## Introduction of the Rapporteur Organizing Team

<table>
<thead>
<tr>
<th>Section/Sub-section</th>
<th>Programme Secretary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult Child and Lung Health</td>
<td>Andrew Steenhoff</td>
</tr>
<tr>
<td>HIV</td>
<td>Keren Middelkoop</td>
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<tr>
<td>Tobacco Control</td>
<td>Omara Dogar</td>
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<tr>
<td>Tuberculosis</td>
<td>Kevin Schwartzman</td>
</tr>
<tr>
<td>Bacteriology and immunology</td>
<td>Stella van Beers</td>
</tr>
<tr>
<td>Civil society</td>
<td>Evaline Kibuchi</td>
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<tr>
<td>Nurses and Allied Professionals</td>
<td>Carrie Tudor</td>
</tr>
<tr>
<td>Zoonotic TB</td>
<td>Adrian Muwonge</td>
</tr>
</tbody>
</table>
## Overview of Abstracts

<table>
<thead>
<tr>
<th>Session type</th>
<th>Number submitted and peer reviewed</th>
<th>Number accepted for presentation at the conference</th>
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<tbody>
<tr>
<td>Oral abstract presentations</td>
<td>2,127</td>
<td>207 in 26 sessions</td>
</tr>
<tr>
<td>Short oral presentations</td>
<td></td>
<td>52 in 5 sessions</td>
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<tr>
<td>E-poster presentations</td>
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<td>127 in 15 sessions</td>
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<tr>
<td>Poster presentations</td>
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<td>628 in 73 sessions</td>
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</table>

Meetings, plenaries, workshops, post-graduate courses, and symposia were not included.
Thank you to session chairs who provided feedback

<table>
<thead>
<tr>
<th>Name</th>
<th>Chair Name</th>
<th>Organizer Name</th>
<th>Presenter Name</th>
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<tbody>
<tr>
<td>Daouda Adam</td>
<td>Chibuike Amaechi</td>
<td>Fouad Aslam</td>
<td>Paul Jensen</td>
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<tr>
<td>Mirjam Bakker</td>
<td>Anurag Bhargava</td>
<td>Rajita Bhavaraju</td>
<td>Jody Boffa</td>
</tr>
<tr>
<td>Alice Christensen</td>
<td>Charlotte Colvin</td>
<td>James Cowan</td>
<td>Helen Cox</td>
</tr>
<tr>
<td>Riitta Dlodlo</td>
<td>Susan Dorman</td>
<td>Leslie Enane</td>
<td>Charles Feldman</td>
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<tr>
<td>Jacqueline Firth</td>
<td>JW Fitting</td>
<td>Agnes Gebhard</td>
<td>Jonathan Golub</td>
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<tr>
<td>Alexander Golubkov</td>
<td>Anthony Harries</td>
<td>Samson Haumba</td>
<td>Nadia Aït Khaled</td>
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<tr>
<td>Moses Kitheka</td>
<td>Ekaterina Kurbatova</td>
<td>Blessina Kumar</td>
<td>Irwin Law</td>
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<tr>
<td>Liang Maama</td>
<td>Robert Makombe</td>
<td>Lesibana Malinga</td>
<td>Ben Marais</td>
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<tr>
<td>Sara Massaut</td>
<td>Kedibone Mdolo</td>
<td>Graeme Meintjes</td>
<td>Keren Middelkoop</td>
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<tr>
<td>Valerie Mizrahi</td>
<td>Surbhi Modi</td>
<td>Chakaya Muhwa</td>
<td>Nii Nortey-Hanson Nortey</td>
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<tr>
<td>Jove Oliver</td>
<td>Tolullah Oni</td>
<td>Marlene Poolman</td>
<td>Simon Schaaf</td>
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<tr>
<td>Thomas Shinnick</td>
<td>Neil Schlunger</td>
<td>Charlotte Schutz</td>
<td>Kevin Schwartzman</td>
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<td>Si Thu Aung</td>
<td>Rinn Song</td>
<td>Jean Tesche</td>
<td>Carrie Tudor</td>
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<tr>
<td>Mikhail Volik</td>
<td>Rob Warren</td>
<td>Myra Wisotzky</td>
<td>Mukadi Ya Diul</td>
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<tr>
<td>Getahun Haileyesus</td>
<td>Martie van der Walt</td>
<td>Phoebe Nzombe</td>
<td>Virginia De Azevedo</td>
</tr>
<tr>
<td>Annelies van Rie</td>
<td>Vishnu Mahamba</td>
<td>Tope Adepoyibi</td>
<td>Helen Ayles</td>
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<tr>
<td>Adrian Muwonge</td>
<td>Helen McIlneron</td>
<td>Shu-Hua Wang</td>
<td>Muyabala Munachitombwe</td>
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<tr>
<td>Ed Nardell</td>
<td>Zolani Barnes</td>
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</tbody>
</table>
A to Z in 25 minutes

- Adult and Child Lung Health
- Bacteriology and Immunology
- Civil Society
- HIV
- Nurses and Allied Professionals
- Tobacco Control
- Tuberculosis
- Zoonotic Tuberculosis
ADULT AND CHILD LUNG HEALTH
Andrew Steenhoff
Adult Lung Health

• Lung sequelae post successful TB treatment
  – India post MDR-TB, Zimbabwe post drug sensitive & MDR-TB
    » 93% patients ongoing symptoms, 100% radiological abnormalities, 89% abnormal lung function
    » Importance: recognize, not unsuccessful treatment, BUT needs to be managed to improve quality of life

• Innovation ... satellites & lung health, Malawi
  – Traditionally manual mapping methods for prevalence surveys: heavy on resources & time
  – Used Google Earth Pro & mobile technology to map, sample, collect & manage resp. data

