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RESEARCH ARTICLE

SOCIOECONOMIC IMPACT OF TUBERCULOSIS IN SOUTHWEST ASIA: A META-ANALYSIS

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Abstract

The impact of tuberculosis on the economy of a nation is not addressed in any conclusive way as per the literature review.Most of the studies fo cus on household and patient level economy.World Economic Forum e stimates that in India,TB causes loss of 100 million workdays per year. In the analysis we have discussed the burden of tuberculosis on southw est Asia and it significantly contributes to the existing literature.
Methods: We selected nine studies after excluding the irrelevant studies The studies were taken up from PubMed, Embase,Google Scholar, and ScienceDirect. After a detailed review of each study the following data were extracted.

Introduction:

Tuberculosis(TB)remains a significant public health challenge globally,particularly in Southwest Asia,encompassing Afghanistan, Pakistan, India, Bhutan, Bangladesh, Maldives, Sri Lanka, and Nepal. The World Health Organization (WHO) identifies TB as one of the top 10 causes of death worldwide, with approximately 60% of the global TB burden concentrated in Asia. Southwest Asia bears a substantial portion of this burden due to its large population and socio-economic challenges.

Socioeconomic Disparities and TB:

Disparities in healthcare access and treatment outcomes across socioeconomic strata exacerbate the TB burden in Southwest Asia. Factors include:

- **Cultural Beliefs and Myths:** Stigma and discrimination based on cultural beliefs and myths hinder TB diagnosis and treatment.
- **Social Norms:** Social norms can limit access to healthcare and support for TB patients.
- **Level of Awareness and Education:** Low levels of awareness and education about TB contribute to delayed diagnosis and incomplete treatment.

Global and Regional TB Statistics:

According to WHO, every year, 10 million people fall ill with TB, and 1.5 million people die from the disease. Half of all TB cases are found in Bangladesh, China, India, Indonesia, Pakistan, Nigeria, the Philippines, and South Africa.

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TB Incidence Rates per 100,000 People

COUNTRY	INCIDENCE PER 100000
INDIA.	**: 199**
PAKISTAN.	**: 258**
MALDIVES.	**: 39**
BHUTAN.	**: 190**
BANGLADESH	**: 221**
NEPAL.	**:229**

Key Challenges:

The persistent TB burden in Southwest Asia is attributed to several factors:

- **Public Awareness:** Limited public knowledge about TB prevention and treatment.
- **Drug Resistance:** Rising cases of multi-drug-resistant TB (MDR-TB).
- **HIV Coinfection:** High rates of TB-HIV coinfection complicate treatment.
- **Diagnostic and Treatment Challenges:** Inadequate diagnostic facilities and treatment protocols.
- **Social Determinants:** Poor living conditions and malnutrition.
- **Funding and Resources:** Insufficient funding and resources for TB control programs.
- **Stigma and Discrimination:** Cultural stigma deters individuals from seeking treatment.
- **Failing Public Health Systems:** Weak healthcare infrastructure.

National TB Control Programs:

India:

- **National TB Elimination Program:** Aims to eliminate TB by 2025, five years ahead of the global target.
- **DOTS Strategy (Directly Observed Therapy Short Course):** Ensures completion of TB therapy to prevent drug resistance. Focuses on raising awareness, managing TB cases, expanding TB detection and treatment, and engaging the business sector (e.g., India Business Alliance with the World Economic Forum).

Pakistan:

- **National TB Control Program:** Targets a 50% reduction in TB prevalence by 2025 compared to 2012 and aims for zero TB deaths.

Maldives:

- **National Strategic Plan for TB (2018-2022):** Aims to end TB by 2025.
-

Bhutan:

- **National Strategic Plan 2 to End TB (2017-2023):** Aims to reduce TB and MDR-TB burden, achieve a case notification rate of at least 90%, maintain a treatment success rate of at least 90% for drug-susceptible TB, and improve TB/HIV coinfection detection.

Bangladesh:

- **National TB Control Program (2021-2025):** Targets a 75% reduction in TB deaths and a 90% reduction in TB incidence.

Nepal:

- **National TB Program:** Aims to end TB by 2035.

Discussion:

Country	GOVERNMENAL AGENCIES	NGOS	INTERNATIONAL organization	PRIVATE SECTOR PARTNERS	RESEARCH INSTITUTIONS AND ACADEMIC PARTNERS	CIVIL SOCIETY ORGANIZATION AND COMMUNITY GROUPS
INDIA	Ministry of health and family welfare	The union	World heath organization	Pharmaceutical companies	Indian council of medical research	TBsurvivor networks
	State health department	Project Axshya	The global fund to fight AIDS, Tuberculosis and Malaria	Corporate social responsibility	National institute for research in Tuberculosis	Community health workers
		Operation ASHA	USAID	Private healthcare providers	Academic institutions	
PAKISTAN	National TB control program	The Indus hospital	World Health Organization	Pharmaceutical Companies	National Institute of Health	Pakistan TB Alliance
	Ministry of National health services	Interactive Research and Development	Global fund to fight AIDS, TB, Malaria	Private Hospital and Clinics	Aga khan University	Community health workers
	Provincial health departments	Heartfelt	United nations Development programme	Corporate Social Responsibility		
BANGLADESH	National Tuberculosis control program	Bangladesh Rural Advancement Committee	World Health Organization	Pharmaceutical companies	International centre for diarrhoeal disease Research, Bangladesh	Bangladesh Anti TB association
	Directorate general of health services	International centre for diarrhoea disease research,	Global fund to fight AIDS, TB,Malaria	Private Hospital and Clinics	Bangladesh Institute of Tropical and infectious diseases	Community health workers

		Bangladesh				
	Ministry of health and family welfare	The Damien foundation Bangladesh	United Nations Development Programme	Corporate Social Responsibility	Academic Institutions	
BHUTAN	Ministry of health	Lung health program, Bhutan	World Health Organization Bhutan	Pharmaceutical Companies	Khesar Gyalpo University of Medical Sciences of Bhutan	Community health workers
	National TB control Program	Bhutan red cross society	United nations Development programme	Private Hospitals and Clinics	Royal Centre for Disease control	Community based organisations
	District health office ls	Bhutan health trust fund	Global fund to fight AIDS,TB,Malaria	Corporate social responsibility		
MALDIVES	Ministry of health	Maldivian red crescent	World Health Organization	Pharmaceutical companies	Maldives National University	Community health workers
	National TB program	Women and health Alliance International	United nations Development programme Maldives	Private Hospital and Clinics	Maldives research and health institute	Community based Organization
	Atoll Health centers		Global fund to fight AIDS, TB, Malaria	Corporate Social Responsibility		

SRILANKA	Ministry of health	Family health bureau	The global fund to fight AIDS, TB, Malaria	Pharmaceutical companies	University of Colombo	Community health workers
	National Tuberculosis control programme		World Health Organization, Srilanka	Private Hospital and Clinics	Medical research institute	Rotary clubs and Lionsclubs
	District health authorities			Corporate Social Responsibility		
NEPAL	National Tuberculosis center	The union	World health organization Nepal	Pharmaceutical companies	Tribhuvan university	Community health workers
	Ministry of health and population	Save the children	Global fund to fight AIDS, TB, Malaria	Private Hospitals Clinics	Napalm health research council	Nepal AntiTB association.
	District health offices	United Mission to Nepal	United nations Development programme	Corporate Social Responsibility		

Studies on the Socioeconomic Impact of TB:

A1	Title: Burden of Tuberculosis and Its Association with Socio-economic Development Status (1990-2019)
	Study by Xue Yi et al.
	DISEASE- TB
	TIER- GLOBALLY
	Findings: o TB is inversely proportional to the socio-demographic index. o Countries with higher SDI had lower age-standardized incidence, DALYs, and death rates.

