Assessing Tuberculosis Management and Prevention in Rural and Semi-urban Ethiopia

Current practice and opportunities for improvement

Jamie Cowan, MD MPH
Jessica Greenberg, MPH
University of Washington
The disease burden of tuberculosis globally and in Ethiopia

Goals and description of our project

Preliminary findings: strengths and weaknesses of the current TB program in Ethiopia

Recommendations
The Global Burden of TB

<table>
<thead>
<tr>
<th></th>
<th>New Cases</th>
<th>Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total TB Cases</td>
<td>9.4 million</td>
<td>1.3 million</td>
</tr>
<tr>
<td>MDR TB Cases</td>
<td>511,000</td>
<td>150,000</td>
</tr>
<tr>
<td>XDR TB Cases</td>
<td>50,000</td>
<td>30,000</td>
</tr>
</tbody>
</table>

• HIV related TB accounts for 1.4 million cases, approximately 15% of all TB cases
• Globally an estimated 2 billion people have latent TB

WHO Global TB Report 2009
The Incidence of Tuberculosis per 100,000 Population in African Countries in 1990 and 2005

*HIV Incidence among patients with TB is ~19% in Ethiopia

TB incidence in Africa 1990 and 2005 from Chaisson and Martinson, NEJM 2008;358:1089
Combating the TB Epidemic

- The WHO/STOP TB Strategy launched in 2006
  - Pursue high quality DOTS expansion and enhancement
  - Address TB/HIV, MDRTB, and poor/vulnerable populations
    - The 3 I’s
    - Health-system strengthening based on primary care
    - Engage all care providers
    - Empower people with TB, and communities through partnership
    - Enable and promote research

- Dr. Hopewell, a TB expert from UCSF, advocates for:
  - Integration of care
  - Identification of Cases
  - Interruption of transmission

- Dr. Chaisson, a TB expert from Johns Hopkins, suggests:
  - Find the TB that is there
  - Treat the TB once it is found
  - Prevent transmission/infection
Burden of HIV Associated TB

- Globally tuberculosis is #1 cause of death in HIV patients

- Autopsy studies from Botswana, Ivory Coast, and DRC reported that 30-40% of HIV-infected adults die from tuberculosis

- Incidence of TB doubled in Africa between 1990-2005, approx 149 to 343 cases per 100,000
ART and the Incidence of TB

- 60-80% reduction of the incidence of active TB in 2 large observational studies in Europe and the US. (low HIV, low TB settings, HAART)\(^1,2\)

- In a high TB/HIV transmission setting in Brazil 80% reduction in the incidence of active TB using HAART\(^3\)

---

\(^1\) Girardi E. AIDS 2000. \(^2\) Jones JL. Int J Tuberc Lung Dis 2000  
\(^3\) Santoro Lopes G. Clinical Infectious Diseases 2002
International Training and Educational Center for HIV/Health (I-TECH)

- NGO based at UW that supports the development of a skilled work force and functional national health system in more than 14 countries across Africa, Asia, South America and the Caribbean.
  - Clinical mentoring for health care workers
  - Develops infrastructure, hospitals, labs, schools
  - 600 staff, 85% of whom are hired locally

- Funded by PEPFAR, USAID, CDC, DOD, HRSA

- In Ethiopia provides clinical mentoring at 43 hospitals in Amhara, Tigray, and Afar originally focused on HIV
22 High Burden Countries account for 80% of the Global TB Burden per WHO

