) were identified as having latent TB infection (LTBI). Seventy-six (86%) were started on LTBI treatment. Six cases of active TB were revealed through this investigation, and eight additional cases were diagnosed through routine hospital admissions. Directly observed therapy was initiated for all patients. Sixty-three percent of eight symptomatic patients had >30 days delay from symptom onset to diagnosis. All (n=8) available genotypes were identical.

### **Conclusion**

This investigation revealed multiple TB cases and a high infection rate among contacts. A majority of infected contacts were treated for LTBI. Responding to an outbreak of TB in the Marshallese community required dedicating resources to address multiple barriers, including lack of access to health care, nontraditional definitions of family and household, and limited understanding of TB transmission among exposed persons.

## **AN INTERVENTION TO IMPROVE KNOWLEDGE IN LATENT TB INFECTION MANAGEMENT IN PRIMARY CARE**

### **Authors**

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### **Background/ Objectives**

The CDC, PHSKC/TBESC, and the UW Refugee and Immigrant Health Promotion Program have partnered to identify the barriers and facilitators to primary care management of latent TB infection (LTBI). Based on immigration patterns within the United States and recent data on trends of TB in the foreign-born, a focus was placed on medical providers who serve recent immigrants from Mexico, the Philippines, and Vietnam.

### **Method**

Initial qualitative data (focus groups & key informant interviews) were collected from 80 primary care clinicians to determine their TB knowledge, attitudes, and belief about LTBI management. Clinicians worked in six US regions, were in private practice, and served patient populations of  $\geq 25\%$  immigrants. Data were coded, analyzed, and used to develop a tailored, standardized intervention. The intervention was conducted in a group setting and included a presentation from a TB expert and group discussion among peers on the current medical management of LTBI. Pre and post (3-6 weeks postintervention) test survey information was collected to analyze changes in knowledge and attitudes toward LTBI management in primary care.

### **Results**

Preliminary partial data (n=47) from 3/7 sites show that knowledge about LTBI testing (interpretation of TST in different risk settings) and management (interpretation of drug toxicity and interactions) were improved by  $\geq 15\%$ . However, challenges still remained in clinicians' confidence to convince their patients to start and complete LTBI treatment, an attitude that did not improve with this intervention.

### **Conclusion**

This educational intervention has improved primary care clinicians' service by updating their knowledge about LTBI management. In order to further address TB in the foreign-born further outreach to primary care clinicians who see foreign-born patients must be conducted to educate them on CDC guidelines and recommendations.

## **DOES HIV ABROGATE TB IMMUNE RESPONSE?**

### **Authors**

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Tuberculous meningitis(TBM) is one of the common and serious forms of extra-pulmonary tuberculosis prevalent in many developing countries. The diagnosis of the disease is often difficult causing delay in accurate and adequate treatment leading to serious consequences. The mortality due to TBM in children is high and can leave serious sequelae in survivors.

In the present study, 27 autopsy proven TBM cases were studied for anti-mycobacterial antibody responses by ELISA using indigenously prepared H37Ra sonicated soluble extract antigen. The samples were paired (lumbar CSF, ventric CSF and serum) and were also analysed for pro and anti-inflammatory cytokines (TNF-alpha, IFN-gamma, IL-4 and IL-6) by standard methods. Ten non-neurological control CSF(LP) were also used.

The anti-mycobacterial antibody response in the LP-CSF in the present study as well as in our earlier studies remained in the range of 55-60% in TBM cases. Anti-mycobacterial antibody responses were higher in lumbar CSF than in corresponding serum highlighting intrathecal synthesis of antibodies in CNS compartment. Pro and anti-inflammatory cytokine signals were quite varied in these cases. IL-4 and TNF signals were weak whereas the signals for IFN gamma and IL-6 were exaggerated. However, mild reduction in IFN positivity is noticed when there is associated HIV infection.

## CHALLENGES OF CONTACT INVESTIGATIONS FOR TUBERCULOSIS CASES DIAGNOSED POST MORTEM

### Authors

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### Background

Contact investigations are a critical component in controlling tuberculosis (TB) in the community. This study analyzed characteristics of individuals diagnosed with pulmonary TB post mortem and identified challenges to contact investigations specific to post mortem cases of TB.

### Methods

We reviewed all individuals meeting the TB case definition set by the Centers for Disease Control and Prevention within King County, Washington from January 1993 through September 2007. Enumeration of post mortem cases as well as demographic and clinical data were abstracted from *Report of Verified Case of Tuberculosis* data. We selected contact investigations from the following three categories for an in depth review through chart abstraction and medical personnel interview.

- (1) homeless
- (2) medical facility
- (3) family/other close contacts

### Results

Thirty-one cases of TB were reported to Public Health Seattle & King County post mortem during this 15 year period in which a total of 1917 cases of TB were counted (1.6% of all cases). An additional eleven individuals died during the first two weeks of treatment. Barriers we encountered included:

- (1) determining when to initiate a contact investigation;
  - a. was the case infectious,
  - b. if infectious, degree of infectivity, and
  - c. quantifying exposure.
- (2) identification of contacts when next of kin was unknown; and/or
- (3) communicating with a grieving family.

### Conclusion

Contact investigations initiated post mortem present unique challenges. Maintaining partnerships with community members (e.g. homeless providers) and consulting culturally appropriate personnel is essential in identifying close contacts for screening and follow-up to prevent future transmission of TB.

## MISSED OPPORTUNITIES FOR PREVENTION AND TREATMENT OF TUBERCULOSIS IN THE DOMINICAN REPUBLIC

### Authors

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### Background

Public health contact investigations are conducted to identify persons who have been exposed to patients with tuberculosis (TB) and to evaluate and treat those contacts for TB infection and active TB. Currently, in health centers of the Dominican Republic (DR), individuals who go to the hospital for non-TB related causes are not evaluated for TB exposure or treatment.

### Methods

During July-November 2007, all persons older than 15 years of age with sign and symptoms of TB, who were seeking non-TB-related health care attention (i.e. prenatal care, dental treatment, etc) in health centers of the DR, were invited to participate in the study. A sputum smear test to identify *mycobacterium* was performed in individuals who reported having a productive cough for more than two weeks.

### Results

To date, of the enrolled 96 study participants, 70% were not evaluated for signs and symptoms of TB at the health center. Twenty percent of the participants (19/96) reported living with persons who had a productive cough for more than 15 days, and 10% (10/96) were sputum smear positive for *mycobacterium tuberculosis*. Only 10% (1/10) of those with a positive sputum smear reported having been previously tested and treated for TB.

### Conclusions

The study results reveal an important strategy to enhance identification of persons exposed to TB. Expanding TB prevention efforts to include patients seeking health care for non-TB related causes needs to be considered as a potentially cost-effective and necessary public health opportunity for diagnosis and treatment of active TB in the DR.

## **STRATEGIES FOR MANAGING TUBERCULOSIS AMONG THE FOREIGN-BORN IN CANADA: A SYSTEM DYNAMICS APPROACH**

### **Author**

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### **Background**

The presentation of tuberculosis among the foreign-born in Canada is a complex interaction of numerous factors and policy decisions. The purpose of this work was to build a representative system dynamics model of tuberculosis among the foreign-born in Canada (pre, during and post-migration) and determine strategies to effectively manage infection and disease and to ultimately reduce the number of active TB cases in Canada.

### **Methods**

Each hypothetical migrant in the model is grouped a priori by level of disease risk and age group. Once in Canada, this population risk is transformed into a personal disease risk as the migrant moves into one of five disease states: susceptible, low risk infection, high-risk infection, very-high risk infection (HIV/AIDS co-infected), active disease (infectious and non-infectious). The model begins with the immigration medical examination and entry of the migrant to Canada, and follows the basic transmission dynamic of TB disease. We assessed the following key variables:

1. *number of individuals screened for active TB disease prior to entry percent of individuals:*
2. *completing treatment for active disease*
3. *detected with high risk infection*
4. *completing treatment for high risk infection*

All key variables in the model were manipulated allowing the model to run different disease and control scenarios.

### **Results**

The output of this model suggest that the more effective strategies for reducing TB disease in Canada among the foreign-born include continued screening for active disease in high risk applicants and increased detection of those with high risk infection.

## TUBERCULOSIS IN DOWNTOWN BUENOS AIRES

### Authors

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### Background

Retrospective analysis of TB clinical presentation, sputum yield and Mycobacterium Tuberculosis (MTB) drug resistance pattern, nationality and comorbidities among the HIV - patients treated from 9-1994 till 2- 2007.

### Methods

Medical records of patients with confirmed TB were reviewed. Cases were included when sputum smears were positive, cultures grew MTB (Lowenstein Jensen, Stone Brink or Bactec 460), or clinical response to treatment.