A2	Title: Socio-economic Impact of TB Patients and Families in India
	Study by Rajeswari Raghurajan
	DISEASE- TB
	TIER AFFECTED- GLOBALLY
	Findings: ○ Mean direct cost due to TB: ₹2052 ○ Mean indirect cost due to TB: ₹3934 ○ TB led to the loss of 83 workdays. ○ 15% of rural and urban female patients faced rejection by families. ○ 11% of school children discontinued education; 8% took up employment.

A3	Title: Socio-economic Profile and Risk Factors Among Pulmonary Tuberculosis Patients in Madurai, India: A Cross-sectional Study
	Study by Mohamed Saleem
	DISEASE- TB
	TIER- GLOBALLY
	Findings: ○ TB is most prevalent among the 35-54 age group. ○ Urban risk factors: Smoking, alcohol, diabetes mellitus. ○ Rural risk factors: Undernutrition, poor housing.

A4	Title: The Socioeconomic Impact of Tuberculosis on Children and Adolescents: A Scoping Review and Conceptual Framework
	Study by Atkins S.
	DISEASE-TB
	TIER- GLOBALLY
	Findings: ○ TB affects children and adolescents even if not directly infected. ○ TB leads to poverty, reduced physical and emotional growth, mental health issues, missed educational opportunities, and increased stigma.

A5	Title: Socioeconomic Position in TB Prevalence and Access to Services: Results from Population and Facility-Based Surveys in Bangladesh
	Study by Hossain Shahed
	DISEASE- TB
	TIER- GLOBALLY
	Findings: ○ Despite free DOTS availability, it is not equally accessible to the poor. ○ 75% of prevalent cases were detected in the survey.

A6	Title: Socioeconomic Constraints Faced by TB Patients Leading to Non-compliance: A Cross-sectional Study in Southern Punjab, Pakistan
Study by Khan Aubid Allah	
DISEASE- TB	
TIER- GLOBALLY	
Findings: ○ Factors: Low education status, unawareness, crowded population, poverty, high treatment cost, distant access to public health facilities. ○ 58% experienced changed family behavior. ○ 59% faced negative behavior from colleagues. ○ 92.9% received no support from governmental or non-governmental organizations. ○ 90% reported drugs were unaffordable; 82% had partially available drugs.	

A7	Title: Examining the Social Status, Risk Factors, and Lifestyle Changes of Tuberculosis Patients in Sri Lanka During the Treatment Period: A Cross-sectional Study
Study by Senanyake Madapathage Gayan Buddhika	
DISEASE- TB	
TIER- GLOBALLY	
Findings: ○ Changes in employment and reduction of social interaction were main lifestyle changes. ○ Positive correlation between low social status, sputum smear infectivity, and use of dangerous drugs.	

A8	Title: Barriers and Facilitators to Accessing Tuberculosis Care in Nepal: A Qualitative Study
Study by Dixit Kritika	
DISEASE- TB	
TIER- GLOBALLY	
Findings: ○ 90% of households used mobile phones, beneficial for spreading knowledge. ○ High stigma, especially for MDR-TB patients. ○ Over 60% incurred catastrophic costs.	

A9	Title: Demographic Risk Factors for Extrapulmonary Tuberculosis: A Rising Public Health Threat in Bhutan
Study by Zangpo Tandin et al.	
DISEASE- TB	
TIER- GLOBALLY	
Findings: ○ Lymphatic TB was most common, followed by genitourinary TB. ○ Extrapulmonary TB inversely proportional to age. ○ Higher odds of EPTB in females, increased BMI, and urban residents.	

Results:

On the basis of data analysed, the impact of TB is described below:

INDIA

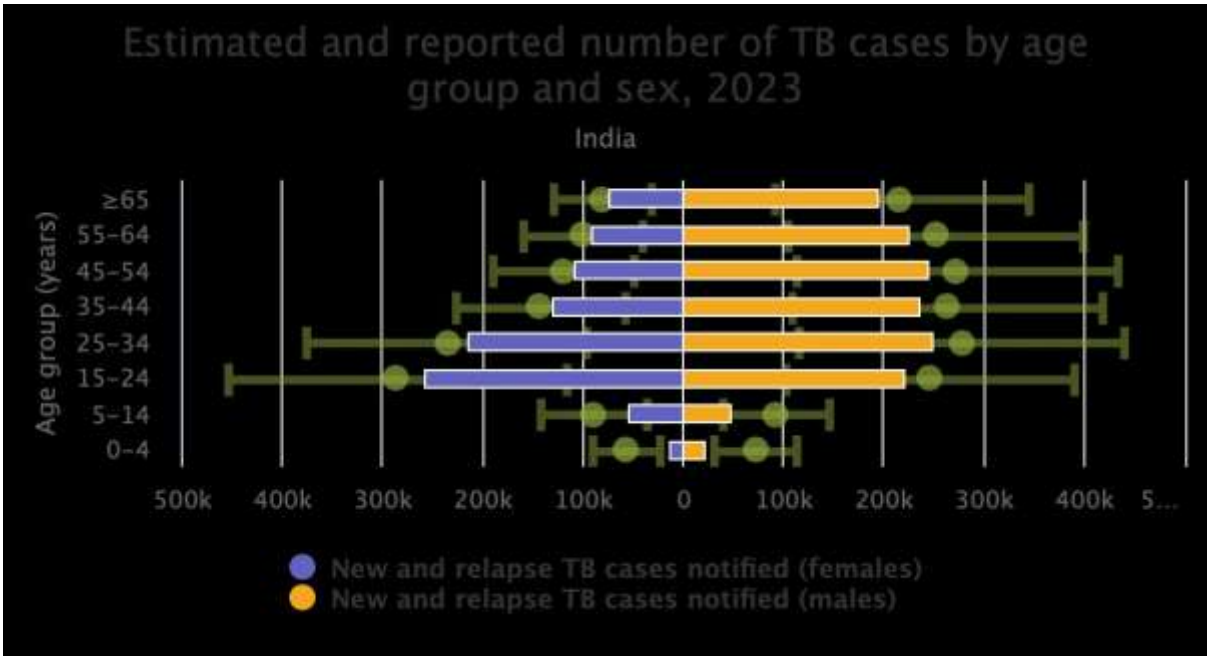


Figure 1

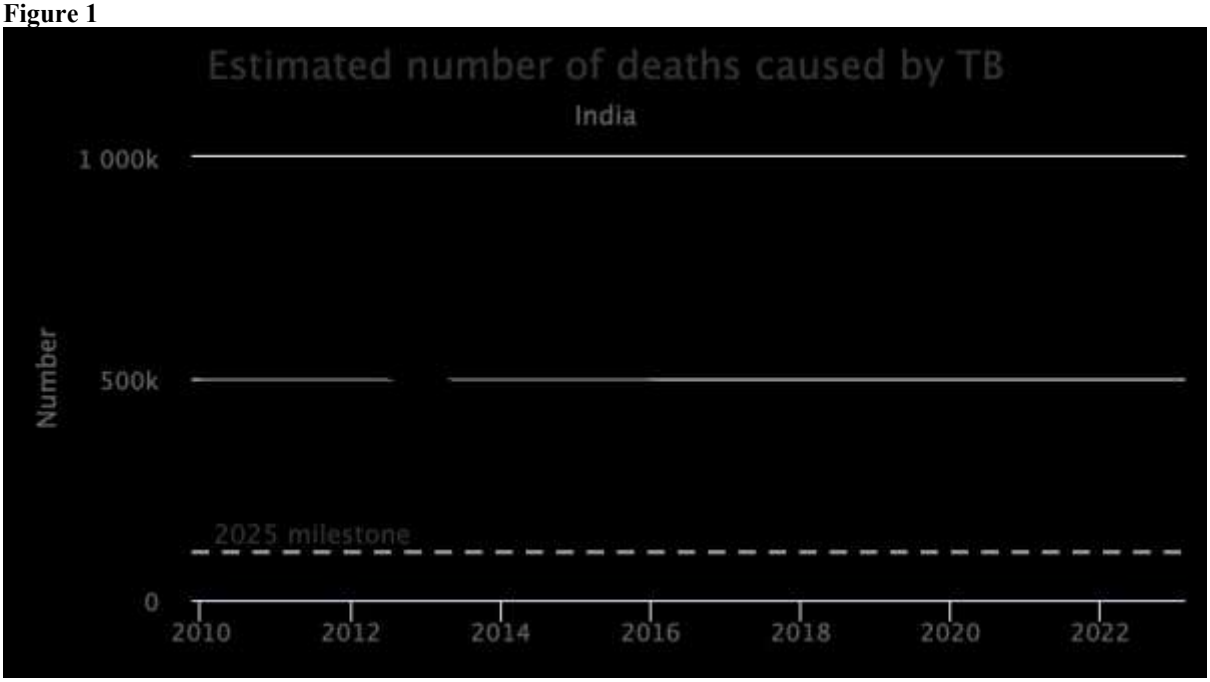


Figure 2

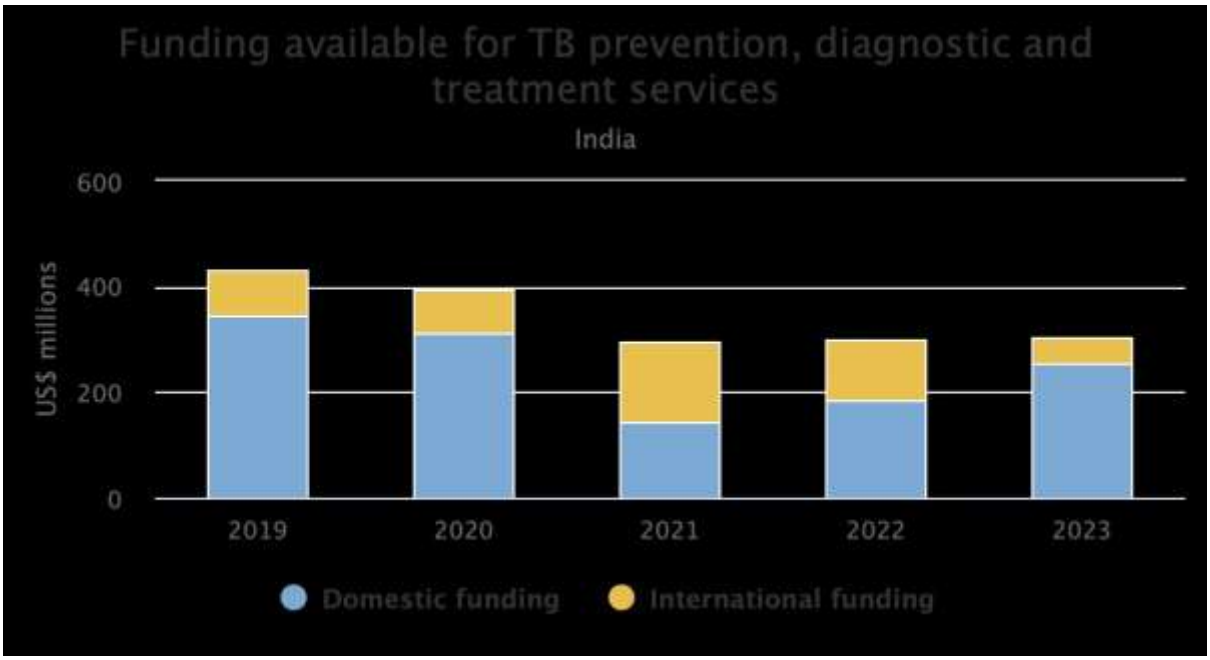
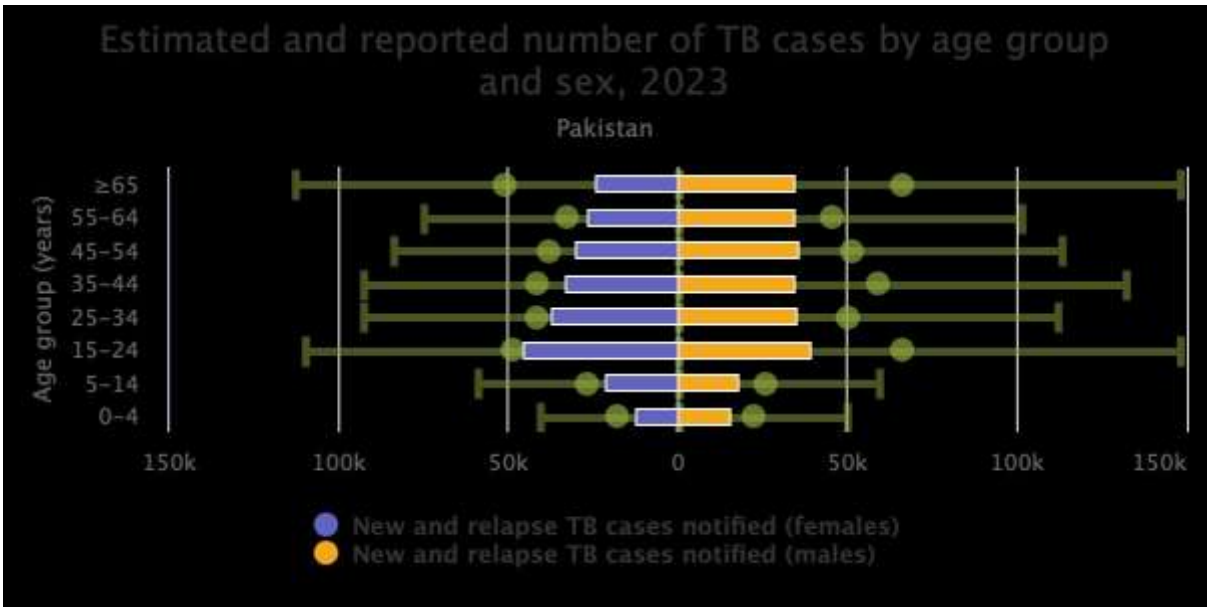


