DETERMINANTS OF TUBERCULOSIS SERVICES ACCEPTANCE AMONG PATIENTS IN IBADAN, NIGERIA
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ABSTRACT

The paper examined the effects of religion, educational status and stigmatization on acceptance of tuberculosis services in government hospitals in Oyo State, Nigeria. Descriptive survey research design was adopted. The population consisted of three 300 tuberculosis patients attending a government chest hospital in Jericho, Ibadan. Purposive sampling method was used to select the respondents for the study. A structured questionnaire duly scrutinized and validated by experts in the field of health and medical social work was used. A reliability value of r=0.71 was obtained. Data collected were coded and analyzed with the use of frequency counts, percentages and Pearson correlation statistical method. The result of the study showed that stigmatization did not have any significant relationship on acceptance of tuberculosis services (r=0.001, n=300, P>0.05). Also, the finding revealed that there was a significant relationship between religion and acceptance of tuberculosis services (r=590, n=300, p<0.05) and there was a significant relationship between the level of education and acceptance of tuberculosis services (r=.253, n=300, p<0.05). It was recommended that tuberculosis education should form an essential part of social work, health education and health promotion curriculum. Also, there is the need for stakeholders to participate fully in the campaign to eradicate tuberculosis. Tuberculosis patients should be motivated to accept modern and free tuberculosis health services in Nigeria.

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INTRODUCTION

Tuberculosis (TB) remains one of the worlds' greatest public health challenges. It is a common lethal infectious disease caused by various strains of mycobacterium usually called mycobacterium tuberculosis. It usually attacks the lungs but can also affect other parts of the body such as the brain, bones and the spinal cord. The mode of spread or transmission is through the air when people who have active TB infection cough, sneeze or otherwise transmit their saliva through the air. Konstantinos (2010) found out that, most infections in humans result in asymptomatic latent infection. About one in ten infections eventually progress to active disease which, if left untreated, kills more than fifty percent (50%) of its victims. This calls for a serious concern from the health social workers and health educators because the unprecedented spread of the disease remain a great challenge to the nation of Nigeria and there is urgent need for adequate and prompt intervention.

BACKGROUND

Prevalence of tuberculosis

The portion of people who become sick with tuberculosis each year is stable or falling worldwide, but because of population growth, the absolute number of new cases is still increasing. Newacheck and McManus (2009) found out that, an estimated 13.7 million chronic cases, 9.3 million new cases and 1.8 million deaths, mostly in developing countries like Nigeria was reported in 2007. In addition,

more people in the developed world contract tuberculosis because their immune systems are more likely to be compromised due to higher exposure to immunosuppressive drugs, substance abuse and HIV and AIDS. In like manner, Kumar, Abbas, Fausto and Mitchell (2007) affirmed that, the distribution of tuberculosis is not uniform across the globe. About 80% of the population in many Asian and African countries test positive to tuberculin tests while only 5-10% of the United States' population test positive. WHO (2012) further reported that, Nigeria has the world's fourth largest tuberculosis (TB) burden with more than 460,000 estimated new cases in 2007. The report further said that, between 2002 and 2007, directly observed treatments (DOT) – the internationally recommended strategy for tuberculosis control- coverage had increased rapidly from 55% in 2002 to 91% in 2007. After declining for several years, the treatment success rate was established at 76%.

 In the same vein, both case detection and treatment rates in Nigeria were among the lowest of high burden TB countries in Africa. This sends a crucial signal that the public health burden posed by TB is becoming increasingly important as the country's HIV and AIDS epidemic unfolds. In support of the aforesaid, Rubel and Garro (2002) found out that, more than a quarter of new TB patients are HIV positive. The report further said, as collaborative efforts are being scaled up, the number of TB patients tested for HIV and AIDS has increased from about 7,500 in 2006 to 27,850 in 200. Premised on the above, the Federal Ministry of Health declared TB a national

emergency in April 2006 and inaugurated the National TB/HIV/AIDS Working Group in June 2006.

