45th Union World Conference on Lung Health
BARCELONA, SPAIN
28 OCTOBER - 1 NOVEMBER 2014
www.worldlunghealth.org
**Introductions of the Rapporteur Organizing Team**

<table>
<thead>
<tr>
<th>Section/Sub-section</th>
<th>Programme Secretary</th>
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<tr>
<td>Adult Child and Lung Health</td>
<td>Andrew Steenhoff</td>
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<tr>
<td>HIV</td>
<td>Keren Middelkoop</td>
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<td>Tobacco Control</td>
<td>Ehab Asaad</td>
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<td>Tuberculosis</td>
<td>Kevin Schwartzman</td>
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<tr>
<td>• Bacteriology and Immunology</td>
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<td>• Civil Society</td>
<td>Evaline Kibuchi</td>
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<td>• Nurses and Allied Professionals</td>
<td>Carrie Tudor</td>
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<td>• Zoonotic TB</td>
<td>Adrian Muwonge</td>
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</tbody>
</table>
### Overview of Abstracts

<table>
<thead>
<tr>
<th>Session type</th>
<th>Number of submitted and peer reviewed</th>
<th>Number accepted for presentation at the conference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral abstract presentations</td>
<td>1,900</td>
<td>159 in 20 sessions</td>
</tr>
<tr>
<td>Oral poster presentations</td>
<td></td>
<td>96 in 10 sessions</td>
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<tr>
<td>Poster discussion sessions</td>
<td></td>
<td>762 in 66 sessions</td>
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<tr>
<td>E-Poster sessions</td>
<td></td>
<td>35 in 3 sessions</td>
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</tbody>
</table>

Meetings, plenaries, post-graduate courses, workshops and symposia were not included......
A to Z in 25 minutes

- Adult and Child Lung Health
- Bacteriology and Immunology
- HIV
- Nurses and Allied Professionals
- Tobacco Control
- Tuberculosis
- Zoonotic Tuberculosis
Thank you to session chairs who provided feedback

<table>
<thead>
<tr>
<th>Stacie Stender</th>
<th>Thomas Shinnick</th>
<th>Carrie Tudor</th>
<th>James Seddon</th>
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<tbody>
<tr>
<td>Ria Grant</td>
<td>Derek Sloan</td>
<td>Wim Vandevelde</td>
<td>Beate Kampmann</td>
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<tr>
<td>Asa Tapley</td>
<td>Nii Nortey-Hanson</td>
<td>Marian Loveday</td>
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<td>Kedibone Mdolo</td>
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<tr>
<td>Mark Nicol</td>
<td>Rajita Bhavaraju</td>
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<td>Manfred Danilovits</td>
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<tr>
<td>Martin Dedicoat</td>
<td>Andrew Nunn</td>
<td>Tereza Cristina S Villa</td>
<td>Wei Xiaolin</td>
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<tr>
<td>Hans Rieder</td>
<td>Arnaud Trébucq</td>
<td>Gerry Davies</td>
<td>Chibuike Amaechi</td>
</tr>
<tr>
<td>Ronald Ncube</td>
<td>Jean-William Fitting</td>
<td>Sabine Rüscher-Gerdes</td>
<td>Robin Mason</td>
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<tr>
<td>Helene Wallstedt</td>
<td>Steve Graham</td>
<td>Jacqueline Firth</td>
<td>Omara Dogar</td>
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<tr>
<td>Christopher Zishiri</td>
<td>Mamodikoe Makhene</td>
<td>Valérie Schwoebel</td>
<td>Thomas Novotny</td>
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<tr>
<td>Robert Makombe</td>
<td>Carlos M. Perez-Velez</td>
<td>Dalene von Delft</td>
<td>Luis Cuevas</td>
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<td>Mary Edginton</td>
<td>Antonio Catanzaro</td>
<td>Lukas Fenner</td>
<td>Mukadi Ya Diul</td>
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<tr>
<td>Rumina Hasan</td>
<td>Alice Christensen</td>
<td>Adam Karpati</td>
<td>N.C. Ruswa</td>
</tr>
<tr>
<td>Joseph Nikisi</td>
<td>Susan van den Hof</td>
<td>Leen Rigouts</td>
<td>Anne Jones</td>
</tr>
<tr>
<td>Akira Shimouchi</td>
<td>Timothy Walker</td>
<td>Moses Kizheka</td>
<td>Austin Arinze Obiefuna</td>
</tr>
<tr>
<td>Matteo Zignol</td>
<td>Simon Schaaf</td>
<td>Andrey Borisov</td>
<td>Abbas Zezai</td>
</tr>
</tbody>
</table>
Adult and Child Lung Health
Andrew Steenhoff
Adult and Child Lung Health

