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Tuberculosis and co-existing chronic diseases in West Africa: patterns, causes, and improved diagnosis

Submission date
16/07/2026

Recruitment status
Not yet recruiting

Registration date
20/08/2026

Overall study status
Ongoing

Last Edited
20/08/2026

Condition category
Infections and Infestations

[X] Prospectively registered
[_] Protocol
[_] Statistical analysis plan
[_] Results
[_] Individual participant data
[X] Record updated in last year

Plain English summary of protocol

Background and study aims
Tuberculosis (TB) remains one of the most common serious infections in West Africa. Many people being treated for TB also live with other long-term health conditions at the same time, such as diabetes mellitus, high blood pressure, HIV, or depression, but these are often missed, which can make TB harder to treat and recovery slower. This study aims to find out how often TB occurs alongside other chronic illnesses, who is most affected, and whether newer tools (including artificial intelligence and advanced laboratory testing) can help detect these conditions earlier and improve care.

Who can participate?
People of any age who have just been diagnosed with TB, whether the ordinary (drug-sensitive) form or the harder-to-treat (drug-resistant) form. This includes children, teenagers, and adults.

What does the study involve?
Taking part mainly involves a set of health checks at the start, in addition to a person's normal TB care. These include a chest X-ray reviewed with the help of AI software, tests for TB and drug resistance, a blood test for diabetes, a blood pressure check, and a short questionnaire about mood and wellbeing. Everyone is referred to their nearest TB treatment centre for standard treatment, and anyone found to have another condition is also referred to the appropriate clinic. Participants receive two follow-up phone calls, at around 2 months and 6 months, to check on their treatment and wellbeing. Some participants, healthcare workers, and policymakers in The Gambia and Nigeria are also invited to take part in interviews or group discussions about living with these conditions and the care available.

What are the possible benefits and risks of participating?
Participants benefit from being checked for other health conditions that might otherwise go undetected, and from being referred for treatment if anything is found. The risks are small: the main ones are minor discomfort from a blood test, the time taken to answer questions or attend

an interview, and the possibility that some questions (for example about mood) touch on sensitive topics. This is an observational study, so no new or experimental treatment is being tested.

Where is the study run from?
The study is coordinated by the Medical Research Council Unit The Gambia at the London School of Hygiene & Tropical Medicine (MRCG at LSHTM). It is carried out at eight partner institutions across seven West African countries, including Senegal, The Gambia, Guinea-Bissau, Mali, Burkina Faso, Ghana, and Nigeria.

When is the study starting and how long is it expected to run for?
November 2026 to June 2031

Who is funding the study?
The study is funded by the Global Health EDCTP3 Joint Undertaking

Who is the main contact?
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Study information

Scientific Title
WANETAM-4 TB Work Programme: Clinical and Molecular Epidemiology of TB Multimorbidity in West Africa

Study objectives
1. Determine the prevalence, pattern, and determinants of TB multimorbidity across the life course in West African populations
2. Apply artificial intelligence (AI)-based approaches to enhance diagnosis of TB multimorbidity across the life course
3. Assess the quality of life of individuals with TB multimorbidity, as well as health system capacity and integration and pathways to relevant care within national health systems
4. Determine the influence of multimorbidity on the emergence, evolution, and fixation of drug resistance-associated mutations by microbiology and genomic epidemiology.
5. Define the genetic and strain-related factors that predispose to and/or increase the risk of multimorbidity in drug-sensitive and drug-resistant TB patients.

Ethics approval required
Ethics approval required

Ethics approval(s)
Not yet submitted

Primary study design
Observational

Secondary study design
Cross sectional study

Study type(s)

Health condition(s) or problem(s) studied
Tuberculosis

Interventions
1. To determine the prevalence, patterns, distributions and risk factors of TB multimorbidity across the life course in West African populations
Multicountry cross-sectional study on TB multimorbidity to be conducted at eight WAPIs located in seven TB-endemic West African countries with high TB incidence (i.e., TB incidence rate >40 cases per 100,000 population per year), including Senegal, The Gambia, Guinea-Bissau, Mali, Burkina Faso, Ghana, and Nigeria.
Consecutive recruitment of all newly-diagnosed persons with either drug-sensitive or drug-resistant TB aged <15, 15–49, and >50 years over a 24-month period.

We will use conventional diagnostic tools (e.g., Xpert Ultra and mycobacterial culture for TB, HbA1c for diabetes, blood pressure monitoring) and validated mental health screening scales (e. g., PHQ-9) for depression.
Participants will be referred to the DOTS TB treatment centre nearest their home address for the standard TB treatment according to the respective national TB treatment guideline. Participants with TB multimorbidity will also be referred to the medical outpatient department and/or HIV clinics nearest their home address for treatment and follow-up of the co-morbid condition. Telephone follow-up will be conducted after 2 and 6 months to ascertain well-being and treatment and survival status.

2. To apply artificial intelligence (AI)-based approaches to enhance diagnosis of TB multimorbidity across the life course
This mathematical modelling sub-study that includes application of AI-based approaches will be embedded within the multicountry cross-sectional study on TB multimorbidity (Task 1.1).
Evaluate the performance of the optimised AI-based qXR/qTrack computer-aided detection (CAD) for TB device (Qure.ai) for the diagnosis of TB and comorbidities within the national public health systems in West Africa.
Use mathematical modelling with multimodal AI-driven tools to develop predictive models for TB-NCD risk to enhance diagnosis and prioritise high-risk patients.

