

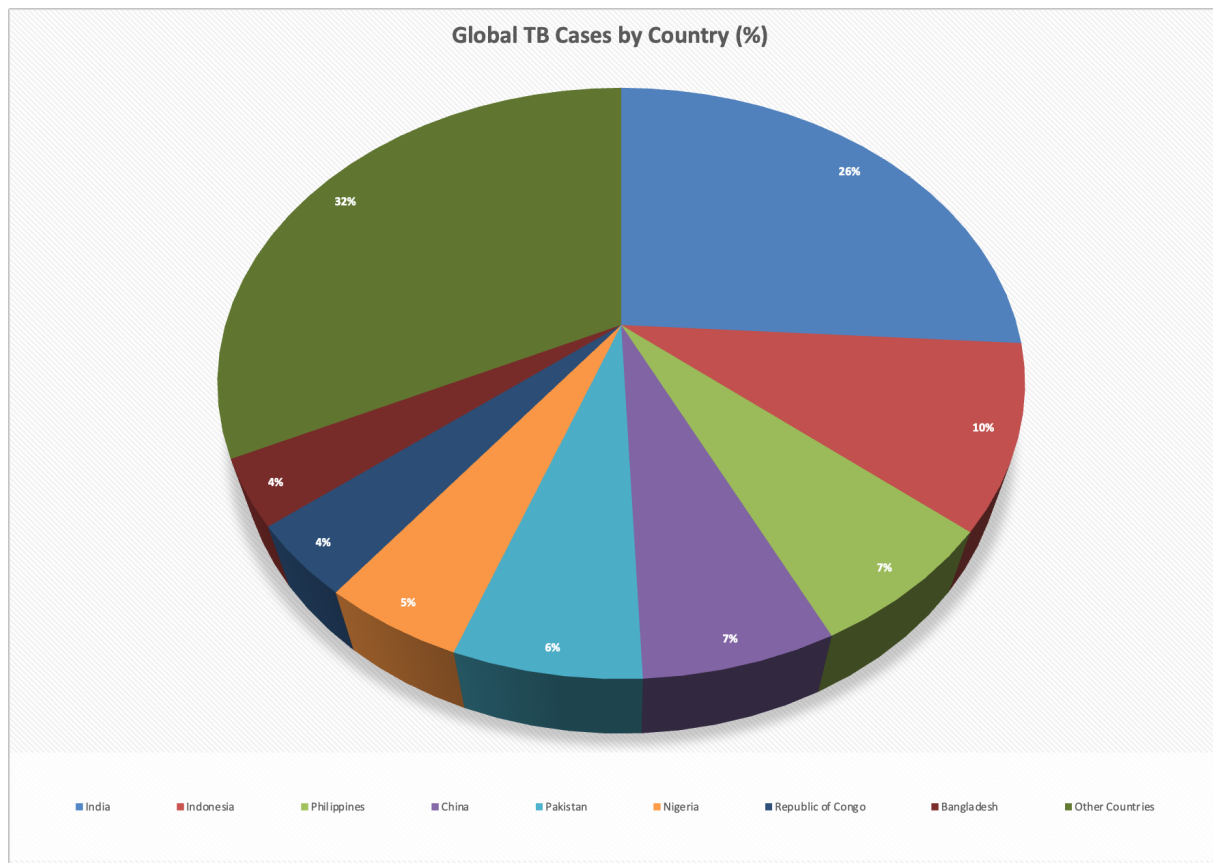
# Chapter 1

## Introduction

### 1.1 Research Background

The healthcare and life sciences industry has continued to be an important source of innovative technologies; however, the commercialization of diagnostic technologies has remained an ever-present management challenge (Mehta, 2022). Diagnostic technologies have generally shown promising technical attributes; however, they do not always succeed in the market due to the lack of market positioning, cost-effectiveness, and pricing strategies and the development of the business model. In the diagnostics industry, management decisions go beyond the technical attributes and involve technological compatibility, regulatory acceptability, and readiness for institutional adoption (Kruachottikul et al., 2023). In this regard, the evaluation of the market acceptance prior to the launch has become an essential management decision in the biotechnology and diagnostics industry (Rodriguez-Manzano et al., 2024). This is particularly relevant in the infectious diseases diagnostics arena, which is critical in the control and management of infectious diseases.