OA-454-05 Singla
OA-456-05 Metcalfe
OA-501-06 Chisunkha
PART 1 - ACLH

Adult Lung Health

• COPD in Bangladesh
  – Cohort study of 652 adult smokers: previous normal lung function 2 years ago, underwent spirometry
  – COPD developed in 46 adult smokers
    » a 2-year cumulative incidence of 7.1%
    » an average annual incidence of 3.55%
  – COPD incidence is high in adult smokers in Bangladesh
  – Importance:
    » As in many LMIC, COPD is a major public health problem in Bangladesh

PC-870-04 Siddiquee
Childhood TB

- Expediting the diagnosis in New Delhi, India
  - 261 children with TB (confirmed & probable)
  - Immediate access to Xpert detected
    - 62 cases that were smear negative (sensitivity 81% vs 18%)
    - rifampicin R in 4 cases which were culture negative

- HIV-TB co-infection in Kinshasa, DRC
  - 1009 children treated for TB
    - 809 (80%) tested for HIV
    - 441 (55%) were HIV-infected
    - underscores need for HIV test in all child TB cases
Childhood MDR TB

• Web survey of clinical approach to child MDR contacts in Europe
  • Proportion new TB cases that are MDR: 15% in Europe
  • 25 countries, 72 clinicians
    » Wide spectrum of clinical practice around screening, preventive therapy & follow-up
    » Need for better evidence and consensus guidelines

OA-482-06 Turkova
PART 1 - ACLH

Childhood MDR TB

• PK

• Ofloxacin in Cape Town
  – 85 children 0-5 years, ofloxacin dose 20mg/kg
  – exposures were low, simulated optimal dosing
  – no effect of crushing, HIV, malnutrition
  – good outcomes, safe & well tolerated (no arthropathy)

• Delamanid in paeds MDR patients, Phillipines
  – 7 patients, 12-17 years, 6 months of delaminid
  – well tolerated, plasma concentrations in ranges of adult trial
  – trials ongoing in younger children

OA-479-06 Garcia-Prats
EP-115-04 Hafkin
PART 1 - ACLH

Childhood INH monoresistance

- INH R is most common form of resistant TB globally

- Karachi, Pakistan
  - Lab study 2003-2012: 767 culture+ samples, children 0-14 yrs
  - 329/767 (43%) showed INH monoresistance
  - Significant upward linear trend from 2003 to 2012 (p=0.02)

- Cape Town
  - 72 children (<13) with INH R, Rifampin S TB, 2006-2012
  - Outcomes were good but 10/37 had +cx >2m

PC-1070-05 Shakoor S
PC-1073-05 Garcia-Prats
BACTERIOLOGY AND IMMUNOLOGY

Stella van Beers

Members interested in the laboratory aspects of tuberculosis
Improving efficacy of sample examinations to detect TB?

Possible predictors of MTB negative sputum?

- **Sputum Quality**
  - Appearance
  - Volume

- **Clinical symptoms**
  - Cough
  - Sputum production
  - Haemoptysis

Clinical and Sputum Characteristics as Predictors of *Mycobacterium Tuberculosis* Positive Sputum in Community-Wide Active Case Finding for Tuberculosis

OA-300-04
Ho J et al

Urinary Lamp Lateral flow test especially for HIV patients, with low CD4 count,
Meet the expert session, Grant Theron
Discordance:

GenXpert positive result and confirmative test negative indicating rifampicin susceptible TB (LPA, phenotypic DST or repeat Xpert)

- Hybridization pattern of probes (A-E) examined:
  Resistance can occur through no – or delayed hybridization

- Discordant result mainly could be explained delayed ($\Delta$Ct): 4-4.9
Detecting latent tuberculosis?

Risk of Quantiferon (QFT) leading to over-diagnosis of conversion when used for annual serial testing among HCWs in a low-incidence setting

A Zwerling

Early biomarkers using elevated peripheral blood monocyte rate combined with a strong [tuberculin] skin test response associated with progression of latent tuberculosis infection to clinically active disease.

N Rakotosamimanana
Understanding heterogeneity in Mtb populations

Conflicting results doing Whole Genome sequencing (WGS): genomic stability or instability during evolution of drug resistance?

*WGS reveals* genetic heterogeneity and suggests the role of selective bottleneck in defining the population structure of *Mycobacterium tuberculosis*.

Provides insight in 1) methodological perspective: how to accurately detect heterogenous variants.
2) Biological perspective: showing intra-patient evolution of isoniazid resistance

PC-979-05 de Vos et al.
Identifying threat of drug resistance of old drugs - pyrazinamide resistance

- 50% prevalence of pncA mutations in MDR isolates from South Africa: suggests major problems with standardized MDR regimen
- Enforces the need for standard routine PZA DST
- PCR-based testing for PZA resistance problematic
- Mixed infections may show susceptibility.

Identifying threat of drug resistance of new drugs

Good correlation in identifying drug resistance among second line agents and new drugs such as delamnid and bedaquiline. WGS approach may be clinically useful to rapidly detect drug-related mutations prior to treatment.
Finding new drugs for treatment

Colony phenotyping – quantifying TB colony dynamics

Potential utility for monitoring early treatment responses during TB therapy. Adds value to surrogate markers of efficacy in phase II TB treatment trials, which would be an important step towards shorter regimens.

New horizons for quinolone-class agents

Exciting new work on developing next-generation quinolones with improved lethality and other favorable characteristics.
Improving drug therapy

Host targeted therapy for tuberculosis via aerosol administration of small interfering RNA which have an important role in defending cells against infectious organism

Restoring host antimicrobial capacity to kill drug tolerant bacilli. Thereby enhancing the possibility to shorten TB treatment.