Figure 3

Pakistan:



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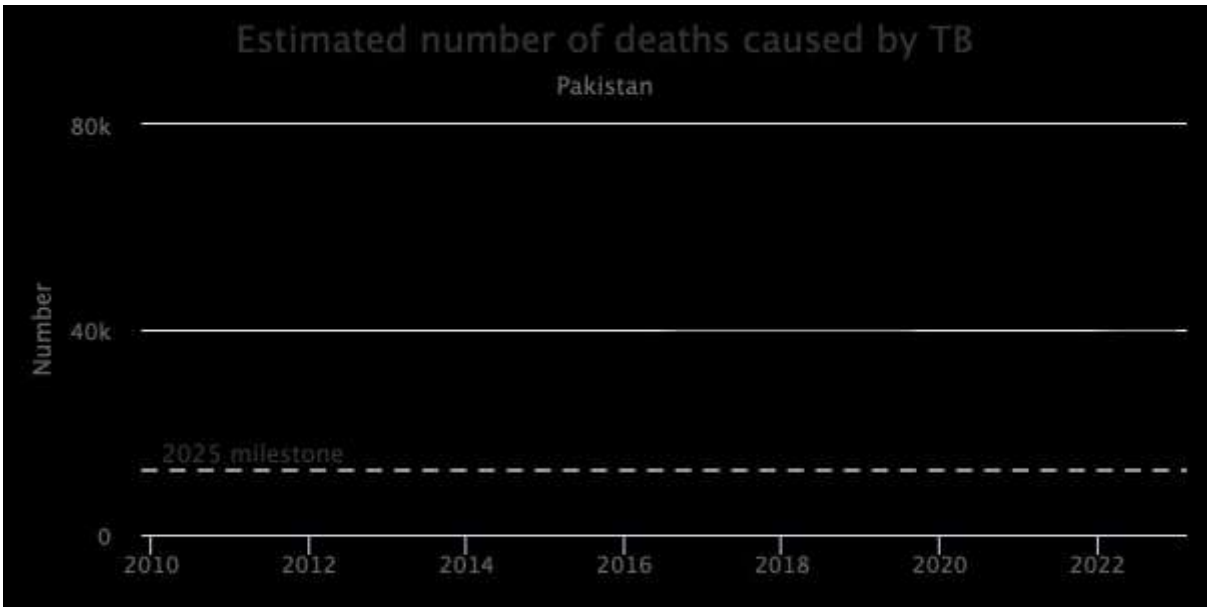
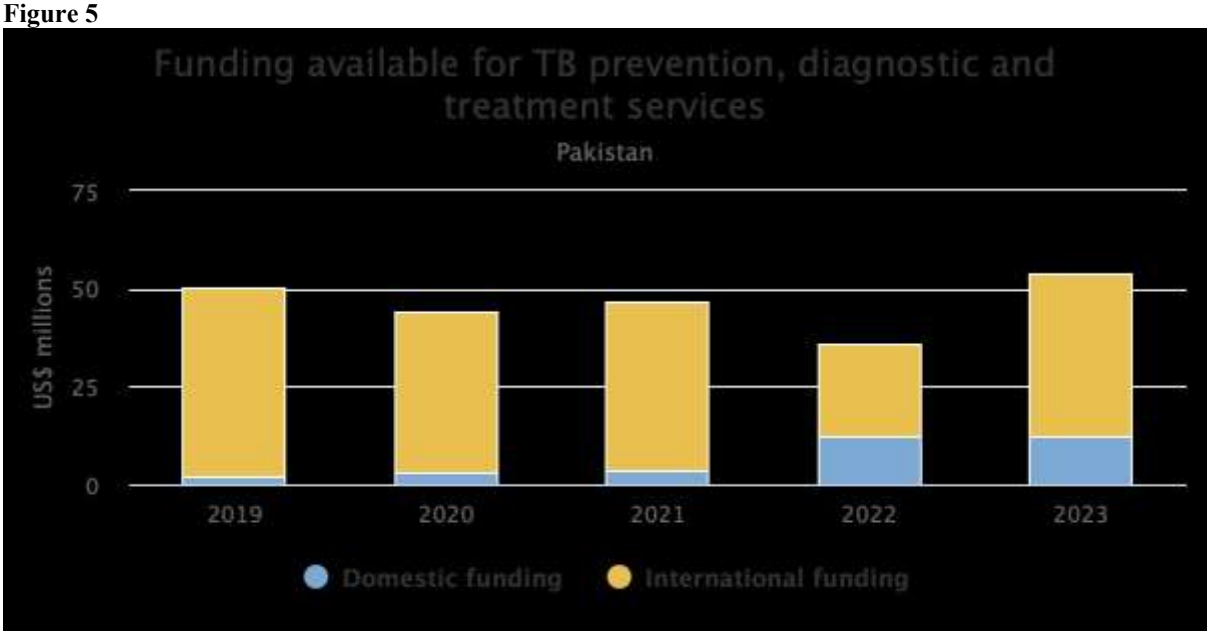


