



Knowledge, Attitude and Practice Survey on Tuberculosis 2023



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ABBREVIATION & ACRONYMS

ACF	: Active case finding
AIDS	: Acquired Immunodeficiency Syndrome
AMR	: Antimicrobial resistance
BRIN	: Badan Riset dan Inovasi Nasional
CI	: Contact investigation
CHWs	: Community health workers
DEFF	: Design effect
DM	: Diabetes mellitus
DR-TB	: Drug-resistant tuberculosis
GP	: General practitioner
HCWs	: Healthcare workers
HIV	: human immunodeficiency virus
IQR	: Interquartile range
KAP	: Knowledge, attitude, and practice
MDR	: multidrug-resistant
NTP	: National tuberculosis program
PHC	: Public Health Center
RR	: rifampicin-resistant
sd	: Standard deviation
SDGs	: Sustainable Development Goals
TB	: Tuberculosis
WHO	: World Health Organization

EXECUTIVE SUMMARY

Tuberculosis (TB) remains one of the top 10 causes of death worldwide and the leading cause by an infectious disease with an estimated 10 million people falling ill with TB each year. Being the largest and most populated country in Southeast Asia, Indonesia also contributes highly in the number of global TB cases, ranking second overall in TB incidence with an estimation of 969,000 cases.

TB prevalence survey data in 2013-2014 show that knowledge about TB is one of the factors that influence treatment-seeking behavior. Based on the data, only 26% of people with coughing for more than 14 days, coughing up blood, or an abnormal X-ray result went to a health facility to get help. 43% of them did not get help, and 31% tried to treat themselves. To reinforce the case finding of TB, contact investigation is used by the National TB Program (NTP) particularly due to COVID-19 pandemic that has changed the behaviour, knowledge, and health practice related to TB. Additionally, drug resistant TB also became a problem in Indonesia with an estimated 17,353 cases of RR-TB, 6,095 cases of MDR-TB, and 241 cases of XDR-TB in 2021(WHO, 2023). MDR-TB treatment failure is linked to low patient adherence due to the treatment's complexity and duration, as well as stigma, feeling ashamed, boredom, and adverse drug effects. MDR-TB treatment failure arises from low patient adherence, driven by the treatment's complexity and duration, adverse drug effects, and psychosocial factors like stigma and boredom (Naidu et al., 2020; Rumende, 2018). Antimicrobial resistance (AMR) poses an increasing danger to public health since it can make it more difficult to treat infections, which can extend hospital stays, increase healthcare expenses, and in some circumstances even result in death. This survey aimed to explore baseline information on knowledge, attitudes, and practice related to TB among TB patients and their household contacts, contact investigation among health care workers (HCWs) and community health workers (CHWs), as well as to assess general awareness of AMR among HCWs. The results of this survey will guide the policy and strategy development to improve the public awareness and knowledge about TB and AMR in order to reduce the diagnostic delay and improve access to TB treatment and care service.

This is a cross-sectional survey conducted in six districts across the six provinces represented TB epidemiological differences in west, middle, and east regions of Indonesia. We interviewed 1,787 TB patients enrolled in public health centers (PHC) with 1,701 close-contacts of TB patients, 194 TB programmers at primary health care facilities, 202 community health workers (CHWs), and 399 HCWs across those six selected districts. In this survey, the information obtained from the patients included knowledge, attitude, and practice (KAP) related to TB, contact investigation, and AMR. The information collected from TB patients' contacts included knowledge, attitude, and practice related to TB and contact investigation. Data collected from TB programmers and CHWs included knowledge, attitude, and practice on contact investigation. Meanwhile, information obtained from HCWs at hospitals and TB programmers related to general awareness on AMR.

From the study regarding KAP on TB patients and contacts, we found several interesting results. The proportion of male TB patients was 52.86% and nearly half of TB patients were in the 18-40 years age group (47.0%), while there were more females among contacts and the majority of contacts were at the age 21-50 years old. Most TB patients were bacteriologically confirmed, had pulmonary TB, new TB cases and had a drug sensitive TB. Both TB patients and contacts had low overall TB knowledge scores. Most TB patients and contacts know about TB and agree that TB is dangerous. But only less than half TB patients and contacts know that TB is caused by bacteria. Gender, age, districts, occupation, marital status, educational level, diagnosis of TB, and nearest health facilities were the

significant determinant factors of TB knowledge score among TB patients. While among TB contacts we found that age, gender, districts, marital status, educational level, and nearest health facilities were the significant determinant factors of TB knowledge score. For both TB patients and their contacts, several factors were significant determinant factors of their practice related to TB, including district, marital status, and knowledge score. Additionally, working status, comorbidities, and first facility visits were found to be significant determinant factors among patients, while age, gender, attitude score, and stigma score were significant determinant factors for contacts.

For contact investigation results, both TB officers and community health workers (CHWs) were predominantly female, with mean age around 42-45 years old. Majority of TB officers and CHW correctly defined TB contact investigation, TB contacts, TB household contacts, and TB close contacts. The contact investigation guideline mentioned that the priority of contact investigation is bacteriologically confirmed and paediatric TB patients. However, only half of TB officers and CHWs answered that bacteriologically confirmed and paediatric TB patients are the priority of contact investigation (53.94% vs 40.60%). Around half of TB officers and CHW stated that TB contact investigation could be conducted by both TB officer and CHW, performed at least on 20 contacts, and conducted within a week. Most TB officers and CHW agree that TB contact investigation is crucial to stop the spread of TB, required to wear PPEs and conducted on all types of contacts.

Most of the participants were aged 31-50 years old and located in Bandung city. This study found that most TB officers disagreed that AMR could happen if antibiotics were used in livestock feed to promote growth (n=126, 65.28%), or if human antibiotics were used to treat infections in animals (n=130, 67.36). But only less than half agreed that AMR could happen if human antibiotics were present in human sewerage or human antibiotics discarded into the environment. If antibiotics do not work, more than half of TB officers and healthcare workers disagree to give the same antibiotics with different duration of medication, different dosage, and different brand or manufacture. Most healthcare workers agree to refer patients to take culture and sensitivity tests. The result shows that most TB officers and healthcare workers agree that antibiotic price (47.15% vs 86.21%), availability (72.96% vs 89.98%), and side effects (85.94% vs 94.99%) influence the decision to prescribe antibiotics. Our result shows that less than half of TB officers and healthcare workers said that they were exposed with antibiotic advertisement, while around half of TB officers and healthcare workers said that the existence of AMR campaigns is known.

In terms of KAP among TB patients and their contacts, this survey recommends the interventions to improve knowledge of TB patients including their contacts, address stigma associated with TB and capacity of HCWs in TB diagnosis and management to reduce the diagnosis delay and enhance TB control initiatives. This survey found that CHWs have better knowledge of TB rather than TB officers. Therefore, regular training and educational opportunities to ensure they are up-to-date on the latest TB control guidelines and practices as well as fostering a collaborative approach to TB control is required to improve the implementation of contact investigation. Meanwhile, regarding AMR, since HCWs play a critical role in preventing and controlling antimicrobial resistance, this survey recommends developing intervention to improve KAP of AMR among HCWs to reduce the misuse and overuse of antibiotics, i.e., addressing factors influencing antibiotic prescriptions: improve communication with patients, provide better diagnostic tools and training, and implement policies prohibiting financial incentives; improving surveillance and supervision at PHC level: Establish antimicrobial stewardship programs, collect/analyze antibiotic usage data, and provide feedback; and establishing region-based AMR control teams: develop tailored control plans, coordinate surveillance, train healthcare workers, and raise public awareness.

CHAPTER 1

INTRODUCTION

1.1. Background

Tuberculosis (TB) remains one of the top 10 causes of death worldwide and the leading cause by an infectious disease with an estimated 10 million people falling ill with TB each year. In 2017, TB was responsible for an estimated 1.3 million deaths worldwide, with an additional 300,000 for TB-HIV deaths. The region of Southeast Asia contributes to over 45% of the global TB burden. Being the largest and most populated country in Southeast Asia, Indonesia also contributes highly in the number of global TB cases, ranking third overall in TB incidence with an estimation of 969,000 cases of TB and 93,000 TB deaths (WHO, 2023)

TB is a disease that is more prevalent in poor and marginalized people and communities. In addition, TB illness has a great potential to worsen the financial state of already socioeconomically problematic and impoverished individuals and/or households. Expenses related to TB diagnosis and treatment are often aggravated by costs related to transportation to treatment facilities, temporary accommodations and food, loss of income due to time spent seeking and receiving treatment, and/or loss of employment due to disability or discrimination. These costs can lead to catastrophic consequences for TB patients and their families (WHO, 2017).

To overcome access and adherence barriers, as well as to minimize the economic burden for TB patients (as well as their households) it is therefore pivotal to address both direct and indirect costs. Interventions are needed to address high medical costs, as well as costs for food and transport, and loss of earnings. Therefore, both health financing and delivery models, as well as socioeconomic protection mechanisms (such as job protection, paid sick leave, social welfare payments, or other cash transfers of any kind) need to be considered (Mauch et al 2013, Lönnroth et al 2014).

The End TB Strategy and the Sustainable Development Goals (SDGs) both have a common objective: to end the global TB epidemic with specific achievement targets: reduction in the number of TB deaths, TB incidence rate, and family catastrophic cost due to TB.

TB prevalence survey data in 2013-2014 show that knowledge about TB is one of the factors that influence treatment-seeking behavior. Based on the data, only 26% of people with coughing for more than 14 days, coughing up blood, or an abnormal X-ray result went to a health facility to get help. 43% of them did not get help, and 31% tried to treat themselves. The Spiritia Foundation's 2019 evaluation of Community, Rights, and Gender (CRG) showed that both men and women do not know enough about tuberculosis. Similar lack of knowledge and practice regarding tuberculosis was found among drug-resistant tuberculosis patients in New Delhi, Shenzhen, and Ethiopia (Dzeyie et al., 2019; Wang et al., 2021; Datiko et al., 2019)

The aforementioned facts and study findings are only a few of the probable contributors to the present TB epidemic. With the present Covid-19 pandemic crisis, disruption, changes in behavior, knowledge, and health practice are unavoidable. Since 2018, the National Tuberculosis Program has used an active case finding (ACF) TB strategy, using contact investigations (CI) as one of the therapies. CI conducted by health professionals and communities. Concurrently, a nationwide effort against tuberculosis has been intensified to raise awareness.

	TARGETS			
	MILESTONES		SDG*	END TB
	2020	2025	2030	2035
Reduction in number of TB deaths compared with 2015 (%)	35%	75%	90%	95%
Reduction in TB incidence rate compared with 2015 (%)	20%	50%	80%	90%
TB-affected families facing catastrophic costs due to TB (%)	0%	0%	0%	0%

* The United Nations Sustainable Development Goals (SDGs) include ending the TB epidemic by 2030 under Goal 3.

Figure 1. The main targets of the United Nations Sustainable Development Goals (SDGs) and End TB strategy.

Antimicrobial resistance (AMR) is the capacity of microorganisms, such as bacteria, viruses, fungi, and parasites, to resist the effects of antimicrobial medications, such as antibiotics, antivirals, antifungals, and antiparasitic, which are used to treat illnesses (WHO, 2015). As bacteria develop defence mechanisms against medications meant to kill them, they become less susceptible to them or fully resistant to them. Several things, such as the misuse or overuse of antibiotics, poor infection control procedures, insufficient public health infrastructure, and environmental contamination, might contribute to this (Prestinaci, 2015).

AMR poses an increasing danger to public health since it can make it more difficult to treat infections, which lead to increased mortality rates, decreased quality of life, and economic losses (Dadgostar, et al., 2019). The cost of AMR is estimated to be trillions of dollars per year. Antibiotics and other antimicrobial medications should be used cautiously, infection prevention and control procedures should be improved, and funds should be allocated to the research and development of novel medications and alternative treatment modalities to combat AMR (Sannathimmappa et al., 2021).

Preventing and controlling the development of drug resistance is fundamental for both AMR and TB, as the widespread overuse and misuse of antibiotics, including fluoroquinolones, contribute significantly to the growing threat of AMR. This poses a particular danger in the context of TB, where fluoroquinolones play a critical role in treating multidrug-resistant (MDR) and rifampicin-resistant (RR) strains. As highlighted in the WHO document, the long duration of TB treatment (6 months for drug-susceptible TB, up to 18-20 months for MDR/RR-TB) with second-line medications necessitates careful management of fluoroquinolones. Improper use, including over-the-counter access and self-medication, can lead to the development of pre-extensively or extensively drug-resistant TB (pre-XDR-TB or XDR-TB), leaving patients with limited treatment options and putting them at increased risk of death.

One of the pillars of the WHO's 2015 End TB Strategy to fulfil the Sustainable Development Goals is more research and innovation. In accordance with the End TB Strategy and the National Strategic Plan (NSP) 2020-2024, evidence-based planning is required to bring about sustainable social and behavioral change and to improve the quality of CI interventions (Kemenkes RI, 2020). This survey aims to estimate the national and regional level of knowledge, attitude, practice, related to TB, health-seeking

behavior and antimicrobial resistance (AMR). There is no national survey since 2014 that collects data regarding KAP on tuberculosis patients.

1.2. Objectives

The survey objectives are:

1. Gather baseline information on the knowledge, attitudes and practices of TB patients and the contacts in 6 districts across 6 provinces in Indonesia to identify barriers to seeking care;
2. Identify knowledge gaps, cultural beliefs, or behavioral patterns that may facilitate understanding and action, as well as pose problems or create barriers for TB control efforts;
3. Identify factors influencing behavior that are not known to most people, reasons for their attitudes, and how and why people practice certain health behaviors;
4. Explore knowledge, attitudes and practices of healthcare and community workers on contact investigation.
5. Assess knowledge, awareness, and practice of antimicrobial resistance (AMR) in health care workers in relation to AMR.

CHAPTER 2

SURVEY ORGANIZATION

2.1. Management and Organization of the Survey

The survey was coordinated by Center for Tropical Medicine, Universitas Gadjah Mada in collaboration with Universitas Sebelas Maret Surakarta. WHO provided technical assistance throughout the survey process and was involved in the data analysis process, and the NTP was closely involved during the preparation and the data collection process.

2.2. Composition of Survey Team, Roles, and Responsibilities

Principal Investigator

1. Closely coordinated with WHO and the NTP in the implementation of the survey, including data collection, data analysis, and reporting;
2. Validated the protocol for the survey;
3. Maintained communication and coordination with the NTP, WHO, and local authorities;
4. Appointed and supervised the work of the data analyst/biostatistician and data manager;
5. Coordinated overall implementation of the survey and ensured the survey implementation and data analysis were conducted according to the protocol;
6. Supervised the detail of survey budget, cash flow, fund distribution and their accountability;
7. Discussed any problems encountered during the survey, proposed and decided the solution;
8. Planned the detailed budget of the survey;
9. Validated the survey results and reporting; and
10. Led the data analysis in coordination with WHO and the NTP.

Co-Principal Investigator

1. Assisted PI in coordinating the overall implementation of the survey;
2. Actively involved in the design of the study;
3. Provided recommendations for the finalization of survey instruments
4. Planned the field implementation and training needed;
5. Developed plan and strategies for pilot test and finalized the strategies of data collection during the pilot test;
6. Organized the writing of SOP for the data collection;
7. Together with the PI, contacted and coordinated with WHO, the NTP, and local authorities;
8. Prepared training manual and survey manual;
9. Provided training for field coordinators and data collectors;
10. Ensured the quality assurance for all processes is implemented according to the protocol;
11. Assessed reports from the program manager and data managers;
12. Monitored the data collection process;
13. Oversee the provision of supplies and required materials;
14. Organized the writing of activity reports and final report; and

Program Manager (PM)

1. Assisted PI and Co-PI to finalize the survey instruments;
2. Assisted Co-PI to develop plan and strategy for the pilot test;
3. Developed timeline for survey implementation and register for patients' cluster, health care workers, and community health workers involved in this survey;
4. Assisted Co-PI to prepare training materials and training implementation;
5. Assisted Co-PI to develop SOP for the survey implementation;
6. Assisted Co-PI in monitoring the data collection process;
7. Coordinated with the data manager to monitor the achievement of the target of data collection;
8. Responsible for the weekly report, monthly report, and progress report;
9. Assisted Co-PI in writing up the final report;
10. Conducted weekly calls and wrote up the weekly report from the field based on the report from data manager, field coordinators, and research assistant;
11. Coordinated with administration & finance staff to ensure the financial report and financial request were following SOP from the WHO;
12. Ensured the security and confidentiality of all respondents' information;
13. Ensured the security and integrity of survey materials; and
14. Ensured the logistic support for the field team.

Team Leader

1. Coordinated the survey implementation with the local government in the areas within their responsibility
2. Responsible for the organization and proper implementation of the survey in their appointed facility or cluster of facilities;
3. Coordinates the day-to-day survey implementation;
4. Assisted Co-PI and PM to ensure that interviews and data validation is implemented according to appropriate standards; and
5. Monitored the implementation of data collection.

Research Assistant (RA)

1. Assisted PI and Co-PI to develop survey protocol and instrument;
2. Helped in applying ethical clearance and arranging survey permit;
3. Helped in the implementation of pilot test;
4. Helped in preparing training materials and training implementation for the field team;
5. Assisted PM to communicate with field coordinators and monitor the data collection day-to-day;
6. Assisted PM in coordination with, monitoring and supervision to the field team during the data collection;
7. Assisted PM to prepare and writing up the progress report (weekly and monthly);
8. Assisted data analyst in data analysis and preparing survey dissemination materials; and
9. Assisted PI, Co-PI, and PM in writing up the final report.

Data Analyst/biostatistician

1. Assisted PI and Co-PI to develop survey protocol and instrument;
2. Assisted Co-PI in the implementation of pilot test and training for field coordinators and data collectors;
3. Ensured the software and instrument developed by data manager for data entry is in accordance with the protocol and survey instrument;
4. Assisted Co-PI and PM to ensure data collection and data validation is implemented as the standard;
5. Responsible for the data management and data cleaning in a regular basis;
6. Together with PI responsible for data analysis during the survey period;
7. Assisted PI, Co-PI and PM to prepare the survey dissemination and to write up the final report;

Data Manager

1. Coordinated data management activities for the survey: receiving, batching, cleaning, merging data from different sources;
2. Responsible for the validation of double data entry;
3. Ensured that data are correctly stored and backed up;
4. Checked validated data files regularly for systematic errors (cleaning);
5. Developed data entry software and tools, practical and feasible to support the survey;
6. Prepared database to be ready for analysis and data entry screens;
7. Provided assistance for the field team related to troubleshooting during the data collection;
8. Contributed to the analysis of results;
9. Responsible for completion of regular data management reports;
10. Liaised with the Co-PI regularly; and
11. Reported without delay any problems encountered in data management.

Field Coordinator

1. Arranged permit letter in each district;
2. Coordinated with health facilities included in this survey;
3. Coordinated the selection of survey sample in each health facility with the data analyst, PM, and research assistant;
4. Provided technical assistance to data collectors related to data collection;
5. Validated data collected by data collectors;
6. Responsible for data monitoring submitted by data collectors to a server of the Center for Tropical Medicine;
7. Provided weekly and monthly reports concerning the progress of data collection to PM, data manager, and research assistant;
8. Performed day to day coordination with data collectors; and
9. Ensured the number of respondents achieved the target within the data collection period.

Data Collector

1. Built and maintained the relationship with health care providers in health facilities;
2. Responsible for the selection of respondents in closed coordination with field coordinator and keep their data security and confidentiality;
3. Responsible for obtaining informed consent for carrying out the interviews and entry the patient records information required in the survey;

4. Responsible for carrying out the interviews and recording patient records information required in the survey;
5. Potentially, responsible for uploading the survey data collected into the online designated software;
6. Provided confirmation or follow up towards the feedback provided by the PM, research assistant or data manager via field coordinator;
7. Filled out the daily logbook and reported it to field coordinator; and
8. Documented all the data collection in the field.

CHAPTER 3

METHODS

3.1. Survey Area and Design

This survey was an interview-based cross-sectional study with retrospective data collection. The survey was facility-based where interviews with the health care workers (HCWs) were conducted at health facilities, while interviews with TB patients and community health workers (CHWs) conducted at their households or at health facility according to their preference.



Figure 2. The overall outline of the survey

The basic cross-sectional design of this survey included a representative sample of all adult TB patients, including drug-resistant TB (DR-TB) and extrapulmonary TB patients registered for treatment in a chosen TB-treating healthcare facility. This approach simplified sampling and made data collection efficient since most patients attending the facility during the study period were eligible to be invited to the survey.

A total of six districts across six provinces were selected to represent TB epidemiological differences in west, middle, and east regions of Indonesia. The selected provinces also reflect the need of the National TB program to understand the health system capacities to respond to the TB patients needs in these regions. These included Kota Bandung (West Java), Kota Semarang (Central Java), Aceh Besar (Aceh), Kota Palangkaraya (Central Kalimantan), Lombok Timur (West Nusa Tenggara), and Kota Ambon (Maluku).

3.2. Survey Population

TB patients initially registered at primary healthcare facilities (PHCs) were recruited for the survey, along with their contacts. Additionally, the survey included healthcare workers (HCWs) and community health workers (CHWs).

For TB patients and their contacts, the inclusion criteria are: TB patients registered in the selected PHC and their contacts who are adults older than 17 years and planned to reside in the survey region for more than 3 months after living there for more than 6 months and agree to participate in this study. The exclusion criteria are: suffer from illness leading to difficulties in comprehending the survey questions, and are inmates treated in correctional facilities, patients in military/police healthcare facilities.

For healthcare and community workers, the inclusion criteria are as follows: Adults older than 17 years, working as a healthcare worker related to the TB program in a public health center, hospital or working as a community health worker in TB program, and agree to participate in this study. While the exclusion criteria are as follows: respondents' illness made it harder for them to comprehend the survey questions.

3.3. Survey Duration

The survey was conducted for about 9 months after obtaining an ethics approval from the ethical committee of Faculty of Medicine, Public Health, and Nursing, Universitas Gadjah Mada as well as Badan Riset dan Inovasi Nasional (BRIN). Preparation for the study (engagement and consultation with stakeholders, refining the study protocol, developing and piloting survey instrument, obtaining ethics approval, developing manual of operations, staff training etc) occurred in the months prior to the commencement of participant recruitment and the survey. The recruitment of the participants and the survey were completed within 2 months. Analysis, reporting and preparing publication outputs continued beyond the study period. The survey was concluded on 1 November 2023.

3.4. Sampling Strategy

The minimum sample size of TB patients collected in this survey was calculated using formula as follows:

$$n = Z^2 \frac{P(1 - P)}{e^2}$$

Where:

n = total sample size

Z = level of confidence, we use 95% so the Z value will be 1.96

P = anticipated proportion, we use 50% because we do not have information regarding the predicted proportion

E = margin of error, this study used 5% or 0.05

Using above formula and value, there were 384 TB patients for the minimum total sample size. Since this survey used cluster random sampling with design effect (DEFF) 1.5 and anticipated a 20% non-response, the sample size became 693 TB patients for each region to estimate the KAP result in each region. One household contact in the same household with TB patients was used as a sample for this survey. So, there was a similar number of sample sizes between TB patients and household contacts with a total of 693 household contacts per region. Since there were three regions, a minimum of 2079 household samples or 4158 participants consisting of 2079 TB patients and 2079 household contacts were included in this survey. This survey used a public health center as a cluster, and for each cluster, 30 households with TB patients (cluster size) were selected to participate in this survey. The total number of clusters for each province was divided proportionally across regions based on the total number of TB patients. The distribution of clusters for each district and province was presented in the table 1 below. The final sample size for this study were 2,160 households which consisted of 2,160 TB patients and 2,160 TB household contacts.

The minimum sample size for healthcare and community workers were calculated based on the same formula as above. Using P=0.49 based on research by Chukwu, et al. (2021), DEFF=1.5, non-response rate was anticipated to be 10%, and 5% margin of error. Based on that calculation, there were 611 healthcare and community workers as the sample size of this study. This number was divided into TB program workers, medical doctor work in PHC, and community health worker or cadre. Each of the groups consisted of 204 respondents.

3.5. Survey Instrument and Tool Development and Piloting

A structured questionnaire was used to collect information regarding participants' demographic characteristics, clinical characteristics, knowledge regarding TB, attitude regarding TB, practice regarding TB, and health-seeking behaviours. There were four types of questionnaires used in this

survey, included: 1) a questionnaire for assessing KAP on TB among TB patients; 2) a questionnaire for assessing KAP on TB among household contacts; 3) a questionnaire assessing contact investigation for TB officers at public health center and community health workers; and 4) a questionnaire for AMR assessment among healthcare workers.

The questionnaires for KAP on TB among TB patients and household contacts were adapted from the questionnaires of KAP survey on TB from Ethiopia (Datiko et al, 2019). The questionnaire for assessing contact investigation was developed based on the guideline of contact investigation published by the Ministry of Health. Meanwhile, the questionnaire for AMR assessment was adapted from the questionnaire of the AMR survey developed by the London School of Hygiene and Tropical Medicine (Chandler et al, 2018).

A meeting with TB experts and TB research group was conducted on 2nd March, 2023 in order to obtain input on the instruments. All the feedback and input have been accommodated in the instruments prior to the pilot test.

After all survey instruments were translated, tested, and reviewed, a pre-testing survey was conducted to test the instrument and revise it accordingly. The purposes of this pilot testing were to identify any problems with the survey tool and validate the assumptions made for the sample size calculation, timing of interviews, and budget. It also aimed to ensure that illogical or missing steps in the survey instrument were identified and corrected prior to the data collection. The wording of questions, their sequence, and the structure of the questionnaire were improved based on the findings of the pilot testing.

The pilot test of the survey instruments was performed in Surakarta, Central Java. Two Puskesmas and two hospitals were being selected purposively for this pilot test, including Puskesmas Purwodiningratan, Puskesmas Banyuwanyar, UNS hospital, and Dr. Moewardi hospital. The pilot test was conducted between 14-18 March 2023 and there were 18 respondents who were interviewed during the pilot test. These included TB patients (5), household contacts (5), community health workers (2), TB officers (2), medical doctors at Puskesmas (2), and medical doctors at hospital (2).

After the pilot test, the survey instruments were then converted into electronic questionnaires employing an online designer through <https://redcap.pktfkugm.net/>, carried out by the Data Manager with administrator access to the Project.

The electronic questionnaires were divided into several parts: 1) KAP Form for TB Patients; 2) KAP Form for Contacts; 3) Contact Investigator Form for CHWs and TB officers; 4) AMR for Doctors at the Public Health Centers and Hospital Healthcare Workers; and 5) AMR - Contact Investigation Form for TB Officers at the Public Health Centers. Knowledge, attitude, and practice score of 80% of the total score or above were categorized as high.

The database was stored on the server at <https://redcap.pktfkugm.net/>, which could be accessed with limited access using a Username and Password. It was fully accessible by the Data Manager yet with restricted access by the Data Analyst.

All electronic forms were then distributed to the Data Collectors using QR barcodes scanned with the REDCAP application on each data collector's smartphone. The forms were initially downloaded from the internet. Once they were downloaded and installed in the Data Collector's smartphones, they could be completed even without using an internet connection.

3.6. Training for the Field Team

A three-day training for field coordinators and enumerators was conducted to equip the field coordinators and data collectors with the knowledge and skills of performing interviews, safety protocol, questionnaire, indicators used in the questionnaire, as well as how to enter data appropriately.

3.7. Data Collection

Data collection was conducted using electronic questionnaires through the REDCap application installed on each data collector's smartphone. The data collection took place in six cities over a period of two months, from 5 June to 29 July 2023. Data was obtained from 1,787 TB patient respondents, 1,701 TB patient contact respondents, 194 TB officers at the Public Health Centers, 198 doctors at Public Health Centers, 201 Community Health Workers, and 201 Hospital Healthcare Workers. The detail of the survey respondents is presented below:

Table 1. The number of respondents included in this survey across the six districts

No.	Districts	TB patients	Contacts	TB officers	CHWs	HCWs
1	Aceh Besar	152	148	26	30	36
2	Kota Palangkaraya	84	82	10	6	30
3	Kota Bandung	560	480	66	73	160
4	Kota Semarang	233	248	37	37	46
5	Kota Ambon	241	249	22	23	47
6	Lombok Timur	517	494	33	33	80
Total		1787	1701	194	202	399

3.8. Data Management

The electronic questionnaires completed by data collectors were stored on their smartphones and then sent directly to the server. Field Coordinators then performed the first level of data validation by downloading the data stored in the server using their smartphones with REDCap installed. If there were unanswered or doubtful responses detected during this stage, the Field Coordinator promptly reported these issues to the Data Collector for correction and resubmission to the server. The second validation was carried out by the Data Manager for every dataset that entered the server using REDCap tools to check for completeness and questionnaire accuracy. If incomplete data was identified, the Data Manager communicated with the Field Coordinator to have it corrected by the Data Collector.

The data was stored securely in our database. Only the Data Manager, who has administrator access, could view, manage, and make changes to the data after confirming with the Data Collector regarding any modifications. A secondary level of data access is granted to Data Analysts, allowing them to view and download the data once all data has been collected. The data was stored on a server and backed up on an external hard drive and a computer's PC, with access limited to the Data Manager.

The electronic questionnaires were deactivated and the barcode links were disabled after the completion of data collection to prevent any data entry. Only the Data Manager, with administrator access, can view, manage, and make changes to the data after confirming with the relevant data collector regarding any modifications.

3.9. Preparation for Data Analysis

After completion of the data collection, the data underwent a detailed cleaning and validation process to ensure its accuracy and completeness. This involved identifying and correcting errors, missing values, and inconsistencies in the data. The datasets were then exported to DTA files for further analysis using STATA.

3.10. Data Analysis

The data analysis was performed to answer the objectives of the survey. Although clusters had been collected in each of six provinces, the reliable district-level coverage estimates were unlikely given the limited sample size. We will estimate the KAP percentage based on three regional and national levels. Further sub-analyses were conducted in this survey as needed. A univariate and bivariate analysis was conducted using STATA 15 software. A univariate analysis was performed to check the consistency and variability of information collected in this survey. A special table was developed based on the univariate analysis. A bivariate analysis was conducted to see the distribution of KAP-related variables across different age groups, gender, working status, distance, and income status. Mean, median, standard deviation, Interquartile range (IQR), percentage and absolute number was used in this study, as well as tables and graphics to visualize the data. Furthermore, a multivariate analysis was conducted to investigate the effect of demographic and clinical characteristics on each study outcome. Table 2 below summarizes the type of analysis used for each outcome.

Table 2. Type of multivariate analysis used for each survey outcome

Multivariate analysis type	Population	Characteristics	Outcomes
Multiple linear regression	TB patients	Demographic and clinical	1. Knowledge on TB, 2. Practice on TB, 3. Stigma, 4. Health facilities satisfaction, 5. Knowledge and practice on AMR.
Multiple cox regression	TB patients	Demographic and clinical	Diagnostic delay
Multiple logistic regression	TB patients	Demographic and clinical	First facilities preferences
Multiple linear regression	TB contacts	Demographic	1. Knowledge on TB, 2. Practice on TB, 3. Stigma.
Multiple linear regression	community health worker	Demographic	1. Knowledge on TB contact investigation, 2. Attitude on TB investigation contact, 3. Practice on TB contact investigation.
Multiple linear regression	TB officer	Demographic	1. Knowledge on TB contact investigation, 2. Attitude on TB investigation contact, 3. Practice on TB contact investigation, 4. General awareness on AMR, 5. Practice on AMR, 6. Attitude on AMR, 7. Practice of AMR in the workplace.
Multiple linear regression	Healthcare worker	Demographic	1. General awareness on AMR, 2. Practice on AMR, 3. Attitude on AMR, 4. Practice of AMR in the workplace.

3.11. Ethical Approval

The data collection was started after obtaining ethics approval from the MHREC Faculty of Medicine, Public Health, and Nursing, Universitas Gadjah Mada, ethical clearance from the National Research and Innovation Agency (BRIN), and research permission from the Ministry of Home Affairs.

CHAPTER 4

RESULTS

4.1. Knowledge, attitude, and practice of TB among TB Patients and Contacts

Demographic characteristics of TB patients

Table 3 below shows the demographic characteristics of TB patients. After data cleaning, we found a total of 1,784 TB patients with a median of age 42.60. The proportion of male TB patients was 52.86%. Almost 50% of TB patients were in the 18-40 years age group and only 15.55% TB patients were included in ≥ 61 years age group. Bandung city (31.34%) had the highest number of TB patients compared with other districts. This study found 38.62% TB patients without any active job or unemployed. One third of TB patients had been working as farmers/laborers and factory workers/private workers. Most TB patients were married (63.89%) and only 10% TB patients widowed/divorced. Half of TB patients finished their education at least high school level. The median and mean per capita income of TB patients were Rp. 666,667 and Rp. 940,636.

Table 3. Demographic Characteristics of TB Patients (n = 1,784)

Characteristic of TB patients	N	%
Gender		
1. Male	943	52.86
2. Female	841	47.14
Age	42.58 \pm 16.43 ¹	42.60 \pm 27.40 ²
1. 18-30 years	553	31.05
2. 31-40 years	284	15.95
3. 41-50 years	338	18.98
4. 51-60 years	329	18.47
5. ≥ 61 years	277	15.55
District		
1. Aceh Besar	152	8.51
2. Palangkaraya	84	4.7
3. Bandung	560	31.34
4. Semarang	233	13.04
5. Ambon	241	13.49
6. Lombok Timur	517	28.93
Occupation		
1. Not working	689	38.62
2. Students	103	5.77
3. Farmer/labourer	395	22.14
4. Factory worker/private worker	204	11.43
5. Entrepreneur	203	11.38
6. Civil servants/Army/Police	28	1.57
7. Professionals (doctor, architect, etc)	11	0.62
8. Others	151	8.46
Marital status		
1. Not married	449	25.14
2. Married	1,141	63.89
3. Widowed	131	7.33
4. Divorced	65	3.64
Last educational level		
1. Not finished elementary school	134	7.51
2. Finished Elementary school	415	23.26
3. Finished Middle school	303	16.98
4. Finished High school	712	39.91
5. Finished higher education	195	10.93
6. Others	25	1.40
Per Capita income (n=1,529)	940,636 \pm 1,096,686 ¹ (16,667 – 15,000,000)	666,667 \pm 846,667 ² (333,333 – 1,180,000)

¹ mean \pm sd (min-max); ² median \pm IQR (Q1-Q3)

Demographic characteristics of TB contacts

Table 4 describes the distribution of demographic characteristics for TB patient contacts. A total of 1701 contacts were recruited from TB patients. There were more females among contacts than males. More than 50% of contacts were aged 21-50 years and married. Around 42% of contacts live in Java island. The proportion of unemployed TB contacts was 41% among total participants. Half of TB contacts had educational background at least high school or higher.

Table 4. Demographic Characteristics of TB Patient Contacts (N=1701)

Characteristic of TB contacts	N	%
Gender		
1. Male	562	33.04
2. Female	1,139	66.96
Age	42.7±13.8 ¹	43.1±20.6 ²
1. ≤10 years	7	0.41
2. 11-20 years	85	4.99
3. 21-30 years	295	17.31
4. 31-40 years	362	21.24
5. 41-50 years	475	27.88
6. 51-60 years	314	18.43
7. ≥61 years	166	9.74
Districts		
1. Aceh Besar	148	8.70
2. Palangkaraya	82	4.82
3. Bandung	480	28.22
4. Semarang	248	14.58
5. Ambon	249	14.64
6. Lombok Timur	494	29.04
Occupations		
1. Not working	704	41.24
2. Students	77	4.51
3. Farmer/laborer	333	19.51
4. Factory worker/private worker	163	9.55
5. Entrepreneur	253	14.82
6. Civil servants/Army/Police	41	2.40
7. Professionals (doctor, architect, etc)	18	1.05
8. Others	118	6.91
Marital status		
1. Not married	219	12.84
2. Married	1,362	79.88
3. Widowed	98	5.75
4. Divorced	26	1.52
Last educational level		
1. Not finished elementary school	100	5.86
2. Finished Elementary school	377	22.09
3. Finished Middle school	311	18.22
4. Finished High school	682	39.95
5. Finished higher education	212	12.42
6. Others	25	1.46
Percapita income	940,636±1,096,686 ¹	666,667±846,667 ²
Min-max (Q1-Q3)	16,667 – 15,000,000	(333,333 – 1,180,000)

¹mean±sd; ²median±IQR

Table 5 shows the result of household characteristics distribution from TB patients and contacts. The majority of participant's households had their own house (80.18%). Most of participant's houses were made of bricks (93.57%) and ceramics (65.86%) as their floor material. Almost all of participant's households used electricity as their lighting type (9.54%) and had their own toilet (95.67%). Bottled water was used as the main source for drinking water by 63,36% participants. More than 70% participants own a motorcycle and use mobile phones as their entertainment device. More than half

of participants had a television, electric fan, refrigerator, and electric iron in their household. There were 79.51% participants who reported that a public health center is the nearest health facility from their house with the median value of distance to the nearest health facilities being 1000m. There were only 4.27% participants who reported using telemedicine.