### Results

1710 cases of micobacterioses were reviewed. 629 (37%) MTB in HIV - patients. 486 (77.26%) pulmonary localization (PTB), 67 (10.5%) serous, 12% nodular, renal, bone or central nervous system forms. Among PTB, diagnosis was made in 89% cases by sputum smears, 11% by BAL. ZN was + in 74% of the samples. 89% were sensible to first line TB drugs; resistance was found in 7% to Isoniacid, 3% to Rifampin, 7% to Streptomycin and 4% to Ethambutol. MDR was detected in 18 (3.4%) of the cultured samples. None of these patients had been previously treated for TB. During the last 5 years 71.1% of the patients were of Argentine origin, 16% Peruvian, 8.3% Bolivian and 4 % from other Latin American countries. The most frequent comorbidities were autoimmune diseases, renal failure, diabetes and neoplasms.

### Conclusions

Sputum yield was high among PTB for diagnosis. The rate of isolated drug resistance is similar to the country's historical values, whereas the MDR found (3.4%) doubles Argentina's reported media, tending towards our neighbor countries (2-3%) and HIV+ medias (>10%).

## ESCUELA ALIADA POR UN MEXICO LIBRE DE TUBERCULOSIS

### **Autores**

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### **Antecedentes**

La Resolución 48.8 de la OMS destaca la importancia de la formación de recursos humanos en salud. En el 2005 la Universidad Nacional Autónoma de México y la Escuela Nacional de Enfermería y Obstetricia se integran al Comité Nacional de STOP-TB México. Y al subcomité de la RED TAES de enfermería.

### **Desarrollo**

Por convenio de Colaboración Académica la Dirección de Micobacteriosis en México la ENEO se declaro el día 24 de marzo del 2006 como “**Escuela Aliada por un México Libre de tuberculosis**” sus objetivos son: Fortalecer la Red TAES de Enfermería, Coadyuvar en la mejoría de la Atención en TB-SIDA, Favorecer la participación de académica, Colaborar en educación continua, capacitación y actualización, y desarrollo de Investigación.

### **Resultados**

Se realizaron cursos a distancia por televisión y la Red Edusat en todo el País de “Actualización *en tuberculosis y la Red TAES de enfermería*” en 3 años 19 programas, personal inscrito 2180, se investiga la *Caracterización de perfil del estado de salud en adultos con enfermedad pulmonar por MNT y TB para Diagnósticos de Enfermería*. Cuyas conclusiones fortalecerán el DOTS/TAES. Inicio el programa de Servicio social de “Atención a *adultos con tuberculosis con enfoque de familia*” incorporando 24 pasantes de licenciatura que otorgarán atención exclusiva en el programa de Tuberculosis por año.

### **Conclusiones**

El proyecto Escuela Aliada permite un acercamiento a la realidad epidemiológica, la generación de interrogantes de investigación y hace posible la vinculación docencia servicio.

## **PEDIATRIC TUBERCULOSIS CASE DETECTION, MONTGOMERY COUNTY, MARYLAND, 1997-2006**

### **Authors**

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<sup>2</sup>Montgomery County Department of Health and Human Services, Silver Spring, USA

### **Background**

Montgomery County is a principal destination for immigrant resettlement, with one-third of residents of foreign-origin (293,568/927,280). From 1997-2006, 90% of all tuberculosis cases (698/773) and 70% of pediatric cases (38/54) occurred in foreign-born individuals. School Health Services policy recommends foreign-born students be screened for tuberculosis upon public school enrollment. This study assessed the efficacy of school screening, compared to all methods of pediatric case detection, for one decade.

### **Methods**

Retrospective analysis included data from the Tuberculosis Information Management System, medical record reviews, and school health statistics. Cases were assessed for method of detection and clinical characteristics.

### **Results**

The majority of pediatric cases (63%) were asymptomatic and detected through various screening activities. The majority of foreign-born cases were detected through school screening (45%) vs. immigration examination (8%). The majority of U.S.-born cases were detected through contact investigation (75%) vs. symptomatic presentation (25%). Asymptomatic cases were more likely to have pulmonary tuberculosis (91%); 68% were diagnosed as clinical cases.

### **Conclusions**

Highly-focused screening activities remain a productive source of pediatric case detection. School screening yielded an annual average of 1.7, and contact investigations 1.4, totaling 3.1 cases/year compared to 2.0 cases/year diagnosed secondary to symptoms. Evidence supports the application of localized epidemiology to policy development, which has accelerated the diagnosis and treatment of asymptomatic tuberculosis in this community.

## PROSPECTIVE STUDY OF DIABETES AND QUALITY OF BLOOD GLUCOSE CONTROL AMONG TUBERCULOSIS PATIENTS

### Authors

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### Background

The association between diabetes and tuberculosis (TB) is gaining importance worldwide with the growing pandemic of type 2 diabetes. Most published studies are retrospective and based on self-reported diabetes. We therefore sought to explore prospectively the prevalence of laboratory confirmed type 2 diabetes among TB patients and the quality of blood glucose control in TB patients with diabetes in the Texas-Mexico border region where both diseases are endemic.

### Methods

We recruited sequentially all consenting, newly-diagnosed TB patients in two clinics in South Texas and one in adjacent northeastern Mexico. Diabetes assessment was based on history and measurements of blood glucose, and chronic hyperglycemia established by levels of glycosylated hemoglobin (HbA1c). Socio-demographic information was collected at interview, and clinical data recorded.

### Results

We identified 122 TB patients, mostly Mexican American. Confirmed diabetes was found in 35%, significantly higher than in the local population (19.4%). Among TB patients with diabetes, over two thirds had elevated HbA1c levels indicating poor glucose control. Half were women. TB patients with diabetes were more likely to be older than 30 years and with no classical social/medical risk factors for TB (alcohol, drug abuse, HIV, history of incarceration;  $p < 0.05$ ).

### Conclusion

Our TB patients not only have one of the highest prevalence rates of diabetes in the world, but more than half of those with diabetes have poor blood glucose control. The significance of this newly emerging, distinct group of older patients susceptible to TB is only now becoming widely appreciated in regions with high rates of both diseases.

## **ASSESSING USE OF THE BINATIONAL HEALTH CARD FOR TUBERCULOSIS AMONG PATIENTS IN THE SAN DIEGO-TIJUANA BORDER REGION**

### **Author**

**Riley A.** Stanford University, Stanford, California, USA

### **Background**

In 2003, the U.S. Mexico Border Health Commission launched the Binational Health Card for Tuberculosis along the U.S. Mexico border to address high rates of treatment abandonment and drug resistance. Card is still used in the U.S. and Mexico and has been championed for TB control in highly mobile, binational populations. This study aims to fill the void of research that exists regarding how the Card is used and affects treatment outcomes.

### **Methods**

Structured interviews were conducted with 43 TB patients. Items discussed included: Card use; border crossing; perceived obstacles to treatment completion. Treatment outcome data, gathered 6 months after interviews, was incorporated into analysis. Quantitative and qualitative analytical methods were applied.

### **Results**

Obstacles to treatment completion identified by patients: 43% lack of information about TB, 36% embarrassment associated with having TB; 9.5% immigration status. 70% of Card possessors had completed or were continuing treatment, compared with 60% of non-Card-possessors. 20% of both Card possessors and non-Card-possessors (6/30 and 1/5, respectively) abandoned treatment.

### **Conclusion**

Card fails to address the most reported obstacles to treatment completion. Card provides no apparent benefit when considering treatment outcome. This is partly due to confusion about how to use Card. Immigration status as an obstacle was irrelevant for most Card-holding patients due to lack of border crossing. Still, patient satisfaction with the Card is high, which is explained by unintended benefits of the Card experienced by patients: provides security; provides sense of importance; provides education about TB. With revision, Card program could prove important tool for TB control in mobile populations.

**TRANSMISSION OF MYCOBACTERIUM TUBERCULOSIS TO  
HOUSEHOLDS OF SMEAR POSITIVE PULMONARY TUBERCULOSIS  
PATIENTS IN CALI, COLOMBIA**

**Authors**

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**Background**

Tuberculosis continues being a major problem in developing countries. In Colombia, Tuberculosis is a re-emerging health problem; perhaps due to deterioration of the health system and inadequate investigation in household members living with pulmonary tuberculosis patients.

**Methods**

Between September 2005 and November 2006, pulmonary tuberculosis adult patients with positive sputum smear and their household contacts were enrolled in a prospective cohort to determine the incidence of infection and active tuberculosis disease in household contacts during 12 months of follow up, and whether characteristics of the index case, household contact and environment were associated with infection and active disease in contacts.

**Results**

Ninety-four patients with smear positive pulmonary tuberculosis were enrolled (index cases). A total of 525 household contacts were included (Median of 6 contacts per index case), 53% were female, age ranged from 2 months to 85 years. Prevalence of skin test  $\geq 10$  mm was 54.8%. There was an annual incidence of 1.5% of new tuberculosis cases among household contacts.

