

# **NATIONAL PLANNING**

## **OF MEDICAL AND HEALTH WORKFORCE:**

### **PROJECTION OF NEEDS THROUGH A POPULATION-BASED APPROACH, 2023–2032**

**MINISTRY OF HEALTH  
DIRECTORATE GENERAL OF HEALTH WORKFORCE  
2026**



**MINISTER OF HEALTH OF THE  
REPUBLIC OF INDONESIA**

**FOREWORD**



We give praise and gratitude to God Almighty for His grace and blessings, which have made possible the publication of the *"National Planning of Medical and Health Workforce: Projection of Needs through a Population-Based Approach, 2023–2032"*. This publication represents a strategic milestone in supporting the transformation of Indonesia's national health system, particularly in ensuring the availability and equitable distribution of medical and health workforce in accordance with the population needs across all regions.

A population-based planning approach provides a more objective, responsive, equitable, and sustainable overview of medical and health workforce needs. This approach enables a more comprehensive understanding of variations in workforce needs across provinces and districts/cities throughout Indonesia, including disadvantaged regions, borders, and islands.

This book is intended to serve as a key reference for ministries/agencies as well as Local Governments in formulating policies for medical and health workforce planning, thereby strengthening synergy between the central and local governments in delivering equitable and high-quality health services.

We extend our highest appreciation to the entire technical team, the Indonesian Health Council, Collegium, academics, Local Governments, and all stakeholders who have contributed through data provision, analysis, and valuable insights throughout the preparation of this document.

Lastly, hopefully this book's publication will provide meaningful benefits and serve as a strong foundation for national and regional health development. Let us continue to work collaboratively, foster innovation, and strengthen our commitment toward realizing a resilient, equitable, and sustainable National Health System.

Jakarta, February 2026  
Minister of Health,

**BUDI G. SADIKIN**



## PREFACE



We express our gratitude to God Almighty for the publication of the *"National Planning of Medical and Health Workforce: Projection of Needs through a Population-Based Approach, 2023–2032"*. This book presents projections of workforce needs for 49 types of medical workforce and 32 types of health workforce, disaggregated to the provincial and district/city levels. This edition represents an improvement of the previous publication, particularly regarding the methodology for calculating the demand for physicians and dentists.

The projection of medical and health workforce needs is developed using a population-based supply–demand approach that takes into account population dynamics, disease burden, patterns of service delivery in health facilities, and the effective working hours of medical and health workforce. The projection process was conducted through systematic stages, beginning with the estimation of service time requirements, adjustment of effective working hours, calculation of workforce needs at the district/city level, and culminating in projections based on population size and structure using data from Statistics Indonesia (BPS), as well as trends in disease burden derived from nationally representative health surveys. The preparation of this publication was carried out through collaboration among various stakeholders, including the Indonesian Health Council, Collegium, relevant ministries and institutions, local governments, professional organizations, and academic experts.

This book is expected to serve as a reference for the Central Government and Local Governments in policy decision-making related to the planning, education, and fulfillment of the medical and health workforce. This includes the development of educational programs, the determination of enrollment quotas, the provision of scholarships, as well as actions aimed at achieving equitable distribution and improving the quality of health services.

Finally, I would like to express my sincere appreciation to all parties who have contributed to the preparation of this book. It is our hope that this publication will support efforts to strengthen the fulfillment and equitable distribution of medical and health workforce, thereby contributing to the achievement of the highest attainable and equitable standard of public health.

Jakarta, February 2026  
Director General of Human Resources for Health,

**YULI FARIANTI**



## ACKNOWLEDGMENTS

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- 44. Association of Medical Education Institutions
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## GLOSSARY

- Projection of Medical and Health Workforce Needs through a Population-Based Approach** : Medical and health workforce planning conducted by the Central Government using the supply-demand method for the years 2023-2032, taking into account epidemiology at the national/provincial/district/city levels (top-down).
- Supply and Demand Method** : Modelling is used to analyse the gap between the number of available medical and health workforce (supply) and the number of medical and health workforce needed in accordance with the level of service that should be available (demand/needs).
- Demand** : The total number of medical and health workforce needed in a region at the national/provincial/district/city level has been calculated and projected. The demand calculation takes into account demographic dynamics, the volume of health services, effective working hours, correction factors, and disease distribution, which are then allocated per district/city.
- Correction Factors** : Adjustment parameters in calculating the estimated needs/demand for medical and health workforce, taking into account the scope of health services that should be available.
- Supply** : The amount of medical and health workforce available in a region, calculated based on:
1. Health workforce availability based on headcount
  2. Annual graduates; and
  3. Attrition of 1.5% of the existing total.
- Gap** : The gap between the total number of medical and health workers needed to the total number available.



## LIST OF ABBREVIATIONS AND ACRONYMS

<b>ASN</b>	: State Civil Apparatus
<b>BKD</b>	: Regional Civil Service Agency
<b>BKPSDM</b>	: Human Resources and Civil Service Development Agency
<b>BLU</b>	: Public Service Agency
<b>BLUD</b>	: Regional Public Service Agency
<b>BPJS</b>	: Social Health Insurance Administration Body
<b>Dinkes</b>	: Health Office
<b>DI Yogyakarta</b>	: Special Region of Yogyakarta
<b>DKI Jakarta</b>	: Special Capital Region of Jakarta
<b>DTPK</b>	: Disadvantaged Regions, Borders and Islands
<b>FKRTL</b>	: Advanced-referral-level health facilities
<b>FTE</b>	: Full-time Equivalent
<b>ICD 9 CM</b>	: The International Classification of Procedure Code, 9th Revision, Clinical Modification
<b>ILP</b>	: Integrated Primary Care
<b>INA-CBG</b>	: Indonesian Case Base Groups
<b>JKN</b>	: National Health Insurance
<b>Kemendikti Saintek</b>	: Ministry of Higher Education, Science, and Technology
<b>KJSU-KIA</b>	: Cancer, Heart, Stroke, Uronephrology, and Maternal and Child Health
<b>MMR</b>	: Maternal Mortality Rate
<b>IMR</b>	: Infant Mortality Rate
<b>Nakes</b>	: Health Workforce
<b>Named</b>	: Medical Workforce
<b>NCD</b>	: Non-communicable Diseases
<b>OPD</b>	: Local Government Agency
<b>P-Care</b>	: Primary care
<b>PDDikti</b>	: Database of Higher Education
<b>PermenPAN-RB</b>	: Regulation of the Minister of Administrative and Bureaucratic Reform
<b>Poltekkes</b>	: Health Polytechnic of the Ministry of Health
<b>PP</b>	: Government Regulation
<b>Puskesmas</b>	: Primary Health Centers
<b>Rajal</b>	: Outpatient
<b>Renstra</b>	: Strategic Plan
<b>RIBK</b>	: Health Sector Master Plan
<b>RPJMD</b>	: Regional Medium-Term Development Plan