3. To assess the quality of life of individuals with TB multimorbidity, as well as health system capacity and integration and pathways to relevant care within national health systems
This qualitative sub-study on quality of life, socioeconomic and cultural barriers, and health system capacity to address TB multimorbidity will also be embedded within the multicountry cross-sectional study on TB multimorbidity, specifically at the study sites in The Gambia and Nigeria.
We will conduct in-depth semi-structured narrative interviews (n = 24) and focus group discussions (FDGs) with separate groups of (i) persons with TB multimorbidity, (ii) healthcare workers, and (iii) policymakers at each study site (8 – 10 persons per FGD).
We will use a standardized framework (e.g., WHO Health Systems Building Blocks) to assess infrastructure, workforce training, diagnostic capacity (e.g., availability of Xpert MTB/RIF or glucose testing), and funding.

4. To determine the influence of multimorbidity on the emergence, evolution and fixation of drug resistance-associated mutations by microbiology and genomic epidemiology
This is a genomic study of DR-TB multimorbidity with next-generation whole genome sequencing (WGS) of MTBC isolated from multimorbid individuals with confirmed drug-sensitive and drug-resistant TB. Apply paired culture-free and culture-based whole genome sequencing assays by the Illumina platform for improved diagnosis of MDR-TB and resistant strain catalogue
Investigate the types and prevalence of drug resistance and pattern/diversity of drug-resistant strains
Direct gene expression analysis (mycobacterial load assay) to determine bacterial load at different time points during clinical follow-up.

5. To define the genetic and strain-related factors that predispose to and/or increase the risk of multimorbidity in drug-sensitive and drug-resistant TB patients
Pair next-generation sequencing/molecular microbiology data with clinical data on comorbidities in multimorbid drug-sensitive and drug-resistant TB patients to understand the underlying biological, genomic and molecular pathways toward TB multimorbidity.
Use bioinformatics approaches to explore the DR-TB/comorbidity synergies (e.g., diabetes worsening DR-TB prognosis).
Investigate associations between the diverse MTBC lineages in West Africa and TB

multimorbidity; the region has seven out of the nine classified phylogenetic lineages, including Mycobacterium africanum, which is geographically restricted to West Africa.

Intervention Type
Other

Primary outcome(s)
1. Prevalence of TB multimorbidity across the life course measured using the proportion of newly-diagnosed TB patients with one or more co-occurring chronic communicable or non-communicable conditions. TB is confirmed using Xpert MTB/RIF Ultra and mycobacterial culture; co-morbid conditions are ascertained using HbA1c (diabetes), blood pressure monitoring (hypertension), the PHQ-9 scale (depression), and rapid antibody testing (HIV status) at baseline

2. Types of co-occurring chronic conditions, measured using the proportion of newly-diagnosed TB patients with each specific chronic communicable or non-communicable condition, ascertained using the same tools (HbA1c, blood pressure monitoring, PHQ-9 scale, HIV rapid antibody testing), at baseline

3. Distribution of TB multimorbidity across the life course measured using the proportions above disaggregated by age group (<15, 15–49, >50 years), sex, and country, at baseline

Key secondary outcome(s)
1. Diagnostic performance of a WHO-compliant AI-assisted computer-aided detection tool for TB and comorbidities, measured against Xpert MTB/RIF Ultra and mycobacterial culture as the reference standard at baseline
2. Treatment and survival status, measured by structured telephone follow-up at 2 months and 6 months
3. Prevalence and patterns of drug resistance, measured using paired culture-free and culture-based whole genome sequencing (Illumina platform) at baseline
4. Mycobacterial load, measured using a gene-expression mycobacterial load assay at baseline
5. Health system capacity to address TB multimorbidity, assessed using the WHO Health Systems Building Blocks framework at study sites in The Gambia and Nigeria at baseline
6. Quality of life and socioeconomic/cultural barriers, explored through in-depth semi-structured interviews (n = 24) and focus group discussions at the Gambia and Nigeria sites after 2 months of TB treatment

Completion date
30/06/2031

Eligibility

Key inclusion criteria
1. Newly-diagnosed TB patients
2. Drug-sensitive or drug-resistant TB
3. Children, adolescents, and adults (aged <15, 15–49, and >50 years)

Healthy volunteers allowed
No

Age group
All

Lower age limit
0 Years

Upper age limit
99 Years

Sex
All

Total final enrolment
0

Key exclusion criteria
1. TB patient unable or unwilling to give informed consent
2. TB patients with altered sensorium

Date of first enrolment
01/11/2026

Date of final enrolment
31/10/2028

Locations

Countries of recruitment
Burkina Faso

Gambia

Ghana

Guinea-Bissau

Mali

Nigeria

Senegal

Sponsor information

Organisation
Medical Research Council Unit The Gambia at the LSHTM

Funder(s)

Funder type

Funder Name
European and Developing Countries Clinical Trials Partnership

Alternative Name(s)
The European & Developing Countries Clinical Trials Partnership, The European & Developing Countries Clinical Trials Partnership (EDCTP), European and Developing Countries Clinical Trials, Le partenariat Europe-Pays en développement pour les essais cliniques, A Parceria entre a Europa e os Países em Desenvolvimento para a Realização de Ensaios Clínicos, EDCTP

Funding Body Type
Private sector organisation

Funding Body Subtype
International organizations

Location
Netherlands

Results and Publications

Individual participant data (IPD) sharing plan
The datasets generated during and/or analysed during the current study will be available upon request from the Principal Investigator (Prof. Toyin Togun)

IPD sharing plan summary
Available on request