Other posters mentioned

PC-975-05 Genetic polymorphisms of glutathione S-transferase P1 and the incidence of anti-tuberculosis drug-induced hepatitis in a Chinese cohort
J He, quan Wu, yu Wang, can Wu, yi Ji

PC-1015-05 GeneXpert® shortens time to treatment initiation for Latvian MDR-TB cases
H Stagg, P White, V Riekstina, A Cirule, J Brown, G Dravniece, E Adam, C Jackson
Improving access to services: organize triage

Employing a ‘cough monitor’ in a crowded clinic is an effective way to prioritize patients for testing and improve the detection of infectious TB patients. Increas of 30% to 37% of sputum positive cases.
CIVIL SOCIETY
Evaline Kibuchi
Resilience Pays

My champion. This pair of shoe reminds me of the journey I’ve gone through to be where I am today. These shoes helped me a lot during the times I was undergoing treatment and needed to take long treks from and to the health centre for treatment and psychological support. I know they look uncomfortable but what I see today is resilience and triumph.

Photo Kevin

ID 963 TB Photo voice projects to engage your community Teresa Ruggs
Patients Engagement in Case Finding

• Engagement of persons who have undergone the TB experience is effective in Case finding as demonstrated in South-Kivu Province, Democratic Republic of Congo

• **OA-497 06** : *Active case finding activities performed by former TB patients: experience from South-Kivu Province, Democratic Republic of Congo, Olivier Bahati*
Community engagement in improving Treatment success rate

• Involvement of communities in effective in improving treatment outcomes:

• OA-498-06: Improving Treatment success rate by use of community mobilizers in Juba, South Sudan who were able to retrace 87% of patients who had dropped out treatment in a period one year (Jan-Dec 2012) Stephen Macharia
Human rights and social protection for TB Patients

• TB treatment need an environment with assured humans rights and social protection;

• **PC-838** Civil Society forums gears up to protect human rights of TB Patients and help ensure social security of TB patients. S Nayak
And all these will only be possible with increased advocacy for more investment in TB from the national Governments!
HIV
Keren Middelkoop
Patient characteristics and contribution to overall caseload from three different TB case finding strategies in Blantyre, Malawi

Peter MacPherson, Emily Webb, Augustine Choko, Marriott Nliwasa, Aaron Mdolo, James Mpunga, Lingstone Chiume, Liz Corbett
Contribution to caseload

January 2011 - August 2014

- Passive case finding: 9,308
- HIV/TB screening: 785
- cwACF: 144

27,789 HIVST + 107,000 routine HTC episodes p.a.

Choko PLOS Med 2015
## Characteristics of TB cases as captured by routine Ministry of Health TB Officers

<table>
<thead>
<tr>
<th></th>
<th>Passive case finding</th>
<th>HIV/TB screening</th>
<th>cw-ACF</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Median age</strong></td>
<td>34 years</td>
<td>35 years</td>
<td>32 years</td>
<td>0.046</td>
</tr>
<tr>
<td><strong>Men</strong></td>
<td>60%</td>
<td>59%</td>
<td>58%</td>
<td>0.718</td>
</tr>
<tr>
<td><strong>Cough &gt;3w</strong></td>
<td>37%</td>
<td>38%</td>
<td>69%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td><strong>Smear +ve</strong></td>
<td>57%</td>
<td>35%</td>
<td>84%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td><strong>HIV-positive</strong></td>
<td>73%</td>
<td>86%</td>
<td>59%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td><strong>On ART</strong></td>
<td>68%</td>
<td>65%</td>
<td>67%</td>
<td>0.490</td>
</tr>
</tbody>
</table>
Including traditional health practitioners in community-based public private partnership to provide HIV and TB services in KwaZulu-Natal

GN Mbokazi et al

- 800 THP trained to identify symptoms of HIV/TB
- 22,879 clients screened
  - 1,271 symptom positive
  - 818 referred to clinics
SOA-631-06: HIV and TB: Snapshots

Using C-reactive protein to improve efficiency of TB screening among patients new to HIV/AIDS care

Christina Yoon, F Semitala, J Katende, P Byanyima, A Andama, I Ayakaka, M Kamya, A Cattamanchi
602 consecutive adults (48% F, age 33 years, CD4 count 149 cells/μL) new to HIV/AIDS care (Kampala, Uganda) from July 2013 – Oct 2015

WHO symptom screen, CRP testing, Xpert x1, liquid culture x2

### Test characteristics of TB screening tests

#### WHO SYMPTOM SCREEN

<table>
<thead>
<tr>
<th>Symptom +</th>
<th>Symptom -</th>
</tr>
</thead>
<tbody>
<tr>
<td>TB (N=113)</td>
<td>No TB (N=489)</td>
</tr>
<tr>
<td>108</td>
<td>430</td>
</tr>
<tr>
<td>5</td>
<td>59</td>
</tr>
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</table>

Sensitivity 96% (90-99)
Specificity 12% (9-15)

#### POINT-OF-CARE CRP

<table>
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<tr>
<th>CRP ≥ 10 mg/L</th>
<th>CRP &lt; 10 mg/L</th>
</tr>
</thead>
<tbody>
<tr>
<td>TB (N=113)</td>
<td>No TB (N=489)</td>
</tr>
<tr>
<td>100</td>
<td>175</td>
</tr>
<tr>
<td>13</td>
<td>314</td>
</tr>
</tbody>
</table>

Sensitivity 89% (81-94)
Specificity 64% (60-69)

> 5-fold increase
High rate of late incident tuberculosis among HIV infected patients on long term antiretroviral therapy in Western India

Dravid AN; Kulkarni MV; Mahajan U; Saraf CK

- Incident rate: 2.35 cases/100 pyrs (95% CI: 1.94-2.79)
Routine Implementation of Six Months Isoniazid Preventive Therapy in HIV Infected Patients in Seven Pilot Sites in Zimbabwe

K C Takarinda, R C Choto, A D Harries, T Mutasa-Apollo, C Chakanyuka-Musanhu, B Nkomo, E Zhou, P Shiri, C Mbito
### Outcomes of HIV infected clients enrolled and commenced on IPT

