

# Assessment on the Burden of tuberculosis among health care workers in Nigeria: A Systematic Review

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## ABSTRACT

**Title:** Assessment on the Burden of Tuberculosis among Healthcare Workers in Nigeria: A Systematic Review

**Background:** Healthcare workers (HCWs) are health professionals providing tuberculosis care services among infected tuberculosis patients, who are at greater risks of developing active tuberculosis (ATB) than the general populations, more especially with emergence of Corona Virus Disease in 2019 (Covid-19), that resulted to total deviation on attention of TB care Globally.

**Methods:** Two electronic databases of Pubmed and Google Scholar were used to search on the burden of tuberculosis among healthcare workers in Nigeria. The search terms used includes prevalence of TB, death due to TB, nosocomial transmission, occupational TB, hospital-based infection and prevention of TB, incidence rate of TB, associated risk factors to nosocomial transmission of TB and proportions of healthcare workers trained on tuberculosis infectious control in Nigeria respectively.

**Result:** the prevalence, death, cured, TB/HIV and associated risk factors of nosocomial TB were assessed among HCWs in Nigeria.

**Conclusion:** The burden of TB among HCWs in Nigeria is low, this is due to poor documentation and reporting system.

**Recommendation:** A retrospective and prospective cohort study should be conducted to document the actual burden of TB among HCWs. The reporting system and proper documentation of TB in HCWs should be strengthening.

mycobacterium Tuberculosis (MTB), which affects the lungs, pulmonary tuberculosis (PTB) and other part of the body extra pulmonary tuberculosis (EPTB), the disease spread when an effected person sneeze or cough. One infected pulmonary TB patient can infect on average of 10-20 people every year. ((FMoH TB Training Manual). It's confirmed that 85% of all people who developed active TB can be successfully treated with approved TB drugs (WHO 2021). TB is curable and preventable infectious disease provided all measured are put in place to adhere to the WHO END-TB strategy (Orcau et al. 2011).

Healthcare workers are health professionals providing TB care services among TB patient who are 7.5- 60% more vulnerable to develop active TB than the general population (Xie et al. 2018). It's confirmed that an estimated 4000 people die from TB every day and nearly 30,000 people develop tuberculosis respectively (WHO, 2021). Globally south East Asia contributed to (44%) of the global TB burden while African and western medeterinian pacific contributed to (25%) and (18%) respectively (World TB Report, 2020). Nigerian alone has contributed to 4.4% of the global TB burden but the actual burden among these cohorts remain undocumented (Kehinde et al. 2011). The burden of TB is higher among low and middle income countries like Nigeria, this is because of their inability to provide and implement effective TB infection control. Nigerian alone has an estimated annual new TB cases of 590,000 (FMoH Annual TB Report 2019) TB is one of the higher killer infectious diseases from single germs. The disease was confirmed as an occupational disease since 1950s more especially among health care workers with poor infectious control in the facilities (Xie, et al. 2020). The disease was discovered as the disease of poverty, but with the emergence of Human immune deficiency virus

## I. INTRODUCTION

Tuberculosis (TB) is an infectious disease leading to high morbidity and mortality from single germ until including covid-19 in 2019 (WHO 2021). The disease is caused by the bacillus

HIV, diabetes, unhealthy life styles like alcoholism and cancer the risks of developing the disease is beyond poverty as a single determinant. (MacNeil, et al. 2018). Infected health care worker stand more chance of infecting other people than the general population due to prolonged exposure to patients than the general population while discharging professional responsibility. It was reported that one infected pediatrician has infected an average of 15 adult and 09 children age 0-5 within 9 months of infection in Italy (Dibella, et al. 2019). The associated risk factors to nosocomial transmission include but not limited to poverty, poor provision and implementations of TBIC, unhealthy life style like alcoholism, medical conditions like HIV, diabetes and prolonged exposure to pulmonary TB patient, despite the WHO ability to developed guideline on TBIC (Kuyinu, et al. 2019) The identification of vulnerable group to infectious TB is an important strategy to effective TB control, but the science among health care workers is seems to be neglected (Shi et al. 2018) The likely hood of nosocomial transmission of TB depend majorly on the patient population, duration of exposure, availability of medical facility and efficiency of TB infected control (Salami 2008).

## II. OBJECTIVE

The general objective of this systematic review was to assess the burden of tuberculosis among health care workers in Nigeria, which was achieved under the following specific objectives. 1. To assess the prevalence of TB among healthcare workers in Nigeria. 2. To assess the incidence rate of tuberculosis among healthcare workers in Nigeria. 3. To assess the proportions of healthcare workers who are trained on tuberculosis infectious control in Nigeria. 4. To identified the associated risk factors to nosocomial transmission of tuberculosis among health care workers in Nigeria. 5. To assess the cure rate among HCWs due to TB. 6. To assess the death rate among HCWs due to TB. 7. To identify the possible intervention that limits nosocomial transmission of TB among HCWs in Nigeria respectively.

