Zim Anal / Workshop report

PERSONAL AND SYSTEM RELATED DETERMINANTS OF ACCESS TO TUBERCULOSIS SERVICES IN ADULTS IN ZIMBABWEAN COMMUNITIES

LITERATURE REVIEW

One of the most important causes of the global resurgence of tuberculosis has been the human immunodeficiency virus (HIV)[1], particularly in Sub-Saharan Africa. In sub-Saharan Africa, tuberculosis is the most common opportunistic infection associated with HIV[2 3]. Furthermore, case management tends to be deficient because of deteriorating health services, or because patients do not come to the health services or access them late in the clinical course of the disease leading to further spread of the disease. In many sub-Saharan countries, macroeconomic adjustment policies introduced in the 1990s have negatively impacted on the health sector. Women in particular face financial and social barriers in utilization and access to health services for tuberculosis treatment.

Although extensive biomedical and epidemiological investigations into tuberculosis have been undertaken, relatively little is known about the determinants of access to health services by individuals, particularly in resource-poor settings such as exist in Zimbabwe. Current health sector reforms in many east and southern African countries have made it urgent to undertake an in-depth study of their impact on access to and utilization of health services, particularly with respect to tuberculosis control.

Health worker and patient delay

Delay in presentation by symptomatic individual accounts for patient delay. Doctor or health service delay is accounted for by the time taken by health workers to consider tuberculosis as a possible diagnosis, to initiate microscopic investigations, for laboratory workers to make the bacteriological diagnosis, for results to return to clinicians, and for them to initiate appropriate treatment[4].

In several studies, health worker delay exceeds patient delay[5 6 7], with a total delay of more than three months in one study. Patient delay was shown by multivariate analysis to be associated with a higher level of self-rated health, while health service delay was associated with poor patient self-rated health, previous visits to traditional healers, and to first visits to a health post[6]. Doctor delay was associated with being female, rural residence, patients requiring hospital admission, and also longer in rural areas[8].

A series of studies from Kenya during the 1980s showed that most people who had symptoms suggestive of tuberculosis had presented to health facilities but health staff failed to identify such patients as tuberculosis suspects[9]. In developing countries, the distance from health facilities has been suggested as a cause of patient delay[10 11], as have the perception and interpretation of symptoms, which influence health-seeking behaviour.

Gender differentials

There are well-described gender differentials in tuberculosis notification rates and prevalence rates, but many gaps exist in our knowledge of the extent and cause of these differentials. Whether lower tuberculosis notification rates among women are due to reduced access or to epidemiological differences still needs to be resolved. A review of smear-positive tuberculosis prevalence surveys reported to the WHO found that notification rates varied widely, but the overall female to male ratio was less than one and decreased with increasing age in almost all countries surveyed[12]. However, the female to male ratio of prevalent cases was equal to or lower than for notifications, suggesting that differences according to sex in notification rates may be due to epidemiological differences rather than to differentials in access.

It has been suggested that females with symptoms suggestive of tuberculosis may be less likely to present to health facilities[13 14]. The lower notification rates among women in developing countries suggest that there may be an under-reporting of cases[15]. Indeed, among tuberculosis suspects in Malawi, the yield of cases was higher in males than in females[16].

Socio-economic and cultural factors

A review of several studies on tuberculosis and tuberculosis control found gender differentials in socio-economic activities and roles in many vital areas such as: exposure to infection, rate of acquiring infection, rate of progression to disease, barriers to early detection, compliance with treatment, response to disease and general health as reflected by nutritional status[17]. In most cases, women were at a disadvantage compared to men.

Social stigma and fear associated with tuberculosis

The fear and stigma associated with tuberculosis seem to have a greater impact upon women than upon men[17]. In this study in two urban areas in the Transvaal, South Africa, tuberculosis was perceived as a great threat to personal and family health, and was associated with social rejection by the family and community for the afflicted[18]. Because mothers are strongly linked to the welfare of their children, the effect of stigma and social rejection also has serious consequences on children.

TUBERCULOSIS SITUATION IN ZIMBABWE

Demography

The population of Zimbabwe is estimated at about 13 million (Central Statistical Office, Government of Zimbabwe), basing estimates on the 1992 census and an intercensal growth rate of 2.5%. In 1995, the female to male ratio was 1.08. Approximately 70% of the population is rural-based, and 30% is urban. Mbare, one of the oldest suburbs in Harare, is a densely populated area of less than two kilometres in radius, and has an estimated population of approximately 154 000 people (Harare City Health department, 2000). There are three council clinics, an infectious diseases hospital, and more than ten private surgeries in Mbare. Makoni district, in Manicaland Province, has a population of about 100 000 and is served by a district hospital and several small health centres.

The National Tuberculosis Control Programme (NTP)

The NTP was established in 1963 and was reorganised in 1982 with a clear strategy of integration and decentralisation within a primary health care structure. A nation-wide programme review in 1998 recommended the progressive extension of DOT throughout the country, with a target of 100% coverage by 2002. A new tuberculosis treatment card was introduced in 1998, with the main aim of enabling closer monitoring and supervision of the performance of the NTP[19].

Case finding in Zimbabwe is passive, mainly through direct sputum smear-microscopy. Treatment consists of short-course treatment regimens according to WHO/IUATLD guidelines. The key points of the Zimbabwean TB policy are that treatment should be short, effective, and free of charge to the patient, and that the TB service should be integrated within the primary health care system[20]. The integration of the NTP with the National AIDS Control Programme in was commenced in 2000, though this still has to be implemented at all levels of the Ministry of Health and Child Welfare. The Government of Zimbabwe is highly committed to the NTP, and provides more than US$8 million annually, compared to US$650 000 from external donations.