Tuberculosis (TB) is arguably one of the most significant infectious diseases that have persisted over the years and continue to pose significant public health challenges across the world. Global health reports indicate that millions of new cases of tuberculosis infections are reported annually across the world, with a significant number reported in the developing and densely populated countries of the world (Saktiawati & Probandari, 2025). Despite the availability and implementation of treatment and preventive strategies, tuberculosis has remained a significant cause of morbidity and mortality across the world. Some countries have consistently reported the highest number of TB infections compared to others across the world (Vasiliu et al., 2024).

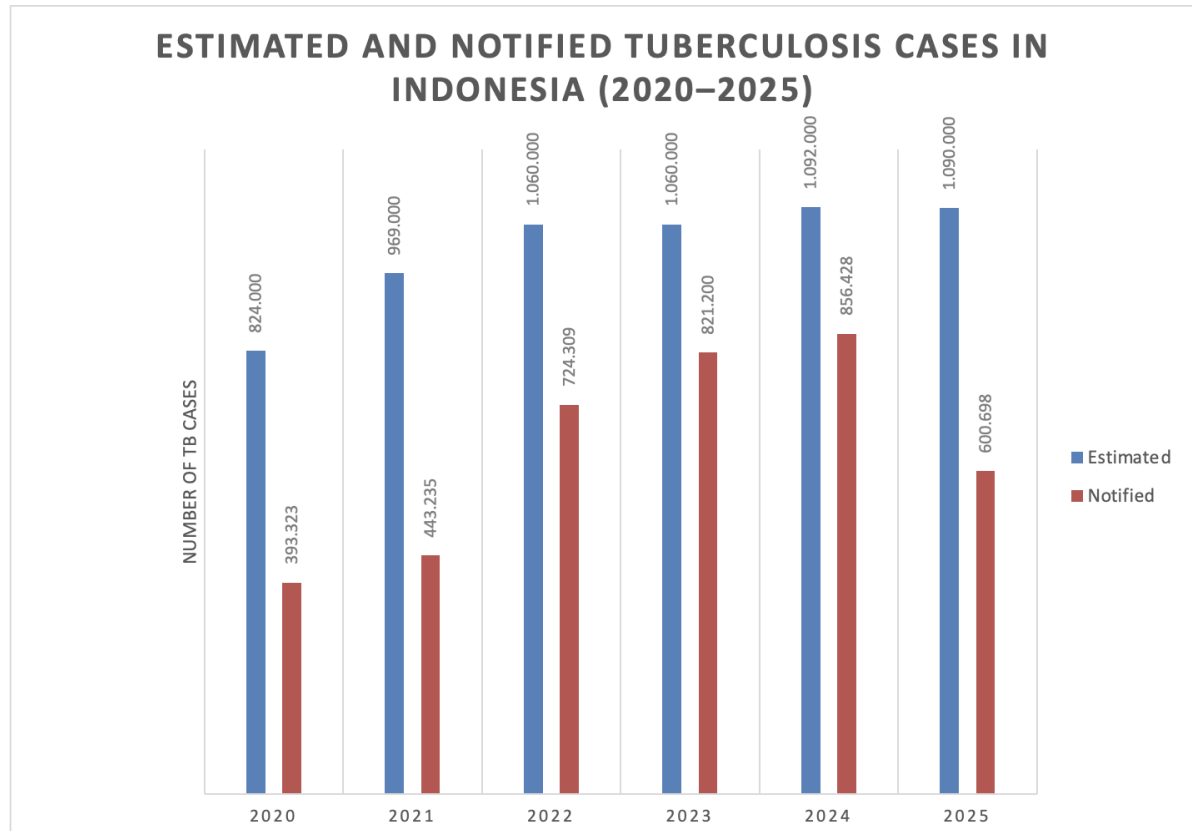


Source: World Health Organization (2025)

Figure 1.1 Top Eight Countries with the Highest Tuberculosis Incidence Worldwide

As shown in Figure 1.1, tuberculosis incidence is focused in a small group of high-burden countries. Indonesia has always been included in the list of countries with the highest number of tuberculosis infections in the world. In 2025, Indonesia accounts for approximately 10% of the global tuberculosis burden. This shows the burden of tuberculosis in the country, which needs to be addressed (World Health Organization, 2025).

