Children are not just small adults

Looking at Tuberculosis through Gender Glasses

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TB, a preventable and curable disease, affects children, BUT

• 1 million estimated cases/year\(^1\)
  – The majority, (61%) are not diagnosed/notified to NTPs
  – Children die: 210,000 in 2015\(^1\)
    • 80% (191,000) of deaths in children <5
    • >96% of deaths occurred in children that did not access treatment

• 67 million children with prevalent TB infection (2014)\(^2\) = at risk of future disease
  – Only 7% of 1.2 million eligible children accessed preventive therapy in 2015\(^1\)

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\(^1\) WHO 2016. Global TB Report
\(^2\) Dodd et al. Lancet ID 2016
\(^3\) Dodd et al. Lancet GH 2017
TB affects child health and survival

• Pneumonia
  – 7.5% culture confirmed\(^1\), 19% clinical TB\(^2\) among (mostly hospitalized) children with severe pneumonia

• Under-nutrition
  – Malnutrition increases risk – TB presents with loss of weight
  – 2-24% TB among acutely malnourished children\(^3\)
  – TB is not adequately addressed in guidelines for management of acute malnutrition in many high TB burden settings\(^3\)

• HIV
  – Co-infection > 50% in some settings
  – Highly increased risk of TB among HIV+ children

\(^1\)Oliwa J, Lancet RM 2015, \(^2\)Nantongo BMC Ped 2013 \(^3\)Patel PHA 2017
The public health response to TB failed children for a long time

Focus of TB programming as well as R&D on adults
TB not part of child health, (HIV) and nutrition programs

- Lack of recording and reporting = no data
- Verticalization of health programs
- Limited resources
- No transmission = no problem
- Prevention not a priority
- Diagnosis difficult = cannot be done
Children rarely involved in novel diagnostic studies of TB

<table>
<thead>
<tr>
<th>Test</th>
<th>Publications*</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Adults</td>
</tr>
<tr>
<td>Fine needle aspiration</td>
<td>&gt; 6000</td>
</tr>
<tr>
<td>Fluorescence Microscopy (FM)</td>
<td>299</td>
</tr>
<tr>
<td>LED-FM</td>
<td>33</td>
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<tr>
<td>MODS</td>
<td>31</td>
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<tr>
<td>BACTEC 960</td>
<td>49</td>
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<tr>
<td>Fully automated BACTEC</td>
<td>13</td>
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<tr>
<td>Line Probe assays</td>
<td>113</td>
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<tr>
<td>LAMP</td>
<td>13</td>
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<tr>
<td>Automated NAAT (Xpert)</td>
<td>32</td>
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</tbody>
</table>

All current diagnostic tests: not feasible at POC, sub-optimal accuracy in children

* Cuevas Ind J Pediatr 2011
Getting children on the global agenda


Stop TB Partnership Childhood TB Subgroup

- Few research groups
- Union Childhood TB WG

Global TB Report 2012: First WHO estimates for childhood TB

CALL TO ACTION for CHILDHOOD TB

Read the Call in French, Read the Call in Russian
## The power of data

<table>
<thead>
<tr>
<th></th>
<th>TB Incidence (0-14)</th>
<th>TB mortality (0-14)</th>
<th>Drug-resistant TB incidence (0-14)</th>
<th>TB Infection</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WHO 1989</strong></td>
<td>1,300,000</td>
<td>450,000</td>
<td></td>
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<tr>
<td><strong>WHO 2012</strong></td>
<td>490,000</td>
<td>64,000 (HIV-)</td>
<td>?</td>
<td>?</td>
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<tr>
<td><strong>WHO 2013</strong></td>
<td>530,000</td>
<td>84,000</td>
<td>?</td>
<td>?</td>
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<tr>
<td><strong>Dodd 2014</strong></td>
<td>650,977</td>
<td></td>
<td></td>
<td>53 million prevalent infection</td>
</tr>
<tr>
<td><strong>Jenkins 2014</strong></td>
<td>999,792</td>
<td>31,948</td>
<td></td>
<td></td>
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<tr>
<td><strong>Dodd 2016</strong></td>
<td>850,000</td>
<td></td>
<td>58,000 INH 25,000 MDR 1,200 XDR</td>
<td>67 million prevalent infection</td>
</tr>
<tr>
<td><strong>WHO 2016</strong></td>
<td>1,000,000</td>
<td>210,000 (incl. 40,000 HIV-)</td>
<td></td>
<td>1.2 million ‘eligible’ for PT</td>
</tr>
<tr>
<td><strong>Dodd 2017</strong></td>
<td></td>
<td>239,000: 181,000 in &lt;5</td>
<td></td>
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</tbody>
</table>
2013: A roadmap for childhood TB
10 steps to zero deaths

