

Supplementary File 1: Structured Questionnaire for Healthcare Workers

Study Title

Health system readiness for tuberculosis infection prevention and control: a cross-sectional study of healthcare workers in Southeast Nigeria

Instructions

Please tick (✓) the appropriate response(s) or write in the space provided. All responses are confidential.

Note: This questionnaire is the original data collection instrument used in the study. Correct responses indicated in the tables were used for scoring during analysis and were not visible to participants.

SECTION 1: Sociodemographic Characteristics

No.	Question	Response Options
1	Age at last birthday	_____ years
2	Sex	☐ Male ☐ Female
3	Marital status	☐ Single ☐ Married ☐ Others (Divorced/Widowed/Separated)
4	Highest educational level	☐ No formal ☐ Primary ☐ Secondary ☐ Higher institution
5	Professional cadre	☐ Cleaner/Ward maid ☐ Nurse ☐ SCHEW ☐ JCHEW ☐ CHO ☐ Doctor ☐ Others: _____
6	Years of practice	_____ years
7	IPC training received	☐ Yes ☐ No
8	Last IPC training	_____ years ago

SECTION 2: General Concept of IPC

No.	Question	Options
1	Main goal of infection control	☐ Restrict spread ☐ Increase awareness ☐ Minimize contact ☐ Don't know
2	Definition of standard precautions	☐ N95 + isolation ☐ Hand hygiene + PPE + safe handling ☐ Gloves only ☐ Don't know
3	Components of standard precautions (tick all)	☐ Hand washing ☐ Patient placement ☐ Cough etiquette ☐ Safe injection ☐ PPE ☐ Sharps safety
4	When is hand washing performed	☐ Before patient ☐ Between patients ☐ After gloves ☐ After body fluids
5	Standard precautions apply to	☐ Blood-borne ☐ TB ☐ Skin infections ☐ All patients
6	All patients are sources of infection	☐ True ☐ False ☐ Don't know

No.	Question	Options
7	All body fluids except sweat infectious	☐ True ☐ False ☐ Don't know

SECTION 3: Hand Hygiene

No.	Question	Options
1	Hand washing minimizes microorganisms	☐ True ☐ False ☐ Don't know
2	Hand washing reduces infections	☐ True ☐ False ☐ Don't know
3	Minimum duration	☐ 5–10 sec ☐ 10–15 sec ☐ 15–20 sec ☐ Don't know
4	Hand decontamination includes washing	☐ Hands ☐ Hands & wrists ☐ Hands & forearms ☐ Don't know
5	Alcohol rub replaces washing when soiled	☐ True ☐ False ☐ Don't know
6	Hand washing between procedures	☐ True ☐ False ☐ Don't know
7	Gloves replace hand washing	☐ True ☐ False ☐ Don't know
8	Hand washing after glove removal	☐ True ☐ False ☐ Don't know
9	Hand washing needed for TB patients	☐ True ☐ False ☐ Don't know

SECTION 4: PPE

No.	Question	Options
1	PPEs such as masks and head caps provide protective barriers against infection	☐ True ☐ False ☐ Don't know
2	Use of PPEs eliminate risk of acquiring occupational infections	☐ True ☐ False ☐ Don't know
3	PPEs are exclusively suitable to laboratory and cleaning staff for their protection	☐ True ☐ False ☐ Don't know
4	PPEs should be used only whenever there is contact with blood	☐ True ☐ False ☐ Don't know
5	Gloves and masks can be re-used after proper cleaning	☐ True ☐ False ☐ Don't know
6	Used PPEs are to be discarded through regular dust bins	☐ True ☐ False ☐ Don't know
7	Gloves should be changed between different procedures on the same patient	☐ True ☐ False ☐ Don't know
8	Masks made of cotton or gauze are most protective	☐ True ☐ False ☐ Don't know

No.	Question	Options
9	Masks and gloves can be re-used if dealing with same patient	☐ True ☐ False ☐ Don't know

SECTION 5: Sharps Safety

No.	Question	Options
1	Needles should be recapped	☐ True ☐ False ☐ Don't know
2	Needles should be bent	☐ True ☐ False ☐ Don't know
3	Sharps should be shredded	☐ True ☐ False ☐ Don't know
4	Injuries should not be reported	☐ True ☐ False ☐ Don't know
5	Needle-stick least common	☐ True ☐ False ☐ Don't know
6	PEP used for HIV needle-stick	☐ True ☐ False ☐ Don't know
7	Immediate management	☐ Wash water ☐ Antiseptic ☐ Squeeze ☐ Don't know

SECTION 6: Respiratory Hygiene and Cough Etiquette

Practice	True	False	Don't know
Cough into tissue and wash hands	☐	☐	☐
Use shoulder if no tissue	☐	☐	☐
Maintain 3 ft distance	☐	☐	☐
Wipe on coat	☐	☐	☐