• Crook et al (OAP 200-30)
• Open-label parallel-group factorial trial
  • 1206 Ugandan and Zimbabwean children with HIV, aged 3 months to 17 years and eligible for ART
• To investigate
  • *effect of stopping daily CTX* prophylaxis on *the risk of developing TB* in children over 3 years of age, with no history of TB, who have been on ART >96 weeks

• Finding
  • Children *continuing CTX prophylaxis beyond 96 weeks were diagnosed with TB less frequently*
## Patient Characteristics and TB from CTX Randomisation

<table>
<thead>
<tr>
<th></th>
<th>TB N=20 (3%)</th>
<th>No TB N=602 (97%)</th>
<th>p-value</th>
<th>Adjusted p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Female; n (col%)</strong></td>
<td>12 (60%)</td>
<td>307 (51%)</td>
<td>0.428</td>
<td>-</td>
</tr>
<tr>
<td><strong>Age, years; median (IQR)</strong></td>
<td>7 (4,12)</td>
<td>7 (4,11)</td>
<td>0.847</td>
<td>-</td>
</tr>
<tr>
<td><strong>Country: Uganda</strong></td>
<td>21 (95%)</td>
<td>485 (81%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Zimbabwe</strong></td>
<td>1 (5%)</td>
<td>115 (19%)</td>
<td>0.111</td>
<td>-</td>
</tr>
<tr>
<td><strong>Weight Z score; median (IQR)</strong></td>
<td>-1.0 (-2.0,-0.2)</td>
<td>-1.2 (-1.9,-0.6)</td>
<td>0.798</td>
<td>-</td>
</tr>
<tr>
<td><strong>CD4%; median (IQR)</strong></td>
<td>22 (13,34)</td>
<td>33 (27,39)</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td><strong>ART; n (col%)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3TC ABC EFV</td>
<td>6 (30%)</td>
<td>139 (23%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3TC ABC NVP</td>
<td>8 (40%)</td>
<td>244 (41%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ZDV 3TC ABC</td>
<td>4 (20%)</td>
<td>198 (33%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td>2 (10%)</td>
<td>21 (4%)</td>
<td>0.307</td>
<td>-</td>
</tr>
<tr>
<td><strong>CTX Randomisation; n(col%)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stop CTX</td>
<td>15 (75%)</td>
<td>305 (51%)</td>
<td>0.030</td>
<td>0.028</td>
</tr>
<tr>
<td>Continue CTX</td>
<td>5 (25%)</td>
<td>297 (49%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Adult and Child Lung Health

- Brent et al (PD-1015-01), Kilifi Kenya
- Prospective incidence of childhood TB from this high burden country
- Incidence of childhood TB (<15yrs)
  - Kilifi: 83/100,000 per year
  - Estimated national case burden: 14,583 (compared to 5,721 notified cases)
- Underestimate of childhood TB in Kenya
  - >60% child TB cases not currently diagnosed or notified
  - 50% cases potentially preventable with INH prophylaxis
Adult and Child Lung Health

• Oliwa et al (OPP-436-01), Kenya
• Randomized controlled non-inferiority trial, 6 public hospitals, post introduction of HiB and 10-valent pneumococcal conjugate vaccines
• Amoxicillin vs benzyl penicillin for children with severe pneumonia
• Treatment failure at 48 hrs
  • No difference between groups
  • Amox 7.7% vs BenzPen 8.0%
Adult and Child Lung Health