<b>RPJMN</b>	: National Medium-Term Development Plan
<b>RPJPD</b>	: Regional Long-Term Development Plan
<b>RPJPN</b>	: National Long-Term Development Plan
<b>RPTK</b>	: Health Workforce Development Plan
<b>RS</b>	: Hospital
<b>SDGs</b>	: Sustainable Development Goals
<b>SDM</b>	: Human Resources
<b>SDMK</b>	: Human Resources for Health / HRH
<b>SISDMK</b>	: Human Resources for Health Information System
<b>SIP</b>	: Practice License
<b>SUSENAS</b>	: National Socioeconomic Survey
<b>STR KT</b>	: Certificate of Registration for Additional Qualifications
<b>UHC</b>	: Universal Health Coverage
<b>UU</b>	: Law
<b>WHO</b>	: World Health Organization
<b>WPRO</b>	: Western Pacific Regional Office



## SUMMARY EXECUTIVE

One of the key pillars of health transformation is the availability of sufficient, competent, and equitably distributed medical and health workforce aligned with health service needs. For this reason, data and evidence-based planning of the medical and health workforce is critically important. The *National Planning of Medical and Health Workforce: Projection of Needs through a Regional-Based Approach, 2023–2032* has been prepared as a national planning reference to illustrate the ideal needs for medical and health workforce over the next ten years. The projections apply a regional-based approach using a supply–demand method commonly employed in developed countries. The calculations are based on the total time required to meet health service demand, effective working hours in a year, and adjustments for changes in disease burden as well as population size and structure down to the district/city level.

This book presents projections of workforce needs for 49 types of medical workforce, consisting of 37 types of medical specialists and 10 types of dental specialists, including general practitioners and dentists. In addition, projections are provided for 32 types of health workforce. The projected needs indicate that Indonesia continues to face shortages across almost all types of medical workforce, with the exception of obstetrics and gynecology specialists (OB-GYNs). However, the distribution of OB-GYNs remains uneven, particularly outside Java and Bali. Similarly, shortages persist across all types of health workforce, with the exception of nurses.

Beyond the overall shortage in numbers, another major challenge is the significant maldistribution of medical and health workforce. A large proportion of the workforce is concentrated in major urban areas, resulting in limited supply in other regions. This imbalance is even more pronounced in Disadvantaged, Border, and Island (DTPK) areas.

Seven basic specialist categories are mandatory in regional public hospitals, namely pediatricians, OB-GYNs, internists, surgeons, anesthesiologists, radiologists, and clinical pathologists. Based on projections for 2032, the estimated shortages are as follows: surgeons (5.507), anesthesiologists (3.618), clinical pathologists (2.910), radiologists (2.889), internists (2.204), and pediatricians (1.796). In terms of distribution, four specialties—pediatricians, internists, surgeons, and anesthesiologists—show larger shortages in Java–Bali, while clinical pathologists and radiologists experience greater shortages outside Java–Bali. Specifically, shortages of pediatricians are concentrated 90 percent in Java–Bali and 10 percent outside Java–Bali; internists 70 percent in Java–Bali and 30 percent outside Java–Bali; surgeons 63 percent in Java–Bali and 37 percent outside Java–Bali; anesthesiologists 57 percent in Java–Bali and 43 percent outside Java–Bali; clinical pathologists 51 percent outside Java–Bali and 49 percent in Java–Bali; and radiologists 53 percent outside Java–Bali and 47 percent in Java–Bali.

Shortages are also observed among specialists related to Cancer, Heart, Stroke and Urology (KJSU) services including: cardiologists (7.289); anatomical pathologists (2.848); urologists (763); and neurologists (348). In terms of distribution, shortages of cardiologists are concentrated 59 percent in Java–Bali and 41 percent outside Java–Bali; anatomical pathologists 51 percent outside Java–Bali and 49 percent in Java–Bali; neurologists 55 percent outside Java–Bali and 45 percent in Java–Bali; and urologists 64 percent outside Java–Bali and 36 percent in Java–Bali.

Projections of workforce needs in primary health care facilities (Puskesmas) for 13 categories of medical and health workforce up to 2032 indicate that only nurses and health promotion personnel



exceed projected needs. Shortages persist for the remaining 11 categories, namely midwives (136.915), dentists (133.634), general practitioners (93.200), dental therapists (81.727), nutritionists (62.268), pharmacists (53.979), medical laboratory technologists (35.918), physiotherapists (31.051), sanitarians (25.434), epidemiologists (22.742), and clinical psychologists (6.332).

When projections of specialist physicians through 2032 are compared with trends in supply growth, an estimated shortage of approximately 65.000 specialists remains across 37 specialty categories, relative to a projected need of around 140.000. This equals to a ratio of 0.46 specialists per 1.000 population in 2032, remains significantly lower than ratios in other countries, such as the United States (3,30 in 2022), the United Kingdom (2,53 in 2023), Australia (1,47 in 2022), Singapore (1,12 in 2023), and Malaysia (0,42 in 2021). The projected need for OB-GYNs is 5.456, equivalent to a ratio of 0,018 per 1.000 population. This ratio is also lower than in other countries, including the United States (0,13 in 2022), the United Kingdom (0,13 in 2022), Japan (0,11 in 2025), Australia (0,09 in 2022), Singapore (0,06 in 2022), the Philippines (0,04 in 2025), Thailand (0,03 in 2025), and Malaysia (0,02 in 2025).

A similar trend is observed for general practitioners, with a projected need ratio of 0,8 per 1.000 population in 2032. This remains below the existing ratios in other countries, such as China (3,1 in 2023), Singapore (2,8 in 2023), Malaysia (2,3 in 2023), Vietnam (1,1 in 2023), and the Philippines (0,8 in 2023). Meanwhile, the projected ratio of dentists in 2032 is 0,59 per 1.000 population, placing Indonesia between countries such as Japan (0,8 in 2022), Malaysia (0,5 in 2024), the Philippines (0,28 in 2024), and Thailand (0,13 in 2024).

Projections for the health workforce, particularly nurses, indicate a surplus of 75.316 relative to the demand ratio of 2,11 per 1.000 population in 2032. Nevertheless, this ratio remains lower than the existing ratios of other countries, including Japan (12,7 in 2023), the Republic of Korea (9,0 in 2023), Australia (7,7 in 2023), Singapore (6,5 in 2023), the Philippines (4,2 in 2023), and Malaysia (4,0 in 2023). In contrast, midwives continue to face a shortage of 136.915 relative to the demand ratio of 2,06 per 1.000 population in 2032. Comparative ratios in other countries include the Philippines (0,66 in 2015), Japan (0,26 in 2022), and Thailand (0,11 in 2015).