Nigeria is ranked high among the TB burden countries in the world. Because of the prevalence of TB, Nigeria ranked 10th among the 22 high-burden TB countries in the world. According to WHO (2012), 210, 000 new cases of all forms of TB occurred in the country in 2010, an equivalence of 133/100,000 population. Also, there were an estimated 320,000 prevalent cases of TB in 2010, an equivalence of 199/100,000 cases. Further, there were 90.447 TB cases notified in 2010 with 41,416 (58%) cases as new smear positives, and a case detection rate of 40%. In the same vein, 83% of cases notified in 2009 were successfully treated while the death rates have declined from 11% in 2006 to 5% in 2010. It is expected that TB programme will have a comprehensive prevalence and death rates by the year 2015. Current literature revealed that, Lagos, Kano and Oyo State have the highest TB prevalence rate. Other states however experienced a drop in cases notified, resulting in 4% overall decline in 2010. Oyo State increased by 46.5% from 2008 to 2010. Also, record has it that Benue State has a high TB burden which is attributed to a high HIV prevalence.

Tuberculosis as a global burden

Neil (2012) postulated that, tuberculosis remains among the world's great public health challenges, and the advances discussed hold promises for the development of better prevention and treatment of

the disease. Robert Koch identified micro bacterium tuberculosis about 123 years ago. Since then, there have been great advances in our understanding of many of the crucial events in disease pathogenesis. It is however sad to note that, tuberculosis is nowhere near eradication or even control in many areas of the globe with adequate reference to the country Nigeria. It is worth recalling the words of Rene and Jean Dubos that "tuberculosis as it has been said, is a disease of incomplete civilization" meaning, it is a disease of the impoverished – the poor. Neil further asserted that, vague as this statement appears at first, it underlines the fact that the anti-tuberculosis movement cannot be properly understood if seen only in its medical perspective for the historical and social background loom large in picture. However desirable the goal is, the complete elimination of tubercle bacilli is rendered impossible by economic and social factors.

Tuberculosis control

Education is a vital tool of eradicating TB disease. The possibility that, educated people will seek orthodox means of treatment may be much higher than that of the illiterate or person with little or no education. Education may also serve as means of enlightening the general public about the best treatment for TB patients. The health social worker should therefore be prepared to educate all TB suspects. Premised on the above, the Center for Disease Control and Prevention (2000) proposed the under listed procedures for controlling TB:

- Collection of 3 sputum specimen for identification of TB bacilli in the laboratory.
- Collection of good sputum specimen including the time to produce the sputum, how to open and close the specimen container.
- Educate the patient on the need to produce the sputum.
- Confirm that the patient is ready for treatment.

T B and health education challenge

The challenge on the health social workers and allied medical practitioners is greatly enormous. Premised on this, the following health education guidelines and procedures were suggested by Center for Disease Control and Prevention (2000).

- The result of the sputum test and the type of disease diagnosed should be made known to the patient.
- Explanation on the cause of the disease and how it is transmitted should be explicit.
- The disease is curable provided the correct drugs and dosages are taken for a stipulated 8 months without a break.
- Explain the types of the drugs and the number of times they ought to be taken.
- There is the need to bring symptomatic contacts for screening.
- The patients' family members should know the signs and symptoms of TB and should be willing to bring any suspect to the health care service providers.
- The family should also be ready to support the patients in order to be regular on the treatment.
- It should be stressed that the patient is no longer infectious as long as he/she complies with the treatment regularly.
- Explanation on the duration and the nature of the treatment in the hospital and at home should be explicit.

- Educate the patient on the side effects of drugs which may include: skin rash, joint pains, yellow coloration of the conjunctiva, poor vision, imbalance, and red coloration of urine. Instruct patient to report any of these signs promptly.

- Sputum examination should be repeated at the end of 2nd, 5th and 7th months to determine the effectiveness of the drugs taken. It should however be noted that, if the results still identify the TB organism, the treatment may change.

- The health social workers should obtain feedback by allowing patients to recall facts, identify possible problems and deal with them decisively at the end of each health talk session.

T B and stigmatization

Modern American usage of the word 'stigma' and stigmatization refers to an invisible sign of disapproval which permits insiders to draw a line around the outsiders in order to determine the limits of inclusion in any group. Smith, (1996) affirmed that, demarcation permits insiders to know who is in and who is out and allows the group to maintain its solidarity by demonstrating what happens to those who deviate from accepted norms of conduct, hence stigmatization is defined as an issue of disempowerment and social injustice. Once people identify and label someone's differences, others will assume that, it is just how things are and the person will remain stigmatized unless the stigmatizing attribute is undetected.

