South Africa - Infection prevention and control for drug-resistant tuberculosis in South Africa in the era of decentralised care:a whole systems approach

Sweetness H Dube

Report generated on: May 31, 2022

Overview

Identification

ID NUMBER
AHRI.UmoyaOmuhle.Datasets

Version

VERSION DESCRIPTION
V1.0.0

Overview

ABSTRACT
Drug-resistant tuberculosis (DR-TB) is a major threat to global public health, causing one in four estimated world-wide deaths attributable to antimicrobial resistance. In South Africa, DR-TB transmission within clinics, particularly to HIV positive people, is well-documented. Most TB transmission happens before people start TB treatment, but DR-TB transmission may continue after treatment is started, raising concern as DR-TB services in South Africa are decentralised from hospitals to primary care clinics. The extent to which exposure in clinics, as compared to other community settings, drives ongoing transmission of DR-TB requires better definition, to mobilise necessary resources to address this problem. Guidelines for clinics concerning infection prevention and control (IPC) measures to reduce DR-TB transmission are widely available. There is ample evidence that recommended measures are not put into practice, but limited understanding of the reasons. A comprehensive approach to understanding barriers to implementation is required to design effective IPC interventions for DR-TB.

Failure of IPC measures for DR-TB is often attributed to health care workers (HCW) failure to adhere to guidelines. Cognisant that HCW are part of a health system with specific organizational features, we examine how the health system as a whole supports IPC measures. We investigate the biological, environmental, infrastructural, and social dynamics of DR-TB transmission in clinics in two provinces in South Africa (KwaZulu-Natal and Western Cape). Our aim is to provide evidence for effective ways to improve IPC for DR-TB, addressing not only behavioural factors, but also the ways in which clinic space, infrastructure, work and patient flows are managed, and a rights-based occupational health ethos might be cultivated. Our innovative approach brings together a team from several scientific disciplines. Taking a 'whole systems' approach, we will use methods from epidemiology, anthropology, and health systems research to understand the context, practice, and the potential for effective implementation of IPC for DR-TB. We will examine how South African policies on IPC for TB have evolved and been implemented. The epidemiological context will be defined by estimating how much DR-TB transmission happens in clinics compared to other community locations. We will estimate the risk of contact between people with infectious DR-TB and other clients within clinics, and separately estimate, among community members, the frequency of social contacts in clinics as compared to other settings where people meet.

We will use structured and in-depth qualitative methods to document IPC practice in health clinics: the role of clinic design, organisation of care, work practices, as well as HCW, manager, and patient ideas about risk and responsibility in IPC. In collaboration with key stakeholders, we will use health systems mapping and model-building exercises to visually document the environmental and organizational barriers and enablers to implementing optimal DR-TB IPC.

Synthesis of all these data will lead to development of a package of health systems interventions to reduce DR-TB transmission in clinics, adapted to the constraints and opportunities of the South African health system. We will use mathematical and economic modelling to project the potential impact of interrupting clinic-based transmission on community-wide TB incidence, and the consequent economic benefits for health systems and households.

In addition to significant academic, policy and programme-relevant outputs, the project will create an interdisciplinary platform for future implementation and evaluation of health systems strategies to improve IPC. It will stimulate

discussion between researchers working on DR-TB and other drug-resistant infections, and foster greater public

awareness of the importance of systems that minimize the risk of airborne infections in health facilities.

<<Abstract here>> from paper pre-print

Background:

Tuberculosis (TB) case finding efforts typically target symptomatic people attending health facilities. We compared the prevalence of Mycobacterium tuberculosis (Mtb) sputum culture-positivity among adult clinic attendees in rural South Africa with a concurrent, community-based estimate from the surrounding demographic surveillance area (DSA).

Methods:

Clinic: Randomly-selected adults (=18 years) attending two primary healthcare clinics were interviewed and requested to give sputum for mycobacterial culture. HIV and antiretroviral therapy (ART) status were based on self-report and record review. Community: All adult (=15 years) DSA residents were invited to a mobile clinic for health screening, including serological HIV testing; those with =1 TB symptom (cough, weight loss, night sweats, fever) or abnormal chest radiograph were asked for sputum.