This book presents comprehensive data and information on the demand/needs and supply of the medical and health workforce up to 2032, disaggregated to the district/city level. These data are intended to serve as a primary reference for policy-making by both the Central Government and Local Governments. Applications include planning the production of medical and health workforce through educational institutions aligned with scholarship policies and affirmative enrollment quotas; regulating workforce deployment through various schemes in accordance with prevailing laws and regulations (such as civil servant recruitment, special assignments, and BLU/BLUD contractual arrangements); and providing financial and non-financial incentives, particularly to improve retention in DTPK areas and other less desirable locations. In addition, this book may serve as a basis for determining professional practice license (SIP) quotas, career development pathways, workforce redistribution policies for health facilities with surplus personnel, and organizational and individual performance targets. Through structured and data-driven planning, the availability of qualified and equitably distributed medical and health workforce is expected to support the achievement of health development objectives at all levels of government, down to villages and urban wards, and to contribute to the attainment of national health development goals.



## CHAPTER 1.

### INTRODUCTION

#### 1.1. Background

Indonesia's health situation is currently undergoing a significant transition in disease burden and disease patterns. Changes in the demographic structure have resulted in shifts in national health service demands, driven by evolving epidemiological trends. In 2025, Indonesia remained one of the most populous countries globally, with an estimated population of approximately 284 million people. The population growth rate has declined from 1,25 percent in 2023 to 1,09 percent in 2025. Concurrently, Indonesia is experiencing a substantial demographic transition marked by an increasing proportion of older adults. Since 2021, Indonesia has entered the ageing population phase, in which approximately one in ten residents is aged 60 years and above. Older adults currently account for around 12 per cent of the total population.<sup>1,2</sup>

The disease burden in Indonesia has shifted from communicable diseases to non-communicable diseases (NCDs), such as cancer, cardiovascular diseases, stroke, and urological disorders, which require long-term medical care and high treatment costs. The majority of claims under the National Health Insurance (Jaminan Kesehatan Nasional/JKN) are attributable to referral services for these conditions. Furthermore, Indonesia has recorded a significant reduction in maternal and child mortality indicators. The Maternal Mortality Ratio (MMR) declined from 305 per 100.000 live births in 2015 to 189 per 100.000 live births in 2020. Similarly, the Infant Mortality Rate (IMR) demonstrated a downward trend, decreasing from 26 per 1.000 live births in 2010 to 16,85 per 1.000 live births in 2020. However, these achievements have not yet met the 2030 Sustainable Development Goals (SDGs) targets, which set the MMR at 70 per 100.000 live births and the IMR at 12 per 1.000 live births. In addition, the results of the 2024 Indonesian Nutritional Status Survey (Survei Status Gizi Indonesia/SSGI) indicate that the national prevalence of stunting stands at 19,8 percent, which is 0,3 percentage points lower than the national stunting prevalence target for 2024 of 20,1 percent.

Communicable disease control remains a significant challenge. Indonesia is one of the three countries with the highest tuberculosis (TB) burden globally. TB case notifications have shown a substantial increase, rising from 443.235 cases in 2021 to an estimated 831.328 cases in 2024, underscoring tuberculosis as an unresolved public health priority.

At the same time, non-communicable diseases (NCDs) have emerged as the most significant health challenge, accounting for approximately 75 per cent of all deaths in Indonesia. The burden of NCDs—including cancer, cardiovascular diseases, stroke, urological disorders, and diabetes mellitus—requires long-term medical care and entails high treatment costs. Consequently, the majority of claims under the JKN are associated with referral services for these conditions.

To improve access to and equity in quality health services, and to reduce morbidity and mortality from these diseases, the Government has established Priority Service Programs for Cancer, Cardiovascular Diseases, Stroke, and Urology (KJSU), as well as Maternal and Child Health (MCH/KIA). These programs, collectively referred to as KJSU–KIA, form part of the Health Transformation strategy aimed at ensuring improved service delivery and broader accessibility for the population.



Human Resources for Health (HRH) Transformation is an essential pillar of the Health Transformation agenda. The health system cannot function optimally without an adequate health workforce. Strengthening the HRH is aligned with the President's Vision, "*An Advanced Indonesia towards Golden Indonesia 2045*," which is implemented through eight key missions known as *Asta Cita*. The fourth mission of *Asta Cita* specifically focuses on strengthening human capital development, science, technology, education, and health. This mission further reinforces HRH Transformation, which encompasses efforts to ensure the availability and equitable distribution of the number, types, and capacities of health workers. With a competent and high-quality HRH, health services are expected to become more equitable and of higher quality across Indonesia.

In its implementation, the Government has also launched the *Quick Wins* program as an acceleration initiative at two levels of health service delivery. At the hospital level, *Quick Wins* focus on strengthening the capacity of Priority Services for KJSU–KIA. This includes the provision of essential diagnostic equipment—such as CT scanners, catheterisation laboratories (cath labs), radiotherapy equipment, and other medical devices—as well as enhancing the competencies of health workers, including medical specialists. In addition, KJSU–KIA referral network hospitals have been designated to improve access to quality health services. At the primary health care level, Puskesmas serves as the frontline for service strengthening through early detection of non-communicable diseases, capacity building of health workers, and the integration of referral systems with designated referral hospitals.

The National Health Insurance Program / JKN represents a key effort to improve access to and equity of health services for the entire population. *BPJS Kesehatan* plays a crucial role in expanding access to health services through the credentialing of health facilities, including service types and health resources, enabling facilities to provide services to JKN beneficiaries.

Law Number 17 of 2023 on Health stipulates the obligation of both the Central Government and Local Governments to fulfill the needs for medical and health workforce in terms of quantity, type, competence, and equitable distribution, in order to ensure the sustainability of health development. The planning, recruitment, and utilization of medical and health workforce, in accordance with the needs of the population and regional characteristics, constitute a shared responsibility in line with prevailing laws and regulations. Furthermore, Government Regulation Number 28 of 2024 concerning the Implementing Regulation of Law Number 17 of 2023 on Health further regulates the authority and responsibilities related to the preparation of workforce planning for medical and health workforce. Such planning is to be conducted through both the Institution-Based Approach and the Population-Based Approach, as stipulated in the regulation

Challenges in HRH Management in Indonesia encompass three critical aspects, namely: insufficient numbers and types of HRH, unequal distribution, and suboptimal quality. These challenges are influenced by several interrelated factors, including: (1) HRH planning; (2) HRH production and education; (3) HRH deployment and utilization; (4) HRH quality improvement; and (5) HRH development, supervision, and regulation. In addition, other challenges persist, such as varying levels of commitment among local governments in the provision of data, needs assessment, and HRH planning; fiscal constraints and diverse regional characteristics; as well as differences in priority-setting and political will across regions in fulfilling HRH requirements.