• Norback et al (PD-779-31), Sweden
  • Rationale: causes of increasing prevalence of asthma and allergy are still unclear
  • Explored the role of home environment in particular dampness and heating policy

• Crispin Cruz et al (PD-785-31), Colombia
  • School-based screening for asthma using a validated questionnaire (ISAAC)
  • Identified large numbers of never diagnosed asthmatic children in a socially deprived setting
TB Bacteriological and Immunology
Thomas Shinnick
Patient seeks care

Suspect TB
Order test

Specimen Collection

Specimen Transport

Laboratory Testing

Result Reporting

Treatment Initiation

Treatment Monitoring

Bacteriology and Immunology

Diagnostic Cascade
Xpert/LPA

- OAP-314: Impact of Xpert depends on entire diagnostic cascade
- PD-545, -701, -705: Impact depends on epidemiologic and clinical situation
  - May or may not shorten time to treatment, decrease loss to follow up, increase case finding
- OAP-318: the use of Xpert only can lead to initiation of weak MDR TB regimens
  - DST for second-line drugs is essential
Molecular DST for 2\textsuperscript{nd} line are on the way

- OPP-487-01: Next generation sequencing from sputum specimens
- PD-571: Molecular test for 9 drugs in a single tube
- PD-1049: Molecular testing for first, second, and third line drugs
Non-tuberculosis mycobacteria (NTM)

- OAP-212, PD-569, OAP-475, Symposium 18
  - More common than thought
  - Detection of NTM is increasing in many places
  - Difficult to treat
  - May account for >10% of failures of MDR TB treatment
  - May complicate interpretation of Xpert results, e.g., smear-positive, Xpert-negative samples
HIV
Keren Middelkoop
Patient-Centred Planning, Funding & Implementation

Patient Perspectives - Opportunities presented by the Global TB strategy

AIDS & Rights Alliance for Southern Africa

Lynette Mabote, ARASA
Translation of the Global TB Strategy into practice...Recommendations

- We need to **Revise the Patients’ Charter** to incorporate and articulate governments obligations, roles and responsibilities

- We need **better guidance for country programmes** to incorporate rights-based responses in TB programming – current belief at regional level is that such work is work for NGOs

- **Working with patients**, communities alike to educate them about **TB and Human Rights** - ARASA has commenced this work in community structures (e.g. kgotlas, chiefs, traditional leaders and healers)

*Lynette Mabote, ARASA*
**TB Fast Track:** Empirical TB treatment

- Cluster randomised trial in 24 primary care clinics, South Africa
- Intervention clinics: point of care assessment for TB risk (LAM, Hb, BMI), used in an algorithm which assigns high / medium / low probability of TB, aiming to start TB treatment or ART or both with minimum delay
- Control clinics: patients managed according to national guidelines

**High probability**
- LAM +, Hb<10; BMI<18.5
  - Start TB treatment, ART after 2w

**Medium probability**
- TB symptoms; LAM neg; Hb>10, BMI>18.5
  - CXR, sputum culture, ABs, review <1w
  - Start ART

**Low probability**
- no TB symptoms, LAM neg; Hb>10; BMI>18.5
  - Follow to 6m for vital status

Other trials of empirical TB treatment:
- **REMEMBER:** reports early 2015
- **STATIS:** reports 2017

Enrolling HIV+ adults, CD4<150, not on ART
Primary outcome: mortality at 6 months
Currently 2800 participants enrolled
Aiming to report end 2015

Symposium: 06
Alison Grant (Chair)
Safe and effective bedaquiline treatment of drug-resistant tuberculosis (DR-TB)...

Culture conversion by HIV status status

Kaplan-Meier survival estimates

- hiv = 0
- hiv = 1

Union/CDC Late Breaker
Dr Ndjeka, SA TB program
Serum biomarkers for the early detection of tuberculosis in HIV-1 infected adults

HIV/TB Later Breaker
Dr Esmail, UCT

CXR

FDG-PET/CT
**Response to treatment**

**PRE**

- **SUVmax 5**
- **SUVmax 5.4**

**POST**

- **SUVmax 3.2**
- **SUVmax 3.4**

**HIV/TB Later Breaker**

Dr Esmail, UCT
We need quality treatment for TB.
Triple global spending on TB R&D now!