- Include the needs of children and adolescents in research, policy development and clinical practices
- Collect and report better data, including data on prevention
- Develop training and reference materials for health care workers
- Foster local expertise and leadership
- Do not miss critical opportunities for intervention
- Engage key stakeholders
- Develop integrated family-centred and community-centred strategies
- Address research gaps
- Meet funding needs for childhood TB
- Form coalitions and partnerships to improve tools for diagnosis and treatment
Since

- Children included in the WHO End TB strategy and Global Plan to End TB
- Global tools and resources
- Regional child TB Task Forces
- Country roadmaps, FPs, WGs
- Child TB increasingly included in TB NSPs
- Country adaptation of guidelines and tools
Pediatric TB R&D funding

**Pediatric TB R&D Funding by Research Category, 2015**
Total: $26,700,543

- **Diagnostics**: $4,446,229 (17%)
- **Basic Science**: $2,184,371 (8%)
- **Vaccines**: $1,893,253 (7%)
- **Operational Research**: $1,757,335 (7%)
- **Drugs**: $16,139,836 (60%)
- **Infrastructure/Unspecified**: $279,520 (1%)

**2011-2015**
- ‘from neglect to significant’, **but**
- ~ 50% of 200m target for pediatric R&D
- 3% of all TB R&D funding in 2011-2015
Innovation
Child friendly Fixed dose combinations

Total orders: 392,785 treatments by 60 countries
  – Delivered 2016-Apr 2017: 169,619 to 27 countries
  – Pending: 222,866 treatments to 33 countries

BUT: Under-diagnosis undermines impact of the FDCs
Integration

1. TB affects child survival as cause or co-morbidity of childhood illness

2. Children affected by TB present to child health services at community or primary care level

3. Need for efficient programming and HSS
Key gaps remain:

- Dedicated capacity at NTP
- Policy-practice
- Decentralization & Integration
Future actions

Country level: The pathway to prevention & cure

- Susceptible
  - Exposed
  - Infected
  - Did NOT access health system
  - Preventive therapy
  - Prevented
    - Died
    - Un/missdiagnosed
    - Access health system
    - Diagnosed
    - Reported
    - Treated
    - Cured

Global level

- Continued advocacy to ensure child TB remains on the agenda (HLM 2018)
- New, effective tools, adequate for children
- Strengthen regional networks and South to South
- Implementation science, evidence for scale-up
Thank you!

WORLD TB DAY MARCH 24

6 out of 10 children did not access quality care in 2015, risking serious illness and death

World Health Organization

unicef

for every child
Impact of Gender on TB

Studies, personal accounts, and potential solutions

David Bryden
TB Advocacy Officer
RESULTS
Comprehensive review – by Yang et al

• While both men and women reported financial barriers to seeking TB services, the nature of these barriers differed. Women were more likely to be financially dependent on others [19, 26], unemployed, or without income [16, 17, 20].

• Women also experienced greater healthcare seeking costs due to transport or the need for an escort [12, 17, 31], which may impact a woman’s autonomy in seeking care.

• While both genders experienced financial barriers to accessing TB services, the majority of studies that found gender-related differences reported that women experienced greater financial barriers than men, and the identified barriers were gender-specific.

• Symptomatic women were more likely to delay or not seek care than symptomatic men when gender-related differences in individual-level delays were reported.