Table 5. Distribution of household characteristics among TB patients and contacts

Household Characteristics	n	%
Housing ownerships		
1. Own house	1,222	80.18
2. Rent	170	11.15
3. Staying together with other family members	100	6.56
4. Others	32	2.10
Housing materials		
1. Bricks	1,426	93.57
2. Wood/Bamboo	91	5.97
3. Others	7	0.46
Housing floor type		
1. Ceramics	1,007	65.86
2. Cement	506	33.09
3. Soil	11	0.72
4. Wood/Bamboo	45	2.94
5. Others	1	0.07
Lighting type		
1. Electric	1,522	99.54
2. Petromax	2	0.13
Toilet		
1. Own toilet	1,457	95.67
2. Public toilet	61	4.01
3. Others	5	0.33
Drinking water		
1. Bottled water	965	63.36
2. Drinking Water Company (PAM)	181	11.88
3. Well water	344	22.59
4. Others	3	2.17
Vehicle ownership		
1. Car	98	6.41
2. Motorcycle	1,299	84.96
3. Bicycle	201	13.15
4. Did not have any	200	13.08
Entertainment ownership		
1. Subscription TV channels	359	23.48
2. Regular TV channels	945	61.81
3. Radio	97	6.34
4. Mobile phone	1,088	71.16
5. Others	4	0.26
6. Did not have any	75	4.91
Electronic household		
1. AC	80	5.23
2. Washing machine	544	35.58
3. Refrigerator	967	63.24
4. Television	1,183	77.37
5. Radio	99	6.47
6. Electric fan	1,018	66.58
7. Microwave/oven	65	4.25
8. Electric stove	16	1.05
9. Electric iron	1,131	73.97
10. Others	73	4.77
11. Did not have any	65	4.25
Nearest health facilities		
1. Private midwife/nurse	83	5.45
2. Traditional medicine (dukun)	1	0.07
3. Private doctor	61	4.01
4. Private clinic	56	3.68
5. Public health center	1,211	79.51

6. Private hospital	20	1.31
7. Public hospital	22	1.44
8. Pharmacy	55	3.61
9. Drug store	6	0.39
10. Others	8	0.53
Distance to the nearest health facilities (meter)	5763± (1-5000) ¹	1000± (1500-2000) ²
Type of transportation used to go to health facilities		
1. Walking	202	13.25
2. Bicycle	22	1.44
3. Pedicab	3	0.20
4. Motorcycle	1,145	75.13
5. Car	13	0.85
6. Public transportation	71	4.66
7. Taxi/taxi bike	62	4.07
8. Others	6	0.39
Travel time to nearest health facilities (minutes)	10.32±27.55 ¹	7±5 ²
Use of telemedicine		
1. Yes	65	4.27
2. No	1,459	95.73
Purpose of using telemedicine		
1. Health problem consultation with doctor	39	2.55
2. Find or purchase medicine	19	1.24
3. Find health information	40	2.62
4. Others	1	0.07

¹mean±sd; ²median±IQR

Table 6 shows the distribution of clinical characteristics from TB patients. Most TB patients were bacteriologically confirmed (81.42%), drug sensitive TB (98.42%), new TB case (91.40%), and diagnosed as pulmonary TB (92.36%). The mean and median of TB medication duration were 18 and 19 weeks. There were around 20% TB patients with comorbidities such as DM, HIV, and asthma. TB patients with active smoking status were found among 11.6% participants. Filter cigarettes (79.84%) was used by most TB patients who are actively smoking.

Table 6. Clinical Characteristics of TB Patients

Clinical characteristics of TB patients	N	%
Diagnosis of TB		
1. Bacteriologically confirmed	1,236	81.42
2. Clinically confirmed	282	18.58
Anatomical location		
1. Pulmonary TB	1,402	92.36
2. Extra pulmonary TB	116	116
Drug resistant status		
1. Drug sensitive TB	1,496	98.42
2. Drug resistant TB	24	1.58
Type of medication		
1. New case	1,392	91.40
2. Treated after failure	17	1.12
3. Treated after drop out	21	1.38
4. Relapse	93	6.11
Medication duration (weeks)	18±20 ¹	19±16 ²
Comorbidities		
1. Yes	310	20.39
2. No	1,187	78.09
3. No information	23	1.51
Type of comorbidities		
1. HIV	8	2.56
2. Diabetes mellitus	204	65.38
3. Asthma	20	6.41
4. Others	80	25.64

Smoking status		
1. Active smoking	175	11.60
2. Ex-smoker	207	13.73
3. Non-smoker	1,126	74.67
Smoking status for family members		
1. Yes	466	41.17
2. No	666	58.83
Smoking status in workplace		
1. Yes	442	39.15
2. No	687	60.85
Age at first time smoking	17±5 ¹	16±3 ²
Type of cigarette used		
1. Filter cigarette	305	79.84
2. Cigarette	45	11.78
3. Electric cigarette	4	1.05
4. Rolled cigarette	10	2.62
5. Others	18	4.71
Number of cigarettes consumed each day	10±6 ¹	12±6 ²
Number of millilitres consumed each day (e-cigarette)	3.25±2.06 ¹	3.5±3.5 ²

¹mean±sd; ²median±IQR

Knowledge, attitude, and practices related to TB among TB patients

The distribution of knowledge related to TB among TB patients was shown by Table 7 below. Most TB patients know that they had TB (94.47%) from healthcare workers (95.81%). Among those who did not know that they had TB, there were 5.88% participants who knew that they had a curse related disease. This study found that 87% of TB patients think that TB is dangerous as a disease but only 63% of TB patients think that TB is dangerous in their neighbourhood. Less than half of TB patients know that TB is caused by bacteria (46.83%) while around one-third of TB patients did not know the cause of TB. This study also found that there are still few TB patients who think that TB is caused by curse (0.33%) and genetic (3.79%). This result also showed that many participants (38.10%) had not received adequate TB prevention and control information. Only three-quarters of TB patients who answer correctly about how TB is spread to another person. Most TB patients think that all people could have TB disease (90.26%).

Most TB patients know that the lung is one of the organs that could be infected by TB but only less than 10% know that other organs could also be infected by TB such as the digestive system (2.03%), bone (5.89%), and lymph glands (8.37%). Only half of TB patients could answer correctly about TB symptoms with cough (55.33%), cough more than two weeks (54.41%), and weight loss (33.88%) become the top three answers among other symptoms. Only 75% of TB patients know that TB could be prevented. Almost all TB patients know that TB could be cured (94.80%). While 78.56% of TB patients were aware of the potential side effects of treatment, a significant 21.44% lacked this crucial knowledge. This lack of information is concerning, as it may contribute to patients discontinuing treatment due to unforeseen side effects and ultimately lead to lost to follow up. We found that 11.85% TB patients know about drug resistant TB and only 20.56% TB patients know that they are at risk of drug resistant TB. Our finding that nearly 30% of TB patients never received information about who is at high risk of contracting TB from them (close contacts) raises serious concerns about the effectiveness of TB contact investigation efforts.

We found that 71.84% of TB patients know who are their close contacts and most TB patients answer correctly that their household member is their close contacts. Half of TB patients had been informed about TB contact investigation. Almost half of TB patients answer correctly about TB contact investigation and who had the responsibility to do contact investigation.

Table 7. Distribution of knowledge and perceptions on tuberculosis

Knowledge and perceptions	n	%
Participants know that they had TB		
1. Yes	1,436	94.47
2. No	84	5.53
If no, what do you know about your current disease?		
1. Curse related disease	5	5.88
2. Chronic cough and flu	13	15.29
3. Other infectious disease	35	41.18
4. Others	32	37.65
Where do you get information about your current disease?^		
1. Newspaper and magazine	7	0.46
2. Radio	1	0.07
3. Television	36	2.35
4. Social media (IG/twitter/WhatsApp/Facebook/TikTok, etc)	65	4.25
5. Website	45	2.94
6. YouTube	17	1.11
7. Commercial board	7	0.46
8. Brochure, poster, and others	90	5.89
9. Healthcare worker	1,465	95.81
10. Community health workers	133	8.70
11. Family, friend, or neighbour	210	13.73
12. Teacher	7	0.46
13. Others	34	2.22
According to your opinion, how dangerous is TB as a disease?		
1. Dangerous	647	42.51
2. Quite dangerous	678	44.55
3. Not so dangerous	94	6.18
4. No dangerous	20	1.31
5. Not sure	83	5.45
In your opinion, how big is the TB problem in your neighbourhood?		
1. Very big	406	26.68
2. Big enough	552	36.27
3. Not very big enough	262	17.21
4. Not big	49	3.22
5. Not sure	253	16.62
What is the cause of TB?^		
1. Bacteria	716	46.83
2. Virus	264	17.27
3. Curse	5	0.33
4. Genetic	58	3.79
5. Drinking Alcohol	23	1.50
6. Lack of nutrition	41	2.68
7. Smoking	273	17.85
8. Not sure	465	30.41
9. Others	110	7.19
How is TB spread to other people?^		
1. Through the air when coughing/sneezing	1,145	74.89
2. Sharing eating utensils	491	32.11
3. Touching a TB patient	132	8.63
4. Through food/water	132	8.63
5. Sexual contact	56	3.66
6. Mosquito bites	6	0.39
7. Cold air	67	4.38
8. Hereditary/genetic disease	36	2.35
9. Witchcraft or black magic	5	0.33
10. Others	29	1.90
11. Not sure	296	19.36
In your opinion, who can get infected?^		
1. Everyone	1,380	90.26
2. Only the poor	5	0.33
3. Only homeless people	1	0.07
4. Only alcohol drinkers	12	0.78
5. Only drug users	2	0.13
6. Only people with HIV/AIDS	4	0.26

7. Only those who are malnourished	10	0.65
8. Smokers	56	3.66
9. Others	126	8.24
Which parts/organs of the body can be infected by TB? (multiple select)^		
1. Lungs (yes vs no)	1,324	86.59
2. Digestive system (yes vs no)	31	2.03
3. Bone (yes vs no)	90	5.89
4. Lymph glands (yes vs no)	128	8.37
5. Others	30	1.96
6. Not sure	160	10.46
What symptoms will a person with tuberculosis or TB have?^		
1. Cough	846	55.33
2. Persistent cough for more than 2 weeks	832	54.41
3. Weight loss	518	33.88
4. Loss of appetite	337	22.04
5. Night sweats	313	20.47
6. Chest pain	274	17.92
7. Fever	351	22.96
8. Coughing up blood	310	20.27
9. Shortness of breath	410	26.81
10. Fatigue	180	11.77
11. Swelling	64	4.19
12. Other...	72	4.71
13. Not sure	54	3.53
Is TB a preventable disease?		
1. No	75	4.93
2. Yes	1,142	75.13
3. Not sure	303	19.93
How to prevent the transmission of TB?^		
1. Avoid coughing in front of other people	590	38.59
2. Be careful when disposing of sputum	188	12.30
3. Proper home ventilation	96	6.28
4. Avoid close contact with TB patients	194	12.69
5. BCG vaccination for children	33	2.16
6. Use a mask	592	38.72
7. Use separate eating utensils	305	19.95
8. Wash clothes separately	40	2.62
9. Sleep/eat/engage in activities in a different room from TB patients	64	4.19
10. Not smoking	178	11.64
11. Not consuming alcoholic beverages	28	1.83
12. Not sure	81	5.30
13. Other	120	7.85
Can TB be cured?		
1. No	3	0.20
2. Yes	1,441	94.80
1. Not sure	76	5.00
How can someone with TB be cured?		
1. Herbal remedies	48	3.14
2. Home rest without remedies	11	0.72
3. Praying	67	4.38
4. Specific drugs (anti TB drugs)	1,416	92.61
5. Treatment from a traditional healer	5	0.33
6. Other	21	1.37
7. Not sure	10	0.65
In your opinion, have you received information about TB prevention and control well?		
1. No	372	24.54
2. Yes	1,144	75.46
Do you want to get more information about TB?		
1. No	284	18.72
2. Yes	1,233	1,233
What source of information do you think is most effective in reaching people like you?^		
1. Newspapers and magazines	7	0.46
2. Radio	4	0.26
3. Television	129	8.44
4. Billboards	30	1.96
5. Brochures, posters, and other printed media	186	12.16
6. Healthcare workers	1,155	75.54

7. Community health workers	187	12.23
8. Family, friends, or neighbours	127	8.31
9. Religious leaders	7	0.46
10. Teachers	1	0.07
11. Other	94	6.15
Have you ever received information about the side effects of TB medication?		
1. Yes	1,187	78.56
2. No	324	21.44
If yes, who provided this information?		
1. Healthcare workers	1,156	97.31
2. Community health workers	11	0.93
3. Neighbours	1	0.08
4. Family members	8	0.67
5. Other	12	1.01
List the side effects of TB medication that you are aware of [^]		
1. Nausea	942	61.61
2. Vomiting	393	25.70
3. Red-coloured urine	804	52.58
4. Loss of appetite	238	15.57
5. Joint pain	273	17.85
6. Tingling sensation	101	6.61
7. Burning sensation in the feet	36	2.35
8. Itching	517	33.81
9. Skin redness	80	5.23
10. Hearing impairment	27	1.77
11. Vision problems	22	1.44
12. Yellowing of the skin	12	0.78
13. Other	218	14.26
Have you ever heard about drug-resistant TB?		
1. No	1,339	88.15
2. Yes	180	11.85
What do you know about drug-resistant TB?		
1. Drug-resistant TB occurs if patients do not regularly take anti-TB drugs	153	10.01
2. Drug-resistant TB is a severe form/level of TB	19	1.24
3. Can be transmitted to family and friends	3	0.20
4. Treatment lasts at least 2 years	6	0.39
5. Other	12	0.78
6. Not sure	10	0.65
Do you feel that you are at risk of drug-resistant TB?		
1. Yes	37	20.56
2. No	143	79.44
If yes, what is the reason?		
1. Because I do not take medication regularly	24	64.86
2. Because I rarely eat nutritious food	3	8.11
3. Because I am unsure about the treatment provided	4	10.81
4. Other	6	16.22
If no, what is the reason?		
1. Because I take medication regularly	131	91.61
2. Because I eat nutritious food	2	1.40
3. Because I believe in the treatment provided by healthcare workers	7	4.90
4. Other...	3	2.10
Do you know how to prevent getting drug-resistant TB?		
1. Yes	151	83.43
2. No	30	16.57
If yes, how do you do it?		
1. Take medication regularly	139	92.05
2. A healthy lifestyle, including exercise and nutritious food	7	4.64
3. Getting closer to God	2	1.32
4. Following all the instructions of healthcare workers	3	1.99
If not, do you want to know?		
1. Yes	25	83.33
2. No	5	16.67
Who do you expect to provide information on this prevention method?		
1. Healthcare workers	162	89.50
2. Community health workers	2	1.10

3. Family members	14	7.73
4. Other	3	1.66
What kind of support do you expect from your family to prevent drug-resistant TB?		
1. Reminding to take medication regularly	163	10.66
2. Reminding to go for regular check-ups	72	4.71
3. Accompanying to health facility visits	49	3.20
4. Supervising medication intake	50	3.27
5. Other	2	0.13
What kind of support do you expect from healthcare workers to prevent drug-resistant TB?		
1. Information	134	8.76
2. Providing DOTS (Directly Observed Treatment, Short-course)	48	3.14
3. Reminding to take medication regularly	99	6.47
4. Providing incentives for patients	16	1.05
5. Other	4	0.26
Have you ever received an explanation about who is at high risk of getting TB from you (close contacts)?		
1. Yes	1,087	71.84
2. No	426	28.16
List who is at high risk of getting TB from you:^		
1. Family members living in the same house	1,397	91.37
2. Co-workers or classmates sharing the same space	129	8.44
3. Neighbours	134	8.76
4. Family members not living in the same house	38	2.49
5. Anyone who had direct contact (physical contact)	140	9.16
6. Healthcare workers at health centers	28	1.83
7. Other	85	5.56
In your opinion, should people at high risk of getting TB undergo TB testing?		
1. Yes	1,283	84.69
2. No	232	15.31
Have you ever received an explanation about TB contact investigation?		
1. No	832	54.77
2. Yes	687	45.23
If yes, from whom did you receive the information?		
1. Healthcare workers	664	43.43
2. Community health workers	121	7.91
3. Neighbours	3	0.20
4. Family members	10	0.65
TB contact investigation is...		
1. Examination of all family members of TB patients	738	48.62
2. Examination of everyone who has had direct contact with TB patients	36	2.37
3. Examination of symptomatic family members of TB patients	51	3.36
4. Not sure	693	45.65
Who should conduct a contact investigation?		
1. Healthcare workers	830	54.71
2. Community health workers	98	6.46
3. Patients	4	0.26
4. Anyone	16	1.05
5. Not sure	569	37.51

^questions with multiple answers

Stigma perception among TB patients

Table 8 shows the distribution of stigma among TB patients. TB patients reported that they lost their job because of TB (17.68%). We found that 7.3% TB patients reported that TB caused their family to be underestimated by other people. While 10% of TB patients answered that TB caused them to be underestimated by other people. Because of TB, one-fifth (20.1%) participants feel less confident. We found approximately 9% TB patients reported that they were asked to distance themselves from their social group.

Table 8. Distribution of perception of stigma against TB patients

Perceptions and stigma	N	%
Others look down on you because you have TB		
1. Strongly disagree	177	11.66
2. Disagree	1,007	66.34
3. Neutral	181	11.92
4. Agree	138	9.09
5. Strongly agree	15	0.99
Being a TB patient makes you feel ashamed		
1. Strongly disagree	173	11.40
2. Disagree	910	59.95
3. Neutral	186	12.25
4. Agree	222	14.62
5. Strongly agree	27	1.78
Others avoid you because you have TB		
1. Strongly disagree	161	10.61
2. Disagree	895	58.96
3. Neutral	242	15.94
4. Agree	205	13.50
5. Strongly agree	15	0.99
Do you have a partner (spouse)?		
1. Yes	975	64.31
2. No	541	35.69
As a TB patient, you may have difficulty finding a partner to marry even after recovery		
1. Strongly disagree	46	8.47
2. Disagree	357	65.75
3. Neutral	99	18.23
4. Agree	40	7.37
5. Strongly agree	1	0.18
As a TB patient, you are still allowed to sleep in the same room with your partner		
1. Strongly disagree	45	4.60
2. Disagree	407	41.57
3. Neutral	206	21.04
4. Agree	305	31.15
5. Strongly agree	16	1.63
As a TB patient, you may be asked to distance yourself from social groups		
1. Strongly disagree	134	8.84
2. Disagree	1,007	66.42
3. Neutral	238	15.70
4. Agree	130	8.58
5. Strongly agree	7	0.46
As a TB patient, you will not disclose it, even to those you trust (those you usually confide in).		
1. Strongly disagree	110	7.25
2. Disagree	894	58.89
3. Neutral	278	18.31
4. Agree	210	13.83
5. Strongly agree	26	1.71
You feel less confident because you have TB.		
1. Strongly disagree	111	7.31
2. Disagree	883	58.17
3. Neutral	218	14.36
4. Agree	278	18.31
5. Strongly agree	28	1.84
People look down on your family because you have TB.		
1. Strongly disagree	135	8.90
2. Disagree	1,000	71.19
3. Neutral	190	12.52
4. Agree	101	6.66
5. Strongly agree	11	0.73
Do you have children?		
1. Yes	1,052	69.76
2. No	456	30.24

Being a TB patient, it would be a problem for your children		
1. Strongly disagree	72	6.83
2. Disagree	729	69.17
3. Neutral	115	10.91
4. Agree	121	11.48
5. Strongly agree	17	1.61
You lost your job because you had tuberculosis		
1. Strongly disagree	78	5.15
2. Disagree	989	65.24
3. Neutral	181	11.94
4. Agree	229	15.11
5. Strongly agree	39	2.57

Patient satisfaction towards healthcare facilities

Table 9 gives the distribution of TB patient satisfaction on health facilities. Most TB patients feel satisfied with their supporters on TB treatment (92.8%). The majority of TB patients feel satisfied with the availability of TB medicine (91%) and service in their healthcare facilities (89.6%). More than 75% of TB patients feel satisfied with the waiting time in public health centres (77.9%). Most TB patients (88%) feel that their healthcare facilities give support and respect to people with TB.

Table 9. Distribution of perceptions regarding healthcare service satisfaction

Perceptions regarding healthcare service satisfaction	N	%
Health facilities provide support and respect for people with TB.		
1. Strongly disagree	10	0.66
2. Disagree	55	3.63
3. Neutral	104	6.86
4. Agree	1,162	76.65
5. Strongly agree	185	12.20
Before coming for diagnosis/treatment, you hope that health facilities will support and respect people with TB.		
1. Strongly disagree	10	0.66
2. Disagree	26	1.71
3. Neutral	121	7.98
4. Agree	1,191	78.51
5. Strongly agree	169	11.14
Most people in your community believe that they will be treated supportively and respectfully by healthcare providers if they have TB.		
1. Strongly disagree	14	0.92
2. Disagree	58	3.83
3. Neutral	181	11.94
4. Agree	1,100	72.56
5. Strongly agree	163	10.75
You are satisfied with the service you receive at healthcare facilities		
1. Strongly disagree	6	0.40
2. Disagree	22	1.45
3. Neutral	129	8.51
4. Agree	1,157	76.37
5. Strongly agree	201	13.27
How does the service you receive from the health facility compare to your expectations before receiving healthcare services?		
1. More than I expected	122	8.05
2. As I expected	1,358	89.58
3. Not as good as I expected	336	3.27
Healthcare workers answer all your questions about TB.		
1. Strongly disagree	2	0.13
2. Disagree	29	1.91
3. Neutral	176	11.61
4. Agree	1,158	76.39
5. Strongly agree	151	9.96
You are satisfied with health center schedule		
1. More than I expected	100	6.60
2. As I expected	1,385	91.42
3. Not as good as I expected	30	1.98

You are satisfied with waiting time in the health center		
1. Strongly disagree	2	0.13
2. Disagree	60	3.96
3. Neutral	273	18.01
4. Agree	1,059	69.85
5. Strongly agree	122	8.05
You are satisfied with the availability of drugs at the health center		
1. Strongly disagree	3	0.20
2. Disagree	11	0.73
3. Neutral	120	7.92
4. Agree	1,178	77.70
5. Strongly agree	204	13.46
Do you have a TB treatment supporter?		
1. Yes	1,041	68.67
2. No	475	31.33
You are satisfied with your TB treatment supporter.		
1. Strongly disagree	3	0.29
2. Disagree	9	0.86
3. Neutral	622	5.94
4. Agree	822	78.74
5. Strongly agree	148	14.18

Health-seeking behavior on tuberculosis

Table 10 describes the distribution of TB practice including health seeking behavior. The first facilities visited by 62% TB patients were public health centres followed by private clinics (13.62%) and public hospitals (8.03%). Half of TB patients reported that the cause of seeking treatments were symptoms not recovering (52.64%) followed by worsening of symptoms (30.38%), and according to the health insurance scheme (10.30%). This study found that there was a delay in the patient, health system and as a total diagnostic delay. Patient delay is defined as time needed by patients to start finding treatment from healthcare facilities, health system delay defined as time needed by patients to be diagnosed as TB after they visit healthcare facilities, and lastly diagnostic delay is the sum of patient delay and health system delay. We found the median of patient delay around 20 days (7-46 days), while the median of diagnostic delay was 64 days (25-119 days), and the median of total delay was 63 days (25-135 days). Half of TB patients reported that they need to visit at least two facilities before being diagnosed as TB patients.

The majority of TB patients reported that they took TB medication at their house (81.02%) with their family members acting as treatment observers (94.94%). We found 6.21% TB patients reported that they stop their medication at least once. More than half of TB patients reported experiencing side effects of TB medication with vomiting (41.6%), reddish urine (41.07%), and itchy (27.93%) as the most side effects occurred. Less than half of TB patients inform other people outside their family members about their TB diagnosis. Half of TB patients reported that community health workers in their neighbourhood know about their TB status. TB patients start to eat many and varied foods (56.28%), open their window/door in the house (77.53%), open windows in their workplace (80.59%), and routinely measure body weight after being diagnosed as TB patients (65.98%). Most TB patients close their mouths when they cough (84.05%). Less than half of TB patients reported that they had been visited for TB related screening (40.53%). Only 46.74% of patients investigated had their contacts receiving TPT with the majority not getting the TPT as they felt healthy (74.70%).

Table 10. Distribution of TB health seeking behavior

Health-seeking behavior practices	n	%
The first facility visited		
1. Primary Health Center	951	62.57
2. Government hospital	122	8.03
3. Private hospital	88	5.79
4. Private specialist clinic (Specialist doctor clinic)	70	4.61
5. Private general clinic (General doctor clinic)	207	13.62
6. Pharmacy/drugstore	34	2.24
7. Herbal/traditional health practitioner	1	0.07
8. General store/convenience store	15	0.99
9. Community health worker	3	0.20
10. Other	29	1.91
The reason for the visit		
1. Not getting better	797	52.64
2. In accordance with the health insurance scheme I have	156	10.30
3. Symptoms getting worse	460	30.38
4. Fear of being rejected/losing my job	1	0.07
5. Fear of expensive treatment	2	0.13
6. Lack of time	6	0.40
7. Difficulty accessing the health center/transportation issues	4	0.26
8. Lack of satisfactory prior experience with the healthcare system	25	1.65
9. I feel there is no delay in seeking treatment	63	4.16
Patient delay in seeking treatment (in days)	62±181 ¹ 1-2593 ³	20±39 ² 7-46 ⁴
Health system delay in diagnosis (in days)	98±230 ¹ 1-4904 ³	64±94 ² 25-119 ⁴
Total delay related to treatment-seeking and diagnosis (Diagnostic delay) (in days)	122±261 ¹ 1-4904 ³	63±110 ² 25-135 ⁴
The number of visits to healthcare facilities before being diagnosed with TB	4±4 ¹ 1-29 ³	2±4 ² 1-5 ⁴
Reasons for not going directly to the health center		
1. Not aware	288	50.70
2. Fear	8	1.41
3. Distant access to the health center	32	5.63
4. Fear of expensive treatment	4	0.70
5. Lack of time	44	7.75
6. Difficulty accessing the health center/transportation issues	3	0.53
7. Unsatisfactory prior experience	6	1.06
8. Other	183	32.22
Where do you usually take your daily TB medication?		
1. Hospital	20	1.32
2. Public health center	260	17.14
3. Home	1,229	81.02
4. Other	8	0.53
Do you have someone who supervises you when taking medication every day?		
1. No	347	22.95
2. Yes	1,165	77.05
Who supervises you when you take medication every day?		
1. Healthcare worker at the healthcare facility	39	3.34
2. Community health worker	8	0.69
3. Family member	1,108	94.94
4. Neighbour	4	0.34
5. Other	8	0.69
Travel time to the health center (minutes)	6.6±5.5 ¹ 1-180 ³	10±10 ² 5-15 ⁴
How often do you visit the healthcare facility during your current treatment period?		
1. Every day	4	0.26
2. Every week	123	8.12
3. Every two weeks	608	40.13
4. Every month	738	48.71
5. Every two months	11	0.73
6. Every three months	1	0.07
7. More than every three months	30	1.98

Have you ever stopped treatment?		
1. Yes	94	6.21
2. No	1,420	93.79
What was the reason for you to stop taking TB medication?		
1. No medicine available at the healthcare facility	1	0.07
2. I experienced medication side effects.	26	1.70
3. I sought alternative treatment	10	0.65
4. Distance to the healthcare facility	3	0.20
5. I traveled out of the area	17	1.11
6. I couldn't go to the clinic, and no one could get my medicine	3	0.20
7. Other	54	3.53
Have you ever experienced side effects from TB medication?		
1. Yes	1,184	78.20
2. No	330	21.80
If yes, what side effects of TB medication did you experience?^		
1. Nausea	636	41.60
2. Vomiting	230	15.04
3. Red-colored urine	628	41.07
4. Loss of appetite	160	10.46
5. Joint pain	217	14.19
6. Tingling	59	3.86
7. Burning sensation in the legs	19	1.24
8. Itching	427	27.93
9. Redness of the skin	62	4.05
10. Hearing problems	22	1.44
11. Vision problems	17	1.11
12. Yellow skin	11	0.72
13. Other, please specify	133	8.70
Have you ever told a family member that you have TB?		
1. No	196	12.95
2. Yes	1,318	87.05
Among your family members, who have you told that you have TB?^		
1. Spouse	768	50.23
2. Sibling	779	50.95
3. Child	647	42.32
4. Parent	589	38.52
5. Other	11	0.72
Have you ever told someone other than family members that you have TB?		
1. Yes	558	36.88
2. No	955	63.12
Apart from family, who have you told?^		
1. Religious leader	28	1.83
2. Neighbour	409	26.75
3. Co-worker	181	11.84
4. Other friend	175	11.45
5. Other	7	0.46
Do the community health workers in your area know that you have TB?		
1. Yes	790	52.21
2. No	723	47.79
Who informed the community health workers about your condition?^		
1. Health center staff	689	45.06
2. Myself	154	10.07
3. Family member	102	6.67
4. Non-family medication supervisor	2	0.13
Have you been eating more and diversifying your diet since you found out you have TB?		
1. No	661	43.72
2. Yes	851	56.28
Have you been regularly opening windows/doors at home since you found out you have TB?		
1. Yes	1,170	77.53
2. No	339	22.47
Is your job predominantly indoors or in a building?		
1. Yes	568	37.74
2. No	937	62.26
Have you been regularly opening windows/doors at your workplace since you found out you have TB?		
1. Yes	461	80.59
2. No	111	19.41

Is your body weight regularly measured?		
1. Yes	995	65.98
2. No	513	34.02
Has a healthcare worker ever told you that your weight is below what is expected?		
1. Yes	615	40.76
2. No	894	59.24
Have you received nutritional support from a healthcare facility when your weight was below what was expected?		
1. Yes	144	23.30
2. No	474	76.70
Do you cover your mouth when coughing?		
1. Yes	1,270	84.05
2. No	241	15.95
Has your family ever received visits for investigations?		
1. Yes	612	40.53
2. No	898	59.47
Who was investigated?		
1. All family members	552	36.10
2. Only those with symptoms	34	2.22
3. Only children	9	0.59
4. Only adults	30	1.96
5. Other	10	0.65
Have any of your family members received TB prevention therapy after being investigated for TB?		
1. Yes	287	46.74
2. No	327	53.26
If yes, who received the TPT prescription?		
1. All family members	242	15.83
2. Only those with symptoms	6	0.39
3. Only children	26	1.70
4. Only adults	16	1.05
5. Other	6	0.39
If they did not receive TB prevention therapy, what is the reason?		
1. Feel healthy	245	74.70
2. Don't feel contagious	32	9.76
3. Fear of side effects	8	2.44
4. Fear of TB patient stigma	1	0.30
5. Other	42	12.80
What support do you need to be willing to receive TB prevention therapy?		
1. Psychological support	182	11.90
2. Financial support	143	9.35
3. Medication reminders	174	11.38
4. Support with additional food	120	7.85
5. Compensation if there are side effects	32	2.09
6. Other	9	0.59
If they have never been investigated, have you ever encouraged family members to go to a healthcare facility for TB testing?		
1. Yes	329	36.60
2. No	570	63.40

^Questions with multiple answers ¹mean±sd; ²median±IQR; ³min-max; ⁴Q1-Q3

4.2. Knowledge, attitude, and practice of antimicrobial resistance (AMR) among TB patients

Table 11 and 12 describe the distribution of AMR knowledge and practice among TB patients. One-third of TB patients know about antimicrobial medicine (31%). We found that 42.36% TB patients reported that antibiotics are effective to treat colds and flu. Improper use of antibiotics could cause antimicrobial resistance is reported by 32.63% of TB patients. There are only 12.84% TB patients who know that antimicrobial medicine is different from anti-inflammation medicine. We found 29.76% TB patients reported that antibiotic consumption should be terminated according to doctor's

prescription. In the past 12 months, only 7.6% remember that they received information about AMR and mostly from doctors (60.5%). One-third of TB patients reported that they took antibiotics beside TB medication in the last one year and most of those TB patients received the antibiotics without a doctor's prescription (63.78%). The source of antibiotics without prescription were from public health centers (28.67%) followed by pharmacies (27.33%).

Table 11. Knowledge of AMR among TB Patients

Knowledge of AMR	n	%
The medicines for TB therapy are a type of antibiotic drug. What is the meaning of antibiotic drugs according to you?		
1. Medicines used to treat coughs and colds	202	13.36
2. Medicines used to treat infections	206	13.62
3. Medicines used to treat bacterial infections	184	12.17
4. Medicines used to treat viruses	98	6.48
5. Medicines used to treat parasites	2	0.13
6. Not sure	820	54.23
Antibiotics can kill virus		
1. Correct	686	45.31
2. Incorrect	88	5.81
3. Not sure	740	48.88
Antibiotics are effective against the common cold and flu		
1. Correct	640	42.36
2. Incorrect	114	7.54
3. Not sure	757	50.10
Incorrect antibiotic use makes antibiotics ineffective or causes bacterial resistance		
1. Correct	493	32.63
2. Incorrect	60	3.97
3. Not sure	958	63.40
Antibiotics often cause side effects like diarrhea		
1. Correct	172	11.40
2. Incorrect	246	16.30
3. Not sure	1,091	72.30
Antibiotics are the same as anti-inflammatory drugs		
1. Correct	297	19.66
2. Incorrect	194	12.84
3. Not sure	1,020	67.50
In your opinion, when should you stop taking antibiotics after starting treatment?		
1. When your illness improves,	425	28.11
2. When the prescribed medication is finished,	450	29.76
3. Other	7	0.46
4. Not sure	630	41.67
Information about the proper use of antibiotics and AMR		
In the last 12 months, do you remember receiving information about not taking unnecessary antibiotics, such as for a cold or flu, or information about antimicrobial resistance (AMR)?		
1. Yes	115	7.61
2. No	721	47.69
3. Not sure	676	44.71
From whom did you receive that information?		
1. Brochure/poster	0	0
2. Newspaper	0	0
3. Radio	0	0
4. Television	2	1.75
5. Internet/social media	8	7.02
6. Family/friends	8	7.02
7. Doctor	69	60.53
8. Nurse	17	14.91
9. Pharmacist	5	4.39
10. Other healthcare profession	5	4.39

Table 12. Practices related to AMR in TB patients

Practice related to AMR	n	%
Have you used oral antibiotics such as tablets, powder, or syrup in the past year, apart from TB therapy-related drugs? Probing: example: penicillin, tetracycline, amoxicillin, ampicillin, 1. Yes 2. No 3. Not sure	450 577 486	29.74 38.14 32.12
In the past year, have you ever obtained antibiotics without a doctor's prescription, other than TB medication? (You use it to treat diarrhoea/fever/ skin infections/sore throat/body aches/cough/headache/cold) 1. Yes 2. No	287 163	63.78 36.22
Where did you last obtain the antibiotics you used? 1. Public health center 2. Government hospital 3. Private hospital 4. Private doctor's practice 5. Private midwife/nurse practice 6. Clinic 7. Pharmacy 8. Drugstore/shop 9. Leftover medicine from a previous illness 10. Given by someone else 11. Other	129 22 16 45 6 32 123 73 1 2 1	28.67 4.89 3.56 10.00 1.33 7.11 27.33 16.22 0.22 0.44 0.22
Have you ever bought antibiotic medicine less than the amount prescribed by the doctor? 1. Yes 2. No	62 388	13.78 86.22
If yes, why did you buy less medicine than the prescribed amount? 1. I did not have enough money 2. I did not want to take too many pills 3. Not covered by insurance 4. Other	8 50 2 2	12.90 80.65 3.23 3.23
Have you ever stopped taking antibiotics before they were finished? 1. Yes 2. No	175 274	38.98 61.02
If yes, what was the reason? 1. Felt better 2. Side effects 3. Got tired of taking antibiotics 4. Other	163 7 2 3	93.14 4.00 1.14 1.71

4.3. Knowledge, attitude, and practice of TB among household contacts

Table 13 below shows the result about TB knowledge among TB patient's contacts. A total of 1,699 TB contacts completed this survey. We found that 92.8% contacts know about TB and 99% of them know from healthcare workers. This survey also found that 76.9% contacts know that their family member had TB. Majority of TB contacts agree that TB is a dangerous disease. Only few stated that they had received information on TB prevention and control (38.10%), TB contact investigation (30.22%) and only 8.21% ever heard about drug-resistant TB. Less than half of TB contacts (47.3%) know that TB is caused by bacteria, while other contacts answer that TB is caused by virus (20.74%), curse (0.53%), and genetic (3.80%). Approximately more than 75% TB contacts know that TB spread to other people through cough/sneeze (75.99%), while other TB contacts said that TB spread through sharing utensils (35.46%), touching (11.97%), and sexual activity (4.09%). Most of TB contacts (92.23%) answer that everyone could get infected by TB. We found that 83.41% contacts know that lung was the organ infected by TB. The most known TB symptoms among contacts were cough (59.05%), continuous cough for two weeks (49.01%), and loss of body weight (30.37%). TB contacts know that TB could be prevented (75.10%) by avoid coughing in front of other people (39.72%), using mask (38.61%), and

using separate utensils (20.33%). Most of TB contacts had been informed about who is TB close contacts (84.49%) and about TB drug resistant (91.79%).

