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BARRIERS TO ACCESS AND USE OF PUBLIC TB DIAGNOSTIC SERVICES IN VIETNAM

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Acronyms and abbreviations

AIDS	Acquired Immune Deficiency Syndrome
CIDA	Canadian International Development Agency
DOTS	directly observed therapy – short course
Global Fund	Global Fund to Fight AIDS, Tuberculosis and Malaria
HIV	human immunodeficiency virus
KAP	knowledge, attitudes, and practices
NTB	National Tuberculosis Program
PATH	Program for Appropriate Technology in Health
PNT	Pham Ngoc Thach
PPM	public-private mix
TB	tuberculosis
USAID	US Agency for International Development
VND	Vietnamese dong
WHO	World Health Organization

Executive summary

Background

Vietnam ranks 12th out of 22 countries with a high burden of tuberculosis (TB). Previous estimates by the World Health Organization indicated a prevalence of 89 smear-positive pulmonary TB cases per 100,000 population; however, a national prevalence survey suggested that the rate may be 1.6 times higher, at 145 per 100,000.

The first step along the cough to cure pathway, a conceptual framework designed to help map social and behavioral barriers faced by an individual from the point of seeking care to completion of TB treatment, is seeking care (Academy for Educational Development, 2005). In the absence of active case-finding for pulmonary TB through a formal screening program, the cough to cure pathway relies on individuals who have TB-like symptoms seeking care on their own. Many factors influence care-seeking behavior, including perception of risk of TB infection, knowledge of TB and its symptoms, knowledge of where services are located, the ability to access services, and confidence that services are of high quality.

Studies in Vietnam have suggested that delays in seeking and accessing TB diagnostic services can be attributed to the ease of treating symptoms with medications provided by pharmacies, long distances to TB facilities, financial constraints, complex diagnostic procedures, poor patient-provider communication, and stigma about TB. Additionally, because separate public health departments are responsible for preventive (case detection) and curative (treatment and care services) in Vietnam, services are difficult to navigate.

The move toward a more decentralized health system in Vietnam has helped increase the capacity of the laboratory network for TB specimen processing, improved the availability of medical services in the private sector, and increased insurance coverage over the past ten years. Understanding barriers to access to public TB diagnostic services in this evolving health care environment is important for the National Tuberculosis Program (NTP) and its efforts to increase early case detection and improve service delivery.

Purpose

The purpose of this study was to assess access to and use of public TB diagnostic services in nine districts of Vietnam and to identify barriers to accessing public-sector TB diagnostic services at the individual, provider, and health system levels. This study complements the increasing body of evidence describing the complex system for TB control in Vietnam by providing additional insight into how patients perceive their risk of acquiring TB, their understanding of TB more broadly, and their perceptions of what prevents them from seeking care appropriately.

Methods

The study was conducted in nine districts in three provinces, representing the north (Thai Nguyen), center (Khanh Hoa), and south (Ho Chi Minh City) of Vietnam. Semi-structured interviews were conducted with 398 TB cases (confirmed smear-positive pulmonary TB cases) invited to participate from district and provincial registers of confirmed cases and 1,092 persons presumed to have TB recruited from provincial TB hospitals and district TB units. Structured interviews were conducted with 200 private providers at the commune level. A total of 200 pharmacy workers and 100 TB focal

persons in commune health centers completed self-administered questionnaires. Semi-structured interviews were conducted with 46 non-TB public providers and 18 public-sector TB providers at the district and provincial levels, purposively selected. In total, these populations were included in the study to ensure that diverse perspectives from the health system were represented.

All interviews and questionnaires were designed to collect data on knowledge, attitudes, and practices around TB; care-seeking behavior; barriers to access to and use of TB diagnostic services; and suggestions for improving access to TB services. Questionnaires administered to providers included questions about referral practices, services provided, collaboration between the public and private sectors, and adherence to NTP policies.

Key findings

Different barriers to services were identified by users of the health system as compared with providers. Among TB cases and people with presumptive TB interviewed, results showed:

- High levels of knowledge about TB symptoms, care and cure, and the location of services among both TB cases and persons with presumptive TB.
- Lack of gender bias or stigma related to a TB diagnosis among these populations.
- The greatest barrier identified was lack of personal belief among patients that they could have TB: they did not perceive themselves at risk; thus, when symptoms presented, the most common response was to do nothing or to self-treat (either with medications at home or with medications from pharmacies).
- Accessing public TB services tended to be the third action taken, usually about three weeks after TB symptoms began.
- Other barriers identified to a lesser degree by TB cases and people with presumptive TB included the amount of time required to seek care (<10%), financial expenses (5%), complex insurance procedures (5%), and quality of public services (about 20% were dissatisfied with the care they received in the public TB system, with long wait times as the most common reason for dissatisfaction).

Among providers interviewed:

- Many providers identified cost, lack of insurance, capacity of professional staff to accurately diagnose TB, and attitude of staff toward patients as barriers to care.
- There was also a strong feeling by providers that patients had low knowledge of TB symptoms, the treatability of TB, and where to access services. The barriers to patient access to and use of the public TB system, as reported by providers, were mostly opposite of what patients said themselves, illustrating a large gap in each other's understanding regarding this important matter.

Recommendations

Based on study findings, the following are recommendations for the Vietnam NTP to consider:

1. Develop and implement a targeted communication strategy to increase individuals' awareness of the risks for TB and raise awareness of the need for early access to TB diagnostic services broadly throughout the entire community. The communication strategy should also address normal health care-seeking behaviors versus ideal care-seeking behaviors in response to TB-like symptoms.

2. Reinforce linkages and collaboration between the NTP, private, and public providers that have not traditionally provided formal TB services to improve referral and diagnosis of TB.

3. Strengthen the capacity of district TB providers to provide high-quality TB diagnostic services and implement effective NTP activities, such as public-private mix and communication at the district level.

4. Make efforts to advocate for health insurance policies that support early access to public-sector TB diagnostic services.

5. Leverage the next national TB prevalence survey to explore barriers to access and use of public health services using not only a population-based representative sample but one that also includes persons with TB symptoms who may not be accessing services.

Background

Vietnam ranks 12th out of 22 countries with a high burden of tuberculosis (TB). In 2011, the World Health Organization (WHO) estimated prevalence of all forms of TB was 323 per 100,000 population (WHO, 2011a); however, case detection was estimated by the Vietnam Ministry of Health National Tuberculosis Program (NTP) to be 56%. A recently conducted national prevalence survey by Hoa et al. (2010) suggested there be under-detection of TB in Vietnam, and the prevalence may be as high as 1.6 times higher than WHO previously estimated prevalence. Incidence estimates from WHO in 2011 suggested Vietnam should have approximately 180,000 (range: 140,000-220,000) new cases (all forms) reported each year. However, the annual reporting of cases to the NTP is about 100,000 new cases (all forms). By both estimates, TB cases are either not being detected at all or are being detected but not reported. Even though the data suggest under-detection or under-reporting of TB cases, the proportion of cases diagnosed that eventually initiate and complete treatment is quite high: more than 90% of detected pulmonary cases were reported by the NTP to have been cured during the period 2007-2010.

On the cough to cure pathway (Figure 1), the first step is seeking care (Academy for Educational Development, 2005). Active case-finding for pulmonary TB by an organized screening program is a challenging endeavor for low-resource settings like Vietnam; thus, for the health system to become aware of a possible TB case, it is important for patients who may have symptoms to come forward and get assessed.

Many factors are involved in care-seeking, including perception of risk, knowledge of the disease and its symptoms, knowing where services are located, having the capacity to travel to these services, and feeling that once there the services will be of high quality and delivered by competent health care professionals. A recent literature review conducted by PATH concluded that knowledge about TB disease and its causes, transmission route, and key symptoms, as well as knowledge of TB prevention and treatment, is generally high (Cu et al., 2010; Hoa et al., 2004). Other studies have suggested additional reasons for patient delay in accessing or using TB diagnostic services, including treating symptoms with easy-to-access medication from pharmacies, distance to TB facilities, financial constraints, complex diagnostic procedures, and stigma (Hoa et al., 2009; Hoa et al., 2011).

Figure 1. Cough to cure pathway.

However, research has also explored the provider behavior or system barriers to access to and use of TB diagnostic services (Lönnroth et al., 1999; Long et al., 1999; Huong et al., 2007; Hoa et al., 2011; Hoa et al., 2003). The detection of and care for TB is complicated by different scopes of responsibility between preventive (involved in case detection) and medical services (involved in care) departments of the public health system in Vietnam. Increasingly, individuals need to purchase insurance to cover tests as well as pay in cash for services not covered by either the NTP budget or insurance. Combined with a burgeoning entrepreneur class of doctors offering services in the private sector, surveys have indicated that the population is accessing the private health sector for a wide spectrum of illnesses and treatments, including for suspected symptoms of TB. Even though TB smear testing is, according to national policy, supposed to be provided free of charge by the NTP, financial constraints at the provincial and district levels have resulted in some areas charging for this basic diagnostic service. There is variability between provinces and within provinces as to the TB diagnostic services for which fees are applied. These services could be sputum smear tests, x-rays, blood tests, and others.

The organization of public health services, the capacity for service provision at the district and commune levels, the increased need for TB specimen processing within the laboratory network, and the increased availability of medical services in the private sector over the past ten years have also changed the landscape of medical care dramatically. Decentralization of fiscal allocations from the national government to provinces for delivering health care to their populations (through Socialist Republic of Vietnam Decree No. 171/2004/ND-CP and Decree No. 172/2004/ND-CP), combined with limits in coverage by national insurance has created structural changes to the way in which services are financed and delivered.

Concerns have been raised that the expansion of a largely unregulated private sector for medical care and increased direct use of pharmacies for treatment have had negative consequences on individuals being able to be properly diagnosed. In recent years, the NTP has responded to this development by increasing their partnerships with the private sector and other public providers (separate from public TB facilities). These initiatives have been funded by external sources, such as the Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund), Royal Netherlands Tuberculosis Association, US Agency for International Development (USAID), Canadian International Development Agency (CIDA), and others. The model of public-private mix, or PPM, brings a strong focus on training providers in the private sector, including pharmacists, to know the signs and symptoms of a person with presumptive TB and know where and how to refer such patients to the public health network for a complete diagnostic assessment.

The primary first location for diagnostic services is the district TB clinic/unit. All 688 districts in Vietnam have a specialized public TB clinic/unit to perform sputum tests for diagnosis of pulmonary TB and to know the symptoms of extrapulmonary and other TB forms, and refer the patient to the provincial public TB/lung hospital for additional tests, such as x-rays and culture, to confirm the diagnosis. At the lower level of the public commune health center, the primary function of the TB focal person has been monitoring of treatment for cases after they have been diagnosed and rendered noninfectious by the initial intensive course of therapy. The NTP follows the WHO guidelines for directly observed therapy – short course, or DOTS, for uncomplicated pulmonary TB, which is the internationally recognized therapy regimen (WHO, 2011a). The broader WHO Stop TB Strategy is also incorporated into the NTP (WHO, 2006).

Rationale

This study provides additional insight into the behaviors of both people with confirmed smear-positive pulmonary TB and people with presumptive TB who have recently sought diagnostic services for symptoms, as well as the providers these users may have contacted for such services. The results help to understand barriers that may prevent the access and use of services as well as the provision of them. These findings can be used by the NTP to determine where program improvements could be made to target and increase appropriate care-seeking behaviors on the part of the population at large and the appropriate diagnostic and/or referral behaviors of providers who are integral to the success of the national program.

Study objectives and methods

Objectives

The objectives of this study were to:

1. Assess access to and use of public- and private-sector TB diagnostic services in Vietnam.
2. Identify and describe individual, provider, and health system barriers to access to and use of public TB diagnostic services in Vietnam.

Methods

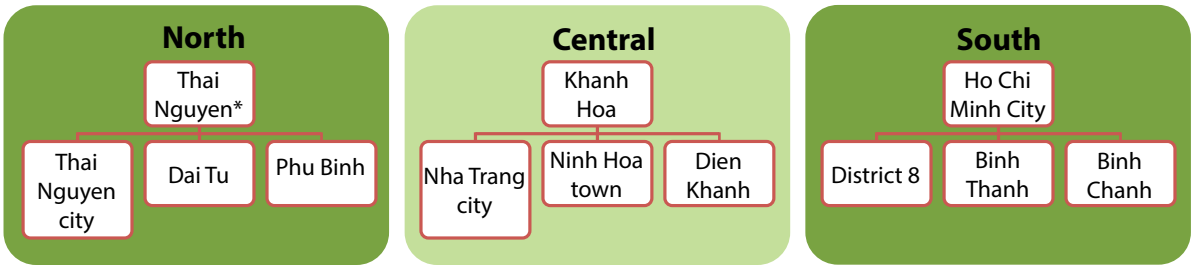
Study design

We conducted a cross-sectional study of confirmed smear-positive pulmonary TB cases (TB cases) and people with presumptive TB and TB service providers in the private and public sectors in nine districts of three provinces (North, Central, and South) in Vietnam, with projected sample sizes as follows (Figure 2):

- People with presumptive TB: up to 1,200 people who have recently attended a district or provincial TB clinic or hospital.
- TB cases: up to 400 people recently diagnosed with smear-positive pulmonary TB and who initiated treatment.
- Public TB service providers: up to 63 providers from public TB clinics and hospitals and public general hospitals at the district and provincial levels, and up to 100 TB focal persons at commune health centers.
- Private providers: up to 200 private providers and up to 200 pharmacy workers in the nine study districts.

Study locations

Figure 2. Provincial and district study sites.



*TB cases were also recruited from Dong Hy and Pho Yen districts due to low case volumes in Thai Nguyen.

Study locations were selected based on criteria relevant for the study objectives and practicalities of the field logistics and time available for study implementation. Data from all provinces were collated for the following criteria: number and rate of recently reported TB cases in the NTP (2010); estimated regional prevalence of TB in 2007 (Hoa et al., 2010); projections of under-detection of cases (based on regional prevalence data and a 2010 NTP midterm evaluation report); HIV prevalence and number of cases in the adult population (≥15 years) (Ministry of Health, 2010);

population density (Office of General Statistics, 2010); establishment of the PPM model in districts; and previous research conducted on TB in the province. Although not a part of the official selection criteria, we also considered provinces where systems strengthening work for either pharmacies or TB diagnostics and treatment has been occurring. These included locations of focus for the Global Fund (Ha Noi, Binh Dinh, Ba Ria-Vung Tau), Atlantic Philanthropies (Khanh Hoa, Vinh Long, Hue, Da Nang, Thai Nguyen), US President's Emergency Plan for AIDS Relief/USAID (Hai Phong, Quang Ninh, Lao Cai, Dien Bien, Ho Chi Minh City, An Giang, Can Tho, Nghe An, Ha Noi), and others. In addition, consultation regarding study locations was held with the NTP. In the end, three districts in each province were selected (Figure 2) and the distribution of the 207 wards/communes across these districts was as follows: North (80)—Thai Nguyen city (28), Dai Tu (31), and Phu Binh (21); Central (75)—Nha Trang city (27), Ninh Hoa (27), and Dien Khanh (21); and South (52)—District 8 (16), Binh Thanh (20), and Binh Chanh (16). Due to low volumes of TB cases in Thai Nguyen, two additional districts—Dong Hy and Pho Yen—were used to recruit TB cases only.

Because there are no data on the magnitude of under-detection at the provincial or district levels, we had to focus our study on areas with a high number of reported TB cases, high densities of both the general population and HIV cases, and where expanded efforts for TB case-finding are under way through the PPM model. Within each province, a mix of districts that were implementing PPM and those that had yet to implement PPM were selected.

