

Bio-Statistics Final Project Presentation

Group-7

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Research Title

Gender difference and age distribution in tuberculosis case detection in rural & urban areas in Bangladesh

Research Questions

- Why are there gender differences associated with low tuberculosis case detection in the rural and urban communities of Bangladesh?
- Why are there age distribution associated with low tuberculosis case detection in the rural and urban communities of Bangladesh?

General Objectives

- To investigate the gender differences in the epidemiological factors associated with tuberculosis case detection in the rural and urban communities of Bangladesh.
- To investigate the age distribution in the epidemiological factors associated with tuberculosis case detection in the rural and urban communities of Bangladesh.

Specific Objectives

- To investigate the gender differences in the tuberculosis case detection between urban and rural community by various socio- demographic factors
- To investigate the difference in the knowledge on TB by various socio- demographic factors
- To examine the gender differences in the tuberculosis case detection by various TB service-related factors
- To investigate gender difference in the pulmonary and extrapulmonary tuberculosis
- To explore the age differences among the pulmonary and extrapulmonary tuberculosis

Research Hypothesis

- There are gender differences in the epidemiological factors associated with low tuberculosis case detection.
- There is age distribution in the pulmonary and extrapulmonary TB cases in the rural communities.
- There are gender differences in the TB case detection in the rural and urban communities in Bangladesh.

Exposure and Outcomes

Main Exposure: Gender, Age, Type of residence

Outcome variable: Site of disease compared to the gender differences, age, residential area type of residence.

Confounders: treatment category, registration group, pulmonary forms

Conceptual Framework

Independent variables

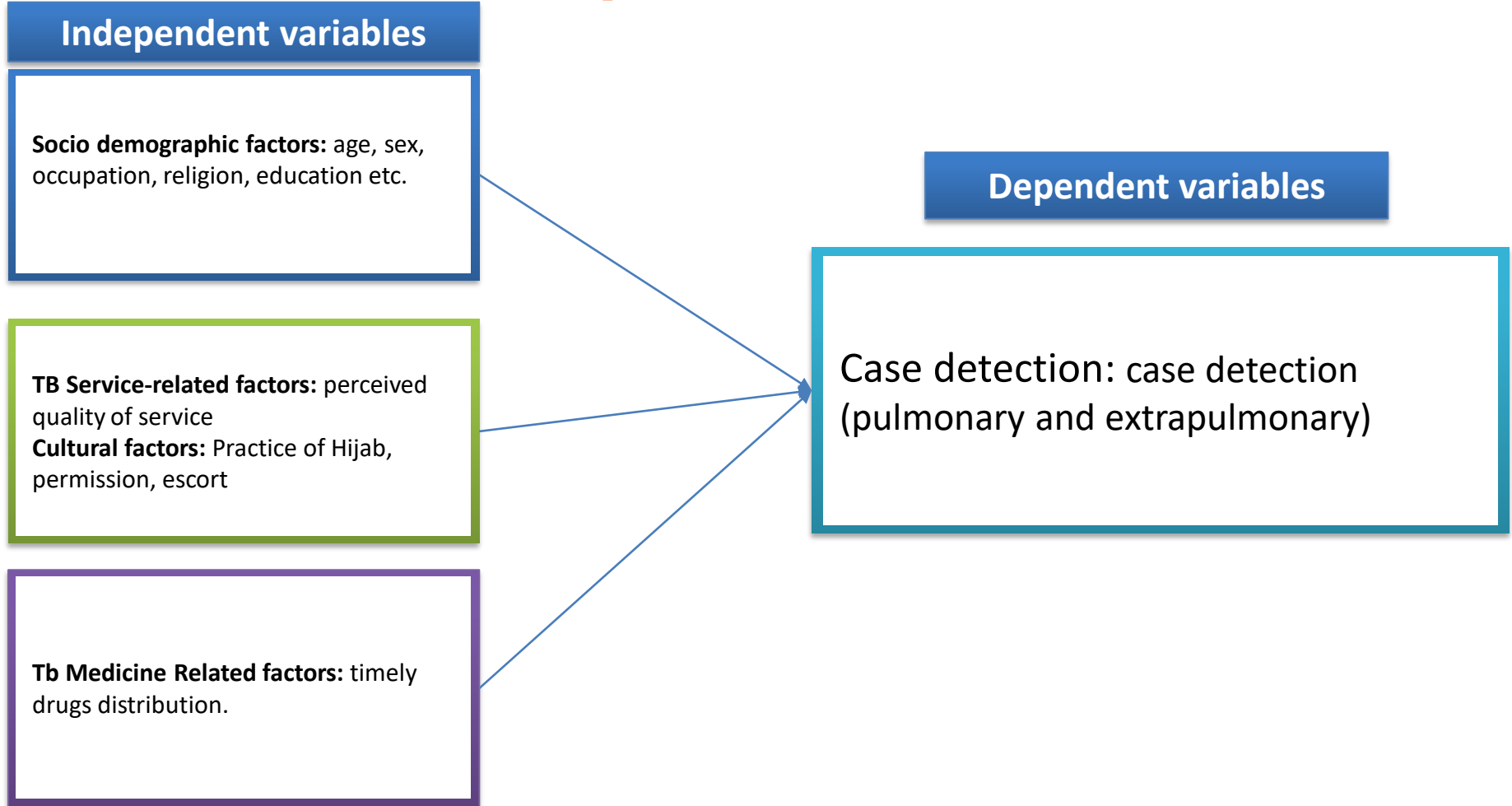
Socio demographic factors: age, sex, occupation, religion, education etc.