<table>
<thead>
<tr>
<th>Variable (N=578)</th>
<th>n (%)</th>
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<tbody>
<tr>
<td><strong>IPT Outcomes</strong></td>
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<tr>
<td>Completed IPT</td>
<td>466 (80.6)</td>
</tr>
<tr>
<td>Did not complete IPT</td>
<td>112 (19.4)</td>
</tr>
<tr>
<td><strong>Reasons for not completing IPT</strong></td>
<td></td>
</tr>
<tr>
<td>Loss to follow-up</td>
<td>69 (61.6)</td>
</tr>
<tr>
<td>Stopped Treatment (reason not documented)</td>
<td>30 (26.8)</td>
</tr>
<tr>
<td>Drug stock-outs</td>
<td>5 (4.5)</td>
</tr>
<tr>
<td>Developed toxicity/adverse reaction*</td>
<td>6 (5.3)</td>
</tr>
<tr>
<td>Transferred Out</td>
<td>2 (&lt;1)</td>
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<tr>
<td>Refused to Continue Treatment</td>
<td>3 (&lt;1)</td>
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<table>
<thead>
<tr>
<th>Current ART status</th>
<th>Not on ART</th>
<th>Reference</th>
<th>Reference</th>
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<tr>
<td>On ART</td>
<td>0.07 (0.03-0.16)</td>
<td>0.09 (0.03; 0.28)</td>
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</table>
PART 1 - SECTION 1

HIV/TB Late Breaker

Cell phone ringtones intervention to improve adherence to antiretroviral therapy in Yaounde, Cameroon: a randomized controlled trial

EW Pefura-Yone ¹,², Z Nzina-Toupendi ³, AD Balkissou ¹,², AP Kengne ⁴, E Afane-Ze ¹,²
## Results/ Adjustment with baseline data

<table>
<thead>
<tr>
<th>Factors</th>
<th>Odds ratio</th>
<th>95% CI</th>
<th>p value</th>
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</thead>
<tbody>
<tr>
<td>Ringtones group</td>
<td>1.89</td>
<td>1.19-2.98</td>
<td>0.007</td>
</tr>
<tr>
<td>Age</td>
<td>0.96</td>
<td>0.93-0.99</td>
<td>0.013</td>
</tr>
<tr>
<td>Sex</td>
<td>0.70</td>
<td>0.38-1.30</td>
<td>0.263</td>
</tr>
<tr>
<td>Education level</td>
<td>0.82</td>
<td>0.58-1.18</td>
<td>0.291</td>
</tr>
<tr>
<td>Living alone</td>
<td>1.74</td>
<td>1.06-2.85</td>
<td>0.028</td>
</tr>
<tr>
<td>Employed</td>
<td>1.12</td>
<td>0.57-2.21</td>
<td>0.745</td>
</tr>
<tr>
<td>Not using condoms</td>
<td>1.26</td>
<td>1.02-1.55</td>
<td>0.032</td>
</tr>
<tr>
<td>Alcohol consumption</td>
<td>0.73</td>
<td>0.53-1.01</td>
<td>0.059</td>
</tr>
<tr>
<td>Smoking</td>
<td>0.71</td>
<td>0.48-1.06</td>
<td>0.093</td>
</tr>
<tr>
<td>CDC Sage C</td>
<td>1.48</td>
<td>0.88-2.49</td>
<td>0.139</td>
</tr>
<tr>
<td>Durée en mois du TARV</td>
<td>0.99</td>
<td>0.97-1.01</td>
<td>0.602</td>
</tr>
</tbody>
</table>
The effect of antiretroviral therapy on chronic lung disease in HIV-infected children

G. McHugh¹, J. Rylance², E. Majonga¹,³ J. Metcalf⁴, T. Bandason¹, H. Mujuru⁵, K. Kranzer³, RA. Ferrand¹,³

- Substantial burden of respiratory morbidity in HIV+ children compared to HIV-ve (SOA-632-06: HIV and TB: Snapshots)
# Clinical Features

<table>
<thead>
<tr>
<th></th>
<th>ART NAÏVE n=385</th>
<th>ART EXPERIENCED n=202</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Previous TB</td>
<td>20(5%)</td>
<td>76(38%)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Smokers in household</td>
<td>94(24%)</td>
<td>42(21%)</td>
<td>0.32</td>
</tr>
<tr>
<td>Chronic cough</td>
<td>206(54%)</td>
<td>30(15%)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Breathlessness</td>
<td>68 (18%)</td>
<td>12(6%)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>MRC dyspnoea Score&gt;1</td>
<td>46(16%)</td>
<td>28(14%)</td>
<td>0.58</td>
</tr>
</tbody>
</table>

¹Data collected n=291
## Respiratory function

<table>
<thead>
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<th></th>
<th>ART NAÏVE</th>
<th>ART EXPERIENCED</th>
<th>PVALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resp Rate&gt;30/min</td>
<td>14 (4%)</td>
<td>5 (2%)</td>
<td>0.28</td>
</tr>
<tr>
<td>SpO₂&lt; 88%/ desaturation post exercise (%)</td>
<td>69 (18%)</td>
<td>24 (12%)</td>
<td>0.06</td>
</tr>
<tr>
<td>FEV₁ z-score, mean (sd)</td>
<td>-0.73 (1.40)¹</td>
<td>-0.75 (1.20)²</td>
<td>0.99</td>
</tr>
<tr>
<td>FVC z-score, mean (sd)</td>
<td>-0.63 (1.35)</td>
<td>-0.81 (1.28)</td>
<td>0.22</td>
</tr>
<tr>
<td>Bronchodilator response*</td>
<td>7 (26%)³</td>
<td>11 (35%)⁴</td>
<td>0.43</td>
</tr>
</tbody>
</table>