| Country       | Population 1000s | Incidence | Prevalence | Mortality | HIV/Prevalence in Incident TB cases
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number 100s</td>
<td>ALL FORMS</td>
<td>smear-positive</td>
<td>ALL FORMS</td>
<td>smear-positive</td>
</tr>
<tr>
<td>India</td>
<td>1103371</td>
<td>1852</td>
<td>168</td>
<td>1627</td>
<td>75</td>
</tr>
<tr>
<td>China</td>
<td>1315844</td>
<td>1319</td>
<td>180</td>
<td>593</td>
<td>45</td>
</tr>
<tr>
<td>Indonesia</td>
<td>222781</td>
<td>533</td>
<td>239</td>
<td>240</td>
<td>108</td>
</tr>
<tr>
<td>Nigeria</td>
<td>131530</td>
<td>372</td>
<td>283</td>
<td>126</td>
<td>123</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>141822</td>
<td>322</td>
<td>227</td>
<td>145</td>
<td>102</td>
</tr>
<tr>
<td>Pakistan</td>
<td>157935</td>
<td>286</td>
<td>181</td>
<td>129</td>
<td>82</td>
</tr>
<tr>
<td>South Africa</td>
<td>47432</td>
<td>232</td>
<td>600</td>
<td>116</td>
<td>245</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>77431</td>
<td>266</td>
<td>344</td>
<td>118</td>
<td>152</td>
</tr>
<tr>
<td>Philippines</td>
<td>83654</td>
<td>242</td>
<td>291</td>
<td>109</td>
<td>131</td>
</tr>
<tr>
<td>Kenya</td>
<td>14455</td>
<td>220</td>
<td>641</td>
<td>94</td>
<td>275</td>
</tr>
<tr>
<td>Uganda</td>
<td>28816</td>
<td>106</td>
<td>369</td>
<td>46</td>
<td>158</td>
</tr>
<tr>
<td>Thailand</td>
<td>64233</td>
<td>91</td>
<td>142</td>
<td>41</td>
<td>63</td>
</tr>
<tr>
<td>Mozambique</td>
<td>19792</td>
<td>89</td>
<td>447</td>
<td>37</td>
<td>185</td>
</tr>
<tr>
<td>Myanmar</td>
<td>50519</td>
<td>86</td>
<td>171</td>
<td>38</td>
<td>76</td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>132000</td>
<td>78</td>
<td>200</td>
<td>32</td>
<td>245</td>
</tr>
<tr>
<td>Cambodia</td>
<td>140713</td>
<td>31</td>
<td>506</td>
<td>32</td>
<td>226</td>
</tr>
<tr>
<td>Afghanistan</td>
<td>298633</td>
<td>50</td>
<td>168</td>
<td>23</td>
<td>76</td>
</tr>
<tr>
<td>High-burden countries</td>
<td>4045482</td>
<td>7033</td>
<td>174</td>
<td>3117</td>
<td>77</td>
</tr>
<tr>
<td>Africa (AFR)</td>
<td>738083</td>
<td>2529</td>
<td>343</td>
<td>1088</td>
<td>147</td>
</tr>
<tr>
<td>Americas (AMR)</td>
<td>890757</td>
<td>352</td>
<td>39</td>
<td>157</td>
<td>18</td>
</tr>
<tr>
<td>Eastern Mediterranean (EMR)</td>
<td>541034</td>
<td>565</td>
<td>104</td>
<td>253</td>
<td>47</td>
</tr>
<tr>
<td>Europe (EUR)</td>
<td>882395</td>
<td>448</td>
<td>50</td>
<td>199</td>
<td>23</td>
</tr>
<tr>
<td>South East Asia (SEAR)</td>
<td>1656329</td>
<td>2993</td>
<td>181</td>
<td>1399</td>
<td>81</td>
</tr>
<tr>
<td>Western Pacific (WPR)</td>
<td>1752283</td>
<td>1927</td>
<td>110</td>
<td>866</td>
<td>49</td>
</tr>
<tr>
<td>Global</td>
<td>6461751</td>
<td>8111</td>
<td>136</td>
<td>3902</td>
<td>60</td>
</tr>
</tbody>
</table>

* All estimates include TB in people with HIV.

* Prevalence of HIV in incident TB cases in adults aged 15–49 years.
WHO 2008 estimates for Tuberculosis burden in Ethiopia

Population of Ethiopia 81,021,000

Incidence Ratio--all forms of TB 379 per 100,000

Incidence Ratio of SS +veTB 168 per 100,000

Prevalence of TB infection 643 per 100,000

Mortality rate due to TB 84 per 100,000

1.6% of newly identified cases were MDRTB
12% of re-treatment cases were MDR-TB
Estimated 5-6000 new MDRTB cases each year in Ethiopia
HIV Prev. among TB patients – 19%
The Burden of TB - Ethiopia

Hospital Data from the FMOH

- TB is a leading cause of morbidity
- TB is the fourth leading cause of hospital admission
- TB is the second leading cause of hospital death
# Ethiopia TB Case Detection Rate by Region 2008/09: FMOH