TB Service-related factors: perceived quality of service
Cultural factors: Practice of Hijab, permission, escort

Tb Medicine Related factors: timely drugs distribution.

Dependent variables

Case detection: case detection (pulmonary and extrapulmonary)



Introduction

Tuberculosis (TB) has been one of the major causes of death and disability in the world for several decades. Its control is the main concern in the global public health. Millennium Development Goals (MDGs) set the main target for global TB control for declining the incidence rate, having TB prevalence and decreasing death rate for 1990 by 2015 [1]. In 2015, 10.4 million new cases of tuberculosis were reported worldwide, which represents 142 new cases per 100,000 people, or a decline of 17 per cent since 2000. In 2015, 1.6 billion people required mass or individual treatment and care for neglected tropical diseases, a 21 per cent decline from 2010 and 1.8 million died from the disease (including 0.4 million among people with HIV). Over 95% of TB deaths occur in low- and middle-income countries [2], [3].

In 2016, the MDGs were succeeded by a new set of goals, known as the Sustainable Development Goals (SDGs). Adopted by the UN in September 2015 following 3 years of consultations, the SDG framework of goals, targets and indicators is for the period 2016–2030 [2]. Similarly, WHO initiated work on a new global TB strategy in 2012, which was completed in 2014. The End TB Strategy was unanimously endorsed by all WHO Member States at the 2014 World Health Assembly and is for the period 2016–2035 [3].

Justification/ rationale

- Globally men are significantly more at risk of contracting and dying from TB than women [4]
- In 2019, an estimated 4.3 million people fell ill with TB and estimated 632 000 died because of the disease which is more than half of global TB deaths [6]
- Treatment success for new and relapse TB cases was 84% (for those initiated on treatment in 2018)
- In Bangladesh, the estimated incidence rate for all forms of Tuberculosis in 2015 225 per 100 000 population. An estimated 45 per 100 000 people died of TB in the same year[7].
- Retrospective study for the TB case detection in urban and rural areas.

Methodology

Searches were conducted to identify articles related to Tuberculosis in Bangladesh specifically on the gender and age difference in Google Scholar, PubMed using different keywords.