Results:

Clinic: 2,055 patients were enrolled (76.9% female, median age 36 years); 1,479 (72.0%) were classified HIV-positive (98.9% on ART) and 131 (6.4%) reported =1 TB symptom. Of 20/2,055 (1.0% [95% CI 0.6-1.5]) with Mtb culture-positive sputum, 14 (70%) reported no symptoms. Community: 10,320 residents were enrolled (68.3% female, median age 38 years); 3,105 (30.3%) tested HIV-positive (87.4% on ART) and 1,091 (10.6%) reported =1 TB symptom. Of 58/10,320 (0.6% [95% CI 0.4-0.7]) with Mtb culture-positive sputum, 45 (77.6%) reported no symptoms.

In both surveys, sputum culture positivity was associated with male sex and reporting >1 TB symptom.

Conclusions:

In both clinic and community settings, most participants with Mtb culture-positive sputum were asymptomatic. TB case finding based on symptom screening in health facilities will miss many people with active disease.

KIND OF DATA
Sputum samples (1035 specimens) clinical data; interviewing of participants-textual data (2055 interviews); health care utilisation survey-textual data participant interviews (90)

UNITS OF ANALYSIS
Various - includes clinical results of sputum sample and qualitative and quantitative textual data from interviews

KEYWORDS
Tuberculosis; sputum; culture-positive; prevalence; South Africa

Coverage

GEOGRAPHIC COVERAGE
KwaZulu-Natal

UNIVERSE
Adult clinic attendees in KZN South Africa - sputum sample

Adult clinic attendees in KZN South Africa - interviews

Adult clinic attendees in KZN South Africa - heath care utilisation survey

Producers and Sponsors

PRIMARY INVESTIGATOR(S)

Name	Affiliation
Govender, Indira	LSHTM

OTHER PRODUCER(S)

Name	Affiliation	Role
Africa Health Research Institute		

FUNDING

Name	Abbreviation	Role
Economic and Social research council	ESRC	

OTHER ACKNOWLEDGEMENTS

Name	Affiliation	Role
Alison Grant	LSHTM / AHRI	PI

Metadata Production

METADATA PRODUCED BY

Name	Abbreviation	Affiliation	Role
Africa Health Research Institute	AHRI		

DDI DOCUMENT ID

DDI.AHRI.UmoyaOmuhle.Datasets

Sampling

Sampling Procedure

The prevalence survey interviewed 2055 participants, collected sputum specimens from 1035 and then attempted to contact 90 of those participants for the health care utilisation survey.

Questionnaires

No content available

Data Collection

Data Collection Dates

Start	End	Cycle
2018-06-25	2019-05-25	N/A

Data Processing

No content available

Data Appraisal

No content available

Documentation

Questionnaires

Questionniare:Social Contacts Questionnaire.2022.V.1.3

Title	Questionniare:Social Contacts Questionnaire.2022.V.1.3
Author(s)	Sweetness H Dube
Date	21/04/2022
Country	South Africa
Language	English
Filename	AHRI.UmoyaOmuhleSocialContactsQuestionnaire.2022.V.1.3.xlsx

Questionnaire:Social Contacts Questionnaire.2022.V.1.3.pdf

Title	Questionnaire:Social Contacts Questionnaire.2022.V.1.3.pdf
Author(s)	Sweetness H Dube
Date	21/04/2022
Country	South Africa
Language	English
Filename	AHRI.UmoyaOmuhleSocialContactsQuestionnaire.2022.V.1.3.pdf

Technical documents

DDI:Umoya Omuhle

Title	DDI:Umoya Omuhle
Author(s)	Sweetness H Dube
Date	31/05/2022
Country	South Africa
Language	English
Publisher(s)	Sweetness H Dube
Filename	AHRI.UmoyaOmuhle.Datasets.v3.pdf