#CoughUpTheTBMoney
Nurses and Allied Professionals
Carrie Tudor
OAP-352-31  Daftary et al.

**Preliminary research**

- 2009-2011, KZN
- N=104
- Treatment adherence for XDR-TB < ART
  - 68% vs. 85%
- WHY?

Patients are educated and counseled on ART

ART involves fewer pills with fewer side effects

ART is the patient’s responsibility
TB treatment is the nurse’s responsibility

Patients are asking to be encouraged and given responsibility to take TB treatment

XDR-TB is clinically and socially isolating
DR-TB is more stigmatizing

Yellow car came to my house... put the gloves on and it was clear that this is bad... I am sick of this vehicle because people knows about it... [My child] just ran away...

You don’t feel safe... you see yourself at the last stage. It’s worse than HIV. I’m scared of it more than HIV...

TB notification is incriminating
XDR-TB invokes fear
Drivers of adherence

<table>
<thead>
<tr>
<th></th>
<th>DR-TB</th>
<th>HIV</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>PILL BURDEN</td>
<td>Low</td>
</tr>
<tr>
<td>Many</td>
<td>ADVERSE EFFECTS</td>
<td>Few</td>
</tr>
<tr>
<td>Public</td>
<td>NOTIFICATION</td>
<td>Private</td>
</tr>
<tr>
<td>Supervised</td>
<td>DRUG INTAKE</td>
<td>Self-administered</td>
</tr>
<tr>
<td>Low</td>
<td>PATIENT EDUCATION</td>
<td>High</td>
</tr>
</tbody>
</table>

DR-TB: Drug-resistant Tuberculosis
HIV: Human Immunodeficiency Virus
Strengthening Community-based TB Care Improves TB Case Notification Rates in the Amhara and Oromia Regions of Ethiopia
Conclusions

• This is the first report of large-scale community TB care implementation experience from Ethiopia

• Strengthening the routine community TB program contributed to a high yield of presumptive TB cases identified, TB cases notified, and DOTS provided

• Empowering the community health workers and introducing operational tools are key factors for successful scale up

• The community health information system should be further strengthened to better monitor and document community based TB care and its contribution to overall case finding
Tuberculosis in healthcare workers 2009-2013, UK

Overall there were 2,320 TB cases known to be healthcare workers between 2009 and 2013

- This was 7.7% of 16-64 year old TB cases with an occupation recorded

<table>
<thead>
<tr>
<th>Year</th>
<th>No. HCW TB cases</th>
<th>% TB cases*</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>484</td>
<td>8.4</td>
</tr>
<tr>
<td>2010</td>
<td>484</td>
<td>8.4</td>
</tr>
<tr>
<td>2011</td>
<td>481</td>
<td>7.6</td>
</tr>
<tr>
<td>2012</td>
<td>470</td>
<td>7.4</td>
</tr>
<tr>
<td>2013</td>
<td>401</td>
<td>6.9</td>
</tr>
</tbody>
</table>

HCW = health care worker

* Aged 16-64 with known occupation

** Per 100,000 for only England and Wales cases and population – 2011 ONS Census

Notification rate of TB in healthcare workers was 22.1 per 100,000**
## Types of healthcare workers with TB 2009-2013

There were 1,307 (56.3%) healthcare workers with further occupational information available:

<table>
<thead>
<tr>
<th>Occupational group</th>
<th>No. HCW TB cases</th>
<th>% HCW TB cases*</th>
<th>Rate of TB (95% CI)**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurse</td>
<td>547</td>
<td>41.9</td>
<td>19.5 (17.8-21.3)</td>
</tr>
<tr>
<td>Doctor</td>
<td>414</td>
<td>31.7</td>
<td>41.2 (37.2-45.5)</td>
</tr>
<tr>
<td>Healthcare assistant</td>
<td>259</td>
<td>19.8</td>
<td>5.0 (4.4-5.8)</td>
</tr>
<tr>
<td>Other</td>
<td>33</td>
<td>2.7</td>
<td>2.5 (1.7-3.5)</td>
</tr>
<tr>
<td>Dentist</td>
<td>28</td>
<td>2.1</td>
<td>17.0 (11.2-24.7)</td>
</tr>
<tr>
<td>Pharmacist</td>
<td>25</td>
<td>1.9</td>
<td>12.5 (8.1-18.4)</td>
</tr>
</tbody>
</table>