Tuberculosis patients just like HIV and AIDS patients are liable to be stigmatized. The reason is obvious. This is simply because of the fear of being infected, an average person tend to run away from, and call the infected by name there is also the tendency for people not to allow their loved ones to move near the suspected carrier of tuberculosis and people living with HIV and AIDS. Premised on the aforesaid, Shreatha, Kuwahara, Wice, Deluca and Taylor (2002) asserted that, patients' denial or hesitation to disclose their TB status to the family or friends is due to the overwhelming fear of being socially ostracized. In the same vein, Rubel and Garro (2002) found out that, stigma among Mexican immigrants in Califonia significantly influenced patients' perceptions of their illness and caused them to cease contact with family and friends. It was further reported that patients blamed the social consequences of stigmatization and ostracism for their long delays in seeking care and their poor adherence to treatment.

TB and religion

Religion, according to Emma (2011) is a cultural system that creates powerful and long lasting meaning, by establishing symbols that relate humanity to truths and values. Many religions have narratives, symbols, traditions and sacred histories that are intended to give meaning to life or to explain the origin of life or the universe. They tend to derive morality, ethics, religious laws or a preferred lifestyle from their ideas about the cosmos and human nature. Emma further said, the development of religion has taken different forms in

different cultures. Hundelson (2006) also affirmed that some religions place emphasis on belief, while others emphasize practice. In the same vein, Carey, Oxtoby, Ngunyen, Huynh, Morgan and Jeffery (2007) said, some other religions focus on the subjective experience of the religious individuals, while others consider the activities of the religious community to be most important. Some religions claim to be binding on everyone, while others are intended to be practiced only by a closely defined or localized group. In many places including Nigeria, religion has been associated with public institutions such as education, hospitals, the family, government and political hierarchies. In the same vein, Enwereji (1999) earlier found out in a study of the Igbo of Nigeria that, TB patients who held rigidly to traditional views that TB can spread by eating beef and other high-protein foods reportedly delayed seeking treatment and often waited until they were malnourished.

 In Malawi, Brouwer, Boeree, Kager and Varkevisser (2008) found out that, patients thought that TB resulted from bewitchment or breaking sexual taboos. They explained further that patients also believed that they could only be treated by traditional healers, while TB from other causes could be treated with western medicine. Conversely too, Cary, Oxtoby, Nguyen, Huynh, Morgan and Jeffery (2007) found out that some groups of patients express strong preferences for treatment from bio-medically trained physicians with little and or no interest in traditional remedies. In Malawi too, Wandwalo and Morkve (2000) found out that, traditional healers

advised TB patients to attend medical clinics when patient presented with certain signs and symptoms. They however found no connection between knowledge about TB and completion of treatment. In the same vein, Menegoni (2006) found out that religious movements have increased the acceptance of germ theory and of western medicine, reducing the attribution of disease to witchcraft. In another interesting development, Newachek and Mcmanus (2000) found out that, educational attainment, stigmatization and religion influenced parents of uninsured Latino children with chronic illness. However, it was said that higher educational attainment and religion was associated with significantly higher rates of being up to date for DPT immunization in Mexican-American children.

STATEMENT OF PROBLEM

Tuberculosis is fast becoming a worldwide problem. War, famine, homelessness and lack of medical care all contribute to the increasing incidence of TB among disadvantaged persons. Since TB is easily transmissible between persons, then the increase in tuberculosis in any segment of the population represents a threat to all segment of that population. This means that, it is important to institute and maintain appropriate public health measures including screening, vaccination and treatment. It is important to note that, a laxity of public health measures will contribute to an increase in incidence of TB infections. Failure of adequate treatment will also promote the development of resistant strains of tuberculosis. The

social workers therefore, should assist those affected by TB. In many social work settings, TB social workers are part of the interdisciplinary team that works together to increase patients' treatment compliance. TB social workers face the challenge of working with staff doctors, nurses, medical assistants and language interpreters to help achieve this compliance. Apart from the function to link patients with health care, the social workers also face the challenges such as advocating, intervening, locating TB patients and assisting them with permanent housing options. In the same vein, low levels of education, religious believe and stigmatization are said to have militated against acceptance of tuberculosis service in most parts of the world. Premised on this, this paper therefore tried to find out the effects of religion, educational status and stigmatization on acceptance of tuberculosis services among tuberculosis patients in Ibadan, Oyo state, Nigeria.