SECTION 7: Care of Healthcare Providers

No.	Question	Options
1	Immunization history of health care providers should be obtained before recruitment	☐ True ☐ False ☐ Don't know
2	The risk for a health provider to acquire HIV infection after needle-stick injury is..... Less than 0.5%	☐ <0.5% ☐ About 5% ☐ >10% ☐ Don't know
3	Post exposure immunization prevents the risk of hepatitis B infection following exposure	☐ True ☐ False ☐ Don't know
4	For the prevention of hepatitis B, immunizations are recommended for all healthcare workers	☐ True ☐ False ☐ Don't know
5	Following exposure to a patient with flu, antibiotics are required for prevention of infection	☐ True ☐ False ☐ Don't know
6	Health providers with highest risk of exposure to tuberculosis include radiologists	☐ True ☐ False ☐ Don't know

SECTION 8: IPC Programme

No.	Question	Options
1	IPC programme exists	☐ No ☐ Yes
1a	If yes: defined objectives	☐ No ☐ Yes
2	IPC team exists	☐ No ☐ Yes
3	Full-time IPC professional	☐ None ☐ Part-time ☐ Yes
4	Dedicated IPC time	☐ No ☐ Yes
5	Team includes all cadres	☐ No ☐ Yes
6	IPC committee exists	☐ No ☐ Yes
7	Leadership represented	☐ No ☐ Yes
8	Defined IPC objectives	☐ No ☐ Yes
9	Leadership support (budget)	☐ No ☐ Yes
10	Lab support available	☐ No ☐ Yes

SECTION 9: IPC Guidelines

No.	Question	Options
1	IPC expertise available	☐ No ☐ Yes
2	Guidelines available	Tick all that apply: ☐ Standard ☐ Hand hygiene ☐ TB precautions ☐ Outbreak ☐ Disinfection ☐ Waste
3	Guidelines consistent	☐ No ☐ Yes
4	Adapted to local needs	☐ No ☐ Yes
5	HCWs involved	☐ No ☐ Yes
6	Stakeholders involved	☐ No ☐ Yes
7	Training on guidelines	☐ No ☐ Yes
8	Monitoring implementation	☐ No ☐ Yes

SECTION 10: IPC Training

No.	Question	Options
1	IPC trainers available	☐ No ☐ Yes
2	Additional trainers	☐ No ☐ Yes
3	HCW training frequency	☐ Never ☐ Orientation ☐ Annual ☐ Mandatory

No.	Question	Options
4	Cleaner training frequency	☐ Never ☐ Orientation ☐ Annual ☐ Mandatory
5	Admin staff trained	☐ No ☐ Yes
6	Training evaluation	☐ No ☐ Irregular ☐ Regular
7	Patient IPC education	☐ No ☐ Yes
8	IPC staff development	☐ No ☐ Yes

SECTION 11: HAI Surveillance

No.	Question	Options
1	Surveillance part of IPC	☐ No ☐ Yes
2	Personnel available	☐ No ☐ Yes
3	Personnel trained	☐ No ☐ Yes
4	Surveillance evaluated	☐ No ☐ Yes
5	Standard definitions used	☐ No ☐ Yes
6	Lab capacity adequate	☐ No ☐ Yes
7	Data used for planning	☐ No ☐ Yes
8	Feedback provided	☐ No ☐ Yes
9	Feedback method	☐ None ☐ Written/oral ☐ Interactive

SECTION 12: Monitoring/Audit

No.	Question	Options
1	Monitoring personnel available	☐ No ☐ Yes
2	Monitoring plan exists	☐ No ☐ Yes
3	Indicators monitored	☐ Hand hygiene ☐ TB precautions ☐ Cleaning ☐ Outbreak ☐ Sterilization ☐ Waste
4	Audit feedback given	☐ No ☐ Yes
5	Feedback recipients	☐ None ☐ IPC team ☐ Dept heads ☐ HCWs ☐ IPC committee ☐ Management
6	Reporting regular	☐ No ☐ Yes
7	Blame-free culture	☐ No ☐ Yes

SECTION 13: Built Environment

No.	Question	Options
1	Water available	☐ No ☐ Yes

No.	Question	Options
1a	Availability level	☐ <5 days ☐ ≥5 days insufficient ☐ Adequate
2	Hand hygiene stations	☐ No ☐ Yes
2a	Supplies reliability	☐ Not reliable ☐ Reliable
3	Toilets adequate	☐ Insufficient ☐ Partial ☐ Adequate
4	Power supply adequate	☐ No ☐ Yes
5	Ventilation available	☐ No ☐ Yes
6	Cleaning materials available	☐ No ☐ Yes
7	Isolation rooms available	☐ No ☐ Yes
8	PPE sufficient	☐ No ☐ Yes
9	Waste bins available	☐ No ☐ Yes
9a	Waste bin status	☐ Full adequate ☐ Partial ☐ Not segregated
10	Waste disposal methods	☐ Burial ☐ Dump ☐ Municipal ☐ Incinerator ☐ Wastewater ☐ Decontamination
11	Disposable items available	☐ No ☐ Yes

Scoring Framework

Each correct knowledge response was scored as 1, and incorrect or “don’t know” responses as 0. Composite scores were calculated and converted to percentages. Scores ≥70% were classified as “good,” while scores <70% were classified as “poor.”