Table 13. Distribution of knowledge and perceptions on tuberculosis among contacts

Distribution of knowledge and perceptions on tuberculosis	n	%
Have you ever heard of a disease called tuberculosis (TB)?		
1. Yes	1,576	92.76
2. No	123	7.24
Are you aware that your spouse/family member we interviewed has TB?		
1. Yes	97	76.98
2. No	29	23.02
If not, what does your spouse/family member have?		
1. A curse-related illness	0	0
2. Chronic cough and cold	10	34.48
3. Another respiratory infection	9	31.03
4. Other	10	34.48
Where did you hear that information?^		
1. Newspapers and magazines	21	1.23
2. Radio	7	0.41
3. Television	149	8.70
4. Billboards	31	1.81
5. Brochures, posters, and other printed media	216	12.62
6. Healthcare workers	1,364	79.67
7. community health workers	175	10.22
8. Family, friends, or neighbours	530	30.96
9. Religious leaders	4	0.23
10. Teacher	38	2.22
11. Other	63	3.68
According to your opinion, how dangerous is TB as a disease?		
1. Dangerous	809	47.62
2. Quite dangerous	798	46.97
3. Not so dangerous	92	5.41
In your opinion, how big is the TB problem in your neighbourhood?		
1. Very big	614	36.14
2. Quite big	763	44.91
3. Not very big	322	18.95
What is the cause of TB?^		
1. Bacteria	810	47.31
2. Virus	355	20.74
3. Curse	9	0.53
4. Genetic	65	3.80
5. Alcohol drink	42	2.45
6. Lack of nutrition	62	3.62
7. Smoking	334	19.51
8. Not sure	508	29.67
9. Others	80	4.67
How is TB spread to other people?^		
1. Through the air when coughing/sneezing	1,301	75.99
2. Sharing eating utensils	607	35.46
3. Touching a TB patient	205	11.97
4. Through food/water	165	9.64
5. Sexual contact	70	4.09
6. Mosquito bites	12	0.70
7. Cold air	63	3.68
8. Others	25	1.46
9. Not sure	296	17.29
In your opinion, who can get infected?^		
1. Everyone	1,579	92.23
2. Only the poor	13	0.76
3. Only alcohol drinkers	17	0.99
4. Only drug users	3	0.18
5. Only people with HIV/AIDS	5	0.29
6. Only prisoners	3	0.18
7. Others	133	7.77

Which parts/organs of the body can be infected by TB?^		
1. Lungs	1,428	83.41
2. Digestive system	42	2.45
3. Bone	64	3.74
4. Lymph glands	131	7.65
5. Others	40	2.34
6. Not sure	243	14.19
What symptoms will a person with tuberculosis or TB have?^		
1. Cough	1,011	59.05
2. Persistent cough for more than 2 weeks	839	49.01
3. Weight loss	520	30.37
4. Loss of appetite	307	17.93
5. Night sweats	252	14.72
6. Chest pain	237	13.84
7. Fever	346	20.21
8. Coughing up blood	404	23.60
9. Shortness of breath	225	13.14
10. Fatigue	130	7.59
11. Swelling	46	2.69
12. Other	40	2.34
13. Not sure	108	6.31
Is TB a preventable disease?		
1. No	71	4.19
2. Yes	1,273	75.10
3. Not sure	351	20.71
How to prevent the transmission of TB?^		
1. Avoid coughing in front of other people	680	39.72
2. Be careful when disposing of sputum	176	10.28
3. Proper home ventilation	95	5.55
4. Avoid close contact with TB patients	240	14.02
5. BCG vaccination for children	42	2.45
6. Use a mask	661	38.61
7. Use separate eating utensils	348	20.33
8. Wash clothes separately	48	2.80
9. Sleep/eat/engage in activities in a different room from TB patients	72	4.21
10. Stop smoking	194	11.33
11. Stop drinking alcoholic beverages	33	1.93
12. Not sure	81	4.73
13. Other	111	6.48
Can TB be cured?		
1. No	8	0.47
2. Yes	1,589	93.75
3. Not sure	98	5.78
How can someone with TB be cured?		
1. Herbal remedies	13	0.82
2. Home rest without remedies	4	0.25
3. Praying	2	0.13
4. Specific drugs (anti-TB drugs)	1,504	94.65
5. Other	40	2.52
6. Not sure	26	1.64
In your opinion, have you received information about TB prevention and control well?		
1. No	645	38.10
2. Yes	1,048	61.90
Do you want to get more information about TB?		
1. No	338	19.94
2. Yes	1,357	80.06
What source of information do you think is most effective in reaching people like you?^		
1. Newspapers and magazines	22	1.29
2. Radio	2	0.12
3. Television	146	8.53
4. Billboards	48	2.80
5. Brochures, posters, and other printed media	243	14.19
6. Healthcare workers	1,274	74.42
7. Community health workers	257	15.01
8. Family, friends, or neighbours	202	11.80
9. Religious leaders	6	0.35
10. Teachers	6	0.35
11. Other	49	2.86

Have you ever heard about drug-resistant TB?		
1. No	1,554	91.79
2. Yes	139	8.21
What do you know about drug-resistant TB? [^]		
1. Drug-resistant TB occurs if patients do not regularly take anti-TB drugs	112	6.54
2. Drug-resistant TB is a severe form/level of TB	11	0.64
3. Can be transmitted to family and friends	8	0.47
4. Treatment lasts at least 2 years	7	0.41
5. Other	8	0.47
6. Not sure	14	0.82
Have you ever received an explanation about who is meant by a TB close contact?		
1. No	21	15.11
2. Yes	118	84.49
If yes, please mention who is considered a TB close contact?		
1. Family members living in the same house	114	6.66
2. Co-workers in the same room or classmates	17	0.99
3. Neighbours	14	0.82
4. Family members not living in the same house	6	0.35
5. Anyone who had direct contact (physical contact)	9	0.53
6. Healthcare workers at the health center	2	0.12
7. Other, please specify	1	0.06
Have you ever received an explanation about TB contact investigation?		
1. No	42	30.22
2. Yes	97	69.78
If yes, from whom did you receive the information?		
1. Healthcare workers	90	5.26
2. Community health workers	19	1.11
3. Family members	2	0.12
4. Other	1	0.06
TB contact investigation is...		
1. Examination of all family members of TB patients	99	71.22
2. Examination of everyone who has had direct contact with TB patients	4	2.88
3. Examination of symptomatic family members of TB patients	7	5.04
4. Not sure	29	20.86
Who should conduct a contact investigation?		
1. Healthcare workers	110	79.14
2. Community health workers	6	4.32
3. Patients	2	1.44
4. Anyone	3	2.16
5. Not sure	18	12.95

[^]questions with multiple answers ¹mean±sd; ²median±IQR; ³min-max; ⁴Q1-Q3

Table 14 shows the distribution of TB related stigma answers among TB contacts. A total of 1,694 contacts answered this survey. Most TB contacts know about people who had TB near them (87.87%). Majority of contacts feel that they could get infected by TB (85.42%) and they will accept it if they have TB (63.5%). But around 20% contacts feel that they need to keep it confidential from other people if their family member had TB or when they had TB. There are around 5% contacts who feel embarrassed if their family member had TB. Eight percent of contacts feel that they would be underestimated if they had TB. If TB contacts had TB, they would feel less confident (7.6%), hard to find a spouse (8%), and rejected by the social environment (7%).

Table 14. Distribution of attitude and stigma on TB among TB contact

Distribution of attitude and stigma on TB	n	%
In your opinion, are you at risk of getting TB infection?		
1. No	247	14.58
2. Yes	1,447	85.42
How would you react if you found out you had TB?		
1. Accept it	1,087	63.49
2. Afraid	675	39.43

3. Surprised	454	26.52
4. Ashamed	135	7.89
5. Sad/desperate	234	13.67
6. Other	27	1.58
To whom would you tell if you had tuberculosis?^		
1. Doctor or healthcare worker	933	54.50
2. Spouse	1,112	64.95
3. Parents	595	34.75
4. Children	559	32.65
5. Other family members	371	21.67
6. Close friends	132	7.71
7. No one	18	1.05
8. Other	5	0.29
What would you do if you think you have TB symptoms?^		
1. Go to a public healthcare facility	1,670	97.55
2. Go to a private healthcare facility	198	11.57
3. Visit a pharmacy	28	1.64
4. Traditional treatment	16	0.93
5. Other self-treatment (Herbal)	14	0.82
6. Other	4	0.23
7. Not sure	9	0.53
If you don't want to visit a healthcare facility, what is the reason?		
1. Not sure where to seek treatment	11	0.64
2. Cost constraints	9	0.53
3. Distance/transportation issues	11	0.64
4. Dislike of healthcare provider behavior	4	0.23
5. Unable to leave work (clinic hours clash with working hours)	6	0.35
6. Don't want to know that there's a health problem	9	0.53
7. Other...	16	0.93
If you experience TB symptoms, when would you go to a healthcare facility?		
1. Immediately	1,557	91.97
2. After a few days	86	5.08
3. One to two weeks	22	1.30
4. After two weeks	16	0.95
5. Will not go to a healthcare facility	5	0.30
6. Other	7	0.41
In your opinion, how expensive is the diagnosis and treatment of TB in this country?		
1. Free/no cost	1,247	73.57
2. Affordable	203	11.98
3. Quite expensive	55	3.24
4. Very expensive	35	2.06
5. Not sure	155	9.14
Do you know anyone who has ever had or currently has TB?		
1. Yes	1,485	87.87
2. No	205	12.13
Which statement comes closest to your feelings about people with TB?		
1. I feel sorry for them and want to help	1,304	77.02
2. I feel sorry but tend to stay away from these people	107	6.32
3. It's their problem, and I do not want to get TB by helping them	4	0.24
4. I'm afraid because they can transmit the disease	40	2.36
5. No particular feeling (neutral)	232	13.70
6. Other...	6	0.35
How are TB patients typically treated in your community?		
1. Most people avoid them	245	14.47
2. Most people are still friendly but keep their distance	497	29.36
3. Help and provide support	769	45.42
4. Other	182	10.75
The fact that a family member has TB should be kept secret from neighbours and the community.		
1. Strongly disagree	175	10.35
2. Disagree	853	50.44
3. Neutral	290	17.15
4. Agree	315	18.63
5. Strongly agree	58	3.43
If you have TB, you will keep it a secret.		
1. Strongly disagree	158	9.33
2. Disagree	855	50.50

3. Neutral	295	17.42
4. Agree	332	19.61
5. Strongly agree	53	3.13
It is very embarrassing to have a family member with TB.		
1. Strongly disagree	225	13.29
2. Disagree	1,169	69.05
3. Neutral	206	12.17
4. Agree	81	4.78
5. Strongly agree	12	0.71
If you have TB, others will look down on you.		
1. Strongly disagree	234	13.82
2. Disagree	1,102	65.09
3. Neutral	226	13.35
4. Agree	120	7.09
5. Strongly agree	11	0.65
You will feel ashamed if you have TB.		
1. Strongly disagree	212	12.53
2. Disagree	1,009	59.63
3. Neutral	253	14.95
4. Agree	196	11.58
5. Strongly agree	22	1.30
If you have TB, others will avoid you.		
1. Strongly disagree	188	11.12
2. Disagree	884	52.28
3. Neutral	391	23.12
4. Agree	218	12.89
5. Strongly agree	10	0.59
Do you have a spouse (husband/wife)?		
1. Yes	1,368	80.91
2. No	323	19.09
If you have TB, you will have difficulty finding a partner to marry even after recovery.		
1. Strongly disagree	22	6.81
2. Disagree	198	61.30
3. Neutral	77	23.84
4. Agree	23	7.12
5. Strongly agree	3	0.93
If you have TB, your partner will refuse to have sexual intercourse with you.		
1. Strongly disagree	60	4.38
2. Disagree	667	48.72
3. Neutral	360	26.30
4. Agree	267	19.50
5. Strongly agree	15	1.10
If you have TB, you will be asked to stay away from social environments		
1. Strongly disagree	178	10.52
2. Disagree	1,084	64.07
3. Neutral	306	18.09
4. Agree	121	7.15
5. Strongly agree	3	0.18
If you have TB, you won't even tell it to someone you trust (whom you usually confide in).		
1. Strongly disagree	154	9.11
2. Disagree	1,035	61.21
3. Neutral	285	16.85
4. Agree	188	11.12
5. Strongly agree	29	1.71
You will have low self-esteem if you have TB.		
1. Strongly disagree	205	12.12
2. Disagree	1,150	68.01
3. Neutral	208	12.30
4. Agree	110	6.51
5. Strongly agree	18	1.06
If you have TB, other people will look down on your family.		
1. Strongly disagree	210	12.42
2. Disagree	1,166	68.95
3. Neutral	211	12.48
4. Agree	92	5.44
5. Strongly agree	12	0.71

Do you have children?		
1. Yes	1,369	80.96
2. No	322	19.04
Your children will feel burdened if you have TB		
1. Strongly disagree	110	8.03
2. Disagree	882	64.38
3. Neutral	157	11.46
4. Agree	191	13.94
5. Strongly agree	30	2.19

^questions with multiple answers

Table 15 describes the distribution of TB practice among TB contacts. A total of 1,699 completed this survey. Most TB contacts live in the same house as TB patients. Most contacts support TB patients to take their medicine regularly (94.03%) by advising them to always take medicine (81.3%) and monitoring patients when they take medication (46.50%). We found that 81.5% of contacts open their window regularly after their family was diagnosed with TB. Only around two-thirds of contacts inform people outside their family members about the TB status of their family members (66.90%). Most of the contacts answered that they told TB patients to eat various foods (80.7%) and routinely open windows or house doors (81.5%).

Table 15. Distribution of TB-related practices in TB patient contacts

Practices of TB	n	%
Do you live with a family member who has TB?		
1. No	202	11.94
2. Yes	1,490	88.06
Have you ever received counseling or information from healthcare providers about TB prevention and control after your family member was diagnosed with TB?		
1. No	529	31.30
2. Yes	1,161	68.70
Do you support your family members with TB to take their medication regularly?		
1. No	101	5.97
2. Yes	1,590	94.03
How do you support your family members to always take their medication?^		
1. I advise them to always take their medication.	1,391	81.25
2. I accompany them to the health facility to collect/take their medication.	762	44.51
3. I supervise them when taking the medication.	796	46.50
4. I facilitate transportation to the health facility to collect/take the medication.	285	16.65
5. I provide financial assistance.	212	12.38
6. Other...	9	0.53
Did you tell other family members that one of your family members has TB?		
1. No	521	30.85
2. Yes	1,168	69.15
Whom have you informed?		
1. Spouse	543	31.72
2. Siblings	895	52.28
3. Children	447	26.11
4. Parents	379	22.14
5. Other	6	0.35
Did you inform people other than your family members that one of your family members has TB?		
1. No	1,130	66.90
2. Yes	559	33.10
Apart from family, who else have you informed?		
1. Religious leader	3	0.53
2. Neighbours	466	82.48
3. Co-workers	51	9.03
4. Other healthcare workers who are not responsible for your family member with TB	34	6.02
5. Others	11	1.95
Have you ever informed community health workers that your family member has TB?		
1. No	1,112	65.80
2. Yes	578	34.20

Do you support or encourage your family member with TB to eat more and have a varied diet?		
1. No	326	19.32
2. Yes	1,361	80.68
How do you support them to eat more and have a varied diet?^		
1. Giving advice	1,068	62.38
2. Buying food	865	50.53
3. Providing financial assistance	489	28.56
4. Cooking for them	817	47.72
5. Other	19	1.11
Do you regularly open windows/doors in your house after learning that a family member has TB?		
1. No	313	18.53
2. Yes	1,376	81.47
Is the weight of your family member with TB regularly measured?		
1. No	529	31.36
2. Yes	1,158	68.64
Have healthcare workers ever informed you that your family member's weight is less than expected?		
1. No	1,008	59.64
2. Yes	682	40.36
Did your family member with TB receive nutritional support from healthcare facilities when their weight was below the expected range?		
1. No	518	75.95
2. Yes	164	24.05
Does your family member with TB cover their mouth when coughing?		
1. No	289	17.11
2. Yes	1,400	82.89
Do healthcare workers/cadres conduct contact investigations on you to determine whether people who have been in contact with TB patients are infected or sick with TB?		
1. No	697	41.27
2. Yes	992	58.73
Have you ever told other family members to come to a health facility for contact investigation?		
1. No	620	88.70
2. Yes	79	11.30
Did they go for a contact investigation?		
1. No	23	29.11
2. Yes	56	70.89
Are there any children under the age of 5 in your household?		
1. No	1,348	79.62
2. Yes	345	20.38
Did the children receive TB preventive therapy?		
1. No	252	72.41
2. Yes	96	27.59
Did the children receive TB preventive therapy?		
1. No	1,625	96.10
2. Yes	66	3.90
Did the children receive TB vaccines?		
1. No	32	48.48
2. Yes	34	51.52
Are there any people with HIV in your household?		
1. No	1,529	90.42
2. Yes	14	0.83
3. Not sure	148	8.75
Did you ever recommend that person to receive TB preventive therapy?		
1. No	9	60.00
2. Yes	6	40.00
Did that person receive TB preventive therapy?		
1. No	7	46.67
2. Yes	8	53.33
Have you ever told your family members how to prevent TB?		
1. No	908	53.66
2. Yes	784	46.34
Do you inform the community about the prevention and control of TB?		
1. No	1,480	87.47
2. Yes	212	12.53

^questions with multiple answers

4.4. Factors associated with knowledge of TB among patients and household contacts

Table 16 presents the distribution of mean and standard deviation (SD) knowledge scores based on demographic characteristics stratified by TB patients and contacts. There is a slight difference in the maximum score between TB patients (49) and contacts (47). Overall, the mean knowledge scores for both patients and contacts are considered low (below 29 and 28, respectively). Among patients, younger age groups and females have higher mean scores than older age groups and males. TB patients with an educational level of at least high school have higher mean knowledge scores than TB patients with an educational level lower than high school. Palangkaraya and Bandung cities were the two cities with the highest mean scores compared to other cities. Tuberculosis contacts had a similar pattern of mean knowledge scores as TB patients. Younger and female contacts had higher mean scores than older and male contacts. Married TB contacts had higher mean scores than single TB contacts. TB contacts with higher education had higher mean scores than contacts with lower educational levels.

Table 16. Distribution of knowledge scores of TB among TB patients and TB patient contacts according to demographic characteristics

Characteristic variables	TB Patient's Knowledge Score (max=49)			TB Contact's Knowledge score (max=47)		
	Mean	SD	P-value	Mean	SD	P-value
Age			<0.001			<0.001
1. 18-30	19.95	5.54		15.59	4.77	
2. 31-40	19.37	5.28		15.62	4.50	
3. 41-50	19.60	5.63		15.20	4.68	
4. 51-60	18.07	5.89		14.36	4.64	
5. 61+	16.35	5.73		13.20	4.56	
Gender			0.010			<0.001
1. Male	18.53	5.61		14.67	4.57	
2. Female	19.29	5.88		15.23	4.73	
District			<0.001			<0.001
1. Aceh Besar	19.1	6.20		15.73	4.95	
2. Kota Palangkaraya	24.07	6.84		17.29	4.53	
3. Kota Bandung	20.18	4.87		16.39	4.43	
4. Kota Semarang	17.60	5.23		14.31	3.70	
5. Kota Ambon	18.59	6.04		16.82	4.62	
6. Lombok Timur	17.13	5.50		12.57	4.28	
Occupation			0.006			<0.001
1. Not working	18.43	5.85		14.61	4.53	
2. Working	19.24	5.64		15.38	4.81	
Marital status			0.533			<0.001
1. Single	19.01	5.95		14.26	4.95	
2. Married	18.81	5.63		15.23	4.61	
Last education level			<0.001			<0.001
1. Middle school or lower	17.16	5.39		13.53	4.37	
2. High school or higher	20.36	5.64		16.32	4.59	
Nearest health facilities			0.002			<0.001
1. PHC/hospital	19.15	5.57		15.22	4.60	
2. Non PHC/hospital	17.98	5.94		14.55	4.78	

Table 17 shows the distribution of mean and standard deviation (SD) knowledge scores based on clinical characteristics of TB patients. Bacteriologically confirmed patients had higher mean knowledge scores than clinically confirmed patients. Patients with pulmonary TB had similar mean scores with extra pulmonary TB patients. Patients who lived near a PHC/hospital had higher mean scores than

those who live far from a PHC/hospital. New patients had lower mean scores than failure/drop out/relapse patients.

Table 17. Distribution of knowledge scores on TB among TB patients according to clinical characteristics

Characteristic variables	Mean	SD	p-value
Diagnosis of TB			<0.001
1. Bacteriologically confirmed	19.19	5.77	
2. Clinically confirmed	17.87	4.98	
Anatomical location			0.868
1. Pulmonary TB	18.96	5.67	
2. Extra pulmonary TB	18.87	5.49	
Comorbidities			0.001
1. Has comorbid	18.03	6.14	
2. Doesn't have any comorbid	19.22	5.46	
Type of treatment			0.243
1. New patients	18.89	5.69	
2. Failure/drop out/relapse	19.49	5.23	
Nearest health facilities			0.002
1. PHC/hospital	19.15	5.57	
2. Non PHC/hospital	17.98	5.94	
Smoking			0.351
1. Smoking	18.72	5.62	
2. Not smoking	19.03	5.64	
First facilities visited			0.178
1. Non health facilities	18.37	5.58	
2. Clinics	19.45	5.24	
3. Puskesmas/hospitals	18.88	5.70	

Table 18 shows that most TB patients had low knowledge on TB (n=1458, (95.36%). The distribution of high knowledge score proportion based on demographic and clinical characteristics. Females had a higher proportion of high knowledge than male. Younger people had a higher proportion of high knowledge than older age patients. Patients with higher education levels had a higher proportion of high knowledge than patients with an educational level lower than high school. Bacteriologically confirmed and pulmonary TB patients had a higher proportion of high knowledge score than clinically confirmed and extra pulmonary TB patients.

Table 18. Distribution of the proportion of knowledge about TB among TB patients according to demographic and clinical characteristics

Characteristic variables	High knowledge (≥ 29) n (%)	Low knowledge (≤ 28) n (%)	p-value
	71 (4.64%)	1458 (95.36%)	
Gender			0.011
1. Male	38 (3.39)	799 (96.61)	
2. Female	43 (6.13)	659 (93.87)	
Age group			0.042
1. 18-30 years	25 (5.35)	442 (94.65)	
2. 31-40 years	11 (4.51)	233 (95.49)	
3. 41-50 years	21 (7.07)	276 (92.93)	
4. 51-60 years	10 (3.50)	276 (96.50)	
5. ≥ 61 years	4 (1.70)	231 (98.30)	
Districts			<0.001
1. Aceh Besar	9 (6.00)	141 (94.00)	
2. Palangkaraya	21 (28.38)	53 (71.62)	
3. Bandung	21 (4.44)	452 (95.56)	

4. Semarang	1 (0.44)	227 (99.56)	
5. Ambon	13 (5.96)	205 (94.04)	
6. Lombok Timur	6 (1.55)	380 (98.45)	
Occupations			0.801
1. Not working	32 (4.80)	635 (95.20)	
2. Working	39 (4.52)	823 (95.48)	
Marital status			0.518
1. Not married/widowed/divorced	28 (5.11)	520 (94.89)	
2. Married	43 (4.38)	938 (95.62)	
Last educational level			<0.001
1. Middle school or lower	14 (1.99)	691 (98.01)	
2. High school or higher	57 (6.92)	767 (93.08)	
Diagnosis of TB			0.004
1. Bacteriologically confirmed	67 (5.42)	1,169 (94.58)	
2. Clinically confirmed	4 (1.42)	278 (98.58)	
Anatomical location			0.267
1. Pulmonary TB	68 (4.85)	1,334 (95.15)	
2. Extra pulmonary TB	3 (2.59)	113 (97.41)	
Comorbidities			0.875
1. Has comorbid	15 (4.84)	295 (95.16)	
2. No comorbid	56 (4.63)	1,154 (95.37)	
Type of treatment			0.361
1. New patients	67 (4.81)	1,325 (95.19)	
2. Failure/drop out/relapse	4 (3.05)	127 (96.95)	
Nearest health facilities			0.653
1. PHC/hospital	57 (4.55)	1,196 (95.45)	
2. Non PHC/hospital	14 (5.19)	256 (95.34)	
Smoking			0.442
1. Smoking	15 (3.93)	367 (96.07)	
2. Not smoking	55 (4.88)	1,071 (95.12)	
First facilities visited			0.290
1. Non health facilities	2 (2.44)	80 (97.56)	
2. Clinic	17 (6.14)	260 (93.86)	
3. Health facilities	51 (4.39)	1,110 (95.61)	

Table 19 shows the distribution of stigma score among patients and contacts based on demographic characteristics. Older age in patients had higher stigma score while in contacts the result is similar across age groups. Aceh reported the highest stigma score in contacts while Palangkaraya had the highest mean stigma score for patients. Higher educational level corresponds with lower mean stigma score in both patients and contacts. Married patient and contact had higher stigma score than non-married patients and contacts.

Table 19. Distribution of stigma scores about TB among TB patients and TB patient contacts according to demographic characteristics.

Characteristic variables	TB Patient's Stigma Score			TB Contact's Stigma score		
	Mean	SD	P-value	Mean	SD	P-value
Age						
1. 18-30	21.78	5.73	Ref	26.29	7.82	Ref
2. 31-40	22.58	6.18	0.061	27.34	6.81	0.050
3. 41-50	23.58	5.00	<0.001	26.94	6.69	0.196
4. 51-60	23.22	5.91	0.001	27.86	7.67	0.005
5. 61+	23.66	4.76	<0.001	27.95	8.42	0.015
Gender						
1. Male	22.88	5.53	Ref	27.01	7.32	Ref
2. Female	22.74	5.71	0.635	27.24	7.31	0.540
District						
1. Aceh Besar	24.03	4.87	Ref	34.70	7.04	Ref
2. Kota Palangkaraya	24.27	6.07	0.764	29.30	6.09	0.000

3. Kota Bandung	21.86	5.92	<0.001	25.52	7.16	0.000
4. Kota Semarang	22.19	5.00	0.002	26.21	6.11	0.000
5. Kota Ambon	22.45	6.24	0.007	26.78	7.75	0.000
6. Lombok Timur	23.82	5.09	0.684	26.59	7.00	0.000
Occupation						
1. Not working	22.91	5.95	Ref	27.57	7.81	Ref
2. Working	22.75	5.34	0.578	26.79	6.94	0.028
Marital status						
1. Single	21.67	5.49	Ref	26.07	8.10	Ref
2. Married	23.46	5.58	<0.001	27.41	7.14	0.003
Last education level						
1. Middle school or lower	23.62	5.27	Ref	27.39	7.56	Ref
2. High school or higher	22.13	5.81	<0.001	26.94	7.18	0.211
Nearest health facilities						
1. PHC/hospital	23.42	5.59	Ref	27.20	6.78	0.258
2. Non PHC/hospital	22.78	5.44	0.079	27.69	8.35	Ref

Table 20 shows the distribution of mean stigma score among TB patients according to clinical characteristics. Bacteriologically confirmed patients had similar mean stigma scores with clinically confirmed patients. Patients with pulmonary TB had higher stigma score than extra pulmonary TB patients. New and relapse/failure/dropout TB patients had relatively similar mean of stigma score. Smokers had higher stigma scores than non-smokers TB patients. Patients with high knowledge of TB had similar mean stigma score than patients with low knowledge score. Patients live near PHC/hospital had higher stigma score than those live far from PHC/hospital.

Table 20. Distribution of stigma perception scores among TB patients according to clinical characteristics

Characteristic variables	Mean	SD	P-value
Diagnosis of TB			
1. Bacteriologically confirmed	22.94	5.41	0.611
2. Clinically confirmed	22.76	5.56	Ref
Anatomical location			
1. Pulmonary TB	23.03	5.41	0.002
2. Extra pulmonary TB	21.38	5.61	Ref
Comorbidities			
1. Has comorbid	23.78	5.52	0.001
2. Doesn't have any comorbid	22.68	5.40	Ref
Type of treatment			
1. New patients	22.97	5.48	0.002
2. Failure/drop out/relapse	22.02	4.27	Ref
Nearest health facilities			
1. PHC/hospital	23.42	5.59	Ref
2. Non PHC/hospital	22.78	5.44	0.079
Smoking			
1. Smoking	23.59	5.31	Ref
2. Not smoking	22.68	5.45	0.005
First facilities visited			
1. Non health facilities	23.51	6.58	0.141
2. Clinics	22.49	5.77	0.418
3. Puskesmas/hospitals	23.02	5.17	Ref
Knowledge score			
1. High (≥ 29)	22.67	5.33	0.426
2. Low (≤ 28)	22.90	5.78	Ref

Table 21 below shows the distribution of satisfaction score among TB patients stratified by demographic and clinical characteristics. Higher score means better satisfaction. Patients in

Palangkaraya had the highest satisfaction score than other districts. Aceh had the lowest satisfaction score than other districts. Similar mean score was observed in each age groups. Clinically confirmed TB patients had higher mean satisfaction score than bacteriologically confirmed patients. Patients with a high knowledge level of TB had a higher mean satisfaction score than patients with a low knowledge level of TB.

Table 21. Distribution of service satisfaction scores among TB patients according to demographic and clinical characteristics

Characteristic variables	Mean	SD	P-value
Gender			
1. Male	30.05	4.70	0.329
2. Female	30.29	4.82	
Age group			
1. 18-30 years	30.65	4.68	Ref
2. 31-40 years	29.99	5.61	0.079
3. 41-50 years	30.17	4.13	0.175
4. 51-60 years	29.62	5.43	0.004
5. ≥61 years	30.00	5.60	0.091
Districts			
1. Aceh Besar	27.22	3.70	Ref
2. Palangkaraya	38.57	6.45	0.040
3. Bandung	31.08	5.59	<0.001
4. Semarang	31.11	2.89	<0.001
1. Ambon	29.78	4.80	<0.001
2. Lombok Timur	30.12	3.85	<0.001
Occupations			
1. Not working	29.95	4.92	Ref
2. Working	30.32	4.62	0.129
Marital status			
1. Not married/widowed/divorced	30.27	4.81	Ref
2. Married	30.10	4.73	0.504
Last educational level			
1. Middle school or lower	30.02	4.06	Ref
2. High school or higher	30.28	5.28	0.290
Diagnosis of TB			
1. Bacteriologically confirmed	30.07	4.30	Ref
2. Clinically confirmed	31.23	4.54	<0.001
Anatomical location			
1. Pulmonary TB	30.30	4.26	0.553
2. Extra pulmonary TB	30.05	5.56	Ref
Comorbidities			
1. Has comorbid	30.45	4.06	0.440
2. Doesn't have any comorbid	30.24	4.45	Ref
Type of treatment			
1. New patients	30.22	4.39	Ref
2. Failure/drop out/relapse	30.77	4.86	0.170
Nearest health facilities			
1. PHC/hospital	30.33	4.57	0.182
2. Non PHC/hospital	29.93	3.78	Ref
Smoking			
1. Smoking	30.26	4.24	0.923
2. Not smoking	30.28	4.40	Ref
First facilities visited			
1. Non health facilities	31.23	3.66	0.011
2. Clinics	31.33	4.08	<0.001
3. Puskesmas/hospitals	30.04	4.17	Ref
Knowledge score			
1. High (≥29)	30.53	4.12	0.018
2. Low (≤28)	29.94	5.08	Ref

Table 22 shows the distribution of TB practice score among patients and contacts based on demographic characteristics. Overall, the mean practice score was low for both contacts and patients (<32.8 and 26.24, respectively). Palangkaraya had the highest mean practice score while Aceh Besar had the lowest practice score than other districts for both patients and contacts. Similar pattern was observed for both patients and contacts. Younger patients and contacts had higher mean practice score than older patients and contacts. Both patients and contacts with higher educational level had higher mean score than those with educational level lower than high school.

Table 22. Distribution of practice scores related to TB among TB patients and TB patient contacts according to demographic characteristics

Characteristic variables	TB Patient's Practice Score (max = 41)			TB Contact's Practice score (max = 32)		
	Mean	SD	P-value	Mean	SD	P-value
Age						
1. 18-30	21.94	4.40	Ref	12.27	4.49	Ref
2. 31-40	21.69	4.96	0.495	13.87	4.30	0.000
3. 41-50	21.92	4.81	0.950	13.73	4.23	0.000
4. 51-60	21.54	4.99	0.251	13.02	4.21	0.000
5. 61+	20.88	4.25	0.004	11.42	4.14	0.001
Gender						
1. Male	21.43	4.83	Ref	12.79	4.49	Ref
2. Female	21.93	4.47	0.039	13.26	4.25	0.001
District						
1. Aceh Besar	18.41	4.79	Ref	11.91	4.64	Ref
2. Kota Palangkaraya	23.19	5.30	<0.001	15.26	3.76	0.000
3. Kota Bandung	22.70	3.89	<0.001	13.70	4.48	0.000
4. Kota Semarang	22.60	3.95	<0.001	12.82	3.82	0.001
5. Kota Ambon	19.69	4.06	0.007	12.65	4.77	0.010
6. Lombok Timur	21.92	5.18	<0.001	12.87	4.12	0.000
Occupation						
1. Not working	21.55	4.55	Ref	12.71	4.40	Ref
2. Working	21.80	4.84	0.293	13.39	4.32	0.000
Marital status						
1. Single	21.25	4.30	Ref	11.63	4.61	Ref
2. Married	21.89	4.86	0.010	13.45	4.21	0.000
Last education level						
1. Middle school or lower	21.52	4.63	Ref	12.66	4.46	Ref
2. High school or higher	21.78	4.71	0.279	13.43	4.25	0.000
Nearest health facilities						
1. PHC/hospital	21.96	4.53	<0.001	13.23	4.18	0.005
2. Non PHC/hospital	20.57	4.74	Ref	12.75	4.64	Ref

Table 23 shows the distribution of practice score according to clinical characteristics for TB patients. Patients with high knowledge level had higher mean practice score than patients with low knowledge level. Similar score was found among comorbidities status, type of treatment, smoking status, anatomical location, and type of TB diagnosis. Patients who live near a public health center or a hospital had higher mean practice score than those live far from PHC/hospital.

Table 23. Distribution of practice scores related to TB in TB patients according to clinical characteristics

Characteristic variables	Mean	SD	P-value
Diagnosis of TB			
1. Bacteriologically confirmed	21.78	4.73	0.368
2. Clinically confirmed	21.51	3.89	Ref
Anatomical location			
1. Pulmonary TB	21.72	4.65	0.615
2. Extra pulmonary TB	21.5	3.89	Ref

Comorbidities			
1. Has comorbid	21.92	4.82	0.406
2. Doesn't have any comorbid	21.68	4.51	Ref
Type of treatment			
1. New patients	21.68	4.57	Ref
2. Failure/drop out/relapse	22.06	4.91	0.366
Nearest health facilities			
1. PHC/hospital	21.96	4.53	<0.001
2. Non PHC/hospital	20.57	4.74	Ref
Smoking			
1. Smoking	21.55	4.7	Ref
2. Not smoking	21.79	4.68	0.383
First facilities visited			
1. Non health facilities	20.16	4.01	0.003
2. Clinics	22.51	4.05	0.006
3. Puskesmas/hospitals	21.68	4.64	Ref
Knowledge score			
1. High (≥ 29)	23.32	4.28	<0.001
2. Low (≤ 28)	20.68	4.62	Ref

Table 24 shows the distribution of first facilities visited by patients. Characteristics such as gender, occupations, marital status, anatomical location, comorbidities, type of treatment, knowledge, and stigma shows that there is no difference in proportion of choosing PHC/hospital as the first visited facilities compared with other facilities. Palangkaraya, Aceh, and Lombok Timur had the highest proportion of patients choosing PHC/hospital as the first facilities visited than other districts. Patients with lower educational level tend to choose PHC/hospital as their first visited facilities than patients with higher educational level. Patients with bacteriologically confirmed TB had higher proportion of choosing PHC/hospital as their first visited facilities than clinically confirmed patients.

Table 24. Distribution of the proportion of healthcare facility choices according to respondent characteristics

Characteristic variables	PHC/hospital n (%)	Other facilities n (%)	p-value
Gender			
1. Male	634 (77.22)	187 (22.78)	0.403
2. Female	527 (75.39)	172 (24.61)	
Age group			
1. 18-30 years	348 (74.68)	118 (25.32)	0.060
2. 31-40 years	181 (74.79)	61 (25.21)	
3. 41-50 years	216 (72.97)	80 (27.00)	
4. 51-60 years	222 (79.00)	59 (21.00)	
5. ≥ 61 years	194 (82.55)	41 (17.45)	
Districts			
1. Aceh Besar	146 (97.33)	4 (2.67)	<0.001
2. Palangkaraya	69 (95.83)	3 (4.17)	
3. Bandung	298 (63.54)	171 (36.46)	
4. Semarang	152 (66.67)	76 (33.33)	
5. Ambon	132 (60.83)	85 (39.17)	
6. Lombok Timur	364 (94.79)	20 (5.21)	
Occupations			
1. Not working	516 (77.95)	146 (22.05)	0.207
2. Working	645 (75.17)	213 (24.83)	
Marital status			
1. Not married/widowed/divorced	408 (74.73)	138 (25.27)	0.255
2. Married	753 (77.31)	221 (22.69)	
Last educational level			
1. Middle school or lower	580 (82.50)	123 (17.50)	<0.001
2. High school or higher	581 (71.11)	236 (28.89)	
Diagnosis of TB			
1. Bacteriologically confirmed	956 (77.53)	277 (22.47)	0.024
2. Clinically confirmed	200 (71.17)	81 (28.83)	

Anatomical /location			
1. Pulmonary TB	1,067 (76.32)	331 (23.68)	0.911
2. Extra pulmonary TB	88 (75.86)	28 (24.14)	
Comorbidities			
1. Has comorbid	231 (74.76)	78 (25.24)	0.446
2. Doesn't have any comorbid	928 (76.82)	280 (23.18)	
Type of treatment			
1. New patients	1,056 (76.03)	333 (23.97)	0.308
2. Failure/drop out/relapse	104 (80.00)	26 (20.00)	
Nearest health facilities			
1. PHC/hospital	986 (78.94)	263 (21.06)	<0.001
2. Non PHC/hospital	174 (64.44)	96 (35.56)	
Smoking			
1. Smoking	277 (72.70)	104 (27.30)	0.044
2. Not smoking	874 (77.76)	250 (22.24)	
Knowledge score			
1. High	630 (75.54)	204 (24.46)	0.394
2. Low	531 (77.41)	155 (22.59)	
Stigma on TB patient			
1. High stigma	680 (76.58)	208 (23.42)	0.832
2. Low stigma	481 (76.11)	151 (23.89)	
Satisfaction on health facilities			
1. Satisfied	610 (72.53)	231 (27.47)	<0.001
2. Not satisfied	551 (81.15)	128 (18.85)	

Table 25 shows the distribution of patient, health system, and diagnostic delay according to demographic and clinical characteristics. We found significant difference in patient delay among districts as well as health system and diagnostic delay. Aceh had the lowest patient delay and Palangkaraya had the highest patient delay among other districts. Semarang had the shortest health system delay and Palangkaraya had the longest health system delay than other districts. For diagnostic, Palangkaraya had the longest delay and Semarang had the shortest delay compared with other districts. Patients with higher educational level and bacteriologically confirmed TB had higher delay than lower educational level and clinically confirmed TB. Patients with pulmonary TB had similar patient delay with extra pulmonary TB patients. Patients with comorbidities had significantly highest health system delay than patients without any comorbidities. Smoker had significantly higher patient, health system, and diagnostic delay compared with non-smoking patients. Patients with high knowledge TB level had experienced higher health system but lower diagnostic delay than patients with low knowledge TB level. Patients with high stigma score had higher health system and diagnostic delay than patients with low stigma level.