<table>
<thead>
<tr>
<th>S/N</th>
<th>Regions</th>
<th>Population</th>
<th>New Smear Positive TB</th>
<th>All forms of new TB Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Annual Estimate ( 168 per 100,000)</td>
<td>Cases Detected</td>
</tr>
<tr>
<td>-----</td>
<td>-----------</td>
<td>--------------</td>
<td>------------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>1</td>
<td>Tigray</td>
<td>4,541,724</td>
<td>7,630</td>
<td>1,953</td>
</tr>
<tr>
<td>2</td>
<td>Afar</td>
<td>1,485,423</td>
<td>2,496</td>
<td>1,471</td>
</tr>
<tr>
<td>3</td>
<td>Amhara</td>
<td>18,120,824</td>
<td>30,443</td>
<td>6,948</td>
</tr>
<tr>
<td>4</td>
<td>Oromiya</td>
<td>28,589,071</td>
<td>48,030</td>
<td>17,567</td>
</tr>
<tr>
<td>5</td>
<td>Somali</td>
<td>4,672,984</td>
<td>7,851</td>
<td>1,495</td>
</tr>
<tr>
<td>6</td>
<td>Benshangul</td>
<td>706,185</td>
<td>1,186</td>
<td>458</td>
</tr>
<tr>
<td>7</td>
<td>SNNPR</td>
<td>15,834,911</td>
<td>26,603</td>
<td>10,429</td>
</tr>
<tr>
<td>8</td>
<td>Gambella</td>
<td>323,083</td>
<td>543</td>
<td>247</td>
</tr>
<tr>
<td>9</td>
<td>Hareri</td>
<td>193,002</td>
<td>324</td>
<td>308</td>
</tr>
<tr>
<td>10</td>
<td>Addis Ababa</td>
<td>2,882,488</td>
<td>4,843</td>
<td>3,027</td>
</tr>
<tr>
<td>11</td>
<td>Dire Dawa</td>
<td>360,886</td>
<td>606</td>
<td>493</td>
</tr>
<tr>
<td>-----</td>
<td>-----------</td>
<td>--------------</td>
<td>------------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td></td>
<td>National</td>
<td>77,710,579</td>
<td>130,554</td>
<td>44,396</td>
</tr>
</tbody>
</table>
FIGURE 1.28
DOTS progress in high-burden countries, 2006–2007. Treatment success refers to cohorts of patients registered in 2005 or 2006, and evaluated, respectively, by the end of 2006 or 2007. Arrows mark progress in treatment success and DOTS case detection rate. Countries should enter the graph at top left, and proceed rightwards to the target zone. Countries from AFR, AMR, EMR and EUR are shown in red, those from SEAR and WPR are shown in black.

WHO Data from “Global Tuberculosis Control 2009”
Ethiopia TB Treatment Success Rate (%) 2008/09: FMOH
A Brief Timeline of Tuberculosis and Leprosy Control in Ethiopia

- 1960s - TB Sanatoria established
- 1976 – Establish National Tuberculosis Control Program (NTCP)
- 1992 - TB DOTS first piloted
- 1994 - Central office of NTCP combined the TB & Leprosy control Programs – TBL prevention & Control Team established
- 1995 - Project Development Plan (PDP) for 1996-2000
- 1996 - Tripartite Agreement signed: FMOH, WHO, KNCV to implement DOTS all over the country
- 1997 - PDP implemented
- 1997 - TB and Leprosy control program is integrated into the general health services
- 2001 - Full integration of TB & L Control program
- 2004 - Initial rollout of TB/HIV collaborative activities
Project Goals

- Explore current TB management and prevention strategies through focus groups and interviews with health care personnel in Amhara and Tigray at ITECH clinical mentoring hospitals

- Identify factors that enhance and hinder TB service delivery

- Provide recommendations for future ITECH projects and partnerships
Study Methodology

- Develop open-ended interview protocol to explore TB management and prevention activities, elicit HCW belief system vis a vis the TB program and identify gaps between written government protocols and actual practice.

- Obtain UW, EPHA, CDC, Harvard and ITECH IRB and technical approval (no small feat)

- Identify 5 ITECH clinical mentoring hospitals as study sites (low volume and high volume)

- Identify and stratify subjects into one-on-one interviews and focus groups

- Analyze qualitative data; provide recommendations
Why a qualitative study?