HYPOTHESES

Ho1: There is no significant relationship between religion and acceptance of tuberculosis services in Ibadan.

Ho2: There is no significant relationship between educational status and acceptance of tuberculosis services in Ibadan.

Ho3: There is no significant relationship between stigmatization and acceptance of tuberculosis services in Ibadan

METHODOLOGY

The study examined the effects of religion, educational status and stigmatization on acceptance of tuberculosis services among patients in Oyo state government chest hospital, Ibadan, Nigeria. Descriptive research design method was used for the study. The population was 300 tuberculosis male and female patients receiving treatment at the Oyo state government chest hospital, Jericho, Ibadan. The purposive sampling method was used to select both the hospital and respondents. This method was adopted because the chosen hospital is the referral tuberculosis centre for Oyo state which enabled the use of 300 respondents for the study. Convenient sampling method was also adopted to select new patients on clinic days. The instrument used for the study was an adapted and modified likert type questionnaire on effects of religion, educational status and stigmatization of tuberculosis patients (ERESTP) on acceptance of tuberculosis services in Ibadan. The questionnaire was in two sections, A and B. Section A elicited demographic characteristics while section B featured statements on the variables for the study. The inputs of experts from social work educators, health social workers, health educators and other health care providers were fully annexed. Twenty (20) copies of the questionnaire were administered to TB patients attending TB clinic at Iseyin primary health centre who were not part of the research population. This ensured the validity of the instrument and a reliability coefficient of r = 0.71 was obtained.

The questionnaire was personally administered by the researcher with the help of six trained research assistants. The completed questionnaires were collected on the spot. These were coded and analyzed with the use of frequency counts, simple percentages for the demographic characteristics while Pearson moment correlation was used for section B which elicited statements on effects of religion, education and stigmatization on acceptance of tuberculosis services. The two hypotheses generated for the study were tested using Pearson moment correlation for data analysis at 0.05 alpha level.

FINDINGS

The findings of the study shows that, 82 (27.3%) of the respondents have no formal education, 29 (9.7%) of them have primary school education, 139 (46.3) have secondary school education while 50 (16.7) have tertiary education respectively. With this result, those who had secondary school education constituted the highest number of respondents used for this study. This might be responsible for the prompt responses from the participants. By implication, education and level of awareness play an important role in the acceptance of tuberculosis services. The hypotheses tested revealed the following results:

Religion and acceptance of TB services

Hypothesis I: There is no significant relationship between religion and acceptance of tuberculosis services among tuberculosis patients

in Ibadan, Oyo State, Nigeria. The result obtained is presented in Table 1.

Table 1: *Pearson Correlation showing the significant relationship between religion and acceptance of tuberculosis services among tuberculosis patients in Ibadan Oyo State, Nigeria.*

	Mean	S.D	N	r	P	Remark
Acceptance of Tuberculosis	30.2567	5.8707	300			
				590**	.000	Sig
Religion	18.8533	3.2114	300			

r = 590, n = 300, p < 0.05

Table 1 shows that, there was a significant relationship between religion and acceptance of tuberculosis services (r = 590, n = 300, p < 0.05). This implies that increase in the level of religiosity of tuberculosis patients will lead to an increase in the level of acceptance of the tuberculosis services among the tuberculosis patients in Ibadan. The null hypothesis is therefore rejected.

Educational attainment and acceptance of TB services

Hypothesis 2: There is no significant relationship between education attainment and acceptance of tuberculosis services among

tuberculosis patients in Ibadan, Oyo State, Nigeria. The result obtained is presented in Table 2.

Table 2: *Pearson Correlation showing the significant relationship between level of education and acceptance of tuberculosis services among tuberculosis patients in Ibadan, Oyo State.*

	Mean	S.D	N	r	P	Remark
Acceptance of Tuberculosis	30.2567	5.8707	300			
				.253**	.000	Sig
Education	14.8433	3.5610	300			

r = .253, n = 300, p < 0.05

Table 2 shows that, there was a significant relationship between education and acceptances of tuberculosis services (r = .253, n = 300, p < 0.05). This implies that increase in the level of educational attainment of tuberculosis patients will lead to an increase in the level of acceptance of the tuberculosis services among the tuberculosis patients in Ibadan. The null hypothesis is therefore rejected.

