

The burden of TB Meningitis in children admitted to Modilon General Hospital

DCH

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INTRODUCTION

- ▶ TB Meningitis- lethal form of *Mycobacterium tuberculosis* infection
- ▶ TB bacilli : aerosol spread
- ▶ Local infection in lung parenchyma
- ▶ Dissemination- Haematogenous/lymphatic
- ▶ Rich foci- caseous lesions in meninges or brain parenchyma
- ▶ Meningitis: rich foci grows and ruptures into sub-arachnoid space

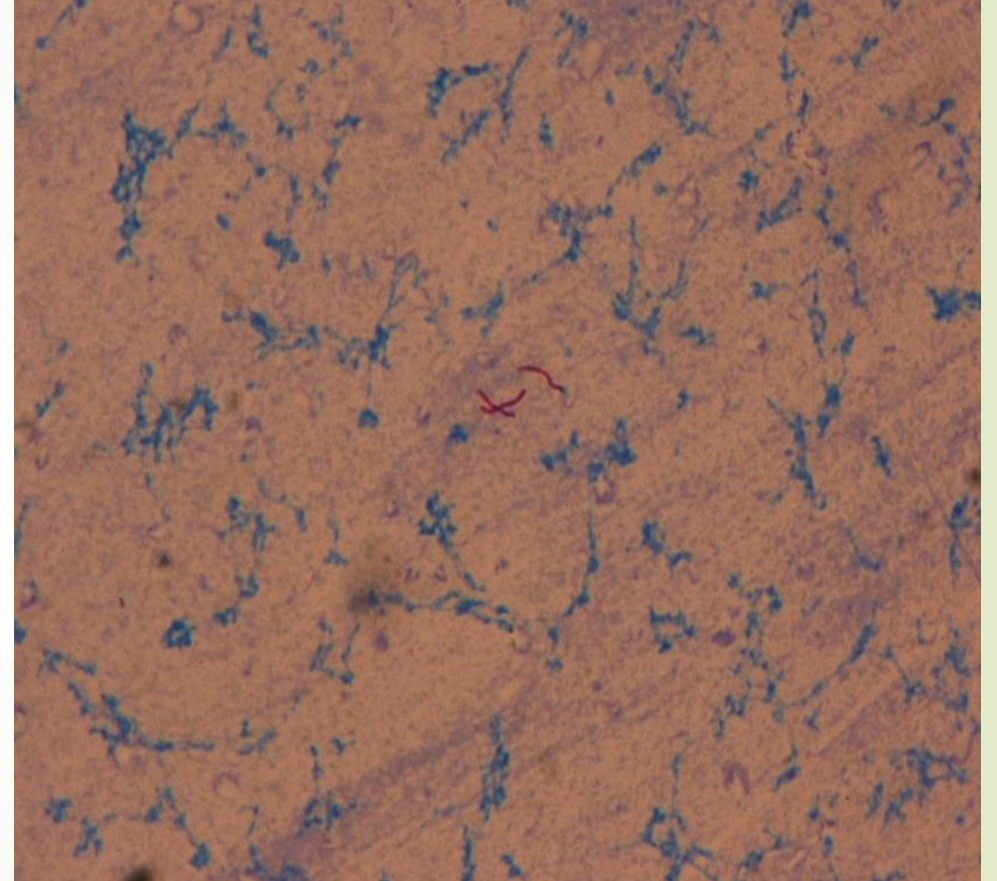


Figure 1: *Mycobacterium tuberculosis* (X1000 magnification) isolated from the CSF of a child who died of TB meningitis at Modilon Hospital.