In the end, our selection of locations, although based on epidemiological data relevant for TB, was purposive, but included a large enough diversity to capture the various paradigms and experiences of users and providers of public TB diagnostic services.

Study population and sampling frame

Table 1 provides an overview of all study populations and sample sizes achieved.

Table 1. Study populations, selection and data collection methods, and sample size.

Population	Selection and collection method	Sample size achieved
TB cases	• All adults diagnosed with smear-positive pulmonary TB and who initiated treatment in the last three months at a district or provincial public TB facility • Semi-structured interview	398
People presumed to have TB	• All adults attending district or provincial public TB facilities over a period of 10 to 15 consecutive days • Semi-structured interview	1,092
Public TB service providers at the district and provincial levels	• Purposive • Semi-structured interview	18: district and provincial levels
Public non-TB service providers (general hospitals) at the district and provincial levels	• Purposive • Semi-structured interview	28: district level 18: provincial level
TB focal persons at commune health centers	• Purposive • Self-administered questionnaire	100
Registered private providers in communes in selected districts	• Self-selected • Semi-structured interview	200
Pharmacy workers at registered pharmacists in communes in selected districts	• Self-selected. • Self-administered questionnaire.	200

Areas of inquiry

We conducted semi-structured interviews with TB cases and people with presumptive TB and utilized quantitative, fixed-response questions to assess knowledge, attitudes, and practices (KAP) regarding TB, its symptoms, diagnosis, and treatment; to determine care-seeking behaviors for TB symptoms and diagnostic services (both the current episode and any past episodes); describe the use of private and public services for diagnosis, including laboratory tests received and/or treatment (for current and past episodes, if applicable); describe any barriers in accessing diagnostic services, including but not limited to structure of services, turnaround time for different diagnostic tests, diagnostic algorithms, insurance coverage, payments at private and public providers, time and travel required for accessing services, and actions on any referrals; explore issues of stigma and gender bias related to suspicion or diagnosis of active TB; and probe through qualitative open-ended questions regarding health care-seeking behavior, perceived community support and social norms related to those suspected or diagnosed with active TB, perceived or actual barriers to services (personal, system, or structural), and suggestions for improvements. Because the focus of this study was on barriers to access and use of public diagnostic services, we did not ask any questions about treatment among the cases in our study.

The interviews with public TB providers utilized a mix of quantitative, fixed-response questions and qualitative, open-ended questions. Domains explored included KAP regarding TB, its symptoms, diagnostic algorithms (such as skin tests, sputum testing, chest x-rays, etc.), treatment (including DOTS), health facility procedures, provincial and national policies, training received, and counseling skills; structure of services, patient mix, types and quality of services provided, frequency of diagnostic tests requested and timeliness of specimen processing by laboratories, referral procedures, system barriers such as payments, insurance, location, or availability of services; referral processes and interface between public and private systems; stigma and gender bias; perceived or actual barriers (system, structural, policy) to access to and use of the TB services provided and policies affecting those; perceived user behaviors regarding these barriers; and suggestions for improvements.

The semi-structured interviews with public general hospital providers included both quantitative, fixed-response questions and qualitative open-ended questions. Domains explored either through fixed-response or open-ended questions included KAP regarding TB, its symptoms, diagnostic algorithms (such as skin tests, sputum testing, chest x-rays, etc.), treatment (including DOTS), health facility procedures, provincial and national policies, training received, and counseling skills; patient mix, types and quality of services provided as they relate to seeing people with presumptive TB or TB cases, frequency of diagnostic tests requested and timeliness of specimen processing by laboratories, and referral procedures; system barriers such as policies, payments, insurance, location, or availability of services, referral processes, and interface between public and private systems; stigma and gender bias; and suggestions for improvements.

A short, self-administered questionnaire was given to commune TB focal persons that utilized quantitative, fixed-response questions to assess KAP regarding TB, its symptoms, diagnostic algorithms (such as skin tests, sputum testing, chest x-rays, etc.), and treatment (including DOTS); health facility procedures; provincial and national policies; training received; and counseling skills; explored the structure of services, role of the commune in detection and referral of people with presumptive TB, system barriers such as payments, insurance, location, or availability of services, referral processes and interface between public and private systems, and stigma and gender bias; and probed through qualitative open-ended questions regarding perceived or actual barriers (system, structural, policy) to the access and use of the TB services provided, policies affecting services, perceived user behaviors regarding these barriers, and suggestions for improvements.

We conducted a short, structured interview with private providers utilizing quantitative, fixed-response questions focusing on their expected role and actual practices. Domains explored included

KAP regarding TB, its symptoms, diagnostic algorithms (such as skin tests, sputum testing, chest x-rays, etc.), treatment (including DOTS), and national policies; patient mix, types and quality of services provided as they relate to seeing people with presumptive TB or TB cases, and referral procedures; system barriers such as policies, payments, insurance, location, or availability of services, and referral processes and interface between public and private systems; stigma and gender bias; and suggestions for improvements.

Private pharmacy workers were given a short, self-administered questionnaire that utilized quantitative, fixed-response questions to assess KAP regarding TB, its symptoms, diagnostic algorithms (such as skin tests, sputum testing, chest x-rays, etc.), provincial and national policies, training received, structure of services, role of the pharmacy worker in detection and referral of people with presumptive TB, perceived system barriers such as payments, insurance, location, or availability of services, referral processes, and interface between public and private systems.

Survey instruments were pretested in the field and revised for clarity and accuracy prior to study implementation. All interviews were conducted by experienced researchers from the Center for Creative Initiatives in Health and Population (a local nongovernmental organization), Thai Nguyen Medical University, Khanh Hoa Preventive Medicine Center, Ho Chi Minh City College of Social Sciences and Humanities, and the Mekong Delta Development Research Institute, and trained interviewers who were public health students of Thai Nguyen Medical University.

Training for data collection teams was conducted over nine days, three days in each province. The training covered an overview of the study protocol, ethics, introduction of the TB program and service delivery system in each province, and interview and notetaking skills, and included role play, questionnaire familiarity, and informed verbal consent protocol. Each province had a research coordinator and three supervisors (one for each district), who conducted daily reviews of the activities and debriefed with interviewers to answer questions and resolve any problems that may have occurred during that day's data collection. Data were collected over a period of six weeks from April to June 2012.

Table 2 provides a summary of the areas of inquiry by study population.

Table 2. Areas of inquiry by study population.

Population	Data collection themes
People with presumptive TB	KAP Care-seeking for TB symptoms and diagnostic services Use of private and public services for TB diagnosis and/or treatment Barriers in accessing diagnostic services Stigma and gender bias Community support and norms Suggestions for improvements
TB cases	KAP Care-seeking for TB symptoms and diagnostic services Use of private and public services for TB diagnosis and/or treatment Barriers in accessing diagnostic services Stigma and gender bias Community support and norms Suggestions for improvements

Population	Data collection themes
Public TB service providers at the district and provincial levels	KAP Provincial and national policies Training and skills; quality of services Health facility procedures and services TB diagnostic algorithms and treatment Referral procedures and interface with the private sector Barriers (structural, system, policy) in access to or use by patients Stigma and gender bias Suggestions for improvements
Public non-TB service providers (general hospitals) at the district and provincial levels	KAP Provincial and national policies Training and skills; quality of services Health facility procedures and services TB diagnostic algorithms and treatment Referral procedures and interface with the private sector Barriers (structural, system, policy) in access to or use by patients Stigma and gender bias Suggestions for improvements
TB focal persons at commune health centers	KAP Provincial and national policies Training and skills Health facility procedures and services TB diagnostic algorithms and treatment Referral procedures and interface with the private sector Barriers (structural, system, policy) in access to or use by patients Stigma and gender bias Suggestions for improvements
Registered private providers in communes in selected districts	KAP Provincial and national policies Training and skills Health facility services TB diagnostic algorithms and treatment Referral procedures and interface with the public sector Barriers (structural, system, policy) in access to or use by patients Suggestions for improvements
Pharmacy workers at registered pharmacists in communes in selected districts	KAP Provincial and national policies Training and skills TB diagnostic algorithms Referral procedures and interface with the private sector Barriers (structural, system, policy) in access to or use by patients Suggestions for improvements

Data management and analysis

Quantitative data were entered into Epidata and exported for analysis into SPSS software. Composite measures were created from questions related to knowledge, attitudes, stigma, and gender bias. For knowledge, several different measures were generated covering knowledge of disease (5 item score), knowledge of symptoms (9 item score), knowledge of transmission and prevention (3 item score), knowledge of specific prevention methods (6 item score), and overall knowledge of the most important items for TB (7 item score).

We generated an attitudes score from 44 different questions that probed perceptions of attitudes within the community and by the respondent toward a TB diagnosis and persons with or suspected of

having TB. Responses suggesting positive attitudes were assigned -1, and those suggesting negative attitudes were assigned +1. A total attitude score was tabulated from all 44 questions and a scale of attitude was created by which respondents with scores of ≤-3 were considered as having generally positive attitudes toward people with TB, scores between -2 and +2 were categorized as neutral, and respondents with a composite score of ≥+3 were considered as having generally negative attitudes.

Stigma was measured using a subset of 33 questions from the 44 attitude questions and scaled similarly: negative and positive values were assigned for each question, scores were totaled, and composite scores ranked on the same scale as attitudes. All questions regarding attitudes and stigma were obtained from previous TB surveys.

There were four specific questions that directly measured bias against either women or men. Each response suggestive of bias was given 1 point, and the total across the four questions was tallied for the composite bias score. A scale was derived whereby a composite bias score of 0-1 was classified as no or weak bias and 2-3 was classified as medium to strong bias. As with the stigma and attitudes composite variables, questions measuring bias were adapted from other TB surveys.

The classifications of poor, near poor, and not poor were defined per Socialist Republic of Vietnam Decree No. 09/2011/QD-TTg, as follows: poor (rural household monthly income <400,000 Vietnamese dong [VND] per person, urban <500,000 VND per person); near poor (rural 401,000-520,000 VND per person, urban 501,000-650,000 VND per person).

Qualitative data were generated from transcribed field notes of interviews with providers or from responses to open-ended questions on self-administered questionnaires, or from responses from open-ended questions completed by trained interviewers with TB cases and people with presumptive TB.. A codebook of themes and subthemes was created and textual data management software (Nvivo) was used to code qualitative data to these themes. Coded qualitative data were then synthesized using inductive techniques and reviewed by two researchers for consistency. Where appropriate, additional quantitative frequencies were generated from qualitative data to tabulate the magnitude of specific comments made on various themes and subthemes. Because this was not a comparison study, no statistical testing was performed.

Ethical considerations

The study protocol was reviewed and approved by the NTP. The PATH Research Determination Committee (USA) determined the study did not meet the US federal definition of research, as it did not systematically collect generalizable information to test a research hypothesis, but used convenience samples from different populations to inform improvements or changes to an existing public health program, namely the NTP.

Verbal consent was obtained from people with presumptive TB, TB cases, public TB providers, and public non-TB providers at the provincial and district levels, and private providers at the commune level who agreed to respond to the study questionnaire. A short verbal consent statement was read by the interviewer prior to asking any study questions and documentation that consent was received was noted on each record.

Results

The results were organized around two principal themes: health care-seeking behavior of people with presumptive TB and TB cases and barriers identified to access and use of TB diagnostic services. Due to the descriptive nature of this study and the sample size, data are presented in aggregate for all study populations. Select data tables for each province have been included on pages 34–42 as a reference, but inference or comparisons between provinces is not recommended, as the study was not designed or powered for such an analysis.

General characteristics of study populations

Characteristics of the study populations are provided in Table 3. Among the nearly 400 TB cases interviewed, the average age was 46 years, about one-half had completed secondary school or higher, 14% identified as poor (per government classifications), and almost 20% lived more than 10 km away from the nearest district health facility (the first level of primary diagnostic services for TB). Persons with presumptive TB, numbering nearly 1,100, were on average 44 years of age, almost 70% had completed secondary school, 10% identified as poor, and 10% lived more than 10 km from the nearest district health facility. Information regarding educational status, poverty level, and distance to a TB facility are not routinely collected by the NTP for cases detected and diagnosed or for people with presumptive TB who are tested, so we cannot conclude whether the TB cases and people with presumptive TB in this study are broadly representative of those currently in contact with the TB care system.

Table 3. General characteristics of study participants with TB and presumptive TB.

	TB cases N = 398 (%)	Presumptive TB N = 1,092 (%)
Sex		
Male	305 (77)	636 (58)
Female	93 (23)	456 (42)
Age (mean)	*46.1 years*	*44.2 years*
Education		
<Primary	89 (22)	105 (10)
Completed primary	112 (28)	252 (23)
Completed secondary	111 (28)	324 (30)
Completed high school	56 (14)	249 (23)
Completed college or higher	30 (8)	162 (15)
Marital status		
Married	284 (71)	775 (71)
Unmarried	78 (20)	261 (24)
Other (divorced/separated/widowed)	36 (9)	55 (5)
Main job		
Government staff	12 (3)	56 (5)
Staff of private sector	18 (5)	76 (7)
Small business/seasonal worker	126 (32)	294 (27)
Farmer	91 (23)	227 (21)
Worker	29 (7)	105 (10)
Student	12 (3)	63 (6)
Retired	23 (6)	118 (11)
Unemployed	48 (12)	104 (10)
Other	39 (10)	49 (5)

	TB cases N = 398 (%)	Presumptive TB N = 1,092 (%)
Poverty status*		*n = 464 (42)*
Poor	56 (14)	47 (10)
Near poor	30 (8)	22 (5)
Not poor	312 (78)	395 (85)
Distance, home to district health center	*n = 396 (99)*	*n = 1,085 (99)*
<1 km	36 (9)	140 (13)
1-5 km	197 (50)	667 (62)
5-10 km	86 (22)	172 (16)
>10 km	77 (19)	106 (10)
Province (of recruitment)		
Thai Nguyen	98 (25)	351 (32)
Khanh Hoa	120 (30)	233 (21)
Ho Chi Minh City	180 (45)	508 (47)

*Defined per Socialist Republic of Vietnam Decree No. 09/2011/QD-TTg, as follows: poor (rural household monthly income <400,000 VND per person, urban <500,000 VND per person); near poor (rural 401,000-520,000 VND per person, urban 501,000-650,000 VND per person).

We interviewed 18 public TB providers and 46 other providers in the public system who were not specifically providers of TB services. For the public TB providers, nearly all were older than 40 years of age, split equally between men and women, and were ranked as assistant doctors or higher. The public non-TB providers were slightly younger on average—42 years old—but also equally split between men and women, and about half were either vice head or head of their respective departments.

At the commune level, the TB focal persons interviewed numbered 100 in total, with a mean age of 41.5 years, and three-quarters were women. More than 90% of the TB focal persons had completed college-level education or higher, with half working as assistant doctors and 40% as nurse/midwives, and others were either doctors, technicians, or secondary pharmacists.

Private providers and pharmacy workers in the community were also interviewed (200 of each). Private providers were overwhelmingly men (73%), around 52 years of age, with a university or higher education. More than 80% of pharmacy workers were women, averaging 36 years of age, and highly educated (93% had completed college or higher).

Health care-seeking behaviors of TB cases and people with presumptive TB

We found that health care-seeking behaviors of TB cases and people with presumptive TB were complex and varied. Symptoms and services received were reported differently between the two populations (Tables 4 and 5).

Table 4. Symptoms reported prior to TB diagnosis.