Epidemiology of tuberculosis:

Tuberculosis remains one of the most pressing public health problems in Zimbabwe. The incidence rate of new cases increased from 57 per 100 000 in 1980 to 384 per 100 000 in 1999[21]. A total of 50 138 new cases were notified in 1999, compared to less than 5 000 in the mid-eighties. The female to male ratio has consistently been less than 1.

HIV and tuberculosis

The HIV/AIDS pandemic has been particularly devastating in Zimbabwe, which is rated as one of the three countries most heavily infected with HIV in the world, with an estimated seroprevalence of 25% among the adult population in 1999[22]. In 1989, *M. tuberculosis* was estimated to be the most common pathogen in HIV-positive persons in Harare[3]. In an eighteen-month period, the HIV seroprevalence in 1434 tuberculosis patients in Harare increased from 34% to 49% to 58% in successive six-month periods, and as described elsewhere, HIV infection in Zimbabwe was associated with altered clinical and radiological features of tuberculosis, complicating clinical management[23]. The HIV infection rate among TB patients is as high as 85% in 1998, with HIV-positive patients being generally older than HIV-negative ones[24].

Transmission of tuberculosis in Zimbabwe

Very few studies have been done on the transmission of TB in Zimbabwe. The advent of molecular techniques has led to several studies on this subject. One study in 1997 found that recent urban-rural migration was not common and that patients infected with a shared spoligotype were not closely linked geographically within Harare, but were more likely to live in overcrowded conditions[25].

Drug-resistant tuberculosis

The most recent reviews of drug-susceptibility patterns showed that the prevalence of drug-resistant tuberculosis was low, with less than 5% monodrug-resistance and less than 3% multidrug-resistance of all forms of tuberculosis[26 27].

STUDY METHOD

Design and methods

Questionnaires

Two structured questionnaires were developed, one for TB suspects and cases, and the other for health personnel. After piloting and revision, and training of enumerators in December 1999, the questionnaires were administered between February and April 2000. TB suspects were asked a combination of open-ended questions as well as yes/no/don't know/other format questions to measure knowledge, attitudes and beliefs about tuberculosis and HIV/AIDS, and to measure social and demographic characteristics, TB symptoms, lifestyle, TB experience/exposure, health services and social support. A nurse or doctor who normally attended to patients with symptoms of TB was also interviewed, and data collected about the TB case load at the health facility, TB management, manpower coverage, knowledge on TB, and about other facilities in the community for TB management. In addition, there was a data sheet on the participating health facility concerning details about the local communities, which was completed by the researchers.

Informed consent (written or oral) was obtained from the participants according to the policies of the ethics committees. Interviewing was done daily in order to capture even those respondents who were employed. All interviews were conducted in the language of choice of the respondents by interviewers who were fluent in that language. There were two callbacks per household surveyed. No medical procedures or interventions were performed during the course of the study. Individuals needing medical attention were advised to seek care if they had not already sought it.

Design, sample selection and data management:

A community survey was conducted among adults (15 years and older) in Mbare Suburb, Harare (urban) and Makoni District, Manicaland Province (rural), who were suspected or confirmed to have tuberculosis. The communities selected for the study were identified from routine notifications of tuberculosis cases, and were those regularly reporting a high number of cases. Clusters were randomly selected from the communities selected, and all households within selected clusters were then interviewed to provide the study population.

A tuberculosis case was defined as an adult with at least two sputum samples positive on direct microscopy for acid-fast bacilli, or who was treated for tuberculosis, while a suspect was an adult who had or had had a cough for at least three weeks within the preceding six months. Contact with health services was defined as a visit to any structure within the formal health services because of the symptoms in the preceding six months. The formal health service was any institution delivering health care, which was registered with the national health authority.

Data were recorded directly onto the questionnaire and then entered into an Epi-Info 6.04 database through double entry to assure quality. Proportions were compared using the chi-squared test, and by multivariate analysis. A P value of less than 0.05 was accepted as signifying statistical significance.

RESULTS

Demographic characteristics of all respondents

Of 1061 persons recruited into the study in March and April 2000, 357 (33.6%) were TB patients and 704 were TB suspects. Table 1 shows the demographic characteristics of all respondents. About 75% of all respondents recruited were from the urban area. The sex ratio was significantly different ($p<0.001$) between patients and suspects, and patients were on average older ($p<0.001$) than suspects. Of patients, 235 (65.8%) were married compared to 414 (58.9%) of suspects ($p=0.016$). There was no significant difference between patients and suspects with respect to formal education or employment. About 50% of both patients and suspects lived in households of at least 3 to 5 people. More patients than suspects owned their homes (56.8% compared to 43.8%, $p<0.001$), while fewer patients lived in households occupying one room compared to suspects (33.9% versus 50.6%, $p<0.001$). There were no significant differences between the patients and suspects with respect to religion, tribe or country of origin.