- At first we started the selection of specific area where the Electronic Tuberculosis Manager is running from central to community level and three years retrospective data is available.
- From the administrative unit it has eight districts, and 71 sub-district means upazilas.
- We considered 91 TB units both in the urban and rural areas.
- It is a descriptive cross-sectional study within the time frame (2018-2020).

Study Design & Sample Size

The study has extracted data from the electronic tuberculosis management (eTBM) system which is running in National Tuberculosis Program (NTP) and supporting by Management Sciences for Health (MSH), USAID.

- We have collected 1669 TB cases with men and women, age covering rural and urban areas in the south-central region in the country.
- The data are available in the central repository in NTP server.
- However, the study used a sub-sample of 869 men aged 1-97 years and 800 women aged 5-90 years.
- It has been used multi-stage sampling method

Data Collection

- Using the e-TB Manager, patients visit the designated health care and provide their sample for testing like sputum for microscopy, genexpert etc.
- The patient case data, examination history, treatment plan, medical consultation, and comorbidity detail are recorded with ~150 data variables electronically in a relational database.
- For the purpose of the data are collected from this platform which is restricted to access for unauthorized users.
- Data source: <http://etbmanagerbd.org>.

Statistics Analysis

This study presents the association between the gender differences with age distribution and site of disease among the urban and rural population in Bangladesh.

- At first, we identified our exposure, outcome, and confounders then present the characteristics of the study population by gender differences and exposure variables (age, type of residence, site of disease).
- We prepared our dataset by dropping missing observations from exposure, outcome, and confounders.
- We changed the variables to a meaningful name, categorized age as age groups, generated new variables.
- The pulmonary and extrapulmonary cases are indicating the measurement of the site of disease.

Results

- A total number of 1669 patients selected for this study.
- Out of these 47.93% (n=800) are female and 52.07% (n=869) are male.
- About two-thirds 70.16% (n=1171) of the participants lived in rural areas, where 54.48% (n=638) are male and 45.52% (n=533) are female.
- A greater portion of mature working age were taken treatment with the age range 55-64 years (41.52%, n=693).
- Only 22.17% (n=370) of the adult patients are included this study. Many TB cases 89.44% (n=1,491) are pulmonary site of disease where 10.56% are extrapulmonary.

Table-1: Patients socio-demographic characteristics

Variables	Data frequency N= 1,669	Percentage (%)
Type of residence		
Urban	498	29.84
Rural	1,171	70.16
Gender		
Male	869	52.07
Female	800	47.93
Age in years		
<=4 Years	1	0.06
5-14 Years	38	2.28
15-24 Years	144	8.63
25-34 Years	226	13.54
45-54 Years	242	14.50
55-64 Years	693	41.52
>=65 Years	325	19.47
Treatment Regimen		
Cat-1 Pediatric (Dispersible)	2	0.12
Category I	1,574	94.99
Category I - Pediatric	6	0.36
Category II	34	2.05
Retreatment for P-type EP (with Lfx)	11	0.66
Retreatment for P-type (without Lfx)	30	1.81
Site of Disease		
Extrapulmonary	176	10.56
Pulmonary	1,491	89.44
Pulmonary forms		
Bilateral Cavitory	20	3.51
Bilateral Opacity	498	87.37
Normal	13	2.28
Other	39	6.84

Table-1: Frequency distribution of variables

Results-continue....

Age Group	Male (%)	Female (%)	Total (%)
<=4 Years	1 (0.12)	0 (0.00)	1 (0.06)
5-14 Years	19 (2.19)	19 (2.38)	38 (2.28)
15-24 Years	73 (8.40)	71 (8.88)	144 (8.63)
25-34 Years	90 (10.36)	136 (17.00)	226 (13.54)
35-44 Years	97 (11.16)	145 (18.13)	242 (14.50)
45-54 Years	117 (13.46)	169 (21.13)	286 (17.14)
55-64 Years	237 (27.27)	170 (21.25)	407 (24.39)
>=65 Years	235 (27.04)	90 (11.25)	325 (19.47)