	TB cases N = 398 (%)	Presumptive TB N = 1,092 (%)
Reported at least one TB symptom	384 (96)	1,050 (96)
Self-reported TB symptoms (in order of overall frequency)		
Cough >2 weeks	200 (50)	449 (41)
Exhaustion	126 (32)	423 (39)
Chest pain	114 (29)	410 (38)
Hemoptysis (cough with blood)	79 (20)	344 (32)
Weight loss	75 (19)	158 (15)
Difficulty breathing/dyspnea	72 (18)	137 (13)
Loss of appetite	61 (15)	114 (10)
Fever >1 week	62 (16)	106 (10)
Night sweats	33 (8)	41 (4)
Total number of TB symptoms reported		
None	14 (4)	37 (3)
One	63 (16)	159 (15)
Two or three	201 (51)	586 (54)
Four or more	120 (30)	310 (28)

Table 5. Services received prior to TB diagnosis.

	TB cases N = 398 (%)	Presumptive TB N = 1,092 (%)
Before you attended a TB facility for diagnosis, any previous diagnostic tests?		
Smear test (yes)	54 (14)	139 (13)
→ number of tests	Of the 54 who reported smear test, 57% had at least one test done	Of the 139 who reported smear test, 87% had at least one test done
→ location of test	*n = 52 (96)*	*n = 133 (96)*
Commune health center	0 (0)	1 (1)
District TB facility	7 (13)	19 (14)
Provincial TB hospital	16 (30)	43 (31)
Provincial general hospital	14 (26)	20 (14)
District general hospital	10 (19)	37 (27)
Private hospital	3 (6)	9 (7)
Private clinic	2 (4)	4 (3)
X-ray (yes)	209 (53)	560 (51)
→ number of tests	Of the 209 who reported x-ray, 79% had at least one done	Of the 560 who reported x-ray, 86% had at least one done
→ location of test	*n = 206 (99)*	*n = 543 (97)*

	TB cases N = 398 (%)	Presumptive TB N = 1,092 (%)
Commune health center	1 (<1)	0 (0)
District TB facility	7 (3)	43 (8)
Provincial TB hospital	13 (6)	52 (9)
Provincial general hospital	61 (29)	101 (18)
District general hospital	52 (25)	196 (35)
Private hospital	29 (14)	98 (18)
Private clinic	43 (21)	53 (10)
Blood test (yes)	115 (29)	349 (32)
→ location of test	*n = 109 (95)*	*n = 324 (93)*
Commune health center	0 (0)	0 (0)
District TB facility	2 (4)	26 (7)
Provincial TB hospital	11 (10)	38 (11)
Provincial general hospital	37 (32)	71 (20)
District general hospital	29 (25)	113 (32)
Private hospital	19 (17)	58 (17)
Private clinic	11 (10)	18 (5)
Were you referred to the facility where you were diagnosed with TB?		
No one referred me	203 (51)	698 (64)
Among those reporting referral, referred by:	*n = 193 (48)*	*n = 393 (36)*
Commune health center	19 (5)	10 (1)
District TB facility	15 (4)	44 (4)
Provincial general hospital	49 (12)	64 (6)
District general hospital	41 (10)	138 (13)
Private clinic/hospital	38 (10)	85 (8)
Pharmacy	2 (<1)	4 (<1)
Traditional healer	0	2 (<1)
Other	29 (7)	46 (4)

How TB cases and people with presumptive TB sought care was strikingly similar (Table 6). By and large, going to a TB facility, either at the district or provincial level, was not the first response to symptoms. Typically, patients either did nothing or self-treated at home, or they went to a pharmacy. For TB cases interviewed, more than half did nothing or self-treated at home, while another third went to a pharmacy; a pattern similarly found among those with presumptive TB. However, 37% of persons with presumptive TB went to a TB facility as their second action and another 19% went to either the district or provincial general hospital. Of TB cases, only 20% went to a TB facility as their second action, while another 21% went to the district or provincial general hospital. TB cases tended to attend TB facilities as their third or fourth action. How long individual TB cases and people with presumptive TB waited after noticing their symptoms before taking the action steps in Table 6 was as varied as the total number of participants in the study; no clear pattern emerged. Because of this, data on the specific number of days between the first and second action, second and third action, etc., cannot be computed. However, what might be of more importance is the exact sequence of events in terms of how TB cases and persons with presumptive TB seek out different facilities for services related to the symptoms they are experiencing—noting that doing nothing or self-treating at home was the most common reaction to symptoms, after which seeking treatment was sought from pharmacies. Attendance at a health facility itself was rarely the first response to symptoms.

Table 6. Actions taken after noticing TB-like symptoms.

TB cases	When did you go?				
Where did you go?	**First N = 398**	**Second N = 387**	**Third N = 285**	**Fourth N = 140**	**Fifth N = 41**
Did nothing/self-treated at home	208 (52)	50 (13)	39 (14)	14 (10)	1 (2)
Pharmacy	127 (32)	80 (21)	15 (5)	5 (4)	1 (2)
Private clinic/hospital	20 (5)	52 (13)	32 (11)	8 (6)	1 (2)
Commune health center	13 (3)	26 (7)	3 (1)	3 (2)	1 (2)
District/provincial general hospital	20 (5)	82 (21)	63 (22)	22 (16)	9 (22)
District/provincial TB facility	5 (1)	77 (20)	118 (41)	76 (54)	27 (66)
Other	5 (1)	20 (5)	15 (5)	12 (9)	1 (2)
Persons with presumptive TB	**When did you go?**				
Where did you go?	**First N = 1,092**	**Second N = 1,065**	**Third N = 1,063**	**Fourth N = 294**	**Fifth N = 88**
Did nothing/self-treated at home	475 (44)	96 (9)	95 (9)	34 (12)	0
Pharmacy	308 (28)	167 (16)	19 (21)	9 (3)	0
Private clinic/hospital	60 (6)	119 (11)	48 (5)	13 (4)	2 (2)
Commune health center	80 (7)	43 (4)	10 (1)	2 (1)	0
District/provincial general hospital	93 (9)	206 (19)	81 (8)	31 (11)	7 (8)
District/provincial TB facility	49 (5)	393 (37)	443 (42)	200 (68)	78 (89)
Other	27 (2)	41 (4)	18 (2)	5 (2)	1 (1)

In terms of time to receive a diagnosis or attend at a TB facility for diagnosis, we found the mean number of days between symptoms and date of diagnosis was an average of 42 days (quartiles of 13 days, 23 days, and 42 days) for cases interviewed, and the mean number of days between symptoms and date of access to a public TB facility was 21 days for persons with presumptive TB (quartiles of 9 days, 15 days, and 28 days) (Table 7). Given the lack of a standard definition for "delayed care," we considered a three-week period as a "reasonable" care-seeking behavior for the symptoms mentioned by TB cases and people with presumptive TB. In this study, only one-third of those with presumptive TB presented delayed care-seeking, but more than half of TB cases did. However, the date of diagnosis for TB cases may not represent the date of access to a TB facility (as measured among persons with presumptive TB). Among the 68% of TB cases who indicated accessing a public TB facility (either at the district or provincial level), the mean number of days between symptoms and the first time they accessed the public TB facility was 35 days (quartiles of 14 days, 23 days, and 40 days).

Table 7. Time between first symptoms and date of diagnosis.

	TB cases N = 398 (%)	Presumptive TB N = 1,092 (%)
Time between first symptoms and date of diagnosis [TB cases] or date of access to TB facility [presumptive TB] (*mean*)	*n = 396 (99)* *42.3 days*	*n = 1,050 (96)* *21.4 days*
≤21 days (no delay) >21 days (delay)	194 (49) 202 (51)	713 (68) 337 (32)

When asked why they did not go to the TB facility sooner, most respondents (64% of TB cases and 44% of people with presumptive TB) indicated that they thought it was just a common illness (Table 8), and a further 23% of cases and 5% of persons with presumptive TB did not think they were experiencing TB. For the symptoms that TB cases and people with presumptive TB were experiencing (see Table 4 above), and within the context of other health challenges facing the general population in Vietnam, it is worthwhile to note that the actions reported in response to symptoms (e.g., did nothing, treated at home, sought over-the-counter medication from a pharmacy) might reflect what individuals consider as typical health care-seeking behavior. Both TB cases (12%) and people with presumptive TB (17%) stated that it was also difficult to find the time to go to a TB facility for diagnostic services.

Table 8. Reasons for not visiting a district or provincial TB facility earlier.

	TB cases N = 398 (%)	Presumptive TB N = 1,092 (%)
Among those whose first action was not going to a district or provincial TB facility	387 (97)	999 (91)
Thought it was just a common illness	247 (64)	438 (44)
Busy; hard to find the time	46 (12)	174 (17)
Long distance and no transportation	14 (9)	61 (6)
Had no money	30 (8)	52 (5)
Did not think it was TB	89 (23)	47 (5)
Had to follow insurance procedure	14 (4)	49 (5)
Other facility could not identify disease	23 (6)	28 (3)
Do not like check-ups	15 (4)	22 (2)
Did not know about TB	26 (7)	0 (0)

TB cases and those with presumptive TB were also asked about the services they received at the TB facility. As listed in Table 9, the majority of TB cases and people with presumptive TB underwent multiple tests appropriate for diagnosing TB. The lower proportion of persons with presumptive TB reporting smear tests could be the result of having received smear tests elsewhere, as the question only asked about receiving the smear test from the TB provincial hospital on the day they were recruited into this study. Not all respondents answered the questions on the costs of services, but in general, about half reported the tests were less than VND 100,000 and more than a third reported that insurance covered the costs of these tests.

Table 9. Services received at the time of TB diagnosis.

	TB cases N = 398 (%)	Presumptive TB N = 1,092 (%)
At the facility where you were diagnosed with TB, what diagnostic tests did you receive?		
Smear test (at least one)	367 (92)	781 (72)
X-ray	283 (71)	881 (81)
Blood test	326 (82)	706 (65)
Costs of all tests combined:	*n = 290 (73)*	*n = 913 (84)*
No cost	88 (30)	122 (13)
<100,000 VND (<US$4.72)	74 (26)	507 (56)
100-200,000 VND (US$4.72-$9.44)	58 (20)	160 (18)
>200,000 VND (>US$9.44)	70 (24)	124 (14)
Were tests covered by insurance? (yes)	140 (35)	420 (39)

Barriers to access to and use of TB diagnostic services

We report barriers to access to and use of TB diagnostic services along the cough to cure pathway (Academy for Educational Development, 2005). The barriers are collapsed into one of ten key themes. Results from both populations affected by TB (cases and presumptive TB) and the providers in the health system who were interviewed are presented together. This allows for themes to be explored across the different study groups, highlighting the differences and similarities between those seeking services and those providing them. Perspectives from these two groups do not always align, and combining results helps to illustrate that.

The results are not presented in order of magnitude, with the most significant or higher frequency reported barriers presented first. Therefore, the magnitude of each barrier will be explained within each section. In other words, whether the barrier was mentioned by a large number of respondents or just a few is contextualized for each barrier.

Results from quantitative survey data and qualitative probing data are also presented together, to triangulate our findings. Often, the qualitative text presented a theme that suggested it was highly important, but the quantitative data revealed only a few respondents mentioned the issue. Bringing these two types of data encourages nuanced reading of the findings.

Knowledge of TB symptoms

As noted in the methods section, knowledge of TB was measured for several dimensions and in several ways within the populations of TB cases and people with presumptive TB, as well as among the different types of providers. For TB cases and those with presumptive TB, there was very high general knowledge about any symptoms and prolonged cough as the most important symptom (Table 10). The vast majority of people surveyed (90% or more) knew at least five of the nine most common symptoms of TB.

Table 10. Knowledge of TB symptoms.

	TB cases N = 398	Presumptive TB N = 1,092	Private providers N = 200	Pharmacy workers N = 200	Commune TB focal persons N = 100	Public non-TB providers N = 46	Public TB pro-viders N = 18
Knew most important TB symptom (prolonged cough)							
	92%	89%	89%	93%	99%	100%	100%
Number of correctly identified symptoms							
0-1 correct	2%	2%	4%	1%	1%	0%	0%
2-4 correct	9%	10%	10%	8%	9%	6%	6%
5-7 correct	39%	35%	27%	31%	45%	22%	17%
8-9 correct	51%	52%	59%	60%	45%	72%	78%

Both TB cases and those with presumptive TB had quite high knowledge of the transmission and prevention of TB, with 83% of TB cases and 90% of persons with presumptive TB correctly identifying two to three (out of three) of the survey questions exploring this domain. Similar questions were not asked of the providers.

The relationship between knowledge of symptoms more generally and the personal experiences of TB cases and people with presumptive TB with their own symptoms is encapsulated in some of the qualitative responses to open-ended questions about this domain. Some respondents mentioned that they did not know they had contracted TB until they had a routine health check-up with a chest x-ray suggestive of TB.

> I thought TB must have a long cough and fever for several months. I thought I was okay so I didn't go [to TB facility] earlier. [Person with presumptive TB]
>
> *Tôi nghĩ bệnh lao phải ho mấy tháng liền, sốt nhiều. Tôi nghĩ mình bình thường, nên không đến ngay.*
>
> I thought it was 'normal' dyspnea so I didn't think of seeking care. Over a week I did not get better, [so] I suspected I may have TB and decided to go to Pham Ngoc Thach Hospital. [Person with presumptive TB]
>
> *Nghĩ là khó thở 'bình thường', nên chủ quan không đi khám. Sau 1 tuần không đỡ mới nghi ngờ bị lao và đến Bệnh viện Phạm Ngọc Thạch khám.*
>
> I didn't know I had TB, so I did not go to any hospital. Until getting a health check-up at An Phu Hospital (organized by my company) I was told that I have TB, and they referred me to Pham Ngoc Thach Hospital. [Person with presumptive TB]

Tôi không biết mình bị lao, nên đầu tiên không đi bệnh viện nào cả. Đến khi đi khám sức khỏe định kỳ tại BVAn Phú (do công ty tổ chức) thì họ nghi tôi bị lao, nên giới thiệu tôi đến Bệnh viện Phạm Ngọc Thạch.

When providers were asked why they thought patients might delay seeking a diagnosis, they mentioned that it might be because patients are not aware of the symptoms of TB. They suggested that the initial symptoms patients experience might lead them to conclude they have a common disease, such as the flu, and first go to a pharmacy for medication or to a traditional healer or a private clinic. They reported that patients often come to a TB facility when they have had a fever for a long time or chest pain, or they are coughing up blood.

Most patients come late, often after two months or more from onset. They only come when having long cough and fever. They don't think they get TB so they often buy drugs for self-treatment or go to private clinics. When having coughed up blood, long fever, chest pain they worry, and go to hospital. [Provincial TB provider]

Đa số bệnh nhân đến muộn, thường muộn từ 2 tháng trở lên. Ho, sốt kéo dài mới đến. Họ không nghĩ là bị mắc lao, họ thường tự mua thuốc điều trị hoặc đi khám tư nhân. Khi ho ra máu, sốt kéo dài, tức ngực mới thấy sợ, mới đi khám bệnh viện.

The perception of the providers interviewed that patients do not know the symptoms of TB was not borne out by either the quantitative or qualitative data for TB cases and people with presumptive TB in this study, who clearly showed high levels of knowledge about important and varied symptoms of TB (Table 10). Therefore, it seems that knowledge of symptoms per se was not a barrier to access; however, the perceptions among patients who are experiencing TB symptoms is worth noting. This dynamic could come from a place of perceived risk for TB; people know about it, but do not think it will happen to them. Qualitative data from interviews with TB cases and persons with presumptive TB seemed to support this dynamic: 62% of TB cases and 40% of people with presumptive TB reported they did not think they could get TB and had not thought their symptoms, although TB like, were TB, so it may not be knowledge that is a barrier but rather self-awareness of personal risk.