System readiness variables were coded as binary (Yes = 1, No = 0) and aggregated by domain.

Variable Coding and Data Dictionary

Table S1 presents the variable definitions and coding scheme used for data analysis.

Variable Name	Description	Source Section	Coding	Type
age	Age of respondent	Section 1 Q1	Continuous (years); categorized as ≤35=0, >35=1	Continuous / Binary
sex	Sex of respondent	Section 1 Q2	Male=1, Female=2	Binary
marital_status	Marital status	Section 1 Q3	Single=1, Married (currently)=2, Others=3	Categorical
education	Highest educational level	Section 1 Q4	Primary and below=0, Secondary=1, Tertiary=2	Ordinal
cadre	Professional cadre	Section 1 Q5	Cleaner=1, Nurse=2, CHEW/CHO=3, Doctor=4, Others=5	Categorical

years_practice	Years of practice	Section 1 Q6	Continuous (years); categorized as <10=0, ≥10=1	Continuous / Binary
ipc_training	Ever received IPC training	Section 1 Q7	Yes=1, No=0	Binary
last_training	Time since last IPC training	Section 1 Q8	Continuous (years)	Continuous
Knowledge variables				
ipc_knowledge_score	Composite IPC knowledge score	Sections 2–7	Sum of correct responses, scaled to percentage (0–100)	Continuous
ipc_knowledge_cat	IPC knowledge level	Derived	Good (≥70%)=1, Poor (<70%)=0	Binary
IPC Programme and System Variables (IPCAF-aligned)				
ipc_programme	IPC programme availability	Section 8 Q1	Yes=1, No=0	Binary
ipc_team	IPC team exists	Section 8 Q2	Yes=1, No=0	Binary
ipc_professional	IPC staffing level	Section 8 Q3	None=0, Part-time=1, Full-time=2	Ordinal
ipc_committee	IPC committee exists	Section 8 Q6	Yes=1, No=0	Binary
ipc_leadership	Leadership support (budget)	Section 8 Q9	Yes=1, No=0	Binary
lab_support	Laboratory support for IPC	Section 8 Q10	Yes=1, No=0	Binary
IPC Guidelines Variables				
ipc_guidelines	Availability of IPC guidelines	Section 9	Yes=1, No=0	Binary
ipc_guideline_training	Training on IPC guidelines	Section 9 Q7	Yes=1, No=0	Binary
ipc_guideline_monitoring	Monitoring of guideline implementation	Section 9 Q8	Yes=1, No=0	Binary
IPC Training Variables				
ipc_training_freq	Frequency of IPC training (HCWs)	Section 10 Q3	Never=0, Orientation=1, Annual=2, Mandatory=3	Ordinal
cleaner_training_freq	Frequency of IPC training (cleaners)	Section 10 Q4	Same as above	Ordinal
training_eval	Evaluation of IPC training	Section 10 Q6	No=0, Irregular=1, Regular=2	Ordinal
Surveillance Variables				
ipc_surveillance	IPC surveillance system exists	Section 11 Q1	Yes=1, No=0	Binary

surveillance_staff	Surveillance personnel available	Section 11 Q2	Yes=1, No=0	Binary
surveillance_use	Surveillance data used for decision-making	Section 11 Q7	Yes=1, No=0	Binary
surveillance_feedback	Feedback provided from surveillance	Section 11 Q8	Yes=1, No=0	Binary
Monitoring and Audit Variables				
ipc_monitoring	IPC monitoring system exists	Section 12 Q1	Yes=1, No=0	Binary
monitoring_plan	IPC monitoring plan available	Section 12 Q2	Yes=1, No=0	Binary
audit_feedback	Audit feedback provided	Section 12 Q4	Yes=1, No=0	Binary
reporting_regular	Regular IPC reporting	Section 12 Q6	Yes=1, No=0	Binary
blame_free	Blame-free culture for reporting	Section 12 Q7	Yes=1, No=0	Binary
Built Environment / Facility Readiness Variables				
water_supply	Availability of water	Section 13 Q1	Yes=1, No=0	Binary
hand_hygiene_station	Availability of hand hygiene stations	Section 13 Q2	Yes=1, No=0	Binary
ventilation	Adequate ventilation	Section 13 Q5	Yes=1, No=0	Binary
isolation_rooms	Availability of isolation rooms	Section 13 Q7	Yes=1, No=0	Binary
ppe_availability	Availability of PPE	Section 13 Q8	Yes=1, No=0	Binary
waste_management	Availability of waste management system	Section 13 Q9	Yes=1, No=0	Binary
Composite Outcome Variables				
facility_readiness_score	Composite facility readiness score	Sections 8–13	Sum of binary indicators, scaled to percentage (0–100)	Continuous
facility_readiness_cat	Facility readiness level	Derived	Good (≥70%)=1, Poor (<70%)=0	Binary