¹ n=277; ² n=177; ³ n=27; ⁴ n=31

* Reversibility testing performed in those with abnormal lung function
NURSES AND ALLIED PROFESSIONALS
Carrie Tudor
Patient pathway

1. Identify patients
2. Diagnose patients
3. Treatment of patients
4. Continued training
Schematic of patient referral from the pharmacies

Mhimbira et al. OA 417-05, Session 15
Tuberculosis case finding at pharmacies using trained pharmacists and an electronically monitored referral system in Tanzania
RESULTS – Referrals

Six Referring Pharmacies
• 627 presumptive TB patients
• Male, 378 (61%)
• Age, median (IQR); 41 years (IQR: 32-48)

Facility arrival
• Arrived 600 (94.5%)
• Referral time
  • 0 days, 537 (90%)
  • ≤ 3 days, 29 (4%)
  • ≥ 3 days, 34 (6%)
  • Range (≥ 3), 4-146 days

TB diagnosis (done investigations)
• 495 (82.5%) did investigations
• Diagnostic tools any of the following:
  • AFB microscopy, 45 (9.0%)
  • Chest x-ray, 64 (12.9%)
  • Gene-Xpert MTB/RIF, 12 (2.4%)
  • Clinical diagnosis, 99 (20.0%)

TB patients diagnosed
• TB patients 88/505 (17.4%)

IQR: Interquartile range; AFB, Acid Fast Bacilli, MTB, Mycobacterium tuberculosis; RIF, Rifampicin
Conclusions to date

The simplicity and non threatening nature of the intervention is instrumental in getting traditionally hard to reach people, particularly men, to answer the questions and access care.

Care givers are able to;

- Convince community members to go to PHC when signs and symptoms of TB are present.
- Get people to disclose previous TB and HIV status and get access to TB cards for recording treatment start dates and outcomes.
- Consistently fill in the screening tool and understand the signs and symptoms regardless of ability to read and write.
Conclusion

• No significant difference in MDR TB treatment success rates between ambulatory care setting and traditional hospital-based treatment settings.

• Ambulatory treatment indeed has a place in countries like Namibia

• Additional benefits
  – Lower costs
  – Maintaining stable families, especially among special populations
  – Fostering trust in the health care system
OA-323-04, Session 03  Kelly et al.
Adverse drug reactions and resultant health-related quality of life during multidrug-resistant tuberculosis (MDR-TB) treatment in South Africa

- 121 MDR-TB patients
  - Mean age: 33 (±9) years
  - 62 (51%) female
  - Mean time on MDR-TB treatment: 120 (±59) days
  - High degree of food insecurity: 62 (51%) “not enough food to eat everyday”
  - 90 (74%) HIV co-infection
  - 99 (82%) on standardized MDR-TB regimen:
Adverse drug reactions and resultant health-related quality of life during multidrug-resistant tuberculosis (MDR-TB) treatment in South Africa

- 119 (98%) experienced at least one ADR
- Mean number of ADRs per patient: 8.6 (±4.1)
- Many patients required a change to their MDR-TB regimen because of ADRs: 39 (43%)
- No significant difference in ADRs by HIV status or ART regimen
Diarrhea
Headache
Loss of hearing
Tinnitus
Fatigue
Anxiety
Changes in vision
Arthralgia
Anorexia
Myalgia
Gastritis
Dizziness
Rash or pruritus
Nausea or vomiting
Depression
Confusion
Peripheral neuropathy
Insomnia
Peripheral neuropathy
Provider documentation in medical chart
Patient self-report from interview
## Training of Nurses and Allied Professionals

<table>
<thead>
<tr>
<th>Title</th>
<th>Authors</th>
<th>SOA-Number</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Onsite Coaching: An effective way to improve laboratory performance in external quality assurance, Ghana</td>
<td>Dzata et al.</td>
<td>SOA-643-06</td>
<td>2006</td>
</tr>
<tr>
<td>Effectiveness of a training on quality assurance of chest radiography in Laos</td>
<td>Ohkado et al.</td>
<td>SOA-646-06</td>
<td>2006</td>
</tr>
<tr>
<td>Distance-learning pilot course for front-line staff of the Peruvian National Tuberculosis Program guidelines</td>
<td>Lulli et al.</td>
<td>SOA-647-06</td>
<td>2006</td>
</tr>
<tr>
<td>Evaluation of different models of training to improve health care worker knowledge of childhood TB at a primary health care center level in South Africa</td>
<td>Du Plessis et al.</td>
<td>SOA-650-06</td>
<td>2006</td>
</tr>
<tr>
<td>Interactions between nurses and doctors in caring for TB patients</td>
<td>Fedotkina et al.</td>
<td>SOA-649-06</td>
<td>2006</td>
</tr>
</tbody>
</table>
TOBACCO CONTROL
Omara Dogar
Methods & Findings
• Behaviour Change Intervention (BCI) development
• Study settings and participants
• Fidelity to deliver BCI
• Feasibility and acceptability of delivering BCI

Strengths & Limitations
• Provides the methodological basis to measure fidelity to BCI
• Cultural adaptation of the behaviour change theories
• Provision of cessation services and use of Nicotine Replacement

Conclusion
A culturally appropriate behavioural intervention that could help smokeless tobacco users of South Asian-origin in quitting its use, and is ready to be tested in an effectiveness trial.
A closer look at ‘illicit’ white cigarettes

- What are Cheap/Illict Whites?
- Case Study: Jin Ling
- Why trade in Cheap Whites?