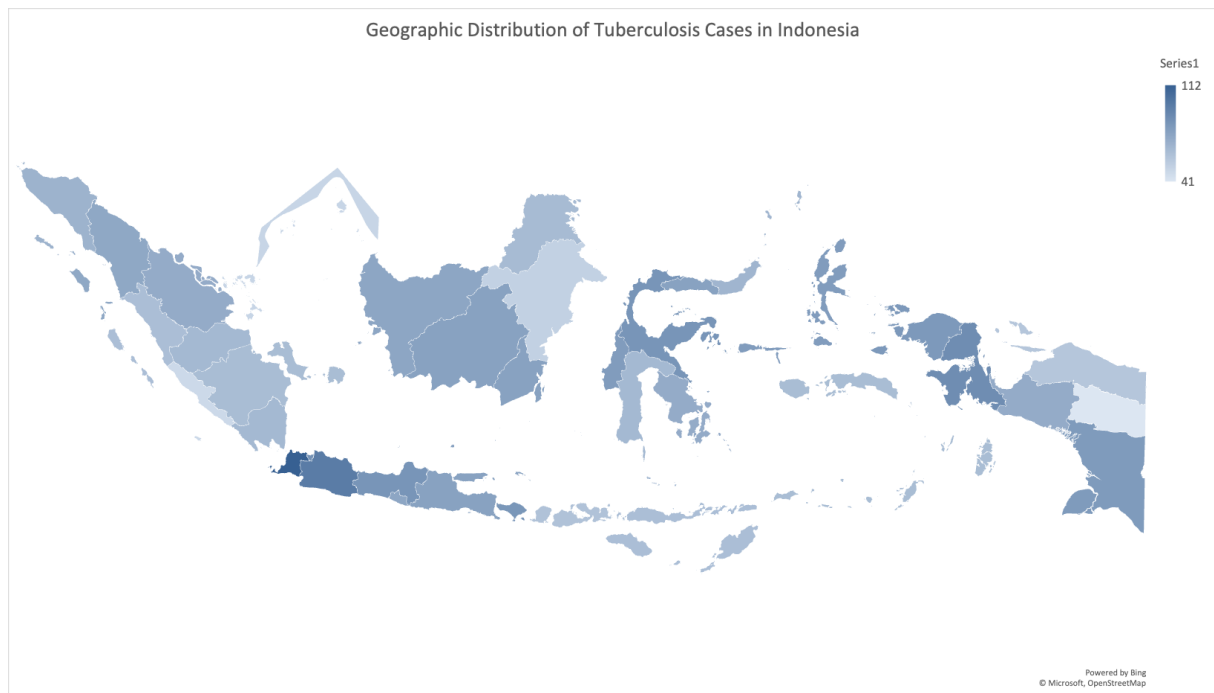
Tuberculosis remains a serious health concern in Indonesia, a country with a huge population, a lack of equal access to health care, and a lengthy diagnostic process, all of which contribute to the burden of tuberculosis in the population. An estimated of 800,000-1,000,000 new tuberculosis infections occur in the country each year (Iskandar et al., 2023).



Source: Kementerian Kesehatan (2025)

Figure 1.2 Tuberculosis Incidence and Reported Cases in Indonesia

From Figure 1.2, it is clear that there is a significant difference between the number of cases of tuberculosis and the number of cases reported. The vast difference of 40-60% of the estimated and notified cases becomes a concerning problem since it implies that a significant number of cases may be going undetected and, in turn, may be left untreated, thus posing a significant risk for further spreading of the disease among the Indonesian population. This may be brought about by delayed detection and inaccessibility to facilities for detecting tuberculosis, thus necessitating the need for improved facilities for detecting tuberculosis. From the trend presented in Figure 1.2, it is clear that the cases of tuberculosis are on the increase rather than on the decline. This, in essence, poses a significant challenge in the control and management of tuberculosis in Indonesia (Kementerian Kesehatan, 2025).