HRH planning is not a new initiative in Indonesia. To date, the Central Government has calculated the required numbers of medical workforce and health workforce as a reference for planning using a population-to-HRH ratio-based method. This approach is stipulated in two main documents: the Decree of the Coordinating Minister for People's Welfare Number 54 of 2013 on the Health



Workforce Development Plan 2011–2025, which covers 13 categories of health workforce, and the Health Workforce Target Ratio Document published in 2022.

In response to changes in disease patterns, the introduction of priority programs, and ongoing challenges in HRH management, the Central Government—through the Ministry of Health of the Republic of Indonesia—has developed projections of medical workforce and health workforce needs for the period 2023–2032 using an Population-Based Approach. This projection applies a supply–demand methodology, representing an enhancement of the previous approach that relied solely on population ratios. The improved methodology takes into account changes in demographic structure, disease epidemiology, and health service capacity.

The projection of medical workforce and health workforce needs using the supply–demand method was published in 2024 under the title “*National Planning of Medical and Health Workforce, 2023–2032*”. This publication serves as an enhancement of the earlier 2024 release and provides comprehensive information on the projected needs for medical workforce and health workforce through a Population-Based approach for the period 2023–2032. The projections cover 49 categories of medical workforce and 32 categories of health workforce, which fall under the authority and responsibility of the Central Government in terms of planning. The projection of medical workforce and health workforce needs commenced in 2023 and spans a ten-year period across all administrative levels, recognizing that the development of a highly skilled health workforce and the implementation of necessary systemic changes require a considerable amount of time. These projections may be reviewed and updated annually to incorporate additional or previously unavailable key parameters, as needed.

Holistic HRH planning will strengthen Indonesia’s resilience in addressing various health challenges, including future global pandemics, in order to achieve the highest possible level of public health, while also advancing national welfare and competitiveness.

## 1.2. Situation Analysis of HRH in Indonesia

Efforts to improve the health status of the population require adequate availability of medical workforce and health workforce. Data from the *Indonesia Health Profile 2024* indicate that a total of 2.147.826 HRH are deployed across health service facilities nationwide. This workforce consists of 207.171 medical workforce (9,65 percent), 1.373.925 health workforce (63,97 percent), and 566.727 supporting health workforce (27,7 percent). However, these aggregate figures do not fully reflect ideal conditions, particularly with regard to distribution and equity. For example, in 2024 the availability of general practitioners in Indonesia reached only 0,574 doctors per 1.000 population, which remains significantly below the World Health Organization (WHO) standard of 1 doctor per 1.000 population.<sup>5</sup>

The *Indonesia Health Profile 2024* also indicates that, at the primary health care level, not all health service facilities have met the required standards for the availability of medical workforce and health workforce. Nationally, 5,99 percent of Puskesmas are classified as experiencing a shortage of general practitioners, 32,51 percent face a shortage of dentists, and 0,22 percent are categorized as having a shortage of nurses. Similar conditions are observed at the referral service level.<sup>5</sup>

In addition to overall shortages, Indonesia continues to face maldistribution of medical workforce and health workforce. In 2024, a total of 56.769 medical specialists (of whom 34,74 percent are basic specialists) were employed in hospitals nationwide, resulting in a national ratio of 18,2. The



majority of specialists were concentrated in Java–Bali (65,88 percent) and Sumatra (18,21 percent), while only 15,91 percent were located in the Eastern regions, including Nusa Tenggara, Kalimantan, Sulawesi, Maluku, and Papua. DTPK, particularly those classified as remote and very remote, continue to experience severe shortages in both the number and types of medical workforce and health workforce. For example, the ratio of medical specialists in Special Capital Region of Jakarta (DKI Jakarta) reached 81,18, significantly exceeding that of Highland Papua Province, which recorded a ratio of only 0,68.<sup>5</sup>

Overall, the Situation Analysis indicates that HRH management in Indonesia faces several critical and interrelated challenges that require systemic interventions, including:

1. Insufficient numbers of HRH;
2. Unequal distribution of HRH; and
3. Low fulfillment of HRH needs in DTPK as well as in less attractive regions.

To address these challenges, HRH management must be carried out through collaborative efforts between the Central Government and Local Governments, with the potential involvement of the private sector as a strategic partner in meeting health workforce needs.

### **1.3. Purpose of the Book**

This book aims to provide an evidence-based projection of the needs for the Medical Professionals and Health Professionals in Indonesia using a population-based approach for the next ten years (2023–2032), as a basis for the fulfillment and equitable distribution of medical workforce and health workforce. The results of this projection are expected to serve as a reference for the Central Government, Local Governments, relevant Ministries/Agencies, the private sector, and the community in the future management of the health workforce.

### **1.4. Legal Basis**

1. Law Number 23 of 2014 on Regional Government (State Gazette of the Republic of Indonesia of 2014 Number 244, Supplement to the State Gazette of the Republic of Indonesia Number 5587), as amended several times, most recently by Law Number 9 of 2015 on the Second Amendment to Law Number 23 of 2014 on Regional Government (State Gazette of the Republic of Indonesia of 2015 Number 58, Supplement to the State Gazette of the Republic of Indonesia Number 5679), and further amended by Law Number 6 of 2023 on the Stipulation of Government Regulation in Lieu of Law Number 2 of 2022 on Job Creation into Law (State Gazette of the Republic of Indonesia of 2023 Number 41, Supplement to the State Gazette of the Republic of Indonesia Number 6856);
2. Law Number 17 of 2023 on Health (State Gazette of the Republic of Indonesia of 2023 Number 105, Supplement to the State Gazette of the Republic of Indonesia Number 6887);
3. Law Number 59 of 2024 on the National Long-Term Development Plan 2025–2045 (State Gazette of the Republic of Indonesia of 2024 Number 194, Supplement to the State Gazette of the Republic of Indonesia Number 6987);
4. Government Regulation Number 28 of 2024 on the Implementing Regulations of Law Number 17 of 2023 on Health (State Gazette of the Republic of Indonesia of 2024 Number 135, Supplement to the State Gazette of the Republic of Indonesia Number 6952);
5. Presidential Regulation Number 12 of 2025 on the National Medium-Term Development Plan 2025–2029 (State Gazette of the Republic of Indonesia of 2025 Number 19);



6. Minister of Health Regulation Number 12 of 2025 on the Strategic Plan of the Ministry of Health for 2025–2029 (State Gazette of the Republic of Indonesia of 2025 Number 778);
7. Minister of Health Regulation Number 13 of 2025 on the Management of the Health Workforce (State Gazette of the Republic of Indonesia of 2025 Number 902); and
8. Presidential Instruction Number 5 of 2025 on the Acceleration of Improving Access to and Quality of Primary Health Care Services and Referral Health Care Services to Support the Implementation of Health Transformation.