Table-2: Age group distribution

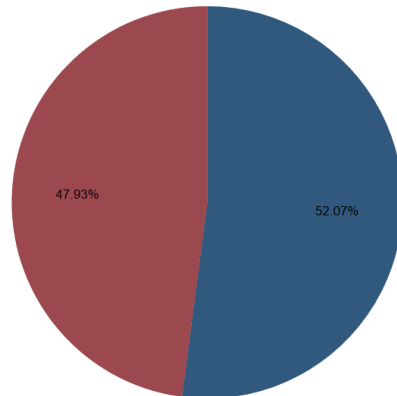


Figure-1: Gender differences

Variables	Unadjusted coefficient (95% confidence interval)	Adjusted coefficient (95% CI)
Gender		
Male	Reference	
Female	.115 (-.184, .415)	.168 (-.128, .465)
Age		
55-64 Years	Reference	
1-4 Years	-1.063 (-7.179, 5.051)	
5-14 Years	1.094 * (.057, 2.130)	
15-24 Years	.582 (-.0103, 1.174)	
25-34 Years	.648 * (.142, 1.155)	
35-44 Years	.432 (-.064, .927)	
45-54 Years	.516 * (.045, .987)	
>=65 Years	.745 *** (.291, 1.199)	

P-value: *** < 0.001, ** < 0.01, * < 0.05

Table-3: Association with the site of disease

Results-continue....

Type of residence	
Urban	Reference
Rural	1.689*** (1.37, 2.01)
Treatment regimen	
Category-I	Reference
Category-II	1.989 *** (.9241, 3.055)
Pulmonary forms	
Bilateral Cavitory	Reference
Bilateral Opacity	-.083 (-1.472, 1.306)
Normal	-.919 (-3.0901, 1.251)

P-value: *** < 0.001, ** < 0.01, * < 0.05

Table-4: Association with the site of disease

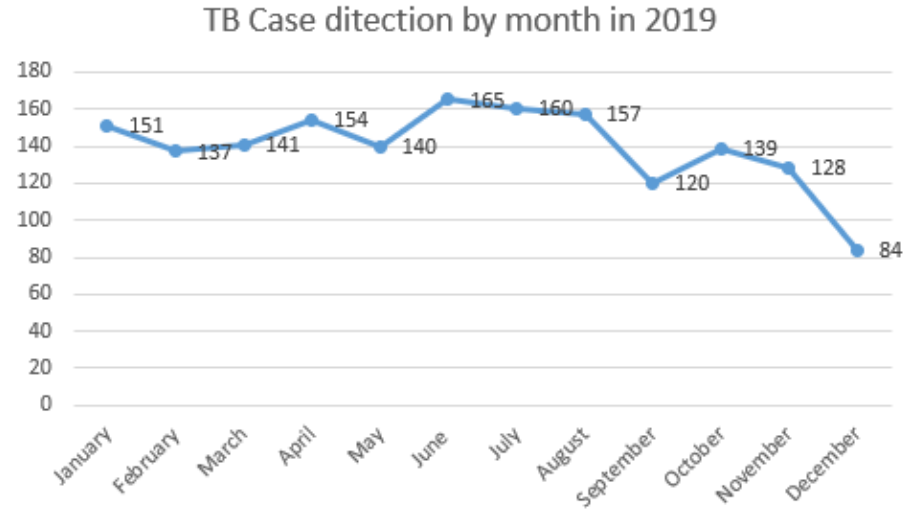


Figure-2: Monthly TB case detection

Conclusion

Our results suggest that the TB case detection is higher in the rural areas among male compared to urban areas. If we increase TB services and test facilities, then case detection will increase.

References

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- [9] <https://en.wikipedia.org/wiki/Barisal>
- [10] Global Tuberculosis Report-2019, <https://apps.who.int/iris/bitstream/handle/10665/329368/9789241565714-eng.pdf>

Thanks

Any queries?