Knowledge of TB care and cure

Lack of information on TB service delivery facilities has previously been identified as a barrier to early access to TB diagnostic services among TB cases and people with presumptive TB (Lönnroth et al., 1999 and 2001; Huong et al., 2007; Hoa et al., 2011). This may be particularly true for temporary migrants in big cities like Ho Chi Minh City, and may have a negative consequence on persons with presumptive TB seeking care in the private sector for their undiagnosed TB symptoms.

When our study asked TB cases and people with presumptive TB where someone could go to obtain TB diagnostic services, 94% of TB cases and 95% of people with presumptive TB correctly identified the district or provincial TB facility. However, a couple of patients mentioned not knowing where to go for services, as reflected in the comments below:

I did not know which hospital was for TB in this city so I just went to the best hospital for health care. [TB patient]

Tôi không biết bệnh viện nào chuyên trị lao ở thành phố này, chỉ đi tới bệnh viện tốt nhất thành phố để chữa bệnh.

I did not know where the appropriate place for health care was, so I decided to go to a private clinic to save time. [TB patient]

Không biết nơi khám chữa bệnh nào là đúng, nên khám phòng khám tư cho nhanh.

Some TB providers and non-TB providers commented that many patients might delay accessing public TB diagnostic services due to lack of information on NTP policies, such as free TB services and registration for TB treatment (for migrants), believing that it would be costly to use TB services, particularly for those without health insurance coverage.

> Many people lack information on TB care and free TB services. They think that it will cost a lot of money so don't dare to go. [Non-TB public provider]
>
> *Nhiều người không biết thông tin khám chẩn đoán lao, điều trị lao là miễn phí. Họ cứ nghĩ là sẽ tốn nhiều tiền nên không đi ngay.*
>
> Those who don't have [health insurance] think that it will be costly so they hesitate to go. Those who have insurance go to commune health station, but are administered for treatment. If the patients leave for higher level, they are only eligible for 50% of health insurance coverage. In this regard, many patients don't dare to leave for higher level. [Non-TB public provider]
>
> *Người không có bảo hiểm thì nghĩ là phải chi phí nhiều, nên họ không đi ngay. Còn người có bảo hiểm, qua tuyến xã phường có thể không cho đi bị giữ lại điều trị. Nếu bệnh nhân bỏ, vượt tuyến lên trên thì họ chỉ được hưởng bảo hiểm 50%, nên nhiều người cũng không dám bỏ để đi tuyến trên.*
>
> People don't know that they can register for TB treatment anywhere [in Vietnam]. They suppose that they need to register as permanent residents [locally] to get TB treatment, and wonder if temporary residents are eligible for TB treatment. Patients don't know where to go for TB care. [Private provider]
>
> *Họ không biết lao có thể điều trị ở bất cứ nơi nào. Họ cứ tưởng phải có hộ khẩu, những người tạm trú không biết là có được điều trị lao. Người bệnh không biết tìm đến các cơ sở nào để chẩn đoán.*

Providers also observed that patients sometimes may not be aware that TB is a curable disease, or how it is treated and prevented. However, data from TB cases and persons with presumptive TB presented earlier seems not to bear this out.

Stigma related to TB diagnosis

Fear of being stigmatized has been noted in other studies as a barrier to accessing TB diagnostic services (Hoa et al., 2009; Long et al., 2001). This stigmatization may result in a sense of inferiority and experience of isolation or rejection. This theme was picked up by a few respondents to the qualitative questions.

> Since I get TB, my wife eats separately and uses utensils separately. I had to buy other utensils for myself. [TB patient]
>
> *Từ khi bị lao, vợ ăn riêng, dùng riêng đồ đạc, nên phải mua sắm đồ đạc khác.*
>
> Some people who fear of being identified as TB delay seeking care…because they are afraid that they will be isolated by others. They wait until weight loss is manifested and then are taken by their family to a health facility and found that they have got TB. These cases often come very late after several months from onset, and their clinical signs are obvious, and their chest x-ray features are clearly suggestive TB. [Non-TB public provider]
>
> *Một số người sợ bị xác định là lao nên cũng trì hoãn đi khám…vì sợ bị người khác xa lánh. Đến khi có các dấu hiệu gầy sút, gia đình mới đưa đi khám thì mới phát hiện là đã mắc lao.*

Những trường hợp này thường đến rất muộn, hàng vài tháng sau khi có bệnh… và khi đó các dấu hiệu lâm sàng rõ, x quang rõ hình ảnh lao.

Stigma specifically associated with a diagnosis of TB was explored in a series of quantitative questions with TB cases and people with presumptive TB, based on previous surveys. A negative-to-positive stigma scale was developed from these questions: the higher the positive score, the more stigma presented itself in the response. Only 3% of TB cases gave responses that suggested they harbored feelings of stigma related to their TB diagnosis. Among people with presumptive TB, about 7% provided responses with indications of personal stigma. A total of 41% of TB cases and 30% of people with presumptive TB gave neutral responses, and the rest—57% of TB cases and 64% of people with presumptive TB—displayed no attitude of stigma related to their TB diagnosis (Table 11).

Table 11. Perceptions of stigma.*

Respondent group	No stigma attitude		Neutral stigma attitude	Stigma attitude		Mean score
	<-6	-6 to -3	-2 to +2	+3 to +6	>6	
TB cases	22 (6)	201 (51)	165 (41)	10 (3)	0 (0)	-2.6
Presumptive TB	197 (18)	499 (46)	328 (30)	63 (6)	5 (<1)	-3.4

*Stigma scale: 33 items; range: -16 to +17; low score indicates less stigma.

Attitudes about health services and health care providers

TB cases and people with presumptive TB were asked about their experience with the TB services they received for their diagnosis. For TB cases, this was asked about the services in the past that led to their diagnosis, and for those with presumptive TB, this was asked about the services they were receiving the day they participated in this study, as almost all were recruited from the provincial TB hospital at the time they were being confirmed as TB or not TB. Both TB cases and people with presumptive TB had gave generally positive responses regarding satisfaction with the services, and a small percentage reported being both satisfied and unsatisfied (Table 12). On the whole, the positive attitude of staff was the most frequently cited reason for satisfaction. Other items of importance were clear and sufficient information, short waiting time, quality of the service, and quick check-in procedure.

Table 12. Satisfaction with TB diagnostic services.

	TB cases N = 398 (%)	Presumptive TB N = 1,092 (%)
Were you satisfied with the service you received?		
Yes	80%	67%
No	4%	13%
Yes and no	15%	12%
Why were you satisfied with the services?	*n = 378* (95%)*	*n = 863* (79%)*
Good attitude of staff	70%	70%
Clear/sufficient information provided	25%	27%
Waiting time was not too long	17%	10%
Quick check-in procedure	7%	9%
Quality of the service	19%	8%
Clean facility	7%	0%
Low cost	4%	0%

What were you dissatisfied with?	n = 74 (19%)	n = 269 (25%)
Long wait time	39%	48%
Poor attitude of staff	32%	32%
Difficult check-in procedure	3%	16%
Poor quality of service	14%	0%
Poor quality of facility	15%	0%
Poor information provided	0%	6%

*Respondents who indicated they were both satisfied and dissatisfied with the services were included in both the reasons for satisfaction and non-satisfaction totals.

The main reasons for not being satisfied with the services were long wait time, poor attitude of staff, poor quality of the facility, and difficulties with the check-in procedure. There were a few TB cases who reported dissatisfaction with the quality of the service or the facility, but no one with presumptive TB reported these. A few qualitative responses from this group are provided below to illustrate some items of dissatisfaction with the services they received.

> Hospital is so 'dirty!' That's why I don't want to go there. [Person with presumptive TB]
>
> *Lên bệnh viện 'bẩn', nên tôi không muốn đi.*
>
> You are sick, but if you don't give money "under-the-table" for the doctors, [then] no one will like you or give you good care. [Person with presumptive TB]
>
> *Mình có bệnh, nhưng không có tiền bồi dưỡng cho bác sĩ thì người ta không thích.*
>
> Health care workers are not enthusiastic to educate patients…treat the poor badly, [and] may think that those patients have no money to pay [for health care]. [Person with presumptive TB]
>
> *Nhân viên y tế không nhiệt tình chỉ dẫn, đối xử không tốt, kỳ thị người nghèo, làm như bệnh nhân không có tiền trả.*

A few providers also noted that the "bad attitude of health care providers" could be a factor in people seeking care for TB symptoms at public TB facilities.

Social and gender norms

A series of questions posed to TB cases and people with presumptive TB explored the issue of possible gender bias in feelings related to being diagnosed with TB or being likely to get TB. Some studies have suggested that gender bias could prevent women from seeking care (Huong et al., 2007; Thorson et al., 2004; Long et al., 1999). However, our data did not support this. A bias composite score was created for each respondent, scaled from zero (no gender bias) to three (strong gender bias). Both biases against women and biases against men were explored. Table 13 summarizes these results, which show strikingly no bias against women but rather a slight bias against men among both TB cases and people with presumptive TB.

Table 13. Gender bias among TB cases and people with presumptive TB .

	TB cases N = 398 (%)	Presumptive TB N = 1,092 (%)
Bias present against women		
0-1 – absent of bias or weak bias	366 (92%)	1,074 (98%)
2-3 – medium to strong bias	32 (8%)	18 (2%)
Bias present against men		
0-1 – absent of bias or weak bias	321 (81%)	944 (86%)
2-3 – medium to strong bias	77 (19%)	148 (14%)

The qualitative data explored this issue in more depth, and what emerged was not necessarily a bias against a particular gender, but rather a perception of the consequences of TB for one gender versus another and what that meant. For example, women were noted to do the housework, take care of the family (husband and children), and work hard, as well as being less likely to socialize, drive, or have economic autonomy. For these reasons, women may be less likely to seek care for an illness.

> Women manage household and do housework. If women get TB, it would be a burden for the husband and children to handle this. The husband is not as good as the wife to manage the household. Women work hard and are less likely to seek health care. [TB patient]
>
> *Đàn bà tề gia nội trợ! Nếu đàn bà bị lao lại trút hết công việc lên chồng con, chồng quán xuyến gia đình không thể bằng vợ được, đàn bà làm việc vất vả nên ít đi khám bệnh.*
>
> Women fear going to health facility, and fear that if she gets TB, her husband and children would be affected, her husband may leave her, and her children may neglect her. [TB patient]
>
> *Phụ nữ sợ đến nơi khám bệnh, sợ phát hiện ra bệnh lao sẽ ảnh hưởng đến chồng con, chồng bỏ, con cái hắt hủi.*

The possible gender inequities between men and women were not explored deeply with providers; however, one provider did note the following:

> If the wife had TB, the husband would not have given thoughtful and good care to her. Vice versa: if the wife had a husband with TB, she would have cared for him thoroughly. [Non-TB provider]
>
> *Vợ bị lao thì chồng không chăm sóc tốt, không chu đáo, không để ý đưa vợ đi khám, còn phụ nữ có chồng bị lao thường phải lo toan từ những cái rất là nhỏ.*

This could reflect a perception of the social norms in Vietnam: women have primary responsibility for caregiving in the household, a perspective reflected above in the remarks from people with presumptive TB. Whether this reflects actual bias is inconclusive.

Time to, cost of, and distance to a TB facility

Time, cost, and distance to services are inter-related contingencies, all of which affect access to and use of TB diagnostic services (Hoa et al., 2009). The quantitative reasons for not seeking care sooner were presented in Table 8 above. Finding the time to go for care was mentioned as a barrier by 12% of TB cases and 17% of those with presumptive TB. Long distance or lack of transport was mentioned by less than 10% of TB cases and people with presumptive TB interviewed, and lack of money was mentioned even less frequently. These issues are not nonexistent, but the magnitude may not be as great as for other issues, such as patients' perception that their symptoms were not TB because they did not perceive themselves as at risk of TB.

These dimensions of access to TB diagnostic services were also explored qualitatively with TB cases and people with presumptive TB. The frequency of these issues being mentioned in qualitative responses was similar to those quantified in the survey. For example, 8% of cases and 5% of people with presumptive TB mentioned financial constraints to seeking services as a barrier, and 4% of cases and 6% of people with presumptive TB mentioned difficulty in transport or distance to a service provider as a barrier. Their concerns related to these matters can be ascertained from reading some selected quotes below:

> I am very busy. As worker, if I took leave, my salary would be subtracted. Thus, I don't want to go to hospital back and forth. [Person with presumptive TB]

Công việc bận rộn, làm công nhân khi nghỉ thì bị trừ lương, nên không muốn đến BV khám nhiều lần.

I couldn't be able to travel by myself so I have to rely on my children. But, they are too busy so it takes time for me to wait for their arrangement of my travel for health care. [TB patient]

Tôi không tự đi lại được, phải nhờ các con. Chúng nó bận quá nên mãi mới thu xếp cho tôi đi khám được.

I don't have insurance so I have to pay a lot for hospital fees. [TB patient]

Tôi không có bảo hiểm, nên phải chi trả viện phí nhiều.

Some TB providers also reflected that the costs of services may be too high for some patients and thus may deter them from seeking care. They listed which costs are covered by the NTP and which costs patients have to pay out of pocket if they do not have health insurance to cover the expense.

Free TB treatment fees [paid by NTP], including hospital bed, drugs [anti-TB drugs], chest x-ray and sputum smear tests are only covered for the patients who have smear-positive TB diagnosis. However, patients still have to pay for their food, other drugs. Those who are diagnosed as drug-resistant patients have to buy and pay for anti-TB drugs by themselves. Economic hardship is a barrier for people to seeking care at health facility because they are afraid of the cost of health care. [TB provider]

Miễn phí điều trị lao chỉ miễn phí giường, thuốc, X quang phổi, xét nghiệm đờm cho bệnh nhân có chẩn đoán dương tính, còn tiền ăn, tiền thuốc khác, bệnh nhân phải tự trả. Nếu là bệnh nhân kháng thuốc thì họ sẽ phải mua thuốc ngoài và tự trả hoàn toàn. Kinh tế của người dân khó khăn, cản trở việc họ đi khám sớm. Đi khám sớm, sợ mất chi phí.

Without insurance, it costs about VND 500,000 for a TB suspect who has to take sputum smear tests twice, a chest x-ray, and 14 days of antibiotic treatment in order to confirm TB or not. It is quite a significant [amount] for the poor. To confirm TB…it may cost much more because many other tests are required. [TB provider]

Nếu không có bảo hiểm, một trường hợp nghi lao xét nghiệm 2 lần, chụp X quang và điều trị kháng sinh 14 ngày thì mất khoảng 500.000 đồng để loại trừ trước khi chẩn đoán. Chi phí này cũng có thể là khó khăn với nhiều người nghèo. Nếu chẩn đoán loại trừ u với lao thì chi phí còn cao hơn nữa vì phải làm nhiều xét nghiệm khác.

Co-location or short distances between facilities for diagnostic services may ease barriers to access, as explained by a provider in Khanh Hoa:

If district TB unit is part of the district hospital, it will be convenient for patients to get TB examination, testing, diagnosis, and treatment, but it is a [management] burden for the hospital. However, if district TB unit belongs to the district health center, it won't be convenient for patients to get TB examination, diagnosis, and treatment. [Non-TB public provider]

Nếu để Tổ lao cho Bệnh viện huyện quản lý thì bệnh nhân lao có thuận lợi về khám, xét nghiệm, chẩn đoán và điều trị, nhưng nặng gánh cho bệnh viện. Còn nếu trả Tổ lao về Trung tâm y tế thì không thuận cho bệnh nhân trong việc khám chẩn đoán và điều trị.