BURDEN OF TB IN CHILDREN-2014

- Global Incidence :9.6million (**estimated 1.0 million among children**)
- Global Deaths: 1.5million (**140,000 deaths among children**)
- Western Pacific Region: Population 1,845,184,000
 - TB MORTALITY: 88,000
 - PREVALENCE: 2,100,000
 - INCIDENCE: 1,600,000
- PNG: Population 7.5 million
 - NEW & RELAPSE CASES: 26,170 (6,959 new cases aged <15years)
 - MORTALITY: 3,500

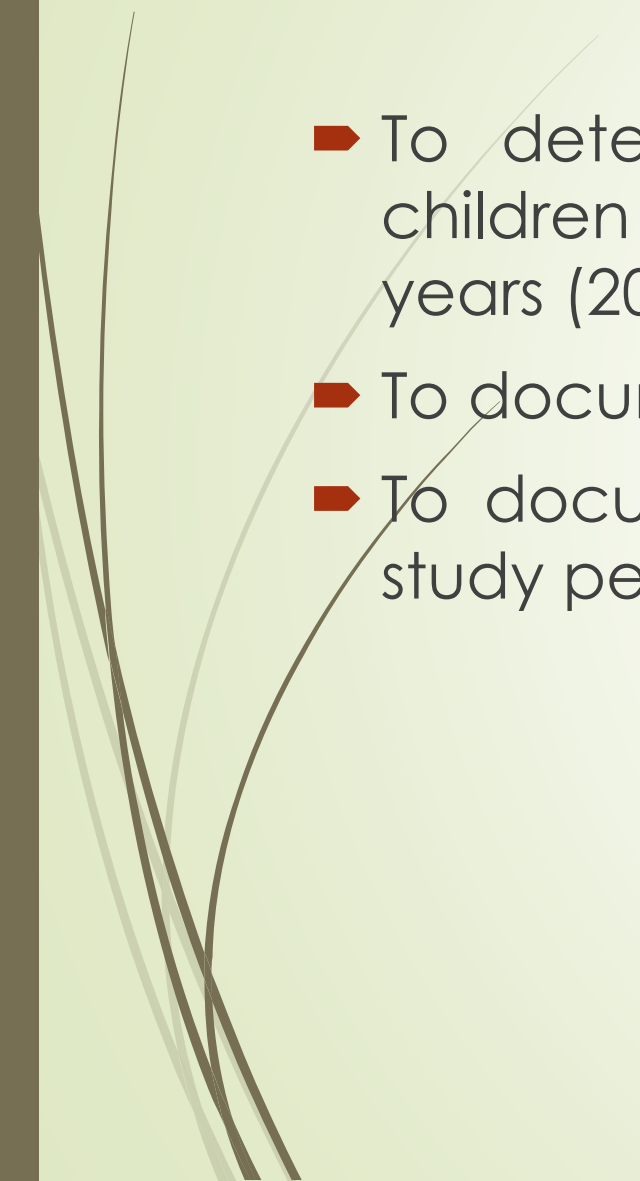
➤ WHO Global Tuberculosis Report 2015, 20th edition

BURDEN OF TB IN CHILDREN- PHR 2014

- ▶ Children admitted with TB: 1,470
- ▶ Children died: 179 (CFR: 12.2%)
- ▶ Over 40% of children were diagnosed with EPTB which included TB Meningitis, Spinal TB, TB lymphadenitis, abdominal TB and Miliary TB



AIM

- To determine the in-hospital prevalence of TB meningitis in children admitted to Modilon General Hospital over the past 2 years (2014-2015)
 - To document the risk factors of TB meningitis
 - To document the case fatality rate of TB meningitis during the study period
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METHODS

- **STUDY SITE/DESIGN:** This is a retrospective study, reviewing the number of children who were admitted to the Paediatric Ward of MGH with a final diagnosis of TB Meningitis (2014-2015)
- **DATA ANALYSIS:** Data was exported from the PHR System for the last 2 years and analysed using the Stata analysis program.

