Trends in HIV- and sex-stratified tuberculosis case notifications in Blantyre, Malawi

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Background

WHO's END TB strategy has targets to reduce TB incidence (by 90%) and mortality (by 95%) by 2035 compared to 2015 [1]

The END TB strategy emphasises disaggregation of indicators of TB burden in order to highlight most affected population groups and help targeting of interventions

Disaggregated TB data may also help inform estimated impact of interventions aimed at controlling TB transmission in communities such as TB active case finding (ACF)

Objective

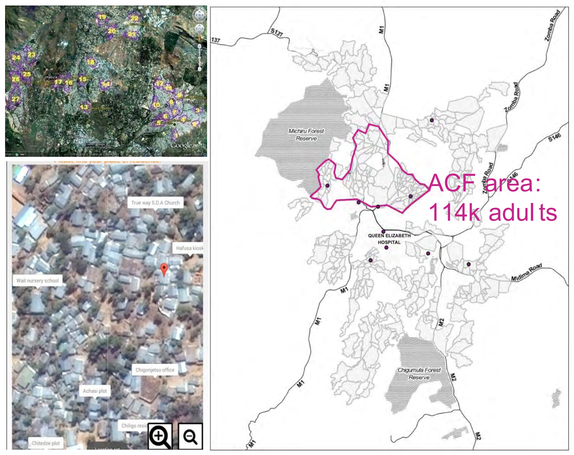
To describe trends in smear+ TB case notification rates (CNRs) in relation to an ACF intervention in Blantyre, Malawi and investigate TB CNR ratios associated with sex, age and HIV status

Methods

An extended monitoring & evaluation system was used to improve reporting of TB cases (numerator for CNRs) in Blantyre in 2009-16

An electronic TB register was used to record patients' age, sex, HIV status and geolocation information (i.e. residence in ACF or non-ACF area).

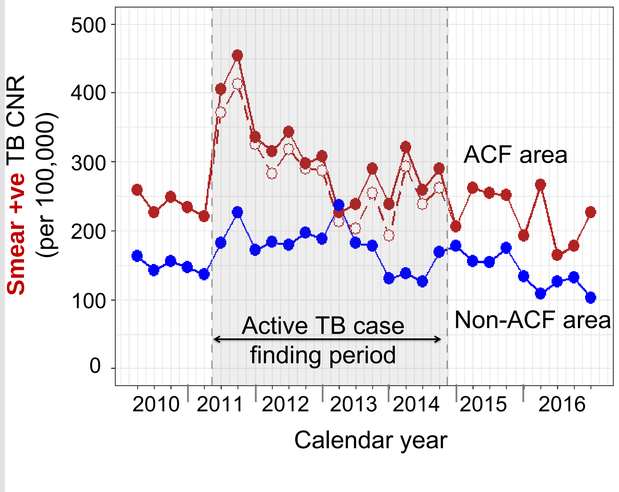
Age-sex population sizes (denominators) were estimated using national census, study area enumeration and HIV prevalence survey data



Study area & methods for collecting geolocation info

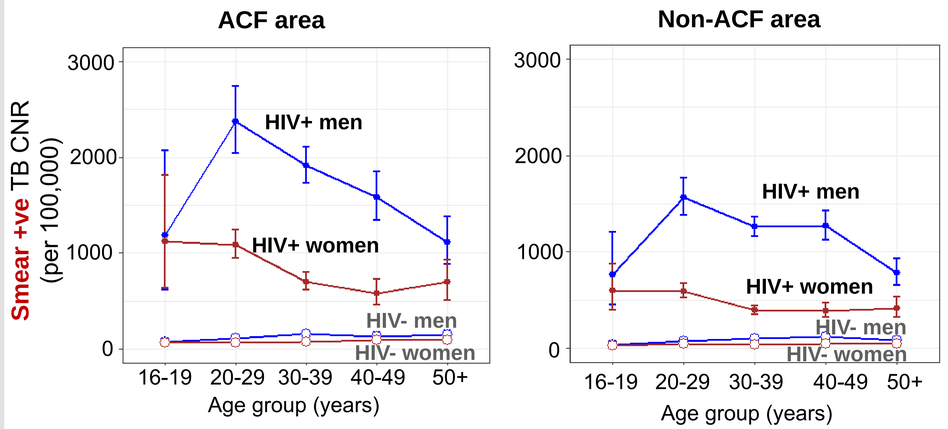
Results

Trend in smear+ TB case notification rates in Blantyre by area



- Smear+ TB CNR before ACF
  - 220 per 100,000
- Peak smear+ TB CNR with ACF
  - 455 per 100,000
- Post-ACF fell again to
  - 206 per 100,000
- Impact mostly indirect
  - 2.5% to 5.9% of quarterly TB cases detected through ACF

Average annual adult smear+ TB case notification rates (data from 2009 to 2016)



- Smear+ TB CNRs highest among young HIV positive men
- 2% of HIV+ men and 1% of HIV+ women had an episode of smear+ TB annually

TB case notification rate ratios by sex, Age and HIV status

Characteristic	CNR Per 100,000	Multivariate CNR ratio (95% CI)	P
Total	202 (197 - 207)		
HIV status			
Negative	73 (70 - 76)	1	<0.001
Positive	874 (845 - 903)	12.7 (11.3 - 14.2)	
Sex			
Female	145 (139 - 151)	1	<0.001
Male	257 (249 - 265)	2.32 (1.97 - 2.72)	
Age group			
16-19 years	63 (56 - 71)	1	<0.001
20-29 years	161 (154 - 168)	1.45 (1.22 - 1.72)	
30-39 years	300 (288 - 312)	1.34 (1.10 – 1.62)	
40-49 years	321 (300 - 342)	1.34 (1.10 - 1.64)	
50+ years	213 (196 - 231)	1.10 (0.88 - 1.37)	

- TB CNRs are adjusted for ACF area and period
- There was interaction between HIV and gender (p= 0.002), compared to HIV- women, the smear+ TB CNR ratios were
  - 1.84 (95% CI: 1.59 to 2.14) among HIV- men,
  - 10.05 (95% CI: 8.63 to 11.70) among HIV+ women
  - 26.07 (95% CI: 15.8 to 43.31) among HIV+ men

Conclusions

TB case-notifications were highest among men and HIV positive individuals

- Increasing access to HIV testing and antiretroviral therapy in sub-Saharan Africa can reduce TB incidence in populations[2]
- High TB burden countries should implement interventions targeting men and address barriers men face in accessing TB care services[3]

TB ACF increased smear+ TB case detection, mostly indirectly
- probably due to ACF's health promotion activities
- TB ACF can to reducing TB transmission in communities[3]

Understanding determinants of TB disease (HIV, age, gender) can help in design of targeted TB prevention and care strategies

References

1. WHO. *Global tuberculosis report*. 2017
2. Gupta A. *TB incidence for individuals on ART*. 2012
3. Horton K. *Gender differences in TB burden.* 2016
4. Dowdy. *Impact of TB active case finding in Asian city.* 2013