Linkages between private and non-TB public providers and TB facilities

Interviews with providers in both the public and private sectors explored the collaborations and linkages between the two, as lack of coordination between public TB facilities and private providers

has been found in previous studies as a possible barrier to access to public TB diagnostic services (Buu et al., 2003; Hoa et al., 2011; Lönnroth et al., 1999; Lönnroth et al., 2001). As noted earlier, TB cases and people with presumptive TB often self-treat at home or go to a pharmacy for medication as a first response to their symptoms. Therefore, pharmacies and private providers are put in the position of being the first contact people with presumptive TB have with health services.

The dynamic of attendance by patients across these two systems as well as the referral processes between the public and private health sectors is captured in a number of quotes below. Although not an exhaustive list of responses, these statements are representative of the common themes mentioned by providers. Directionality of the referring behavior was commonly mentioned, either from the public provider in what they expect the private provider to do or the private provider in how they can manage the process.

> There is no actual linkage…. More often, they [private providers] keep patients for treatment. They only refer patients to me [TB facility], if adverse drug events occur or the patients run out of money. [TB provider]
>
> *Chưa có sự phối hợp chặt chẽ…Thường là họ (y tế tư) giữ bệnh nhân điều trị, chỉ khi có tác dụng phụ/tai biến hoặc bệnh nhân hết tiền thì họ mới chuyển bệnh nhân đến mình.*
>
> The private clinic referred the patient [to the TB facility], but due to lack of commune health station's referral paper, the patient didn't receive an examination. [Private provider]
>
> *Bên phòng mạch tư giới thiệu bệnh nhân đến, nhưng thiếu giấy giới thiệu của trạm y tế nên họ không được khám.*

PPM, or collaboration between district and provincial general hospitals with the NTP, has not been officially established in two out of three provinces (i.e., Thai Nguyen and Khanh Hoa); therefore, there is no guidance on how to refer patients with TB symptoms to a TB facility. Consequently, referring patients to a TB facility is up to the discretion of the provider and may occur only after a patient with TB symptoms has failed treatment. One doctor at a general hospital shared her own experience:

> If a patient has long cough and weight loss, and has been treated as pneumonia or bronchitis for a number of times, but not improved or if a patient has lymph nodes and has been treated as adenitis, but not recovered, I will refer [to a TB facility]. There is no official paper on collaboration with NTP. [non-TB public provider]
>
> *Thấy bệnh nhân ho kéo dài, gầy sút cân, đã điều trị viêm phổi, viêm phế quản nhiều lần không thấy tiến triển hoặc bệnh nhân có nhiều hạch, điều trị theo hướng viêm hạch không khỏi thì chuyển, không có văn bản nào quy định sự hợp tác với chương trình lao.*
>
> There is no official paper to regulate [collaboration between general hospital and NTP]. We do it spontaneously, giving patients counseling on where to go for TB treatment. [non-TB public provider]
>
> *Không có văn bản hợp tác nào quy định. Bọn chị chỉ tự phát, thì mình tư vấn cho bệnh nhân đến tuyến nào để điều trị.*

In the provinces where the district TB unit belongs to a separate district health center, without PPM in place (e.g., Thai Nguyen), referral of patients with TB symptoms from the district general hospital to the district TB unit is challenging because the general hospital tends to refer patients to a higher level rather than to the same level for TB diagnosis. It means that the general district hospital refers patients with TB symptoms to the provincial TB/lung hospital instead of the district TB unit. One provider at a district general hospital said:

> It is regulated [internally] that patients with TB symptoms must refer to Pham Ngoc Thach Hospital [provincial TB hospital], must not refer to district level [district TB unit]. [non-TB public provider]
>
> *Quy định rằng bệnh nhân nghi lao đến thì chuyển qua Phạm Ngọc Thạch, không được chuyển về quận huyện*.

However, in the provinces where the district TB unit belongs to the district hospital or both the district TB unit and district hospital are part of the same district health center (e.g., Khanh Hoa), the referral system for TB diagnosis between the district hospital and the district TB unit functions well, even though PPM is not in place. Two public TB providers working in a district TB unit that is part of the district hospital shared:

> The linkage between examination department (district hospital) and district TB unit is very good. I can manage patients referred from the examination department and diagnose them. With smear-negative patients I refer them to provincial TB hospital for additional tests. If patients are diagnosed with TB, I will refer them to commune health centers for their treatment. [TB public provider]
>
> *Phối hợp rất tốt. Vì là mình quản lý, chẩn đoán xác định, rồi chuyển. Nếu bệnh nhân xét nghiệm âm tính thì mình đưa mẫu cho bệnh nhân cầm lên tuyến trên xét nghiệm. Mình chẩn đoán xong, thì chuyển vê trạm y tế* để điều trị.
>
> Because the district TB unit is located in the district hospital, referring patients with TB symptoms to the TB unit is easy. [Public TB provider]
>
> *Vì tổ lao nằm trong bệnh viện luôn, chuyển bệnh nhân nghi lao sang tổ lao dễ dàng.*

In the provinces where PPM or collaboration between big public hospitals and the NTP has been set up (e.g., Ho Chi Minh City), there is collaboration in referring and diagnosing TB cases in big general hospitals, as well as building capacity in TB diagnosis. One doctor at a general hospital said:

> We collaborate with Pham Ngoc Thach (PNT) Hospital in having consultation on diagnosis of complicated cases and referring severe cases to Pham Ngoc Thach Hospital. Training on TB for hospital staff is also provided. [non-TB public provider]
>
> *Phối hợp với bệnh viện PNT trong: hội chẩn những ca bệnh phức tạp, chuyển bệnh nhân nặng* đến *PNT. Đào tạo, tập huấn cho bệnh viện về;ao cũng được tổ chức.*

And such collaboration is expected by non-TB public providers:

> In my opinion collaboration with NTP is necessary because our hospital [general hospital] has no anti-TB drugs and our staff are not well trained and specialized in TB. [non-TB public provider]
>
> *Theo cô hợp tác với chương trình lao là rất cần thiết* vì bản thân bệnh viện *cô không có thuốc, không được tập huấn kỹ về lao, không có chuyên khoa sâu về lao.*

However, two-way collaboration is required to maintain engagement of either private or non-TB public providers. For example, they expect to receive feedback from the receiving TB facility for their referral cases.

> We did not receive any feedback for cases including pleurisy that we referred to the provincial TB hospital. [non-TB public provider]
>
> *Các trường hợp gửi tỉnh bao gồm trường hợp có khó thở (tràn dịch) thì không được thông tin lại về tình trạng của bệnh nhân.*

Referral and diagnosis by private and non-TB public providers

A small percentage of TB cases (6%) and an even smaller percentage of people with presumptive TB (3%) mentioned that they thought they were misdiagnosed when seeking care from non-TB public and private providers. One TB patient shared:

> Public hospital [district hospital] could not give diagnosis results. It took me a lot of time without having TB treatment. [TB patient]
>
> *Kết quả chẩn đoán ở bệnh viện công [Bệnh viện quận]không cho ra kết quả. Bệnh viện công làm tôi mất thời gian dài không được chữa lao.*

Another TB patient complained:

> I went from one private clinic to another one. It costs me money, but no diagnosis. [TB patient]
>
> *Đi hết phòng khám tư này đến phòng khám tư khác, tốn tiền mà không phát hiện ra bệnh.*

This study found that the first response from patients was to "wait and see" (do nothing or self-treat at home), but the next response was often to go to the private sector, primarily pharmacies. This could be an opportunity or a barrier, the barrier being either use of ineffective treatment or inappropriate treatment.

> The private clinic has no capacity, but keeps patients for treatment using [inappropriate] regimens. After two-three months of treatment the patient didn't get better, so [they] came to my TB clinic. At that time the patient was very serious, and it was difficult to handle this case. The patient might have drug resistance. For other patients sputum smear test would commonly become negative after two months of treatment, but for that patient it took four months to get such a result. [TB provider]
>
> *Phòng mạch tư người ta không có chuyên môn mà giữ bệnh nhân lại điều trị không đúng phác đồ. Điều trị 2-3 tháng không khỏi thì bệnh nhân mới bỏ chỗ đó để đi tới phòng khám lao của chị. Lúc đó đến thì tình trạng bệnh nhân đã nặng rồi, điều trị rất là khó. Bệnh nhân có thể có kháng thuốc. Bình thường các bệnh nhân khác sau khoảng 2 tháng là kết quả đờm âm tính rồi, nhưng bệnh nhân đó thì phải sau 4 tháng mới âm hóa đờm được.*
>
> One patient was diagnosed with TB after taking five treatment courses for [suspected] pneumonia. He had positive TB smear after taking a sputum smear test six times. His weight was 50 kg when [he was] admitted to the hospital, but it reduced to 38 kg [by the time] he was detected with TB. [Non-TB public provider]
>
> *Có người điều trị đến 5 đơn viêm phổi rồi mới phát hiện ra là bị lao. Có người kiên trì xét nghiệm đờm đến lần thứ 6 mới dương tính. Người ấy đến bệnh viện từ lúc 50 mấy cân đến khi còn 38 kg.*

Commune TB focal persons, private providers, and pharmacy workers were also asked about how they collaborate with the public TB system. Table 14 lists the common ways mentioned. The level of collaboration may be reflective of their perceived role in the system or their participation in NTP-sponsored initiatives, such as PPM partnership. One-half of private providers and pharmacy workers explicitly reported they have no collaborations with the NTP, but this does not imply that the others do, as the question was open ended. It is notable that a little more than half of the commune TB focal persons responded that they refer people with presumptive TB to TB facilities.

Table 14. Collaborations with the NTP by commune TB focal persons, private providers, and pharmacy workers.

Type of collaboration	Commune TB focal persons N = 100 (%)	Private providers N = 200 (%)	Pharmacy workers N = 200 (%)
Perform health education about TB prevention; counsel patients to get tested for TB	80 (80)	33 (17)	16 (8)
Encourage patients to get health check-ups	0	29 (15)	0
Refer to TB facilities	54 (54)	74 (34)	4 (2)
Receive referred patients	0	39 (20)	0
Provide Bacille Calmette-Guérin vaccination for TB	12 (12)	0	0
Provide treatment to TB patients	50 (50)	0	0
Assist patients to complete sputum test	17 (17)	0	0
Screen for symptoms	11 (11)	0	0
No collaboration with the NTP	0	100 (50)	107 (54)

Role of health insurance

Health insurance is changing the dynamic of service delivery throughout Vietnam, and may have a special impact on access to TB diagnostic services. For example, non-TB public facilities may be more likely to accept insurance to cover the costs of tests and treatment; however, these same facilities may not have the capacity to diagnosis or treat TB. Public-sector TB facilities at the district and provincial levels are designated as the appropriate locations for persons with presumptive TB to receive free diagnostic tests, such as sputum smears. According to Circular No. 10/2009/TT-BYT, only district health centers that have curative services are eligible to accept health insurance. This means that if the district TB unit belongs to the district hospital (curative department), it is eligible to accept health insurance to cover any cost that is not covered by the NTP. In contrast, if the district TB unit belongs to the district health center (preventive department), it is not eligible to accept health insurance.

The quantitative results for TB cases and people with presumptive TB showed that few (about 5%) had difficulties with the relatively new insurance procedures in the country (Table 8). Even though the magnitude of this dilemma was not borne out by the quantitative data, qualitative information from patients encapsulates this complex issue well, as illustrated below:

> Due to my health insurance being registered at District 8 Hospital, I had to go to the District 8 Hospital. I can't go to Pham Ngoc Thach Hospital directly. [TB patient]
>
> *Vì thẻ BHYT ở BV Quận 8, nên tôi phải đến BV Quận 8, chưa đến BV Phạm Ngọc Thạch ngay được.*
>
> Challenges are related to the health insurance. The procedures are still complicated. It is not possible to go straight to the TB and lung hospital for health care. It requires complicated referral procedures. [Person with presumptive TB]
>
> *Trắc trở ở bảo hiểm y tế! Thủ tục còn phiền hà, không thể vào thẳng Bệnh viện lao và bệnh phổi để khám chữa được, mà phải có giấy chuyển lằng nhằng.*

Insurance procedures were commented on more frequently by providers. Providers reported that insurance plays a role in whether people with presumptive TB seek treatment at a TB facility as a first step.

> If patients who have not been identified as TB need to have TB diagnostic tests, they have to go to a health facility where their health insurance is registered. In other words, patients don't go straight to the TB facility for diagnosis, but go to the health facility they are registered at to receive testing and diagnosis. [Non-TB public provider]
>
> *Khi bệnh nhân chưa phát hiện được bị lao mà phải làm tất cả các xét nghiệm để chẩn đoán thì họ phải làm theo BHYT. Nghĩa là bệnh nhân không đến ngay cơ sở lao để chẩn đoán, mà phải đến cơ sở đăng ký BHYT để xét nghiệm và chẩn đoán.*
>
> Health insurance is the barrier. As hospitals at lower level keep patients for treatment, the patients are often diagnosed late with TB. This is related to limited professional capacity of the district hospital to diagnose TB. [Non-TB public provider]
>
> *Rào cản là BHYT: Bệnh viện ở dưới thường giữ bệnh nhân lại để điều trị bệnh phổi, đến lúc được xác định lao thì đã muộn, do chuyên môn về lao ở bệnh viện huyện là không có.*

The root cause of this dilemma may be related to execution of Decree No. 172/2004/ND-CP and Circular No. 11/2005/TTLT-BNV. Following these legal decrees, the district TB unit belongs to the district health center (formerly, the district preventive medicine center), while Social Insurance only signs service contracts with the district hospital for providing health care. One provider explained:

> The way that district health care system and TB program are organized is not convenient for patients. Patients have to go to the district hospital, and then go to the district health center for TB diagnosis. Patients have to move back and forth between the two agencies for sputum smear tests, chest x-rays, diagnosis, and treatment regimen. If the patients are referred back to the commune health station for treatment, the procedures are much easier. However, if the patients are referred to provincial level [TB and lung hospital], the health insurance procedures are more complicated. It means that the patients have to come back to the district hospital to get referral papers [i.e., one referral paper to the TB provincial hospital issued by the district hospital and one copy of referral paper to the district hospital by the commune health station] to the provincial TB and lung hospital. [TB provider]
>
> *Cách tổ chức hệ thống y tế tuyến huyện và chương trình lao hiện nay không thuận tiện cho bệnh nhân. Bệnh nhân phải lên Bệnh viện huyện rồi lại sang Trung tâm y tế để chẩn đoán lao. Bệnh nhân phải di chuyển nhiều giữa hai đơn vị để được xét nghiệm cũng như chụp phim, kết luận và nhận y lệnh điều trị. Nếu bệnh nhân trở về điều trị tại xã thì dễ hơn, còn nếu bệnh nhân được chuyển lên tuyến tỉnh thì thủ tục làm bảo hiểm còn phức tạp hơn nữa. Tức là bệnh nhân lại phải sang Bệnh viện huyện xin lại giấy chuyển viện rồi mới lên Bệnh viện lao tỉnh được.*

Quality of TB diagnostic services

The quality of TB diagnostic services was explored in several ways with TB cases and people with presumptive TB, and with private and public providers. Components of quality included wait time, hours of operation, attitude of service providers, and perceived capacity and competency of service providers. Quantitative satisfaction with the service delivery from the perspective of TB cases and people with presumptive TB was presented in Table 12. Among the 74 cases (19% of all cases) who indicated dissatisfaction with TB diagnostic services, long wait time was the most frequently mentioned reason (n = 29, or 39% of those dissatisfied). The same was true for people with presumptive TB; 48% of the 269 who expressed dissatisfaction with the service mentioned the long wait time:

> It takes long time for patients to get services at the TB hospital. The patients have to come back and forth for at least three days to have the results. [TB patient]
>
> *Ở Bệnh viện Lao bắt bệnh nhân chờ lâu quá, kết quả thì hẹn tới hẹn lui, đi tới đi lui 3 ngày mới có.*

To a lesser degree, the attitude of the service provider was mentioned as a barrier: 24 TB cases (32% of those dissatisfied) and 86 people with presumptive TB (32% of those dissatisfied) identified this as a reason for dissatisfaction with the service. Qualitatively, there were far fewer direct comments made during the interviews by TB cases or people with presumptive TB that reflected dissatisfaction with the service due to the poor attitude of facility staff.