Figure 5



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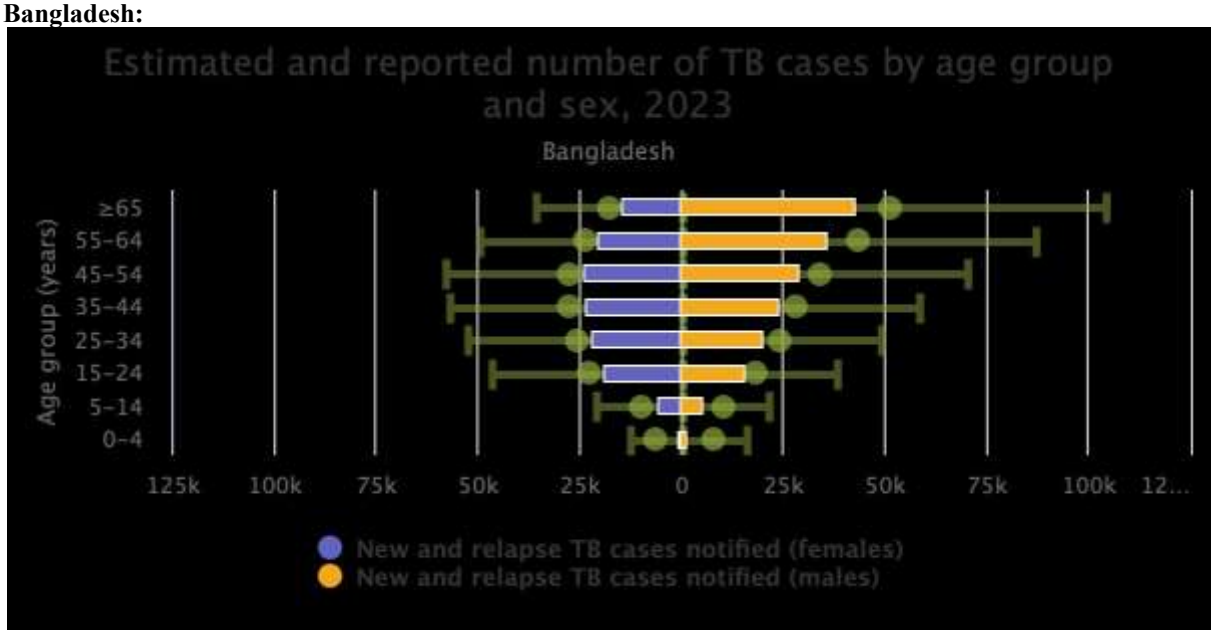
Bangladesh:



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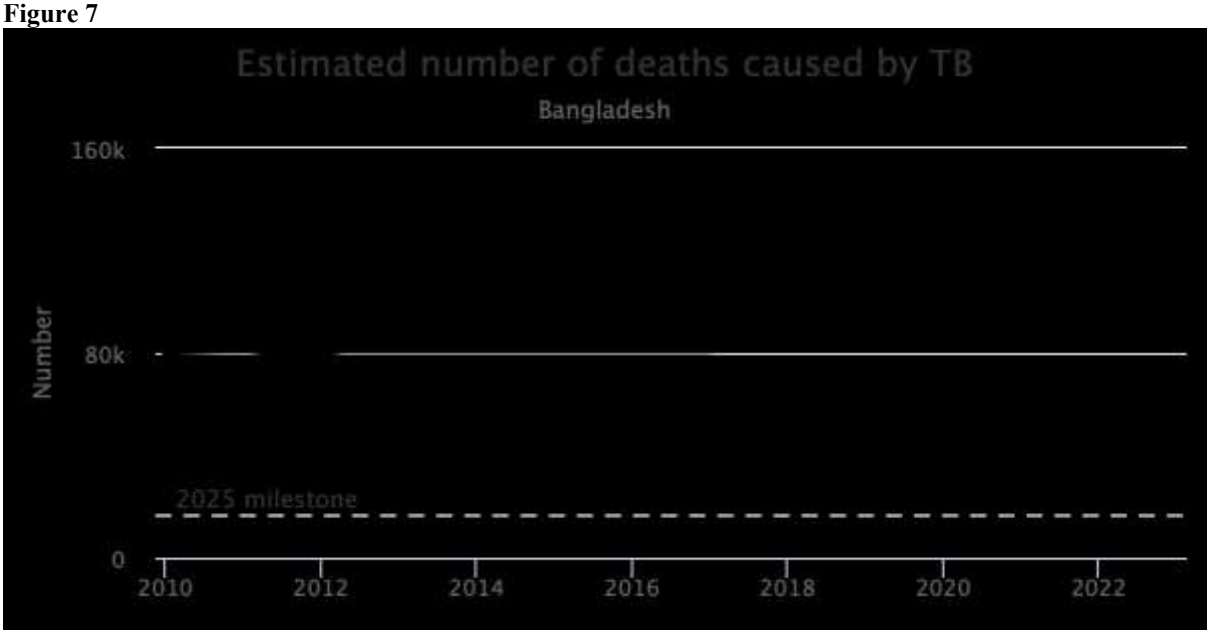

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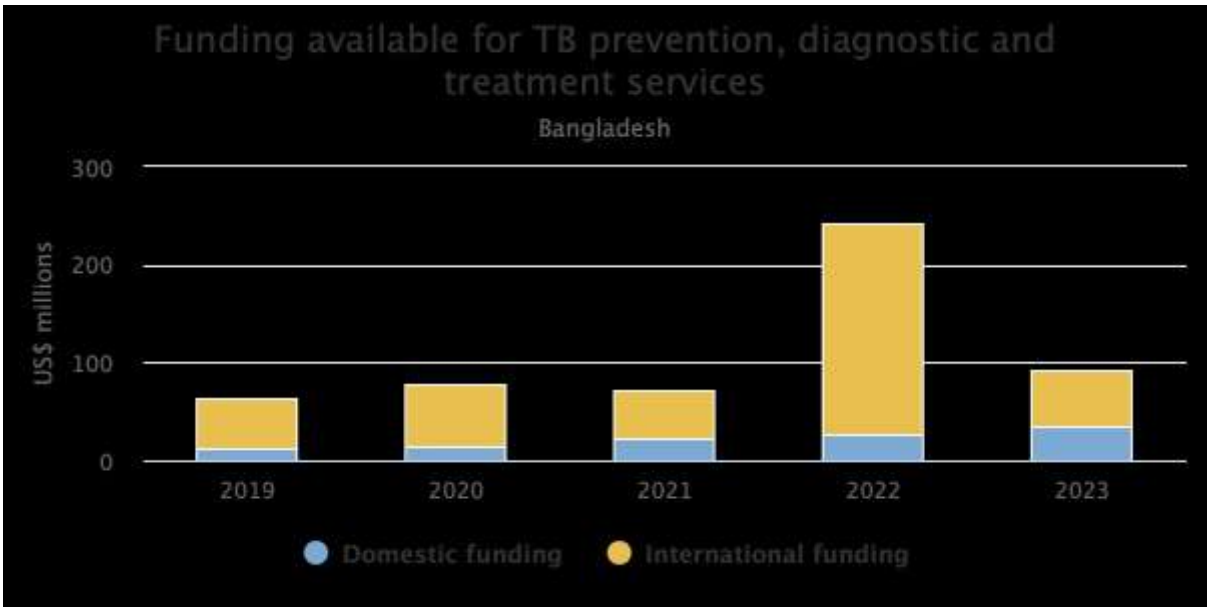
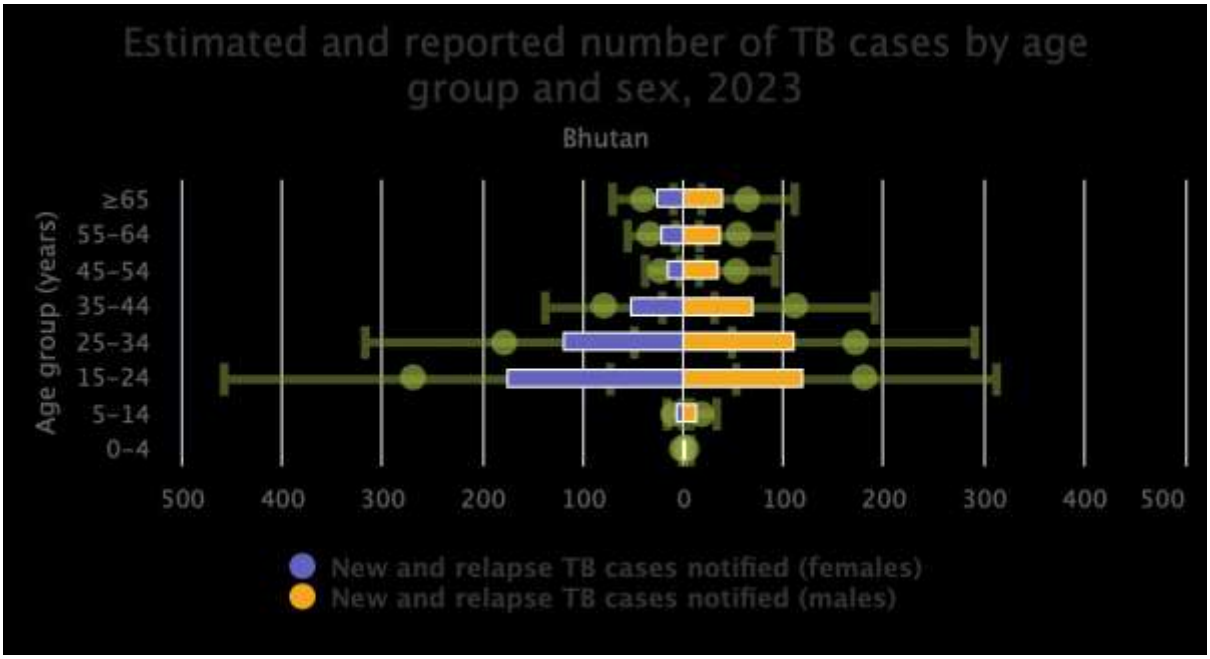