- **CLINICAL DEFINITIONS:**

- TBM in MGH is diagnosed clinically
- Adjunctive tests: CSF (WCC/Protein/Glucose)
- Confirmatory tests: AFB Culture is unavailable.
- CXR
- TB Score >7

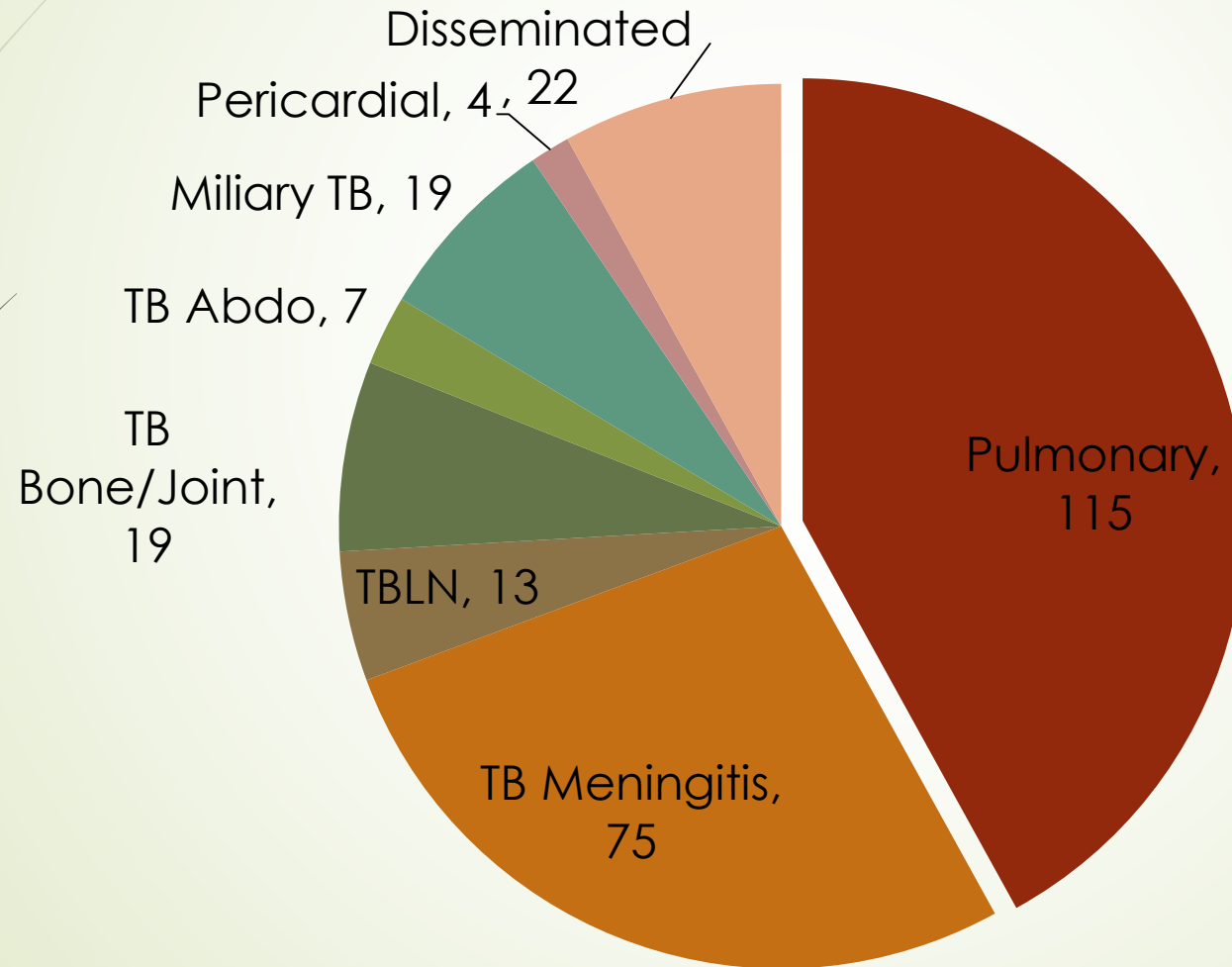
- **ETHICAL APPROVALS:**

Modilon Hospital Ethics Committee and the School of Medicine and Health Sciences Ethics Committee (UPNG)