Stigmatization and acceptance of TB services

Hypothesis 3: There is no significant relationship between stigmatization and acceptance of tuberculosis services among tuberculosis patients in Ibadan, Oyo State, Nigeria. The result obtained is presented in Table 3.

Table 3: *Pearson Correlation showing the significant relationship between stigmatization and acceptance of tuberculosis services among tuberculosis patients in Ibadan, Oyo State, Nigeria.*

	Mean	S.D	N	r	P	Remark
Acceptance of Tuberculosis	30.2567	5.8707	300			
				-.001	.992	NS
Stigmatization	13.8733	3.9669	300			

r = -.001, n = 300, p > 0.05

Table 3 shows that, there was no significant relationship between Stigmatization and Acceptance of Tuberculosis Services (r = -.001, n = 300, p > 0.05). This implies that increase in stigmatization against tuberculosis patients will not lead to an increase in the level of acceptance of the tuberculosis services among the tuberculosis patients in Ibadan. The null hypothesis is therefore not rejected.

DISCUSSION OF FINDINGS

This finding is in line with the findings of Wilkinson, Gcabashe, and Lurie (1999) that TB patients visit spell casters, faith leaders, and those who use plant for healing among South African patients, despite patients' recognition that TB could be cured. It is also in line with the finding of Farmer, Ramilus, & Kim (2001) in rural Haiti, that many patients accepted sorcery as a possible cause for TB. Their etiological beliefs had no impact on compliance with biomedical regimens. Similarly, Rubel (2003) found high rates of adherence with biomedical treatment among migrant farm workers, regardless of whether they attributed their symptoms to biomedical causes or "folk" illnesses. The result also falls in line with Emma (2011) who found out that, religion has been associated with public institutions such as education and hospitals. Further, Enwereji (1999) found out that Igbo community of Nigeria held rigidly to traditional views and therefore delay seeking treatment and often waited until they were malnourished. In the same vein, the result is in line with Menegoni (2006) who found out that religious movements has increased the acceptance of germ theory and of western medicine thereby reducing the attribution of diseases to witchcraft. This implies that people's orientation about tuberculosis must change. Religion should not in any way deter acceptance of TB services. Health social workers must be ready to educate TB patients, their family members and the community at large that, religious believes has nothing to do with this deadly disease. The counseling and advocacy function of the

social workers should be judiciously displayed to bring convincing information to TB clients and their family members.

The result also negates the finding of Wandwalo and Morkve (2000) which found no connection between knowledge about TB and completion of treatment. Meanwhile, the result support the finding of Newacheck & McManus (2009) that higher education attainment and religion was associated with significantly higher rates of being up-to-date for DPT immunization in Mexican-American children. It is imperative to note that, education is a vital tool to eradicating TB disease. In the same vein, there is the possibility that, the number of educated people that will seek orthodox means of treatment may be much higher than that of illiterate or person with little education. Therefore, health social workers must bear in mind that, education may also serve as a means of enlightening the general public about the best treatment available for TB patients.

In the same vein, the result negates the finding of Rubel and Garro (2002) which stated that, fear of stigma significantly influenced patients' perceptions of their illness and caused them to cease contact with family and friends. Similarly, the report further said that, patients blamed the social consequences of stigmatization and ostracism for their long delays in seeking cares and their poor adherence to treatment. Meanwhile, the result is in line with the findings of Shrestha, Kuwahara, Wice, Deluca and Taylor (2002) which found out that, there is strong association between stigmatization and TB. Also, fear of family rejection and loss of

friends led some patients to report for treatment. Stigma also results in loss of employment, or fear of such, thus delaying care seeking, diagnosis, and effective treatment. At this juncture, the heath social workers should remember that TB patients just like any HIV/AIDS patients are liable to be stigmatized. It is therefore an herculean task for the health social workers to function optimally by educating TB patients and their family members that the infected clients could be cured and should not be stigmatized.