> There is difference in providing services for patients who pay directly from their own money and those who pay with health insurance. The former usually receive 'better treatment' than the latter. [Person with presumptive TB]
>
> *Có sự phân biệt giữa khám dịch vụ và khám bảo hiểm. Khám dịch vụ lúc nào cũng được 'đối xử tốt hơn.*

Providers, too, acknowledged that there may be long wait times to receive a confirmed diagnosis for TB, particularly for those who are smear negative. One provider said:

> For diagnosis of the negative-smear TB case, it takes time to do the testing: sputum smear tests [have to be done] three to six times. Many patients, particularly breadwinners, have limited time for attending services so they complain about the long wait time. [Non-TB public provider]
>
> *Đối với chẩn đoán bênh nhân AFB (-) thời gian xét nghiệm lâu quá, thử đờm 3 - 6 lần. Nhiều bệnh nhân, đặc biệt những người lao động chính không có thời gian lại phải chờ đợi lâu để được chẩn đoán, nên phàn nàn.*

Satisfaction with opening hours may also affect service utilization, as public TB facilities tend to be open only during regular office working hours, so it may not be convenient for patients to attend. This was not mentioned as a barrier by any of the TB cases or people with presumptive TB interviewed in our study; however, one provider commented:

> Attending the public health facility is not convenient in terms of opening hours. [TB provider]
>
> *Khám y tế công không thuận tiện về thời gian.*

Finally, some providers reported what they perceived as the limited professional capacity of TB staff, particularly at the district level.

> The district TB system is weak: professional knowledge of the doctor and lab technician is still questionable for people. [Private provider]
>
> *Hệ thống lao tuyến quận/huyện còn yếu: Trình độ chuyên môn của bác sỹ và cán bộ xét nghiệm chưa được người dân tin tưởng.*

Discussion

The system of provision of TB diagnostic services in Vietnam is complicated (Lönnroth et al., 1999; Huong et al., 2005; Hoa et al, 2010; WHO, 2011b). Intersections between public and private health care and between the different levels of the health system (commune, district, and provincial) add layers of complexity which can negatively affect both patients seeking and using services as well as providers seeing those same patients (Huong et al., 2007; Hoa et al., 2011; Lönnroth et al., 2001; Quy et al., 2003; Lönnroth et al., 2000). Our study sought to explore and identify possible barriers to access to and use of public TB diagnostic services. Both quantitative and qualitative data were collected and analyzed to frame a more holistic picture of the current situation.

From these data, we can conclude that patient perspectives differ from those of providers, although a few themes did overlap. It was the magnitude of the perceived barrier and its relationship to how patients sought or received care that was the most significant difference in perspectives. From the TB cases and people with presumptive TB, the most significant barrier was lack of perception that they could have TB, even though they knew the symptoms and were experiencing those symptoms themselves. There was a very real sense that TB was something that affected others, not them. The internalization of perceived risk of TB has been little explored in research in Vietnam, as most studies have focused on a more direct link between knowledge of the disease, symptoms, etiology, and locations of services and different constructs of delayed care (Hoa et al., 2011; Cu et al., 2010; Hoa et al., 2009; Hoa et al., 2003; Hoa et al., 2004). In our study, both TB cases and those with presumptive TB demonstrated good knowledge: they knew the TB symptoms, treatment and prevention methods, and where to seek services. The results from other assessments of knowledge of TB and its relationship to care-seeking behavior have been mixed. Cu et al. (2010) found that good knowledge increased case detection. Hoa et al. (2003) also found that better knowledge led to earlier access to care, but noted that levels of knowledge were only average, based on a predefined composite score.

Responses by patients to TB symptoms were also similar to that found in previous studies in Vietnam. The first response of TB cases and people with presumptive TB was to consider their symptoms the result of another illness, like the flu or a bad cold, not to think of TB. Therefore, if they did not suspect they had TB, initially they did not seek services from public TB providers. The first response was to do nothing or self-treat at home and when that did not work, to obtain medication from a pharmacy, still not seeing themselves at risk specifically for TB. Care-seeking studies by Hoa et al. (2011) and Lönnroth et al. (2001) highlighted the initial action of self-treating before seeing a medical provider. Even though it is not expected that patients can self-diagnose, there is a hope that perception of risk and knowledge of symptoms will lead to seeking appropriate care for a diagnosis. Eventually, TB cases and people with presumptive TB in our study attended a public facility, most often a district- or provincial-level public TB facility. By and large, the tests they received at their diagnostic visit were appropriate for determining whether their symptoms were or were not the result of TB.

From the providers' perspective, patients should immediately access public TB services for their symptoms. They did not have a good recognition of what patients felt was rational behavior in response to the symptoms they were experiencing, so the lack of immediate care-seeking was interpreted by providers as being related to TB cases and people with presumptive TB not knowing either the symptoms of TB or where to obtain services.

Another aspect of barriers that diverged between patients and providers was related to time, money, and distance. The frequency of these being reported either quantitatively or qualitatively was low by both TB cases and people with presumptive TB interviewed in this study. This finding is contrary to that found in a study by Hoa et al. (2009), in which the distance to the public TB facility was related to delay in diagnosis of TB. However, the relative importance given to these as barriers by providers

was much higher. Providers perceived these as obstacles much more than patients reported them, and the quantitative data from patients on how much they spent for testing and how far diagnostic facilities are from their home did not bear out the conclusions from providers that cost and distance are barriers to accessing TB diagnostic services. However, on the matter of time, there was large agreement between patients and providers. Most patients have busy lives, with work obligations both in and out of the home, regardless of gender. Therefore, making the time to seek services and then spending the time required at the facility for all the tests was reported to contribute to delays in diagnosis by both patients and providers, consistent with other studies (Lönnroth et al., 1999; Huong et al., 2007).

From the provider perspective, our study found limited collaboration with the NTP by other providers, both in the public and private sectors. Only half of commune TB focal persons (the lowest level of the public system and the NTP system) referred people with presumptive TB to higher-level TB facilities, and nearly no pharmacy workers did. Other private providers noted that the referral procedure to the public system was sometimes not adequate, and public TB providers had concerns that private providers wanted to keep patients for themselves (implying a financial gain in doing so). Explicit collaborations and linkages that positively manage TB cases and people with presumptive TB were infrequently mentioned by the public and private providers in our study. The challenge of collaboration between these two sectors (public and private) was noted in studies by Lönnroth et al. in 2001 and Quy et al. in 2003, both of which were conducted in Ho Chi Minh City. Lönnroth and colleagues have also looked at the role of pharmacies in detecting cases (2000). Finally, the PPM model was assessed as a part of WHO's end-term evaluation of the NTP in Vietnam (2011), which concluded that due to the limited nature of the PPM model thus far, it was difficult to determine its direct impact on improved case detection. The limited referring behavior of providers in our study could be another illustration of the limited reach of PPM.

Providers did comment that the complicated system of where services are located and how to access them, especially if insurance is to be used, is probably a barrier for TB cases and people with presumptive TB. This perspective was reflected by about 5% of TB patients and persons with presumptive TB who mentioned they had experienced barriers in accessing services. On this issue, as well, there was similarity between these groups. Referral requirements and procedures, especially those affecting persons with insurance, were noted to be difficult to navigate.

This study also found the perception of individual risk of TB by people with presumptive TB and cases was not related to any bias or stigma that they may have felt about being diagnosed with TB. This is an important finding that is different from other research (Thorson, 2003; Long et al., 2001). Other research has explored the gender dynamics of bias in the late diagnosis of women in particular (Long et al., 1999; Thorson et al., 2004). Conversely, studies of stigma have been done within the context of HIV co-infection (Tran et al., 2007), making it difficult to assess whether the perceived stigma was related to a TB diagnosis versus HIV infection. Our study explored stigma within the context of a TB diagnosis only and did not isolate any stigma specific to an HIV diagnosis.

Finally, all participants in this study were asked for their recommendations for improvements in the system and to decrease the barriers to access to and use of public TB diagnostic services. The frequency of what was mentioned is presented in Tables 15 and 16. Despite quantitatively and rigorously measured levels of knowledge about TB symptoms, prevention, and services, nearly one-half of TB cases and people with presumptive TB interviewed recommended that more health education about TB be done in the community. A total of 12% of people with presumptive TB suggested improvements to the facilities and 10% recommended providing more support to vulnerable populations. Even though a few respondents were concerned that time, administrative procedures, costs, and distance were barriers to access, addressing these did not feature largely in the recommendations by TB cases and people with presumptive TB.

Table 15. Suggestions by TB cases and people with presumptive TB for improvements to public TB diagnostic services.

	Cases N = 398	Presumptive TB N = 1,092
Provide more health education	193 (49)	532 (49)
Provide free/lower-cost services	41 (10)	0
Improve attitude of staff	35 (9)	89 (8)
Provide more guidance to patients on procedures	34 (9)	67 (6)
Improve professional capacity of staff	20 (5)	98 (9)
Provide more support for people with difficult conditions (e.g., elderly)	17 (4)	104 (10)
Improve facilities	16 (4)	132 (12)
Make administrative procedures easier	3 (1)	56 (5)
Reduce waiting time	0	46 (4)

Table 16. Provider suggestions for improvements to public TB diagnostic services.

	Private providers N = 200 (%)	Pharmacy workers N = 200 (%)	Commune TB focal persons N = 100 (%)	Public non-TB providers N = 46 (%)	Public TB pro-viders N = 18 (%)
Provide more health education/ communication in the community	131 (66)	149 (65)	32 (32)	26 (57)	14 (78)
Give allowances to staff working in TB	13 (7)	0	20 (20)	3 (7)	5 (28)
Provide more training about TB, relevant to provider roles	0	20 (10)	15 (15)	4 (9)	8 (44)
Provide more support for peo-ple with difficult conditions (e.g., elderly, poor, and persons living with HIV)	7 (4)	26 (13)	7 (7)	13 (28)	2 (11)
Improve professional capacity of staff (all providers) at district and commune levels (noted by public providers only)	41 (21)	9 (5)	3 (3)	9 (20)	3 (17)
Make administrative procedures easier	5 (3)	0	2 (2)	0	1 (5)
Improve attitude of staff	7 (4)	10 (5)	1 (1)	0	0
Improve health facilities (public TB providers focused on equipment)	16 (8)	5 (3)	1 (1)	4 (9)	4 (22)
Improve transport for patients	0	0	1 (1)	0	0
Reduce waiting time	1 (<1)	2 (1)		0	0
Strengthen collaboration between public and private providers	0	7 (4)	0	9 (20)	5 (28)
Fill the gap of TB staff shortages at the district level	0	0	0	0	2 (11)
Integrate the district TB unit with the district hospital	0	0	0	0	3 (17)

Providers also recommended more health education, as there was a perception that patients delayed seeking care because they did not know about TB (Table 16). In addition, providers suggested more training for themselves and specific support for vulnerable populations as improvements the NTP could make in service delivery. Private providers, more than others, suggested improving the capacity of their staff to provide TB diagnostic services. About a third of public providers recommended strengthening the collaboration between themselves, the NTP, and private providers; however, this was rarely mentioned by providers from the private sector.

Study limitations

It is important to contextualize the findings from this study with the potential limitations. First, this is a descriptive study only, not powered to draw generalizable conclusions from the findings. We did not draw random samples of either patients or providers that would be representative of all TB patients or all TB providers in Vietnam, as field data collection challenges and time constraints for study implementation posed barriers to that design. However, the age, sex, and geographic distribution of TB cases and people with presumptive TB who participated in our study were quite similar to recently diagnosed TB cases and the characteristics of these populations from other studies. Additionally, nearly all persons with presumptive TB were recruited from the provincial TB hospital and may not be reflective of those who may attend district TB facilities first.

Second, the time period between interviews and diagnosis for TB cases and people with presumptive TB differed, which could have impacted the potential for recall bias in responses.

Third, our study was not designed to capture possible people with presumptive TB in the community (i.e., people experiencing symptoms but not yet accessing TB diagnostic services); the methods required for such sampling were beyond the scope of our study. People with presumptive TB were asked about barriers during their process of seeking TB diagnostic services; therefore, a much shorter time between initial symptoms and care-seeking was noted. For TB cases, many of whom had been on treatment for several months, the further away in time they were from their diagnosis may have limited their ability to recall the details of the steps they took to obtain diagnostic services.

Another limitation of this study was the fixed number of public TB providers who could be interviewed, as prespecified staff at both the district and provincial levels were assigned to lead TB services. The same was true for non-TB providers from other public health facilities. This limited the total sample size to 18 for public TB providers and 46 for public non-TB providers, making even simple descriptive statistics difficult to interpret. The TB cases interviewed were only confirmed smear-positive pulmonary cases of TB; and thus, health care-seeking behaviors and barriers identified with that group may not reflect unique challenges or behaviors that could be experienced by smear-negative pulmonary TB cases and extrapulmonary TB cases, which in Vietnam in 2011 contributed up to 40% of all confirmed cases of TB.

Mixed-methods research is also challenged by data triangulation required for interpretation. There could have been misclassification of responses from qualitative questions or miscoding of the data into primary themes that could have impacted the results. We tried to minimize this potentiality by having two or more researchers read and interpret the qualitative data. These summaries were matched with quantitative categorizations of these responses to questions, a process that resulted in cross-verification of both.

Finally, the creation of composite variables for knowledge, attitudes, stigma, and gender bias could have introduced classification bias by inappropriately assigning responses to the scales created. The collapsing of data into summary measures may also have masked important differences in responses to individual questions.

Recommendations

This study highlights gaps that prevent access to and use of public TB diagnostic services in Vietnam. The following are recommendations to the NTP to address the gaps for improvement:

1. Develop and implement a targeted communication strategy that aims to increase individuals' perceived risk for TB and raise awareness of the need for early access to TB diagnostic services broadly throughout the entire community, with considerations for vulnerable populations.

   The communication strategy should also address normal health care-seeking behaviors versus ideal care-seeking behaviors in response to TB-like symptoms. The efforts under way in mobilizing social organizations, such as the Vietnam Women's Union, Red Cross Society, and Farmers Union, to implement TB communication activities can be enhanced in order to effectively implement this communication strategy.

2. Reinforce linkages and collaboration between the NTP and the private and non-TB public sectors in referral and diagnosis of TB. This includes, but is not limited to, policy advocacy on PPM guidelines and capacity-building for private and non-TB public providers in TB diagnosis.