Table 25. Distribution of treatment-seeking delay according to demographic and clinical characteristics.

Characteristic variables	Patient	Health system	Diagnostic
Total delay (days)	20±39¹	64±94	63±110
Gender			
1. Male	17±36	63±92	63±102.5
2. Female	21±45	65.5±98	63±120
Age group			
1. 18-30 years	21±42	63±97	65±112
2. 31-40 years	21±37	61±98	47±109
3. 41-50 years	15±36	65±98	63±112
4. 51-60 years	21±42	68±91	69.5±109.5
5. ≥61 years	15±36	64±85	63.5±106
Districts*			
1. Aceh Besar	5±6	78±82	73±87

2. Palangkaraya	38±66	118±88	127±106
3. Bandung	20±35	63.5±93	52±104
4. Semarang	15±25	15±57	30±67
5. Ambon	28±48	67±107	88±145
6. Lombok Timur	31±55	78±81.5	82±110
Occupations			
1. Not working	17±35	62±95	60±106
2. Working	21±45	68±92	69±111
Marital status			
1. Not married/widowed/divorced	25±42.5	63±95	68±114
2. Married	17±36	64±95	61.5±109
Last educational level			
1. Middle school or lower	17±39	62.5±91	64±109
2. High school or higher	21±39.5	66±99	63±110
Diagnosis of TB			
1. Bacteriologically confirmed	20±41	66±96	67±112
2. Clinically confirmed	17±35	57.5±90.5	46.5±96.5
Anatomical location			
1. Pulmonary TB	20±38	63±96	61.5±109.5
2. Extra pulmonary TB	20±59	72±98	90.5±121
Comorbidities			
1. Has comorbid	21±44	69±102*	70±121.5
2. Doesn't have any comorbid	19±39	62.5±93	63±108
Type of treatment			
1. New patients	20±40	63±96	63±110
2. Failure/drop out/relapse	20±39	77±90	70±123.5
Nearest health facilities			
1. PHC/hospital	20±39	63±96	62±110*
2. Non PHC/hospital	15±38	68±94	77.5±118
Smoking			
1. Smoking	20.5±42*	68±99*	76±126*
2. Not smoking	19±39	62±94	61±107
Knowledge score			
1. High (≥29)	19±38	64.5±96*	63±108*
2. Low (≤28)	20±43.5	63±94	64±112
Stigma on TB patient			
1. High stigma (≥22)	18±42	68±92.5*	71±112*
2. Low stigma (≤21)	21±37	57±97	57.5±106

¹Median±IQR; *p<0.05

Table 26 below shows the distribution of total AMR score, knowledge, and practice, among TB patients stratified by demographic and clinical characteristics. The maximum score was 12 and minimum was 0. Overall TB patients had very low knowledge and practice regarding AMR. Female had significantly higher mean AMR score than male. Bandung and Semarang had the highest mean AMR score while Aceh had the lowest mean AMR score than other districts. Younger age groups tend to have significantly higher mean AMR score than older age groups. Bacteriologically confirmed TB patients and pulmonary TB patients had higher mean AMR score than clinically and extra pulmonary TB patients.

Table 26. Distribution of knowledge, awareness, and practice scores on AMR by demographic and clinical characteristics

Characteristic variables	Total AMR score (n=1784)		P-value
	mean	SD	
Gender			<0.001
1. Male	2.67	2.29	
2. Female	3.08	2.28	

Age group			<0.001
1. 18-30 years	3.44	2.28	
2. 31-40 years	3.09	2.31	
3. 41-50 years	2.81	2.29	
4. 51-60 years	2.52	2.22	
5. ≥61 years	1.92	2.00	
Districts			<0.001
1. Aceh Besar	0.83	1.28	
2. Palangkaraya	2.64	2.04	
3. Bandung	3.97	2.18	
4. Semarang	3.92	2.48	
5. Ambon	2.83	1.75	
6. Lombok Timur	1.70	1.75	
Occupations			<0.001
1. Not working	2.61	2.29	
2. Working	3.05	2.28	
Marital status			0.011
1. Not married/widowed/divorced	3.05	2.31	
2. Married	2.74	2.27	
Last educational level			<0.001
1. Middle school or lower	2.05	1.92	
2. High school or higher	3.55	2.35	
Diagnosis of TB			<0.001
1. Bacteriologically confirmed	2.73	2.23	
2. Clinically confirmed	3.45	2.47	
Anatomical location			<0.001
1. Pulmonary TB	2.79	2.26	
2. Extra pulmonary TB	3.78	2.42	
Comorbidities			0.263
1. Has comorbid	2.74	2.30	
2. Doesn't have any comorbid	2.91	2.29	
Type of treatment			0.461
1. New patients	2.85	2.29	
2. Failure/drop out/relapse	3.01	2.29	
Nearest health facilities			0.517
1. PHC/hospital	2.88	2.29	
2. Non PHC/hospital	2.78	2.30	
Smoking			0.023
1. Smoking	2.64	2.25	
2. Not smoking	2.95	2.30	
First facilities visited			<0.001
1. Non health facilities	3.43	2.05	
2. Clinics	3.61	2.24	
3. Puskesmas/hospitals	2.66	2.27	

Table 27 shows the result of multivariate analysis using multiple linear regression on TB knowledge score among TB patients. The analysis resulted that gender, age, districts, working status, marital status, last educational level, diagnosis of TB, and nearest health facilities were significantly associated with TB knowledge score among TB patients. Semarang, Ambon, and Lombok had lower TB knowledge score than Aceh while Palangkaraya had significantly higher TB score than Aceh. Patients among age group more than or equal 61 years old had significantly lower TB knowledge score than those in 18-30 age groups. Female also had higher knowledge on TB compared with male. Patients with lower educational level (lower than high school) had lower knowledge on TB. Patients who live near PHC/hospital had higher knowledge score than those live far from PHC/hospital.

Table 27. Multivariate results on determinant factors of TB knowledge among TB patients using multiple linear regression

Characteristic variables	Adjusted β	95% CI	p-value
Gender			
1. Male	Ref		0.041
2. Female	0.66	0.03-1.28	
Age group			
1. 18-30 years	Ref		0.670
2. 31-40 years	-0.19	-1.04-0.67	0.573
3. 41-50 years	0.25	-0.62-1.11	0.056
4. 51-60 years	-0.88	-1.78-0.02	<0.001
5. \geq 61 years	-2.06	-2.99-(-1.12)	
Districts			
1. Aceh Besar	Ref		<0.001
2. Palangkaraya	4.33	2.87-5.79	0.315
3. Bandung	0.53	-0.51-1.57	0.001
4. Semarang	-1.85	-2.96-(-0.75)	0.004
5. Ambon	-1.64	-2.76-(-0.52)	<0.001
6. Lombok Timur	-2.09	-3.10-(-1.09)	
Occupations			
1. Working	Ref		0.001
2. Not working	-0.93	-1.48-(-0.37)	
Marital status			
1. Married	Ref		0.010
2. Not married/widowed/divorced	-0.81	-1.43-(-0.19)	
Last educational level			
1. High school or higher	Ref		<0.001
2. Middle school or lower	-2.64	-3.24-(-2.04)	
Diagnosis of TB			
1. Bacteriologically confirmed	Ref		<0.001
2. Clinically confirmed	-1.46	-2.18-(-0.74)	
Anatomical location			
1. Extra pulmonary TB	-0.75	-1.79-0.29	0.157
2. Pulmonary TB	Ref		
Comorbidities			
1. Doesn't have any comorbid	Ref		0.228
2. Has comorbid	-0.41	-1.08-0.26	
Type of treatment			
1. Failure/drop out/relapse	0.59	-0.34-1.52	0.213
2. New patients	Ref		
Nearest health facilities			
1. PHC/hospital	Ref		0.016
2. Non PHC/hospital	-0.89	-1.61-(-0.16)	
Smoking			
1. Not smoking	0.38	-0.32-1.06	0.291
2. Smoking	Ref		
First facilities visited			
1. Non health facilities	-0.71	-1.89-0.47	0.236
2. Clinic	-0.001	-0.72-0.71	0.998
3. Health facilities	Ref		

Table 28 shows the result of multivariate analysis using multiple linear regression on TB practice score among TB patients. Districts, working status, marital status, comorbidities, and knowledge were found to have significant association with TB practice score among TB patients. Higher knowledge on TB were positively associated with TB practice score even after adjusted by other variables. Semarang and all other districts had higher TB practice score than Aceh. Married TB patients had significantly higher TB practice score than those not married. TB patients who first visit to non-health facilities had lower TB practice score than patients who first visit health facilities.

Table 28. Multivariate results on determinant factors of TB practice among TB patients using multiple linear regression

Characteristic variables	Adjusted β	95% CI	p-value
Gender			
1. Male	0.35	-0.15-0.85	0.171
2. Female	Ref		
Age group			
1. 18-30 years	Ref		
2. 31-40 years	-0.44	-1.12-0.23	0.201
3. 41-50 years	-0.59	-1.28-0.10	0.090
4. 51-60 years	-0.47	-1.19-0.25	0.199
5. ≥ 61 years	-0.64	-1.39-0.10	0.092
Districts			
1. Aceh Besar	Ref		
2. Palangkaraya	3.62	2.45-4.79	<0.001
3. Bandung	4.30	3.48-5.13	<0.001
4. Semarang	4.84	3.96-5.72	<0.001
5. Ambon	1.73	0.84-2.62	<0.001
6. Lombok Timur	4.07	3.27-4.87	<0.001
Occupations			
1. Working	Ref		
2. Not working	0.67	0.23-1.11	0.003
Marital status			
1. Married	1.03	0.54-1.52	<0.001
2. Not married/widowed/divorced	Ref		
Last educational level			
1. High school or higher	Ref		
2. Middle school or lower	0.24	-0.25-0.72	0.343
Diagnosis of TB			
1. Bacteriologically confirmed	0.58	0.001-1.15	0.050
2. Clinically confirmed	Ref		
Anatomical location			
1. Extra pulmonary TB	Ref		
2. Pulmonary TB	0.47	-0.36-1.15	0.267
Comorbidities			
1. Doesn't have any comorbid	Ref		
2. Has comorbid	0.64	0.11-1.17	0.018
Type of treatment			
1. Failure/drop out/relapse	0.01	-0.73-0.75	0.976
2. New patients	Ref		
Nearest health facilities			
1. PHC/hospital	0.45	-0.13-1.02	0.127
2. Non PHC/hospital	Ref		
Smoking			
1. Not smoking	0.24	-0.31-0.79	0.387
2. Smoking	Ref		
First facilities visited			
1. Non health facilities	-1.25	-2.19-(-0.32)	0.009
2. Clinic	0.49	-0.07-1.06	0.087
3. Health facilities	Ref		
Total knowledge score	0.27	0.23-0.31	<0.001

Table 29 shows the result of multivariate analysis using multiple linear regression on TB stigma score among TB patients. This study found that districts, marital status, diagnosis of TB, anatomical location, and smoking status were associated with TB stigma score among TB patients. Higher knowledge and practice score were not significantly associated with higher stigma score. Patients who were smoking had higher stigma than those non-smoker TB patients. Bandung, Semarang, and Ambon had

significantly lower stigma than Aceh. Married TB patients were positively associated with TB stigma than non-married TB patients.

Table 29. Multivariate results on determinant factors of TB stigma among TB patients using multiple linear regression

Characteristic variables	Adjusted β	95% CI	p-value
Gender			
1. Male	Ref		
2. Female	0.58	-0.07-1.22	0.080
Age group			
1. 18-30 years	Ref		
2. 31-40 years	0.12	-0.75-0.99	0.791
3. 41-50 years	0.66	-0.23-1.55	0.145
4. 51-60 years	0.59	-0.34-1.51	0.216
5. ≥ 61 years	0.58	-0.38-1.54	0.235
Districts			
1. Aceh Besar	Ref		
2. Palangkaraya	1.13	-0.41-2.66	0.150
3. Bandung	-0.18	-2.95-(-0.74)	0.001
4. Semarang	-2.05	-3.23-(-0.88)	0.001
5. Ambon	-1.37	-2.52-(-0.21)	0.020
6. Lombok Timur	-0.14	-1.21-0.93	0.798
Occupations			
1. Working	Ref		
2. Not working	0.49	-0.09-1.06	0.097
Marital status			
1. Married	1.32	0.69-1.96	<0.001
2. Not married/widowed/divorced	Ref		
Last educational level			
1. High school or higher	Ref		
2. Middle school or lower	0.56	-0.07-1.19	0.079
Diagnosis of TB			
1. Bacteriologically confirmed	Ref		
2. Clinically confirmed	0.92	0.17-1.66	0.016
Anatomical location			
1. Extra pulmonary TB	Ref		
2. Pulmonary TB	1.24	0.17-2.31	0.023
Comorbidities			
1. Doesn't have any comorbid	Ref		
2. Has comorbid	0.67	-0.02-1.36	0.056
Type of treatment			
1. Failure/drop out/relapse	Ref		
2. New patients	0.80	-0.16-1.75	0.102
Nearest health facilities			
1. PHC/hospital	Ref		
2. Non PHC/hospital	0.42	-0.32-1.17	0.268
Smoking			
1. Not smoking	Ref		
2. Smoking	1.50	0.79-2.21	<0.001
First facilities visited			
1. Non health facilities	0.95	-0.25-2.16	0.121
2. Clinic	0.21	-0.52-0.94	0.570
3. Health facilities	Ref		
Total knowledge score	0.04	-0.01-0.09	0.127
Total practice score	-0.03	-0.10-0.04	0.389

Table 30 shows the result of multivariate analysis using multiple linear regression on health facilities satisfaction score among TB patients. This analysis found that TB practice score, TB stigma score, first

facilities visited, diagnosis of TB, anatomical location, and districts were significantly associated with health facilities satisfaction score among TB patients. Bandung and other districts had significantly higher satisfaction score than Aceh. Lower TB stigma score was positively associated with satisfaction score even after controlled with other variables. Higher practice score correlates with higher satisfaction score among TB patients.

Table 30. Multivariate results on determinant factors of health facilities satisfaction among TB patients using multiple linear regression

Characteristic variables	Adjusted β	95% CI	p-value
Gender			
1. Male	0.11	-0.36-0.59	0.647
2. Female	Ref		
Age group			
1. 18-30 years	Ref		
2. 31-40 years	-0.41	-1.05-0.24	0.216
3. 41-50 years	-0.48	-1.14-0.17	0.148
4. 51-60 years	-0.56	-1.24-0.12	0.109
5. \geq 61 years	-0.17	-0.88-0.54	0.632
Districts			
1. Aceh Besar	Ref		
2. Palangkaraya	1.17	0.04-2.31	0.042
3. Bandung	2.83	2.02-3.64	<0.001
4. Semarang	2.27	1.40-3.14	<0.001
5. Ambon	2.06	1.21-2.92	<0.001
6. Lombok Timur	2.26	1.48-3.06	<0.001
Occupations			
1. Working	0.33	-0.09-0.75	0.125
2. Not working	Ref		
Marital status			
1. Married	Ref		
2. Not married/widowed/divorced	-0.03	-0.50-0.44	0.887
Last educational level			
1. High school or higher	Ref		
2. Middle school or lower	-0.02	-0.48-0.45	0.943
Diagnosis of TB			
1. Bacteriologically confirmed	Ref		
2. Clinically confirmed	1.06	0.52-1.61	<0.001
Anatomical location			
1. Extra pulmonary TB	Ref		
2. Pulmonary TB	1.23	0.44-2.02	0.002
Comorbidities			
1. Doesn't have any comorbid	Ref		
2. Has comorbid	0.37	-0.14-0.87	0.154
Type of treatment			
1. Failure/drop out/relapse	0.36	-0.34-1.06	0.316
2. New patients	Ref		
Nearest health facilities			
1. PHC/hospital	Ref		
2. Non PHC/hospital	0.04	-0.50-0.59	0.877
Smoking			
1. Not smoking	0.24	-0.28-0.76	0.370
2. Smoking	Ref		
First facilities visited			
1. Non health facilities	1.09	0.20-1.98	0.017
2. Clinic	0.51	-0.03-1.05	0.063
3. Health facilities	Ref		
Total knowledge score	-0.01	-0.05-0.03	0.752
Total practice score	0.21	0.16-0.25	<0.001
Total stigma score	-0.05	-0.09-(-0.01)	0.014

Table 31 shows the result of multivariate analysis on knowledge and practice score related with AMR among TB patients. We found that districts, working status, educational level, smoking status, TB knowledge score, and TB practice score were significantly associated with knowledge, awareness, and practice about AMR. Higher knowledge and practice score were positively associated with higher knowledge and practice score on AMR among TB patients. All other districts had significantly higher knowledge and practice level of AMR compared with Aceh. Patients with higher educational level were significantly associated with higher knowledge and practice score of AMR among TB patients.

Table 31. Multivariate results on determinant factors of Knowledge, awareness, and practice related with AMR among TB patients using multiple linear regression

Characteristic variables	Adjusted β	95% CI	p-value
Gender			
1. Male	Ref		
2. Female	0.05	-0.18-0.28	0.679
Age group			
1. 18-30 years	Ref		
2. 31-40 years	-0.04	-0.36-0.27	0.792
3. 41-50 years	-0.18	-0.51-0.14	0.259
4. 51-60 years	-0.16	-0.49-0.18	0.349
5. ≥ 61 years	-0.27	-0.62-0.08	0.126
Districts			
1. Aceh Besar	Ref		
2. Palangkaraya	1.40	0.85-1.95	<0.001
3. Bandung	2.85	2.45-3.24	<0.001
4. Semarang	2.81	2.39-3.24	<0.001
5. Ambon	1.79	1.38-2.21	<0.001
6. Lombok Timur	1.02	0.64-1.41	<0.001
Occupations			
1. Working	0.38	0.17-0.58	<0.001
2. Not working	Ref		
Marital status			
1. Married	Ref		
2. Not married/widowed/divorced	-0.08	-0.31-0.15	0.487
Last educational level			
1. High school or higher	0.85	0.62-1.08	<0.001
2. Middle school or lower	Ref		
Diagnosis of TB			
1. Bacteriologically confirmed	Ref		
2. Clinically confirmed	0.01	-0.26-0.28	0.949
Anatomical location			
1. Extra pulmonary TB	0.37	-0.02-0.76	0.060
2. Pulmonary TB	Ref		
Comorbidities			
1. Doesn't have any comorbid	Ref		
2. Has comorbid	0.08	-0.16-0.33	0.500
Type of treatment			
1. Failure/drop out/relapse	-0.05	-0.40-0.29	0.754
2. New patients	Ref		
Nearest health facilities			
1. PHC/hospital	Ref		
2. Non PHC/hospital	0.08	-0.19-0.34	0.588
Smoking			
1. Not smoking	0.48	0.22-0.73	<0.001
2. Smoking	Ref		
First facilities visited			
1. Non health facilities	0.01	-0.42-0.45	0.952
2. Clinic	-0.02	-0.29-0.24	0.869
3. Health facilities	Ref		
Total knowledge score	0.06	0.04-0.08	<0.001
Total practice score	0.04	0.02-0.07	0.001

Table 32 shows the result of multivariate for diagnostic delay using multiple cox regression. Higher hazard ratio (HR) indicates higher risk of experiencing diagnostic delay. Palangkaraya, Bandung, and Lombok Timur had higher diagnostic delay than Aceh. Patients with extra pulmonary TB had higher diagnostic delay than pulmonary TB patients. Patients live far from PHC/hospital had higher diagnostic delay than those live near PHC/hospital. Patients who choose non health facilities as their first visit had higher diagnostic delay than those choose PHC/hospital as their first visit facilities.

Table 32. Multivariate result on risk factor of diagnostic delay using Multiple Cox regression with hazard ratio (HR)

Characteristic variables	Adjusted HR	95% CI	p-value
Gender			
1. Male	Ref		
2. Female	0.96	0.84-1.10	0.575
Age group			
1. 18-30 years	Ref		
2. 31-40 years	1.13	0.95-1.35	0.169
3. 41-50 years	1.13	0.94-1.35	0.188
4. 51-60 years	1.11	0.92-1.34	0.291
5. ≥61 years	0.99	0.82-1.20	0.935
Districts			
1. Aceh Besar	Ref		
2. Palangkaraya	0.57	0.42-0.79	0.001
3. Bandung	0.99	0.79-1.24	0.899
4. Semarang	1.13	0.89-1.45	0.324
5. Ambon	0.66	0.52-0.84	0.001
6. Lombok Timur	0.74	0.60-0.92	0.007
Occupations			
1. Not working	0.91	0.81-1.02	0.121
2. Working	Ref		
Marital status			
1. Not married/widowed/divorced	0.97	0.85-1.10	0.600
2. Married	Ref		
Last educational level			
1. Middle school or lower	0.93	0.82-1.05	0.255
2. High school or higher	Ref		
Diagnosis of TB			
1. Bacteriologically confirmed	Ref		
2. Clinically confirmed	1.05	0.90-1.22	0.547
Anatomical location			
1. Pulmonary TB	Ref		
2. Extra pulmonary TB	0.66	0.53-0.82	<0.001
Comorbidities			
1. Has comorbid	0.88	0.76-1.01	0.069
2. Doesn't have any comorbid	Ref		
Type of treatment			
1. New patients	Ref		
2. Failure/drop out/relapse	0.90	0.75-1.09	0.294
Nearest health facilities			
1. PHC/hospital	Ref		
2. Non PHC/hospital	0.85	0.73-0.99	0.037
Smoking			
1. Smoking	Ref		
2. Not smoking	1.26	1.10-1.46	0.002
First facilities visited			
1. Non health facilities	0.77	0.60-1.02	0.076
2. Clinics	0.92	0.79-1.06	0.237
3. PHC/hospitals	Ref		
Total Knowledge score	0.99	0.98-1.01	0.268
Total practice score	0.99	0.98-1.01	0.577
Total Stigma score	1.01	0.99-1.03	0.207

Table 33 shows the result from multiple logistic regression on factors affecting patients to choose health facilities or non-health facilities as their first visited facility. Our result showed that districts and TB practice were significantly associated with choosing health facilities as the first visited facility among TB patients. Patients from Bandung, Semarang, and Ambon were less likely to choose health facilities as their first visited facilities. Higher practice score was significantly associated with higher probability to choose health facilities as the first visited facility among TB patients.

Table 33. Multivariate result on determinant factors for choosing health facilities as the first facilities visited

Characteristic variables	Adjusted OR	95% CI	p-value
Gender			
1. Male	Ref		
2. Female	0.78	0.43-1.42	0.411
Age group			
1. 18-30 years	Ref		
2. 31-40 years	0.83	0.38-1.81	0.647
3. 41-50 years	0.56	0.26-1.20	0.135
4. 51-60 years	0.56	0.25-1.25	0.158
5. ≥61 years	0.82	0.32-2.10	0.678
Districts			
1. Aceh Besar	Ref		
2. Palangkaraya	-		
3. Bandung	0.07	0.01-0.56	0.012
4. Semarang	0.05	0.01-0.36	0.004
5. Ambon	0.04	0.01-0.34	0.003
6. Lombok Timur	1.88	0.11-31.32	0.660
Occupations			
1. Not working	1.03	0.61-1.73	0.925
2. Working	Ref		
Marital status			
1. Not married/widowed/divorced	1.03	0.59-1.82	0.912
2. Married	Ref		
Last educational level			
1. Middle school or lower	1.81	0.99-3.30	0.056
2. High school or higher	Ref		
Diagnosis of TB			
1. Bacteriologically confirmed	Ref	0.45-1.56	0.580
2. Clinically confirmed	0.84		
Anatomical /location			
1. Pulmonary TB	Ref	0.96-55.45	0.055
2. Extra pulmonary TB	7.29		
Comorbidities			
1. Has comorbid	0.77	0.43-1.38	0.381
2. Doesn't have any comorbid	Ref		
Type of treatment			
1. New patients	Ref		
2. Failure/drop out/relapse	1.57	0.59-4.16	0.369
Nearest health facilities			
1. PHC/hospital	0.93	0.52-1.65	0.793
2. Non PHC/hospital	Ref		
Smoking			
1. Smoking	Ref		
2. Not smoking	1.35	0.72-2.53	0.353
TB knowledge score	0.99	0.94-1.05	0.815
TB practice score	1.15	1.07-1.24	<0.001
TB stigma score	0.98	0.93-1.02	0.254
Satisfaction score	0.94	0.88-1.001	0.054

Table 34 shows the analysis result of TB knowledge score among TB close contact. Result showed that age, gender, districts, working status, marital status and nearest health facilities were associated with TB knowledge score among TB contacts. Female had higher knowledge level about TB than male. Older age group has significantly lower knowledge than younger age group. Working, married, and had higher educational level were positively associated with higher TB knowledge level.

Table 34. multivariate analysis on TB knowledge score for TB patient's close contacts

Characteristic variables	Adjusted β	95% CI	p-value
Age group			
18-30 years	Ref		
31-40 years	-0.49	-1.14-0.15	0.132
41-50 years	-0.60	-1.22-0.19	0.058
51-60 years	-1.21	-1.88(-0.54)	<0.001
≥ 61 years	-1.69	-2.49(-0.89)	<0.001
Gender			
Male	Ref		
Female	1.10	0.65-1.55	<0.001
Districts			
Aceh Besar	Ref		
Palangkaraya	1.27	0.14-2.40	0.027
Bandung	0.76	-0.002-1.52	0.051
Semarang	-1.58	-2.41(-0.75)	<0.001
Ambon	0.78	-0.05-1.61	0.065
Lombok Timur	-3.02	-3.78(-2.26)	<0.001
Occupations			
Not working	Ref		
Working	1.06	0.62-1.59	<0.001
Marital status			
Not married/widowed/divorced	Ref		
Married	1.43	0.88-1.97	<0.001
Last educational level			
Middle school or lower	Ref		
High school or higher	1.85	1.42-2.30	<0.001
Nearest health facilities			
PHC/hospital	0.72	0.20-1.24	0.007
Non PHC/hospital	Ref		

Table 35 shows the result from multiple linear regression on TB attitude among TB contacts. The analysis found that gender, districts, working status, and knowledge level were associated with attitude about TB among TB contacts. Male had higher attitude score than female. Bandung, Palangkaraya, and other districts had higher attitude TB score than Aceh. TB contacts who are working have significantly higher attitude TB score than not working contacts. Among TB contacts, higher TB knowledge level was significantly associated with higher attitude score.

Table 35. multivariate analysis on TB attitude score for TB patient's close contacts

Characteristic variables	Adjusted β	95% CI	p-value
Age group			
18-30 years	Ref		
31-40 years	0.05	-0.22-0.31	0.732
41-50 years	0.10	-0.16-0.35	0.464
51-60 years	0.13	-0.15-0.41	0.355
≥ 61 years	-0.21	-0.54-0.13	0.225
Gender			
Male	Ref		
Female	-0.26	-0.44(-0.07)	0.007

Districts			
Aceh Besar	Ref		
Palangkaraya	2.05	1.58-2.52	<0.001
Bandung	2.65	2.33-2.97	<0.001
Semarang	2.15	1.80-2.49	<0.001
Ambon	0.45	0.11-0.79	0.010
Lombok Timur	1.90	1.58-2.22	<0.001
Occupations			
Not working	Ref		
Working	0.23	0.05-0.41	0.012
Marital status			
Not married/widowed/divorced	Ref		
Married	0.14	-0.09-0.37	0.227
Last educational level			
Middle school or lower	Ref		
High school or higher	-0.06	-0.24-1.29	0.552
Nearest health facilities			
PHC/hospital	Ref		
Non PHC/hospital	-0.02	-0.24-0.19	0.830
Total knowledge score	0.05	0.03-0.07	<0.001

Table 36 shows the result from multiple linear regression on TB stigma among TB contacts. The analysis found that age, districts, working status, marital status, last educational level, knowledge level, attitude score, and practice score were associated with stigma about TB among TB contacts. Lower TB stigma was found on contacts with higher attitude and practice about TB. Ambon, Bandung, and other districts had significantly lower stigma than Aceh. TB contacts who had spouse had higher stigma score than single TB contacts. TB contacts with any occupation were significantly associated with lower stigma than unemployed TB contacts.

Table 36. Multivariate analysis on TB stigma among TB patient's close contacts

Characteristic variables	Adjusted β	95% CI	p-value
Age group			
18-30 years	Ref		
31-40 years	0.97	-0.07-2.00	0.068
41-50 years	0.46	-0.54-1.45	0.371
51-60 years	1.47	0.40-2.55	0.007
≥ 61 years	0.96	-0.32-2.26	0.142
Gender			
Male	0.71	-0.02-1.44	0.055
Female	Ref		
Districts			
Aceh Besar	Ref		
Palangkaraya	-3.85	-5.70-(-2.00)	<0.001
Bandung	-6.42	-7.74-(-5.10)	<0.001
Semarang	-6.33	-7.72-(-4.93)	<0.001
Ambon	-7.44	-8.77-(-6.10)	<0.001
Lombok Timur	-6.01	-7.30-(-4.72)	<0.001
Occupations			
Not working	Ref		
Working	-0.76	-1.46-(-0.06)	0.033
Marital status			
Not married/widowed/divorced	Ref		
Married	1.01	0.12-1.89	0.026
Last educational level			
Middle school or lower	Ref		
High school or higher	-0.80	-1.51-(-0.08)	0.030
Nearest health facilities			
PHC/hospital	Ref		
Non PHC/hospital	0.05	-0.79-0.88	0.920

Total knowledge score	0.20	0.12-0.28	<0.001
Total attitude score	-0.78	-0.97-(-0.58)	<0.001
Total practice score	-0.09	-0.18-(-0.01)	0.027

Table 37 shows the result from multiple linear regression on TB practice among TB contacts. The analysis found that age, gender, districts, marital status, knowledge level, attitude score, and stigma score were associated with practice about TB among TB contacts. Higher practice score was significantly associated with higher knowledge and attitude score. Lower stigma about Tb was associated with higher practice score about TB. Only Palangkaraya city had higher TB practice score than Aceh while other districts had almost similar TB practice score among TB contacts. Female also positively associated with higher TB practice compared with male contacts.

Table 37. Multivariate analysis on TB practice among TB patient's close contacts

Characteristic variables	Adjusted β	95% CI	p-value
Age group			
18-30 years	Ref		
31-40 years	1.13	0.54-1.73	<0.001
41-50 years	1.10	0.53-1.68	<0.001
51-60 years	0.77	0.15-1.40	0.015
≥ 61 years	-0.01	-0.75-0.74	0.983
Gender			
Male	Ref		
Female	0.53	0.11-0.95	0.013
Districts			
Aceh Besar	Ref		
Palangkaraya	1.68	0.61-2.75	0.002
Bandung	-0.05	-0.83-0.73	0.901
Semarang	-0.46	-1.29-0.36	0.271
Ambon	-0.02	-0.82-0.77	0.958
Lombok Timur	0.37	-0.39-1.13	0.341
Occupations			
Not working	Ref		
Working	0.17	-0.23-0.58	0.404
Marital status			
Not married/widowed/divorced	Ref		
Married	0.87	0.36-1.36	<0.001
Last educational level			
Middle school or lower	Ref		
High school or higher	0.24	-0.18-0.65	0.261
Nearest health facilities			
PHC/hospital	Ref		
Non PHC/hospital	0.28	-0.20-0.77	0.252
Total knowledge score	0.24	0.19-0.28	<0.001
Total attitude score	0.64	0.53-0.75	<0.001
Total stigma core	-0.03	-0.06-(-0.01)	0.027

4.5. Contact Investigation among TB officers and Community Health Workers (CHW)

Table 38 presents a comprehensive demographic profile of 202 CHWs who participated in this survey. Predominantly female (99.50%), with a mean age of 45.04 years (± 10.05). Their distribution across various districts underscores a broad representation, with the majority being from Bandung (36.32%) and lesser representations in locales like Kota Palangkaraya (2.99%). The occupational diversity among participants reveals a high percentage of CHWs not currently engaged in any employment (48.51%),

ensuring potentially undivided attention to public health duties. The educational attainment across the group is notably high, with the majority having completed at least high school education (High school) (66.34%).

Table 38. Demographic characteristics of the community health workers (CHWs)

Characteristics	N = 202	%
Gender		
Male	1	0.50
Female	201	99.50
Age	45.04±10.05 ¹	45.30±12.00 ²
Districts		
Aceh Besar	30	14.85
Kota Palangkaraya	6	2.97
Kota Bandung	73	36.14
Kota Semarang	37	18.32
Kota Ambon	23	11.39
Lombok Timur	33	16.34
Occupations		
Not working	98	48.51
Civil servants	3	1.49
Private employees	3	1.49
Entrepreneur	23	11.39
Others	75	37.13
Last educational level		
Finished Elementary school	6	2.97
Finished Middle school	26	12.87
Finished High school	134	66.34
Diploma	20	9.9
Bachelor's degree/equivalent	16	7.92

Table 39 shows the distribution of knowledge, attitudes, and practices related to the investigation of TB patient contacts among community health workers. The majority of CHWs correctly defined TB contact investigation (96.53%), TB contacts (98.02%), TB household contacts (91.58%), and TB close contacts (88.61%). The participants claimed to record the contact investigation performed using the TBC.16K form (88.14%), TBC.01 form (22.28%), and other documents (15.84%). Approximately half (51.49%) stated that all TB cases had a high priority for contact investigation, followed by bacteriologically confirmed TB (36.14%) and paediatric TB (4.46%).

Most CHWs stated that TB contact investigation could be conducted by both CHWs and healthcare workers (62.87%), followed by either healthcare workers (42.08%) or CHWs (39.11%). Only 40.10% of respondents in the study knew that contact investigation should be performed for at least 20 patients' contacts. Around 29.00% thought that contact investigation should be performed for at least 10 contacts, while surprisingly, 21.78% stated that there was no minimum number of contacts to be investigated. Approximately half (50.5%) of the respondents believed that contact investigation should be performed within a week, followed by a month (16.34%) and a day (14.84%). According to the survey, community health workers (CHWs) believed that information in the contact investigation form could be recorded by either healthcare workers (HCWs) or CHWs, or by both HCWs and CHWs (45.54%, 40.10%, and 42.57%, respectively). Most participants (94.30%) reported being aware of latent tuberculosis infection (LTBI). The most common characteristic of LTBI identified by participants was an asymptomatic presentation (77.47%), followed by negative bacteriological test results (9.89%). Although most participants (95.83%) knew that latent TB patients could become active TB and that it required treatment (84.46%), nearly half of the respondents (44.51%) mistakenly believed that latent TB patients could transmit the bacteria to others.

All CHWs agreed that a contact investigation is crucial to stop the spread of TB and that they are required to wear PPEs when conducting it. Most participants also agreed that contact investigations should be conducted on all contacts, including workplace contacts (97.92%), and that CHWs should assist the TB program coordinator in conducting them (99.48%) as well as its importance to ensure the right treatment among contacts (99.48%).

During contact investigations, most CHWs reported always wearing PPE (99.48%) and washing their hands (95.85%). The majority also stated that they always carried TBC.01 and TBC.16K (83.94%) and the official investigation assignment letter (81.87%). Most CHWs always informed contacts of the schedule for home visits (91.71%). When contacts investigated had any symptoms, most CHWs referred them for further testing (97.41%). If the referred contact did not appear, most CHWs reached out to them through available channels (98.96%), visited their houses (97.40%), and brought a pot for collecting sputum samples (95.83%).