Access to radio/television, transport and lifestyles of all respondents

Table 2 presents the characteristics regarding access to appliances, transport and lifestyles of respondents. There was no significant difference between suspects and patients according to ownership of or access to appliances and transport. More patients than suspects had listened to a radio or television programme (63.7% compared to 56.2%, $p=0.018$) or to a health talk about tuberculosis (25.6% compared to 11.6%, $p<0.001$). Patients reported their health as being good or fair more often than suspects (81.2% versus 67.5%, $p<0.001$). Fewer patients than suspects were smokers during the time of the survey (7.4% compared to 21.1%, $p<0.001$) while more patients had ever smoked (35.3% versus 16.9%, $p<0.001$). Fewer patients were current drinkers compared to suspects (17.6% versus 41.9%, $p<0.001$) while there was no significant difference according to the number of sexual partners.

Knowledge and beliefs about TB of all respondents

More than 80% of respondents thought that TB was a common disease, while approximately 90% also said that TB was dangerous. Less than 30% of the subjects indicated that TB could be contracted from a family contact, while over half said that TB could be transmitted by infected air droplets. Nearly all respondents reported at least one of the cardinal symptoms of TB (prolonged cough, loss of weight, sputum production or haemoptysis, fever). Almost 40% of subjects believed there was no relationship between HIV/AIDS and TB, with only approximately 20% believing that there was one. Almost all respondents thought that TB should be treated by modern medicine, while approximately 95% believed that TB was curable. Approximately half of the respondents reported that improved housing could prevent TB.

Approximately 40% of respondents had heard about other types of TB besides pulmonary TB, mostly from a family member or friend. Most respondents believed that there were two forms of TB, commonly described as "TB1" and "TB2". Popular belief was that the former was old-fashioned TB without HIV infection, while "TB2" was TB due to or related to HIV or AIDS. Among patients, 72.7% said they had heard about "TB2" while 87.7% of suspects reported the same. The main source of information about TB was radio or television (78.8% of patients, 64.6% of suspects). The health worker was the main source of information for 50.3% of patients and 29.1% of suspects, while about 70% of subjects indicated that health worker was the preferred source of health information.

Access to health services

The nearest health facility was the health clinic for 79.1% and 53.8% of urban and rural respondents respectively (Table 3). Almost 57.2% of urban respondents lived less than 3 km from the nearest health facility, compared to 22.2% of rural dwellers. The majority (42.5%) of rural respondents lived at least 5 km away from the nearest health facility, compared to only 4.5% of town dwellers. It took less than 15 minutes for to walk to the nearest clinic for 47.8% of urban respondents, compared to 12.9% in the rural areas. In contrast, the majority (32.0%) of rural respondents had to walk for at least 75 minutes to get to the nearest health facility, compared to only 0.9% of urban dwellers. With respect to opening times, more rural facilities were open every day (76.9% compared to 45.0%). Rural facilities were also less likely to open only during the week (17.5% compared to 52.0%). About 60% of all respondents waited for less than one hour to get health care at the health facility. Approximately 70% of all subjects reported that they were satisfied with the services given at the health facility.

With respect to the availability of services at health facilities, more rural respondents than urban (41.7% and 15.6% respectively) did not know whether all TB drugs were available. About half of urban respondents indicated that all TB tests could be done locally, while a similar proportion among the rural respondents reported that all TB tests could not be done locally. Facilities for patients from afar were available at the health facilities as reported by 52.6% and 37.4% of urban and rural dwellers respectively.

About 90% of all respondents considered the health facilities to be clean and well maintained, while more than 70% indicated that the equipment used was new and clean, and that health staff were polite and helpful. Approximately 80% of all respondents said that the health advice given was clear and useful, while more than 70% indicated that the date of next visit was properly recorded.

Transport costs were slightly cheaper for rural than urban dwellers (Z$20 compared to Z$20-34 respectively) despite the greater distance to the nearest health facility. The consultation fees in urban areas were reported to be almost twice those in the rural areas (Z$50-99 compared to less than Z$50), while the total cost of a visit to a health facility was similarly higher in urban areas. About half of all respondents paid the cost of visit themselves. Medical insurance schemes paid the cost of visiting health facilities for less than 5% of all subjects.

A total of 353 suspects had not visited health facilities. Lack of money (42.8%) and a belief that their symptoms were not serious (49.0%) were reported as the main reasons for not going to seek treatment.

Knowledge and practice about tuberculosis and treatment among patients currently on tuberculosis treatment

Fewer urban patients did not know for how long TB drugs were to be taken, compared to rural patients (19/257 or 7.4% and 18/80 or 22.5% respectively, p<0.001). More urban than rural patients knew the correct phases of TB treatment (77.0% and 66.3% respectively, p=0.001). More than 90% of both urban and rural patients indicated that they took TB drugs every day.

The majority of the respondents (220/258 or 85.3% urban and 61/81 or 75.3% rural, p=0.056) indicated that they took TB drugs at home. Thirty-six (14.0%) urban respondents reported that they took TB drugs at the health clinic, compared to 17 (21.0%) of rural patients. Table 4 shows aspects of ambulatory treatment in urban and rural areas. About 75% of both urban and rural respondents taking drugs at the health clinic swallowed drugs always in the presence of a health worker. The majority of patients taking drugs at home (93/216 or 43.1% urban and 28/61 or 45.9% rural, p=0.803) took TB drugs always by themselves without being monitored by anyone.

