# Knowledge of Tuberculosis among Residents of Informal Settlements: A Case of Mukuru Kwa Njenga, Nairobi

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**Abstract:** A TB prevalence survey conducted by National Tuberculosis, Leprosy and Lung Disease-Program (NTLD-P) in 2016 revealed that the burden of TB in Kenya is higher than the previous assumptions. Additionally, it demonstrated that there was a higher burden of TB in urban compared to rural settings consistent with routine TB data collection which shows a higher notification in the big cities of Nairobi and Mombasa. There is need to find out factors contributing to the large TB burden in Kenya, especially in the escalating slums near cities such as Mukuru Kwa Njenga slum. The current study assessed existing knowledge regarding TB causes, symptoms, diagnosis and treatment. The study population consisted of residents of Mukuru kwa Njenga who had lived in the area for at least one month aged above 18 years, from both genders. Household survey was the major source of data for the demographics and socio-economic status of the participants who verbally consented to participating in the study. Focused group discussions were conducted with TB patients on intensive phase of treatment at the facility. Descriptive analysis with the help of SPSS was conducted. A majority of the respondents did not know additional symptom of TB other than cough (n=126, 51.2%) while (23% n=57) did not know how TB is transmitted. Additionally, (82 % n=203) of the respondents knew what causes TB. While adequate ventilation is key in TB prevention, majority of houses in this location had one room (94%, n=232) with a majority with only one window (89.4% n=220) and 41% n=102 with more than four occupants per house. The study concluded that the community suffers overcrowding, poor housing and lacks the ability to detect or diagnose TB occurrences earlier in order to acquire early treatment.

**Key Words: Tuberculosis, Knowledge, Informal Settlements**

## BACKGROUND

Tuberculosis (TB) is a highly contagious disease caused by Mycobacterium tuberculosis and remains a public health threat, with approximately 11 million people getting infected annually [1]. People with pulmonary TB (TB of the lungs) are mostly infectious and they can spread the disease by sneezing, coughing or talking among other actions. According to infection prevention factsheet [2] if untreated, a person with infectious pulmonary TB can infect 10 to 15 people annually on average [6]. Every individual is at risk of being infected but the susceptibility to TB is determined by different factors among them poverty. There is substantial evidence that poverty is a determinant of TB, as well as poor health habits such as spitting in the open and not covering their mouths when coughing that have been found mostly among people below poverty line level including those in slums. [3][4]. UN-HABITAT characterizes slums by groups of individuals who live under the same roofing in an urban set-up and they lack one of more of the following: access to safe water in sufficient amounts, adequate sanitation, security of tenure and durable permanent housing[7].

Approximately one out of eight people live in urban slums and a total one billion people live in urban slums globally. Urban slums are termed as high risk settings for TB because they are characterized with poverty, overcrowding, social, cultural and geographical barriers [8]. Knowledge of TB has been linked to complete or incomplete TB treatment in a study to find out patients' knowledge about tuberculosis treatment in Nepal [18]. An Ethiopian study that assessed knowledge of TB and HIV as well as perception about patient initiated testing and counselling (PITC) among TB patients attending health facilities in Harar town, Eastern Ethiopia indicated that most of the participants (70%) believed that there is no association between TB and HIV/AIDS [19]. On the other hand, two thirds (66.5%) of the participants thought that HIV testing has importance for TB patients, however, the majority (81.6%) of the study participants in the age category less than 21 years believed that fear of PITC could cause delay in treatment seeking. In Kenya, TB is a key priority communicable disease and a major public health problem. Kenya is currently ranked among 14 countries with triple burden of TB, TB/HIV and MDR-TB.

The cumulative negative consequences of TB such as human suffering and economic losses are immense. New numbers of TB cases are reported annually, but it is believed that the new cases represent a small fraction of the TB cases existing in Kenya. A TB Prevalence survey conducted by NTLD-P, Kenya in 2016 revealed that the burden of TB in Kenya is higher than the previous assumptions at 426 people per every 100,000 people [13]. The reporting of the TB cases in Kenya is mainly limited to the cases that present themselves for check-ups in health centres and major hospitals[13]. In 2017, only 85,188 people were diagnosed with TB, meaning that the percentage of the undetected and untreated TB cases was at 40 percent. The prevalence survey also demonstrated that a higher burden of TB was in urban compared to rural setting and the prevalence rate among men was twice that of females higher in urban settings than in rural settings and highest in the 25 - 34 age group [13].

According to Word bank report 2013, Kenya has close to 60% of the urban population living in these informal settlements [11]. People in urban areas, and particularly those living in informal settlements, bear the biggest burden of TB in Kenya. In 2015, three regions had the highest reported cases of TB, namely: Nairobi, Nyanza and Coast [12]. Ten out of 47 counties accounted for 76% of the notified cases with Nairobi county contributing 15% of all cases. A prevalence survey conducted in 2016 also demonstrated a higher burden of TB in urban (760 per 100,000 population) compared to rural settings (453 per 100,000 population) [13] consistent with routine TB data which shows higher notification in the big cities of Nairobi and Mombasa [12].