**Conclusion**

Household contacts of smear positive tuberculosis patients have a high prevalence tuberculosis infection. Better contact investigation and therapeutic measures directed towards this group should be implemented in Colombia. Such an approach should reduce the number of incident tuberculosis cases and hasten eradication of the disease.

**LARYNGEAL TUBERCULOSIS – A STUDY OF TWELVE CASE-STUDIES AT THE STATE WORKERS HOSPITAL (HSE), RIO DE JANEIRO, BRAZIL**

**Author**

**Romano S.** Hospital dos Servidores do Estado RJ Brazil \_HSE (State Workers Hospital), Rio de Janeiro, Brazil

In Pre – Tuberculosis Era, 35 to 40% of patients with Pulmonary Tuberculosis (TB) showed Laryngeal Tuberculosis (TL). The most common way of dissemination is the endobronchial one. This fact proves the direct inoculation of the bacillus into the laryngeal structures proceeding from pulmonary secretions.

Nowadays with the arrival of the tuberculosis, prevention measures, the rate has been reduced to 2 at 4%. The increase of described cases about TL in the world medical literature alerts to the coming back of this presentation which was pointed out by many as rare. The most common symptom is the dysphonia.

It is an insidious disease, precociously appearing in the high aerial vias (cough). This brings about delay and difficulty for the diagnosis. It can mimick another illness such as neoplasia. Twelve patients have been observed with TL in the Pneumology Service of the HSE in the period 2003 / 2006. Seven men and five women, age 36.3. Disphonia was the most frequent symptom. Diagnosis took an average period of 7.16 months counting from the onset of symptoms. X-ray images presenting from small atlectasian bands to diffused infiltrates. Three patients have been submitted to induced sputum exam. Two proved to be positive under direct research and one was culture positive. Laryngeal lesions vary from edema to infiltration processes suggesting neoplasia. Treatment applied to the patients: Rifampin (R-600mg/daily) Isoniazid (I-00mg/daily) Pyrazinamide (Z-2g/daily). Two months of RHZ and four months of RH. Corticosteroid is used during the first month at forty mg/day and then tapering it. Towards the end of the treatment patients reached clinical, radiological and laryngeal healing with no sequels. Delays in diagnosis and medical service availability have contributed to the relevance of radiological images and greater intensity in the laryngeal structures taken with.

The simultaneous steroid medication has contributed to reduce the larynx intense inflammatory process.

## ULTRA-POTENT REGIMENS WITH RIFAPENTINE YIELD STABLE CURE BY 3 MONTHS IN A MURINE MODEL OF TB

### Authors

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### Background

A recent study found that the combined substitution of rifapentine (P) for rifampin (R) and moxifloxacin (M) for isoniazid (H) results in 0% relapse after 4 months of twice-weekly (2/7) treatment and that increased rifamycin exposure is associated with increased sterilizing activity. In this experiment we explored the treatment-shortening potential of PM-based regimens with increasing rifamycin exposures compared to the standard 6-month regimen.

### Methods

Mice were aerosol-infected with ~4 log<sub>10</sub> CFU of *M. tuberculosis*. At treatment onset, 15 days later, the lung log CFU count was 7.64. Treatment regimens were R<sub>10mg/kg</sub>H 5 days/week (5/7), P<sub>15</sub>M or P<sub>20</sub>M twice-weekly (2/7), P<sub>15</sub>M thrice-weekly (3/7), P<sub>7.5</sub>M or P<sub>10</sub>M (5/7), and P<sub>10</sub>M daily (7/7). All regimens included pyrazinamide (Z) for the first 2 months. Lung CFU counts were assessed monthly. Relapse rates were assessed in selected groups after 2, 3, 4 and 6 months of treatment.

### Results

Increasing the P dose and dosing frequency was associated with greater bactericidal activity. The mean CFU count after 2 months of treatment with RHZ was 3.17, while all mice receiving PMZ were culture-negative, except 2/5 mice in the P<sub>15</sub>MZ (2/7) group. Relapse rates are presented below.

### Conclusion

Thrice-weekly P<sub>15</sub>M- and daily PM-containing regimens killed tubercle bacilli at least twice as fast as the RHZ control regimen and achieved stable cure in just 3 months. The same endpoint required 4 months of therapy with twice-weekly P<sub>15</sub>M-containing regimens and 6 months for RHZ. PMZ-based regimens have great potential for shortening the duration of TB therapy, even with intermittent administration.

Treatment Groups	Proportion of mice with relapse after:			
	2 mo.	3 mo.	4 mo.	6 mo.
2) R <sub>10</sub> HZ (5/7)	----	----	90% (18/20)	0% (0/20)
3) P <sub>15</sub> MZ (2/7)	----	10% (2/20)	0% (0/20)	----
4) P <sub>20</sub> MZ (2/7)	95% (19/20)	20% (4/20)	----	----
5) P <sub>15</sub> MZ (3/7)	95% (19/20)	0% (0/20)	----	----
6) P <sub>7.5</sub> MZ (5/7)	60% (12/20)	5% (1/20)	----	----
7) P <sub>10</sub> MZ (5/7)	35% (7/20)	0% (0/20)	----	----

## **IMAGE PROCESSING TECHNIQUES FOR IDENTIFYING MYCOBACTERIUM TUBERCULOSIS IN ZIEHL-NEELEN STAINS**

### **Authors**

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### **Background**

Sputum smear microscopy, the primary strategy for diagnosis of active tuberculosis (TB) in high-burden countries, is constrained by its human skill and time-intensive nature. Automated detection of acid-fast bacilli (AFB) could hasten diagnosis, enhance quantitative classification, and reduce errors. We demonstrate proof of principle of an innovative computational algorithm that detects TB bacilli in digital images of Ziehl-Neelsen (ZN) stained sputum smears and tissue samples.

### **Methods**

We used digital AFB images from diverse laboratory and Internet sources. Final tests were performed on images from the Centers for Disease Control's image library, while laboratory images aided initial shape extraction. We implemented a color-based Bayesian segmentation algorithm to initially identify "possible TB objects" in the digital AFB images. Subsequently, objects with a shape similar to TB bacilli (compared using eccentricity and other features) underwent size averaging and were color labelled as "probable" or "definite TB objects" without the need for camera system calibration.

### **Results**

The final algorithm successfully recognized multiple AFB in seven test digital images under wide latitudes of image staining, magnification and resolution. Complexity was encountered with large superimposed bacillary clusters (especially Y- or T-shapes), extreme stain variation from the segmentation database, and low depth of field.

### **Conclusion**

This new AFB recognition method holds promise as a tool in the electronic diagnosis of tuberculosis. Our novel use of ZN-stained images vis-à-vis Auramine-Rhodamine images permits wider application in developing countries, where fluorescent microscopy is neither easily accessible nor affordable. Further refinement, field-testing, and validation is planned in future studies.

## **TUBERCULOSIS AMONG FILIPINOS IN THE UNITED STATES, 2000 – 2006: AN EPIDEMIOLOGIC ANALYSIS**

### **Authors**

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### **Background**

Little is known about tuberculosis (TB) in Asians and Pacific Islanders (API), especially Filipinos, in the United States (US). Since 1993, Filipinos were second highest (after Mexicans) in number of US foreign-born (FB) TB cases.

### **Methods**

We compared Filipino with non-Filipino API TB cases by using US National TB Surveillance data (2000-2006) and US Census Bureau population estimates for rates and calculating unadjusted odds ratios (OR).

### **Results**

The study population (n=24,149) included 6,297 (26%) Filipinos and 17,852 (74%) non-Filipino APIs. From 2000 to 2006, the Filipino TB rate declined 22.4% from 49.2 to 38.2 cases/100,000. The non-Filipino API TB rate declined 24.1% from 30.3 to 23.0 cases/100,000. Filipino cases were more likely to be >44 years old at time of diagnosis (OR=1.74 [ 95% Confidence Interval 1.64–1.85]); >44 years at entry to US (OR=1.49 [1.39–1.59]); have excessive alcohol use (OR=1.38, [1.19–1.61]), pulmonary TB (OR=1.55 [1.45–1.66]), reside for <2 years in the US when diagnosed with TB (OR=1.54 [1.44–1.65]), or be FB (OR=2.08 [1.77-2.43]). Filipino cases were less likely to be in correctional facilities (OR = 0.40 [0.24–0.68]) or unemployed in the 24 months before TB diagnosis (OR=0.87 [0.82–0.93]).

### **Conclusions**

Filipino TB rates are higher and slower in decline than non-Filipino API rates. Different characteristics among Filipino TB cases such as older age at US entry and <2 years US residence at time of diagnosis highlight the importance of vigilant TB screening for this population.