More urban than rural health care workers made records to show that TB drugs had been taken (178/254 or 70.1% and 31/74 or 41.9% respectively, p=0.007). Records to show that TB drugs have been taken as reported by the patients were more consistent with those recorded in the TB treatment card among urban patients than among rural patients (219/250 or 87.6% and 43/72 or 59.7% respectively, p<0.001). Totals of 237 (91.9%) out of 258 urban patients and 78 (96.3%) out of 81 rural patients were in possession TB treatment cards (p=0.267).

Of 97 urban patients on treatment at home who responded, approximately two-thirds were rarely or never visited at all, compared to one third among the 15 rural patients who responded. Only 5 (2.0%) of urban patients and 4 (4.9%) of rural patients interrupted their treatment.

Laboratory investigations

Of 71 cases interviewed at the health centre, 8 (11.3%) submitted 1 sputum sample for TB investigation, 45 (63.4%) submitted 2 samples, 17 (23.9%) submitted 3 samples and 1 (1.4%) submitted 4 samples. Records at the health centre showed that of the 72 first sputum samples, 50 (69.4%) were smear positive. Out of the 37 TB cases diagnosed by X-ray, 28 (75.7%) were smear positive. Totals of 110 (93.2%) out of

118 patients had been receiving drugs according to guidelines and 113 (94.2%) out of 120 patients had been receiving health education and TB DOTS treatment. DUS Pt reports final-not visited?

At the laboratory, records showed that out of 32 patients, 8 (25.0%) brought in 1 sputum specimen, 14 (43.8%) brought in 2 sputum specimen and 10 (31.3%) brought in 3 sputum specimen. Fifteen (45.5%) out of 33 specimen were smear positive.

Time lags

Data on the time taken between receiving first sputum specimen at the health centre and sending it to the laboratory was available on 57 patients. Altogether 49 (86.0%) specimen were received and sent to the laboratory on the same day, 7 (12.3%) were sent the following day and 1 (1.8%) was sent three days later. Time between receiving first sputum specimen at the health centre and receiving results from the laboratory was assessed from information available on 50 cases. About half (52.0%) of the patients had their results back at the health centre at least 6 days since receiving first sputum specimen at the health centre.

Data were available on 52 cases with respect to the time between sending sputum specimens to the laboratory and receiving the results from the laboratory. About half of the cases had their results returned after at least 6 days. The time between receiving first sample results at the health centre and starting on TB treatment was evaluated using 52 cases. Twenty-three (44.2%) cases were started on TB treatment before the results were received, 22 (42.3%) on the same day the results were received, 2 (3.8%) between 1 and 5 days after the results were received and 5 (9.6%) at least 6 days after receiving of the results.

The time lag between receiving sputum specimen at the laboratory and sputum examination was evaluated using 24 specimens. Slightly over half (14) of the 24 specimen were examined the same day of receiving the specimen. Of 20 specimens examined six had their results reported to the health centre the same day of examination, another six within at least six days, and the remainder after more than six days.

Action taken by health staff/facility on suspects who had access to health facility

Altogether 105 (36.8%) out of 285 suspects with access to health facility had sputum samples taken. The distribution of the number of sputum samples taken from suspects was 37 (35.2%) for 1 sample, 39 (37.1%) for 2 samples and 29 (27.6%) for 3 samples. X-ray was done in 86 (33.0%) of the 261 suspects. No action or test was done in 11 (4.7%) suspects and clinical examination only was done in 125 (53.6%) of the suspects. Health advice was given in 81 (34.8%) of the suspects. In all 100 (34.1%) out of 293 suspects who had access to health facilities went back again. In 44 (44.0%) of the 100 suspects, health staff advised them to go back to health centres. The common reasons for going back to health centres were to review treatment (26.8%) and because symptoms became worse (21.6%).

When 165 suspects who had access to health facilities were on treatment, 54 (32.7%) had their close friends/relatives or colleagues at work (associates) examined for TB,

92 (55.8%) did not have their associates examined for TB and 19 (11.5%) did not know whether their associates were examined for TB.

Factors associated with TB suspects accessing health facilities in bivariate analyses

Age (p<0.001), marital status (p=0.002), the respondent's education level (p=0.040), and house ownership (p=0.018) were significantly associated with accessing health facilities among suspects, as shown in Table 5. None of the appliance and transport factors was significantly associated with access to health facility. Of the signs and symptoms of TB, only loss of weight (p=0.030) was significantly associated with access to health facility. The health status (p<0.001), smoking cigarettes (p=0.004) and drinking alcohol (p=0.002) were significantly associated with access to health facility.

A past history of TB in the respondent or an immediate family member or a close friend was not significantly associated with access to health facility. Receiving support from spouse/partner (p=0.001), receiving material support from other sources (p=0.013) and knowing that TB drugs are provided by government free of charge were significantly associated with access to health facility (p=0.035).

Only the factors age (p=0.007), health status (p=0.002), drinking alcohol (p<0.001) and having support from spouse/partner (p=0.002) were independently associated with access to health facilities among suspects (Table 6). Compared to the respondents of age 15 to 19 years, respondents of age 30 to 39 years (OR=4.77, 95%CI 1.25, 18.21), 40 to 49 years (OR=5.36, 95%CI 1.36, 21.10) and 60 to 69 years (OR=15.39, 95%CI 2.74, 86.65) were more likely to access health facilities. Participants who described their health as poor were 2.28 (95%CI 1.26, 4.12) times more likely to access health facilities than participants who described their health as good. Subjects who drank alcohol were 48% (OR=0.52, 95%CI 0.35, 0.76) less likely to access health facilities. Compared to respondents who did not have support at all from spouse/partner, those who had support from spouse/partner were 2.82 (95%CI 1.30, 6.09) times more likely to access health facilities.