Source: Badan Pusat Statistika, 2025

Figure 1.3 Geographic Distribution of Tuberculosis Cases in Indonesia

The gradient of colors on Figure 1.3 shows the relative rates of detection of tuberculosis cases per province. The darker shades of blue on the map indicate higher rates of detection of TB cases compared to the lighter shades of blue. Based on the data presented in Figure 1.3, the highest detection rate of TB cases is seen in the province of Banten, which has a detection rate of 112 cases per 100,000 population. There are also higher detection rates of TB cases in the Jabodetabek metropolitan area provinces of DKI Jakarta and West Java. The detection rates of TB cases in these provinces are 86 and 97 per 100,000 population, respectively. The provinces of Jabodetabek metropolitan area have the most populated and urbanized provinces in the country (Badan Pusat Statistika, 2025).

Differences in the incidence rate of tuberculosis in Indonesia may also be attributed to differences in demographic and environmental factors. It is known that differences in the density of populations, overcrowding in urban areas, and differences in environmental sanitation can lead to differences in the transmission rate of tuberculosis (Sayifullah et al., 2025). For instance, areas with high population density, lack of proper ventilation, and poor housing and sanitation can promote the transmission of *Mycobacterium tuberculosis*, the causative agent of tuberculosis, from person to person by airborne transmission. This may, therefore, be the reason for the high incidence rate in some provinces compared to others (Lee et al., 2022).

Despite the existence of various national tuberculosis control programs, issues related to early detection and diagnosis of tuberculosis are still prevalent. The detection of tuberculosis at early stages has a great potential to increase the rates of tuberculosis detection. However, the effective utilization of such technologies is not only based on the availability of technology but also on various other aspects, such as accessibility, affordability, trust, and perceived healthcare needs (Rahmatullah et al., 2025).

Improvements in diagnostic technologies have contributed significantly to the early detection of infectious diseases. Various technologies are being developed to improve the early detection of infectious diseases, as they are capable of detecting diseases at early stages more accurately compared to conventional methods. These technologies are essential in controlling infectious diseases, as early detection of diseases such as tuberculosis has a great impact on the outcome of the disease (Srivastava et al., 2025).

Loop-Mediated Isothermal Amplification (LAMP) rapid detection kits for tuberculosis can be seen as an innovation in the management and diagnosis of tuberculosis with some managerial benefits such as simplicity, minimal equipment required, and rapid turnaround compared to other conventional molecular tests (Mahato & Kumar, 2024). However, it is not the technical capability that is the sole factor in the commercialization of the product. From the strategic management perspective, there are some business issues that need to be addressed in the commercialization process to ensure the successful launch of the product into the market. These issues include the market attractiveness for the product, the relevance of the value proposition to the institutional customer segment, the ability to achieve competitive and profitable prices, and the readiness of the customer segment to buy the product. The regulatory scenario in Indonesia is another factor that could complicate the commercialization process (Soukup et al., 2025).

## **1.2 Research Gap**

Though various studies have identified different aspects regarding the advancement in technology for TB diagnostics and various healthcare commercialization issues in general, few studies have specifically focused on conducting empirical research on the market acceptance of LAMP technology-based TB diagnostic kits in the Indonesian healthcare market, particularly in the Jabodetabek healthcare ecosystem. Most studies available in literature mainly focused on the technical validity of the test kits or their clinical performance, while few studies conducted a holistic market acceptance analysis in relation to the healthcare market scenario. Hence, this thesis attempts to fulfill this research gap by conducting a holistic market acceptance analysis.