## **A RARE PRESENTATION OF ORAL TB**

### **Authors**

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### **Case report & literature review**

A 7 year old girl came from Gambia. She had non healing dental abscess. Her uncle had TB. She had no health record. Physical examination was normal. Swelling on right cheek showed 2 submandibular nodes. No BCG scar seen. Chest x-ray was normal. And ESR was 24mm/hr. Ultrasound of the neck revealed several enlarged lymph nodes. Microscopy and culture of the dental abscess aspirate was sterile. Mantoux test was 15mm and T-SPOT was positive. She was started on anti TB antibiotics. She has improved and the swelling has diminished.

### **Literature**

Search Medline, Google & Embase. Tuberculosis, Abscess, Oral, dental & Mandibular. Articles found 8.

### **Discussion**

No population studies for incidence of oral TB in children found. There is a reduction in per capita Incidence of TB worldwide. This is offset by the population growth. In UK T.B. is fifteen times more likely to affect new migrants (1) Our literature search revealed only one other reported case in a child with TB & dento-alveolar abscess (2) In an adult series of 42 cases of oral tuberculosis, 13 (30%) were primary TB. (3). T-SPOT. TB. Conclusion: Primary tuberculosis (TB) of the oral cavity is rare. T-SPOT test is a quick and effective way to diagnose.

### **References**

1. WHO Sheet 104. March 2007(2)
2. Tuberculous of the mandible Oral Surgery & Endodontics. 97(5):603-606, May 2004.
3. Oral TB of 42 cases. Oral Dis. 2000 Jan; 6(1):25-30

## **INTERNET-BASED SURVEILLANCE SYSTEM CAN ENHANCE TREATMENT MANAGEMENT AND STRAIGHTEN SURVEILLANCE NETWORK**

### **Authors**

**Santos L.** Secretary of Health, Sao Paulo, Brazil

### **Heading**

Patients migration, incarceration and hospitalization frequently leads to bad outcomes as discontinuity or definite interruption of the treatment. When diagnosis is made at hospital, lack of communication with residence's local surveillance team can delay contact tracing.

### **Background and Methods**

São Paulo State, with almost 20,000 TB cases a year, uses since 2005 an internet-based surveillance system – the TBweb. It runs entirely on-line, thus contributing to straighten health-system network to monitor the patient's treatment and follow it, no matter migrations, transferring between prisons, hospitalizations or jail releasing occur. Each patient has a unique record, so that responsibility passes from one to another surveillance team.

### **Results**

In 2006 1,195 TB prisoners were notified. Many of them were on TB treatment when arrested, released from jail during the treatment or had transferences from one to another prison.

Moreover, hospitalizations summed 4075 episodes; 1031 patients had his diagnosis during the hospitalization; 3209 TB were released from hospitals to continue ambulatory treatment and 281 dropped out.

All these occurrences generated automatic e-mails between origin and destiny providers.

Moreover, mensal reports asking for TB treatment status of each patient are sent to facilities and enables at-distance supervision, so that real-time figures can be analyzed for oportune interventions.

Additionally, some providers are allowed to consult TBweb registry to choose if TB suspects were already treated before.

### **Conclusion**

Internet resources are being used to improve communication between health teams and can help to enhance their responsibility.

## **TUBERCULOSIS ACTIVE CASE FINDING IN HEALTH UNITS: PERCEPTION OF THE HEALTH PROFESSIONAL**

### **Authors**

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### **Introduction**

More than half of the respiratory symptomatics (TB suspects) are missed to identification in the State of Sao Paulo. As detection of respiratory symptomatics is done by health professionals, the success of this activity depends solely on them.

### **Objective**

To gain knowledge on the perception of the Active TB case finding performed by health professionals.

### **Methods**

The Collective Discourse (CD) was the methodology used, since it is designed to yield collective opinions from personal points of view. 31 health professionals were previously chosen to study area of Guarulhos. The interviews were tape-recorded and processed stepwise:

1. KEY EXPRESSIONS: selection of most relevant response contents;
2. CENTRAL IDEAS: identification of response meanings of the expressed idea;
3. CATEGORIZATION: assembling central ideas;
4. CD: bringing together key expressions from different statements of same category.

### **Results**

The health professionals know how and when to conduct active case finding. Most of them are concerned about persons coughing and set out an investigation. This is recognized as a good job, despite of steps involved but is also seen as a source of concerns to both, client and health worker. The lack of personnel, motivation and interest, the excess of work, in addition to the lack of work routine and evaluation of the activity turn the active case finding into something difficult to accomplish at the health centers.

### **Conclusion**

These results reveal problems that are real and concrete, and provide guidance into possible interventions to improve the service quality at the health centers.

**Key-words:** Tuberculosis, Control, Active Case Finding, Perception, Collective Discourse

## **FINANCIAL INCENTIVES IMPROVE TB COMPLIANCE IN UNDERHOUSED POPULATIONS**

### **Authors**

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### **Background**

Tuberculosis (TB) is a chronic communicable disease curable with an intensive course of antibiotics lasting at least 6 months. Compliance with treatment is essential for the management of active TB. While directly observed therapy (DOT) has increased treatment compliance, adhering to a long treatment regimen is especially difficult for vulnerable populations like the underhoused.

### **Hypothesis**

Instituting small monetary incentive during clinic visits will increase adherence to treatment regimens.

### **Methods**

In 2005, The TB Disease Management Program and Toronto Public Health began issuing a \$5 financial incentive for all underhoused TB patients assessed in the ambulatory clinic. This retrospective study investigates the TB treatment outcomes for a 24 month period before and after institution of the financial incentive. Subjects of no-fixed address (NFA) with active TB were included in the study and followed for the duration of their treatment. Financial incentives were described to each subject and paid in cash during each clinic visit.

### **Results**

Instituting financial incentives increases TB clinic attendance, and decreases treatment completion times.

### **Conclusion**

Barriers to TB treatment include lack of housing, poor health status, and mental health issues significantly contribute to high default rates. Financial incentives provide an effective method in improving treatment compliance in a vulnerable population. Further studies are needed to prove whether incentive costs can outweigh the compounded cost of default and health complications.

## **IMPROVING TUBERCULOSIS CARE: THE ROLE OF HOSPITAL ADMINISTRATION**

### **Authors**

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### **Background**

TB care in an acute care setting requires a strong partnership between clinical and administrative domains. Although the clinical challenges involved in managing TB are well documented in the literature, the administrative infrastructure and support required to build and sustain a TB program are rarely examined. The role of acute care administration is to cultivate systems and processes that support clinicians, patients, and staff to effectively manage the disease.

### **Methods**

In 1999, the TB Disease Management Program was instituted in an inner city Toronto hospital to improve TB patient outcomes. As TB care is resource intensive, to be successful, programs require administrative support that includes specific allocation and management of funds for TB care, physical plant renovations, recruitment of specialized staff, implementing a disease management framework, and drug procurement.

### **Results**

Prior to administrative implementation and organization of the TB program, TB control practices at St. Michael's Hospital were highly variable, and crossed programs without effective communication or processes in place to support care. Specifically, isolation practices, diagnostic criteria, treatment regimens, and reporting to local public health units were inconsistent.

### **Conclusion**

Organizational commitment is essential to improving TB care. Without formalized administrative support providing the necessary infrastructure, the clinical management of TB is challenging, and potentially fragmented. Thus, the administrative and clinical aspects of TB care work in collaboration to improve care, patient satisfaction, and achieve optimal outcomes.

## **OPTIMIZING CONTACT TRACING USING SOCIAL NETWORK ANALYSIS**

### **Authors**

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### **Background**

In October 2006, a tuberculosis (TB) outbreak was declared in Central Vancouver Island (British Columbia, Canada). Routine contact tracing (CT) was initiated, but investigators were concerned about its adequacy in a substance using and highly mobile population. For example, plausible transmission links between most cases could not be identified. To optimize contact tracing, a Social Network (SN) questionnaire was administered early in the investigation to identify cases' shared locations.

### **Methods**

We interviewed cases with a SN questionnaire to identify shared socialization settings. Data were analyzed using EpiData (3.1) and Pajek (1.21). Molecular typing (IS6110 restriction fragment-length polymorphism and mycobacterial interspersed repetitive unit – variable number tandem repeat) was performed on all *Mycobacterium tuberculosis* isolates to determine genetic relatedness.

### **Results**

Ten of the first 13 cases with the earliest symptom onset were interviewed with the SN questionnaire. Three locations (a hotel, a pub and a crack house), which were not highlighted through routine contact tracing, could account for transmission among eight (80%) of cases interviewed. SN questionnaire identified 80 high risk contacts unidentified during routine contact tracing. Molecular typing results showed TB isolates from all cases were identical.

### **Conclusion**

Thorough contact tracing is resource intensive. Interviewing a small number of early cases with the SN questionnaire allowed for improved understanding of transmission associated with this TB outbreak. Targeting a smaller number of the highest risk contacts in the most crucial venues for transmission may help to focus follow up efforts, especially when public health resources are burdened by active case management.