### 1.5. Scope of the Book

The book *“National Planning of Medical and Health Workforce: Projection of Needs through a Population-Based Approach, 2023–2032”* presents the results of projected workforce needs calculations for 49 categories of Medical Professionals (comprising General Practitioners, Dentists, 37 types of Medical Specialists, and 10 types of Dental Specialists) as well as 32 categories of Health Professionals at the national, provincial, and district/city levels.

### 1.6. Limitations

This book presents the results of projections of medical and health workforce' needs using a population-based approach, developed on the basis of available data and incorporating considerations of disease prevalence, epidemiological burden, service demand, and population projections. Nevertheless, as the projection methodology is constrained by data availability, the results are subject to several limitations, including:

1. The application of a constant annual attrition rate assumption;
2. The absence of modeling for interregional workforce migration; and
3. The lack of aggregation that accounts for geographic disparities.

### 1.7. Structure of the Book

The book *“National Planning of Medical and Health Workforce: Projection of Needs through a Population-Based Approach, 2023–2032”* consists of five chapters, systematically structured to facilitate readers' understanding of the continuity of steps in preparing medical and health workforce projections. The structure and description of the contents of each chapter are as follows:

CHAPTER I. Introduction	:	Presents the justification underlying the urgency of preparing this document, including its objectives, scope, legal basis, and the limitations encountered in the development of the book.
CHAPTER II. Methodology	:	Presents the stages, theoretical framework, benchmarking, and methods applied in formulating the calculation of projected medical and health workforce needs, with reference to relevant sources
CHAPTER III. Results of the Projections	:	Presents the results of the projected needs calculations for 49 categories of Medical Professionals and 31 categories of Health Professionals at the national level and by category and region for the period 2023–2032.



CHAPTER IV. Policy Recommendations	:	Presents recommendations for the utilization of the projected needs results for 49 categories of Medical Professionals and 31 categories of Health Professionals in Indonesia.
CHAPTER V. Conclusion	:	Presents the overall conclusions of the document.

## CHAPTER 2.

# METHODOLOGY FOR CALCULATING NATIONAL PROJECTIONS OF MEDICAL AND HEALTH WORKFORCE NEEDS THROUGH A REGIONAL-BASED APPROACH FOR 2023–2032

### 2.1. Conceptual Framework for HRH Planning in Indonesia

HRH planning in Indonesia is a strategic process to identify, anticipate, and fulfill the availability of medical and health workforce in terms of number, type, competence, and equitable distribution to ensure the sustainability of health development and the achievement of Universal Health Coverage (UHC). Conceptually, HRH planning in Indonesia is in line with the global conceptual framework, namely The Health Labor Market Framework for Universal Health Coverage, which is adapted to the conditions, characteristics, and needs of Indonesia.

Holistic alignment between the regional (top-down) and institutional (bottom-up) approaches is the main foundation for strong and effective health workforce management, both now and in the future, and is key to the implementation of Government Regulation No. 28 of 2024. The entire health workforce planning process using these two approaches is standardized, evidence-based, and nationally integrated.



Figure 1. Concept of Medical and Health Workforce Planning Through Top-Down and Bottom-Up Approaches

The planning of medical and health workforce must be carried out in a sustainable and integrated manner with all development planning documents, such as the National Long-Term Development Plan (RPJPN) and Regional Long-Term Development Plan (RPJPD), National Medium-Term Development Plan (RPJMN) and Regional Medium-Term Development Plan (RPJMD), to technical documents in the health sector such as the Health Sector Master Plan (RIBK) and the Strategic Plan (Renstra) of the Ministry of Health and the Regional Apparatus Strategic Plan. This comprehensive integration aims to ensure vertical (central-regional) and horizontal (inter-sectoral) continuity between national policies and their implementation in the regions. (Figure 2)

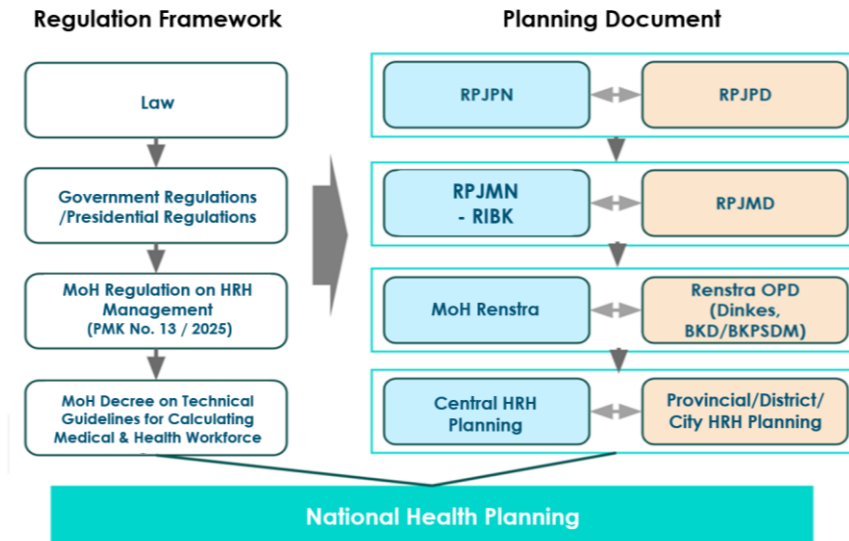


Figure 2. Alignment of National Medical and Health Workforce Planning with the Regulatory Hierarchy and National Strategic Plan

## 2.2. The Concept of Calculating Projected Medical and Health Workforce Needs through a Population-Based Approach

Workforce analytics is the process of analyzing data using methods or modeling to predict or project future workforce needs. Workforce supply and demand modeling is a method that can be used to assist in planning and decision-making in the field of human resource management.<sup>6</sup>

The results of this method will estimate the gap between the workforce needed and the workforce available in the future. Based on the results of the study, the model can be grouped into three main approaches, namely: (1) supply-based, (2) demand-based, and (3) needs-based:

- **Needs** describes the amount of service that should be available or the ideal and standard amount of service, regardless of whether the service currently exists or not.
- **Demand** describes the amount of service requested but does not necessarily reflect the ideal need. Demand is influenced by various factors, such as culture, habits, education level, media influence, and ease of access to services, quality, and costs incurred.
- **Supply** describes the services that can be provided by the existing system or workforce. Supply is influenced by the number of existing workforce, government policies, labor production conditions, and other related factors.<sup>6</sup>