   The efforts under way include development of a circular on PPM and revision of the national guidelines on PPM by the Ministry of Health and implementation of PPM activities engaging private and non-TB public providers in referral and diagnosis of TB in 21 provinces, supported by the Global Fund, USAID, and CIDA/TB REACH through the NTP, PATH, University Research Co., LLC, WHO, and Population Services International.

   These linkages can also be reinforced by simple provider education. Commune focal persons were not referring to TB facilities; they should be retrained on this. Private providers did not see collaboration with the NTP as important; they need to be educated on why this is important and how they will benefit from participating. Public TB providers were distrustful of private providers and thought they were only motivated by money; they need refresher training on how to collaborate, and new effective communication channels between the two sectors need to be established.

3. Strengthen capacity of district TB providers to provide high-quality TB diagnostic services and implement effective NTP activities, such as PPM and communication at the district level.

   As time, money, and distance are barriers for some TB patients, strengthening district TB services may help improve access to and use of public TB diagnostic services. This includes, but is not limited to, improving TB staff professional capacity and health facilities, including equipment, and ensuring adequate human resources and management structure supportive of easy access to TB services at the district level.

4. Make an effort to implement policy advocacy on health insurance procedures to support early access to public TB diagnostic services. This includes, but is not limited to, simplification of paperwork, improvements in the referral system, and payment for health insurance patients using TB services at all levels.

5. Leverage the next national TB prevalence survey to explore the access and use barriers identified in this study with not only a population-based representative sample but one that also identifies persons with TB-like symptoms who may not be accessing services.

The national TB prevalence survey (Hoa et al., 2010) yielded estimates of under-detection of TB cases or probable TB cases that has provided important information to the NTP on the magnitude of the burden in the country. Specifically with this population, care-seeking behavior for TB-like symptoms could be explored in depth to both validate our study findings on perception of risk and uncover whether barriers to access to and use of TB diagnostic services are similar to or different from those reported by confirmed TB cases and persons with presumptive TB who are seeking care.

Select data tables: TB cases and people with presumptive TB, Thai Nguyen

Table 1. Characteristics of TB cases and people with presumptive TB, Thai Nguyen, 2012.

	TB cases N = 98 (%)	Presumptive TB N = 351 (%)
Sex		
Male	73 (75)	196 (56)
Female	25 (25)	155 (44)
Age (mean)	53.0 years	49.8 years
Education		
<Primary	25 (26)	27 (8)
Completed primary	21 (21)	86 (25)
Completed secondary	28 (29)	133 (38)
Completed high school	21 (21)	77 (22)
Completed college or higher	3 (3)	28 (8)
Marital status		
Married	71 (72)	293 (84)
Unmarried	12 (12)	26 (7)
Other (divorced/separated/widowed)	15 (15)	32 (9)
Main job		
Government staff	2 (2)	17 (5)
Staff of private sector	2 (2)	3 (1)
Small business/seasonal worker	18 (18)	60 (17)
Farmer	49 (50)	155 (44)
Worker	1 (1)	16 (5)
Student	2 (2)	8 (2)
Retired	11 (11)	53 (15)
Unemployed	10 (10)	24 (7)
Other	3 (3)	15 (4)
Poverty status*	*n = 98 (100%)*	*n = 239 (68%)*
Poor	28 (29)	34 (14)
Near poor	5 (5)	19 (8)
Not poor	65 (66)	187 (78)
Distance, home to district health center		
<1 km	5 (5)	22 (6)
1-5 km	33 (34)	156 (45)
5-10 km	35 (36)	96 (27)
>10 km	24 (25)	76 (22)

*Defined per Socialist Republic of Vietnam Decree No. 09/2011/QD-TTg, as follows: poor (rural household monthly income <400,000 VND per person, urban <500,000 VND per person); near poor (rural 401,000-520,000 VND per person, urban 501,000-650,000 VND per person).

Table 2. Symptoms reported by TB cases and people with presumptive TB, Thai Nguyen, 2012.

	TB cases N = 98 (%)	Presumptive TB N = 351 (%)
Reported at least one TB symptom	96 (98)	344 (98)
Self-reported TB symptoms (in order of overall frequency)		
Cough >2 weeks	70 (72)	187 (53)
Exhaustion	32 (33)	166 (47)
Chest pain	30 (31)	146 (42)
Hemoptysis (cough with blood)	15 (15)	121 (35)
Weight loss	21 (21)	41 (12)
Difficulty breathing	21 (21)	41 (12)
Loss of appetite	15 (15)	30 (9)
Fever >1 week	24 (25)	45 (13)
Night sweats	6 (6)	15 (4)

Figure 1. Number of reported symptoms, Thai Nguyen, 2012.

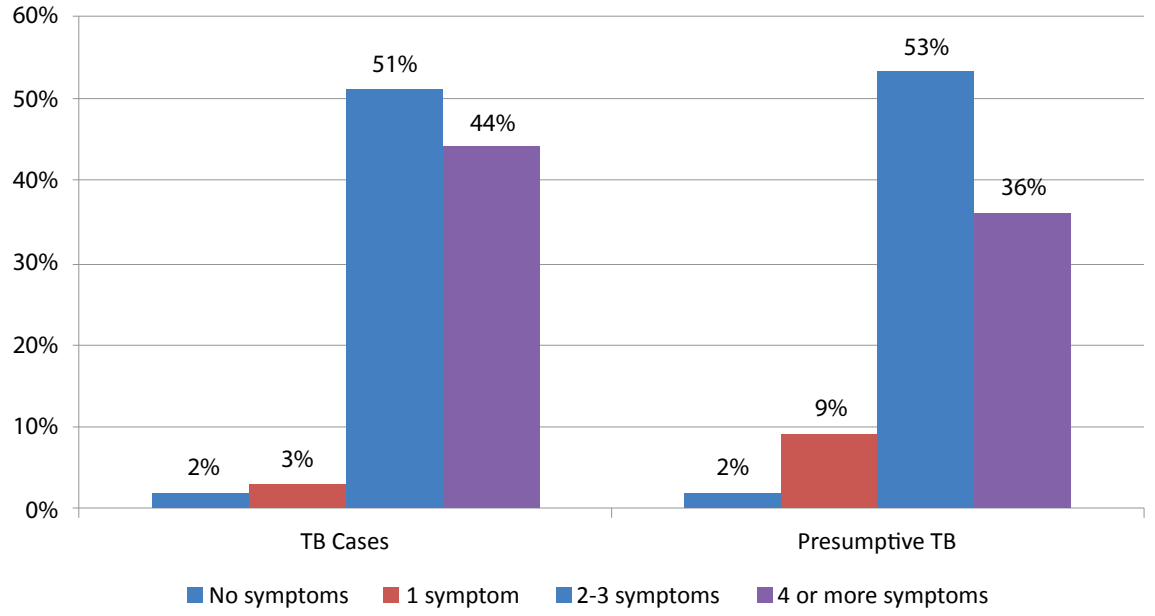


Table 3. Services received prior to seeking care at a TB facility, Thai Nguyen, 2012.

	TB cases N = 98 (%)	Presumptive TB N = 351 (%)
Before you went to the public TB facility, any previous diagnostic tests?		
Smear test (yes)	20 (20)	33 (9)
→ number of tests	Of the 20 who reported smear test, 60% had at least one test done	Of the 33 who reported smear test, 84% had at least one test done
X-ray (yes)	58 (59)	170 (48)
→ number of tests	Of the 58 who reported x-ray, 67% had at least one done	Of the 170 who reported x-ray, 79% had at least one done
Blood test (yes)	39 (40)	109 (31)

Table 4. Referrals reported by TB cases and people with presumptive TB, Thai Nguyen, 2012.

	TB cases N = 98 (%)	Presumptive TB N = 351 (%)
No one referred me	40 (41)	248 (71)
Among those reporting referral, referred by	*n = 58 (59)*	*n = 103 (29)*
Commune health center	10 (10)	4 (2)
District TB facility	9 (9)	17 (5)
Provincial general hospital	15 (15)	12 (3)
District general hospital	18 (18)	46 (13)
Private clinic/hospital	3 (3)	12 (3)
Pharmacy	0	0
Traditional healer	0	0
Other	3 (3)	12 (3)

Table 5. Response to symptoms, Thai Nguyen, 2012.

Where did you go?	When did you go?				
TB cases (n = 98)	**First N = 98**	**Second N = 95**	**Third N = 64**	**Fourth N = 31**	**Fifth N = 6**
Did nothing/self-treated at home	53 (54)	6 (6)	5 (8)	1 (3)	0
Pharmacy	20 (20)	15 (16)	3 (5)	0	0
Private clinic/hospital	2 (2)	8 (8)	2 (3)	2 (6)	0
Commune health center	12 (12)	14 (15)	3 (5)	0	1 (17)
District/provincial general hospital	3 (3)	23 (24)	17 (27)	4 (13)	0
District/provincial TB facility	2 (2)	21 (22)	27 (42)	21 (68)	5 (83)
Other	3 (3)	8 (8)	7 (11)	3 (10)	0
People with presumptive TB (n = 351)	**N = 351**	**N = 344**	**N = 215**	**N = 84**	**N = 25**
Did nothing/self-treated at home	156 (44)	31 (9)	34 (16)	7 (8)	0
Pharmacy	63 (18)	33 (10)	5 (2)	3 (4)	0
Private clinic/hospital	14 (4)	25 (7)	5 (2)	3 (4)	0
Commune health center	66 (19)	34 (10)	4 (2)	2 (2)	0
District/provincial general hospital	22 (6)	67 (20)	26 (12)	7 (8)	0
District/provincial TB facility	17 (5)	145 (42)	138 (64)	59 (70)	25 (100)
Other	13 (4)	9 (3)	3 (1)	3 (4)	0

Table 6. Time between first symptoms and date of diagnosis (TB cases) or date of access to TB facility (people with presumptive TB), Thai Nguyen, 2012.

	TB cases N = 98 (%)	Presumptive TB N = 351 (%)
Mean time (in days)	66.6 days	26.8 days
Delayed seeking care		*n = 344 (98)*
≤21 days (no delay)	32 (33)	206 (60)
>21 days (delay)	66 (67)	138 (40)

Table 7. Reasons for not accessing a district or provincial TB facility earlier, Thai Nguyen, 2012.

	TB cases N = 98 (%)	Presumptive TB N = 351 (%)
Among those whose first action was not going to a district or provincial TB facility	*n = 96 (98)*	*n = 334 (95)*
Thought it was just a regular illness	46 (48)	103 (31)
Busy; hard to find the time	7 (7)	20 (6)
Long distance and no transportation	8 (8)	16 (5)
Had no money	8 (8)	18 (5)
Did not think it was TB	26 (27)	5 (2)
Had to follow insurance procedure	3 (3)	21 (6)
Other facility could not identify disease	7 (7)	10 (3)
Do not like check-ups	4 (4)	11 (3)
Did not know about TB	0	0

Table 8. Services received at the time of TB diagnosis, Thai Nguyen, 2012.

	TB cases N = 98 (%)	Presumptive TB N = 351 (%)
At the facility where you were diagnosed with TB, what diagnostic tests did you receive?		
Smear test (at least one)	94 (96)	275 (78)
X-ray	82 (84)	336 (96)
Blood test	84 (86)	294 (84)
Costs of all tests combined	*n = 43*	*n = 272*
No cost	24 (56)	58 (18)
<100,000 VND (<US$4.72)	6 (14)	191 (70)
100-200,000 VND (US$4.72-$9.44)	4 (9)	24 (9)
>200,000 VND (>US$9.44)	9 (21)	7 (3)
Were tests covered by insurance? (yes)	60 (72)	213 (61)

Select data tables: TB cases and people with presumptive TB, Khanh Hoa

Table 1. Characteristics of TB cases and people with presumptive TB , Khanh Hoa, 2012.

	TB cases N = 120 (%)	Presumptive TB N = 233 (%)
Sex		
Male	101 (84)	152 (65)
Female	19 (16)	81 (35)
Age (mean)	48.2 years	48.8 years
Education		
<Primary	37 (31)	53 (23)
Completed primary	34 (28)	67 (29)
Completed secondary	31 (26)	66 (28)
Completed high school	9 (8)	35 (15)
Completed college or higher	9 (8)	12 (5)
Marital status		
Married	87 (73)	170 (73)
Unmarried	22 (18)	48 (21)
Other (divorced/separated/widowed)	11 (9)	15 (6)
Main job		
Government staff	4 (3)	4 (2)
Staff of private sector	5 (4)	5 (2)
Small business/seasonal worker	36 (30)	60 (26)
Farmer	36 (30)	64 (28)
Worker	2 (2)	23 (10)
Student	0	8 (3)
Retired	4 (3)	24 (10)
Unemployed	14 (12)	26 (11)
Other	19 (16)	19 (8)
Poverty status*	*n = 120 (100%)*	*n = 60 (26%)*
Poor	13 (11)	3 (5)
Near poor	23 (19)	0
Not poor	84 (70)	57 (95)
Distance, home to district health center		
<1 km	14 (12)	32 (14)
1-5 km	61 (51)	158 (68)
5-10 km	28 (23)	25 (11)
>10 km	17 (19)	18 (8)

*Defined per Socialist Republic of Vietnam Decree No. 09/2011/QD-TTg, as follows: poor (rural household monthly income <400,000 VND per person, urban <500,000 VND per person); near poor (rural 401,000-520,000 VND per person, urban 501,000-650,000 VND per person).

Table 2. Symptoms reported by TB cases and people with presumptive TB, Khanh Hoa, 2012.

	TB cases N = 120 (%)	Presumptive TB N = 233 (%)
Reported at least one TB symptom	116 (97)	223 (97)
Self-reported TB symptoms (in order of overall frequency)		
Cough >2 weeks	48 (40)	66 (28)
Exhaustion	31 (26)	81 (35)
Chest pain	35 929)	87 (37)
Hemoptysis (cough with blood)	30 (25)	75 (32)
Weight loss	15 (13)	52 (22)
Difficulty breathing	13 (11)	39 (17)
Loss of appetite	8 (7)	34 (15)
Fever >1 week	6 (5)	11 (5)
Night sweats	1 (1)	5 (2)

Figure 1. Number of reported symptoms, Khanh Hoa, 2012.

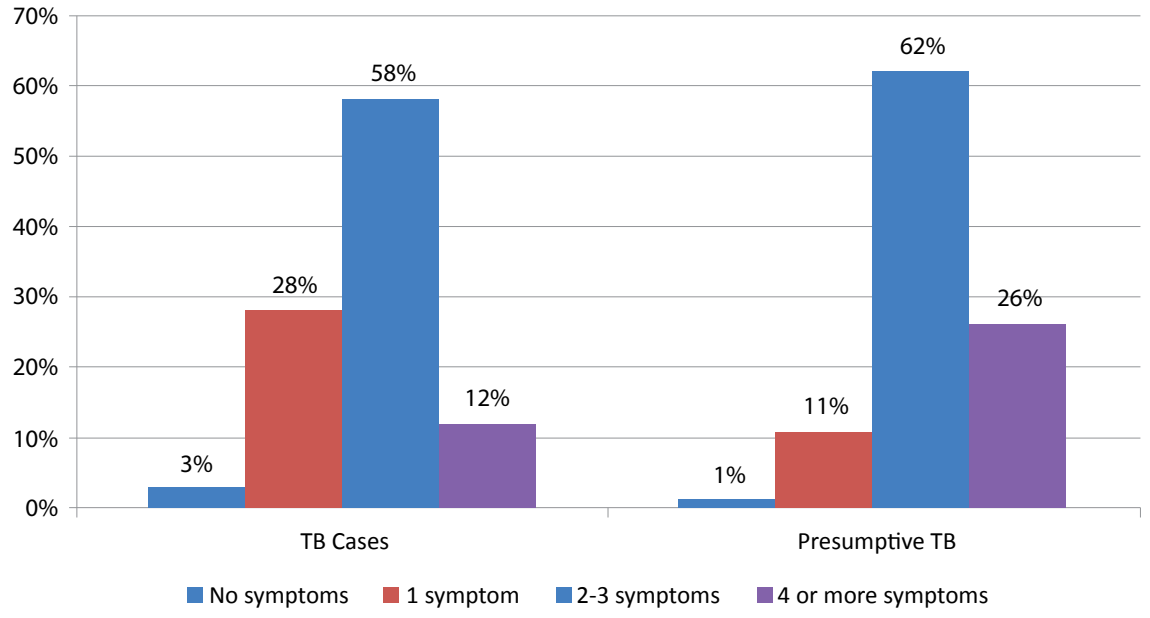


Table 3. Services received prior to seeking care at a TB facility, Khanh Hoa, 2012.