Figure 9

Bhutan:



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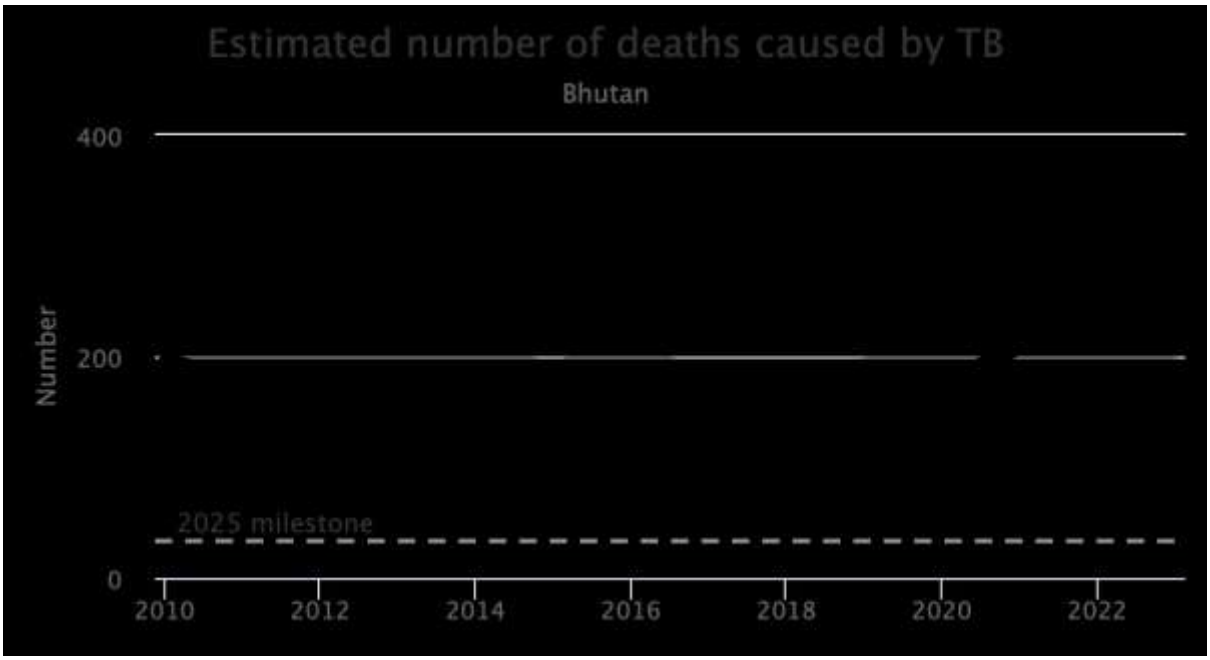

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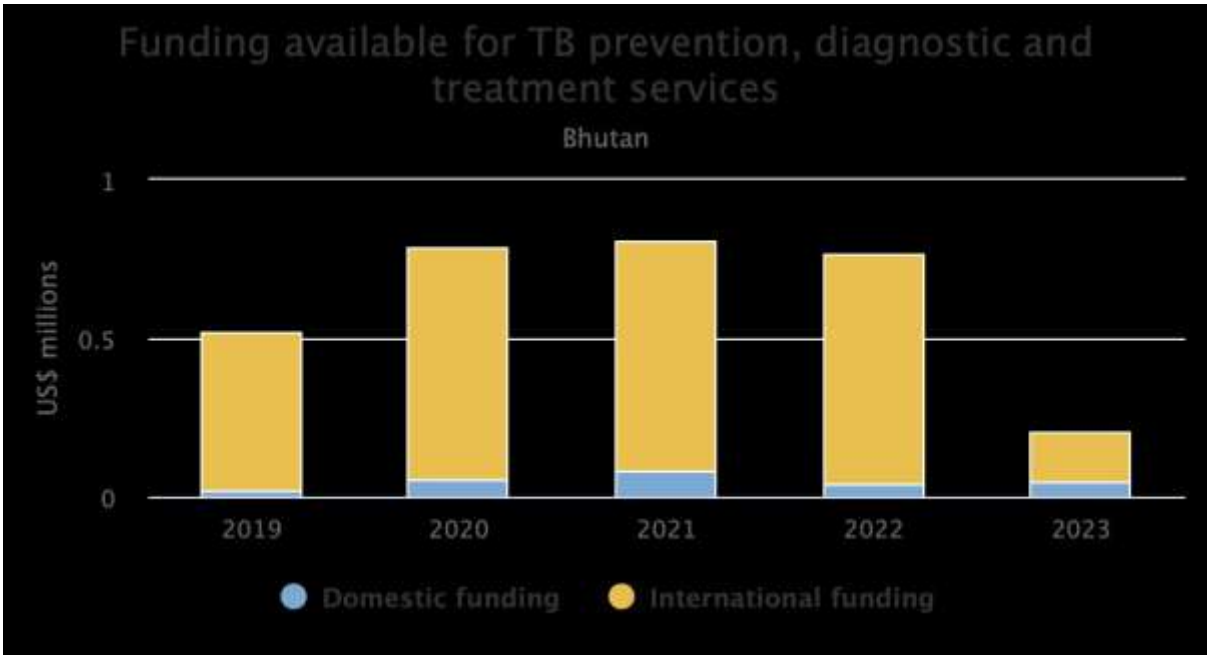