- Routine ministry and ITECH data collection captures many of the raw numbers of patients on treatment and the gap between estimated prevalence and treatment rates.
- These quantitative measures do not illuminate which systems are malfunctioning in which ways.
- Qualitative data illuminates process, and is essential for quality improvement.
Study sites: public sector hospitals

- Amhara
  - Gondar University Hospital (Regional referral hospital and medical school)
  - Felege Hiwot Hospital, Bahir Dar (Regional referral hospital)
  - Fenote Selam District Hospital (Secondary hospital)

- Tigray
  - St. Mary’s Hospital, Axum
  - Mekele Hospital (Regional referral hospital)
Subjects

- Physicians – 21
  - GP, Internal Medicine, Pediatricians, Medical Directors
- Nurses – 31
  - DOTS, ART, Wards, OPD, Triage
- Health Officers – 6
- Pharmacists – 4
- Laboratory Technicians – 11
- Sanitarian – 1
- Total Participants – 74
  - 18 Interviews, 25 Focus Groups
Study Results:
Strengths and weaknesses of the current system

- Case identification
- TB treatment/management
- Infection control
- Integration of services
- Health care worker retention
Background Information:
Current TB treatment in Tigray and Amhara

- There is some limited knowledge about TB and its symptoms in the community

- Patients often delay initial visit during farming season, often first visit a local healer and if this doesn’t work then travel to a local health center. These centers often have no doctor, and no CXR; irregular sputum capacity.

- Often referred to district hospital for evaluation by doctor or HO, CXR, sputum, and diagnosis

- Return home and travel daily for DOTS therapy for two months, then pick up meds weekly/monthly for 4 more months. Meds occasionally may not be in stock.
Delayed Diagnosis of TB

Threshold for visibility of AFB by smear microscopy

- Infection of healthy patient
- Patient visits clinic: no diagnosis made
- First smear: AFB negative
- Patient visits pharmacy
- Blood appears in sputum; infant daughter infected with TB
- Too weak to work

AFB+: TB diagnosis made

Hopewell, Presentation entitled “Global Challenges in TB Care and Control”
Case Identification

- Delays in diagnosis result in worse outcomes, and greater exposure to index case by household and community members.

“One problem may be that our society in the rural areas is that they do not seek medical attention fast enough. They seek medical attention when they get time after doing their farm activities. By the month of January/February. Their complaint is a year back, long long history….being a source of infection for other patients.” -GP
Case Identification

- The current system for diagnosis is passive, not active.
  - Ethiopia’s 30,000 Health Extension Workers (HEW) are not actively screening for TB
  - No system for household screening
  - Studies in Morocco and by Chaisson demonstrate the benefit of active screening – led to 15-25% of total diagnosis for TB cases in regions where it was implemented
  - There is no communication between HEWs, health centers, and referral hospitals
Diagnostic Challenges: Laboratories

- Acid-fast smears are the only diagnostic lab test available, and one site did not have any reagents.

- Very low sputum-positive rates throughout study sites
  - Saliva vs. real sputum samples
  - Ineffective reagents
  - Excessive workload on staff, unable to look at the recommended number of fields
  - No consistent external validation
  - Limited training for laboratory staff, often rotating jobs
  - Concern that too many patients are being screened, or that the assumptions behind the calculated rate are wrong
  - Many HIV patients with TB are not sputum positive

“I have been here for five months; I have sent fifty sputums, but only two were positive.” -GP
Ethiopia TB Laboratory
Case Identification: Laboratories

TB Culture

- Currently there is only one laboratory in all of Ethiopia that is capable of doing TB culture and sensitivity testing.

- Laboratory and clinicians were emphatic about the need for culture and resistance testing for their patients.

“There must be cultures. We don’t have cultures even for sputum. If patients become resistant to drugs, we send to Addis if he has money (which is rare). If he does not, he dies here.”
- DOTS Nurse
Case Identification: Relying on guesswork

- Challenging to diagnose TB by history, particularly in HIV patients
  - Treatment is time consuming, and not benign

- CXR inconsistently available; radiology reads generally not available.