## TUBERCULOSIS IN THE ELDERLY, NEW YORK CITY, 2000-2006

### Authors

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### Background

Elderly tuberculosis (TB) patients are unique because of greater prevalence of latent TB infection (LTBI) from past exposure and immune senescence that inhibits resisting active TB. We aim to describe the epidemiology of elderly NYC TB patients.

### Methods

NYC TB registry data were analyzed to compare elderly (age  $\geq 65$ ) to non-elderly (age 18-64) patients.

### Results

From 2000-2006, of the 7162 patients with confirmed TB, 1174 (16%) were elderly and 5988 (84%) were non-elderly. During the study period, the elderly increased from 15% (105/700) to 18% (118/653) of non-US-born patients ( $p_{\text{trend}}=0.04$ ), but decreased from 21% (88/427) to 18% (43/241) of US-born patients. They were more likely than the non-elderly (all  $p_{\chi^2}<0.01$ ) to be non-Hispanic White (20% vs. 7%); Asian (36% vs. 28%); US-born (37% vs. 30%); to have drug-susceptible organism (90% vs. 84%); to have culture-confirmed TB (87% vs. 80%); and were more frequently diagnosed (75%) and cared for by private providers (55%) than non-elderly patients (49% and 23%, respectively). Non-US-born elderly patients were more frequently in the US for  $\geq 5$  years at diagnosis (81% vs. 49%;  $p_{\chi^2}<0.001$ ). The elderly were less likely ( $p_{\chi^2}<0.01$ ) to be HIV-infected (6% vs. 26%); to have cavitory lesions on chest X-ray (16% vs. 23%) or extrapulmonary TB (28% vs. 33%). They were less likely to be lost to follow-up (1% vs. 4%;  $p_{\chi^2}=0.002$ ), and died more frequently during treatment (26% vs. 7%;  $p_{\chi^2}<0.0001$ ).

### Conclusion

As the US population ages, providers should be aware of the epidemiology and differing TB clinical presentations in the elderly.

**12<sup>th</sup> Annual Conference**  
**IUATLD – North American Region**  
**February 28 – March 1, 2008**

## **INCENTIVES TO TUBERCULOSIS PATIENTS UNDER SUPERVISED TREATMENT IN HIGH BURDEN MUNICIPALITIES OF SAO PAULO STATE, BRAZIL**

### **Authors**

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### **Introduction**

Controlling tuberculosis (TB) contributes to reduce human suffering, social and economic consequences for the patient and his family. One element of TB control recommended by Brazilian Ministry of Health (BMH) is DOTS strategy for all TB patients. Incentives to promote adherence to treatment, must be part of the Tuberculosis Control Program (TCP). Incentives are offered to patients in DOTS to reduce the risks of treatment defaulting. In other words, the patient must adhere to DOT. These incentives are food packages and transportation coupons during therapy.

### **Objective**

This is an essay and a contribution to facilitate the access to DOT conducted in high burden cities in the State of Sao Paulo.

### **Method**

This is also a descriptive and retrospective study using data on supplementary care generated by the Evaluation and Control Instrument (ECI), which is a questionnaire issued by BMH with questions about TCP covering the first semester of 2006.

### **Results**

ECI responses were received from 48 cities, 65.8% of the 73 high burden cities in the State of Sao Paulo. In the 35 five cities (72.9%) using DOTS strategy, 37.1% offer just one incentive, while 45.8% offer both: food package and transportation coupons.

### **Conclusion**

Since DOTS implementation in the State of Sao Paulo it has been working with municipalities' providers to warrant the access of patient to the treatment of TB allowing the construction of a respectable development indicator for the municipality and consequently for the State.

**Key-words:** Tuberculosis Control; DOTS; Supervised Treatment; Incentives.

**INCENTIVES TO TUBERCULOSIS PATIENTS UNDER  
 SUPERVISED TREATMENT IN HIGH BURDEN MUNICIPALITIES  
 OF SAO PAULO STATE, BRAZIL (continued)**

**Table 1 – Participant high burden municipalities and incentives offered to tuberculosis patients under supervised treatment – 1st semester 2006, Sao Paulo, Brazil.**

Incentives offered by high burden municipalities of Sao Paulo State	Participating Municipalities		Estimated population – 2006 (IBGE)	1st semester 2006		
	<i>n</i>	%		Food Package	Transportation coupons	Patients under DOT
Food Package and transportation coupons	18	37,5	16.488.422	11.710	30.730	2.120
Food Packages	15	31,2	2.451.959	849	0	491
Transportation coupons	1	2,1	110.213	0	41	2
Do not offer any incentives	6	12,5	1.869.187	0	0	183
With no ST patients in the period	8	16,7	1.988.022	159	62	0
<b>Total</b>	<b>48</b>	<b>100,0</b>	<b>22.907.803</b>	<b>12.718</b>	<b>30.833</b>	<b>2.796</b>

DOT – *Supervised Treatment*; IBGE, *Brazilian Institute for Geography and Statistics*.

Source: E.C.I. – Priority Municipalities of National Tuberculosis Control Program – Sao Paulo State. October 2006.

## **OPERATIONAL RESEARCH ON TUBERCULOSIS AT SAO PAULO STATE, BRAZIL**

### **Authors**

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### **Introduction**

The State of Sao Paulo with its 41 million inhabitants registers circa 21,000 tuberculosis (TB) cases per year. This is the highest contingent of the country with an incidence rate of 45 cases per 100,000 inhabitants, a number that has been stable for the last years. The Regional TB Plan 2006-2015 from PAHO has been followed by the Sao Paulo State's Tuberculosis Control Program (SP/TCP). One of the six additional components is to promote and to make easier operational research (OR) in TB conceived as a tool that may contribute to the implementation/acceleration/expansion of DOTS.

### **Objective**

To describe OR performed by SP/TCP during 2007.

### **Method**

It is a descriptive study using data from all researchers registered by authors at the SP/TCP in 2006/2007. OR can be classified as quantitative as qualitative into their respective methodologies. It was made the 'I Course on TB Operational Research' promoted by Sao Paulo State's TCP and ICOHRTA Project. It has worked with quantitative method but it was also introduced the qualitative method as a tool to answer much of inquests related to TB. SP/TCP has begun partnership projects with *USAID* and *DAH*W Foundation. Three researches are already going on with these partnerships with an innovator method – 'Collective Discourse' which processes testimonies to reveal what thinks collectivities.

### **Conclusion**

OR is one of the priorities of SP/TCP and according PAHO there's not a clear conscience regarding the role of investigations for effective TB control and OR is not a priority into TCPs.

**Key-words:** Operational Research; Sao Paulo State; Tuberculosis Control Program; DOTS; Collective Discourse.

## IMPACT OF QUANTIFERONTB-GOLD TESTING IN MANAGEMENT OF PATIENTS WITH SUSPECTED FALSE POSITIVE TUBERCULIN SKIN TESTS

### Authors

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### Background

Interferon-gamma release assays (IGRAs) can improve the efficiency of latent tuberculosis infection (LTBI) treatment programs by identifying patients whose tuberculin skin tests (TSTs) are falsely positive. We assessed the impact of selective QuantiferonTB-Gold (QFG) testing to guide management of patients with suspected false-positive TSTs.

### Methods

QFG testing was conducted among selected attendees seeking evaluation for a positive TST through the Snohomish Health District during June 2006 through September 2007. A single clinician ordered QFG when a false positive TST was suspected (e.g., United States [US]-born individuals with no risk factors, foreign-born [FB] individuals with TST <15mm and no additional risk factors, patient request) or when there was a medical reason to pursue confirmation (e.g., risk factors for or occurrence of isoniazid intolerance).

### Results

Of 67 patients tested 44 (67%) were QFG negative. TST<15mm and age <45 years were strongly associated with negative QFG results (ORs=5.7 [1.8-17.7] and 6.3 [2.0-20.3], respectively). QFG was negative in 27 (98%) of 28 patients who were both age <45 years and TST<15mm. All 44 patients with negative QFG results were classified as not infected and had treatment withheld (39) or interrupted (5). At a per-test cost of \$55, the marginal direct cost of the testing program was \$82 US per unnecessary treatment prevented.

### Conclusion

IGRA testing among patients suspected of having false positive TST results found two-thirds to be QFG negative. This approach led to prevention of unnecessary LTBI treatment in the majority of cases tested and was reasonably cost-effective.

## **ANTIGEN DETECTION TESTS FOR THE DIAGNOSIS OF TUBERCULOSIS: A SYSTEMATIC REVIEW**

### **Authors**

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### **Background**

Microscopy, the mainstay of TB diagnosis in resource-constrained areas, has limitations. Immune-based tests, preferably point-of-care, may be useful for replacing microscopy and extending TB diagnosis to health service levels without laboratories. We conducted a systematic review to assess sensitivity and specificity of antigen detection tests for TB.

### **Methods**

Studies were identified by searching multiple databases. Reference standards were culture/smear (pulmonary TB [PTB]) and culture/smear/histology/cytology (extrapulmonary TB). Studies were excluded if they lacked results by sputum status (PTB) or enrolled fewer than 50 participants. Study quality was appraised.