Table 39. Distribution of knowledge, attitudes, and practices related to the investigation of TB patient contacts among community health workers

Knowledge	N = 202	%
1. TB contact investigation is the examination of symptoms from people who have close contact with a TB patient to determine whether the contact person is infected or sick with TB.		
1. Yes	195	96.53
2. No	7	3.47
2. TB contacts are people who have been exposed to or in contact with a person with TB, such as household members, roommates, residents of the same dormitory, coworkers, classmates, or daycare providers/caregivers.		
1. Yes	198	98.02
2. No	4	1.98
3. Household contacts are people who live in the same household for at least one night, or who often stay in the same household during the day with the index case in the last 3 months before the index case starts taking anti-tuberculosis drugs.		
1. Yes	185	91.58
2. No	17	8.42
4. Close contacts are people who do not live with the index case but have spent a lot of time with them and have been close to them, just like household contacts.		
1. Yes	179	88.61
2. No	23	11.39
5. Which forms are used to record contact investigations?		
1. TBC.01	45	22.28
2. TBC.16K	174	86.14
3. Other documents	32	15.84
6. Name the types of TB cases that have a high priority for contact investigation		
1. Bacteriologically confirmed TB	73	36.14
2. Paediatric TB	9	4.46
3. All TB cases	104	51.49
4. No one is more prioritized	4	1.98
5. Tuberculosis in the elderly	6	2.97
6. Do not know	2	0.99
7. Others	4	1.98
7. Contact investigation can be conducted by:		
1. Healthcare workers	85	42.08
2. Community health workers	79	39.11
3. Both	127	62.87
4. Not sure	1	0.5
5. Others	7	3.47

8. Minimum number of contacts to be investigated		
1. 20 or more	81	40.1
2. 10 or more	60	29.7
3. No standard	44	21.78
4. Not sure	8	3.96
5. Others	9	4.46
9. What is the maximum duration for contact investigation for one index case?		
1. A week	102	50.5
2. A day	30	14.85
3. A month	33	16.34
4. Free	15	7.43
5. Not sure	6	2.97
6. Others	16	7.92
10. In your opinion, who can record information in the contact investigation form?		
1. Healthcare workers	92	45.54
2. Community health workers	81	40.1
3. Both	86	42.57
4. Not sure	2	0.99
11. Do you know about latent TB infection?		
1. Yes	182	94.3
2. No	11	5.7
12. What are the characteristics of latent TB infection?		
1. Asymptomatic	141	77.47
2. Symptomatic	12	6.59
3. Negative bacteriological test result	18	9.89
4. Positive bacteriological test result	5	2.75
5. Others	6	3.3
13. Can latent TB patients transmit TB disease to others?		
1. Yes	81	44.51
2. No	96	52.75
3. Not sure	5	2.75
14. Does latent TB infection require treatment?		
1. Yes	163	84.46
2. No	27	13.99
3. Not sure	3	1.55
15. In your opinion, can latent TB infection become active TB?		
1. Yes	184	95.83
2. No	3	1.56
3. Not sure	5	2.6
ATTITUDE	N = 202	%
1. TB contact investigation needs to be conducted on all contacts, including workplace contacts		
1. Strongly agree	127	65.8
2. Agree	62	32.12
3. Disagree	4	2.07
2. We are required to use personal protective equipment (PPE) like masks when conducting TB contact investigation		
1. Strongly agree	159	82.38
2. Agree	34	17.62
3. TB contact investigation is crucial to stop the spread of TB		
1. Strongly agree	159	82.38
2. Agree	34	17.62
4. TB contact investigation is important because it can ensure the right treatment for latent TB infection or active TB disease among contacts		
1. Strongly agree	129	66.84
2. Agree	63	32.64
3. Disagree	1	0.52

5. Community health workers should assist the TB program coordinator in conducting TB contact investigations		
1. Strongly agree	126	65.28
2. Agree	66	34.2
3. Disagree	1	0.52
PRACTICE	N = 202	%
1a. I usually use PPE or a mask during contact investigation		
1. Yes	191	99.48
2. No	1	0.52
1b. I usually wash my hands during contact investigation		
1. Yes	185	95.85
2. No	8	4.15
2a. I always carry Form TBC.01 and TBC.16K when conducting TB contact investigations		
1. Yes	162	83.94
2. No	31	16.06
2b. I always carry the official investigation assignment letter when conducting TB contact investigations		
1. Yes	158	81.87
2. No	35	18.13
3. Do you provide information about the home visit schedule to close contacts of the patient?		
1. Yes	177	91.71
2. No	16	8.29
4. I will refer contacts for TB testing if they exhibit symptoms such as cough and other TB symptoms		
1. Yes	188	97.41
2. No	5	2.59
5. If the referred contact does not appear, I will:^		
1. I will reach out through available channels	190	98.96
2. I will visit his/her house	187	97.4
3. I will bring a pot for a sputum sample	184	95.83

^questions with multiple answers

Table 40 shows the demographic profiles of 194 TB officers who participated in this survey. The TB officers are predominantly female (83.51%), with a mean age of 42.67 years (± 16.33). Their distribution across various districts underscores a broad representation, with the majority being from Bandung (34.02%) and lesser representations in locales like Kota Palangkaraya (5.15%). Our participants are the majority staff of primary care units (99.48%), with the majority having a diploma or higher (99.48%) and only one person having a junior high school education as the highest level of education.

Table 40. Demographic characteristics of TB officers

Characteristic of TB officer	n = 194	%
Gender		
1. Male	32	16.49
2. Female	162	83.51
Age	42.67 \pm 16.33 ¹	42.70 \pm 26.60 ²
1. 18-30 years	28	14.43
2. 31-40 years	74	38.14
3. 41-50 years	61	31.44
4. 51-60 years	31	15.98
Districts		
1. Aceh Besar	26	13.4
2. Palangkaraya	10	5.15
3. Bandung	66	34.02
4. Semarang	37	19.07
5. Ambon	22	11.34
6. Lombok Timur	33	17.01

Occupations		
Health office staff	1	0.52
Public health center staff	193	99.48
Marital status		
1. Not married	384	25.11
2. Married	981	64.16
3. Widowed	108	7.06
4. Divorced	56	3.66
Last educational level		
1. Middle school	1	0.52
2. Associate degree	105	54.12
3. Bachelor's degree/equivalent	87	44.85
4. Master's degree or higher	1	0.52

Table 41 shows the distribution of knowledge, attitudes, and practices related to the investigation of TB patient contacts among healthcare workers. The majority of TB officers correctly defined TB contact investigation (98.45%), TB contacts (99.48%), TB household contacts (95.34%), and TB close contacts (96.37.61%). The participants claimed to record the contact investigation performed using the TBC.16K form (84.54%), TBC.01 form (25.77%), and other documents (9.79%). Approximately half (52.85%) stated that bacteriologically confirmed TB had a high priority for contact investigation, followed by all TB cases (43.01%).

Most TB officers stated that TB contact investigation could be conducted by both CHWs and healthcare workers (58.25%), followed by either healthcare workers (55.67%) or CHWs (24.74%). Approximately 58.03% of TB officers knew that contact investigation should be performed for at least 20 patients' contacts. Around 28.50% thought that contact investigation should be performed for at least 10 contacts, while 8.29% stated that there was no minimum number of contacts to be investigated. Approximately half (51.3%) of the respondents believed that contact investigation should be performed within a week, followed by a month (18.13%), while 14.51% stated that there was no certain number. According to the survey, the TB officers believed that information in the contact investigation form could be recorded by both TB officers and CHWs (58.25%) followed by either HCWs (55.67%) or CHWs (24.74%). Around half of TB officers (58.42%) reported being aware of latent tuberculosis infection (LTBI). The most common characteristic of LTBI identified by participants was an asymptomatic presentation (60.17%). Although most participants (82.18%) knew that latent TB patients could become active TB and that it required treatment (83.66%), most TB officers (77.12%) mistakenly believed that latent TB patients could transmit the bacteria to others.

Most TB officers agreed that a contact investigation is crucial to stop the spread of TB (99.5%), that they are required to wear PPEs when conducting it (97.52%), and that contact investigations should be conducted on all contacts, including workplace contacts (96.04%). Most TB officers agreed that CHWs should assist the TB program coordinator in conducting them (99.50%) as well as its importance to ensure the right treatment among contacts (99.50%).

During contact investigations, most TB officers reported always wearing PPE (98.51%) and washing their hands (99.01%). The majority also stated that they always carried TBC.01 and TBC.16K (81.19%) and the official investigation assignment letter (77.72%). Most TB officers always informed contacts of the schedule for home visits (83.17%). When contacts investigated had any symptoms, most TB officers referred them for further testing (98.51%). If the referred contact did not appear, most TB officers reached out to them through available channels (94.06%), visited their houses (97.52%), and brought a pot for collecting sputum samples (92.57%).

Table 41. distribution of knowledge, attitudes, and practices related to the investigation of TB patient contacts among healthcare workers

Knowledge	N = 194	%
1. TB contact investigation is the examination of symptoms from people who have close contact with a TB patient to determine whether the contact person is infected or sick with TB.		
1. Yes	190	98.45
2. No	3	1.55
2. TB contacts are people who have been exposed to or in contact with a person with TB, such as household members, roommates, residents of the same dormitory, coworkers, classmates, or daycare providers/caregivers.		
1. Yes	192	99.48
2. No	1	0.52
3. Household contacts are people who live in the same household for at least one night, or who often stay in the same household during the day with the index case in the last 3 months before the index case starts taking anti-tuberculosis drugs (OATs).		
1. Yes	184	95.34
2. No	9	4.66
4. Close contacts are people who do not live with the index case but have spent a lot of time with them and have been close to them, just like household contacts.		
1. Yes	186	96.37
2. No	7	3.63
5. Which forms are used to record contact investigations?		
1. TBC.01	50	25.77
2. TBC.16K	164	84.54
3. Other documents	19	9.79
6. Name the types of TB cases that have a high priority for contact investigation		
1. Bacteriologically confirmed TB	102	52.85
2. Pediatric TB	2	1.04
3. All TB cases	83	43.01
4. Tuberculosis in the elderly	2	1.04
5. Others	4	2.07
7. Contact investigation can be conducted by:		
1. Healthcare workers	108	55.67
2. Community health workers	48	24.74
3. Both	113	58.25
4. Others	4	2.06
8. Minimum number of contacts to be investigated		
1. 20 or more	112	58.03
2. 10 or more	55	28.5
3. No standard	16	8.29
4. Others	10	5.18
9. What is the maximum duration for contact investigation for one index case?		
1. A week	99	51.3
2. A day	26	13.47
3. A month	35	18.13
4. Free	28	14.51
5. Not sure	2	1.04
6. Others	3	1.55
10. In your opinion, who can record information in the contact investigation form?		
1. Healthcare workers	108	55.67
2. Community health workers	48	24.74
3. Both	113	58.25
11. Do you know about latent TB infection?		
1. Yes	118	58.42
2. No	84	41.58
12. What are the characteristics of latent TB infection?		
1. Asymptomatic	71	60.17

2. Symptomatic	19	16.1
3. Negative bacteriological test result	6	5.08
4. Positive bacteriological test result	12	10.17
5. Others	3	2.54
13. Can latent TB patients transmit TB disease to others?		
1. Yes	91	77.12
2. No	26	22.03
3. Not sure	1	0.85
14. Does latent TB infection require treatment?		
1. Yes	169	83.66
2. No	8	3.96
3. Not sure	25	12.38
15. In your opinion, can latent TB infection become active TB?		
1. Yes	166	82.18
2. No	5	2.48
3. Not sure	31	15.35
ATTITUDE		N = 194
		%
1. TB contact investigation needs to be conducted on all contacts, including workplace contacts		
1. Strongly agree	80	39.6
2. Agree	114	56.44
3. Disagree	8	3.96
2. We are required to use personal protective equipment (PPE) like masks when conducting TB contact investigation		
1. Strongly agree	125	61.88
2. Agree	72	35.64
3. Disagree	5	2.48
3. TB contact investigation is crucial to stop the spread of TB		
1. Strongly agree	120	59.41
2. Agree	81	40.1
3. Disagree	1	0.5
4. TB contact investigation is important because it can ensure the right treatment for latent TB infection or active TB disease among contacts		
1. Strongly agree	94	46.53
2. Agree	106	52.48
3. Disagree	2	0.99
5. Community health workers should assist the TB program coordinator in conducting TB contact investigations		
1. Strongly agree	89	44.06
2. Agree	112	55.45
3. Disagree	1	0.5
PRACTICE		N = 194
		%
1a. I usually use PPE or a mask during contact investigation		
1. Yes	199	98.51
2. No	3	1.49
1b. I usually wash my hands during contact investigation		
1. Yes	200	99.01
2. No	2	0.99
2a. I always carry Form TBC.01 and TBC.16K when conducting TB contact investigations		
1. Yes	164	81.19
2. No	38	18.81
2b. I always carry the official investigation assignment letter when conducting TB contact investigations		
1. Yes	157	77.72
2. No	45	22.28
3. Do you provide information about the home visit schedule to close contacts of the patient?		
1. Yes	168	83.17
2. No	34	16.83

4. I will refer contacts for TB testing if they exhibit symptoms such as cough and other TB symptoms		
1. Yes	199	98.51
2. No	3	1.49
5. If the referred contact does not appear, I will:		
1. I will reach out through available channels	190	94.06
2. I will visit his/her house	197	97.52
3. I will bring a pot for a sputum sample	187	92.57

4.6. AMR among Health Care Workers (HCWs)

The demographic characteristics of TB officers and healthcare workers are shown in Table 42 below. Most of the TB officers and healthcare workers were female, 31-50 years old. Bandung has the highest number of TB officers and healthcare workers in the survey. Most healthcare workers are general practitioners in public health centers or puskesmas followed by pharmacists and nurses. More than half of TB officers have a diploma degree or higher while the majority of healthcare workers have bachelor degrees or higher.

Table 42. Demographic Characteristics of TB officers at Health Centers and Healthcare Workers Related to TB at Health Centers and Hospitals

Characteristic	TB officer n (%)	Healthcare workers n (%)
Gender		
1. Male	32 (16.49)	88 (22.06)
2. Female	162 (83.51)	311 (77.94)
Age group		
1. 18-30 years	28 (14.43)	81 (20.35)
2. 31-40 years	74 (38.14)	197 (49.5)
3. 41-50 years	61 (31.44)	87 (21.86)
4. 51-60 years	31 (15.98)	29 (7.29)
5. 61+	0 (0)	4 (1.01)
Districts		
1. Aceh Besar	26 (13.4)	36 (9.02)
2. Palangkaraya	10 (5.15)	30 (7.52)
3. Bandung	66 (34.02)	160 (40.1)
4. Semarang	37 (19.07)	46 (11.53)
5. Ambon	22 (11.34)	47 (11.78)
6. Lombok Timur	33 (17.01)	80 (20.05)
Occupations		NA
1. Health Department Officer	1 (0.52)	
2. Public Health Center Officer	193 (99.48)	
Occupations	NA	
1. GP at PHC		198 (49.62)
2. Pharmacist at hospital		51 (12.78)
3. Nurse at hospital		72 (18.05)
4. GP at hospital		40 (10.03)
5. Pulmonologist at hospital		25 (6.27)
6. Internist at hospital		13 (3.26)
Marital status		NA
1. Not married	384 (25.11)	
2. Married	981 (64.16)	
3. Widowed	108 (7.06)	
4. Divorced	56 (3.66)	
Last educational level		
1. Middle school	1 (0.52)	0
2. Associate degree	105 (54.12)	39 (9.77)
3. Bachelor's degree/equivalent	87 (44.85)	306 (76.69)
4. Master's degree or higher	1 (0.52)	54 (13.53)

This study found that more than half of TB officers and healthcare workers disagree that AMR could happen if antibiotics were used in livestock feed to promote growth, or if human antibiotics were used to treat infections in animals. Only less than 30-40% TB officers and healthcare workers agree that AMR could happen if human antibiotics was present in human sewerage or human antibiotics discarded into the environment. Most TB officers and healthcare workers both agree that AMR could spread from healthcare facilities including hospital. We found that 40-80% TB officers and healthcare workers know that AMR could spread within residential areas, from livestock farms, and through waste water. The detailed information about general awareness of AMR among TB officers and healthcare workers are available in table 43 and 44, respectively.

Table 43. Distribution of general awareness related to AMR among TB officers at primary health centers

AMR Awareness	Strongly agree		Agree		Disagree		Strongly disagree	
	n	%	N	%	n	%	n	%
Antibiotic resistance is when a microorganism becomes resistant to antibiotics	113	58.55	78	40.41	1	0.52	1	0.52
Some microorganisms can mutate and therefore become resistant to antibiotics	89	46.11	98	50.78	4	2.07	2	1.04
Some microorganisms can transfer resistance by exchanging genetic material	69	35.75	102	52.85	17	8.81	5	2.59
Antibiotic resistance can develop if antibiotics are given when they are not indicated, for example, when a person has a viral infection	71	36.79	106	54.92	13	6.74	3	1.55
Antibiotic resistance can develop if courses of antibiotic treatment are interrupted, for example, stopping and starting again halfway through a prescribed course	88	45.6	97	50.26	7	3.63	1	0.52
Antibiotic resistance can develop if antibiotics are given/taken in lower than recommended doses	63	32.64	91	47.15	36	18.65	3	1.55
Antibiotic resistance can develop if antibiotics are used to treat bacterial colonization rather than bacterial infection	39	20.21	107	55.44	39	20.21	8	4.15
Antibiotic resistance can develop if antibiotics are used as a 'just in case measure' for any routine procedure	60	31.09	93	48.19	35	18.13	5	2.59
Antibiotic resistance can develop if broad-spectrum antibiotics are used when a narrow-spectrum antibiotic would resolve the infection	54	27.98	97	50.26	37	19.17	5	2.59
Antibiotic resistance can develop if antibiotics are used in livestock feed to promote animal growth	25	12.95	42	21.76	105	54.4	21	10.88
Antibiotic resistance can develop if human antibiotics are used to treat infections in animals	18	9.33	45	23.32	108	55.96	22	11.4
Antibiotic resistance can develop if antibiotics are present in human sewerage	13	6.74	41	21.24	116	60.1	23	11.92
Antibiotic resistance can develop if antibiotics are discarded into the environment	16	8.29	44	22.8	107	55.44	26	13.47
Resistant infections can spread from health care facilities including hospitals	51	26.42	104	53.89	34	17.62	4	2.07
Resistant infections can spread within residential areas	52	26.94	98	50.78	38	19.69	5	2.59
Resistant infections can spread from livestock farms	22	11.4	61	31.61	95	49.22	15	7.77
Resistant infections can spread through waste water	23	11.92	57	29.53	102	52.85	11	5.7
Strict hand hygiene before and after contact with patients can help prevent the spread of antibiotic resistance between patients	67	34.72	74	38.34	44	22.8	8	4.15

Isolation in a single room can help prevent the spread of antibiotic resistance between patients	56	29.02	77	39.9	52	26.94	8	4.15
Appropriate environmental cleaning can help prevent the spread of antibiotic resistance between patients	53	27.46	92	47.67	42	21.76	6	3.11
Wearing personal protective equipment such as gloves, masks and aprons can help prevent the spread of antibiotic resistance between patients	67	34.72	74	38.34	47	24.35	5	2.59
I recognise that a person has a resistant infection when the person remains unresponsive to a number of different antibiotics	51	26.42	102	52.85	34	17.62	6	3.11
I recognise that a person has a resistant infection by sending them for culture and sensitivity testing at a laboratory	87	45.08	96	49.74	8	4.15	2	1.04

Table 44. Distribution of general awareness related to AMR among healthcare workers at primary health centers and hospitals

AMR Awareness	Strongly agree		Agree		Disagree		Strongly disagree	
	n	%	n	%	n	%	n	%
Antibiotic resistance is when a microorganism becomes resistant to antibiotics	255	63.91	138	34.59	5	1.25	1	0.25
Some microorganisms can mutate and therefore become resistant to antibiotics	201	50.38	192	48.12	4	1	2	0.5
Some microorganisms can transfer resistance by exchanging genetic material	123	30.83	238	59.65	36	9.02	2	0.5
Antibiotic resistance can develop if antibiotics are given when they are not indicated, for example, when a person has a viral infection	208	52.13	162	40.6	25	6.27	4	1.0
Antibiotic resistance can develop if courses of antibiotic treatment are interrupted, for example, stopping and starting again halfway through a prescribed course	207	52.01	170	42.71	21	5.28	0	0.0
Antibiotic resistance can develop if antibiotics are given/taken in lower than recommended doses	136	34.09	185	46.37	73	18.3	5	1.25
Antibiotic resistance can develop if antibiotics are used to treat bacterial colonisation rather than bacterial infection	83	20.8	184	46.12	123	30.83	9	2.26
Antibiotic resistance can develop if antibiotics are used as a 'just in case measure' for any routine procedure	150	37.59	172	43.11	66	16.54	11	2.76
Antibiotic resistance can develop if broad-spectrum antibiotics are used when a narrow-spectrum antibiotic would resolve the infection	101	25.31	177	44.36	110	27.57	11	2.76
Antibiotic resistance can develop if antibiotics are used in livestock feed to promote animal growth	77	19.4	144	36.27	143	36.02	33	8.31
Antibiotic resistance can develop if human antibiotics are used to treat infections in animals	46	11.59	126	31.74	191	48.11	34	8.56
Antibiotic resistance can develop if antibiotics are present in human sewerage	49	12.28	109	27.32	196	49.12	45	11.28
Antibiotic resistance can develop if antibiotics are discarded into the environment	55	13.78	121	30.33	175	43.86	48	12.03
Resistant infections can spread from health care facilities including hospitals	132	33.08	224	56.14	38	9.52	5	1.25
Resistant infections can spread within residential areas	107	26.82	223	55.89	64	16.04	5	1.25
Resistant infections can spread from livestock farms	63	15.83	181	45.48	138	34.67	16	4.02
Resistant infections can spread through waste water	72	18.09	179	44.97	131	32.91	16	4.02
Strict hand hygiene before and after contact with patients can help prevent the spread of antibiotic resistance between patients	173	43.36	152	38.1	66	16.54	8	2.01

Isolation in a single room can help prevent the spread of antibiotic resistance between patients	143	35.84	177	44.36	71	17.79	8	2.01
Appropriate environmental cleaning can help prevent the spread of antibiotic resistance between patients	140	35.09	195	48.87	59	14.79	5	1.25
Wearing personal protective equipment such as gloves, masks and aprons can help prevent the spread of antibiotic resistance between patients	155	38.94	177	44.47	61	15.33	5	1.26
I recognise that a person has a resistant infection when the person remains unresponsive to a number of different antibiotics	114	28.57	226	56.64	51	12.78	8	2.01
I recognise that a person has a resistant infection by sending them for culture and sensitivity testing at a laboratory	231	57.89	156	39.1	11	2.76	1	0.25

Distribution of answers related to AMR practice for TB officers (Table 45) and healthcare workers (46) are shown in both tables below. If antibiotics do not work, more than half of TB officers and healthcare workers disagree to give the same antibiotics with different duration of medication, different dosage, and different brand or manufacture. The majority of healthcare workers agree to refer patients to take culture and sensitivity tests. More than half of TB officers and healthcare workers disagree to stop all antibiotics medication. Around 60-70% of TB officers and healthcare workers agree about recognizing AMR when antibiotics that normally cures this disease is not making any difference or when they had previous encounters with similar cases.

Table 45. Distribution of practice related to AMR among TB officers at primary health centers

Practices	Always		Often		Sometimes		Never	
	n	%	n	%	n	%	n	%
I always supervise my TB patients regarding their TB treatment.	76	39.38	115	59.59	2	1.04	0	0
	Strongly agree		Agree		Disagree		Strongly disagree	
	n	%	n	%	n	%	n	%
I always ask my TB patients to take their medicine on schedule.	106	54.92	87	45.08	0	0	0	0
If an antibiotic is not effective, I prescribe the same antibiotic with a different period of use.	13	6.74	13	6.74	13	6.74	13	6.74
If an antibiotic drug is not effective, I prescribe the same antibiotic but with a different dosage.	10	5.18	58	30.05	112	58.03	13	6.74
If an antibiotic drug is not effective, I prescribe the same antibiotic but with a different brand or manufacturer.	13	6.77	38	19.79	124	64.58	17	8.85
If a course of antibiotics does not work, I send a patient for culture and sensitivity testing	65	33.68	108	55.96	20	10.36	65	33.68
If a course of antibiotics does not work, I change to a different group of antibiotics	38	19.69	109	56.48	41	21.24	5	2.59
If a course of antibiotics does not work, I stop all antibiotic treatment	19	9.9	64	33.33	98	51.04	11	5.73
I know some antibiotics are not working because we have resistance, so I prefer to prescribe next-line antibiotics as a first line treatment	32	16.58	107	55.44	47	24.35	7	3.63
I prescribe/dispense antibiotics as prophylaxis when I am concerned about surgical site infections	30	15.54	105	54.4	52	26.94	6	3.11
I prescribe/dispense antibiotics as prophylaxis after every surgery	31	16.06	103	53.37	54	27.98	5	2.59
I prescribe/dispense antibiotics as prophylaxis when a person is unlikely to return for follow up	12	6.22	53	27.46	113	58.55	15	7.77

prescribe/dispense antibiotics when I think the standard of hygiene and sanitation is low	9	4.66	45	23.32	124	64.25	15	7.77
I recognise that a person has a resistant infection, when the antibiotic that normally cures this condition isn't making any difference	21	10.94	92	47.92	73	38.02	6	3.13
I recognise that a person has a resistant infection when the person remains unresponsive to a number of different antibiotics	35	18.13	106	54.92	48	24.87	4	2.07
I recognise that a person has a resistant infection, when I have had previous encounters with similar cases	23	11.98	96	50	68	35.42	5	2.6

Table 46. Distribution of practice related to AMR among healthcare workers at primary health centers and hospitals

Practices	Always		Often		Sometimes		Never	
	n	%	n	%	n	%	n	%
I always supervise my TB patients regarding their TB treatment.	110	27.64	227	57.04	57	14.32	4	1.01
	Strongly agree		Agree		Disagree		Strongly disagree	
	n	%	n	%	n	%	n	%
I always ask my TB patients to take their medicine on schedule.	196	49.12	180	45.11	22	5.51	1	0.25
If an antibiotic is not effective, I prescribe the same antibiotic with a different period of use.	14	3.51	84	21.05	254	63.66	47	11.78
If an antibiotic drug is not effective, I prescribe the same antibiotic but with a different dosage.	15	3.76	112	28.07	235	58.9	37	9.27
If an antibiotic drug is not effective, I prescribe the same antibiotic but with a different brand or manufacturer.	9	2.26	49	12.28	278	69.67	63	15.79
If a course of antibiotics does not work, I send a patient for culture and sensitivity testing	166	41.6	208	52.13	22	5.51	3	0.75
If a course of antibiotics does not work, I change to a different group of antibiotics	80	20.05	283	70.93	33	8.27	3	0.75
If a course of antibiotics does not work, I stop all antibiotic treatment	14	3.51	88	22.06	253	63.41	44	11.03
I know some antibiotics are not working because we have resistance, so I prefer to prescribe next-line antibiotics as a first-line treatment	41	10.28	242	60.65	105	26.32	11	2.76
I prescribe/dispense antibiotics as prophylaxis when I am concerned about surgical site infections	52	13.03	266	66.67	65	16.29	16	4.01
I prescribe/dispense antibiotics as prophylaxis after every surgery	47	11.78	234	58.65	101	25.31	17	4.26
I prescribe/dispense antibiotics as prophylaxis when a person is unlikely to return for follow up	15	3.76	91	22.81	164	41.1	129	32.33
prescribe/dispense antibiotics when I think the standard of hygiene and sanitation is low	24	6.02	110	27.57	229	57.39	36	9.02
I recognise that a person has a resistant infection, when the antibiotic that normally cures this condition isn't making any difference	44	11.06	235	59.05	107	26.88	12	3.02
I recognise that a person has a resistant infection when the person remains unresponsive to a number of different antibiotics	66	16.54	255	63.91	73	18.3	5	1.25
I recognise that a person has a resistant infection, when I have had previous encounters with similar cases	30	7.52	266	56.54	133	33.33	10	2.51

Table 47 and 48 shows the result of distribution related to AMR attitude among TB officers and healthcare workers. The result shows that more than half of TB officers and healthcare workers agree that antibiotic price, availability, and side effects influence the decision to prescribe antibiotics. There

are approximately 75% and 88% of healthcare workers agree that pressure from patients or family of the patients and availability of laboratory service influence the decision to prescribe antibiotics, respectively. The majority of TB officers and healthcare workers disagree that fear of disappointing the patients and losing reputation influence the decision to prescribe antibiotics. More than half of healthcare workers agree that fear of their business could be disturbed influence the decision to prescribe antibiotics. The training curricula already has all information about AMR said 71% TB officers and 72% healthcare workers. We also found that 70% TB officers and 67% healthcare workers feels that all of the information and training they had been enough. All of healthcare workers agree that they ever attend specific training regarding AMR but there is only less than half of TB officers who give similar answer. Approximately half of TB officers and healthcare workers agree that they could access local data regarding AMR pattern and have officer who monitor AMR pattern.

Table 47. Distribution of attitude related to AMR among TB officers at primary health centers

AMR attitude	Strongly agree		Agree		Disagree		Strongly disagree	
	n	%	n	%	N	%	n	%
In my own work, I am certain that I have encountered a person with a resistant infection	38	19.69	136	70.47	16	8.29	3	1.55
The cost of antibiotic medicines affects which antibiotic I decide to prescribe/dispense	16	8.29	75	38.86	92	47.67	10	5.18
The availability of antibiotic medicines affects which antibiotic I decide to prescribe/dispense	25	12.95	116	60.1	49	25.39	3	1.55
Previous success in other people I have treated affects which antibiotic I decide to prescribe/dispense	41	21.35	122	63.54	28	14.58	1	0.52
The side effects of antibiotic medicines affect which antibiotic I decide to prescribe/dispense	39	20.31	126	65.63	27	14.06	0	0
The spectrum of antibiotic medicines (whether they are broad or narrow spectrum) affects which antibiotic I decide to prescribe/dispense	37	19.27	122	63.54	33	17.19	0	0
Pressure from patients or the families of patients affects my decision to prescribe/dispense antibiotics	5	2.6	42	21.88	119	61.98	26	13.54
The availability of laboratory services affects my decision to prescribe/dispense antibiotics	23	11.98	108	56.25	60	31.25	1	0.52
My ability to access the medical record or history of the person I am treating affects my decision to prescribe/ dispense antibiotics	37	19.17	119	61.66	36	18.65	1	0.52
The fear of legal sanctions (such as being sued) affects my decision to prescribe/dispense antibiotics	15	7.77	89	46.11	77	39.9	12	6.22
If I do not prescribe/dispense an antibiotic, there could be a worse health outcome for the person I am treating	14	7.25	87	45.08	84	43.52	8	4.15
If I do not prescribe/dispense an antibiotic the person I am treating could be disappointed	7	3.63	33	17.1	125	64.77	28	14.51
If I do not prescribe/dispense an antibiotic my reputation could be damaged	4	2.07	15	7.77	132	68.39	42	21.76
If I do not prescribe/dispense an antibiotic my business could suffer	3	1.56	16	8.33	132	68.75	41	21.35
I was taught everything I needed to know about Antibiotic Resistance as part of my training curriculum	24	12.5	112	58.33	50	26.04	6	3.13
The information and training I currently receive on Antibiotic Resistance is adequate for my day-to-day practice	28	14.51	107	55.44	53	27.46	5	2.59
I have attended specific training on Antibiotic Resistance and/or Antibiotic Stewardship	12	6.22	67	34.72	92	47.67	22	11.4
I have access to data on local Antibiotic Resistance patterns	11	5.73	76	39.58	91	47.4	14	7.29

I receive data on local Antibiotic Resistance patterns at my working place	13	6.77	85	44.27	80	41.67	14	7.29
Someone at my working place is monitoring Antibiotic Resistance	16	8.29	75	38.86	88	45.6	14	7.25
My facility has the capacity to provide culture and sensitivity testing	14	7.25	46	23.83	103	53.37	30	15.54
There is a nearby facility that I can send samples to if I need culture and sensitivity testing	37	19.17	108	55.96	40	20.73	8	4.15
I am confident that the facility I use for culture and sensitivity testing has functional equipment	41	21.24	114	59.07	33	17.1	5	2.59

Table 48. Distribution of attitude related to AMR among healthcare workers at primary health centers and hospitals

AMR attitude	Strongly agree		Agree		Disagree		Strongly disagree	
	n	%	N	%	n	%	n	%
In my work, I am certain that I have encountered a person with a resistant infection	39	9.77	185	46.37	150	37.59	25	6.27
The cost of antibiotic medicines affects which antibiotic I decide to prescribe/dispense	82	20.55	262	65.66	47	11.78	8	2.01
The availability of antibiotic medicines affects which antibiotic I decide to prescribe/dispense	73	18.3	286	71.68	39	9.77	1	0.25
Previous success in other people I have treated affects which antibiotic I decide to prescribe/dispense	95	23.81	287	71.93	16	4.01	1	0.25
The side effects of antibiotic medicines affect which antibiotic I decide to prescribe/dispense	98	24.56	281	70.43	19	4.76	1	0.25
The spectrum of antibiotic medicines (whether they are broad or narrow spectrum) affects which antibiotic I decide to prescribe/dispense	9	2.26	55	13.78	230	57.64	105	26.32
Pressure from patients or the families of patients affects my decision to prescribe/dispense antibiotics	59	14.79	241	60.4	87	21.8	12	3.01
The availability of laboratory services affects my decision to prescribe/dispense antibiotics	74	18.55	277	69.42	45	11.28	3	0.75
My ability to access the medical record or history of the person I am treating affects my decision to prescribe/dispense antibiotics	23	5.76	141	35.34	197	49.37	38	9.52
The fear of legal sanctions (such as being sued) affects my decision to prescribe/dispense antibiotics	22	5.53	135	33.92	197	49.5	44	11.06
If I do not prescribe/dispense an antibiotic, there could be a worse health outcome for the person I am treating	4	1	36	9.02	257	64.41	102	25.56
If I do not prescribe/dispense an antibiotic the person I am treating could be disappointed	3	0.75	11	2.76	244	61.15	141	35.34
If I do not prescribe/dispense an antibiotic my reputation could be damaged	2	0.5	14	3.51	237	59.4	146	36.59
If I do not prescribe/dispense an antibiotic my business could suffer	39	9.77	185	46.37	150	37.59	25	6.27
I was taught everything I needed to know about Antibiotic Resistance as part of my training curriculum	48	12.03	209	52.38	127	31.83	15	3.76
The information and training I currently receive on Antibiotic Resistance is adequate for my day-to-day practice	44	11.03	224	56.14	117	29.32	14	3.51
	Yes		No					
	n	%	n	%				
I have attended specific training on Antibiotic Resistance and/or Antibiotic Stewardship	129	32.33	270	67.67				
I have access to data on local Antibiotic Resistance patterns	23	5.78	187	46.98	164	41.21	24	6.03

I receive data on local Antibiotic Resistance patterns at my working place	27	6.78	181	45.48	163	40.95	27	6.78
Someone at my working place is monitoring Antibiotic Resistance	40	10.05	189	47.49	144	36.18	25	6.28
My facility has the capacity to provide culture and sensitivity testing	49	12.31	148	37.19	149	37.44	52	13.07
There is a nearby facility that I can send samples to if I need culture and sensitivity testing	77	19.3	241	60.4	72	18.05	9	2.26
I am confident that the facility I use for culture and sensitivity testing has functional equipment	76	19.05	242	60.65	71	17.79	10	2.51

The distribution of AMR practices in the working place is shown on table 49 (TB officer) and 50 (healthcare workers) below. This study found that 63% TB officers and 47% healthcare workers agree that malnutrition is more prioritized than AMR. While there is approximately 64% TB officers and 44% healthcare workers agree that chronic disease is more prioritized than AMR. Our result shows that 41% TB officers and 41% healthcare workers said that they had been exposed with antibiotic advertisement. The existence of AMR campaigns is known by 59% TB officers and 66% healthcare workers.

Table 49. Distribution of AMR practices in the workplace and sources of AMR information among TB officers at primary health centers

AMR practices in the workplace	Strongly agree		Agree		Disagree		Strongly disagree	
	n	%	n	%	n	%	n	%
At my working place, I consider malnutrition a higher concern than antibiotic resistance	23	11.92	99	51.3	67	34.72	4	2.07
At my working place, I consider chronic disease a higher concern than antibiotic resistance	20	10.36	103	53.37	64	33.16	6	3.11
At my working place, I consider hygiene and sanitation a higher concern than antibiotic resistance	20	10.36	71	36.79	97	50.26	5	2.59
At my working place I consider other infectious diseases (TB/Malaria/HIV) a higher concern than antibiotic resistance	36	18.65	106	54.92	48	24.87	3	1.55
At my working place I consider trauma and accidents (for example, traffic accidents and burns) a higher concern than antibiotic resistance	17	8.81	68	35.23	99	51.3	9	4.66
Sources of AMR information	Yes		No					
	n	%	n	%				
I am exposed to advertising on antibiotics	79	40.93	114	59.07				
I am aware of campaigns about antibiotic resistance	113	58.55	80	41.45				

Table 50. Distribution of AMR practices in the workplace and sources of AMR information among healthcare workers at primary health centers and hospitals

AMR practices in the workplace	Strongly agree		Agree		Disagree		Strongly disagree	
	n	%	n	%	n	%	n	%
At my working place, I consider malnutrition a higher concern than antibiotic resistance	21	5.28	165	41.46	188	47.24	24	6.03
At my working place, I consider chronic disease a higher concern than antibiotic resistance	22	5.51	155	38.85	200	50.13	22	5.51
At my working place, I consider hygiene and sanitation a higher concern than antibiotic resistance	18	4.51	156	39.1	205	51.38	20	5.01
At my working place I consider other infectious diseases (TB/Malaria/HIV) a higher concern than antibiotic resistance	42	10.53	197	49.37	138	34.59	22	5.51

At my working place I consider trauma and accidents (for example, traffic accidents and burns) a higher concern than antibiotic resistance	18	4.51	116	29.07	229	57.39	36	9.02
sources of AMR information	Yes		No					
	n	%	n	%				
I am exposed to advertising on antibiotics	164	41.1	235	58.9				
I am aware of campaigns about antibiotic resistance	265	66.42	134	33.58				

Table 51 below shows that healthcare workers had higher mean score of AMR general knowledge than TB officer. Internist, pharmacist, and pulmonologist were the top 3 highest mean score among other professions regarding AMR general knowledge. Bandung, Palangkaraya, and Semarang had the highest mean AMR score than other districts. The overall AMR general awareness score is moderate for both TB officers and healthcare workers.

Table 51. Distribution of general awareness score AMR according to demographic characteristics among TB officers and healthcare workers.