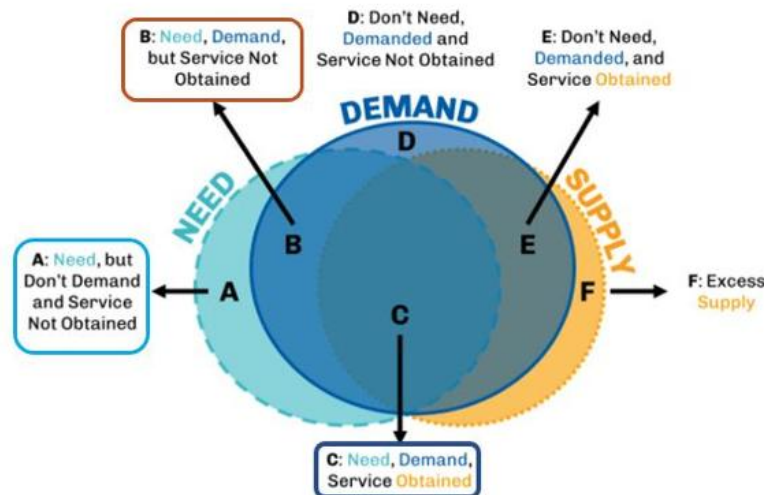


Figure 3. Conceptual Framework of the Supply-Demand-Needs Method<sup>6</sup>

Using the supply-demand-needs method, the following short-term and long-term targets can be planned:

- Short-term target:  
Obtained by increasing C, i.e., by increasing supply so that B, which is the gap between supply and demand, will decrease.
- Long-term target:  
Obtained by increasing C further, namely by further increasing supply, so that B and A, which are demand and needs, are decreased.<sup>6</sup>

In an ideal system, the need for a service should be equal to the demand for that service. However, in reality, this rarely happens. For example, in health services, there are people who actually need care but do not seek or obtain these services due to factors such as lack of knowledge, education, or limited access, including limited availability of health workforce.

The above planning method or model forms the basis for supply-demand modeling to calculate the projected needs for medical and health workforce through a population-based approach. This method is used because it provides a realistic and strategic overview in determining the number, type, and distribution of medical and health workforce in accordance with future community service needs. This method is powerful because the calculation of needs has taken into account:

1. health services needed (needs) including health services that are inaccessible;
2. population demographics, disease burden, and service utilization in each region as well as service standards, equipment availability, and technological developments;
3. availability of medical and health workforce based on headcount so that potential shortages, potential surpluses, and areas of uneven distribution can be seen more accurately and without overestimation;
4. scenario changes, such as an increase in services or the number of graduates;
5. the scope of work of each medical and health workforce with different characteristics;
6. the use of supply and demand/need methods used by various countries.

### 2.3. Benchmarking Planning through a Population-Based Approach in Other Countries

Based on the document Health and Care Workforce Planning Tools: A Rapid Review published by the WHO in 2025, a total of 96 health workforce projection methods have been identified and used in 179 WHO member countries, through a review of scientific literature and grey literature using a rapid review approach.<sup>7</sup>

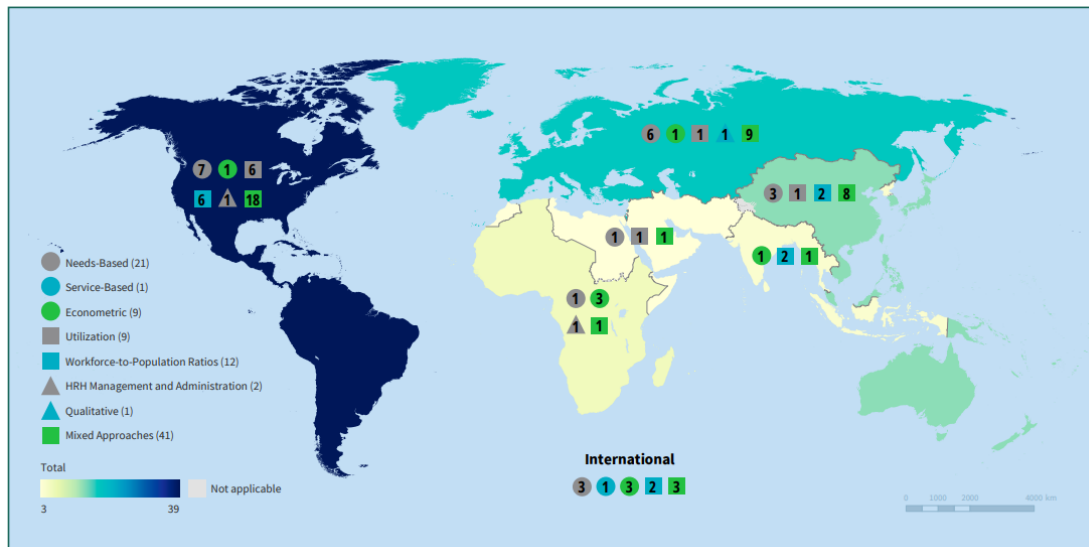


Figure 4. Mapping of Planning Methods in Various Countries, Based on Eight WHO Planning Models<sup>7</sup>

Various countries, such as Australia, the United States, the United Kingdom, Japan, Ireland, South Africa, and the Philippines, project medical and health workforce using supply and demand/needs methods. Each country has different components of analysis in making projections, both in terms of availability (supply) and demand or needs. This comparison between countries provides an important overview for the application of medical and health workforce projections using the supply and demand method in Indonesia, taking into account the availability of data.

The following is a benchmarking of several countries, such as Australia, the United States, the United Kingdom, Japan, Ireland, South Africa, and the Philippines, which project medical and health workforce using the supply and demand/needs method. Each country has developed a supply-demand model tailored to its national context in projecting both supply and demand/need.

Table 1. Benchmarking of Supply and Demand/Needs Approaches in Various Countries

Countries	Method	Component	Time Range	PIC
Australia <sup>8</sup>	Supply and Demand	<b>Supply factors</b> <ul style="list-style-type: none"> <li>inflow (graduates, immigration, extended retirement, increased working hours, foreign student quotas)</li> <li>outflow (retirement, death, permanent illness, career change, reduced working hours, emigration)</li> <li>stock</li> </ul> <b>Demand Factors</b> <ul style="list-style-type: none"> <li>utilization of health services</li> <li>demographics (age, gender, aging population)</li> <li>disease epidemiology</li> <li>geography (remote areas)</li> <li>technological developments</li> </ul>	10 Years	Department of Health, Australia
United States <sup>9</sup>	Supply and Demand	<b>Supply Factors</b> <ul style="list-style-type: none"> <li>Existing Workforce, Graduates, and attrition (retirement, participation rate) based on Full Time Equivalent (FTE).</li> </ul> <b>Demand Factors</b>	10 Years	Department of Health and Human Services