### **Results**

Seven (PTB, six; lymph node TB, one) studies were identified (median, 116 TB patients). Only two (29%) studies explicitly reported blinded interpretation of index test and reference standard. No studies involved children or HIV-infected individuals. Five (71%) studies investigated four distinct in-house tests and two studies (same investigators), one commercial test in different populations. Lipoarabinomannan (LAM) was the antigen most frequently targeted (three [43%] studies). Sensitivity (76-89%) was variable and specificity (89-93%) consistent across studies detecting different antigens and using different techniques and clinical specimens (serum, sputum, urine, lymph node aspirates). In smear-positive patients (four studies) sensitivity ranged from 81-89%; in smear-negative patients (two studies) sensitivity was 76% (95% CI 62-87%) and 82% (95% CI 74-88%). The study of lymph node TB achieved sensitivity of 92% (95% CI 81-96%).

### **Conclusions**

Too few studies were available to draw firm conclusions; however, results in smear-negative patients are promising. Research activities aimed at discovering new antigens with immunodiagnostic potential need to be intensified.

## **PARENTAL HOSPITALIZATION FOR TUBERCULOSIS TREATMENT: A PRELIMINARY REVIEW OF TYPES AND SOURCES OF ASSOCIATED STRESSORS**

### **Authors**

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### **Setting**

The TB Service at West Park Healthcare Centre, located in Toronto, Canada's most culturally diverse city, is the only dedicated in-patient centre in the province of Ontario. Its mandate is the provision of treatment for complex and difficult to treat cases of TB.

### **Purpose**

To identify and describe the types and sources of stressors experienced by parents admitted to West Park Healthcare Centre for TB treatment.

### **Background**

The majority of West Park Healthcare Centre's TB patients are foreign born recent arrivals to Canada. They may not have access to affective and instrumental support through immediate or extended family. They may also be unfamiliar with or hesitant to use the formal community resources available to them.

### **Method**

A retrospective case series review was conducted for an 18 month period with all patients who had a length of stay of 10 days or more and children 14 years and younger in the family unit, ( N=22).

### **Conclusions**

Primary stressors associated with parental admission for TB treatment are identified. These stressors are presented within a biopsychosocial framework and discussion is given to implications for patient outcomes and quality of life. Opportunities for strategic interventions, both internal and external to West Park Healthcare Centre are reviewed.

### **Practice Implications**

It is hoped that study results may contribute to prospective research that can more fully examine the unique needs of this segment of the in-patient TB population.

## **BLOOD CULTURES AND URINARY LAM ANTIGEN DETECTION FOR THE DIAGNOSIS OF TUBERCULOSIS AMONG HOSPITALIZED HIV-INFECTED TB SUSPECTS IN TANZANIA**

### **Authors**

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### **Background**

The diagnosis of TB in hospitalized HIV-infected patients is challenging. Blood cultures and urine lipoarabinomannan (LAM) antigen detection may increase yield over routine sputum smear and culture.

### **Methods**

In Dar es Salaam, Tanzania, we prospectively enrolled hospitalized HIV-infected TB suspects. Subjects gave 10 mL urine, 3 sputum specimens for concentrated AFB smear and solid media culture and 40 mLs blood for culture by both automated broth-based MB Bac T and manual solid agar-based Isolator methods. Subjects were randomized 1:1 to have the 40 mL drawn as a single sample or as two 20 mL samples 12-24 hours apart. Urine was tested for LAM by ELISA.

### **Results**

Of 70 patients (target 250), 29 (41%) were male and median CD4 count was 67 (1-669); 28 (40%) had microbiological confirmation of TB. Blood cultures were positive in 14/70 (20%) subjects: 10/14 by MB Bac T and 8/14 by Isolator, with range of time to positivity of 39-42 and 12-32 days respectively. For 6 of 28 TB patients (19%), blood culture was the only source of TB diagnosis. Of the 14 patients with any positive blood culture, only 4 had concordant positive blood culture sets with the 2 methods. Sixteen of 22 patients with microbiologic TB confirmation had positive urine LAM assays (73% sensitivity) while 35 of 42 patients without microbiologic TB confirmation had negative LAM assays (83% specificity).

### **Conclusions**

Blood cultures and LAM urine testing improve the sensitivity of TB diagnosis over sputum smear and culture in this setting.

## PERFORMANCE OF TWO INTERFERON-GAMMA RELEASE ASSAYS (IGRAS) AND TUBERCULIN SKIN TEST (TST) FROM LOW AND HIGH TB INCIDENCE AREAS

### Authors

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### Background

The T-SPOT<sup>®</sup> TB (T-SPOT) and QuantiFERON<sup>®</sup> –TB Gold (QFT-G) are IGRAs used to detect latent tuberculosis infection (LTBI). Performance data are needed in low TB-incidence settings.

### Methods

Subjects were U.S. - and foreign-born adults with TST indications living in a region with TB rate <3/100,000 population. Subjects were recruited from hospital occupational health clinics, refugee organizations, local health departments, and a university student health service. Subjects provided written consent, medical and TB-exposure history, and underwent TST and IGRA testing by both methods.

### Results

Of 200 patients, 140 (70%) were U.S.-born and 60 were foreign-born; 139 (69.5%) were female; median age was 35.5 years (range: 18–86). TST indications included healthcare employment (49%), birth in high TB-incidence country (>40/100,000 population, 27.5%), and TB case contact (4.5%). Positive results were identified in 19.5% of TSTs (n=195), 17% of T-Spots (n=189 [11 had insufficient blood]), and 9% of QFT-Gs (n=198 [2 had insufficient blood]); indeterminate results were uncommon: 0%, 3% and 2%, respectively. Of 178 with TST and at least one IGRA result, TST/IGRA agreement was good (T-SPOT  $\kappa$ =0.525; QFT-G  $\kappa$ =0.549). Compared with U.S.-born, patients from high TB-incidence countries had higher relative risk for positive TST/negative IGRA discordance: T-SPOT 7.8 (95% confidence interval [CI], 2.6–23.5) and QTF-G 9.1 (95%CI, 3.5–23.6).

### Conclusions

IGRAS have potential to replace TST for patients at low risk, but improved guidance for interpretation for patients at high risk is needed.

## **DRUG-RESISTANT TB IN FOREIGN-BORN TB CASES IN THE US: SHOULD THE DRUG-RESISTANCE PROFILE OF THE COUNTRY OF ORIGIN GUIDE TREATMENT DECISIONS IN THE US?**

### **Authors**

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### **Background**

Frequent inquiries have been directed to CDC regarding the prevalence of drug resistance in the countries of origin of foreign-born patients to guide TB treatment decisions. This proxy is not appropriate if foreign-born TB patients differ from the TB patients in the country of origin.

### **Methods**

We compared the US National TB Surveillance System data with the WHO/IUATLD Global Drug Resistance Surveys (Global DRS) we correlated US foreign-born (USFB) TB case data with TB case data in their countries of origin in terms of prevalence INH and RIF resistance by country or region.

### **Results**

The prevalence of INH resistance and MDR among foreign-born TB patients in the United States correlated better with foreign-born patients in the United States in previous years from the same country or region ( $r^2=.49-.91$ ;  $r^2=.63-.94$ ) than it did with the previous prevalence in the population actually in those same countries or regions in the Global DRS ( $r^2=.49-.52$ ;  $r^2=.34-.66$ ).

### **Conclusions**

US data on TB drug-resistance prevalence in foreign-born patients from the same country or region of origin in previous years is a better proxy than country of origin resistance prevalence for determining the treatment of foreign-born TB patients in the US.

## **ARE FOREIGN-BORN TUBERCULOSIS CASES ALONG THE TEXAS-MEXICO BORDER SIGNIFICANTLY DIFFERENT THAN NON-BORDER CASES?**

### **Authors**

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### **Background**

In 2005 tuberculosis (TB) incidence among foreign-born (FB) in Texas counties bordering Mexico (BC) was 29.2 per 100,000 compared to 20.8 in non-border counties (NBC). Because of this regional disparity, we sought to determine whether there were differences between FB TB cases diagnosed in BC and NBC.

### **Methods**

FB adult TB cases were recruited as part of a national multi-center study. Cases on TB therapy for >180 days or who were incarcerated were excluded. Sociodemographic and epidemiologic information were obtained by interview and clinical information from surveillance reports. Participants reported between 1/1/2005 and 1/31/2006 from Texas (except Tarrant County) were compared by county location.

### **Results**

Enrollment totaled 159, including 48 from BC and 111 from NBC. BC cases were significantly older (mean 53.6 versus 40.9 years) and more likely to be Mexico-born and non-English speaking compared to NBC cases ( $P<0.01$ ). Analysis of employment, income and crowding showed BC cases tended to have a lower socioeconomic status (SES) than NBC ( $P<0.01$ ). A history of Diabetes and cancer was more common among BC ( $P<0.01$ ). BC cases were more likely to have a documented immigration status (83% versus 58%,  $P<0.01$ ) and made more trips outside the US (mean 18 vs. 1.9 in preceding 2 years,  $P<0.01$ ). The groups did not significantly differ by gender, HIV status, past TB or symptom duration.