Characteristic	n	Mean	Level	Median	SD	IQR
TB officer	194	16.1	Moderate	17	4.6	7
healthcare workers	399	17.6	Moderate	18	4.1	6
Profession (p-value = 0.847)						
1. TB officer	194	16.1	Moderate	17	4.6	7
2. GP at PHC	198	17.2	Moderate	17	3.5	7
3. GP at hospital	40	17.3	Moderate	17	3.7	5
4. Pulmonologist	25	18.9	High	19	3.6	6
5. Internist	13	21.2	High	23	3.0	2
6. Nurse	72	16.2	Moderate	17	4.6	4.5
7. Pharmacist	51	19.9	High	21	3.5	4
District (p-value = 0.07)						
1. Aceh Besar	62	16.9	Moderate	16.5	3.8	6
2. Palangkaraya	40	17.4	Moderate	17.5	5.4	9.5
3. Bandung	226	17.7	Moderate	18	4.3	6
4. Semarang	83	17.1	Moderate	18	3.6	4
5. Ambon	69	16.4	Moderate	17	4.2	7
6. Lombok Timur	113	16.5	Moderate	17	4.8	6

The distribution of AMR practice score according to demographic characteristics is shown on Table 52 below. There is a similar mean score of AMR practice between healthcare workers and TB officer. Nurse, GP at PHC, and TB officers were the top 3 highest mean score among other professions regarding AMR practice. Aceh Besar, Palangkaraya, and Lombok had higher mean score compared with other districts. The overall level of AMR practice score is moderate across all characteristics

Table 52. Distribution of AMR practice score according to demographic characteristics among TB officers and healthcare workers.

Characteristic	n	Mean	Level	Median	SD	IQR
TB officer	194	9.6	Moderate	9	3.5	4
healthcare workers	399	9.6	Moderate	9	2.6	3
Profession (p-value = 0.394)						
1. TB officer	194	9.6	Moderate	9	3.5	4
2. GP at PHC	198	9.7	Moderate	9	2.4	3
3. GP at hospital	40	9.3	Low	9	2.1	2.5
4. Pulmonologist	25	8.3	Low	8	2.7	2
5. Internist	13	8.2	Moderate	8	1.9	3
6. Nurse	72	10.3	Moderate	11	3.2	3
7. Pharmacist	51	9.3	Moderate	9	2.5	3

District (p-value = 0.001)						
1. Aceh Besar	62	10.9	Moderate	11	2.9	3
2. Palangkaraya	40	10.2	Moderate	10	3.0	4
3. Bandung	226	9.0	Moderate	9	2.5	3
4. Semarang	83	9.1	Moderate	9	2.9	2
5. Ambon	69	9.6	Moderate	9	3.0	4
6. Lombok Timur	113	10.2	Moderate	10	3.4	5

The distribution of AMR attitude score is shown in table 53 below. The AMR attitude score for healthcare workers is higher than TB officer. Pulmonologist, internist, and GP at hospital were the top 3 highest mean score among other professions regarding AMR attitude. There is similar mean score of AMR attitude score among districts. The overall AMR attitude score is moderate across all characteristics.

Table 53. Distribution of AMR attitude score according to demographic characteristics among TB officers and healthcare workers.

Characteristic	n	Mean	Level	Median	SD	IQR
TB officer	194	15.1	Moderate	15	3.3	4
healthcare workers	399	17.2	Moderate	17	2.9	4
Profession (p-value=0.389)						
1. TB officer	194	15.1	Moderate	15	3.3	4
2. GP at PHC	198	15.9	Moderate	16	2.7	4
3. GP at hospital	40	18.4	Moderate	19	2.2	3
4. Pulmonologist	25	19.4	High	20	2.3	3
5. Internist	13	20.0	High	21	2.2	2
6. Nurse	72	17.4	Moderate	18	2.9	3
7. Pharmacist	51	18.7	High	19	2.1	3
District (p-value = 0.966)						
1. Aceh Besar	62	16.2	Moderate	17	3.9	6
2. Palangkaraya	40	16.4	Moderate	16	3.0	6
3. Bandung	226	16.7	Moderate	17	3.1	5
4. Semarang	83	16.5	Moderate	17	2.8	3
5. Ambon	69	16.4	Moderate	17	2.8	5
6. Lombok Timur	113	16.4	Moderate	17	3.3	4

Table 54 shows the distribution of AMR practice on working place score. TB officers had higher mean score of AMR practice on working place than healthcare workers. Nurse, GP at hospital, and GP at PHC were the top 3 highest mean score among other professions regarding AMR practice on working place. Internist had the lowest mean score. Aceh had the highest mean score of AMR practice on working place than other districts. The overall AMR practice was low.

Table 54. Distribution of AMR practice on working place score according to demographic characteristics among TB officers and healthcare workers.

Characteristic	N	Mean	Level	Median	SD	IQR
TB officer	194	2.9	Low	3	1.8	3
healthcare workers	399	2.3	Low	2	1.9	4
Profession (p-value = 0.185)						
1. TB officers at PHC	194	2.9	Low	3	1.8	3
2. GP at PHC	198	2.4	Low	2.5	1.9	4
3. GP at hospital	40	2.2	Low	2	1.8	3
4. Pulmonologist	25	1.6	Low	1	1.7	3
5. Internist	13	0.7	Low	0	1.0	1
6. Nurse	72	3.0	Moderate	4	1.9	4
7. Pharmacist	51	1.8	Low	1	1.6	3

District (p-value=0.02)						
1. Aceh Besar	62	3.2	Moderate	4	1.7	3
2. Palangkaraya	40	2	Low	1	1.9	4
3. Bandung	226	2.4	Low	2.5	1.8	3
4. Semarang	83	2.3	Low	3	1.8	4
5. Ambon	69	2.2	Low	2	1.8	4
6. Lombok Timur	113	2.6	Low	3	1.9	4

Multivariate analysis result using multiple linear regression are reported in table 55 below. For TB officer, we found that age, educational level, and districts have association with AMR general awareness score. While for healthcare workers, our analysis shows that occupation type and educational level are associated with AMR general awareness score. TB officers with age more than forty years had lower AMR awareness scores than younger TB officer. Pharmacists and interns are associated with higher AMR attitude scores than GP at public health centre. TB officers with a higher educational level than diploma has a higher AMR attitude score than TB officers with a diploma or lower educational level.

Table 55. Multivariate analysis on AMR general awareness among TB officers and healthcare worker on public health centre and hospitals

Characteristic variables	Adjusted β (95% CI)	
	TB officer	healthcare workers
Age		
1. 18-30	Ref	Ref
2. 31-40	-0.64 (-1.57-0.30)	0.03 (-1.01-1.08)
3. 41-50	-2.30 (-3.36-(-1.24))	-0.82 (-2.08-0.44)
4. 51-60	-2.77 (-4.13-(-1.42))	-0.67 (-2.42-1.08)
5. 61+	-1.03 (-5.43-3.36)	0.37 (-4.01-4.76)
Gender		
1. Male	Ref	Ref
2. Female	-0.92 (-1.81-(-0.04))	-0.75 (-1.74-0.24)
District		
1. Aceh Besar	Ref	Ref
2. Kota Palangkaraya	-0.07 (-1.74-1.61)	0.31 (-1.60-2.22)
3. Kota Bandung	0.28 (-0.92-1.49)	0.19 (-1.25-1.62)
4. Kota Semarang	-0.29 (-1.68-1.11)	0.42 (-1.30-2.14)
5. Kota Ambon	-1.21 (-2.68-0.25)	-1.10 (-2.86-0.64)
6. Lombok Timur	-1.63 (-2.99-(-0.26))	-1.54 (-3.13-0.05)
Occupation		
1. GP at puskesmas	-	Ref
2. Pharmacist at hospital		2.66 (1.41-3.91)
3. Nurse at hospital		0.13 (-1.17-1.42)
4. GP at hospital		-0.08 (-1.42-1.26)
5. Pulmonologist at hospital		1.72 (-0.41-3.84)
6. Internist at hospital		4.30 (1.79-6.81)
Last education level		
1. Diploma or lower	Ref	Ref
2. Bachelor's or equivalent	1.20 (0.39-2.01)	2.16 (0.56-3.75)
3. Master's or higher	2.62 (1.25-3.99)	1.75 (-0.42-3.92)

Table 56 shows the result of multiple linear regression for AMR practice for both TB officers and healthcare workers. Significant factors identified were age and districts for TB officers and healthcare workers. Bandung and all other cities, except Palangkaraya, were associated with lower AMR practice score than Aceh. TB officers with older age than 30 years had lower score than those within 18-30 age group. Difference in educational level did not have significant impact on AMR attitude score.

Table 56. Multivariate analysis on AMR practice among TB officers and healthcare worker on public health centre and hospitals

Characteristic variables	Adjusted β (95% CI)	
	TB officer	healthcare workers
Age		
1. 18-30	Ref	Ref
2. 31-40	-0.64 (-1.28-(-0.01))	-0.68 (-1.35-(-0.01))
3. 41-50	-1.59 (-2.30-(-0.87))	-1.23 (-2.04-(-0.42))
4. 51-60	-1.56 (-2.47-(-0.65))	-1.75 (-2.87-(-0.62))
5. 61+	-2.30 (-5.28-0.67)	-2.12 (-4.93-0.70)
Gender		
1. Male	Ref	Ref
2. Female	-0.21 (-0.80-0.39)	0.04 (-0.59-0.68)
District		
1. Aceh Besar	Ref	Ref
2. Kota Palangkaraya	-0.74 (-1.87-0.39)	-0.04 (-1.27-1.19)
3. Kota Bandung	-1.88 (-2.70-(-1.07))	-1.58 (-2.49-(-0.66))
4. Kota Semarang	-1.89 (-2.84-(-0.96))	-1.82 (-2.93-(-0.72))
5. Kota Ambon	-1.59 (-2.58-(-0.60))	-1.48 (-2.59-(-0.37))
6. Lombok Timur	-1.13 (-2.05-(-0.21))	-1.34 (-2.36-(-0.32))
Occupation		
1. GP at Puskesmas		Ref
2. Pharmacist at hospital		-0.68 (-1.48-0.12)
3. Nurse at hospital		0.77 (-0.06-1.60)
4. GP at hospital		-0.39 (-1.24-0.47)
5. Pulmonologist at hospital		-0.40 (-1.77-0.96)
6. Internist at hospital		-0.68 (-2.29-0.93)
Last education level		
1. Diploma	Ref	Ref
2. Bachelor's or equivalent	0.08 (-0.47-0.63)	0.45 (-0.57-1.47)
3. Master's or higher	-0.62 (-1.54-0.31)	0.10 (-1.28-1.49)

Table 57 shows the result of multivariate linear regression for AMR attitude among TB officers and healthcare workers. Districts and occupations were associated with AMR scores among healthcare workers. Pharmacists and other types of healthcare workers had significantly higher AMR attitude scores than general practitioners in public health centres. Healthcare workers at Palangkaraya and Ambon were associated with lower AMR attitude scores than Aceh. While none of the characteristics had significant association with AMR attitude score among TB officers.

Table 57. Multivariate analysis on AMR attitude among TB officers and healthcare workers on public health centre and hospitals

Characteristic variables	Adjusted β (95% CI)	
	TB officer	healthcare workers
Age		
1. 18-30	Ref	Ref
2. 31-40	-0.60 (-1.29-0.10)	-0.03 (-0.72-0.66)
3. 41-50	-0.49 (-1.28-0.30)	0.10 (-0.74-0.94)
4. 51-60	-0.38 (-1.38-0.62)	0.71 (-0.45-1.86)
5. 61+	1.19 (-2.08-4.47)	0.91 (-1.99-3.82)
Gender		
1. Male	Ref	Ref
2. Female	-0.27 (-0.93-0.39)	0.03 (-0.63-0.69)
District		
1. Aceh Besar	Ref	Ref
2. Kota Palangkaraya	-0.21 (-1.45-1.03)	-1.36 (-2.62-(-0.09))
3. Kota Bandung	0.01 (-0.89-0.91)	-0.53 (-1.48-0.42)
4. Kota Semarang	0.03 (-1.01-1.06)	-0.39 (-1.53-0.75)
5. Kota Ambon	-0.12 (-1.21-0.96)	-1.51 (-2.66-(-0.36))
6. Lombok Timur	-0.21 (-1.22-0.81)	-0.76 (-1.81-0.30)

Occupation		
1. GP at puskesmas		Ref
2. Pharmacist at hospital		2.86 (2.03-3.69)
3. Nurse at hospital		2.01 (1.15-2.87)
4. GP at hospital		2.41 (1.52-3.29)
5. Pulmonologist at hospital		3.32 (1.91-4.73)
6. Internist at hospital		4.13 (2.46-5.79)
Last education level		
1. Diploma	Ref	Ref
2. Bachelor's or equivalent	0.94 (0.34-1.55)	1.19 (0.13-2.25)
3. Master's or higher	2.46 (1.44-3.48)	0.89 (-0.55-2.33)

Table 58 below shows the result of multivariate analysis using multiple linear regression for AMR practice on workplace scores among TB officers and healthcare workers. Both results showed that educational level, age group, occupation, and districts were associated with AMR score. Older TB officers and healthcare workers had lower AMR scores than younger TB officers and healthcare workers. Internist and pharmacist had significantly lower AMR score than GP at public health centre. Higher education level than diploma was correlated with lower AMR score than diploma.

Table 58. Multivariate analysis on AMR practice on working place among TB officers and healthcare worker on public health centre and hospitals

Characteristic variables	Adjusted β (95% CI)	
	TB officer	Healthcare workers
Age		
1. 18-30	Ref	Ref
2. 31-40	-0.22 (-0.62-0.18)	-0.41 (-0.89-0.07)
3. 41-50	0.16 (-0.30-0.62)	-0.14 (-0.72-0.44)
4. 51-60	-0.05 (-0.63-0.53)	-0.39 (-1.19-0.41)
5. 61+	-0.77 (-2.67-1.12)	-1.01 (-3.02-1.00)
Gender		
1. Male	Ref	Ref
2. Female	-0.09 (-0.48-0.29)	-0.02 (-0.47-0.44)
District		
1. Aceh Besar	Ref	Ref
2. Kota Palangkaraya	-0.98 (-1.70-(-0.26))	-0.65 (-1.53-0.23)
3. Kota Bandung	-0.52 (1.04-0.01)	-0.59 (-1.25-0.06)
4. Kota Semarang	-0.74 (-1.33-(-0.13))	-1.09 (-1.88-(-0.29))
5. Kota Ambon	-0.71 (-1.34-(-0.08))	-0.93 (-1.72-(-0.13))
6. Lombok Timur	-0.29 (-0.88-0.29)	-0.61 (-1.33-0.12)
Occupation		
1. GP at puskesmas		Ref
2. Pharmacist at hospital		-0.79 (-1.36-(-0.22))
3. Nurse at hospital		0.09 (-0.50-0.68)
4. GP at hospital		-0.15 (-0.77-0.46)
5. Pulmonologist at hospital		-0.63 (-1.60-0.35)
6. Internist at hospital		-1.57-(-2.72-(-0.41))
Last education level		
1. Diploma	Ref	Ref
2. Bachelor's or equivalent	-0.63 (-0.97-(-0.28))	-1.15 (-1.88-(-0.41))
3. Master's or higher	-1.38 (-1.97-(-0.79))	-1.21 (-2.20-(-0.21))

CHAPTER 5

DISCUSSION AND CONCLUSIONS

5.1. Discussion

Knowledge, Attitude, and Practice among TB Patient and Contact

This study found that most TB patients understood their illness and acknowledged that TB is a dangerous illness. They, however, had incorrect perception on the cause, transmission, and prevention of tuberculosis. Less than half of TB patients did not know how TB transmitted to other people and thought that TB is caused by something other than bacteria. While many TB patients were aware that TB is curable and also aware of the adverse effects of treatment, many of them did not know how to prevent it.

While most TB patients correctly identified the lungs as the most common affected organ of TB infection, only few recognized that TB could also affect other organs such as the digestive system, bones, and lymph glands. Furthermore, only half of the patients could correctly identify cough and prolonged cough as the most common symptoms of TB. Despite limited knowledge about TB transmission and prevention, most patients were aware of TB's curability and the potential side effects of TB treatment. However, understanding of drug-resistant TB remains limited, with only 20.56% of patients aware of the risk of developing drug-resistant TB.

Similar to previous studies (Kasa et al., 2019), this study found that both TB patients and contacts had low mean knowledge scores. Majority of TB patients and contacts had higher knowledge among general TB questions such as bacteria as cause of TB, lungs as main organ affected on TB, and TB could be transmitted through cough and sneeze. But detailed knowledge such as other organs affected by TB, other symptoms than cough, and adverse drug reaction side effects, are not well known among TB patients and contacts. Younger age groups, females, higher educational level, and living in specific cities were associated with higher mean knowledge scores. Of the patients, those who were bacteriologically confirmed TB patients, lived near PHC/hospital, and patients who had experienced failure/drop out/relapse had higher mean knowledge scores.

The knowledge score concerning tuberculosis (TB) is significantly influenced by various factors. Age is a primary determinant, as older individuals often demonstrate higher knowledge scores, possibly due to longer exposure to health information (Balogun et al., 2019; Datiko et al., 2019). Gender also plays a role, with studies indicating that women might have a slightly better understanding of TB symptoms and prevention methods compared to men (Datiko et al., 2019). Occupation is another crucial factor; healthcare workers, unsurprisingly, show higher knowledge scores due to their professional background (Balogun et al., 2019; Obuku et al., 2012). Clinical characteristics of TB, such as symptom recognition and treatment knowledge, are better understood among individuals who have had direct or indirect experiences with the disease. Lastly, demographic characteristics, including education level and socio-economic status, significantly influence TB knowledge. Individuals from higher socio-economic backgrounds and with higher education levels tend to have better access to health information, thereby scoring higher in TB knowledge assessments (Balogun et al., 2019; Datiko et al., 2019). These determinants collectively suggest that TB knowledge is multifaceted, necessitating targeted educational strategies for different demographic groups.

The practices related to tuberculosis (TB) management and prevention among TB patients and their contacts are influenced by several key determinants. Age plays a crucial role, as younger individuals

may demonstrate less adherence to TB prevention practices due to limited disease awareness or perceived invulnerability (Wang et al., 2021; Bashorun et al., 2020). Gender differences also impact TB-related practices, with studies suggesting that men might exhibit lower compliance with TB treatment regimens compared to women, possibly due to socio-cultural factors (Bashorun et al., 2020). Occupation is another significant determinant; individuals in certain high-risk occupations, such as healthcare workers, are more likely to adhere to TB prevention and control practices due to better knowledge and workplace policies (Wang et al., 2021; Mushtaq et al., 2010). The clinical characteristics of TB, particularly the severity and type of disease (pulmonary vs. extrapulmonary), influence patient practices and compliance with treatment protocols (Wang et al., 2021; Mu). Lastly, demographic characteristics, including education level and socio-economic status, significantly affect TB-related practices. Patients from higher socio-economic backgrounds and with higher education levels are often more engaged in proactive health-seeking behaviors and adherence to TB treatment due to better access to resources and health literacy (Wang et al., 2021; Mushtaq et al., 2010). These determinants underscore the need for tailored educational and support interventions that cater to the diverse needs of TB patients and their contacts.

The majority of TB patients first sought treatment at public health centers, followed by private clinics and public hospitals. The most common reasons for seeking treatment were persistent symptoms, worsening symptoms, and adherence to the health insurance scheme.

Most TB patients are satisfied with the support they receive from healthcare workers, the availability of TB medication, and the services provided by their healthcare facilities. They are also satisfied with the waiting time at public health centers. Overall, TB patients feel supported and respected by their healthcare providers.

While the majority stated that they would immediately (91.97%) (Table 14), there were long delays in TB diagnosis in our study, with a median patient delay of 20 days, health system delay of 64 days, and total diagnostic delay of 63 days. Half of the TB patients visited at least two healthcare facilities before diagnosis. These findings are comparable to other studies, which have reported a median patient delay of 33 days and a median total delay of 90 days (Qureshi, et al., 2008). However, the median health system delay in our study was longer (64 days vs. 57 days (Bonadonna et al., 2018)). As the significant two-month window where undiagnosed TB patients can unknowingly infect others, urgent action is needed to address diagnostic delays, this suggests that there may be areas where the health system can be improved to reduce the time it takes for TB patients to be diagnosed, i.e., simplifying the referral system and collaborating with private sectors to perform the diagnostic test under national funding scheme.

The diagnostic delay in tuberculosis (TB) patients is a multifactorial issue influenced by a range of determinants. Age is a significant factor, as older patients often experience longer delays, potentially due to the atypical presentation of TB in this age group (Miller et al., 2021; Teo et al., 2021). Gender differences also impact diagnostic delays, with women likely experiencing longer delays, possibly due to social and healthcare access barriers (Teo et al., 2021). Occupational factors are crucial; individuals in occupations with limited healthcare access or heightened exposure to TB show varied delay patterns (Teo et al., 2021). The clinical characteristics of TB, such as the site of the disease (pulmonary or extrapulmonary) and symptom severity, directly affect the time taken to diagnose. Pulmonary TB, being more recognizable, might lead to shorter delays compared to extra-pulmonary TB (Miller et al., 2021; Lorent et al., 2008). Lastly, demographic characteristics, including socio-economic status and geographical location, play a pivotal role. Patients from lower socio-economic backgrounds or remote areas often experience longer delays due to limited access to healthcare facilities and lack of

awareness (Teo et al., 2021). These findings highlight the need for targeted interventions addressing these specific determinants to reduce diagnostic delays in TB patients.

TB Contact Investigation among CHW and TB officers

Based on the demographic data, it was found that most CHWs are female. This may be related to the nature of women who are more concerned about health aspects and want to be involved with the health sector. In addition, the nature of women who are more able to care and maintain is directly proportional to the work of CHWs who need to educate and provide assistance to communities in need (Khan, et al, 2019; Okerene, et al., 2019). In Indonesia itself, especially in villages, there are still many women who work as housewives. This factor makes women have more free time and are more flexible in managing time to participate in CHWs activities. This is also related to the work aspect of CHWs. In the data that has been obtained, most of the population that participates in CHWs activities is a population that does not work or works as an entrepreneur. The freedom to manage time and the encouragement of the non-working population to contribute to the community may have an effect on the high participation of this group to join CHWs (Perry and Rogers, 2014).

This demographic analysis also found that most CHWs are high school graduates. The difference in the number of CHWs based on education level may be due to the minimum requirements needed to perform their duties as CHWs. In their activities as CHWs, the management of health information that is educated to CHWs must be understood and reiterated to the community. In the population with a minimum education level of senior high school, the basic educational skills possessed are sufficient to help CHWs to understand the material and communicate health education material to the community more effectively. However, the group with higher education than high school level had fewer CHWs enrolled. This could be due to the fact that most people with education levels higher than senior high school are already employed and therefore have less time or are unable to engage with CHWs activities that coincide with community working hours (Perry and Rogers, 2014).

Knowledge, attitude, and practice of antimicrobial resistance among TB patients

Many TB patients lack adequate knowledge about antimicrobial resistance (AMR), with only a third recognizing antimicrobial medicine and a small fraction understanding its distinction from anti-inflammatory drugs. This knowledge gap is reflected in antibiotic misuse, with nearly half of TB patients believing antibiotics are effective against colds and flu and almost a third reporting improper antibiotic consumption. Additionally, a significant portion of TB patients have taken antibiotics without a doctor's prescription, highlighting the need for improved AMR education and prescription practices.

Various characteristics, such as age, gender, and occupational exposure to healthcare workers, have been found to exert an impact on the knowledge, attitude, and practice (KAP) pertaining to antimicrobial resistance (AMR) among individuals diagnosed with tuberculosis (TB). The impact of age on knowledge, attitudes, and practices (KAP) towards antimicrobial resistance (AMR) in tuberculosis (TB) is noteworthy. Result from Zowalaty et al. (2016) a similar result that age is a significant factor on KAP towards AMR. Older patients who may have challenges in comprehending and integrating new information on AMR, mostly owing to cognitive alterations. This observation is consistent with cognitive aging theories, which propose that the ability to absorb information and respond to new health-related knowledge may diminish as individuals grow older. Gender also has a significant impact, as women may exhibit distinct attitudes and behaviors about antimicrobial resistance (AMR) due to diverse health-seeking habits driven by socio-cultural norms as shown by Zowalaty et al. (2016) and

Alnasser et al. (2021). This phenomenon might be ascribed to gender role theory, a theoretical framework that suggests that societal norms influence health habits in distinct ways for individuals of various genders. Occupation type also has a major influence on their knowledge, attitudes, and practices (KAP) concerning antimicrobial resistance (AMR). According to Bepari et al. (2023) and Alnasser et al. (2021), individuals who have received professional training, such as medical and pharmacy, and possess a bachelor degree are expected to exhibit enhanced KAP towards AMR. The aforementioned phenomenon may be elucidated via the lens of the Social Learning Theory, which posits that persons working in healthcare occupations are consistently immersed in medical information and practices, hence influencing their comprehension and perspectives regarding health-related matters such as antimicrobial resistance (AMR). The significance of taking into account individual patient characteristics while designing educational and intervention initiatives to tackle antimicrobial resistance (AMR) in tuberculosis (TB) therapy is emphasized by these variables.

Knowledge, attitude, and practice of antimicrobial resistance among HCWs

The study revealed that a significant portion of TB officers and healthcare workers lack awareness about the potential sources of antibiotic resistance (AMR). More than half of them believe that AMR cannot occur if antibiotics are used in livestock feed or to treat animal infections. Additionally, less than 30-40% of them acknowledge that AMR can be spread through human sewage, discarded antibiotics, or healthcare facilities. However, a majority of them recognize that AMR can spread within residential areas, from livestock farms, and through wastewater.

Factors such as age, gender, and profession type significantly influence the knowledge, attitude, and practice (KAP) of healthcare workers about antimicrobial resistance (AMR). The disparities in knowledge, attitudes, and practices (KAP) among individuals of different age groups may be elucidated within the framework of the Lifespan Development Theory. This theoretical perspective posits that older healthcare professionals may exhibit a greater depth of knowledge and a more cautious approach towards antimicrobial resistance (AMR) owing to their extensive professional experience and ongoing educational endeavours (Wang et al., 2020; Tegagn et al., 2017). On the other hand, it is worth noting that younger employees tend to exhibit contemporary practice patterns that are supported by current research. This tendency aligns with the theory's emphasis on continuous learning and adaptation. The Gender Schema Theory provides a framework for understanding gender disparities in knowledge, attitudes, and practices (KAP) regarding antimicrobial resistance (AMR). It posits that societal and cultural norms may have differential influences on the attitudes and behaviors of male and female healthcare professionals. For example, female healthcare practitioners may have a greater inclination towards patient-centeredness and caution in the context of antibiotic prescribing than male (Wang et al., 2020; Tegagn et al., 2017). The Social Cognitive Theory was employed to examine the relationship between occupation type and its impact on individuals' knowledge, attitudes, and practices (KAP) about antimicrobial resistance (AMR) in the healthcare sector (Abera et al., 2014; Balliram et al., 2021; Sulayyim et al., 2023). One possible explanation for the disparity in knowledge levels between physicians and nurses might be attributed to the rigorous training that physicians undergo. Conversely, nurses may exhibit a greater emphasis on patient-centric attitudes and behaviors as a result of their direct involvement in patient care. These theoretical frameworks emphasize the necessity of customized educational and policy initiatives to effectively tackle antimicrobial resistance (AMR) within various healthcare worker populations.

5.2. Conclusion

Knowledge, Attitude, and Practice among TB Patient and Contacts

Although TB patients in Indonesia are predominantly educated, married, working, and are newly diagnosed drug-sensitive pulmonary TB patients, this study reveals a worrying reality: while most TB patients know about the basics of diagnosis and treatment, significant knowledge gaps remain. Many are unaware of TB's bacterial cause, its potential organ involvement beyond the lungs, and specific symptoms. Nearly a third lack crucial information about close contacts and their risk of infection, hindering effective contact tracing. To combat this, we must prioritize patient education, empower healthcare workers as communicators, and ensure updated information permeates all healthcare levels. The majority prefer to use public health centers for treatment because participants were recruited from public health centers. Diagnostic delay is associated with district, extra-pulmonary TB patients, occupation, and smoking. TB stigma is still prevalent and associated with marital status, district, type of TB diagnosis, type of TB location, and smoking status. Most patients received information on TB from HCW. Approximately 20% of TB patients feel less confident and lose their job due to TB. One-third of TB patients know about antimicrobial medicine and reported that antimicrobial medicine should be terminated based on doctor's prescription. Overall, there is low knowledge and practice on AMR among TB patients.

TB Contact Investigation among CHW and TB officers

TB officers in Indonesia are relatively younger and have higher education levels than CHWs. Both groups have good knowledge and attitudes towards contact investigation, but their practices may be influenced by sociodemographic characteristics and districts. Most of HCW and CHW defined the type of TB contacts and TB contact investigation correctly. Only half of CHW and HCW correctly answered about duration of contact investigation and minimum number of contacts to investigate. HCW knows better than CHW regarding characteristics of TB latent.

Antimicrobial Resistance among HCWs

TB officers and healthcare workers in Indonesia have moderate general knowledge of AMR, but their practices in the workplace are low. They also have limited knowledge of the causes of AMR. Pressure from patients or family and concerns about business could influence healthcare workers to prescribe antibiotics unnecessarily.

CHAPTER 6

POLICY IMPLICATIONS AND RECOMMENDATIONS FROM THE FINDINGS OF THE STUDY

6.1. Policy Implications

Based on the survey results, the following policy implications can be developed:

Knowledge, Attitude, and Practice on Tuberculosis

Knowledge

1. Develop and implement targeted educational programs to improve TB knowledge among all population groups, with a focus on younger individuals, females, and those with lower education levels. Integration of information, education, and communication (IEC) into school curricula to improve essential TB knowledge. Integrating age-appropriate TB education modules into school curriculums equips young people with essential knowledge, such as TB basics knowledge (transmission, symptoms, and early detection), misconceptions and combating stigma, prevention strategies: hygiene, cough etiquette, and vaccination, and treatment options as well as the importance of adherence and community support.
2. Utilize various communication channels, such as mass media, social media, and community-based interventions, to disseminate TB awareness and prevention messages.
3. Partner with healthcare workers, community leaders, and other stakeholders to educate the public about TB.

Attitude

1. Address the stigma associated with TB through public awareness campaigns and educational programs.
2. Promote positive attitudes towards TB patients and their contacts by emphasizing the curability of TB and the importance of social support.
3. Encourage TB patients and their contacts to seek early diagnosis and treatment.

Practice

1. Strengthen the health system to reduce diagnostic delays and improve access to TB treatment and care services.
2. Provide TB patients and their contacts with adequate support, including financial assistance, transportation, and counseling.
3. Develop and implement innovative interventions to improve adherence to TB treatment regimens.

Contact Investigation and Diagnostic delays

TB patient and contact investigation

1. Increase the number of community health workers (CHWs) and train them on TB case identification, contact tracing, and referral.
2. Improve collaboration between CHWs and TB officers to ensure effective TB contact investigation and management.
3. Provide CHWs with adequate resources and support to carry out their duties effectively.

Diagnostic delays

1. Strengthen the capacity of healthcare facilities to diagnose TB quickly and accurately.
2. Raise awareness among healthcare workers about the importance of early TB diagnosis
3. Disseminate evidence-based guidelines and algorithms for TB diagnosis and management.
4. Advocate for policy updates at the health service level to prioritize and facilitate rapid TB diagnosis.
5. Ensure updated policies are disseminated and communicated effectively to all relevant healthcare facilities and personnel.
6. Improve access to TB diagnostic testing, especially for vulnerable populations.

TB contact investigation among CHWs and TB officers

1. Develop flexible training programs for CHWs and TB officers that accommodate the needs of different population groups.
2. Provide CHWs with incentives and recognition for their contributions to TB prevention and control.

Antimicrobial Resistance among HCWs, TB patients, and poultry farmers

For TB patients

1. Provide TB patients with clear and accurate information about AMR, including the risks and consequences of inappropriate antibiotic use. This can be done through educational materials, one-on-one counselling, and support groups.
2. Encourage TB patients to complete their full course of antibiotics, even if they start to feel better sooner. This can be done by explaining the importance of completing the full course of treatment to prevent the development of drug-resistant TB.
3. Provide TB patients with support and resources to help them adhere to their treatment plans. This may include providing financial assistance, transportation assistance, and access to medication reminders.

For Healthcare workers

1. Provide healthcare workers with training on AMR, including the latest evidence-based guidelines for antibiotic prescribing. This training should be provided to all healthcare workers who prescribe antibiotics, including doctors, nurses, and pharmacists. The training materials should include potential sources of antimicrobial resistance.
2. Develop and implement policies and guidelines to support healthcare workers in following best practices for antibiotic prescribing and infection prevention and control. These policies and guidelines should be based on the latest scientific evidence and tailored to the healthcare facility's specific needs.
3. Encourage healthcare workers to report suspected cases of AMR to their supervisors and public health officials. This is important for tracking the prevalence and spread of AMR and for developing effective interventions.
4. Train healthcare workers on how poultry farms and the environment contribute to AMR spread, emphasizing interconnectedness and zoonotic risks.
5. Develop concise and informative materials (e.g., infographics, fact sheets) explaining the poultry farm-environment-AMR link and disseminate these materials through relevant channels (e.g., staff newsletters, intranet forums).
6. Organize workshops or talks featuring experts on poultry farming and AMR.

6.2. Recommendations

Knowledge, Attitude, and Practice on Tuberculosis

Need to reduce diagnostic delay, particularly outside public health facilities

Diagnosis delay becomes one of the main challenges in the fight against tuberculosis. When people with TB symptoms are delayed in being diagnosed, it can lead to poorer health outcomes and increased transmission of the disease. These delays are especially common in people who do not seek care at public health facilities, due to either a lack of understanding of TB symptoms, financial issues, or geographical barriers in accessing public health services.

Enhance the capabilities of primary healthcare centers and private clinics to perform TB screening and diagnosis

In Indonesia, PHCs and private clinics play an important role in the fight against tuberculosis. Improving these facilities' capacity for TB screening and diagnosis is crucial to accelerating diagnosis and enhancing TB control initiatives. This could entail giving medical staff members the tools and training they need, expanding access to diagnostic testing, and setting up referral networks between these clinics and public health services.

Tailor interventions to reduce diagnostic delay based on identified risks

Different factors can contribute to diagnostic delay, such as patient factors (lack of awareness of symptoms, stigma), healthcare provider factors (inadequate training, lack of resources), and health system factors (fragmented care, limited access to diagnostic services). To effectively reduce diagnostic delay, interventions should be tailored to address these specific risks. For example, patient education campaigns can raise awareness of TB symptoms and encourage early care-seeking behavior. Healthcare workers can receive training on TB diagnosis and management. And health systems can be strengthened to improve access to diagnostic services and ensure continuity of care.

Address stigma among TB patients

Stigma associated with tuberculosis (TB) is a major barrier to TB prevention and control. It can prevent people from seeking care, adhering to treatment, and disclosing their TB status to others, leading to delayed diagnosis and treatment, and worse health outcomes. By taking a multiple approach to fighting TB stigma, we can help to create an environment where TB patients feel comfortable seeking care and adhering to treatment.

Contact Investigations

Need to maintain good KAP among TB officers and community healthcare workers (CHWs)

TB officers and CHWs play a critical role in TB control efforts, from case detection and contact tracing to patient support and treatment adherence monitoring. To ensure effective TB control, it is important to maintain good KAP among TB officers and CHWs: 1) Adequate knowledge of TB epidemiology, diagnosis, treatment, and prevention, 2) A positive attitude towards TB control, and 3) Adherence to recommended TB control guidelines and procedures, including proper case detection, contact tracing, patient education, and treatment support.

Analyze the area need for improvement

Contact investigation, the process of identifying and evaluating close contacts of TB patients to prevent further transmission, is a critical component of TB control. Analyzing whether good reported practices among TB officers and CHWs are associated with better contact investigation outcomes can help identify areas for improvement and inform training and supervision strategies.

Disseminate information addressing operational gaps

The evidence that CHWs sometimes have better knowledge of TB than TB officers suggests that TB officers may not be receiving adequate or up-to-date information. To address this gap, TB officers should have access to regular training and educational opportunities to ensure they are up-to-date on the latest TB control guidelines and practices. Additionally, mechanisms should be established for CHWs to share their knowledge and expertise with TB officers, fostering a collaborative approach to TB control.

Antimicrobial Resistance

Develop interventions to improve knowledge, attitude, and practice (KAP) of AMR

As healthcare workers play a critical role in preventing and controlling antimicrobial resistance which is a growing global health threat, and developing interventions to improve the KAP of AMR among healthcare workers is important to reduce the misuse and overuse of antibiotics, which are major drivers of AMR. These interventions should address various aspects of AMR, including: 1) providing healthcare workers with up-to-date information on AMR, 2) Fostering a culture of antibiotic stewardship among healthcare workers, emphasizing the importance of rational antibiotic use and promoting a sense of shared responsibility for AMR control, and 3) Equipping healthcare workers with the skills and tools to implement effective antibiotic stewardship practices, including proper antibiotic prescribing, infection prevention and control measures, and patient education on antibiotic use.

Address factors that influence antibiotic prescription among healthcare workers

As antibiotic prescription practices among healthcare workers can be influenced by patient pressure, fear of missing a serious infection, and financial incentives, there is a need to improve effective communication with patients, provide better diagnostic tools and training, and implement policies that prohibit financial incentives for antibiotic prescription.

Improve surveillance and supervision of AMR at the Primary Health Care (PHC) level

As the first point of contact for patients seeking healthcare, primary healthcare centers (PHCs) play a crucial role in AMR control. This involves establishing and implementing an antimicrobial stewardship program at the PHC level, collecting and analyzing antibiotic usage data, and providing feedback to healthcare workers on antimicrobial use.