Table 1:
Demographic characteristics of 1061 adults accessing health facilities in Mbare, Harare and Makoni District, Zimbabwe, 2000

	Patient	Suspect	p value
	n (%)	n (%)	
Setting			
Urban	272 (76.2)	562 (79.8)	0.198
Rural	85 (23.8)	142 (20.2)	
Sex			
Female	152 (42.6)	316 (44.9)	0.515
Male	205 (57.4)	388 (55.1)	
Median age (years)	34 (Q1=25, Q3=42)	32 (Q1=25, Q3=41)	<0.001
Marital status			
Married or cohabiting	235 (65.8)	414 (58.9)	0.030
Never married	33 (9.2)	109 (15.5)	
Divorced or separated	53 (14.8)	103 (14.7)	
Widowed	36 (10.1)	77 (11.0)	
Education level			
No formal education	16 (4.5)	55 (7.8)	0.134
Primary incomplete	51 (14.4)	121 (17.2)	
Primary complete	80 (22.5)	127 (18.1)	
Secondary incomplete	101 (28.5)	193 (27.5)	
Form 4 complete	106 (29.9)	201 (28.6)	
Tertiary complete	1 (0.3)	5 (0.7)	
Formal employment	101 (28.7)	171 (24.6)	0.182
Period of employment			
<5 years	31 (31.0)	71 (41.5)	0.269
5-9 years	24 (24.0)	42 (24.6)	
10-19 years	27 (27.0)	36 (21.1)	
20 years and more	18 (18.0)	22 (12.9)	
Family/household size			
1 or 2	66 (18.5)	178 (25.3)	0.043
3-5	166 (46.6)	327 (46.4)	
6-8	90 (25.3)	148 (21.0)	
9+	34 (9.6)	51 (7.2)	
Type of accommodation			
Owned	201 (56.8)	305 (43.8)	<0.001
Rented	125 (35.3)	344 (49.4)	
Other	28 (7.9)	47 (6.7)	
Rooms per household			
1	118 (33.9)	350 (50.6)	<0.001
2	84 (24.1)	126 (18.2)	
3	44 (12.6)	79 (11.6)	
4 or more	102 (29.3)	137 (19.8)	
Religion			
Christian	206 (57.7)	381 (54.3)	0.131
Independent African	47 (13.2)	87 (12.4)	
Traditional	25 (7.0)	44 (6.3)	
None	77 (21.6)	171 (24.4)	
Other	2 (0.6)	19 (2.7)	
Tribe/origin			
Shona	293 (83.0)	583 (83.4)	0.837
Ndebele	8 (2.3)	19 (2.7)	
Foreign origin†	52 (14.7)	96 (13.7)	

† Country of origin either Zambia, Malawi or Mozambique

Table 2:
Lifestyles of 1061 adults from Mbare, Harare and Makoni District, Zimbabwe, 2000

	Patient n (%)	Suspect n (%)	p value
Ownership of/access to working appliances and transport			
Television			
Radio	145 (40.7)	256 (36.6)	0.772
Bicycle	227 (63.6)	388 (55.3)	
Cart	55 (7.8)	76 (10.8)	
Car	32 (9.8)	56 (8.2)	
	11 (3.2)	15 (2.2)	
Number who listened to radio/TV on TB in preceding week	226 (63.7)	391 (56.2)	0.018
Number who listened to individual or group health talk on TB in preceding month	88 (25.1)	80 (11.6)	<0.001
Health status			
Good	68 (19.1)	92 (13.1)	<0.001
Fair	221 (62.1)	381 (54.4)	
Poor	67 (18.8)	228 (32.5)	
Smokes cigarette			
Yes	26 (7.4)	147 (21.1)	<0.001
No	327 (92.6)	549 (78.9)	
Smoked cigarettes before			
Yes	101 (35.3)	76 (16.9)	<0.001
No	185 (64.7)	374 (83.1)	
Drinks alcohol			
Yes	62 (17.6)	293 (41.9)	<0.001
No	291 (82.4)	406 (58.1)	
Number of sex partners			
0	94 (27.1)	190 (27.9)	0.065
1	223 (64.3)	397 (58.3)	
2+	26 (7.5)	74 (10.9)	
Casual sex	4 (1.2)	20 (2.9)	

Table 3:
Health services available at health facilities in Mbare, Harare and Makoni District, Zimbabwe, 2000