Data sources
- 3 academic articles (Lo et al. 2009, Joossens and Raw 2012, Gilmore et al. 2014), Review of grey literature, other news and government documents

Results
- 82 Cheap White brands identified
- By 53 manufactures
- 1/3rd production facilities in Free Zones of Russia, Cyprus and UAE
- TPackSS database

Conclusion
Illicit whites are cheaper, but not everywhere and sometimes the local taxed products are cheaper than the untaxed smuggled products.
The 46th Union World Conference on LUNG HEALTH!
A long way to go.....
TUBERCULOSIS
Kevin Schwartzman
Active Case Finding (1)

- Four districts in Cambodia
- Mobile teams used symptom screen, CXR, Xpert
- Targeted primarily persons > 55 in rural communities

Chry Monyrrath et al, OA-310-04
Results

• 76 health facilities visited.
• 9,260 individuals screened by CXR.
• 1,756 (19.0%) individuals tested using the Xpert MTB/RIF assay.
• 324 (18.5%) MTB-positive patients detected.
• New Bac+ notifications increased +119.3% for all ages and +266.2% for those ≥55 years during the ACF quarters compared to trend expected notifications.

Chry Monyrath et al, OA-310-04
Active Case Finding (2)

- 789 persons living with HIV in Viet Nam, not yet on antiretrovirals
- TB symptom screen and diagnostic/treatment algorithm added to routine clinical encounters every 3 months
- One year of follow-up

Cowger et al, Union-CDC Late-Breaker
Impact of Regular TB Screening on Mortality

All participants were screened at enrollment; Regular screening was defined as at least 1 screening visit every 4 months.
Diagnostics

• Pragmatic randomized controlled trial examining impact of urine lipoarabinomannan strip test
• Adults admitted to hospital with suspected HIV-TB in South Africa, Tanzania, Zambia, Zimbabwe

Peter et al, Union-CDC Late-Breaker
Primary outcome: Mortality

Overall reduced hazards of 18%
INH Mono-Resistance

• Retrospective cohort from Durban, South Africa (2000-2012)
• Compared TB episodes:
  – INH mono-resistant
    • N = 523
  – Drug susceptible: INH, RIF & any other drug tested
    • N = 16,296
• INH mono-resistant treatment:
  – New cases: 6 months HRZE
  – Retreatment: Modified retreatment regimen

van der Heijden et al, OA-466-06
Mixed Effects Logistic Regression Models Including HIV Status

<table>
<thead>
<tr>
<th>Outcome: Died</th>
<th>N=6,746/16,736 (40%)</th>
<th>Odds Ratio</th>
<th>95% Confidence Interval</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>INH mono-resistant TB</td>
<td>1.91</td>
<td>0.84, 4.31</td>
<td>0.12</td>
<td></td>
</tr>
<tr>
<td>Age (per 1-year increase)</td>
<td>1.03</td>
<td>1.01, 1.05</td>
<td>0.003</td>
<td></td>
</tr>
<tr>
<td>Pulmonary TB</td>
<td>0.58</td>
<td>0.31, 1.10</td>
<td>0.10</td>
<td></td>
</tr>
<tr>
<td>HIV infected</td>
<td>2.94</td>
<td>1.48, 5.84</td>
<td>0.002</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Outcome: Died + Failed</th>
<th>N=6,746/16,736 (40%)</th>
<th>Odds Ratio</th>
<th>95% Confidence Interval</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>INH mono-resistant TB</td>
<td>3.51</td>
<td>1.80, 6.86</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>Age (per 1-year increase)</td>
<td>1.02</td>
<td>1.00, 1.04</td>
<td>0.02</td>
<td></td>
</tr>
<tr>
<td>Pulmonary TB</td>
<td>0.73</td>
<td>0.38, 1.37</td>
<td>0.33</td>
<td></td>
</tr>
<tr>
<td>HIV infected</td>
<td>2.29</td>
<td>1.34, 3.91</td>
<td>0.003</td>
<td></td>
</tr>
</tbody>
</table>
TB and diabetes

• Participants in community-based health screening study in Taipei (2005-2008)
• Records linked with national health insurance database
• Diabetes diagnosis based on drugs prescribed or fasting glucose ≥ 126 mg/mL
• Poor diabetes control defined as fasting glucose ≥ 130 mg/mL

Lee et al, OA-427-05
### Results from Cox proportional hazards regression model for association between diabetes status, glycemic control, and risk of TB

<table>
<thead>
<tr>
<th></th>
<th>No. of cases</th>
<th>Person-year</th>
<th>TB Incidence (95% CI) (per 100,000)</th>
<th>Multivariable-adjusted HR (95% CI) *</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-diabetes</td>
<td>247</td>
<td>463,645</td>
<td>59.6 (52.9, 66.3)</td>
<td>Ref</td>
</tr>
<tr>
<td>Diabetes</td>
<td>57</td>
<td>46,121</td>
<td>53.3 (46.6, 59.9)</td>
<td>1.62 (1.20, 2.19)</td>
</tr>
<tr>
<td>Good glycemic</td>
<td>8</td>
<td>13,144</td>
<td>60.9 (18.7, 103.0)</td>
<td>0.66 (0.32, 1.34)</td>
</tr>
<tr>
<td>Poor glycemic control</td>
<td>49</td>
<td>32,977</td>
<td>148.6 (107.0, 190.2)</td>
<td>2.10 (1.53, 2.89)</td>
</tr>
</tbody>
</table>

*adjusting for age (continuous variable), sex, tobacco smoking, alcohol use, body mass index, frequency of outpatient visit utilization (continuous variable), and medical comorbidities of malignancy, pneumoconiosis, steroid use, end-stage renal disease*
TB and e-cigarettes

- Adherent monocyte model
- Fresh CSE (Marlboro-tobacco), eCSE (e-cig vapour), e-liquid (E-cig solution) TWISP®, nicotine [Sigma®]
- Infected with BCG, H37RV, CDC1551
- Measured TNF-alpha in cell culture supernatant

van Zyl-Smit et al, CDC Late-Breaker Session
M.TB induced TNF-α responses are impaired by: Nicotine, Tobacco smoke & E-cigarette vapour