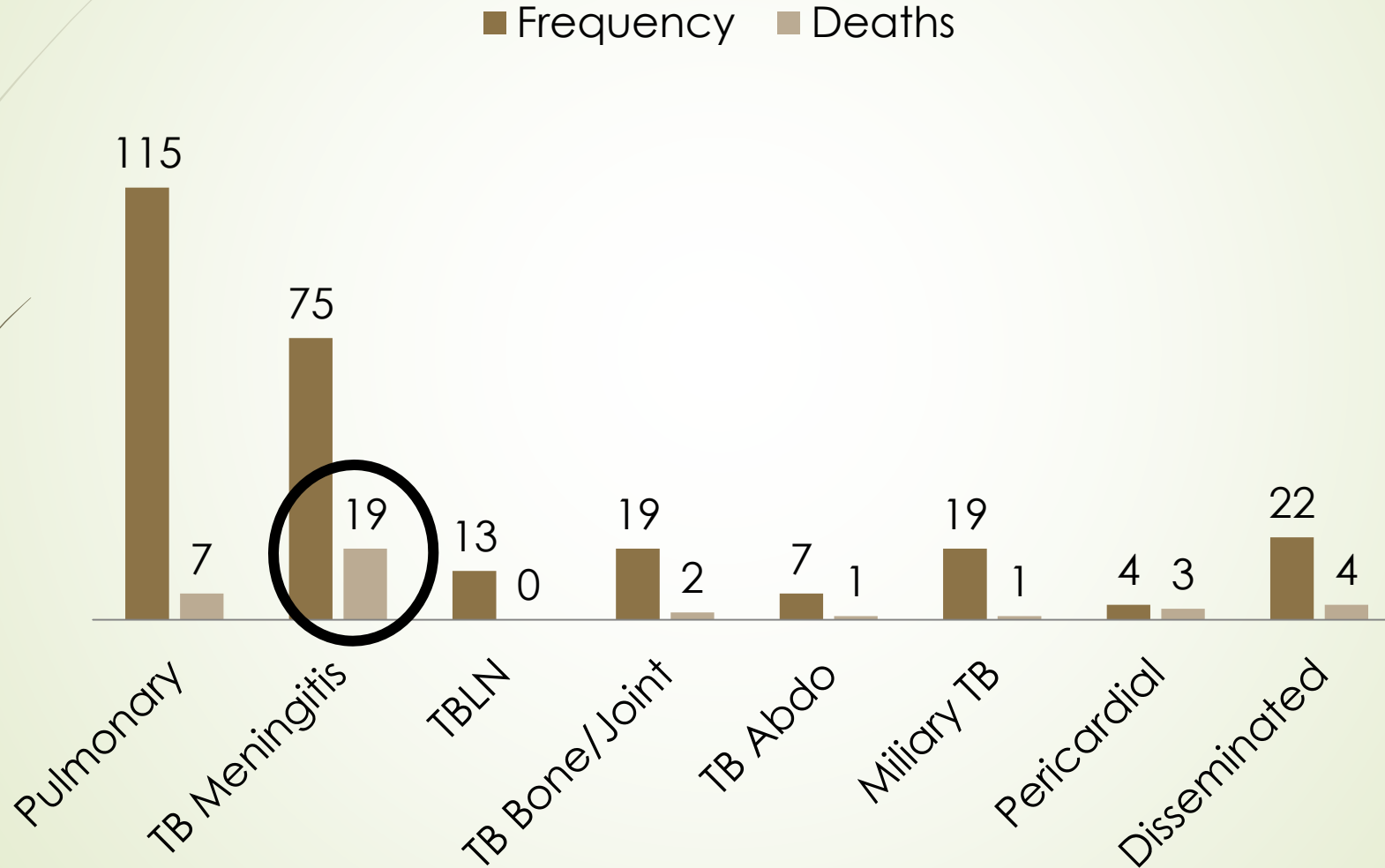
RESULTS

- 3125 paediatric admissions (Jan 2014- Dec 2015)
- Females accounted for 44% (1373) of admissions
- Median age of all admissions:
4 (IQR 0.25 - 12) months
- Neonates accounted for 34% (1073) of admissions
- Median age (excluding neonates):
11 (IQR 5-36) months
- Prevalence of TBM: 3.7% (75/2052; [95% CI 2.9-4.6])