	Urban	Rural	p value
	N (%)	n (%)	
Nearest health facility	N=756	n=212	
Health post	4 (0.5)	0	<0.001
Health dispensary	1 (0.1)	0	
Health centre	14 (1.9)	62 (29.2)	
Health clinic	598 (79.1)	114 (53.8)	
Hospital	123 (16.3)	30 (14.2)	
Private health clinic	10 (1.3)	2 (0.9)	
Other	8 (1.1)	6 (2.8)	
Distance between home and nearest health facility (km)	n=442	n=153	<0.001
<1	121 (27.4)	18 (11.8)	
1-2.9	253 (57.2)	34 (22.2)	
3-4.9	48 (10.9)	36 (23.5)	
5+	20 (4.5)	65 (42.5)	
Time to walk to the nearest health facility (minutes)			
<15	268 (47.8)	19 (12.9)	<0.001
15-29	173 (30.8)	11 (7.5)	
30-44	84 (15.0)	29 (19.7)	
45-49	13 (2.3)	10 (6.8)	
60-74	18 (3.2)	31 (21.1)	
75+	5 (0.9)	47 (32.0)	
Time to get to nearest health facility by public means (minutes)			
<10	106 (65.8)	14 (18.2)	<0.001
10-19	29 (18.0)	23 (29.9)	
20-29	11 (6.8)	8 (10.4)	
30+	15 (9.3)	32 (41.6)	
Opening days for health facility			
Every day	334 (45.0)	163 (76.9)	<0.001
Week days only	386 (52.0)	37 (17.5)	
Sometimes	2 (0.3)	3 (1.4)	
Don't know	20 (2.7)	9 (4.2)	
Waiting time to get health care at health facility (hours)			
<1	434 (60.5)	135 (64.0)	0.108
1-2	199 (27.8)	62 (29.4)	
>2	84 (11.7)	14 (6.6)	
Number satisfied with the service received at the health facility	483 (68.4)	161 (77.8)	0.012

Table 4:
Ambulatory treatment of TB patients in Mbare, Harare and Makoni District, Zimbabwe, 2000

	Urban n (%)	Rural n (%)	p value
Person monitoring taking of TB drugs at home			
Health worker always who visits me	1 (0.5)	0 (0)	0.244
Community health worker	1 (0.5)	1 (1.6)	
Family member	72 (33.3)	26 (42.6)	
Close friend	4 (1.9)	0 (0)	
Close relative	45 (20.8)	6 (9.8)	
Always by myself	93 (43.1)	28 (45.9)	
Person recording that TB drugs have been taken			
Health worker at clinic	178 (70.1)	31 (41.9)	<0.001
Health worker at home visit	2 (0.8)	1 (1.4)	
Community health worker	1 (0.4)	1 (1.4)	
Family member/relative	19 (7.5)	10 (13.5)	
Self	37 (14.6)	10 (13.5)	
Other	17 (6.7)	21 (28.4)	
Treatment outcome			
Don't know	1 (0.4)	0 (0)	0.008
Currently on treatment	193 (76.0)	72 (88.9)	
Treatment completed	55 (21.7)	5 (6.2)	
Treatment interrupted	5 (2.0)	4 (4.9)	

Table 5:
Factors associated with suspects accessing health facilities in Mbare, Harare and Makoni District, Zimbabwe, 2000

	With access n (%)	Without access n (%)	p value
Setting			
Urban	249 (80.1)	313 (79.6)	0.965
Rural	62 (19.9)	80 (20.4)	
Sex			
Female	182 (58.5)	206 (52.4)	0.123
Male	129 (41.5)	187 (47.6)	
Age (years)			
15-19	4 (1.3)	25 (6.4)	<0.001
20-29	96 (31.3)	167 (42.7)	
30-39	104 (33.9)	108 (27.6)	
40-49	59 (19.2)	52 (13.3)	
50-59	17 (5.5)	17 (4.3)	
60-69	16 (5.2)	10 (2.6)	
70+	11 (3.6)	12 (3.1)	

Marital status			
Married or cohabiting	193 (62.1)	221 (56.4)	0.002
Never married	30 (9.6)	79 (20.2)	
Divorced or separated	47 (15.1)	56 (14.2)	
Widowed	41 (13.2)	36 (9.2)	
Education level (respondent)			
No formal education	34 (11.0)	21 (5.4)	0.040
Primary incomplete	53 (17.1)	68 (17.3)	
Primary complete	61 (19.7)	66 (16.8)	
Secondary incomplete	76 (24.5)	117 (29.8)	
Form 4 complete	86 (27.7)	120 (30.6)	
Currently formally employed			
Yes	77 (25.1)	94 (24.2)	0.849
No	230 (74.9)	295 (75.8)	
House ownership			
Owned	155 (50.2)	150 (38.8)	0.018
Rented	135 (43.7)	209 (54.0)	
Tied	8 (2.6)	16 (4.1)	
Other	11 (3.6)	12 (3.1)	
Rooms per household			
1	141 (45.9)	209 (54.3)	0.143
2	64 (20.8)	62 (16.1)	
3	43 (14.0)	36 (9.4)	
4	35 (11.4)	45 (11.7)	
5	11 (3.6)	18 (4.7)	
6+	13 (4.2)	15 (3.9)	
Support factors			
Had support from spouse/partner			
Yes	181 (71.0)	174 (55.1)	0.001
No	52 (20.4)	94 (29.7)	
Some/insignificant	9 (3.5)	16 (5.1)	
Not at all	13 (5.1)	32 (10.1)	
Received material support from spouse/partner			
Yes	84 (28.1)	69 (18.5)	0.013
No	210 (70.2)	297 (79.8)	
Some/insignificant	5 (1.7)	6 (1.6)	
Lifestyle factors			
Health status			
Good	30 (9.7)	62 (15.8)	<0.001
Fair	147 (47.6)	234 (59.7)	
Poor	132 (42.7)	96 (24.5)	
Smokes cigarettes now			
Yes	49 (15.9)	97 (25.1)	0.004
No	259 (84.1)	290 (74.9)	
Drinks alcohol			
Yes	109 (35.4)	184 (47.1)	0.002
No	199 (64.6)	207 (52.9)	

Table 6:
Factors independently associated with access to health facilities among suspects in Mbare, Harare and Makoni District, Zimbabwe, 2000