### **1.3 Research Problem**

Following the background literature review and the identified gap, the present study was undertaken in order to answer the following research questions:

1. Despite the existence of various advantages of LAMP-based TB detection technology, there is limited information about the factors that affect its acceptance in the Indonesian healthcare market especially in the Jabodetabek healthcare market.
2. Most of the previous studies have been conducted regarding the technical aspects of TB diagnostic technology whereas there are limited studies done on the effects of structure factors such as accessibility and affordability on market acceptance.
3. The effect of behavioral factors like need and trust on the market acceptance of the technology can be considered but it has not been studied empirically in Indonesia.
4. Although BPJS is thought to minimize the healthcare barrier, there is limited knowledge regarding the moderating effect of BPJS on the market acceptance of TB diagnostic technology.
5. There is limited empirical evidence concerning the integration of structure, behavior and institutional factors in market acceptance of LAMP-based TB diagnostic technology.

### **1.4 Research Question**

With regards to the research problems outlined above, this research aims to explore the determinants of the market acceptance of a LAMP-based rapid tuberculosis test kit in the Jabodetabek health care market environment. In particular, the influence of structural, behavioral and institutional factors as well as the influence of BPJS coverage as a moderator is analyzed. Therefore, the following research questions are raised:

1. Does accessibility significantly influence the market acceptance of a LAMP-based rapid TB detection kit in Jabodetabek?
2. Does affordability significantly influence the market acceptance of a LAMP-based rapid TB detection kit?

3. Does perceived need significantly influence the market acceptance of a LAMP-based rapid TB detection kit?
4. Does public trust significantly influence the market acceptance of a LAMP-based rapid TB detection kit?
5. Does BPJS coverage moderate the relationship between accessibility and market acceptance?
6. Does BPJS coverage moderate the relationship between affordability and market acceptance?
7. Does BPJS coverage moderate the relationship between perceived need and market acceptance?
8. Does BPJS coverage moderate the relationship between public trust and market acceptance?

### **1.5 Research Objective**

As part of the answers to the research questions formulated, this research defines research objectives which will be used in empirical analysis. The objectives include the attempt to investigate the effect of accessibility, affordability, need perception, and public trust on the market acceptance of the proposed TB rapid test kit using LAMP technology.

1. To examine the effect of accessibility on the market acceptance of a LAMP-based rapid TB detection kit.
2. To examine the effect of affordability on the market acceptance of a LAMP-based rapid TB detection kit.
3. To examine the effect of perceived need on the market acceptance of a LAMP-based rapid TB detection kit.
4. To examine the effect of public trust on the market acceptance of a LAMP-based rapid TB detection kit.
5. To examine whether BPJS coverage moderates the relationship between accessibility and market acceptance.
6. To examine whether BPJS coverage moderates the relationship between affordability and market acceptance.
7. To examine whether BPJS coverage moderates the relationship between perceived need and market acceptance.
8. To examine whether BPJS coverage moderates the relationship between public trust and market acceptance.

## **1.6 Significance of the Study**

This research also has various implications for academic research, industry practices, and the development of public health. From the academic perspective, the research contributes to the commercialization of healthcare innovation, especially on diagnostic innovation. Many researchers have studied the technical performance and validation of diagnostic tools for tuberculosis. However, fewer researchers have examined the market acceptance of diagnostic tools in the healthcare market. Thus, the research contributes to the literature by evaluating the market acceptance of LAMP-based TB diagnostic kits using the strategic management and market analytics approach.

From the managerial perspective, the importance of the study could be seen in that it might offer significant insights to the management of various biotechnology firms, healthcare entrepreneurs, and diagnostic technology developers in assessing the commercialization potential of the rapid tuberculosis diagnostic kits. The study might be of use to the management in assessing the market potential, financial viability, and institutional demand for the diagnostic kits in the healthcare market.

From the public health perspective, the importance of the study could be seen in that it might contribute to the improvement of the detection of tuberculosis in Indonesia. By assessing the acceptance of the implementation of the diagnostic kits, the study might offer significant insights to the improvement of the detection of the disease and the reduction of the gap between the estimated and reported TB cases.