### **Conclusion**

There are significant epidemiologic differences between Texas TB cases in BC and NBC. Factors contributing to increased TB incidence along the border may include lower SES, co-morbidities and foreign travel.

## INTEGRATION OF HIV AND TB SCREENING PROGRAMS IN RURAL HAITI

### Authors

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### Introduction:

Individuals living with HIV are at high risk for reactivation of latent *Mycobacterium tuberculosis* (TB) infection, and subsequent increases in morbidity and mortality. Disease-specific health programs risk focusing on HIV detection and management without actively screening for latent TB. We have implemented an integrated HIV and TB screening program to address this disconnect.

### Methods:

A retrospective analysis was conducted from patient charts from 2003 to 2007. Data was compiled from all mobile clinic sites reaching individuals in a radius of four-hours, by foot, from the medical center in Belladere, Haiti. Individuals testing positive for HIV had follow-up screening for TB using purified tuberculin protein derivative (PPD) testing, sputum examination and chest x-ray.

### Results:

HIV Rapid tests were performed on 35,196 individuals from 2003 to 2007. A total of 422 individuals were found to be HIV positive. Of those with HIV, a total of 75% (n= 315) completed subsequent screening for TB, of which 18.4% (n= 58) were co-infected with HIV and TB.

### Discussion:

We have demonstrated that an integrated screening program can be successfully implemented in a rural setting, with a large proportion of our HIV positive patients completing subsequent screening for TB. A strong community network was found as an enabling factor to get a high number of patients returning for subsequent follow up. We speculate that of those not returning for testing, a large number of them work as migrant laborers, and did not return to the site of initial HIV testing. Future challenges include the extension of combined services to other areas of rural Haiti and creation of methods to follow-up with migrant patients.

## **ENHANCING TB SURVEILLANCE IN A RESOURCE POOR SETTING: CASE STUDY GUYANA**

### **Authors**

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### **Introduction**

Guyana is one of the Countries in the Americas heavily affected by TB with an incidence of 149/100,000 population in 2005. In 2006, Guyana's NTP at its clinics countrywide treated 691 new cases, 95 % of which were pulmonary cases. Each clinic maintains a paper based registry of patients and submits monthly reports to the NTP. Compiling national TB statistics was always a difficult task as clinic registers were often not properly maintained and monthly reports were late.

### **Objective**

To enhance TB surveillance through the establishment of an electronic National TB registry.

### **Methodology**

The NTP with assistance from the Canadian Society for International Health (CSIH) developed an active case report form utilizing the WHO TB register as the basis. Health personnel at TB clinics were trained in the application of the form and asked to submit a case report form for each patient on enrollment and on completion of treatment. The data from clinics are entered into an electronic health information system designed for Guyana by CSIH.

### **Results**

The implementation of this project commenced in July 2007. Case reports for all new patients registered at TB clinics in 2007 are collected and entered into the HIS. Data quality is ensured through thorough review of the forms of receipt and direct communication with TB clinics.

### **Lessons learnt and conclusions**

TB surveillance requires ongoing supervision and monitoring of the quality of data at clinical and national levels. Health workers' understanding of the importance of accurate data recording and reporting for evidenced based programme planning is crucial. TB surveillance should be an integral part of training designed for health workers in the NTP. The database will analysed at the end of 2007 to generate the 2007 TB report.

## **GENDER DIFFERENCE IN SPUTUM POSITIVE PULMONARY TB CASES**

### **Authors**

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### **Introduction**

Incidences of tuberculosis among males are considered about double that of females. There was no geographical difference reported in this rate so far. Alappuzha district is one of backward district of South India. Females are usually of working class of manual labour group. So we are trying to evaluate any difference from usual presentation in gender difference in sputum positive pulmonary TB cases from a backward district of South India.

### **Material & Method**

All sputum positive cases registered for two years (ie, 2003 & 2004) were included in the study. Sputum positive grade with gender and age strata were analyzed from the TB lab register maintained at District TB Center, Alappuzha. Sputum was examined as per RNTCP policy and EQA activities were implemented at the centre.

### **Observations**

A total of 260 sputum positive cases registered during the study period. 215 were male and 45 were female. Among the females there were no scanty cases and only 3 cases were 1+. 3+ cases were 33 among females and 156 among males.

### **Conclusion**

A high incidence of sputum positive cases among males (1:5) may be due to low reporting of working class females. Late reporting is also common among females in backward areas.

## **ADDRESSING CHILDHOOD TB UNDER THE PHILIPPINES’ NATIONAL TB PROGRAM**

### **Authors**

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### **Background**

As a high-burdened country, Philippines prioritized TB management among adult population to capture highly infectious cases and achieve better control measures. However, children were equally important since they would comprise our future economic workforce yet TB mortality was still high.

### **Methods**

Childhood TB Task Force, headed by the Department of Health (D.O.H.) was created to address such problem, with collaboration from key NGOs and academe (Philippine Pediatric Society). Membership was later expanded from 6 to 10 agencies, inclusive of public and private sectors. They developed and pilot-tested initial guidelines in various settings and embodied as an Administrative Order issued by D.O.H. in 2004. Results of the pilot favored expansion of implementation to other sites.

### **Results**

Two-week cough (99%) was topmost symptom while household contacts served as the most frequent sources of cases (62%) of children identified. Majority of contacts (60%) were sputum smear positives, 37% were negatives and 3.3% had unconfirmed smear results. Most commonplace of exposure was home. Although accepted PPD size was 8 mm and above, pilot results revealed 10 mm as most frequent at 21%. Treatment outcomes from initial sites ranged from 98 to 100% and nutritional status of children were still within normal limits.

### **Conclusion**

This country experience on childhood TB management demonstrated favorable results and with the recently endorsed W.H.O. recommended guidelines, the Philippine guidelines are now under revision.

## **D.O.T.S.CERTIFICATION OF THE PHILIPPINES' NATIONAL TUBERCULOSIS PROGRAM**

### **Authors**

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<sup>2</sup>World Health Organization, Geneva, Switzerland

### **Background**

Directly-Observed Treatment Shortcourse (*D.O.T.S.*) remains the overarching strategy of NTP in addressing tuberculosis. Coverage in public was achieved in 2002 and in 2004, NTP initiated Public-Private Mix D.O.T.S. (PPMD) strategy, where private was engaged to deliver TB services, attuned to NTP guidelines. NTP is embarking a certification process for D.O.T.S facilities to ensure delivery of quality services and adherence to NTP guidelines.

### **Methods**

Although NTP has reached international targets (70% case detection, 85% treatment success), sustaining quality implementation remains as priority. To ensure that clients receive high quality care and safety, D.O.T.S. certification is adopted, where a set of agreed standards serve as bases for certification that facilities need to comply. These are applicable for all types of health centers, PPMD units – public or private. There are policy instruments to systematize the process where a team of certifiers, evaluates adherence to standards. A certificate of quality service is accorded to compliant ones and this also endows them to access the TB-D.O.T.S. OPD Benefit Package, through accreditation. This is NTP's basic health financing scheme, adopted by certified centers, to support operations and enable them to sustain quality implementation.

### **Results**

There are 637 certified facilities, 92% public, and 8% private. 79% are accredited, with 91% public, 9% private.

### **Conclusion**

D.O.T.S. certification is a scheme under NTP to ensure quality and safety of TB services that is acceptable for both public and private sectors.

## **PUBLIC-PRIVATE MIX D.O.T.S. (PPMD) - A WORKABLE STRATEGY OF THE PHILIPPINES' NTP**

### **Authors**

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### **Background**

NTP has covered public sector with D.O.T.S. implementation but case detection rate (CDR) was still below an acceptable value of 70%. “Missing” cases were analyzed and private sector was identified as a fertile source for detection of such. Engaging private would require conditions and structures to facilitate their implementation of D.O.T.S. Free drugs were provided to motivate them to partake in NTP.

### **Methods**

Policies and operational guidelines were developed, in partnership with Philippine Coalition Against TB (PhilCAT), its strong ally for key private agencies, and with W.H.O. as technical advisor. Selection of areas was important to maximize availability of a critical mass of private physicians. Coordinating Committees on PPMD were established to oversee implementation at respective designated sites. Essential activities like planning, training and monitoring were undertaken during installation process. D.O.T.S. remained as strategy for delivery of TB services and each PPMD unit conformed to standardized NTP records and reports.

### **Results**

An external evaluation spearheaded by W.H.O. showed that PPMD units contributed 10-12% CDR to areas where these were located. At national level, PPMD contribution allowed NTP to attain 70% CDR and with scale-up, this progressively increased to 75% in 2006.