HCW = health care worker

* Those with unknown further occupational excluded from denominator

** Per 100,000 for only England and Wales cases and population – 2011 ONS Census
Tobacco Control
Chan CK et al. Hong Kong Smoking and TB outcomes (OPP-490-01)

- 1,6345 patients on TB treatment
- Setting: 18 government chest clinics
- Prospective 2 year follow-up for treatment outcome

Outcomes

- Proportion of patients with treatment success within 24m compared by baseline smoking status with control of potentially confounding baseline parameters
- Effect of smoking on relapse assessed with adjustment for other baseline characteristics
Univariable and multivariable of risk of TB relapse by smoking status

<table>
<thead>
<tr>
<th>Baseline smoking Status</th>
<th>All Relapse</th>
<th>Bacteriologically Confirmed Relapse</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number (%)</td>
<td>P</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Never-smokers, N=6517</td>
<td>166 (2.5)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Ex-smokers, N=3611</td>
<td>124 (3.4)</td>
<td>1.33 (1.04-1.71)</td>
</tr>
<tr>
<td>Current Smokers, N=3221</td>
<td>136 (4.2)</td>
<td>1.63 (1.29-2.06)</td>
</tr>
<tr>
<td>Overall, N=13349</td>
<td>426 (3.2)</td>
<td>2.10 (1.50-2.94)</td>
</tr>
</tbody>
</table>

#Adjusted hazard ratio in Cox proportional hazards analysis, adjusted for gender, age, ethnicity, residency status, employment status, housing situation, alcohol dependence, drug abuse, diabetes mellitus, HIV status, retreatment vs new case, extent of lung involvement, lung cavity, sputum status

Leung CC et al. Eur Respir J 2014 (article in press)

**Conclusion**

Both current smokers & ex-smokers: less likely to achieve treatment success in 2yrs

Increasing relapse risk from never smokers to ex-smokers & current smokers

Smoking cessation is called for in all TB patients who smoke
Tuberculosis Section
Kevin Schwartzman
Xpert MTB/RIF misses the vast majority of TB among symptomatic household contacts

31 October 2014

Kavindhran Velen, Salome Charalambous, Laura Podewils, Sarita Shah, Gavin Churchyard, Tiro Dinake, Mary Reichler

Union/CDC Late Breaker Session
Xpert positivity by Smear and Culture status

Among 244 symptomatic household contacts

Smear and Culture status

- **SM+; C+** (N=2) 100%
- **SM-; C+** (N=33) 12%
- **C-; Contaminated** (N=7) 100%
MDRTB and Drug Sensitive Tuberculosis Transmission in Households: A Prospective Cohort Study

Dr. Louis Grandjean
MD MSc PhD MRCPCH

Imperial College
London

Welcome Trust

Johns Hopkins Bloomberg School of Public Health

Union/CDC Late Breaker Session
Insight from Modelling Fitness

- Ratio of primary to acquired drug resistance dependent on the relative fitness of drug resistant to drug sensitive tuberculosis
  
  Cohen et al 2008

- Modelling strains of varying fitness
- A threshold fitness of 70% of MDRTB
- Below which MDRTB would not outcompete DSTB
  
  Cohen and Murray 2004

- If MDR less fit than DSTB, then:
- **DOTS cure rate is crucial parameter to control MDRTB**
  
  Dye and Espinal 2000
MDRTB cases identified 309

- 93 MDRTB Cases Unable to Be Recruited

MDRTB Cases Recruited 216

Total MDRTB Household Contacts 1069

- Total Tuberculosis Disease 37 (3.5%)
- No TB Disease 1032

- 30 (81%) DST Performed
  - 26 (87%) MDRTB
  - 4 (13%) Drug susceptible
  - 7 (19%) Clinical Diagnosis Only