Overcrowding, poor housing and sanitation, conditions commonly found in the informal settlements, are known predisposing factors for TB disease. Additionally, the prevalence rate among men (809 per 100,000) was twice that of females (359 per 100,000), higher in urban settings (760 per 100,000 population) than in rural settings (453 per 100,000 population) and highest in the 25 - 34 age group (716 per 100,000). The survey also showed that among other TB symptoms, frequency of cough was higher among participants in urban settings compared to the rural setting. Despite the efforts and progress being made to control and eliminate tuberculosis, it still remains one of the fourth biggest diseases causing death after HIV/AIDs.  This highlights likelihood of several deficiencies in the health systems that contribute to the lack of access to TB control interventions and the low effectiveness of the interventions than expected. There is therefore need to find out what factors are contributing to the large TB burden in Kenya, especially in the escalating slums near cities such as Mukuru Kwa Njenga slum. This assessment focuses on determining the existing knowledge gap regarding TB causes, symptoms, diagnosis, treatment among residents of Mukuru kwa Njenga

**METHODOLOGY**

The study was conducted in Mukuru kwa Njenga which is among the largest slum in Nairobi and is located in Embakasi East Sub-county. The study population consisted of residents of Mukuru kwa Njenga who had lived in the area for at least one year aged above 18 years, from both genders. The participants had to be permanent residents in the area. Additionally, key informant interviews were conducted among facility health care workers and focused group discussions were conducted with TB patients on intensive phase of treatment as well as community gate keepers.

Community health volunteers interviewed the heads of the households using a paper- based questionnaire. Focused group discussions were conducted with TB patients on intensive phase of treatment at the facility. Key Informant interviews were also conducted. Qualitative data analysis was used in the research. Codes and themes were created from the data from the household survey, key informants' interviews and focus groups with TB patients through inductive content analysis. The data was broken down into different component parts which were later given labels. To establish the emerging essential themes, thematic analysis was conducted and the themes were classified according to the research objectives with which they were focused. Further analysis was conducted to search for any themes that occurred across the different sequences of coded labels and to establish if there were any links between the different codes.

## RESULTS

Out of the 308 participants selected, there were 246 respondents giving a response rate of 80%. The findings are also inclusive of two focused group discussions with TB patients, two focused group discussions with CHVs and five key informant interviews from health care workers.

**Socio-demographic Characteristics of Respondents**

Majority of the respondents were aged between 18-34 years old (n=156, 63.4%). Most of the respondents were females (n=172, 69.9%), were married (n=182, 74.0%) with majority having primary education (50.8% and (49.2%) above level of education. Majority of the residents had an average income of more than US dollars (USD) 48.6 per month (n=168; 68.29%) and nearly all the houses are single rooms (n=232, 94.3%) with the same room being used for sleeping (n=236, 95.9%). Most houses had between 1 to 3 members (n=131, 53.2%) as described in table as shown in the Table 1.

**TB Prevention and Care**

The respondents reported that they visit and discuss health issues by a healthcare worker once every 2-4 weeks (n=36, 14.6%) and nearly four-fifth of the respondents talked about TB by healthcare workers (n=205, 83.4%). However, only nearly a tenth of the respondents had been treated or were being treated for TB (n=21, 8.6%) and side effects of the treatment being the major concern (n=10, 52.6%) as revealed in Table 2.

On further exploration on patient related factors during the focused group discussion, one respondent indicated, *"I waited for two days to have my sputum results ready, I was told the test is not available here"* Additionally, on an interview with clinicians in the health center, two clinicians did not associate chest pains with TB as one of the clinicians said *"At times we delay to diagnose because we have to refer for further testing either chest X-ray or Gene Xpert and we may tire a patient. We also do not have new updates on TB which could guide us like guidelines"*

**Knowledge Assessment among TB patients**

Majority of the residents knew what causes TB (n=203, 82.5%), nearly half (n=120, 48.78%) knew symptoms associated with TB while 23% did not know how TB is transmitted as showed in Table 3. A majority of the respondents knew at least one symptom of TB and how long the treatment took (n=18, 26%). Adequate ventilation was determined as being key in TB prevention (n=7, 33%) and most of the respondents first heard of TB from school (n=9, 43%) as seen in Table 4

Although 48% of the respondents knew more than one symptom of TB, one respondent said "I was just coughing, it was just a small cough and really I wasn't coughing deeply like someone who has TB." Another respondent indicated that "I had chest pains, I wasn't coughing, I would never think it was TB." Among the respondents who did not know how TB is spread indicated that "I have never smoked cigarettes in my life so I did not expect to have contracted TB." Additionally, a young lady who had a child with TB said, "I know crowded places contribute to spread of diseases including TB but our houses are just built that way, spread is inevitable"