### **Conclusion**

PPMD is a strategy that enhances active participation of private sector to implement D.O.T.S. under NTP guidance. This also demonstrates that both sectors need to synchronize on their TB management to provide better service and care.

## PERIPHERAL TUBERCULOUS LYMPHADENITIS FROM THE UHN TB CLINIC (CHART REVIEW 2001-2006)

### Authors

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### Background

Treatment of TB lymphadenitis may be complicated by paradoxical worsening of symptoms after starting therapy and clinical relapse after adequate therapy. The frequency of these complications is not well defined in the literature.

### Methods

Retrospective chart review was performed on 70 patients with peripheral TB lymphadenitis between 2001 and 2006. Clinical, epidemiologic, and diagnostic data as well as treatment and outcome information were obtained from the clinic database.

### Results

All patients were foreign born (76% Asian origin) and lived in Canada for a median of 7 years. Females were more affected than males (2.2:1). Age ranged from 17-82 years (median 39 years). Main complaints included swelling (100%), fatigue (27%) and weight loss (26%). Lymphadenopathy was identified on the right side of the neck more than the left (51% vs. 31%). The median period between symptoms and treatment was 4 months. A histologic versus culture diagnosis was made from 51% vs. 80% of fine needle aspirates and 97% vs. 87% of surgical biopsies respectively. 37% of patients had abnormal chest radiographs. The median treatment duration was 6.4 months with a 100% clinical cure rate. Paradoxical worsening occurred in 10% of patients. Six patients (9%) had symptom recurrence within a median of 5.3 months after stopping treatment.

### Conclusion

In our clinic, TB lymphadenitis is a disease of the foreign born. Surgical biopsies have a higher histologic and culture yield. Paradoxical worsening is relatively common as is symptom recurrence despite appropriate therapy.

## **“CAJA FELIZ” PARA TRATAMIENTO DE TUBERCULOSIS (TB)**

### **Autores**

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Las enfermeras en Bolivia tienen dificultades con la solicitud correcta de medicamentos y a menudo no conocen las reservas existentes.

La disponibilidad de medicamentos para todo el tratamiento es una preocupación permanente de los pacientes.

### **Método**

Para solucionar estos problemas el PNCT de Bolivia implementó como proyecto piloto el uso de cajas para cada paciente, que contienen todos los medicamentos para el tratamiento. Los Centros del KTW/CR participan en este ensayo. En la farmacia de los Centros se prepararon y entregaron más de 400 cajas desde septiembre 2007.

### **Resultados**

Los pacientes la llaman “Caja Feliz”, porque ella garantiza la existencia de todos los medicamentos para su tratamiento. Ellos notan como disminuyen los medicamentos y participan más activamente en el tratamiento. Cuando a veces no toman sus medicamentos la cantidad de los mismos permanece constante y sirve de control.

El personal de salud tiene un mejor control sobre los medicamentos y no tienen que llenar formularios complicados para su solicitud.

Desventaja: Las cajas - ocupan mucho espacio, - son de material delgado, - la preparación y entrega toma más tiempo, - son pequeñas para el tratamiento de niños y el retratamiento.

### **Conclusión**

Ventajas: La “Caja Feliz” da a los pacientes la seguridad de tener un tratamiento completo.

Para el personal de salud se facilita el pedido y el control de los medicamentos.

Desventajas: Las cajas ocupan mucho espacio, aumentan el trabajo en la farmacia y el tiempo en la entrega de los medicamentos a los pacientes.

( y la aplicación del tratamiento)

Sugerencias: cajas de un material más resistente y de un tamaño que permita colocar la ficha clínica.

## **USE OF QUANTIFERON-TB-GOLD® AMONG FOREIGN-BORN UNIVERSITY STUDENTS IN HAWAII – A PILOT STUDY**

### **Authors**

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### **Background**

Many foreign-born (FB) students enrolled in universities in the United States originate from TB prevalent areas of the world. However, many US jurisdictions do not routinely screen FB students for TB. Over 6,000 FB students enrolled in universities in Hawaii in 2006. Nearly 12% of the >15,000 students (tested by the state) had positive tuberculin skin tests (TSTs). Several new diagnostic TB tests offer alternatives to TSTs for screening.

### **Methods**

Students were screened for TB in 2006 per Hawaii state policy. TSTs by standard Mantoux method were administered to students by a university. Those with positive TSTs (>10mm induration) referred for chest radiograph were randomly offered QuantiFERON-TB-Gold ® (QFT) testing. State TB and LTBI data were also reviewed.

### **Results**

From 2002-06, there were 24 FB university students with TB reported in HI (mean annual rate of 85.7/100,000, 9x the mean annual HI state rate). Among the 37 TST+ students referred, 16 (43%) had QFT testing, 7(44%) were female, mean age was 24.4 yrs, 15 (94%) originated from 12 countries (in Asia or the Pacific), TSTs ranged from 12-40 mm. Five (31%) were TST+/QFT+, 11 (69%) were TST+/QFT-, and 1(6%) was diagnosed with pulmonary TB (PTB, TST=40mm, ESAT6=5.86, CFP10=7.67). No other PTB cases were reported.

### **Conclusion**

Screening FB students is important to identify TB. In this pilot, QFT and TST both identified a PTB case, but discordant test results were found among 69%. New diagnostic tests offer more specific TB testing, however more data are needed to help interpret discordant test results.

## GENOTYPING OF *MYCOBACTERIUM TUBERCULOSIS* IN SIOUX LOOKOUT, ONTARIO USING MYCOBACTERIAL INTERSPERSED REPETITIVE UNIT-VARIABLE NUMBER TANDEM REPEATS AND RESTRICTION FRAGMENT LENGTH POLYMORPHISM

### Authors

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### Background

The overall incidence rate of tuberculosis (TB) in Canada is low at 5.1/100,000. Canadians of Aboriginal ancestry are a high risk group, with some Aboriginal communities experiencing incidence rates up to 20 times the national average. Sioux Lookout is a region in Northwestern Ontario with a population of 25,000 in 23 Aboriginal communities, most of which are accessible only by air. The molecular epidemiology of *Mycobacterium tuberculosis* has not been studied in Sioux Lookout, though it has been examined in the neighboring province of Manitoba. We are presenting the results of a molecular epidemiology study of *M. tuberculosis* isolates from Sioux Lookout from 1998-2007.

### Methods

Genotyping was performed on 38 isolates of smear positive pulmonary TB using IS6110-restriction length fragment polymorphism (RFLP) and 12-loci mycobacterial interspersed repetitive unit-variable number tandem repeat (MIRU-VNTR).

### Results

21 distinct genotypes were found based on MIRU-VNTR with RFLP sub-typing, and these were compared with regional and global databases. 20/38 (53%) of the Sioux Lookout isolates had exact MIRU-VNTR genotype matches with at least one other strain in a Manitoba (Canada) database published in 2003. Many of these matching strains had similar RFLP banding patterns. By contrast, only 5/38 (13%) of Sioux Lookout isolates had matching MIRU-VNTR genotypes in an international reference database (MIRU-VNTR-plus), and the RFLP banding patterns were not similar.

### Conclusion

This suggests that specific strain families of *M. tuberculosis* have spread regionally within Canada. These strain families do not appear to have a widespread global distribution, and may represent expansion of a specific clone in Canada.

## **MISSED OPPORTUNITIES FOR PREVENTION AND EARLY DIAGNOSIS OF TB IN IMMIGRANTS TO CANADA**

### **Authors**

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### **Background**

The Immigration Subcommittee of the Canadian Tuberculosis Committee, a pan-Canadian advisory group, indicated the need to identify missed opportunities for prevention and early diagnosis of active tuberculosis (TB) in recent immigrants to Canada. An inter-jurisdictional working-group was formed to explore the creation of an enhanced surveillance system for this purpose.

### **Methods**

In order to identify existing gaps in data collection, routine surveillance data from 1995 to 2004 for all foreign-born TB cases reported to the Public Health Agency of Canada, diagnosed within two years of arrival, were analyzed. A literature search and reviews of international surveillance reporting forms and intake forms from Canadian TB clinics were conducted to identify variables that might provide valuable information on missed opportunities.

### **Results**

Data variables on the current TB case reporting form related to immigration status, post-immigration surveillance and risk factors for progression to active disease were not well completed. A number of relevant variables not on the current form included:

- results of the immigration medical exam
- immigration status upon arrival
- BCG vaccination status
- pre- and post-immigration occupation, living circumstances and travel history
- time spent in refugee camps before arrival
- time spent in settlement centres after arrival
- detailed process indicators and adherence data related to the post-immigration medical surveillance system

### **Conclusion**

Data collected through routine surveillance is not sufficient to identify missed opportunities for prevention and early diagnosis of active TB in recent immigrants. Enhanced surveillance to collect detailed socioeconomic, medical and immigration procedures is recommended.