H37RV induced TNF-alpha production

Consistent trend with BCG, H37RV & CDC1551
LTBI in low-incidence countries (1)

- Examined experience with 12 week INH-rifapentine regimen (once-weekly dosing) in 7 US federal prisons
- 70% male, median age 36
- 20% were known contacts of persons with pulmonary TB
- 424/463 (92%) completed treatment, compared with historical figure of ~55% for INH

Lobato, OA-398-05
LTBI in low-incidence countries (2)

- Micro-simulation Markov model to project diagnostic outcomes in a simulated North American health care worker cohort, over 10 years
- Modeled different serial screening strategies after accounting for the major sources of variability in serial QFT results
- Projected outcomes under different testing algorithms and different cut-offs for defining a positive conversion

Zwerling, Dowdy et al, OA-400-05
Results: 10-Year Outcomes of Serial Testing

<table>
<thead>
<tr>
<th></th>
<th>Percentage</th>
<th>Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>True Negative</td>
<td>66.5%</td>
<td>(65.6, 67.4)</td>
</tr>
<tr>
<td>False Negative</td>
<td>0.2%</td>
<td>(0.1, 0.3)</td>
</tr>
<tr>
<td>True Positive</td>
<td>8.1%</td>
<td>(7.6, 8.7)</td>
</tr>
<tr>
<td>False Positive</td>
<td>25.2%</td>
<td>(24.3, 26.0)</td>
</tr>
<tr>
<td>Number of Tests</td>
<td>83,500</td>
<td>(82900, 84000)</td>
</tr>
<tr>
<td>Infections Missed*</td>
<td>8.2%</td>
<td>(1.5, 14.8)</td>
</tr>
</tbody>
</table>

* People who were truly infected and tested negative on their subsequent test

- 33% tested positive after 10 years
- Only 8% truly infected
- 3 to 1 false positive for every true positive
- 8.2% of true infections missed
Costs of TB care

- Early post-diagnosis costs for patients living with TB and/or HIV and their households in South Africa (Gauteng)
- Data collected in 2013

Mudzengi et al, OA-335-04
## Definition of terms

<table>
<thead>
<tr>
<th>Type of cost</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Direct</strong></td>
<td></td>
</tr>
<tr>
<td>Medical</td>
<td>Consultation fees and cost of medicines.</td>
</tr>
<tr>
<td>Travel</td>
<td>Transport cost on a round trip to any health facility</td>
</tr>
<tr>
<td>Food</td>
<td>Cost of supplementary food and food bought while admitted in hospital</td>
</tr>
<tr>
<td><strong>Indirect</strong></td>
<td></td>
</tr>
<tr>
<td>Reported income loss</td>
<td>Money lost due to a diagnosis-related job loss and unpaid sick leave</td>
</tr>
<tr>
<td><strong>Catastrophic</strong></td>
<td>Patient costs accounting for more than 10% of individual cost 4</td>
</tr>
</tbody>
</table>

- **Household costs** - Guardians and carers refer to persons who accompanied the patient to health facility and those who took household duties during illness of patient, respectively

4. Ranson MK, WHO Bulletin 80, 2002
**Mean costs (USD, 2013)**

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Patient Direct</th>
<th>Patient Total direct</th>
<th>Household Indirect</th>
<th>Household Mixed</th>
<th>Total costs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Food Cost</td>
<td>Medical</td>
<td>Travel</td>
<td>Income loss</td>
<td>Guardian</td>
</tr>
<tr>
<td><strong>TB/HIV</strong></td>
<td>117</td>
<td>13.84</td>
<td>1.81</td>
<td>5.18</td>
<td>20.83</td>
<td>48.74</td>
</tr>
<tr>
<td><strong>HIV only</strong></td>
<td>302</td>
<td>9.9</td>
<td>0.86</td>
<td>1.51</td>
<td>12.27</td>
<td>15.49</td>
</tr>
<tr>
<td><strong>TB only</strong></td>
<td>44</td>
<td>9.4</td>
<td>0.06</td>
<td>1.95</td>
<td>11.41</td>
<td>38.73</td>
</tr>
</tbody>
</table>

- **Primary cost driver was income loss**
- **Mean costs catastrophic, highest for TB/HIV (18% of income)**
  - 16% & 9% for TB only and HIV only respectively
Social protection and cash transfers

- Pilot trial with cluster randomization at household level in Lima, Peru
- 311 households with TB patient and contacts randomized to either standard care or standard care plus socioeconomic intervention
- The intervention consisted of household visits, community meetings and conditional cash transfers

Wingfield, Union-CDC Late-Breaker Session
Results: TB preventive therapy

Log rank p=0.005
Results: Feedback

*p<0.0001*

<table>
<thead>
<tr>
<th>Social Support Activities</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educational workshop</td>
<td>1st</td>
</tr>
<tr>
<td>Health post visits</td>
<td>2nd</td>
</tr>
<tr>
<td>TB Club</td>
<td>3rd</td>
</tr>
<tr>
<td>Home visits</td>
<td>4th</td>
</tr>
<tr>
<td>Conditional cash transfers</td>
<td>5th</td>
</tr>
</tbody>
</table>

Social support  
Economic support
MDR-TB, stigma and ethics

- Adolescents’ experience of MDR-TB and participation in clinical research
  - South African study highlights challenges of stigmatization, body image, particular needs for support in this group
- The ethics of risk-benefit analysis of new TB drugs
  - Beyond traditional “consequentialist” risk-benefit approach, we need to consider broader social context and dynamics
    - These impose the risks on patients who are deciding about complex and potentially fatal disease and treatment
    - Need to consider other principles e.g. reciprocity, solidarity