Countries	Method	Component	Time Range	PIC
		<ul style="list-style-type: none"> <li>Demographics,</li> <li>Socioeconomics (income, insurance coverage)</li> <li>health status, and health risk factors</li> </ul>		(HHS), United States
England <sup>10,11</sup>	Supply and Demand	<b>Supply Factors</b> <ul style="list-style-type: none"> <li>education and training, graduates, career switch, labor market, immigration</li> </ul> <b>Demand Factors</b> <ul style="list-style-type: none"> <li>Health workforce productivity</li> <li>epidemiology (risk factors, health status)</li> </ul>	15 Years	National Health Service (NHS), England
Japan <sup>13</sup>	Supply and Demand	<b>Supply Factors</b> <ul style="list-style-type: none"> <li>existing workforce</li> <li>graduate growth</li> <li>career switch</li> </ul> <b>Demand Factors</b> <ul style="list-style-type: none"> <li>working hours</li> <li>population aging rate</li> <li>population growth</li> </ul>	15 Years	Ministry of Health, Labour, and Welfare, Japan
Ireland <sup>14</sup>	Supply and Demand	<b>Supply Factors</b> <ul style="list-style-type: none"> <li>New graduates</li> <li>training and education</li> <li>working conditions related to retention rates (salaries/wages, security, career development opportunities)</li> </ul> <b>Demand factors</b> <ul style="list-style-type: none"> <li>Sociodemographics (age, gender)</li> <li>disease prevalence</li> <li>medical and therapeutic innovations policy</li> <li>technological development</li> </ul>	Short - term: 1-3 years  Long-term:: 10-15 years	Department of Health, Ireland
South Africa <sup>15</sup>	Supply and Need	<b>Supply Factors</b> <ul style="list-style-type: none"> <li>existing workforce</li> <li>distribution of healthcare facilities</li> <li>production/new graduates</li> <li>retention</li> <li>regulation</li> <li>migration</li> <li>employment status</li> </ul> <b>Need Factors</b> <ul style="list-style-type: none"> <li>population growth</li> <li>demographics and epidemiology</li> <li>new technologies</li> <li>skill mix</li> <li>financing and budgeting</li> </ul>	10 Years	Department of Health, South Africa
The Philippines <sup>16</sup>	Supply and Demand	<b>Supply Factors</b> <ul style="list-style-type: none"> <li>education and training</li> <li>attrition (migration)</li> </ul> <b>Demand factors</b> <ul style="list-style-type: none"> <li>disease epidemiology (public health phenomena, such as pandemics)</li> <li>sosiodemographics</li> <li>technological development</li> </ul>	20 years (update every 5 years)	Health Human Resource Development Bureau, Department of Health, The Philippines
Malaysia <sup>18</sup>	Supply and Requirement/Needs	<b>Supply Factors</b> <ul style="list-style-type: none"> <li>production/new graduates</li> <li>migration</li> <li>attrition</li> </ul> <b>Demand Factors</b> <ul style="list-style-type: none"> <li>demographics</li> <li>epidemiology</li> <li>level of service (age and gender)</li> <li>HRH productivity</li> </ul>	15 Years	Ministry of Health, Malaysia

All of the above countries project the need for medical and health workforce over a period of 10-20 years; only one country, Ireland, also plans a supply-demand method with a period of 1-3 years. Supply parameters are generally the same, namely inflow (labor availability, new graduates) and outflow (retirement, death). However, some countries include more comprehensive parameters, such as emigration and immigration, training, career changes, and others. For demand parameters, almost all countries use the same parameters, namely disease epidemiology and demographics, except for Japan, which places greater importance on its aging

demographic conditions. Several countries also include more comprehensive demand parameters, such as technological developments, geography, financing, and others.

## 2.4. Stages of the Projection Process for Medical and Health Workforce Needs Using a Population-Based Approach

The projection process is conducted through **five key stages**, as follows:



1. **Assessment of the current situation and determination of the calculation approach:** this stage was carried out in collaboration with stakeholders to identify the scope of work and determine the most appropriate calculation approach for each category of medical and health workforce.
2. **Data collection:** this stage involved the collection and validation of data from relevant stakeholders, including collegium and related technical units, in accordance with data requirements.
3. **Calculation of medical and health workforce needs:** data management and analytical calculations were performed using the compiled datasets to generate population-based projections of medical and health workforce needs.
4. **Finalization:** the preliminary calculation results were reviewed and discussed with stakeholders to obtain feedback and reach consensus.
5. **Document preparation:** the final stage involved preparing the document to present the results of the medical and health workforce projections.

## 2.5. Methodology for Projecting Medical and Health Workforce Needs Using a Population-Based Approach

The projection of medical and health workforce needs is based on a set of parameters that reflect demographic dynamics, disease epidemiology, and the capacity of health service delivery across regions.

Table 2. Parameters Used in the Population-Based Needs Projection

<i>Demand</i>	<i>Supply</i>
1. Demographic trend and population growth projection by age group and sex.	1. Number of graduates from medical and health education institutions
2. Changes in disease epidemiology (burden of disease)	2. Mobility of medical and health workforce, including immigration and emigration
3. Utilization and demand for health services	3. Attrition rates
4. Effective working time norms and productivity of medical and health workforce	4. Availability of active medical and health workforce
5. Other relevant factors as required	

Steps in Projecting Medical and Health Workforce Needs Using a Population-Based Approach:

**1. Step 1: Calculating demand projections**

Demand estimates were derived by taking into account demographic dynamics, health service volumes, effective working time, correction factors, and disease distribution, which were subsequently allocated at the district/city level.

**2. Step 2: Calculating supply projections**

Supply estimates were determined based on the current availability of medical and health workforce, the number of new graduates, workforce mobility (including immigration and emigration), and attrition rates.

**3. Step 3: Calculating the gap**

A comparison between projected demand and supply produced measures of the workforce gap, both in absolute numbers and as a percentage of the total shortage. These measures serve as the basis for planning the fulfillment of medical and health workforce needs.