	OR (95%CI)	P value
Age		
15-19	1	
20-29	2.80 (0.74, 10.58)	0.130
30-39	4.77 (1.25, 18.21)	0.022
40-49	5.36 (1.36, 21.10)	0.016
50-59	4.43 (0.96, 20.46)	0.057
60-69	15.39 (2.74, 86.65)	0.002
70+	3.87 (0.77, 19.59)	0.102
Health status		
Poor	2.28 (1.26, 4.12)	0.006
Fair	1.14 (0.66, 1.98)	0.635
Good	1	
Drinking alcohol		
Yes	0.52 (0.35, 0.76)	<0.001
No	1	
Having support from spouse/partner		
Yes	2.82 (1.30, 6.09)	0.008
No	1.45 (0.64, 3.31)	0.375
Some/insignificant	1.42 (0.45, 4.52)	0.548
Not at all	1	

DISCUSSION

The level of participation in the study was high, and respondents were adults who were willing to access health services, and most of whom fell into the age groups most at risk from TB and HIV. Participants in the community were randomly selected, reducing the possibility of selection bias. Certain limitations however have to be considered before interpreting the findings. The veracity of self-reported beliefs and behaviours cannot be validated. While about 40% of respondents did not believe there was a connection between HIV and TB, over 80% believed that there was TB1 and TB2, an inconsistency that illustrates the point. The number of patients found at the institutions for assessing laboratory determinants was rather small to allow full interpretation. Patients interviewed at health institutions were already more likely to have access to health care than those who were not present at the clinic, but constitute a segment of the population where appropriate interventions can be made to improve time lags and general laboratory utilisation. Despite these limitations, the study provided useful data that allow certain conclusions and recommendations to be made.

More men that women were identified as having tuberculosis, while patients were generally older than suspects. This could be due to the higher prevalence of HIV in older patients. Patients were more likely than suspects to be married while suspects who presented to health facilities were also more likely to be married than those who did not, suggesting that good social support improved access to health care, as has been shown elsewhere. Patients were more likely than suspects to have better socio-economic conditions, as reflected by their greater ownership of houses and lower level of crowding. The overall quality of health care did not appear to influence

access and utilisation of TB services, and most respondents considered the quality of health services to be satisfactory.

There was no significant difference in access to TB services among suspects according to setting (urban or rural), gender, in the number of persons in a household, in employment status or ownership of appliances and transport. Patients were more likely than suspects to have greater information about tuberculosis, possibly due to heightened awareness and anxiety about their diagnosed disease. Once diagnosed as having tuberculosis, it appears that patients tended to take better care of themselves, and were more likely to have recently changed their behaviour for a healthier one, as reflected by number who had stopped smoking and drinking compared to suspects. Reporting of their health status as good by patients could be a result of a more positive frame of mind following a diagnosis of TB, since most believed that TB was curable.

There was a good level of knowledge about tuberculosis, its mode of transmission and its clinical features. However, more than a third of all respondents reported that no connection existed between tuberculosis and HIV, though many believed in "TB1" and "TB2", in which the latter is considered to be tuberculosis related to HIV. This widely held belief appears to be more strongly held among suspects, a reflection perhaps of the anxiety associated with the possibility of TB. Since about 40% of respondents obtained their information from family members and friends, it appears that the public perception of two forms of TB is strongly held. This should be a major topic of information, education and communication campaigns, which need to be modified to address close associates of patients. Urban patients were better informed than their rural counterparts about their treatment, and their treatment relatively more fully recorded.

One of the key elements of the directly observed treatment, short course (DOTS) strategy for tuberculosis control is direct observation of treatment (DOT)[28]. While DOT reduces the development and spread of drug-resistant tuberculosis, it has not had an effect on the increase in total number of cases in countries with high rates of HIV infection[29]. Our study shows that the DOT is not really working in Zimbabwe. Of the more than 75% of urban and rural patients taking treatment from home, more than 40% are doing so without any supervision. A significant number of these patients on unsupervised ambulatory treatment are probably taking rifampicin without supervision. The combination of an upsurge in new cases and unsupervised treatment is likely to create an epidemic of drug resistant tuberculosis.

Despite the reluctance of health care workers to involve family members in the diagnosis and especially treatment of TB, family members can be highly effective treatment supervisors, provided that they are supervised by health professionals[30]. Another option for optimising treatment adherence is to have once-weekly supervision of treatment in the intensive phase, followed by fortnightly supervision in the continuation phase[31]

The concept of 'TB clubs' has worked in resource-poor settings such as Ethiopia[32]. These clubs consist of groups of TB patients from the same locality who attend the same health facility together on the same day. Members share information about TB

and its treatment, side effects of treatment, offer each other support with treatment adherence, and assist in the identification of suspects.

Because the driving force behind the resurgence of tuberculosis is HIV/AIDS, there is a need for greater interaction between the tuberculosis and HIV control programmes. An important adaptation will have to be the introduction of voluntary counselling and testing to all TB patients. A standardised minimum package of care for HIV-infected persons also should be developed for the Zimbabwe setting.

It has been shown that to reduce delays, patients should be educated in culturally appropriate ways to seek help more quickly, and that health care workers should maintain a high index of suspicion and perform appropriate investigations[33]. Our study showed that the most preferred source of information about TB is the health care worker, as has been found in countries within the region[34]. The onus of raising community awareness about the signs and symptoms of TB thus lies primarily with health professionals. However, this should be with the involvement of community members such as village leaders, schoolteachers, community health workers, trade unions and women's organisations[35]. Raising awareness will, of course, only be beneficial if there are adequate diagnosing and treatment facilities, and no barriers to accessing these services.