- Pediatric diagnosis even less certain, with no sputum production
  - Several clinicians asked for PPD testing, bronchial lavage/aspiration

- TB lymphadenitis is a common diagnosis for patients undergoing TB treatment, but there are many other causes of lymphadenitis
  - Some clinicians would like FNA to facilitate diagnosis

- Concern by some clinicians that there may be over diagnosis and over treatment of TB. Several respondents said that patient’s “like” to explain symptoms as TB, less stigma than HIV or other diseases
Case Identification: Recommendations

- Promote **active** case findings
  - HEW’s, and community mobilization/education
  - Actively screen and follow families of new index cases; utilize case worker model
  - Address patient and system delays in diagnosis
  - Work with private health centers to facilitate diagnosis

- Continue screening all HIV pts for TB, and all TB patients for HIV

- Continue to study the epidemiological dynamics
Case Identification: Recommendations

- Improve diagnostic capability and tests
  - Provider education
  - Study and improve smear detection rates
  - Implement widespread use of culture and sensitivity testing, CXR

- Continue to develop and implement new tools:
  - Provide culture facilities
  - Fluorescent staining of smears
  - LAM
  - Nucleic acid assays like Gene Xpert
  - Line probe assays like Hain Genotype
TB Treatment in Ethiopia

- Outpatient treatment and DOTS centers
- Inpatient treatment
- IPT
- MDR-TB
- Pharmacy concerns
  - Procurement
  - Quality of the medications
  - Drug formulary and doses
  - Integration with HIV care
TB Treatment Algorithm

Flow chart for follow-up of new smear-positive pulmonary TB patients

Month week

0 0
New smear positive patient
Start intensive phase

2 8
Start continuation phase
Neg
Smear at end of 2nd month
Pos (2x)
Give 1 more month intensive phase

3 12
Start continuation phase

5 20
Continue continuation phase
Neg
Smear at end of 20th month
Pos (2x)
Treatment Failure (needs re-treatment)

7 28
Provide final 4 weeks of treatment
Neg
Smear at end of 7th month
Pos (2x)
Treatment Failure (needs re-treatment)

8 32
Cured
TB Treatment: Outpatient Centers and DOTS

- There has been decentralization of DOTS to health centers
  - No HEW/community level treatment
  - Concern that current system imposes time and financial pressure on patients

- In general screening for HIV among TB pts, PICT, is improving

- Improved national standards for documentation but still inadequate

- Concern among DOTS team that TB and DOTS has been neglected by the FMOH during the last decade

- Sites are working to improve communication between DOTS and HIV offices
TB Treatment: Inpatient Care

- There is no medicine administration record for in-patients, unclear adherence to DOTs by admitted patients
  - Irregular dosing particularly problematic for PO medications

“To be exact, to be on time to administer the drugs is less likely, to be frank. I have faced many problems with missed doses. I have encountered many children without medications as prescribed. So sometimes it may be erratic.”  
  —Specialist Physician

- TB medications are only available through the DOTS office, so the patient or family member must go there each day to collect TB meds

- 4/5 facilities charge patients who must then pay out of pocket for inpatient care.

- Less consistent screening for HIV among inpatients with TB in ward patients
The WHO recommends IPT for patients diagnosed with HIV and who do not have active TB
- Initial data suggested 6-9 months of therapy
- Cochrane Review from 2006
  - 36% decreased relative risk for all comers
  - 62% decreased relative risk for patients with a positive PPD
- Recent data from Chaisson suggests that 36 months may be better
- Further studies underway, looking at shorter treatments and using multiple medications for prophylaxis

IPT is also indicated for HIV negative children <5 who are exposed to active pulmonary TB in their homes
IPT in Ethiopia

- Currently IPT is being slowly rolled out in Ethiopia
  - 2 of the 3 ITECH hospital sites in Amhara offer IPT
  - No reports of health centers offering IPT
  - No sites in Tigray offer IPT to adults or children
  - Per report the regional health director is concerned that the low case detection rate and the use of IPT may lead to resistance and MDR-TB among pts with active disease
  - Many health providers that we spoke to support IPT and are frustrated by the cost of inaction
St. Peter’s Hospital in Addis
TB Treatment in Ethiopia: Medication Procurement

- Challenges with medication procurement
  - Multiple sources and supply lines for meds following vertical funding streams
  - Inconsistent supply and delivery time
    - Each site reported shortages in the last year of essential TB medications and supplies including EH, RH, INH, streptomycin, AFB supplies, and X-ray film
  - Some medications delivered near or past expiration date
TB Treatment in Ethiopia: Drug formulary and doses

- The continuation phase is Ethambutol/INH
  - This has poorer cure rates than Rifampicin/INH

- There are no pediatric doses of TB meds

- Pills are combo pills to prevent resistance
  - Problematic when there are side effects
  - Difficult to tailor a regimen with HIV medication