	TB cases N = 120 (%)	Presumptive TB N = 233 (%)
Before you went to TB facility, any previous diagnostic tests?		
Smear test (yes)	10 (8)	43 (18)
→ number of tests	Of the 10 who reported smear test, 70% had at least one test done	Of the 43 who reported smear test, 93% had at least one test done
X-ray (yes)	65 (54)	127 (55)
→ number of tests	Of the 65 who reported x-ray, 86% had at least one done	Of the 127 who reported x-ray, 90% had at least one done
Blood test (yes)	24 (20)	77 (33)

Table 4. Referrals reported by TB cases and people with presumptive TB, Khanh Hoa, 2012.

	TB cases N = 120 (%)	Presumptive TB N = 233 (%)
No one referred me	55 (46)	138 (60)
Among those reporting referral, referred by	*n = 65 (54)*	*n = 95 (30)*
Commune health center	6 (5)	3 (1)
District TB facility	2 (2)	14 (6)
Provincial general hospital	14 (12)	17 (7)
District general hospital	8 (7)	29 (13)
Private clinic/hospital	17 (14)	17 (7)
Pharmacy	1 (1)	0
Traditional healer	0	2 (1)
Other	17 (14)	12 (5)

Table 5. Response to symptoms, Khanh Hoa, 2012.

Where did you go?	When did you go?				
TB cases (n = 120)	**First N = 120**	**Second N = 119**	**Third N = 97**	**Fourth N = 50**	**Fifth N = 19**
Did nothing/self-treated at home	76 (63)	12 (10)	13 (13)	7 (14)	0
Pharmacy	37 (31)	29 (24)	4 (4)	1 (2)	0
Private clinic/hospital	4 (3)	26 (22)	18 (19)	3 (6)	0
Commune health center	1 (1)	9 (8)	0	2 (4)	0
District/provincial general hospital	1 (1)	18 (15)	23 (24)	11 (22)	5 (26)
District/provincial TB facility	0	17 (14)	35 (36)	20 (40)	13 (68)
Other	1 (1)	8 (7)	4 (4)	6 (12)	1 (5)
People with presumptive TB (n = 233)	**N = 233**	**N = 227**	**N = 157**	**N = 57**	**N = 18**
Did nothing/self-treated at home	79 (34)	11 (5)	19 (12)	9 (16)	0
Pharmacy	91 (39)	41 (18)	1 (<1)	0	0
Private clinic/hospital	16 (7)	24 911)	12 (8)	4 (7)	0
Commune health center	12 (5)	6 (3)	3 (2)	0	0
District/provincial general hospital	21 (9)	51 (23)	14 (9)	9 (16)	7 (39)
District/provincial TB facility	9 (4)	76 (34)	104 (66)	35 (61)	10 (56)
Other	5 (2)	18 (8)	4 (3)	0	1 (5)

Table 6. Time between first symptoms and date of diagnosis (TB cases) or date of access to TB facility (people with presumptive TB), Khanh Hoa, 2012.

	TB cases N = 120 (%)	Presumptive TB N = 233 (%)
Mean time (in days)	47.2 days	19.7 days
Delayed seeking care		*n = 227 (97)*
≤21 days (no delay)	54 (45)	158 (70)
>21 days (delay)	66 (55)	69 (30)

Table 7. Reasons for not accessing a district or provincial TB facility earlier, Khanh Hoa, 2012.

	TB cases N = 120 (%)	Presumptive TB N = 233 (%)
Among those whose first action was not going to a district or provincial TB facility		*n = 224 (96)*
Thought it was just a regular illness	86 (72)	73 (33)
Busy; hard to find the time	11 (9)	9 (4)
Long distance and no transportation	3 (3)	5 (2)
Had no money	10 (8)	5 (2)
Did not think it was TB	14 (12)	12 (5)
Had to follow insurance procedure	2 (2)	5 (2)
Other facility could not identify disease	5 (4)	0
Do not like check-ups	6 (5)	3 (1)
Did not know about TB	5 (4)	0

Table 8. Services received at the time of TB diagnosis, Khanh Hoa, 2012.

	TB cases N = 120 (%)	Presumptive TB N = 233 (%)
At the facility where you were diagnosed with TB, what diagnostic tests did you receive?		
Smear test (at least one)	117 (98)	199 (85)
X-ray	68 (57)	168 (72)
Blood test	102 (85)	163 (70)
Costs of all tests combined	*n = 100*	*n = 219*
No cost	39 (39)	53 (24)
<100,000 VND (<US$4.72)	29 (29)	163 (74)
100-200,000 VND (US$4.72-$9.44)	20 (20)	2 (1)
>200,000 VND (>US$9.44)	12 (12)	1 (<1)
Were tests covered by insurance? (yes)	36 (30)	93 (40)

Select data tables: TB cases and people with presumptive TB, Ho Chi Minh City

Table 1. Characteristics of TB cases and people with presumptive TB, Ho Chi Minh City, 2012.

	TB cases N = 180 (%)	Presumptive TB N = 508 (%)
Sex		
Male Female	131 (73) 49 (27)	288 (57) 220 (43)
Age (mean)	41.0 years	38.2 years
Education		
<Primary Completed primary Completed secondary Completed high school Completed college or higher	27 915) 57 932) 52 (29) 26 (14) 18 (10)	25 (5) 99 (20) 125 (25) 137 (27) 122 (24)
Marital status		
Married Unmarried Other (divorced/separated/widowed)	126 (70) 44 (24) 10 (6)	312 (62) 187 (37) 8 (2)
Main job		
Government staff Staff of private sector Small business/seasonal worker Farmer Worker Student Retired Unemployed Other	6 (3) 11 (6) 72 (40) 6 (3) 26 (14) 10 (6) 8 (4) 24 (13) 17 (9)	35 (7) 68 (13) 174 (34) 8 (2) 66 (13) 47 (9) 41 (8) 54 (11) 15 (3)
Poverty status*	*n = 180 (100%)*	*n = 165 (32%)*
Poor Near poor Not poor	15 (8) 2 (1) 163 (91)	11 (7) 3 (2) 151 (92)
Distance, home to district health center		
<1 km 1-5 km 5-10 km >10 km	17 (10) 103 (58) 23 (13) 36 (20)	86 (17) 353 (70) 57 (10) 12 (2)

*Defined per Socialist Republic of Vietnam Decree No. 09/2011/QD-TTg, as follows: poor (rural household monthly income <400,000 VND per person, urban <500,000 VND per person); near poor (rural 401,000-520,000 VND per person, urban 501,000-650,000 VND per person).

Table 2. Symptoms reported by TB cases and people with presumptive TB, , Ho Chi Minh City, 2012.

	TB cases N = 180 (%)	Presumptive TB N = 508 (%)
Reported at least one TB symptom	172 (96)	479 (94)
Self-reported TB symptoms (in order of overall frequency)		
Cough >2 weeks	82 (46)	196 (39)
Exhaustion	63 (35)	176 (35)
Chest pain	49 (27)	177 (35)
Hemoptysis (cough with blood)	34 (19)	148 (29)
Weight loss	39 (22)	65 (13)
Difficulty breathing	38 (21)	57 (11)
Loss of appetite	38 (21)	50 (10)
Fever >1 week	32 (18)	50 (10)
Night sweats	26 (14)	21 (4)

Figure 1. Number of reported symptoms, Ho Chi Minh City, 2012.

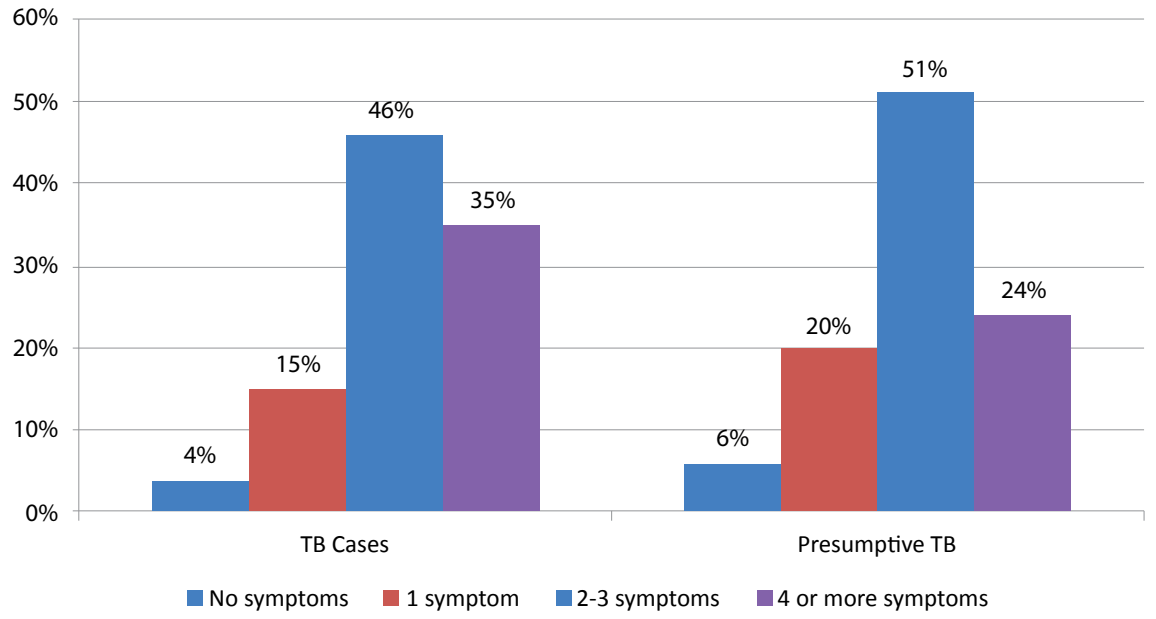


Table 3. Services received prior to seeking care at a TB facility, Ho Chi Minh City, 2012.

	TB cases N = 180 (%)	Presumptive TB N = 508 (%)
Before you went to TB facility, any previous diagnostic tests?		
Smear test (yes)	24 (13)	63 (12)
→ number of tests	Of the 24 who reported smear test, 50% had at least one test done	Of the 63 who reported smear test, 84% had at least one test done
X-ray (yes)	86 (48)	263 (52)
→ number of tests	Of the 86 who reported x-ray, 83% had at least one done	Of the 263 who reported x-ray, 88% had at least one done
Blood test (yes)	52 (29)	163 (32)

Table 4. Referrals reported by TB cases and people with presumptive TB, Ho Chi Minh City, 2012.

	TB cases N = 180 (%)	Presumptive TB N = 508 (%)
No one referred me	108 (61)	312 (61)
Among those reporting referral, referred by	*n = 70 (39)*	*n = 196 (39)*
Commune health center	3 (2)	3 (1)
District TB facility	4 (2)	13 (3)
Provincial general hospital	20 (11)	35 (7)
District general hospital	15 (8)	63 (12)
Private clinic/hospital	18 (10)	56 (11)
Pharmacy	1 (1)	4 (1)
Traditional healer	0	0
Other	9 (5)	22 (4)

Table 5. Response to symptoms, Ho Chi Minh City, 2012.

Where did you go?	When did you go?				
TB cases (n = 180)	**First N = 180**	**Second N = 173**	**Third N = 124**	**Fourth N = 59**	**Fifth N = 16**
Did nothing/self-treated at home	79 (44)	32 (18)	21 (17)	6 (10)	1 (6)
Pharmacy	70 (39)	36 (21)	8 (6)	4 (7)	1 (6)
Private clinic/hospital	14 (8)	18 (10)	12 (10)	3 (5)	1 (6)
Commune health center	0	3 (2)	0	1 (2)	0
District/provincial general hospital	13 (7)	41 (24)	23 (19)	7 (12)	4 (25)
District/provincial TB facility	3 (2)	39 (23)	56 (45)	35 (59)	9 (56)
Other	1 (<1)	4 (2)	4 (3)	3 (5)	0
People with presumptive TB (n = 508)	**N = 508**	**N = 494**	**N = 342**	**N = 153**	**N = 45**
Did nothing/self-treated at home	240 (47)	54 (11)	42 (12)	18 (12)	0
Pharmacy	154 (3)	93 (19)	13 (4)	6 (4)	0
Private clinic/hospital	30 (6)	70 (14)	31 (9)	6 (4)	2 (4)
Commune health center	2 (<1)	3 (1)	3 (1)	0	0
District/provincial general hospital	50 (10)	88 (18)	41 (12)	15 (10)	0
District/provincial TB facility	23 (5)	172 (35)	201 (59)	106 (69)	43 (96)
Other	9 (2)	14 (3)	11 (3)	2 (1)	0

Table 6. Time between first symptoms and date of diagnosis (TB cases) or date of access to TB facility (people with presumptive TB), Ho Chi Minh City, 2012.

	TB cases N = 180 (%)	Presumptive TB N = 508 (%)
Mean time (in days)	25.6 days	18.5 days
Delayed seeking care	*n = 178 (99)*	*n = 479 (95)*
≤21 days (no delay)	108 (61)	349 (73)
>21 days (delay)	70 (39)	130 (27)

Table 7. Reasons for not accessing a district or provincial TB facility earlier, Ho Chi Minh City, 2012.

	TB cases N = 180 (%)	Presumptive TB N = 508 (%)
Among those whose first action was not going to a district or provincial TB facility	*n = 177 (98)*	*n = 485 (95)*
Thought it was just a regular illness	114 (64)	258 (53)
Busy; hard to find the time	28 (16)	145 (30)
Long distance and no transportation	3 (2)	39 (8)
Had no money	12 (7)	29 (6)
Did not think it was TB	48 (27)	29 (6)
Had to follow insurance procedure	9 (5)	23 (5)
Other facility could not identify disease	11 (6)	17 (4)
Do not like check-ups	4 (2)	7 (1)
Did not know about TB	21 (12)	0 (0)

Table 8. Services received at the time of TB diagnosis, Ho Chi Minh City, 2012.

	TB cases N = 180 (%)	Presumptive TB N = 508 (%)
At the facility where you were diagnosed with TB, what diagnostic tests did you receive?		
Smear test (at least one)	156 (87)	307 (60)
X-ray	133 (74)	377 (74)
Blood test	140 (78)	249 (49)
Costs of all tests combined	*n = 147*	*n = 422*
No cost	25 (17)	19 (5)
<100,000 VND (<US$4.72)	39 (27)	153 (36)
100-200,000 VND (US$4.72-$9.44)	34 (23)	134 (32)
>200,000 VND (>US$9.44)	49 (33)	116 (28)
Were tests covered by insurance? (yes)	44 (25)	114 (23)

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