CONCLUSSION

The finding of the study implies that religion does not in any way affect acceptance of tuberculosis services. It was concluded that the level of education have significant effects on acceptance of tuberculosis services. In the same vein, it was concluded that, fear of stigma and family rejection were responsible for acceptance of tuberculosis services. Succinctly too, it could be affirmed that, the treatment of tuberculosis will be widely accepted if the entire population are properly educated on the causes and factors responsible for TB infection and the necessary line of treatment. In the same vein, it should be borne in mind that, reduced stigmatization and improved religiosity could also help in the eradication of tuberculosis. The implication of this finding is that, the government should be ready to face squarely the social responsibility of controlling and eradicating the disease. Also, the expected roles of the health social workers could not be over emphasized; they have significant roles to play. Such roles include

health education, counseling advocacy among others. The general populace and indeed, the affected clients should be well informed on the prevalence, mode of spread, control and consequences of tuberculosis disease. Access to and acceptance of available tuberculosis services should be of utmost priority. Diagnosed tuberculosis patients, irrespective of their religion or traditional background could benefit from tuberculosis services. Furthermore, the health social workers should help to identify unidentified cases who should be assisted to seek treatment from the public health services available within the confines of their living environment. Finally, other health care providers should collaborate efforts in other to ensure the eradication of tuberculosis from the society.

RECOMMENDATIONS

1. Tuberculosis education should form an essential part of health education curriculum.

2. Health social workers, health educators, parents, teachers and other health care providers should work collaboratively to ensure the adequate dissemination of information aimed at controlling and eradicating tuberculosis.

3. Government at various levels should double their existing efforts on the eradication of tuberculosis through effective personnel, financial and material management

REFERENCES

Brown, J. A., Boeree, M. J., Kager, P., Varkevisser, C. M. & Harris, A. D., 2008.   Traditional healers and pulmonary tuberculosis in Malawi. International Journal of Tuberculosis and lung diseases. 2.3.231-234.

Cary, J. W., Oxtoby, M. J.,Nguyen, L. P., Huyen, V., Morgan, M. & Jeffery, M,. 2007. Tuberculosis beliefs among recent Vienamese refugees in New York state. Public Health Reports. 112. 1. 66-72.

Center for Disease Control and Prevention, 2000. Core Curriculum on Tuberculosis: what the clinician should know. Document.

Emma, A., 2011. Tuberculosis and its scourge on Nigeria's population. Available: www.nasarawa.org/newsday. (Accessed 10 May 2013).

Enwereji, E., 1999. Views on tuberculosis among the Igbo of Nigeria. Indigenous knowledge and development monitor. 7. 2. 3-5.

Farmer, P., Robin, S., Ramilus, S. L., & Kim, J. Y., 2001. Tuberculosis, Poverty and Compliance. Lesson from rural Haiti. Seminars in respiratory infections. 6. 4.254-260.

Hudelson, P., 2006. Gender differentials intuberculosis: The role of Socio-economic and cultural factors. Tubercle and lung disease. 4. 3. 171-178.

Konstantinos, A. 2010. Testing for Tuberculosis. Australian prescriber. 33. 1. 12-18.

Kumar, V., Abbas, A. K., Fausto, N. & Michell, R. N., 2007. Rbbins basic Pathology. (8th Ed) Sanders Elservier. 516-522.

Menegoni, L., 2006. Conception of Tuberculosis and therapeutic choices in Highland Chiapas, Mexico. Medical Anthropology Quarterly. 10. 3. 381-401.

Neil, W.S 2005. The pathogenesis of tuberculosis. American Journal of Respiratory cell and molecular Biology.32.4.251-256.

Newacheki, P. & Mcmanus, M. A., 2009. Health insurance status of Adolescents in United States. Pediatrics. 84. 699-708.

Rubel, A. J. & Garro, L. C., 2000. Social and cultural factors in the successful control of Tuberculosis. Public Health Reports. 107. 6. 626-636.

Shrenstha, K. R., Wilce, M., Deluca, N. & Taylor, Z., 2002. Factors associated with identifying Tuberculosis contacts. Queens Quarterly. 103.2. 403-413.

Smith, G., 1996. Contagious subversion: cultural constructions of diseases. Queens Quarterly 103.2. 128-137.

Wandwalo, E. R. & Morkve, O., 2000. Knowledge of Disease and treatment among Tuberculosis patients in Mwanza, Tanzania. International Journal of Tuberculosis and Lung diseases. 4.11. 1041-1046.

Wilkinson, D., Gcabashe, L. & Lurie, M., 2009. Traditional healers as Tuberculosis treatment supervisors: precedence and potential. International Journal of Tuberculosis and lung diseases 3. 9. 838-842.

WHO, 2012. Tuberculosis diagnostic: Automated DNA test. Available: www.WHO.int/tb/featuresachieve/newrapidtest. (Accessed 27 September 2012).