- There are no medications for MDR-TB
TB Treatment in Ethiopia: Recommendations

- Decentralize DOTS to community level
  - Train family members or have HEWs deliver DOTS to pts at home
  - Expand DOTS to effectively cover the entire country

- Develop a cadre of TB case workers who can identify and track down defaulters
  - ensure treatment completion
  - avoid the emergence of resistance
  - Consider expanding financial and food subsidies to patients

- Develop an inpatient MAR for all PO and IV meds

- Improve communication between DOTS clinics, HIV clinics, pharmacy, OPD and inpatient wards

- Support standardization of data collection efforts and incentivize honest reporting
TB Treatment in Ethiopia: Recommendations for treating MDR-TB

Urgent scale up of Addis MDRTB pilot to regional facilities
- Support introduction of culture and sensitivity testing at regional facilities
- Ensure appropriate infection control measures
- Develop a mechanism for communication of sputum culture results to patients
- Ensure adequate drug supply for MDRTB regimens
- Develop trainings for staff regarding the management of MDRTB: drug regimens, interactions, side effects, infection control, length of treatment etc.
TB Treatment in Ethiopia: Recommendations

Drug/Supply Recommendations

- Ensure a consistent and efficient procurement system for TB drugs and supplies
  - Reduce delivery of expired and near expired medications
- Consider introduction of PPD/TST to determine pediatric (<5) exposures

Drug Formulary

- Support the government plan to transition from EH to RH as soon as possible
- Ensure that appropriate pediatric formulations are available at each site
- Add INH to the formulary in every center for IPT
- Add MDR-TB medications to formulary at sites that will start treatment
TB Treatment in Ethiopia: Recommendations for IPT

- Implement IPT throughout the entire country for all eligible patients
  - Begin to offer this in health centers
  - Further refine the plan to identify candidates, screen for active disease, and maintain adherence
  - Address specific concerns in Tigray
    - Improve diagnostics for active TB cases
  - Ensure adequate INH supply and pediatric formulation
  - Allow for changes in IPT standards/protocols as is dictated by emerging data
Infection Control (IC): A key to improvement

Basic infection control remains **major challenge** in all facilities visited

- Patient to patient transmission
- Patient to HCW transmission

TB, OPD, HIV office waiting area, district hospital, Tigray
Transmission of *M. tb*

**CASE**
- Site of TB
- Cough
- Bacillary load
- Treatment

**CONTACT**
- Closeness and duration of contact
- Immune status
- Previous infection

**Environment**
- Ventilation
- Filtration
- U.V. light

Hopewell, Presentation entitled “Global Challenges in TB Care and Control”
Infection Control: Healthcare worker risk

“We see a lot of medical students [with TB], we see interns also…last year, two medical students, one had been started on anti-TB, she developed drug induced hepatitis and she finally died. And we do have a classmate who has discontinued his medical education and he was forced to stop his medical education [because of MDRTB infection.]” - GP

- Multiple key HCW unable to work because of own infection

- Estimate 20-25 staff out of work due to active TB in past two years, multiple staff co-infected with TB/HIV
Infection Control: Risk to healthcare workers

- No systematic voluntary screening of HCW for TB or HIV
- HC workers that have HIV have no protected way to minimize their exposure to TB patients.
- HC workers that develop TB do not have insurance, and may lose wages and face costs of hospitalization

- No sites provide N95 masks to employees
- Poor ventilation in wards & many exam rooms
- No system for sputum disposal
- Inactive IC committees
- Sanitarians unaware of principles of TB related IC
- Misinformation among medical staff and nurses
Infection Control: Risk to healthcare workers in MDRTB era

- Iatrogenic MDRTB transmission likely fatal
- Iatrogenic infection is a major source of worry, which influences quality of patient care

“It is especially scary to have MDR-TB on the ward. You are always in fear examining them, and you may not visit them as much.