- 73 (64%) DST Performed
  - 71 (97%) Drug susceptible
  - 2 (3%) Drug Resistant
  - 2 (2%) Culture Positive Only (No DST)
  - 11 (10%) Sputum Smear Positive Only
  - 28 (25%) Clinical Diagnosis Only

Drug susceptible cases identified 657

- 170 DS Cases Unable to Be Recruited

Drug susceptible Cases Recruited 487

Total Drug susceptible Household Contacts 2362

- Total Tuberculosis Disease 114 (4.8%)
- No TB Disease 2248

Matched Age and Sex

Callao and Lima South
Drug Resistance and TB Incidence

Hazard Ratio MDR vs DSTB 0.56 (95% CI 0.3-0.9) p=0.02
Tuberculosis In New York City: Insights From A Dynamic Transmission Model

Natalie L. Stennis
Shama D. Ahuja
Andrew S. Azman
David W. Dowdy
TUBERCULOSIS (TB) CASES AND RATES\textsuperscript{1}, NEW YORK CITY, 1982-2013

1. Rates are based on decennial United States Census data.
TB CASES AND RATES\textsuperscript{1} BY U.S. BIRTH\textsuperscript{2}, NEW YORK CITY, 1982-2013

1. Rates prior to 2005 are based on decennial United States Census data. Rates after 2005 are based on 3-year American Community Survey data. 2. United States (U.S.)-born includes individuals born in the U.S. and U.S. territories.
RESULTS: Model fit to data

- Sustained declines difficult to replicate without assuming no local transmission or 50% decline in reactivation rates.
Screening individuals with diabetes for tuberculosis (TB); preliminary data from the TANDEM program in Peru, South Africa, Romania and Indonesia

Ugarte-Gil Cesar, Alisjahbana Bachti, Riza Anca, Walzl Gerhard, Kerry Sarah, Hill Philip, Van Crevel Reinout, Critchley Julia on behalf of TANDEM Investigators

OAP-271-30
Methods

• DM patients attending for routine appointments were screened for TB using symptom-based enquiry and chest x-ray (CXR).

• The criteria for referral for TB investigations (sputum and culture in all sites, with the addition of Xpert in Stellenbosch) were productive cough plus CXR abnormalities indicative of TB, or clinical suspicion of TB.

• Data collection commenced December 2013
Results

• 1362 patients recruited as of 15\textsuperscript{th} October 2014.

• TB confirmation was done by culture (Peru, Indonesia and Romania) and Xpert MTB/RIF (South Africa)

• Only 11 (0.8\%) were detected with active TB
<table>
<thead>
<tr>
<th>Variables</th>
<th>Peru</th>
<th>Indonesia</th>
<th>South Africa</th>
<th>Romania</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>CXR Normal</td>
<td>311</td>
<td>273</td>
<td>31</td>
<td>29</td>
<td>644</td>
</tr>
<tr>
<td>CXR Abnormal, possible TB</td>
<td>1</td>
<td>74</td>
<td>6</td>
<td>0</td>
<td>81</td>
</tr>
<tr>
<td>CXR Abnormal, inactive TB</td>
<td>10</td>
<td>11</td>
<td>0</td>
<td>13</td>
<td>34</td>
</tr>
<tr>
<td>CXR Abnormal, not TB</td>
<td>217</td>
<td>211</td>
<td>13</td>
<td>3</td>
<td>444</td>
</tr>
<tr>
<td>Bacteriologically positive TB</td>
<td>1</td>
<td>9</td>
<td>1</td>
<td>0</td>
<td>11</td>
</tr>
</tbody>
</table>

30.10.2014
BCG VACCINATION PREVENTS TUBERCULOSIS INFECTION AND DISEASE

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Background

Bacille Calmette Guerin vaccination – BCG

• Data suggests prevention of tuberculosis infection¹
• Part of childhood vaccination programme in Greenland
• Discontinued in 1991-1996