## III. METHODS

Two electronic databases of Pubmed and Google Scholar were used to search on the burden of tuberculosis among healthcare workers in Nigeria. Many wards were used in search concept just to meet up with the objectives of this systematic review such as prevalence of TB, nosocomial transmission, occupational TB, cross infection of TB, hospital-based infection and prevention of TB, incidence rate of TB, associated

risk factors to nosocomial transmission of TB and proportions of healthcare workers trained on tuberculosis infectious control in Nigeria respectively. For the interest of this systematic review, all published studies that reported the burden of tuberculosis among healthcare works was included this is due to the limited number of studies published on the issues of active tuberculosis and associated risk factors to nosocomial transmission of tuberculosis among health care workers in the country. All studies that reported the burden of latent TB, multi-drug and extreme drug resistant were excluded.

### Study Characteristics

Only (05) studies meet up the inclusion criteria and used for data extraction. Two descriptive cohort studies were conducted in Ibadan Oyo State, one retrospective cohort study was conducted in University of Ilorin Teaching Hospital and two cross sectional studies was conducted in Lagos state. The studies reported on the prevalence of TB, incidence rate of TB, risks factors of nosocomial transmission, preventions measures to nosocomial transmission of TB and death rate of TB among health care workers in Nigeria (Kehinde, et al. 2011, Kuyinu, et al. 2019 & Salami et al. 2007).

### Prevalence of Active TB among HCWs

One study reported that the prevalence of tuberculosis among healthcare workers in Nigeria is (1.5%). the retrospective cohort study was conducted at University of Ilorin teaching hospital (Salami, et al. 2007)

### Incidence Rate of TB among HCWs

Only one study reported the incidence rate of tuberculosis as (3.3%) by microscopy and (2.2%) by culture respectively. The study was conducted in urban city of Ibadan Nigeria. (Kehinde, et al. 2011).

### Death Rate Due to TB among HCWs

One study reported that the death rate due to tuberculosis among healthcare workers in Nigeria is (6.3%) The study was conducted at university of Ilorin teaching hospital (Salami, et al. 2007).

### Cure Rate Due to TB among HCWs

One study reported that the cure rate of tuberculosis among health care workers in Nigeria is (81%). The study was conducted at University of Ilorin teaching hospital (Salami, et al. 2007)

#### Proportion of HCWs Trained on TBIC

One study reported that only (57%) of health care workers are trained on tuberculosis infectious control in Nigeria. The study was conducted in Lagos state, Nigeria (Kuyinu, et al. 2019)

#### Associated Risk Factors to Nosocomial Transmission among HCWs

Three studies reported the associate risk factor of occupational tuberculosis among healthcare workers includes poor implementation of TBIC, HIV, prolong exposure, unhealthy life, patient population and facility settings. The studies were conducted at Ibadan, Lagos and university of Ilorin teaching Hospital (Kehinde, et al. 2010, Kuyinu, et al. 2019 & Salami et al. 2008).

#### Interventions to Limit Nosocomial Transmission of TB among HCWs

Three studies reported that the interventions to limit nosocomial transmission among healthcare workers include: Managerial activities, administrative control, Environmental control and personal respiratory protections. The studies were conducted at Ibadan, Lagos and university of Ilorin teaching Hospital (Kehinde, et al. 2010, Kuyinu, et al. 2019 & Salami et al. 2008).

#### IV. DISCUSSION

There is high burden of undocumented tuberculosis among health care workers in Nigeria due to inability of HCWs to report active tuberculosis among them and the limited number of studies conducted as well the coverage of the study area. Its only one study that reported prevalence and death rate due to tuberculosis and it was conducted among staff of university of Ilorin teaching hospital. Only one study reported on the incidence rate due to TB using microscopy and culture and the study was conducted among two designated DOTs facilities of University Collage Hospital Ibadan. Only one study reported on the proportions of HCWs who are trained on tuberculosis infectious control, and the study were conducted in Lagos among 112 DOTs facilities only compeering the number of DOTs centers across the country. Three studies reported on the associated risk factors and interventions to limits nosocomial transmission of tuberculosis, two out of the three studies were conducted at University Teaching and Collage hospital in Ibadan and Ilorin while the others one was conducted in Lagos state across 112 DOTs facilities.

#### V. CONCLUSION

The actual burden of tuberculosis among healthcare workers is not document in Nigeria this is due to the healthcare workers attitude of not reporting active TB case among them self because of fear of stigma. The number of studies conducted on the burden of tuberculosis among health care workers in Nigeria is very limited and the coverage of the study area is quite small. Only few health care workers providing tuberculosis care services are ready to participate in a prospective cohort study to determine the incidence rate of tuberculosis among healthcare workers in Nigeria due to fear of developing active TB case that may cause stigmatizations both at the community and work place.

#### VI. RECOMMENDATION

There is need to encourage health care workers to improve on self-report of active tuberculosis despite possible stigmatizations. Aretrospective cohort study of 15 years minimum within a larger participants and wide coverageshould be conducted among healthcare workers so as to assess the long-termneglected burden(Prevalence Rate) of TB among HCWs. Health care workers should encourage to participate in a prospective cohort study (Clinical trials) of two to three years to determine the (Incidence Rate) of TB among HCWs. Global Fund, National Tuberculosis Control Programs (NTBLCP) and other TB control agencies and organizations should provide adequate research grand to enable researchers to conduct intensive furthers research that can inform policy to develop and implements guidelines that limits nosocomial transmission of TB among HCWs in Nigeria.

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