Barriers and Delays in Tuberculosis Diagnosis and Treatment Services: Does Gender Matter? – Yang et al 2014

https://www.hindawi.com/journals/trt/2014/461935/#B48
In Africa – perception of connection to HIV

Study from Zambia:

• Consequences of stigma prevailed both among children and adults and included low self-esteem, insults, ridicule, discrimination, social exclusion, and isolation leading to a decreased quality of life and social status, non-disclosure, and/or difficulties with treatment compliance and adherence.

• Women had significantly more stigma-related problems than men.

Cremers 2015  http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0119861
Gender roles and impact on men:

• **Study from Blantyre, Malawi – Results from focus groups**
  An expectation to provide for and lead their families, and to control various aspects of their lives while facing limited employment opportunities and small incomes leaves men feeling inadequate, devoid of control, and anxious about being marginalised as men.

• ...a widespread view among both men and women was that men should wait until symptoms became unbearable, or use exercise to rid the body of disease.

• “You only seek help when you see that you’re really sick, realising: ‘Oh, I can’t even walk; a few steps and I must sit down.’ Meaning you can’t work either. Only then am I supposed to consider it.” (31-year old father of three, TB patient)

• Being household heads was said to require that men publicly display stoicism even while suffering in private. (Chikovore 2014)

Particular impact in South Asia:

- **Women in India are intensely stigmatized** when they have TB. In both rural and urban settings, they are **offered little support at home**, routinely isolated and discriminated against by close relatives and forced to eat and sleep separately – and yet are still expected to fulfill family obligations and carry out household chores. Married women may be **rejected by husbands and in-laws**, beaten and exiled to their native homes or substituted by a second marriage. They are often held personally accountable for contracting TB – at times as “**divine punishment**” for disreputable behavior – and are believed to pass it on to future generations.

  - Amrita Daftary and Madhukar Pai, McGill University
Violence

• When my husband came to know that I had this disease, he beat me very badly with a stick. I was hospitalised for seven days after that. My husband told to me to take back all the dowries that were paid to him to marry me, and mentioned that he would marry again. My father in-law told everybody about it. – female TB patient in Bangladesh

Impact of myths

**Woman branded witch, murdered in Rajasthan's Kekri**

Monday August 14

The Rajasthan Police on Monday arrested six people for allegedly murdering a 40-year-old woman after branding her a witch in Kekri, a city and a municipality in Ajmer district.

According to police, the incident took place on August 3 wherein the woman was allegedly made to eat faeces, tortured and beaten to death by her relatives who accused her of being a witch.

The woman succumbed to her injuries at the spot, the police said.

The police said that the woman's husband died a month ago because of Tuberculosis, and she was living with her son and daughter.

Impact of pelvic TB

• “Pelvic TB ended up costing me my fertility,” she says, “so all the hopes and dreams my husband and I had for having a family here in our new country came to a grinding halt.”

• “It was a very traumatic experience, because I grew up in a culture where being a mother is a very big part of a woman’s identity,” she says. When you add an infectious disease such as TB to it, it also questions your moral character, because there are so many myths surrounding how you get it.” – Jigna Rao

https://hss.tcnj.edu/2013/03/18/jigna-rao/
Solutions: former patients speaking out

• “When I had TB for the first time, my doctor told me not to talk about it, that it could ‘impact my personal life’ in the future,” she says. “It was an indirect reference to being a lady,” meaning her future marriage prospects.

• For a girl, having TB is almost criminal. We can’t talk about. When people find out they ask you the most insensitive questions.

• Are you normal? Can you still have children? Who will marry you? So many girls approached me and they have all been forbidden to talk about TB.

• Today, we need programs – that are specifically targeted at women. We need counselling for female patients and their families. We need to break this silence around TB in India, especially for women.

-- Nandita Venkatesan, India
Solutions: structural

• Instituting more flexible hours and locations for TB services may help overcome the opportunity cost of lost wages and may improve case detection and treatment initiation among men.

• For women, barriers due to financial dependence may be compounded by the deprioritization of women’s health care within the household below the needs of men and children.