–Medical Intern
Infection Control: Patient Risk

All sites have outpatient triage, but none are actively triaging coughing patients, or facilitating expedited work-ups for TB suspects:

- There is some cough hygiene education
- Some facilities have joint waiting areas for TB, HIV and pediatric patients

Only 2 of 5 hospitals had separate inpatient wards for TB patients, and even these were poorly ventilated

- One site recently decommissioned its TB ward b/c of nursing shortage
- One site w/ separate TB ward under construction
- Ventilation was inadequate in almost every ward we visited
- There is widespread belief among patients and some HC staff that drafts cause illness, and many ward windows were closed
- The two sites with isolation wards for TB patients frequently place inpatient TB suspects in the general ward during their diagnostic process, (3+ days for AFB). These patients are then asked to produce a daily morning sputum while sitting in their beds in mixed wards.
Infection Control and Prevention: Recommendations

MAKE INFECTION CONTROL A PRIORITY

- Build capacity for early, active case finding for TB
- Continue PICT protocols for TB and HIV
- Develop a national campaign to assess and implement infection control measures at health centers and hospitals
  - Train an infection control committee/steward at each site
  - Build HCW knowledge
  - Continue to invest and facilitate necessary infrastructure changes to protect patients and staff
    - Separate TB wards
    - Improved ventilation systems
    - Screen for cough at triage, have separate waiting areas, and expedite work-ups for patients suspected of having TB, separate inpatient TB suspects
  - Provide N95 masks for HC workers caring for patients with active TB
  - Provide systematic opt-out annual TB/HIV screening for all employees
  - Guarantee MDRTB treatment for HCW
Health Worker Retention

- Ongoing challenge--massive healthcare worker exodus throughout sub-Saharan Africa
- Recent changes by the government now require medical school graduates to spend 2-4 years as residents in public hospitals before they receive documentation of completed physician training.
Health Worker Retention

- Despite this new policy, very high physician turnover at public hospitals
  - At 3 of the 5 sites we visited every single physician/HO on staff was serving a training requirement
  - One hospital - 5 medical directors in past year
  - Many of the medical directors we met were recent graduates
  - Several rural hospitals were short-staffed because physicians had left for Addis before completing their required service
Health Worker Retention

“I think that we are new graduates from different medical schools, it is difficult for us because we are serving here for at least 3 years. We are not sure that after three years we can do post-graduate education. We are not sure we will get our degree. I want to join post-graduates so for me it is hard. For example we had 2 other GPs a few weeks back but they went to Addis because there was such uncertainty about if they can do post graduate. So they move to live their life.”

–GP, community service position, district hospital
Health Worker Retention

- Factors listed by interviewees that cause HC workers to leave public hospitals
  - Low salaries
    - Relative to private practice, other countries, and NGOs
    - Being near urban areas allowed doctors to have a private practice, making rural areas less attractive
    - Doctors are unable to purchase homes, vehicles, adequately support their families
  - Unrewarding work environment
    - No training
    - Long hours
    - No communication, internet, cell phone coverage
    - No learning resources
    - Poor relationship between hospital administrators and doctors
Health Worker Retention

“Let me say frankly that as long as I am here I am eager to treat these kids. I know that I have to be here and that I have to serve my community or my country with my profession. But you know there are a lot of mitigating things in this country. As a physician this is not a rewarding environment. I do not have my own home, I am renting a house at the back of a house of people who are owning a house. It is a simple thing to be satisfied and to stay at one place.”

– Specialist physician, repaying residency training in public hospital
Healthcare worker retention: Recommendations

- Continue to support efforts to increase educational capacity while ensuring the quality of graduates in all health disciplines
- Continue to transition responsibility taken on by the NGOs to the national and regional health bureaus as appropriate
- Address high physician turnover and burnout through the ministry of health, considering improved salary support, incentives, endowed positions, training and recognition
  - Focus on keeping quality staff in rural areas
  - Ensure that professionals are able to fund children’s schooling
- Support consistent and reliable service requirements so that providers can plan on a fixed timeline for their release from government service
- Develop clearly defined career paths for specialty training and research
- Enhance the management training of hospital administrators
- Further regulate private practice, consider taxing physicians that choose to leave the country and applying revenue to boost salary
How can we translate this knowledge into action?

- Build capacity, not dependence
- No more silos; TB is a primary care problem in Ethiopia
- Support the HCW who will make change possible
Gondar University, Future Ward
Acknowledgements

- Dr. Scott Barnhart
- Dr. Getachew
- Dr. Solomon
- Dr. Teklu
- Dr. Fana
- Dr. Daniel
- Bill Graham, ITECH Ethiopia Country Director
- Dr. Ken Steinberg
- Dr. Scott Weigle
- All of the ITECH mentoring teams
Thank you

Jamie Cowan, MD, MPH
- jcowan22@gmail.com

Jessica Greenberg, MPH
- jgreenberg@hms.harvard.edu