Establish a region-based Antimicrobial Resistance (AMR) control team at the district and city levels

To effectively address antimicrobial resistance (AMR), region-based control teams should be established at district and city levels, comprising stakeholders like healthcare providers, public health officials, and policymakers. Responsibilities include developing tailored AMR control plans, coordinating surveillance, providing training to healthcare workers, and raising public awareness.

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APPENDICES

Questionnaire

TB STUDY FORM 1.1 For TB Patients

1. Respondent Identity	
1.	Respondent's Name
2.	Respondent's Address RT: / RW: Sub-district: District: Regency:

2. Characteristic of TB patients	
1. Date of Birth :/...../..... (Day/Month/Year)	
2. Gender	
1. Male	2. Female
3. Marital Status	
1. Not married	
2. Married	
3. Widowed	
4. Divorced	
4. Last Education Level	
1. Not finished elementary school	
2. Finished SD	
3. Finished SMP	
4. Finished SMA	
5. Finished higher education	
6. Others.....(explain)	
5. Occupation	
1. Not working	
2. Students	
3. Farmer/laborer	
4. Factory worker/private worker	
5. Entrepreneur	
6. Civil servants/Army/Police	
7. Professionals (doctor, architect, etc)	
8. Others.....(explain)	
6. Your monthly income	Rp.
7. Members of family
8. Number of family members who earn income
9. Total monthly income in the family	Rp.
10. Home coordinates	

3. Ownership	
1. Ownership of the house you live in (choose one)	
1. Own House	
2. Rent/Official Residence	
3. Family's House	
4. Others.....(explain)	
2. The material used to build most of the walls of the house	
1. Bricks	
2. Wood/bamboo	
3. Others.....(explain)	

<p>3. House floor (You may choose more than one option)</p> <ol style="list-style-type: none"> 1. Tile/ceramic floor 2. Cement floor 3. Dirt Floor 4. Wooden/bamboo floor 5. Others.....(explain) 	
<p>4. Source of home lighting (You may choose more than one option)</p> <ol style="list-style-type: none"> 1. Electricity 2. Kerosene Pressure Lantern 3. Oil Lamp 4. Others.....(explain) 	
<p>5. Toilet/Lavatory ownership (choose one)</p> <ol style="list-style-type: none"> 1. Your Own Toilet 2. Shared/Public Toilet 3. Others.....(explain) 	
<p>6. Drinking water used (choose one)</p> <ol style="list-style-type: none"> 1. Bottled/gallon water 2. Tap Water 3. Spring Water 4. Others.....(explain) 	
<p>7. Own means of transportation (You may choose more than one option)</p> <ol style="list-style-type: none"> 1. Car 2. Motorbike 3. Bicycle 4. Don't have any 	
<p>8. Owned electronic entertainment equipment (You may choose more than one option, except number 6 cannot be combined)</p> <ol style="list-style-type: none"> 1. Subscription TV 2. Non-Subscription TV 3. Radio 4. Handphone 5. Others.....(explain) 6. Don't have any 	
<p>9. Electronic household appliances owned You may choose more than one option, except number 11)</p> <ol style="list-style-type: none"> 1. AC 2. Washing Machine 3. Refrigerator 4. Television 5. Radio 6. Fan 7. Microwave/oven/air fryer 8. Electric Stove 9. Iron 10. Others.....(explain) 11. Don't have any 	

4. Access to Health Services	
<p>1. What is the closest health service facility to your home? (Choose one)</p> <ol style="list-style-type: none"> 1. Midwives/private practice nurses/orderlies 2. Traditional medicine (massage therapist, sinshe, herb, etc) 3. Practicing doctor 4. Private medical centers/clinics 5. Public health center 6. Private hospital 7. Government hospital 8. Pharmacy (without clinic/independent practicing doctor) 9. Drugstore 10. Others.....(explain) 	

2. How far is the nearest health facility from home? (in meters)				
3. What mode of transportation do you use to go to the health facility? 1. Walk 2. Bicycle 3. Pedicab 4. Motorbike 5. Car 6. Public transportation such as buses 7. Motorbike taxi/taxi 8. Others.....(explain)				
4. How long does it take to go to the health facility (using the transportation mentioned above)? _____ hour(s) or _____ minute(s)				
5. Have you ever used telemedicine services? Probing: Health consultation via telephone or online application; for example halodoc, alodokter 1. Yes 2. No				
6. If Yes, For what purposes do you use telemedicine services? (there can be more than one answer) 1. Consult health problems with a doctor 2. Looking for/buying medicine 3. Search for health information 4. Others.....(explain)				

Clinical condition (Information obtained from TB register)

	Question	Answer	Skip
Information for questions 1-6 was obtained from the Puskesmas TB register			
1	TB diagnosis	1. Bacteriologically confirmed 2. Clinical diagnosis	
2	Classification Based on Anatomical Location	1. Lung TB 2. Extrapulmonary TB	
3	Drug resistance status	1. Sensitive 2. Resistance	
4	Type of treatment	1. New 2. Treated after failure 3. Treated after stopping treatment 4. Relapse	
5	Treatment initiation date	[][][] dd/mm/yyyy	
6	Patient treatment duration (in weeks)	[]	
The next question is an interview with the patient			
7	Comorbid Diseases	0. None 1. Yes 2. No information	
8	Type of comorbidity	1. HIV 2. Diabetes mellitus 3. Asthma 4. Others.....	
9	Do you smoke?	1. Yes 2. No	
10	If yes, are you an active smoker or former smoker?	1. Active smoker	

		2. Former smoker	
11	If no, does anyone in the family smoke?	1. Yes 2. No	
12	If no, is there anyone smoking in the workplace?	1. Yes 2. No	
	If you are an active smoker, ask 13-17 If a former smoker 13-19		
13	Since when did you start smoking?	dd/mm/yyyy	
14	Age of starting smoking	___ years old	
15	What type of cigarette do you often use?	1. Cigarette filter 2. Kretek 3. Electronic cigarettes 4. Roll your own cigarettes 5. Others...	
16	How many cigarettes per day?	___ cigarette(s)	
17	If electronic cigarettes, how many ml of liquid per day?	___ ml	
18	Since when did you stop smoking?	dd/mm/yyyy	
19	Age of stop smoking	___ years old	

Knowledge and perceptions about TB

	Question	Answer	Skip
1	Did you know that the disease you are currently suffering from is called tuberculosis (TB)?	0. No 1. Yes	
	If no, what do you know about your current illness?	1. Disease due to curse 2. Chronic cough and cold 3. Other infectious diseases 4. Others	
2	Where did you hear this information? (Check all mentioned)	1. Newspapers and magazines 2. Radio 3. Television 4. Social media (IG/twitter/WA/FB/Tiktok, et al) 5. Website 6. YouTube 7. Billboard 8. Brochures, posters and other printed media 9. Health workers 10. Health cadres 11. Family, friends, or neighbors 12. Religious leaders 13. Teacher 14. Others	
3	In your opinion, how dangerous is tuberculosis?	1. Very dangerous 2. Quite dangerous 3. Not too dangerous 4. Not dangerous 5. Have no idea	
4	In your opinion, how big is the problem of tuberculosis in your environment?	1. Very big 2. Big enough 3. Not too big 4. Not big 5. Have no idea	
5	What causes TB?	1. Bacteria/germs 2. Viruses	

	(Answer options are not read out, there can be more than one)	<ol style="list-style-type: none"> 3. Curses/witchcraft 4. Genetics/hereditary 5. Alcoholic drinks 6. Malnutrition 7. Smoking 8. Don't know 9. Others 	
6	<p>How is TB transmitted? (Answer choices are not read out, respondents can answer more than one answer)</p> <p>Probing: Anything else?</p>	<ol style="list-style-type: none"> 1. Through the air when coughing/sneezing 2. Use of shared eating utensils 3. Touching TB sufferers 4. Through food/water 5. Sexual relations 6. Mosquito bites 7. Cold air 8. Hereditary diseases 9. The magic of shamans/black magic 10. Others 11. Have no idea 	
7	<p>In your opinion, who can be infected? (Answer choices are not read out, respondents can answer more than one answer)</p> <p>Probing: Anything else?</p>	<ol style="list-style-type: none"> 1. Everyone 2. Only poor people 3. Just homeless 4. Only alcoholics 5. Only drug users 6. Only people with HIV/AIDS 7. Prisoners only 8. Only the malnourished 9. Smoker 10. Others..... 	
8	<p>Which parts/organs of the body can be infected by TB? (Answer choices are not read out, respondents can answer more than one answer)</p> <p>Probing: Any other body parts?</p>	<ol style="list-style-type: none"> 1. Lungs 2. Digestion 3. Bones 4. Lymph nodes 5. Others..... 6. Have no idea 	
9	<p>What symptoms will TB sufferers experience? (Answer choices are not read out, respondents can answer more than one answer)</p> <p>Probing: Anything else?</p>	<ol style="list-style-type: none"> 1. Cough 2. Continuous cough for more than 2 weeks 3. Weight loss 4. Loss of appetite 5. Sweating at night 6. Chest pain 7. Fever 8. Bloody phlegm 9. Shortness of breath 10. Fatigue 11. Swelling 12. Others.. 13. Have no idea 	
10	Can TB disease be prevented?	<ol style="list-style-type: none"> 0. No 1. Yes 2. Have no idea 	If you don't/don't know , go straight to question 12
11	<p>How to prevent TB transmission? (Answer choices are not read out, respondents can answer more than one answer)</p> <p>Probing: Anything else?</p>	<ol style="list-style-type: none"> 1. Avoid coughing in front of other people 2. Be careful when removing phlegm 3. Good house ventilation 4. Avoid close contact with TB patients 5. BCG vaccination in children 6. Use a mask 7. Use cutlery separately 8. Wash clothes separately 9. Sleep/eat/activities in a different room from TB patients 	

		10. Don't smoke 11. Don't drink alcoholic beverages 12. Have no idea 13. Others	
12	Can TB be cured?	0. No 1. Yes 2. Have no idea	If you don't/don't know , go straight to question 14
13	How is TB cured? (can be more than one)	1. Traditional herbal medicine 2. Rest, no need for medication 3. Pray 4. OAT/TB medicine/drug program 5. Treatment from a shaman 6. Others..... 7. Have no idea	
14	How long is your TB treatment? (in months)	[_____] 99 if the patient does not know	
15	In your opinion, have you received good information about TB prevention and control?	0. No 1. Yes	
16	Do you want to get more information about TB?	0. No 1. Yes	If not , go straight to question 18
17	What information sources do you think are most effective in reaching people like you? <i>(Please choose three answers)</i>	1. Newspapers and magazines 2. Radio 3. Television 4. Billboard 5. Brochures, posters and other printed media 6. Health workers 7. Health cadres 8. Family, friends, or neighbors 9. Religious leaders 10. Teacher 11. Others	
18	Have you ever received information about the side effects of TB drugs?	0. Yes 1. No	
19	If yes, who provided the information?	1. Health workers 2. health cadres 3. Neighbors 4. Family members 5. Others, please specify	
20	Mention the side effects of TB drugs that you know	1. Nausea 2. Vomiting 3. Urine is red 4. Loss of appetite 5. Joint pain 6. tingling 7. burning sensation in the feet 8. itching 9. redness of the skin 10. hearing loss 11. visual impairment 12. yellow skin 13. Others, please specify	
21	Have you ever heard of drug-resistant TB?	0. No 1. Yes	If not , go straight to question 32
22	What do you know about drug-resistant TB? <i>(respondents can answer more than one answer)</i> <i>Probing: Anything else?</i>	1. TB RO occurs if the patient does not regularly take anti-TB medication 2. TB RO is a severe form/level of TB 3. Can be transmitted to family and friends	

		4. Treatment lasts at least 2 years 5. Others..... 6. Have no idea	
23	Do you feel that you are at risk of developing drug-resistant TB?	1. yes 2. No	
24	If yes, why?	1. Because I take medication irregularly 2. Because I rarely eat nutritious food 3. Because I am far from God 4. Because I am not sure about the treatment given 5. Others...	
25	If not, why?	1. Because I take medication regularly 2. Because I eat nutritious food 3. Because I am close to God 4. Because I believe in the treatment given by the officers 5. Others...	
26	Do you know how to prevent getting drug-resistant TB?	1. yes 2. no	
27	If yes, how?	1. Take medication regularly 2. A healthy lifestyle includes exercise and nutritious food 3. Get closer to God 4. Do everything the health center officers tell you to do 5. Others...	
28	If not, would you like to know?	1. yes 2. no	
29	Who do you expect to tell you about this prevention method?	1. health workers 2. health cadres 3. family members 4. others	
30	What kind of support do you expect to prevent drug-resistant TB from your family?	1. Remind yourself to take medication regularly 2. remind you of routine checks/controls 3. Accompany during check-ups to health facilities 4. Supervise medication taking activities 5. others	
31	What kind of support do you expect to prevent drug-resistant TB from health workers?	1. information 2. giving PMT 3. remind you to take medication regularly 4. Providing incentives for patients 5. Others,..	
32	Have you ever received an explanation regarding who is at high risk of contracting TB from you (close contacts)?	0. No 1. Yes	
33	Mention anyone who is at high risk of contracting TB from you? <i>there can be more than one answer.</i> <i>Probing: who else?</i>	1. Family members who live in the same house 2. Colleagues or classmates 3. Neighbors 4. Family members who are not in the same household 5. Everyone who has met in person (physical contact) 6. health workers at community health centers 7. Others, please specify	

34	Do you think people who are at high risk of contracting TB should get tested for TB?	1. yes 2. No	
35	Have you ever received an explanation regarding TB contact investigation?	0. No 1. Yes	
36	If yes, from whom did you get the information? <i>there can be more than one answer</i>	1. health workers 2. Health cadres 3. Neighbors 4. Family members 5. Others, please specify.	
37	TB contact investigation is...	1. Examination of all family members of TB patients 2. Examination of all people who have met directly with TB patients 3. Examination of family members of symptomatic TB patients 4. Have no idea	
38	Who should conduct the contact investigation?	1. health workers 2. Health cadres 3. patient 4. neighbors 5. anyone 6. don't know	

Perception of stigma related to TB

	Question	Answer	Skip
1	Other people look down on you because you have TB	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree	
2	Being a TB sufferer makes you ashamed	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree	
3	Other people avoid you because you suffer from TB	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree	
4	Do you have a partner (husband/wife)?	0. No 1. Yes	If yes , go to question 6
5	<i>Only for respondents who do not have a partner</i> As a TB patient, you have difficulty finding a partner to marry even after recovering.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree	Go to question 7
6	<i>Only for respondents who have a partner</i> As a TB patient, you can still sleep in the same room as your partner.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree	
7	As a TB patient, you are asked to stay away from social groups.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree	

8	As a TB patient, you will not reveal it, including to people you trust (who you usually tell it to).	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree	
9	You will feel less confident because you suffer from TB.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree	
10	People look down on your family because you have TB.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree	
11	Do you have children?	0. No 1. Yes	If not , go straight to question 13
12	Your children feel troubled because you suffer from TB.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree	
13	You lost your job because you had tuberculosis.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree	

Perception of satisfaction with health services

	Question	Answer	Skip
1	Health facilities provide support and respect for people suffering from TB.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree	
2	Before coming for diagnosis/treatment, you hope that the health facility will support and respect the person suffering from TB.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree	
3	The majority of people in your community believe that they will be treated supportively and respectfully by health care providers if they have TB.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree	
4	You are satisfied with the service you receive at the health facility.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree	
5	How does the service you get from this facility compare to your expectations before getting health services at this health facility?	1. More than I expected 2. As I expected 3. Not as good as I expected	
6	Health workers answer all your questions about TB.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree	

7	You are satisfied with the puskesmas schedule.	1. More than I expected 2. As I expected 3. Not as good as I expected	
8	You are satisfied with the waiting time at the health center.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree	
9	You are satisfied with the availability of medicines at the health center.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree	
10	Do you have a supporter of TB treatment?		If not , continue to the next session
11	You feel satisfied with your TB treatment support.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree	

TB treatment seeking practices

1. When did you first experience symptoms and the date of visit to a health facility?

Visit	Type of health facility	Date/when	Facility type	Reason for visiting/searching
	The first symptoms appear			
1			1. Community Health Center	1. Doesn't heal
2			2. Government hospitals	2. In accordance with the health insurance scheme you have
3			3. Private hospitals	3. Symptoms get worse
4			4. Private Main Clinic (Specialist clinic)	4. Fear of rejection/losing your job
5			5. Private Pratama Clinic (General Practitioner Clinic)	5. Afraid that the treatment will be expensive
6			6. Pharmacy/drug shop	6. Lack of time
7			7. Herbal/traditional health practitioners	7. Difficult access to the health center/transportation problems
8			8. Warung/convenience store	8. Have no previous satisfactory experience with the health system
9			9. Community health workers	9. I feel there is no delay in seeking treatment for symptoms that lead to a diagnosis of TB
10			10. Others, please specify.....	10. Others_____
11				
12				
13				
14				

	Question	Answer	Skip
2	If seeking treatment does not go directly to the Community Health Center, what is the reason?	1. Don't know 2. Afraid 3. Remote access to the health center 4. Afraid that the treatment will be expensive 5. Lack of time 6. Difficult access to health centers/transportation problems 7. Previous unsatisfactory experience 8. Other.....	go to form number 2 (search for treatment) last question

3	How long did it take from when you first sought medical help until you were diagnosed with TB? (in days)	[]	calculated from form number 2
4	How long does it take from TB diagnosis to starting treatment? (in days)	[]	calculated from form number 2
5	Where do you usually take your daily TB medication?	1. Hospital 2. Community Health Center 3. Home 4. Others ____	
6	Is there someone to supervise you when you take medicine every day?	0. No 1. Yes	If not , go to question 8
7	Who monitors you when you take your medication every day?	1. Health workers in health facilities 2. Health cadres 3. Family members 4. Neighbors 5. Community figures 6. Others.....	
8	How long does it take to get to the health center where you are treated for TB from your home? (in minutes)	[]	
9	How often do you visit health facilities during your current treatment period?	1. Every day 2. Every week 3. Once every two weeks 4. Every month 5. Every 2 months 6. Every 3 months 7. > once every 3 months	
10	Have you ever stopped treatment?	0. No 1. Yes	
11	If you have ever stopped taking medication, how many times have you stopped taking medication? (asked how many times per month and how many days)	[]	
12	What is the reason you stopped taking TB medication? (<i>Respondents can select more than one option</i>)	1. There is no medicine available at the health facility 2. I experienced side effects from the medication. 3. I am looking for alternative treatments 4. Distance to health facilities 5. I travel outside the area 6. I was too weak to visit a medical facility, and no one could get me medicine. 7. Others	
13	Have you ever experienced side effects from TB medication?	0. yes 1. No	
14	If yes, what kind of side effects did you experience? More than one answer	1. Nausea 2. Vomiting 3. Urine is red 4. Loss of appetite 5. Joint pain 6. tingling 7. burning sensation in the feet 8. itching 9. redness of the skin 10. hearing loss 11. visual impairment 12. yellow skin 13. Others, please specify	

15	Have you ever told a family member that you have TB?	0. No 1. Yes	If not , go to question 17
16	Among your family members, who did you tell that you had TB? (<i>Respondents can select more than one option</i>)	1. Couple 2. Brother 3 children 4. Parents 5. Others.....	
17	Have you ever told anyone other than a family member that you have TB?	0. No 1. Yes	If not , go to question 19
18	Apart from family, who have you told? (<i>Respondents can select more than one option</i>)	1. Religious leaders 2. Neighbors 3. Coworkers 4. Another friend 5. Others.....	
19	Do health workers in your community know that you suffer from TB?	0. No 1. Yes	If not , go to question 21
20	Who informed health workers about your illness? (<i>Respondents can select more than one option</i>)	1. Community health center officers 2. Myself 3. Family members 4. The person taking medication is not your family member 5. Others	
21	Do you eat more and more varied food after finding out you have TB?	0. No 1. Yes	
22	Do you regularly open the windows/doors of your house after finding out that you have TB?	0. No 1. Yes	
23	Is your work more often done indoors or in a building?	0. No 1. Yes	
23a	Do you routinely open the windows/doors at your workplace after finding out that you have TB?	0. No 1. Yes	
24	Is your body weight measured regularly?	0. No 1. Yes	
25	Has a health professional ever told you that your weight is less than expected?	0. No 1. Yes	If not , go to question 27
26	Did you receive nutritional assistance or PMT from a health facility when your weight was less than expected?	0. No 1. Yes	
27	Do you cover your mouth when you cough?	0. No 1. Yes	
28	Has your family ever had a visit to be checked for TB?	0. No 1. 1. Yes	If not , go to question 34
29	Who gets tested for TB? There can be more than one answer	1. all family 2. only the symptomatic ones 3. just kids 4. only adults 5. Other	
30	Have any of your family members received TB prevention therapy after receiving a TB-related examination?	1. Yes 2. No	If not , go to question 32
31	If yes, whoever gets it	1. All family members 2. family members who are asymptomatic 3. Kids only 4. Just be an adult 5. Others	

32	If you don't get TB prevention therapy, what is the reason?	1. Feel healthy 2. Don't feel contagious 3. afraid of side effects 4. afraid of the stigma of TB patients 5. Others	
33	What support do you need to want to get TB prevention therapy? there could be more than one	1. Psychological support 2. Financial support 3. Reminder to take medicine 4. additional food support 5. Compensation if there are side effects 6. Others	
34	If you have never had a visit regarding TB testing, have you ever invited a family member to go to a health facility to be tested for TB?	0. No 1. Yes	

Knowledge and practice of AMR

No	Question	Answer	Skip
A1	Medicines for TB therapy are antibiotics. What do you mean by antibiotics?	1. medicine used to treat coughs and colds 2. drugs used to treat infections 3. drugs used to treat bacterial infections 4. drugs used to treat viruses 5. drugs used to treat parasites 6. Don't know	
In your opinion, is the following statement true or false?			
B1	Antibiotics can kill viruses	1. Correct 2. Wrong 3. Don't know	
B2	Antibiotics are effective against colds and flu	1. Correct 2. Wrong 3. Don't know	
B3	Improper use of antibiotics makes antibiotics ineffective or causes bacterial resistance	1. Correct 2. Wrong 3. Don't know	
B4	Antibiotics often cause side effects such as diarrhea	1. Correct 2. Wrong 3. Don't know	
B5	Antibiotics are the same as anti-inflammatory drugs	1. Correct 2. Wrong 3. Don't know	
B6	When do you think you should stop taking antibiotics after starting treatment?	1. When your health improves, 2. When the prescription for the medication given runs out, 3. Others..... 4. Don't know	
C Information about appropriate use of antibiotics and AMR			
C1	In the last 12 months, do you remember receiving information about not taking antibiotics unnecessarily, for example for colds or flu, or information about antimicrobial resistance?	1. Yes 2. No 3. Don't know	
C2	From whom did you get this information?	1. Leaflets/posters 2. Newspaper 3. Radio 4. Television 5. Internet/social media 6. Family/friends	

		7. Doctor 8. Nurse 9. Pharmacist 10. Other Health Professions 11. Others 12. Don't know/don't remember	
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AMR related practices

1	Have you ever used antibiotics orally (taken by mouth) such as tablets, powder or syrup in the last year other than drugs related to TB therapy? Probing: examples: penicillin, tetracycline, amoxicillin, ampicillin,	1. Yes 2. No 3. Don't know	If you don't or don't know , go to the next section
2	In the past year, have you ever received antibiotics, other than TB drugs, without a doctor's prescription? (You use it to treat diarrhea/fever/skin infections/sore throat/aches/coughs/headaches/colds)	1. Ever 2. Never	
3	Where did you get the last antibiotic you used?	1. Community Health Center 2. Government hospitals 3. Private hospitals 4. Doctor's Independent Practice 5. Independent Practice of Midwives/Nurses 6. Clinic 7. Pharmacy 8. Buy online 9. Drug store/stall 10. Remaining medication from previous illnesses 11. Gifts from other people 12. Others	
4	Have you ever bought less antibiotics than the amount prescribed by the doctor?	1. Ever 2. Never	
5	If so, why do you buy fewer drugs?	1. not enough money 2. Don't want to take a lot of medicine 3. not covered by insurance 4. Other	
6	Have you ever stopped taking antibiotics before they run out?	1. Ever 2. Never	
7	If so, what is the reason?	1. already feel healthy 2. Side effects 3. tired of taking antibiotics 4. Other	

This is the final question for TB patients

**TB STUDY FORM 2.1
For TB Patient Contacts**

1. Respondent Identity		
1.	Respondent's Name	
2.	Respondent's Address	RT: / RW: Sub-district: District: Regency:

2. Individual Characteristics		
1.	Date of Birth :/...../..... (Day/Month/Year)	
2.	Gender	
	1. Male	2. Female
3.	Marital Status	
	1. Not married 2. Married 3. Widowed 4. Divorced	
4.	Last Education Level	
	1. Not finished elementary school 2. Finished SD 3. Finished SMP 4. Finished SMA 5. Finished higher education 6. Others.....(explain)	
5.	Occupation	
	1. Not working 2. Students 3. Farmer/laborer 4. Factory worker/private worker 5. Entrepreneur 6. Civil servants/Army/Police 7. Professionals (doctor, architect, etc) 8. Others.....(explain)	
6.	Your monthly income	Rp.
7.	Members of family
8.	Number of family members who earn income
9.	Total monthly income in the family	Rp.
10.	Home coordinates	

3. Access to Health Services		
1.	What is the closest health service facility to your home? (Choose one)	
	1. Midwives/private practice nurses/orderlies 2. Traditional medicine (massage therapist, sinthe, herb, etc) 3. Practicing doctor 4. Private medical centers/clinics 5. Public health center 6. Private hospital 7. Government hospital 8. Pharmacy (without clinic/independent practicing doctor) 9. Drugstore 10. Others.....(explain)	

2. How far is the nearest health facility from home? (in meters)				
3. What mode of transportation do you use to go to the health facility? 1. Walk 2. Bicycle 3. Pedicab 4. Motorbike 5. Car 6. Public transportation such as buses 7. Motorbike taxi/taxi 8. Others.....(explain)				
4. How long does it take to go to the health facility (using the transportation mentioned above)? _____ hour(s) or _____ minute(s)				
5. Have you ever used telemedicine services? Probing: Health consultation via telephone or online application; for example halodoc, alodokter 1. Yes 2. No				
6. If Yes, For what purposes do you use telemedicine services? (there can be more than one answer) 1. Consult health problems with a doctor 2. Looking for/buying medicine 3. Search for health information 4. Others.....(explain)				

This section is for families of TB patients (Household contacts)

Knowledge and perception about TB

	Question	Answer	Skip
1	Have you ever heard of a disease called tuberculosis (TB/TBC)?	0. No 1. Yes	If Yes, go to number 4
2	Do you know that the disease suffered by your husband/wife/family member whom we are interviewing is TB?	1. Yes 2. No	
3	If not, what did your husband/wife/family member suffer from?	1. Illness due to curse 2. chronic cough and cold 3. other respiratory infections 4. Other	
4	Where did you hear this information? <i>(Respondents can choose more than one answer)</i>	1. Newspapers and magazines 2. Radio 3. Television 4. Billboard 5. Brochures, posters and other printed media 6. Health workers 7. Health cadres 8. Family, friends, or neighbors 9. Religious leaders 10. Teacher 11. Others	
5	In your opinion, how serious is tuberculosis?	1. Very serious 2. Quite serious 3. Not too serious	
6	In your opinion, how serious is the tuberculosis problem in your environment?	1. Very serious 2. Quite serious 3. Not too serious	
7	What causes TB? <i>(Answer options are not read out, there can be more than one)</i>	1. Bacteria/germs 2. Viruses 3. Curses/witchcraft 4. Genetics/hereditary 5. Alcoholic drinks 6. Malnutrition 7. Smoking 8. Don't know 9. Others	
8	How is TB transmitted? <i>(Answer choices are not read out, respondents can answer more than one answer)</i> <i>Probing: Anything else?</i>	1. Through the air when coughing/sneezing 2. Use of shared eating utensils 3. Touching TB sufferers 4. Through food/water 5. Sexual relations 6. Mosquito bites 7. Cold air 8. Others	
9	In your opinion, who can be infected? <i>(Answer choices are not read out, respondents can answer more than one answer)</i> <i>Probing: Anything else?</i>	1. Anyone 2. Only poor people 3. Just homeless 4. Only alcoholics 5. Only drug users 6. Only people with HIV/AIDS 7. Prisoners only 8. Others.....	

10	Which parts/organs of the body can be infected by TB? <i>(Answer choices are not read out, respondents can answer more than one answer)</i> <i>Probing: Any other body parts?</i>	1. Lungs 2. Digestion 3. Bones 4. Lymph nodes 5. Others..... 6. Don't know	
11	What symptoms will TB sufferers experience? <i>(Answer choices are not read out, respondents can answer more than one answer)</i> <i>Probing: Anything else?</i>	1. Cough 2. Continuous cough for more than 2 weeks 3. Weight loss 4. Loss of appetite 5. Sweating at night 6. Chest pain 7. Fever 8. Bloody phlegm 9. Shortness of breath 10. Fatigue 11. Swelling 12. Others 13. Don't know	
12	Can TB disease be prevented?	0. No 1. Yes 2. Don't know	If you don't/don't know , go straight to question 14
13	How to prevent TB transmission? <i>(Answer choices are not read out, respondents can answer more than one answer)</i> <i>Probing: Anything else?</i>	1. Avoid coughing in front of other people 2. Be careful when removing phlegm 3. Good house ventilation 4. Avoid close contact with TB patients 5. BCG vaccination in children 6. Use a mask 7. Use cutlery separately 8. Wash clothes separately 9. Sleep/eat/activities in a different room from TB patients 10. Don't smoke 11. Don't drink alcoholic beverages 12. Don't know 13. Others	
14	Can TB be cured?	0. No 1. Yes 2. Don't know	If you don't/don't know , go straight to question 16
15	How is TB cured?	1. Traditional medicine 2. Rest, no need for medication 3. Pray 4. Specific medication from health workers 5. Others..... 6. Don't know	
16	In your opinion, have you received good information about TB prevention and control?	0. No 1. Yes	
17	Do you want to get more information about TB?	0. No 1. Yes	If not , go straight to question 19
18	What information sources do you think are most effective in reaching people like you? <i>(Choose three answers)</i>	1. Newspapers and magazines 2. Radio 3. Television 4. Billboard 5. Brochures, posters and other printed media	

		6. Health workers 7. Health cadres 8. Family, friends, or neighbors 9. Religious leaders 10. Teacher 11. Others	
19	Have you ever heard of drug-resistant TB?	0. No 1. Yes	If not, go straight to the next section
20	What do you know about drug-resistant TB? <i>(respondents can answer more than one answer)</i> <i>Probing: Anything else?</i>	1. TB DR occurs if the patient does not regularly take anti-TB medication 2. TB DR is a severe form/level of TB 3. Can be transmitted to family and friends 4. Treatment lasts at least 2 years 5. Others..... 6. Don't know	
21	Have you ever received an explanation regarding who is meant by close TB contact?	0. No 1. Yes	
22	If yes, please mention who are close contacts of TB? there could be more than one	1. Family members living at home 2. Colleagues or classmates 3. Neighbor 4. Family members who are not in the same household 5. Everyone who has met in person (physical contact) 6. health workers at community health centers 7. Others, please specify	
23	Have you ever received an explanation regarding TB contact investigation?	0. No 1. Yes	
24	If yes, from whom did you get the information? there could be more than one	1. health workers 2. Health cadres 3. Neighbors 4. Family members 5. Others, please specify.	
25	TB contact investigation is...	1. Examination of all family members of TB patients 2. examination of all people who have met directly with TB patients 3. Examination of family members of symptomatic TB patients 4. Don't know	
26	Siapa yang seharusnya melakukan investigasi kontak?	1. health workers 2. Health cadres 3. patient 4. neighbors 5. anyone 6. don't know	

Questions about attitudes and stigma

	Question	Answer	Skip
1	Do you think you could be infected with TB?	0. No 1. Yes	
2	How would you react if you found out that you had TB? <i>(Mark all those mentioned)</i>	1. Accept it 2. Fear 3. Surprised 4. Embarrassment	

	<i>Probing: Anything else?</i>	5. Sad/hopeless 6. Others....	
3	Who would you tell if you had tuberculosis? <i>(mark all mentioned)</i>	1. Doctor or health worker 2. Husband/wife 3. Parents 4. Child 5. Other family members 6. Close friends 7. None 8. Others.....	
4	What will you do if you think you have TB symptoms? <i>(mark all mentioned)</i>	1. Check with a public health facility 2. Check with a private health facility 3. Go to the pharmacy 4. Traditional medicine 5. Other self-medication (Herbal) 6. Others 7. Don't know	If you answered health facilities (public or private) , go to question 6
5	If you don't want to visit a health facility, what is the reason? <i>(mark all mentioned)</i>	1. Don't know where to go for treatment 2. Cost constraints 3. Distance/means of transportation constraints 4. Don't trust health workers 5. Don't like the behavior of health workers 6. Cannot leave work (clinic practice hours collide with work hours) 7. Don't want to know that there is a health problem 8. Others....	
6	If you have TB symptoms, when will you go to a health facility?	1. Immediately 2. After a few days 3. One or two weeks 4. After two weeks 5. Not going to a health facility 6. Others.....	
7	In your opinion, how expensive is TB diagnosis and treatment in this country?	1. Free of charge/free 2. Quite affordable 3. Quite expensive 4. Very expensive 5. Don't know	
8	Do you know anyone who has/is suffering from TB?	0. No 1. Yes	
9	Which statement most closely approximates your feelings about people with TB? <i>(Read the answer choices. and choose only one answer)</i>	1. I feel sorry for them and want to help them 2. I feel sorry but I tend to stay away from these people 3. This is their problem, and I don't want to get infected with TB as a result of helping them 4. I feel afraid because they can spread the disease 5. No particular feelings (normal) 6. Others....	
10	How are TB sufferers usually treated in your community?	1. Most people stay away from it	

		2. Most people are still friendly, but avoid it 3. Help and provide support 4. Others.....	
	For the next question, read the answer choices. Respondents only choose one answer.		
11	The fact that your family member suffers from TB must be kept secret from your neighbors/surrounding community.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree	
12	If you have TB, you will keep it a secret.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree	
13	It is embarrassing to have a family member suffering from TB.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree	
14	If you have TB, others will look down on you.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree	
15	You will feel embarrassed if you suffer from TB.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree	
16	If you have TB, other people will avoid you.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree	
17	Do you have a partner (husband/wife)?	0. No 1. Yes	If not , go to question 18
18	<i>Only for respondents who do not have a partner</i> If you have TB, you will have difficulty finding a partner to marry even after recovery.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree	Go to question 20
19	<i>Only for respondents who have a partner</i> If you suffer from TB, your partner will refuse to have sexual relations with you.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree	
20	If you suffer from TB, you will be asked to stay away from social environments.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree	
21	If you have TB, you will not reveal it even to people you trust (who you usually tell to).	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree	

22	You will have low self-esteem if you suffer from TB.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree	
23	If you suffer from tuberculosis, others will look down on your family.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree	
24	Do you have children?	0. No 1. Yes	If not , move on to the next session
25	Your children will find it difficult if you have TB.	1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly agree	

Behavioral questions

	Question	Answer	Skip
1	Do you live with a family member who suffers from TB?	0. No 1. Yes	
2	Have you ever received counseling or information from health workers about preventing and controlling TB after your family was diagnosed with TB?	0. No 1. Yes	
3	Do you support your family who suffers from TB to take medication regularly?	0. No 1. Yes	If not , go to question 5
4	How do you support your family to always take medication? (can choose more than one answer)	1. I recommend always taking medication 2. I accompany you to a health facility to collect/take medication 3. I supervise when taking medicine 4. I facilitate transportation to health facilities to collect/drink drug 5. I provide financial assistance 6. Others....	
5	Have you told other family members that one of your family members has TB?	0. No 1. Yes	If not , go to question 7
6	Who have you told? (can choose more than one answer)	1. Couple 2. Brother 3 children 4. Parents 5. Others.....	
7	Have you told anyone other than your family members that one of your family members has TB?	0. No 1. Yes	If not , go to question 9
8	Apart from family, who have you told?	1. Religious leaders 2. Neighbors 3. Coworkers 4. Other health workers who are not responsible for your family who suffers from TB 5. Others.....	
9	Have you ever told health workers that your family suffers from TB?	0. No 1. Yes	

10	Do you support or encourage your family member who suffers from TB to eat more and more varied food?	0. No 1. Yes	
11	How do you support him to eat more and more variety? (can choose more than one answer)	1. Give advice 2. Buy food 3. Provide financial assistance 4. cook 5. Others....	
12	Do you routinely open the windows/doors of your house after finding out that a family member is suffering from TB?	0. No 1. Yes	
13	Are your family members who suffer from TC regularly weighed?	0. No 1. Yes	
14	Have health workers ever told you that your family's weight is less than expected?	0. No 1. Yes	If not , go to question 16
15	Does your family receive nutritional assistance or PMT from a health facility when their weight is less than expected?	0. No 1. Yes	
16	Does your family member who suffers from TB cover their mouths when coughing?	0. No 1. Yes	
17	Have health workers/cadres carried out contact investigations on you to find out whether people who came into contact with TB patients were infected or sick with TB?	0. No 1. Yes	If not , go to question 20
18	Have you ever told other family members to come to a health facility for contact investigation?	0. No 1. Yes	If not , go to question 20
19	Did they go for a contact investigation?	0. No 1. Yes	
20	Are there children aged <5 years in your house?	0. No 1. Yes	If not , go to question 22
21	Is the child receiving TB prevention therapy?	0. No 1. Yes	
22	Are there children aged <1 year in your house?	0. No 1. Yes	If not , go to question 24
23	Has the child received the TB vaccine?	0. No 1. Yes	
24	Is there someone with HIV in your house?	0. No 1. Yes 2. Don't know	If not or don't know , go to question 27
25	Have you ever advised the person to receive TB prevention therapy?	0. No 1. Yes	
26	Is the person receiving TB preventive therapy?	0. No 1. Yes	
27	Have you ever told family members how to prevent TB?	0. No 1. Yes	
28	Do you teach the public about TB prevention and control?	0. No 1. Yes	

This is the final question for the contact (patient's family)

TB STUDY FORM 3.1

**SCREENING OF STUDY ELIGIBILITY AND CONSENT
For TB Officers at the Primary Health Center**

Please answer the following screening questions after you have read the participant information sheet. You are welcome to ask questions or clarifications to the research team.