Figure 12

Maldives:

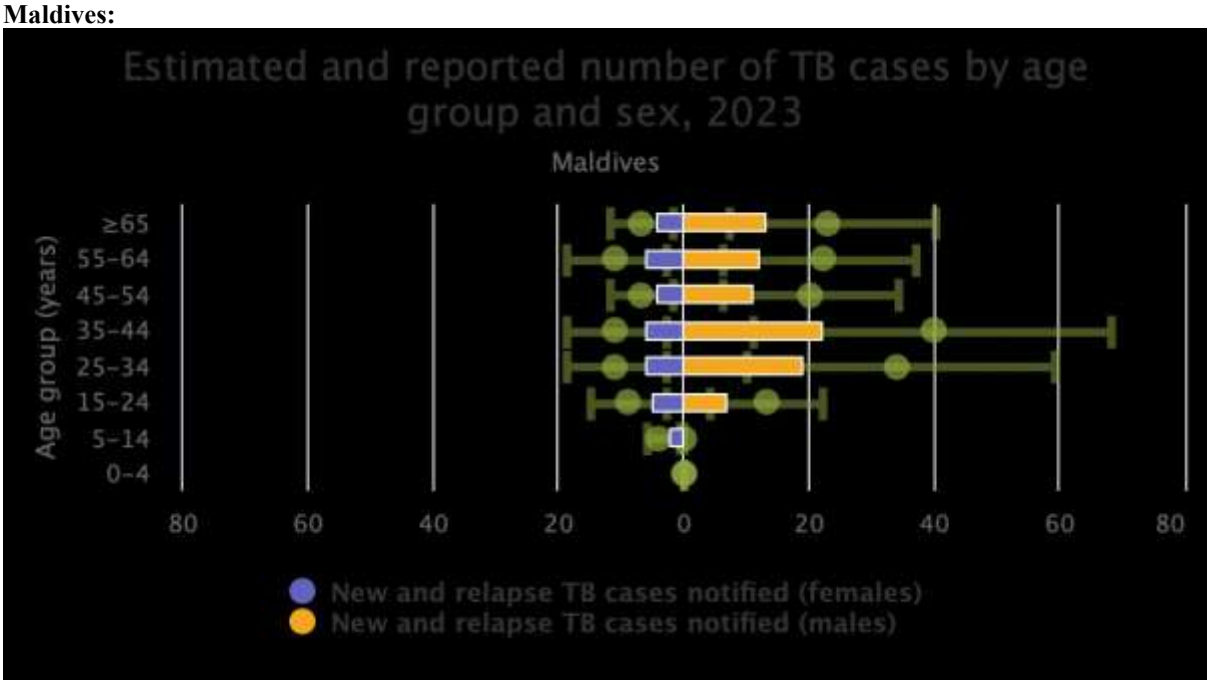

Figure 13

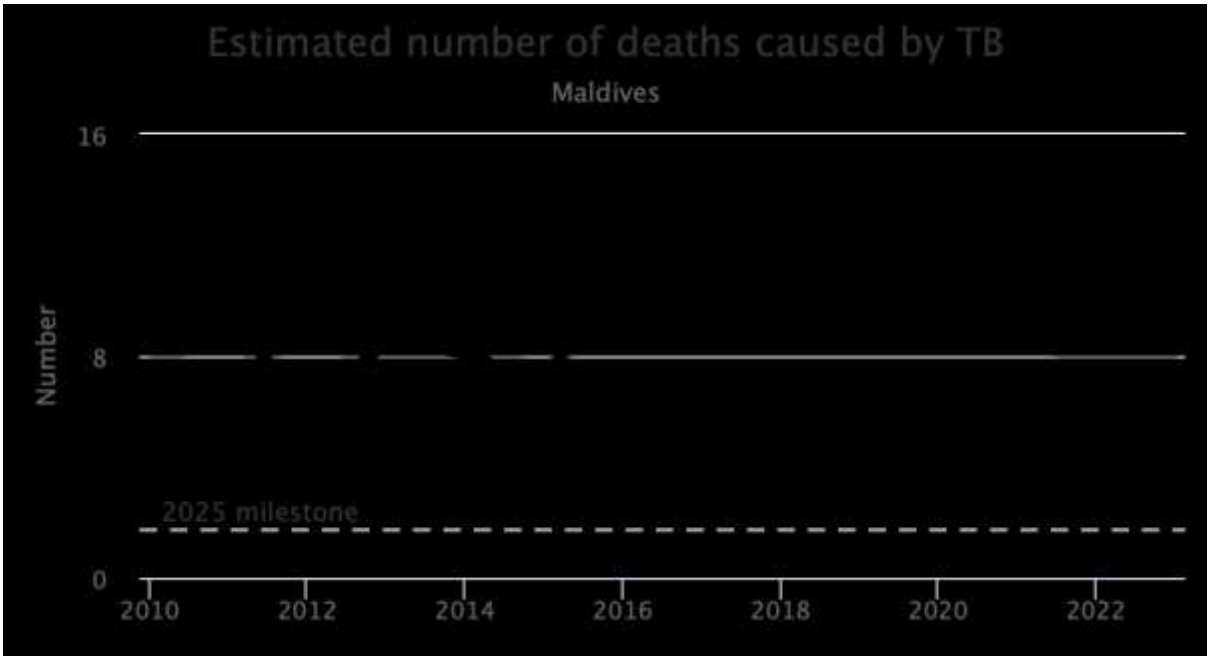

Figure 14

Nepal:

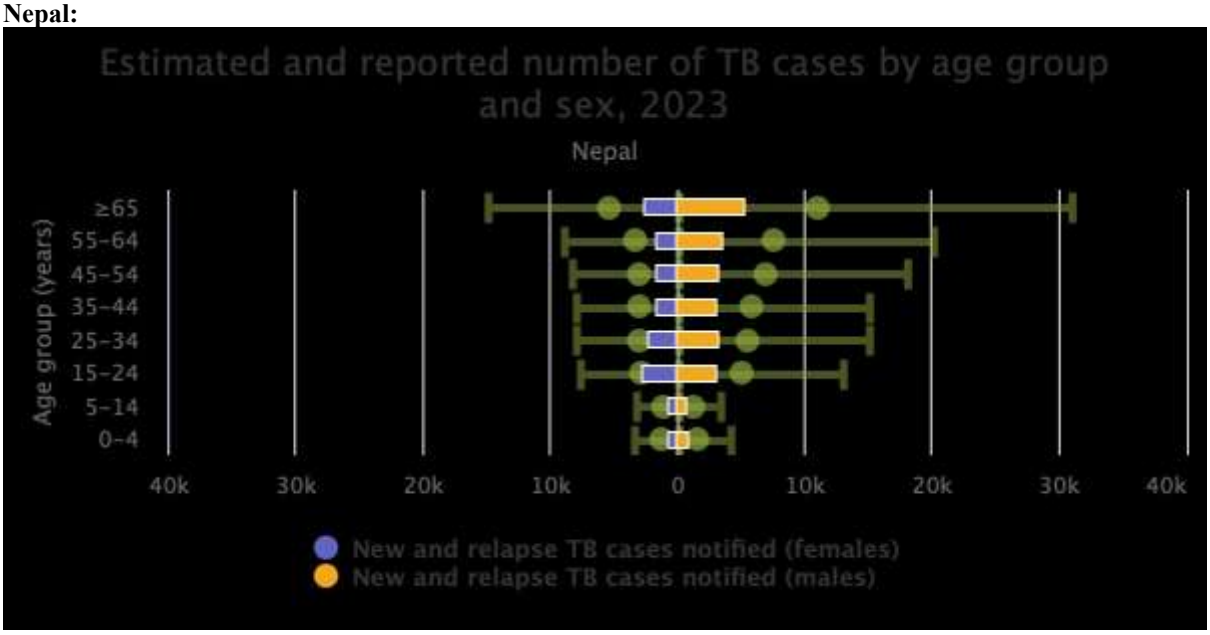

Figure 15

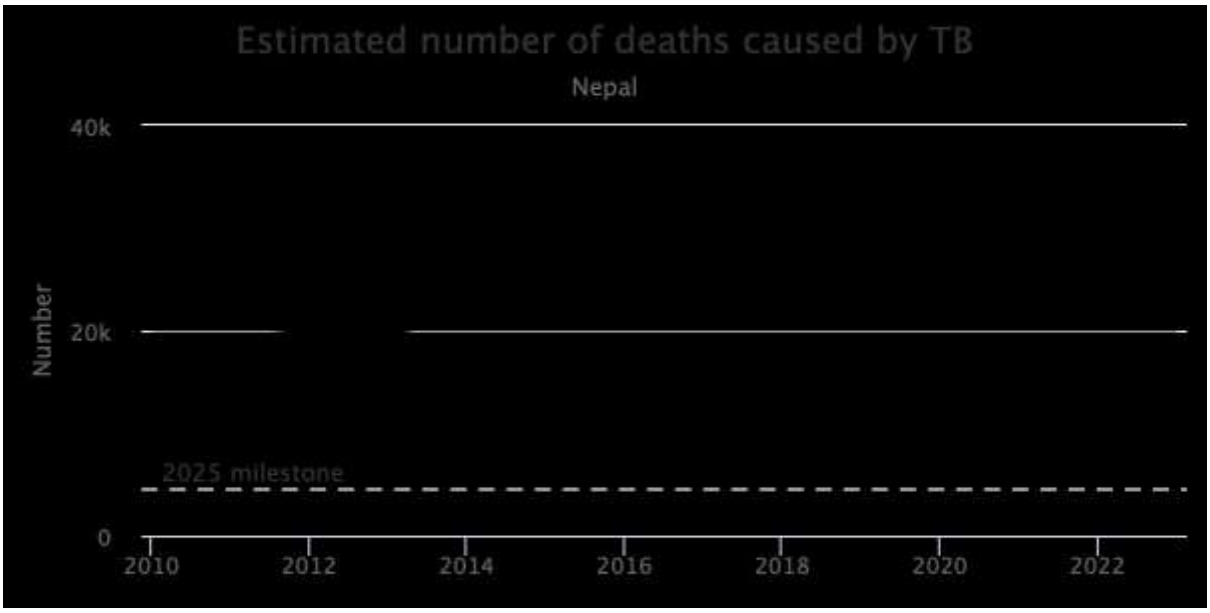

Figure 16

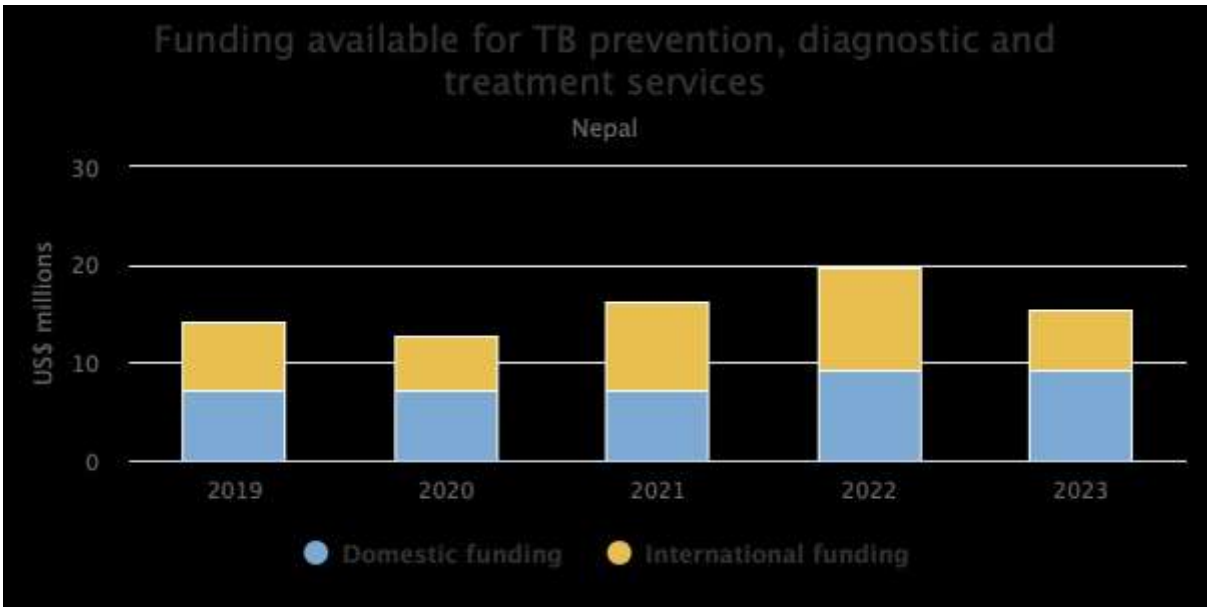

Figure 17

Conclusion:

TB remains a critical public health issue in Southwest Asia, with significant socioeconomic impacts. National TB control programs in the region have set ambitious targets to reduce TB incidence and mortality. Addressing the challenges of public awareness, drug resistance, healthcare access, and social determinants is crucial for achieving these targets and improving TB outcomes in the region.

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