The stigma associated with tuberculosis and HIV need to be addressed. Direct approaches involve understanding and addressing community beliefs and attitudes through research and awareness campaigns, while an indirect approach involves the integration of TB control with a non-stigmatised disease control programme[36]. These approaches have been found to be successful in reducing the stigma associated with TB and HIV/AIDS in Zambia[37], and should be adapted and implemented in Zimbabwe

Unsurprisingly, the nearest health facility was furthest away for most rural people. The quality of health care delivered was satisfactory to most respondents in both urban and rural areas. There was a generally high index of suspicion among health care workers as reflected by the finding that more than 40% of all patients received treatment before results were to hand. This of course raises the possibility that chronic non-TB respiratory conditions may be managed as tuberculosis, particularly if presenting atypical in HIV-positive people. Only a third of suspects received health advice at health facilities, while more than 50% of patients did not have their close contacts examined for TB. The NTP needs to develop feasible strategies of improving upon these figures.

In Zimbabwe, anti-TB drugs are provided free-of-charge to confirmed TB patients. However, suspects have to meet the costs of investigations and any treatment received prior to the diagnosis of TB. Even after being diagnosed as having TB, there are still costs for admission (except in local authority hospitals), further investigations and management of other conditions which have to paid for either directly or through medical insurance schemes. In the private sector, patients pay for all services except anti-TB drugs. In an urban setting in Zambia, economic barriers such as transport costs, cost of 'special food' and lost income contributed to a delayed diagnosis of tuberculosis[38]. The significant linkages between household fundamentals and access to health services were with respect to education and homeownership, but not

employment. Though transport costs did not differ in actual terms between urban and rural areas in our study, these could have been relatively higher in rural areas. These factors are related to the ability to pay for health care, particularly before a diagnosis of TB has been made. The ability to pay can be expected to have a strong influence on health-seeking behaviour. In this scenario, traditional healers would be expected to be consulted at a greater rate than revealed in this study.

This study showed that significant deficiencies exist in the control of tuberculosis in Zimbabwe, particularly with respect to DOT. The NTP needs to know the reasons for the low percentage of patients who are actually on DOT. The improvement of health education to communities, suspects, patients, contacts and health care workers needs to be strengthened. Training of health care workers should be intensified, particularly in the rural areas, with emphasis on the clinical management of TB, as well as on the administration and supervision of treatment. There should be a clear policy on the role of family members as DOT supervisors.

Addressing socio-economic deprivations, redressing gender imbalances, and empowering communities to have a more active role in their own health care, are all vital in combating TB, but are beyond the scope of any single sector. The Ministry of Health and Child Welfare is best placed, if not to lead then at least to co-ordinate a multisectoral approach towards HIV/AIDS and TB control.

Innovative means of strengthening social networks and support will contribute greatly to improving the access to health care facilities, and this should be a major thrust of operational research. The development of better links between the NTP and NACP will assist in the provision of a continuum of care to persons infected and affected by HIV, particularly in resource-poor settings prevailing in most of sub-Saharan Africa. This crucial area of feasible links between HIV/AIDS and TB control and prevention programmes needs to be developed even more at regional and continental level, with the involvement of key organisations such as the Southern African Tuberculosis Control Initiative (SATCI) and World Health Organisation.

Summary of major findings:

- There was no significant difference in access to TB services among suspects according to setting (urban or rural), gender, in the number of persons in a household, in employment status or ownership of appliances and transport.
- In those instances where significant differences in access existed, personal determinants appear to have a greater influence than system determinants on access to TB services.
- There was a widely held erroneous belief about the existence of "TB1" and "TB2", with the latter being attributed to HIV, which was more strongly held among suspects
- DOT is not really being practised in urban and rural Zimbabwe. More than 75% of all patients take treatment at home, with more than 40% of these doing so without any supervision.
- Only a third of suspects received health advice at health facilities
- More than 50% of confirmed TB patients did not have their close contacts screened for TB.

Summary of recommendations:

- The NTP needs to commission operations research to determine the reasons for the low percentage of patients who are actually on DOT, and to design appropriate interventions.
- Innovative means of strengthening social networks and support need to be developed, as these will contribute greatly to improving access to health care.
- The improvement of health education to communities, suspects, patients, contacts and health care workers needs to be strengthened as a matter of priority.
- The clear policy on contact tracing needs to be implemented on a broader scale
- Training of health care workers should be intensified, particularly in the rural areas, with emphasis on the clinical management of TB, and on administration and supervision of treatment.
- The stigma associated with tuberculosis and HIV need to be addressed. Direct and indirect approaches of health education, as well as 'TB clubs', could be useful tools if applied in a culturally acceptable manner.
- There should be a clear NTP policy on the role of family members as DOT supervisors.
- The role of the private sector in management of TB, and of alternative practitioners such as traditional healers needs to be clearly defined, and the level of interaction between these health care providers and the NTP needs to be strengthened.
- The Ministry of Health and Child Welfare should lead in a multisectoral approach towards integrated HIV/AIDS and TB control.
- The development of feasible links between HIV/AIDS and TB prevention and control programmes needs to be strengthened at regional and continental level under the auspices of the appropriate bodies.

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