FREQUENCY OF VARIOUS FORMS OF PAEDIATRIC TB AT MODILON HOSPITAL



FREQUENCY AND MORTALITY DUE TO TB



TBM COMPARED TO OTHER FORMS OF TB

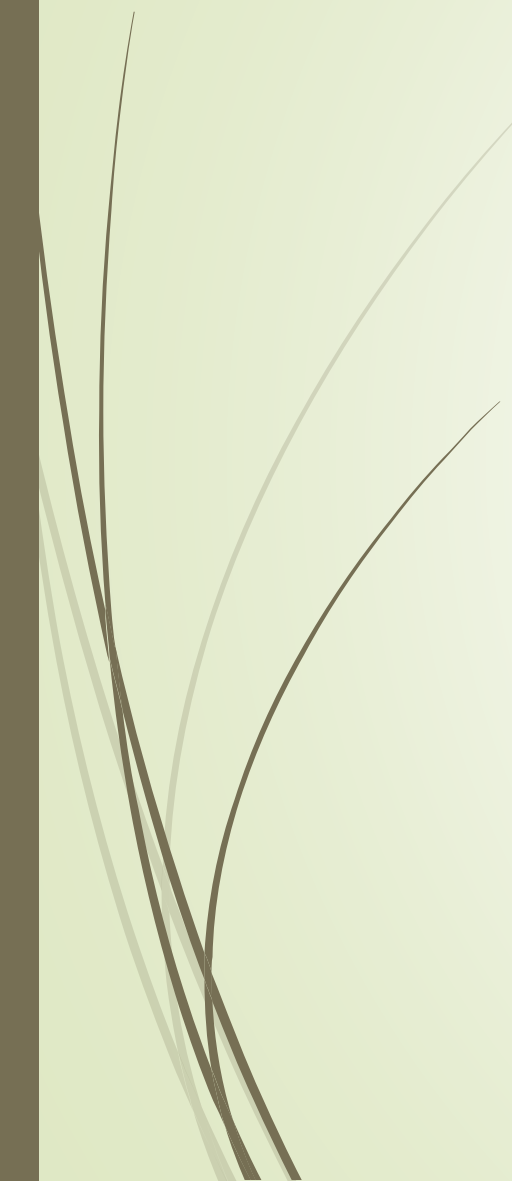
Factors	TBM	TB Other forms	P-values
Number	75	199	
Female Sex	33 (44)	82 (41)	0.68
Median Age	60 [24-84]	36 [11-96]	0.38
Adopted	2 (3)	3 (2)	0.62
Comorbidities			
<i>Moderate malnutrition</i>	30 (40)	62 (31)	0.20
<i>Severe malnutrition</i>	14 (19)	59 (30)	0.09
<i>HIV</i>	2 (3)	11 (6)	0.36
<i>Anaemia</i>	24 (32)	97 (49)	0.01
Readmission	20 (27)	44 (22)	0.43
LOS (days)	27 [10-50]	15 [7-39]	0.01
In-hospital complications	7 (9)	4 (2)	0.01
Case fatality rate	19 (25)	18 (9)	0.001

DISCUSSION AND CONCLUSION

- ▶ A TBM prevalence rate of 3.7% is higher than in most other countries
 - ▶ **Africa (high HIV)-2.2%, Africa (low HIV) -2.0%, Southeast Asia -1.9%**
- ▶ Mortality was highest in patients with TBM (1 in 4 children with TBM died)
- ▶ Cost of inadequate BCG coverage
- ▶ Length of stay and in-hospital complications higher in children with TBM
- ▶ Anaemia was significantly higher in other forms of TB



LIMITATIONS

- This project utilised a retrospective study design
 - Hospital-based study
 - Prior to 2014, the data was not adequately entered
 - Missing data
 - Analysis of a large dataset was a challenge
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RECOMMENDATION:

- Prevention of TBM:
 - Improve BCG coverage
 - Family screening
 - Early identification, effective treatment and follow up of TB cases
- Improve reporting (PHR)
- More research and trainings to improve on methods used to prevent, diagnose and treat childhood TB
- Paediatric society recommendations (Amini et al, 2012)



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 - Dr Rero
 - Dr Yarong
 - HEO's
 - Residents and nurses
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