Zimri et al, PC-1139-06; Silva et al, PC-717-04
ZOONOTIC TUBERCULOSIS
Adrian Muwonge
Human Tuberculosis due to *Mycobacterium bovis* in the United States, 2006–2013

Zoonotic TB accounts for 1.4-1.6% of TB cases in the US

It typically affects: Female, Hispanics and or Foreign-born patients, Patients living along the U.S.-Mexico border region, Children (<15 years of age), who present with EPTB
Human tuberculosis due to *Mycobacterium bovis* in England, Wales and Northern Ireland: a 13 year national cohort analysis of the epidemiology

357 culture confirmed *M. bovis* TB cases, ranging from 17 in 2002 and 35 in 2014

72% of cases were **UK born**
most of who where **65+ years**

Majority of **non-UK born** case were resident in **London**

Most cases in the **Agricultural sector**
Or had contact with animals
Pathogens isolated in Human samples in India

<table>
<thead>
<tr>
<th>Specimen</th>
<th>M.tb</th>
<th>M.bovis</th>
<th>M.tb + M. bovis</th>
<th>Total N-PCR Positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSF (212)</td>
<td>6</td>
<td>36</td>
<td>22</td>
<td>42</td>
</tr>
<tr>
<td>Endometrial Biopsies (393)*</td>
<td>109</td>
<td>14</td>
<td>14</td>
<td>123</td>
</tr>
<tr>
<td>Pleural Fluid + Sputum (58)*,**</td>
<td>20</td>
<td>-</td>
<td>-</td>
<td>20</td>
</tr>
<tr>
<td>Total (663)</td>
<td>135 (20.4%)</td>
<td>50 (7.5%)</td>
<td>36 (5.4%)</td>
<td>185 (27.9%)</td>
</tr>
</tbody>
</table>
### Distribution of Mycobacteria isolation in Cattle Samples, India

<table>
<thead>
<tr>
<th>Specimen</th>
<th>M.tbc</th>
<th>M.bovis</th>
<th>M.tbc + M.bovis</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSLG (64)</td>
<td>10</td>
<td>15</td>
<td>03</td>
<td>28</td>
</tr>
<tr>
<td>Blood (64)</td>
<td>12</td>
<td>12</td>
<td>01</td>
<td>25</td>
</tr>
<tr>
<td>Milk (61)</td>
<td><strong>19</strong></td>
<td><strong>19</strong></td>
<td>07</td>
<td>45</td>
</tr>
<tr>
<td>Total (189)</td>
<td>41</td>
<td>46</td>
<td>11 (10.5 %)</td>
<td>98 (51.9 %)</td>
</tr>
</tbody>
</table>

- **M.tbc**: 39.0% (41 of 106)
- **M.bovis**: 43.8% (46 of 106)
- **Total (M.tbc + M.bovis)**: 10.5% (11 of 106)

---

**Prof. H. Krishna Prasad**

**TB Immunology Lab**

**Department of Biotechnology**

**All India Institute of Medical Sciences**
### Bacteriology (Culture) and Molecular Typing of Cattle Samples Screened at the Abattoir in Nigeria (2013-2015)

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>CATEGORY</th>
<th>FREQUENCY</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of suspected tuberculous lesions collected</td>
<td>North</td>
<td>210</td>
<td>76.1</td>
</tr>
<tr>
<td></td>
<td>South</td>
<td>66</td>
<td>23.9</td>
</tr>
<tr>
<td>Total number of culture positive samples</td>
<td>North</td>
<td>109</td>
<td>69.9</td>
</tr>
<tr>
<td></td>
<td>South</td>
<td>47</td>
<td>30.1</td>
</tr>
<tr>
<td>Total number of <em>M. bovis</em></td>
<td>North</td>
<td>59</td>
<td>68.6</td>
</tr>
<tr>
<td></td>
<td>South</td>
<td>27</td>
<td>31.4</td>
</tr>
<tr>
<td>Total number of NTM</td>
<td>North</td>
<td>13</td>
<td>48.1</td>
</tr>
<tr>
<td></td>
<td>South</td>
<td>15</td>
<td>52.9</td>
</tr>
</tbody>
</table>
### BACTERIOLOGY (CULTURE) AND MOLECULAR TYPING OF LIVESTOCK WORKERS SCREENED IN NIGERIA (2013-2015)

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>CATEGORY</th>
<th>FREQUENCY</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of participants screened</td>
<td>Traders</td>
<td>114</td>
<td>70.1</td>
</tr>
<tr>
<td></td>
<td>Butchers</td>
<td>70</td>
<td>29.9</td>
</tr>
<tr>
<td>Total number of culture positive samples</td>
<td>Traders</td>
<td>7</td>
<td>58.3</td>
</tr>
<tr>
<td></td>
<td>Butchers</td>
<td>5</td>
<td>41.7</td>
</tr>
<tr>
<td>Total number of <em>M. tuberculosis</em></td>
<td>Traders</td>
<td>1</td>
<td>20.0</td>
</tr>
<tr>
<td></td>
<td>Butchers</td>
<td>4</td>
<td>80.0</td>
</tr>
<tr>
<td>Total number of NTM</td>
<td>Traders</td>
<td>6</td>
<td>85.7</td>
</tr>
<tr>
<td></td>
<td>Butchers</td>
<td>1</td>
<td>14.3</td>
</tr>
</tbody>
</table>

S. Cadmus et al - University of Ibadan, Nigeria
A novel lateral flow test developed in the veterinary context for Zoonotic TB diagnostics

Detects whole *M. bovis* cells

Good detection sensitivity

Excellent detection specificity

"A novel rapid test able to distinguish *Mycobacterium bovis* from other MTB complex species in liquid and solid cultures."

Linda D. Stewart and Irene R. Grant
Institute for Global Food Security
Animal transmission models to inform TB vaccine development

Cough and sneeze
Social
THANK YOU AND SEE YOU IN LIVERPOOL