• Because maternal health is prioritized by some households [158], efforts to integrate TB services with maternal healthcare may overcome some financial barriers and facilitate access to TB services among some women. (Yang)
Solutions: communications

• Rhea Lobo -- Former patient, now an activist and advocate:
  • https://youtu.be/m3xfxba27Yk
Solutions: opinion makers

• Bollywood star: Amitabh Bachchan

• https://youtu.be/90FEsA2ogMI
Solutions: building power of community voice

@blessi_k

Great meeting of community reps from TB, PLHIV, IDU, journalists with UN Special Envoy TB Dr. Eric Gooseby @SpeakTB @TAGTeam_Tweets @G_C_T_A
POLITICS

This Disease Can Still Get You Quarantined For Months — And It’s On The Rise

On World Tuberculosis Day, four survivors reveal what it’s like to have “airborne cancer.”

By Lauran Weber

03/24/2016 01:00 pm ET | Updated Mar 24, 2016
Advocacy in Congress
Looking TB through Gender Glasses: Epidemiology and social-cultural aspects at a glance

Sílvia Kelbert
Jhpiego
September 14, 2017
TB, the “perfect storm”

- Airborne disease
- “Disease of poverty”
  - Poor housing/overcrowding, malnutrition, and lack of access to health services
- Associated with HIV
  - TB is a major cause of mortality in HIV/AIDS patients
- Highly stigmatized
Figure 1: Risk factors for Tuberculosis infection and disease.

TB is the 5th top killer worldwide: 1.8 million TB deaths in 2015
TB is ‘more a disease of men than of women’...62% of incident cases in men (2015)

Male: female ratio of adult TB cases detected, prevalence surveys: 2009–2015
Not always…women are heavier affected by TB in some context

- Pakistan: rates of TB cases are 20–30% higher in young females compared with males
- Similar pattern observed in European countries in the early of 20th century
  - Denmark, Norway, England and Wales: rates of TB cases in women were 10–35% higher than in men for ages 15–24 years.

TB in women have severe consequences

- TB kills more women globally than any other single infectious disease
  - In some high HIV burden settings, TB accounted for 15-34% of indirect causes of obstetric mortality
- TB in pregnancy associated with poor outcomes
  - Six-fold increase in perinatal deaths and a two-fold risk of premature birth and low birth-weight
- Infants of HIV-positive women who developed tuberculosis have higher mortality rate
- TB among mothers living with HIV is associated with 2.5 increased risk of MTCT of HIV to the unborn child

"Examing the gender dimensions of Tuberculosis is more than ascertaining which sex has a higher prevalence rate, or a higher case fatality rate. It also includes looking at other issues such as differences in risk of exposure to infection, in health seeking behavior and health systems response, economic consequences, and stigma associated with being known as a tuberculosis patient"
Biological differences and vulnerability - hypothesis

- Men may be more biological vulnerable to Pulmonary TB than women
- TB diagnosis may be more difficult in women
  - Pulmonary TB with different symptoms
  - Different/non typical/less severe TB lung lesions
- TB progresses more quickly in women of reproductive age than in men of the same age group
- Extra-pulmonary TB more frequent in women

- Sex steroid hormones on the immune response to infection
- Variation in the X chromosome vs genetic predisposition to TB
- Nutrition: iron, Vit. D
- Anatomy and physiology of the upper airway and respiratory tract

Neyrolles O. PLoS Med 6(12): e1000199. doi:10.1371/journal.pmed.1000199
Social factors and vulnerability - hypothesis

- Women DO seek care BUT they wait longer (2x) than men for TB diagnosis and treatment
  - Household duties
  - Need to take care of children
- Access to TB services is more difficult for women in some contexts
  - Male family members are unwilling to pay it
  - Women’s health may not be considered as important
- TB is even more stigmatized than in men: divorce, don’t get married
Moving forward…

- Further research to understand better dynamics of TB and underlying causes, including barriers, social aspects
- Data, data, data
  - Data collection, analysis and reporting, systematically
  - Disaggregation by gender, sex, pregnancy status
- Interventions to promote gender equity
  - Maximize the entry points, improve case detection
  - Based on burden of disease and population in need
  - “Different population may need different approaches”
    - Approach to case finding miners may be different for pregnant women
Thank you!