Greenland

• Tuberculosis incidence 157/100,000
• Low incidence of HIV² and non-tuberculous mycobacteria³
• Population ~ 56,000, 89% Inuit, healthcare: free

Results - Study 1: TB Infection study

The predicted TB infection prevalence by age (%)

TB infection overall 29%
- Among vaccinated 23%
- Among non-vaccinated 56%

Odds ratio for TB infection in BCG vaccinated
- Adjusted OR 0.52 (95% CI 0.32-0.85)
  p = 0.01

BCG vaccine effectiveness: BCG reduced the risk of TB infection by 20%

Michelsen et al Thorax 2014
Results - Study 2: TB disease study

Cohort size: \( n = 1,697 \)  
followup: 21,148 person years

TB disease overall 6%
- Among vaccinated 4%
- Among non-vaccinated 11%
- TB incidence 440/100,000

Hazard ratio for TB disease in BCG vaccinated
- Adjusted HR 0.50
  (95% CI 0.26-0.95)
  \( p = 0.03 \)

BCG vaccine effectiveness: BCG reduced the risk of TB disease by 50%

Michelsen et al Thorax 2014

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The cumulative risk of TB disease by age (%)

- BCG vaccinated
- Non BCG vaccinated

Age in years

\( 0 \quad 5 \quad 10 \quad 15 \quad 20 \)
The “Sputnik” program as an effective approach for treatment of tuberculosis in people with drug dependence

Alexandra Solovyeva
Dmitry Taran
Irina Gelmanova

Barcelona 2014
Outcomes of TB treatment in patients with drug addiction corresponding to TB drug susceptibility
17 December, 2000 – 16 December, 2006, Tomsk Oblast

- Susceptible TB
  - TB diagnosis ruled out: 4.9%
  - Transferred outside of Tomsk region: 12.5%
  - Died of TB: 62.5%
  - Died of non-TB reasons: 14.7%
  - Treatment failure: 31.3%
  - Lost to treatment follow-up: 41.3%
  - Cured: 0.0%

- DR-TB
  - TB diagnosis ruled out: 20.0%
  - Transferred outside of Tomsk region: 40.0%
  - Died of TB: 60.0%
  - Died of non-TB reasons: 80.0%
  - Treatment failure: 100.0%
  - Lost to treatment follow-up: 120.0%
  - Cured: 14.7%
The “Sputnik” started in December 2006

- The program goal is to improve adherence among TB patients defaulting from standard ambulatory options

- Program territory – Tomsk city (294.6 km²)

- It started to work as a part of the Tomsk TB service
The main principles

- Multi-professional and patient-centered approach
- Patient can chose time and place for taking medicine
- Medications are given under direct observation six days per week
- Side effects are actively detected and managed
- Provide specialists help: a substance abuse specialist, psychologists, and social workers
- Active detections and resolutions of clinical, psychological and social problems of the patients
Sputnik results
(17.12.06 – 31.12.12)

N = 138
35% drug users
88% drug-resistant

Adherence 55% -> 70%
Adherence 58% -> 77%
Zoonotic Tuberculosis
Adrian Muwonge
United Kingdom

• BTB predictive mathematical modelling with and between farms
• Recommendations on current policy

Ireland

• ZTB 2% in TB case Ireland
• Badger BCG vaccination substitute for culling
• Economic impact: Euro 75Million
United States

- One health approach to zoonotic control in Michigan state

- Outbreak investigative teams is a multi-agency task (USDA, CDC, Environment Agency.....)

- Resource sharing using one health based team saves the state money on the control strategy
Cameroon

- Prevalence bovine tuberculosis in cattle (14%-46%)
- Human awareness of disease in cattle (40%-76%)
- Human awareness of disease being zoonotic(2%-21%)
- The current milk treatment seemed sub-optimal for reduction of zoonotic TB transmission
- The molecular study confirmed zoonotic transmission
Cameroon

• M. tuberculosis was isolated in cattle

• Indication of human to human M. bovis transmission through respiratory route

• Role of human in pathogen evolution
That’s all folks!