**Knowledge of TB among residents**

The respondents knew at least one symptom of TB (n=9, 26%) and the duration of treatment (n=9, 26%). Adequate ventilation (n=4, 21%) was reported as being a key prevention of TB and they first heard of the disease from school (n=4, 33%). On a further interview with a CHV, she indicated that "*At times you identify these coughers within households but they say they cannot miss work to go and get screened and therefore they end up coming late to the health facility.*" A middle aged lady who had two of her children taking anti TB drugs said that "*I had previously attended ante-natal clinics in this facility and they spoke to us about many things but just asked me if I was coughing [...] I was with night sweats, weight loss and fever when I was diagnosed*"

## DISCUSSION

Findings of this study indicate that majority of the houses are a single room with only one window and more than three people living within it. This then indicates that poor housing and ventilation limits the effectiveness of TB eradication in slum dwellings. Effective healthcare delivery is reliant on efficient and properly trained healthcare workers to deal with the health concerns and this study found out that healthcare workers were limited in terms of knowledge and diagnostic equipment to help deal with the occurrence of TB. The healthcare workers in Mukuru kwa Njenga health centre have low index of suspicion for TB symptoms as found out during informants' interviews. This could largely be due to faded memory to diagnose TB bearing in mind that none of them had attended any TB refresher training in the previous 2 years. Aloaibi describes early diagnosis combined with appropriate management by knowledgeable and skilled healthcare workers (HCWs) as key in addressing global health issues [13].

Although majority of the residents had knowledge on causes, symptoms and treatment of TB, aspects of stigma were noted. The population knew few symptoms of TB but most of them did not associate chest pains with TB and in return had sought treatment more than twice before they were finally diagnosed with TB. The community lacks the ability to detect or diagnose TB occurrences earlier in order to acquire early treatment. Early treatment reduces the chances of spread of the disease and the mortality rates. Additional studies conducted in revealed that misconceptions and limited knowledge about TB and its treatment have influence in its

occurrence and defaulting in treatment. [14] Stigma was also among concern that came up as a reason why the residents delayed seeking care largely due to the fact that people associate TB to HIV/AIDS especially due to body wasting.

Additionally, people at times restrict themselves from seeking treatment due to the perception that they would be linked as being affected with HIV/AIDS. Such occurrences are largely due to limited health education on TB. Stigma that is connected to TB is associated with limited effectiveness in the control approaches designed to deal with the disease as patients are isolated within their family or community in turn contributing to delayed healthcare seeking and poor treatment adherence mainly due to poor health education [15]. This study also found out that the majority of the houses in Mukuru kwa Njenga are a single room with only one window and with more than three people living within it. This then indicates that poor housing and ventilation which limits the effectiveness of TB eradication in slum dwellings.

## CONCLUSION

The healthcare workers in Mukuru kwa Njenga health centre have low index of suspicion for TB symptoms as found out during informants' interviews. On the other hand, the residents knew of the symptoms of TB but most of them did not associate chest pains with TB and in return had sought treatment more than twice before they were finally diagnosed with TB. The community lacks the ability to detect or diagnose TB occurrences earlier in order to acquire early treatment. Stigmatization is also a major concern which hinders the affected from seeking health at the government health facility due to attitude from health care workers. This community also is burdened with poor housing and ventilation which could limit the effectiveness of TB eradication in the area.

Although there is an existing plan within the NTLD-P that is designed to help increase the knowledge of the health workers, community health volunteers also need to have this vital information and especially to effectively use this knowledge to keep the community adequately informed. In essence, the community requires health education in order to seek care and eliminate TB associated stigma still present in the area. Further, the health education activities should also include community mobilization to promote effective communication and participation among community members to generate demand for TB prevention, diagnosis, treatment and care services. The Mukuru kwa Njenga facility serves a huge proportion of patients diagnosed with TB and with so, rapid and accurate diagnosis is key. There is therefore need to expand diagnostic methods that are available to this community. Also, proper sample linkage to facilities offering specialised testing.

The larger Ministry of Health needs to put in place mechanisms to bring together key members of the public and private sector to combine efforts in finding and dealing with TB cases in the area and others such as this. A wider range of stakeholders already involved in community-based activities needs to be engaged so as to include TB in their priorities and activities. These include the nongovernmental organizations (NGOs) and other civil society organizations (CSOs) that are active in community-based development. CBO membership consists entirely of the community members themselves, so these organizations can be considered to represent the community most directly. This will help reach and spread and their ability to engage all persons. Operators of chemists and pharmacies also ought to be engaged in at least symptomatic screening of TB to all coughers and eventually link them to diagnosis. Ensuring TB is in control, engagement of the non-health sectors e.g. housing and education sector would be key. Mobilizing the efforts of both sectors would therefore be significant in dealing with health issues in the society and more importantly

construction of houses with adequate ventilation that would reduce the occurrence of TB disease. Further research is however needed to find out the prevalence of TB among dwellers of informal settlements so as to tailor specific interventions to them especially because of overcrowding.

## ACKNOWLEDGEMENTS

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