STUDY ELIGIBILITY SCREENING		
S1	Are you a community health center officer working in the TB program?	<input type="checkbox"/> Yes <input type="checkbox"/> No

INFORMED CONSENT		
S2	I have read the information sheet given to me for the study on TB. I have been given the opportunity to ask questions, and have received satisfactory answers.	<input type="checkbox"/> Yes <input type="checkbox"/> No
S3	I agree to participate in the TB study	<input type="checkbox"/> Yes <input type="checkbox"/> No
S4	I agree that my demographic data and answers will be used for TB study purposes anonymously	<input type="checkbox"/> Yes <input type="checkbox"/> No

Potential participants who answered **<Yes> to S1 or all questions S2-S4** will be included as participants

[Study screening and consent]	Interview Date ____-____-____
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TB STUDY FORM 3.2
Participant Demographic Characteristics

Interview date and time		__/__/20__ and __h__
Demographic characteristics of participants		
1. Participants' initials		
2. Date of birth	__/__/____ (DD/MM/YYYY)	
3. Participant ID		
4. Gender	<input type="checkbox"/> Male <input type="checkbox"/> Female	
5. Last educational level	<ul style="list-style-type: none"> ● Not finished elementary school ● SD ● SMP ● SMA ● D1/D2/D3 ● S1/D4 ● S2/S3 	
6. Occupation (if health worker)	<input type="checkbox"/> Health service officers <input type="checkbox"/> Community health center staff	
7. City		
8. Mobile phone number		

[Client demographics] Inisial enumerator	Interview Date _____
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TB STUDY FORM 3.3
Knowledge, attitudes and practices towards TB contact investigation

	Knowledge	
1	TB contact investigation is examining the symptoms of people in close contact with TB patients to determine whether the people in contact are infected or sick with TB.	<input type="checkbox"/> Yes <input type="checkbox"/> No
2	TB contacts are people who are exposed/in contact with people who are sick with TB, for example people in the same house, room, dormitory, workplace, class, or care/care center.	<input type="checkbox"/> Yes <input type="checkbox"/> No
3	Household contacts are people who live in the same house for at least one night, or often live in the same house during the day with the index case in the last 3 months before the index case started receiving anti-tuberculosis drugs (OAT).	<input type="checkbox"/> Yes <input type="checkbox"/> No
4	Close contacts are people who do not live in the same household, but often meet the index case for quite a long time, whose intensity of exposure/contact is almost the same as household contacts.	<input type="checkbox"/> Yes <input type="checkbox"/> No
5	Contact investigations are recorded using which forms?	1. TBC.01 2. TBC.16K 3. Others, Please specify
6	Mention what types of TB cases have a high priority for contact investigation	1. Bacteriologically confirmed tuberculosis 2. Childhood TB 3. all TB cases 4. Nothing is a priority 5. TB in elderly people 6. Don't know 7. Others, please specify
7	Contact investigations can be conducted by	1. Health workers 2. Health cadre 3. Officers and cadres 4. Don't know 5. Others, please specify
8	The minimum number of contacts that must be investigated	1. 20 or more 2. 10 or more 3. free 4. Don't know 5. Others, please specify
9	What is the maximum time span for carrying out a contact investigation from the discovery of the index case?	1. one week 2. one day 3. one month 4. free 5. Don't know 6. others, please specify
10	Who do you think can record into the contact investigation form	1. Health workers 2. health cadres 3. officers and cadres 4. Don't know 5. Others, please specify
11	Do you know about latent TB infection?	1. Yes 2. No
12	If yes, what are the characteristics of latent TB infection?	1. asymptomatic 2. Symptomatic 3. bacteriological test results were negative

		4. Bacteriological test results were positive 5. Don't know 6. Others, please specify
13	If yes, can latent TB patients transmit TB disease to other people?	1. Yes 2. No 3. Don't know
14	Does latent TB infection require treatment?	1. Yes 2. No 3. Don't know
15	In your opinion, can latent TB infection become active TB?	1. Yes 2. No 3. Don't know
Behaviour		
1	TB contact investigations need to be carried out on all contacts including contacts in the workplace	<input type="checkbox"/> Strongly Agree <input type="checkbox"/> Agree <input type="checkbox"/> Disagree <input type="checkbox"/> Strongly Disagree
2	We are required to wear PPE such as masks when investigating TB contacts	<input type="checkbox"/> Strongly Agree <input type="checkbox"/> Agree <input type="checkbox"/> Disagree <input type="checkbox"/> Strongly Disagree
3	Investigation of TB contacts is very important to stop the spread of TB disease	<input type="checkbox"/> Strongly Agree <input type="checkbox"/> Agree <input type="checkbox"/> Disagree <input type="checkbox"/> Strongly Disagree
4	Investigation of TB contacts is important because it can ensure appropriate treatment for latent TB or TB disease among contacts.	<input type="checkbox"/> Strongly Agree <input type="checkbox"/> Agree <input type="checkbox"/> Disagree <input type="checkbox"/> Strongly Disagree
5	Community officers or cadres must assist the person in charge of the TB program in carrying out TB contact investigations.	<input type="checkbox"/> Strongly Agree <input type="checkbox"/> Agree <input type="checkbox"/> Disagree <input type="checkbox"/> Strongly Disagree
Practice		
1	I usually use PPE or a mask and wash my hands during contact investigations	<input type="checkbox"/> Yes <input type="checkbox"/> No
2	I always bring forms TBC.01, TBC.16K, and an official investigation assignment letter when conducting a TBC contact investigation.	<input type="checkbox"/> Yes <input type="checkbox"/> No
3	Do you provide home visit schedule information to the patient's close contacts?	<input type="checkbox"/> Yes <input type="checkbox"/> No
4	I will refer contacts for TB testing if the contact shows symptoms of cough and other symptoms of TB	<input type="checkbox"/> Yes <input type="checkbox"/> No
5	If the referred contact does not come, I will: 1. Contact via existing communication channels 2. Visit his house 3. Bring a sputum pot (each number has a separate answer)	<input type="checkbox"/> Yes <input type="checkbox"/> No

TB STUDY FORM 3.4
Anti-Microbial Resistance Awareness and Practice
(Completed independently by TBC officer)

	General awareness	Strongly agree/ Agree/ Disagree/ Strongly disagree			
1.	Antibiotic resistance is when a microorganism becomes resistant to an antibiotic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	Some microorganisms can mutate to become resistant to antibiotics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	Some microorganisms can cause resistance by sharing genetic material	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	Antibiotic resistance can occur if antibiotics are given when they are not indicated, for example when someone has a viral infection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	Antibiotic resistance can occur if treatment with antibiotics is interrupted, for example if treatment is stopped and restarted in the middle of the prescribed treatment duration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	Antibiotic resistance can occur if antibiotics are given/taken at a lower dose than the recommended dose	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.	Antibiotic resistance can occur if antibiotics are used to treat bacterial colonization, rather than bacterial infections	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.	Antibiotic resistance can occur if antibiotics are used 'just in case' in routine procedures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.	Antibiotic resistance can occur if broad-spectrum antibiotics are used even if narrow-spectrum antibiotics can cure the infection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.	Antibiotic resistance can occur if antibiotic drugs are used in animal feed to promote animal growth	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.	Antibiotic resistance can occur if human antibiotic drugs are used to treat infections in animals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.	Antibiotic resistance can occur if there are antibiotic substances in human sewage waste	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.	Antibiotic resistance can occur if antibiotic drugs are released into the environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.	Resistant infections can spread from health care facilities including hospitals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.	Resistant infections can spread from residential areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.	Resistant infections can spread from animal farms	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.	Resistant infections can spread through wastewater	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18.	Diligently cleaning your hands before and after contact with patients can help prevent the spread of antibiotic resistance between patients	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19.	Isolation in a single room can help prevent the spread of antibiotic resistance between patients	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20.	Proper environmental cleaning can help prevent the spread of antibiotic resistance between patients	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21.	Using personal protective equipment such as gloves, masks and aprons can help prevent the spread of antibiotic resistance between patients	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22.	I can tell that someone has a resistant infection when the person still doesn't respond to several different antibiotics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

23.	I can tell if someone has a resistant infection by referring the person for culture and sensitivity testing in the laboratory	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Practice	Always / Often / Seldom / Never			
1	I always monitor my TB patients regarding their TB treatment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	I always ask my TB patients to take their medicine according to schedule	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Strongly agree/ Agree/ Disagree/ Strongly disagree			
3	If an antibiotic drug is not effective, I prescribe the same antibiotic with a different duration of use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	If an antibiotic is not effective, I prescribe the same antibiotic but at a different dose	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	If an antibiotic is ineffective, I prescribe the same antibiotic but with a different brand or manufacturer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	If an antibiotic drug is not effective, I refer the patient for culture and sensitivity testing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	If an antibiotic is not effective, I replace it with a different group of antibiotics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	If an antibiotic medication is ineffective, I stop all antibiotic treatment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	I know some antibiotics are ineffective due to resistance, so I prefer to prescribe the next line of antibiotics as the first line of treatment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	I prescribe/give antibiotics as prophylaxis if I am worried about surgical site infections	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	I always prescribe/give antibiotics as prophylaxis after surgery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	I prescribe/give antibiotics as prophylaxis when a patient is unlikely to return to the facility for follow-up	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	I prescribe/give antibiotics if I feel that hygiene and sanitation standards are low	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14	I can tell that someone has a resistant infection when the antibiotics that generally treat the condition have no effect	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15	I can tell that someone has a resistant infection when the person still doesn't respond to several different antibiotics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16	I can tell that someone has a resistant infection when I have encountered similar cases before.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Context				
1	In my work experience, I am sure I have encountered patients with resistant infections	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	The price of antibiotics influences my decision about which antibiotics I will prescribe/give	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	The availability of antibiotics influences my decision about which antibiotic drugs I will prescribe/give	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	The effectiveness of antibiotics in patients I have previously treated influences my decision about which antibiotics I will prescribe/give	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	The side effects of antibiotic drugs influence my decision about which antibiotic drug I will prescribe/give	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	The spectrum of antibiotic drugs (broad spectrum or narrow spectrum) influences my decision about which antibiotic drug I will prescribe/give	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7	Pressure from the patient or the patient's family influences my decision about which antibiotic drug I will prescribe/give	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	The availability of laboratory services influences my decision about which antibiotic drug to prescribe/give	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	Whether I can access the medical records or medical history of the patient I am treating influences my decision about which antibiotic drug I will prescribe/give	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	Fear of legal sanctions (such as prosecution) influences my decisions about which antibiotics to prescribe/give	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	If I do not prescribe/give antibiotics, there could be worse health outcomes for the patients I treat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	If I do not prescribe/give antibiotics, the patient I am treating may become disappointed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	If I do not prescribe/give antibiotics, my reputation could suffer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14	If I do not prescribe/give antibiotics, my business could be disrupted	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15	I've been taught everything I need to know about antibiotic resistance as part of my training curriculum	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16	The information and training I currently receive on antibiotic resistance is adequate for my daily practice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17	I have attended specific training on antibiotic resistance and/or antibiotic stewardship	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18	I can access data on local antibiotic resistance patterns	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19	I received data on antibiotic resistance patterns where I work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20	There is an officer where I work who monitors antibiotic resistance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21	My facility has the capacity to provide culture and sensitivity testing services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22	There is a facility near me where I can send samples if I need to do culture and sensitivity testing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23	I am confident that the facility I use for culture and sensitivity testing has equipment that is in good working order	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
AMR in the workplace					
1	Where I work, I view poor nutrition as a bigger concern than antibiotic resistance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Where I work, I view cornice as a bigger concern than antibiotic resistance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Where I work, I view cleanliness and sanitation as a bigger concern than antibiotic resistance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Where I work, I view other infectious diseases (TB/malaria/HIV) as a bigger concern than antibiotic resistance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Where I work, I view trauma and accidents (e.g., traffic accidents and burns) as a greater concern than antibiotic resistance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sources of information about AMR					
1	I was exposed to advertisements about antibiotics	<input type="checkbox"/> Yes	<input type="checkbox"/> No		
2	I know there are campaigns about antibiotic resistance	<input type="checkbox"/> Yes	<input type="checkbox"/> No		

Research staff initials		Date
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TB STUDY FORM 4.1

**SCREENING OF STUDY ELIGIBILITY AND CONSENT
For TB Community Health Workers**

Please answer the following screening questions after you have read the participant information sheet. You are welcome to ask questions or clarifications to the research team.

STUDY ELIGIBILITY SCREENING		
S1	Are you a health cadre working in a TB program?	<input type="checkbox"/> Yes <input type="checkbox"/> No

INFORMED CONSENT		
S2	I have read the information sheet given to me for the study on TB. I have been given the opportunity to ask questions, and have received satisfactory answers.	<input type="checkbox"/> Yes <input type="checkbox"/> No
S3	I agree to participate in the TB study	<input type="checkbox"/> Yes <input type="checkbox"/> No
S4	I agree that my demographic data and answers will be used for TB study purposes anonymously	<input type="checkbox"/> Yes <input type="checkbox"/> No
Potential participants who answered <Yes> to S1 or all questions S2-S4 will be included as participants		

[Study screening and consent] Inisial staf enumerator	Interview Date _ _ - _ _ _ - _ _ _ _
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TB STUDY FORM 4.2
Participant Demographic Characteristics

Interview date and time	__/__/20__ and __h__	
Demographic characteristics of participants		
1. Participants' initials		
2. Date of birth	_/_/____ (DD/MM/YYYY)	
3. Participant ID		
4. Gender	<input type="checkbox"/> Male <input type="checkbox"/> Female	
5. Last educational level	<ul style="list-style-type: none"> ● Not finished elementary school ● SD ● SMP ● SMA ● D1/D2/D3 ● S1/D4 ● S2/S3 	
6. Occupation (if health cadre)	<input type="checkbox"/> Not Working <input type="checkbox"/> Civil servants <input type="checkbox"/> Private sector employee <input type="checkbox"/> Self-employed <input type="checkbox"/> Others, Please Specify	
7. City		
8. Mobile phone number		

[Client demographics] Enumerator's initial	Interview Date ____-____-____
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TB STUDY FORM 4.3
Knowledge, attitudes and practices towards TB contact investigation

Knowledge		
1	TB contact investigation is examining the symptoms of people in close contact with TB patients to determine whether the people in contact are infected or sick with TB.	<input type="checkbox"/> Yes <input type="checkbox"/> No
2	TB contacts are people who are exposed/in contact with people who are sick with TB, for example: people in the same house, room, dormitory, workplace, class, or care/care center.	<input type="checkbox"/> Yes <input type="checkbox"/> No
3	Household contacts are people who live in the same house for at least one night, or often live in the same house during the day with the index case in the last 3 months before the index case started receiving anti-tuberculosis drugs (OAT).	<input type="checkbox"/> Yes <input type="checkbox"/> No
4	Close contacts are people who do not live in the same household, but often meet the index case for quite a long time, whose intensity of exposure/contact is almost the same as household contacts.	<input type="checkbox"/> Yes <input type="checkbox"/> No
5	Contact investigations are recorded using which forms?	1. TBC.01 2. TBC.16K 3. Others, Please specify
6	Mention what types of TB cases have a high priority for contact investigation	1. Bacteriologically confirmed tuberculosis 2. Childhood TB 3. all TB cases 4. Nothing is a priority 5. TB in elderly people 6. Don't know 7. Others, please specify
7	Contact investigations can be conducted by	1. Health workers 2. Health cadre 3. Officers and cadres 4. Don't know 5. Others, please specify
8	The minimum number of contacts that must be investigated	1. 20 or more 2. 10 or more 3. free 4. Don't know 5. Others, please specify
9	What is the maximum time span for carrying out a contact investigation from the discovery of the index case?	1. one week 2. one day 3. one month 4. free 5. Don't know 6. others, please specify
10	Who do you think can record into the contact investigation form	6. Health workers 7. Health cadre 8. Officers and cadres 9. Don't know 1. Others, please specify
11	Do you know about latent TB infection?	1. Yes 2. No
12	If yes, what are the characteristics of latent TB infection?	1. asymptomatic 2. Symptomatic 3. bacteriological test results were negative 4. Bacteriological test results were positive 5. Don't know 6. Others, please specify
13	If yes, can latent TB patients transmit TB disease to other people?	1. Yes

		2. No 3. Don't know
14	Does latent TB infection require treatment?	1. Yes 2. No 3. Don't know
15	In your opinion, can latent TB infection become active TB?	1. Yes 2. No 3. Don't know
Behaviour		
1	TB contact investigations need to be carried out on all contacts including contacts in the workplace	<input type="checkbox"/> Strongly Agree <input type="checkbox"/> Agree <input type="checkbox"/> Disagree <input type="checkbox"/> Strongly Disagree
2	We are required to wear PPE such as masks when investigating TB contacts	<input type="checkbox"/> Strongly Agree <input type="checkbox"/> Agree <input type="checkbox"/> Disagree <input type="checkbox"/> Strongly Disagree
3	Investigation of TB contacts is very important to stop the spread of TB disease	<input type="checkbox"/> Strongly Agree <input type="checkbox"/> Agree <input type="checkbox"/> Disagree <input type="checkbox"/> Strongly Disagree
4	Investigation of TB contacts is important because it can ensure appropriate treatment for latent TB or TB disease among contacts.	<input type="checkbox"/> Strongly Agree <input type="checkbox"/> Agree <input type="checkbox"/> Disagree <input type="checkbox"/> Strongly Disagree
5	Community officers or cadres must assist the person in charge of the TB program in carrying out TB contact investigations.	<input type="checkbox"/> Strongly Agree <input type="checkbox"/> Agree <input type="checkbox"/> Disagree <input type="checkbox"/> Strongly Disagree
Practice		
1	I usually use PPE or a mask and wash my hands during contact investigations	<input type="checkbox"/> Yes <input type="checkbox"/> No
2	I always bring forms TBC.01, TBC.16K, and an official investigation assignment letter when conducting a TBC contact investigation.	<input type="checkbox"/> Yes <input type="checkbox"/> No
3	Do you provide home visit schedule information to the patient's close contacts?	<input type="checkbox"/> Yes <input type="checkbox"/> No
4	I will refer contacts for TB testing if the contact shows symptoms of cough and other symptoms of TB	<input type="checkbox"/> Yes <input type="checkbox"/> No
5	If the referred contact does not come, I will: 1. Contact via existing communication channels 2. Visit his house 3. Bring a sputum pot	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No

TB STUDY FORM 5.1

SCREENING OF STUDY ELIGIBILITY AND CONSENT
For doctors or health workers related to TB

Please answer the following screening questions after you have read the participant information sheet. You are welcome to ask questions or clarifications to the research team.

STUDY ELIGIBILITY SCREENING		
S1	Are you a doctor or nurse or pharmacist who works in connection with the TB program or handles TB patients from a health center or hospital?	<input type="checkbox"/> Yes <input type="checkbox"/> No

INFORMED CONSENT		
S2	I have read the information sheet given to me for the study on TB. I have been given the opportunity to ask questions, and have received satisfactory answers.	<input type="checkbox"/> Yes <input type="checkbox"/> No
S3	I agree to participate in the TB study	<input type="checkbox"/> Yes <input type="checkbox"/> No
S4	I agree that my demographic data and answers will be used for TB study purposes anonymously	<input type="checkbox"/> Yes <input type="checkbox"/> No
Potential participants who answered <Yes> to S1 or all questions S2-S4 will be included as participants		

[Study screening and consent]	Interview Date
	____-____-____

TB STUDY FORM 5.2
Participant Demographic Characteristics

Interview date and time	__/__/20__ and __h__
Demographic characteristics of participants	
1. Participants' initials	
2. Date of birth	__/__/____ (DD/MM/YYYY)
3. Participant ID	
4. Gender	<input type="checkbox"/> Male <input type="checkbox"/> Female
5. Last educational level	<ul style="list-style-type: none"> ● Not finished elementary school ● SD ● SMP ● SMA ● D1/D2/D3 ● S1/D4 ● S2/S3
6. Occupation (if health worker)	<input type="checkbox"/> Health center doctor <input type="checkbox"/> Hospital pharmacist <input type="checkbox"/> Hospital Nurse <input type="checkbox"/> General practitioner in hospital <input type="checkbox"/> Lung specialist at the hospital <input type="checkbox"/> Hospital specialist in internal medicine
7. Name of health facility	
8. City	
9. Mobile phone number	

[Client demographics] enumerator's Initial	Interview Date ____-____-____
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TB STUDY FORM 5.3
Anti-Microbial Resistance Awareness and Practice
(Completed independently by the doctor/nurse/pharmacist)

General awareness		Strongly agree/ Agree/ Disagree/ Strongly disagree			
1.	Antibiotic resistance is when a microorganism becomes resistant to an antibiotic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.	Some microorganisms can mutate to become resistant to antibiotics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	Some microorganisms can cause resistance by sharing genetic material	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	Antibiotic resistance can occur if antibiotics are given when they are not indicated, for example when someone has a viral infection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.	Antibiotic resistance can occur if treatment with antibiotics is interrupted, for example if treatment is stopped and restarted in the middle of the prescribed treatment duration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.	Antibiotic resistance can occur if antibiotics are given/taken at a lower dose than the recommended dose	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.	Antibiotic resistance can occur if antibiotics are used to treat bacterial colonization, rather than bacterial infections	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.	Antibiotic resistance can occur if antibiotics are used 'just in case' in routine procedures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.	Antibiotic resistance can occur if broad-spectrum antibiotics are used even if narrow-spectrum antibiotics can cure the infection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.	Antibiotic resistance can occur if antibiotic drugs are used in animal feed to promote animal growth	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.	Antibiotic resistance can occur if human antibiotic drugs are used to treat infections in animals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12.	Antibiotic resistance can occur if there are antibiotic substances in human sewage waste	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13.	Antibiotic resistance can occur if antibiotic drugs are released into the environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14.	Resistant infections can spread from health care facilities including hospitals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.	Resistant infections can spread from residential areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16.	Resistant infections can spread from animal farms	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17.	Resistant infections can spread through wastewater	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18.	Diligently cleaning your hands before and after contact with patients can help prevent the spread of antibiotic resistance between patients	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19.	Isolation in a single room can help prevent the spread of antibiotic resistance between patients	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20.	Proper environmental cleaning can help prevent the spread of antibiotic resistance between patients	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21.	Using personal protective equipment such as gloves, masks and aprons can help prevent the spread of antibiotic resistance between patients	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22.	I can tell that someone has a resistant infection when the person still doesn't respond to several different antibiotics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23.	I can tell if someone has a resistant infection by referring the person for culture and sensitivity testing in the laboratory	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Practice		Always / Often / Seldom / Never			
1	I always monitor my TB patients regarding their TB treatment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	I always ask my TB patients to take their medicine according to schedule	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Strongly agree/ Agree/ Disagree/ Strongly disagree			
3	If an antibiotic drug is not effective, I prescribe the same antibiotic with a different duration of use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4	If an antibiotic is not effective, I prescribe the same antibiotic but at a different dose	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	If an antibiotic is ineffective, I prescribe the same antibiotic but with a different brand or manufacturer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	If an antibiotic drug is not effective, I refer the patient for culture and sensitivity testing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	If an antibiotic is not effective, I replace it with a different group of antibiotics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	If an antibiotic medication is ineffective, I stop all antibiotic treatment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	I know some antibiotics are ineffective due to resistance, so I prefer to prescribe the next line of antibiotics as the first line of treatment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	I prescribe/give antibiotics as prophylaxis if I am worried about surgical site infections	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	I always prescribe/give antibiotics as prophylaxis after surgery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	I prescribe/give antibiotics as prophylaxis when a patient is unlikely to return to the facility for follow-up	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	I prescribe/give antibiotics if I feel that hygiene and sanitation standards are low	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14	I can tell that someone has a resistant infection when the antibiotics that generally treat the condition have no effect	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15	I can tell that someone has a resistant infection when the person still doesn't respond to several different antibiotics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16	I can tell that someone has a resistant infection when I have encountered similar cases before.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Context				
1	In my work experience, I am sure I have encountered patients with resistant infections	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	The price of antibiotics influences my decision about which antibiotics I will prescribe/give	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	The availability of antibiotics influences my decision about which antibiotic drugs I will prescribe/give	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	The effectiveness of antibiotics in patients I have previously treated influences my decision about which antibiotics I will prescribe/give	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	The side effects of antibiotic drugs influence my decision about which antibiotic drug I will prescribe/give	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	The spectrum of antibiotic drugs (broad spectrum or narrow spectrum) influences my decision about which antibiotic drug I will prescribe/give	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	Pressure from the patient or the patient's family influences my decision about which antibiotic drug I will prescribe/give	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	The availability of laboratory services influences my decision about which antibiotic drug to prescribe/give	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	Whether I can access the medical records or medical history of the patient I am treating influences my decision about which antibiotic drug I will prescribe/give	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	Fear of legal sanctions (such as prosecution) influences my decisions about which antibiotics to prescribe/give	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	If I do not prescribe/give antibiotics, there could be worse health outcomes for the patients I treat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	If I do not prescribe/give antibiotics, the patient I am treating may become disappointed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	If I do not prescribe/give antibiotics, my reputation could suffer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14	If I do not prescribe/give antibiotics, my business could be disrupted	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15	I've been taught everything I need to know about antibiotic resistance as part of my training curriculum	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

16	The information and training I currently receive on antibiotic resistance is adequate for my daily practice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17	I have attended specific training on antibiotic resistance and/or antibiotic stewardship	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18	I can access data on local antibiotic resistance patterns	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19	I received data on antibiotic resistance patterns where I work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20	There is an officer where I work who monitors antibiotic resistance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21	My facility has the capacity to provide culture and sensitivity testing services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22	There is a facility near me where I can send samples if I need to do culture and sensitivity testing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23	I am confident that the facility I use for culture and sensitivity testing has equipment that is in good working order	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
AMR in the workplace					
1	Where I work, I view poor nutrition as a bigger concern than antibiotic resistance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Where I work, I view cornice as a bigger concern than antibiotic resistance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Where I work, I view cleanliness and sanitation as a bigger concern than antibiotic resistance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Where I work, I view other infectious diseases (TB/malaria/HIV) as a bigger concern than antibiotic resistance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Where I work, I view trauma and accidents (e.g., traffic accidents and burns) as a greater concern than antibiotic resistance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sources of information about AMR					
1	I was exposed to advertisements about antibiotics	<input type="checkbox"/> Yes <input type="checkbox"/> No			
2	I know there are campaigns about antibiotic resistance	<input type="checkbox"/> Yes <input type="checkbox"/> No			

study staff initials		Date
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Participating Facilities

Public Sector

No	Province	District	Type	No	Sampled facilities
1	Aceh	Aceh Besar	Hospital	1	RSUD Zainoel Abidin
				2	RS Teungku Fakinah
			Public health center	1	Puskesmas Darul Imarah
				2	Puskesmas Kuta Baro
				3	Puskesmas Darussalam
				4	Puskesmas Peukan Bada
				5	Puskesmas Ingin Jaya
				6	Puskesmas Lampisang
				7	Puskesmas Krueng Barona Jaya
				8	Puskesmas Baitussalam
				9	Puskesmas Kuta Cot Glie
				10	Puskesmas Indra Puri
				11	Puskesmas Lhoong
				12	Puskesmas Mesjid Raya
				13	Puskesmas Lamteuba
				14	Puskesmas Suka Makmur
				15	Puskesmas Seulimuem
				16	Puskesmas Darul Kamal
				17	Puskesmas Blang Bintang
				18	Puskesmas Lembah Seulawah
				19	Puskesmas Montasik
				20	Puskesmas Lhoknga
				21	Puskesmas Kota Jantho
				22	Puskesmas Leupung
				23	Puskesmas Kuta Malaka
				24	Puskesmas Simpang Tiga
				25	Puskesmas Ie Alang
26	Puskesmas Lam Pupok				
27	Puskesmas Piyeung				
2	Central Kalimantan	Palangka Raya	Hospital	1	RSUD Doris Sylvanus
				Public health center	1
			2		Puskesmas Panarung
			3		Puskesmas Marina Permai
			4		Puskesmas Bukit Hindu
			5		Puskesmas Menteng
			6		Puskesmas Kayon
			7		Puskesmas Jekan Raya
			8		Puskesmas Kalamangan
			9		Puskesmas Krg Bangkirai
			10	Puskesmas Tangkiling	
11	Puskesmas Rakumpit				
3	Cental Java	Semarang	Hospital	1	RSUP Dr. Kariadi
				2	RSUD Tugurejo
			Public health center	1	Puskesmas Bandarharjo
				2	Puskesmas Bangetayu
				3	Puskesmas Kedung Mundu
				4	Puskesmas Sekaran
				5	Puskesmas Rowosari
				6	Puskesmas Gayam Sari
				7	Puskesmas Gunung Pati
				8	Puskesmas Telogosari Wetan
				9	Puskesmas Bulu Lor
10	Puskesmas Karang Doro				
11	Puskesmas Ngalian				

No	Province	District	Type	No	Sampled facilities
				12	Puskesmas Pegandan
				13	Puskesmas Poncol
				14	Puskesmas Mijen
				15	Puskesmas Genuk
				16	Puskesmas Lebdosari
				17	Puskesmas Telogosari Kulon
				18	Puskesmas Lamper Tengah
				19	Puskesmas Pandanaran
				20	Puskesmas Candilama
				21	Puskesmas Ngesrep
				22	Puskesmas Padang Sari
				23	Puskesmas Purwoyoso
				24	Puskesmas Bugangan
				25	Puskesmas Tambak Aji
				26	Puskesmas Manyaran
				27	Puskesmas Halmahera
				28	Puskesmas Karang Anyar
				29	Puskesmas Sronдол
				30	Puskesmas Kagok
				31	Puskesmas Mangkang
				32	Puskesmas Karang Ayu
				33	Puskesmas Krobokan
				34	Puskesmas Ngemplak Simongan
				35	Puskesmas Pundakpayung
				36	Puskesmas Miroto
				37	Puskesmas Karang Malang
4	West Java	Bandung	Hospital	1	RSUP Dr. Hasan Sadikin
				2	RSUD Kota Bandung
				3	RS Dr. H. A. Rotinsulu
				4	RS Dr. M. Salamun
			Public health center	1	Puskesmas Ahmad Yani
				2	Puskesmas Antapani
				3	Puskesmas Astana Anyar
				4	Puskesmas Babakan
				5	Puskesmas Babatan
				6	Puskesmas Balai Kota
				7	Puskesmas Cempaka Arum
				8	Puskesmas Cibolerang
				9	Puskesmas Cigondewah
				10	Puskesmas Cijagra Baru
				11	Puskesmas Cijagra Lama
				12	Puskesmas Cijerah
				13	Puskesmas Cikutra Lama
				14	Puskesmas Cilengkrang
				15	Puskesmas Cipadung
				16	Puskesmas Cipaku
				17	Puskesmas Dago
				18	Puskesmas Derwati
				19	Puskesmas Girimande
				20	Puskesmas Gumuruh
				21	Puskesmas Jajaway
				22	Puskesmas Jatibandap
				23	Puskesmas Karang Setra
				24	Puskesmas Ledeng
25	Puskesmas Lio Genteng				
26	Puskesmas Mandala Mekar				
27	Puskesmas Mengger				
28	Puskesmas Moch. Ramdan				

No	Province	District	Type	No	Sampled facilities
				29	Puskesmas Pamulang Bandung
				30	Puskesmas Panyileukan
				31	Puskesmas Pasawahan
				32	Puskesmas Pasir Luyu
				33	Puskesmas Pasirlayung
				34	Puskesmas Pelindung Hewan
				35	Puskesmas Rusunawa
				36	Puskesmas Sarijadi
				37	Puskesmas Sekejati
				38	Puskesmas Sekeloa
				39	Puskesmas Suka Warna
				40	Puskesmas Sukahaji
				41	Puskesmas Sukapakir
				42	Puskesmas Suryalaya
				43	Puskesmas Taman Sari
				44	Puskesmas Upt Arcamanik
				45	Puskesmas Upt Babakansari
				46	Puskesmas Upt Caringin
				47	Puskesmas Upt Cetarip
				48	Puskesmas Upt Cibiru
				49	Puskesmas Upt Cibuntu
				50	Puskesmas Upt Cinambo
				51	Puskesmas Upt Cipamokolan
				52	Puskesmas Upt Ciumbuleuit
				53	Puskesmas Upt Garuda
				54	Puskesmas Upt Griya Antapani
				55	Puskesmas Upt Ibrahim Adjie
				56	Puskesmas Upt Kopo
				57	Puskesmas Upt Kujang Sari
				58	Puskesmas Upt Margahayu Raya
				59	Puskesmas Upt Neglasari
				60	Puskesmas Upt Padasuka
				61	Puskesmas Upt Pagarsih
				62	Puskesmas Upt Panghegar
				63	Puskesmas Upt Pasir Kaliki
				64	Puskesmas Upt Pasundan
				65	Puskesmas Upt Puter
				66	Puskesmas Upt Riung
				67	Puskesmas Upt Salam
				68	Puskesmas Upt Sindang Jaya
				69	Puskesmas Upt Suka Jadi
				70	Puskesmas Upt Suka Rasa
				71	Puskesmas Upt Talaga Bodas
				72	Puskesmas Upt Tamblong
				73	Puskesmas Upt Ujung Berung Indah
				74	UPT Puskesmas Babakan Tarogong
				75	UPT Puskesmas Cibaduyut Kidul
				76	UPT Puskesmas Cibaduyut Wetan
				77	UPT Puskesmas Cigadung
				78	UPT Puskesmas Pasirjati
				79	UPT Puskesmas Sukagalih
				80	UPT Puskesmas Sukaraja
5	Maluku	Ambon	Hospital	1	RSUD dr. M. Haulussy
				2	RSKD Provinsi Maluku
			Public health center	1	Puskesmas Latuhalat
				2	Puskesmas Amahusu
				3	Puskesmas Air Salobar
				4	Puskesmas Benteng

No	Province	District	Type	No	Sampled facilities	
				5	Puskesmas Urimesing	
				6	Puskesmas Waihaong	
				7	Puskesmas CH. M. Tiahahu	
				8	Puskesmas Kayu Putih	
				9	Puskesmas Belakang Soya	
				10	Puskesmas Karang Panjang	
				11	Puskesmas Waihoka	
				12	Puskesmas Air Besar	
				13	Puskesmas Rijali	
				14	Puskesmas Hative Kecil	
				15	Puskesmas Halong	
				16	Puskesmas Lateri	
				17	Puskesmas Passo	
				18	Puskesmas Nania	
				19	Puskesmas Poka	
				20	Puskesmas Tawiri	
				21	Puskesmas Kilang	
				22	Puskesmas Hutumuri	
6	West Nusa Tenggara	East Lombok	Hospital	1	RSU Soedjono Selong	
				2	RSUD Lombok Timur	
				3	RSUD Patuh karya	
				Public health center	1	Puskesmas Aikmel
					2	Puskesmas Aikmel Utara
					3	Puskesmas Batuyang
					4	Puskesmas Belanting
					5	Puskesmas Dasan Lekong
					6	Puskesmas Denggen
					7	Puskesmas Jerowaru
					8	Puskesmas Kalijaga
					9	Puskesmas Karang Baru
					10	Puskesmas Kerongkong
					11	Puskesmas Keruak
					12	Puskesmas Korleko
					13	Puskesmas Kotaraja
					14	Puskesmas Labuhan Haji
					15	Puskesmas Labuhan Lombok
					16	Puskesmas Lendang Nangka
					17	Puskesmas Lenek
					18	Puskesmas Lepak
					19	Puskesmas Masbagik
					20	Puskesmas Masbagik Baru
					21	Puskesmas Montong Betok
					22	Puskesmas Pengadangan
					23	Puskesmas Pringgasela Utama
					24	Puskesmas Rarang
					25	Puskesmas Rensing
					26	Puskesmas Sakra
					27	Puskesmas Sambelia
					28	Puskesmas Selong
					29	Puskesmas Sembalun
					30	Puskesmas Sikur
					31	Puskesmas Suela
					32	Puskesmas Sukaraja
			33	Puskesmas Suralaga		
			34	Puskesmas Terara		
			35	Puskesmas Wanasaba		
			Total		226 Public Facilities	

Private Sector

No	Province	District	Type	No	Sampled facilities
2	Central Kalimantan	Palangka Raya	Private Hospital	1	RSI PKU Muhammadiyah
3	Central Java	Semarang	Private Hospital	1	RS St. Elisabeth
4	West Java	Bandung	Private Hospital	1 2 3 4 5 6	RS Advent RS Santosa Bandung Central RS Santosa Bandung Kopo RS Muhammadiyah Bandung RS Immanuel Bandung RS Al Islam Bandung
5	Maluku	Ambon	Private Hospital	1	RS Siloam Ambon
6	West Nusa Tenggara	East Lombok	Private Hospital	1 2	RSI S. Anggoro RS Lotim Medical Center
			Total		11 Private Facilities