**2.5.1. Step 1: Calculating Demand Projections**

Before calculating demand projections, some data are needed to support the process:

Table 3. Parameter Used in Calculating Demand Projections

Parameter	Sumber data
Workforce Types	<ul style="list-style-type: none"> <li>The workforce types included in this projection refer to medical and health workforce as stipulated under <b>Law No. 17 of 2023</b>.</li> <li>This book covers 49 types of Medical Workforce and 32 types of Health Workforce.</li> </ul>
Procedure List	<ul style="list-style-type: none"> <li>(i) Professional competency standards and practitioner consensus (to define scope of authority and practice)</li> <li>(ii) ICD-9-CM (for procedure coding)</li> <li>(iii) Integrated Primary Care (ILP) (to ensure alignment between service packages and levels of care)</li> </ul>
Procedure Duration	Practitioner consensus (expert panel).
Effective Working Time	<ul style="list-style-type: none"> <li>(i) Regulation of the Ministry of Administrative and Bureaucratic Reform (<b>PermenPAN-RB No. 1/2020</b>)</li> <li>(ii) Practitioner consensus (expert panel).</li> </ul>
JKN Coverage ( $\alpha$ )	<i>BPJS Kesehatan</i>
Proportion of active JKN participants ( $\beta$ )	<i>BPJS Kesehatan</i>
Referral compliance ( $\gamma$ )	<i>BPJS Kesehatan (P-Care/ e-rujukan, INA-CBG, BPJS Kesehatan sample)</i>
Correction Factors	Calculation of variables $\alpha$ , $\beta$ , $\gamma$
Population Size	Statistics Indonesia (BPS)
Disease prevalence, burden of disease, and case number	<ul style="list-style-type: none"> <li>(i) <i>BPJS Kesehatan</i> samples</li> <li>(ii) Institute for Health Metrics and Evaluation (IHME)</li> <li>(iii) Indonesia Health Survey (SKI) 2023</li> <li>(iv) Indonesia Nutrition Status Survey 2023</li> <li>(v) National Socioeconomic Survey (SUSENAS) 2023</li> </ul>
Proportion of JKN participants bypassing referral due to limited availability of personnel or long waiting times	Practitioner consensus (expert panel).
Ratio of outpatient service utilization among non-JKN vs JKN participants	SUSENAS
Ten-year population projection	BPS

The long-term projection of medical and health workforce needs is conducted by:

1. Considering changes in population size and age structure based on population projections by age group
2. Considering changes in disease burden, using current disease prevalence data and projected trends among high-risk age groups to adjust workforce needs by disease type.

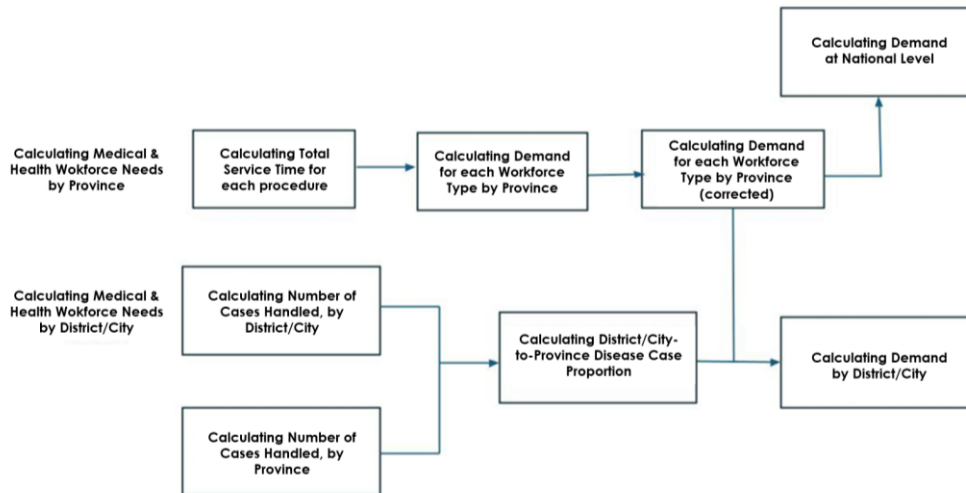


Figure 5. Process of Calculating Demand Projections for Medical and Health Workforce by Province and District/City

As illustrated above, demand calculation is conducted for both medical and health workforce at the provincial and district/city levels through the following steps:

- a. Calculating Total Service Time Demand

$$\text{Total Service Time} = \text{Number of services per procedure} \times \text{Duration per procedure}$$

- b. Calculating Demand at Provincial Level:  
Provincial Workforce Demand (Not corrected)

$$\text{Demand per Province} = \frac{\text{Total service time at provincial level (minutes)}}{\text{Total effective working time at provincial level (minutes)}}$$

Identifying and calculating correction factors

$$\text{Correction Factor} = \left(\frac{100}{\alpha}\right) \times \left(\frac{100}{\beta}\right) \times \left(\frac{100}{\gamma}\right) \times (h)$$

$\alpha$  = JKN coverage

$\beta$  = Proportion of active JKN participants

$\gamma$  = Referral compliance

$h$  = BPJS and Non – BPJS Outpatient Ratio



### Corrected provincial workforce demand

$$\text{Corrected provincial workforce demand} = \text{Provincial Workforce Demand (Not corrected)} \times \text{Correction Factor}$$

c. Calculating Demand at National Level:

National workforce demands are calculated by summing corrected workforce demand across all provinces.

d. Calculating Demand at District/City Level:

Analyzing disease prevalence handled by each type of workforce using BPJS Health sample data.

$$\text{Number of disease cases by workforce type per district/city} = \text{Disease prevalence per district/city} \times \text{Population per district/city}$$

As a denominator, disease prevalence handled by each workforce type at the provincial level is also calculated:

$$\text{Number of disease cases by workforce type per province} = \text{Disease prevalence per province} \times \text{Population per province}$$

Proportion of cases per district/city by comparing number of cases by workforce type per district/city with number of cases by workforce type per province

$$\text{Proportion of cases per district/city} = \frac{\text{Number of cases per district/city}}{\text{Number of cases per province}}$$

Calculating demand per district/city level are done by multiplying proportion of cases per district/city with corrected provincial workforce demand

$$\text{Demand per district/city} = \text{Proportion of cases per district/city} \times \text{Corrected provincial workforce demand}$$

The calculations above use a **direct service workload approach**. In addition, other calculation approaches may be applied, as summarized in the table below:



Table 4. Classification of Approaches for Calculating Medical and Health Workforce Needs Using a Population-Based Approach

No.	Calculation Approach	Details	Calculation Process
1.	Considering Direct Patient Service Workload	<ul style="list-style-type: none"> <li>Applied to medical and health workforce providing service procedures based on ICD-9-CM.</li> <li>The calculation is based on the volume and duration of services, as well as the prevalence of relevant diseases.</li> </ul>	<ol style="list-style-type: none"> <li>Identifying procedures (ICD-9-CM) and their service time.</li> <li>Estimating total service time by considering the number of services delivered.</li> <li>Estimating workforce needs before adjustment by dividing total service time by effective working time.</li> <li>Correcting workforce needs by considering disease prevalence to ensure that needs include populations who do not receive services.</li> </ol>
2.	Considering Specific Health Service Targets	<ul style="list-style-type: none"> <li>Applied to medical and health workforce delivering specialized and specific health services.</li> </ul>	<ol style="list-style-type: none"> <li>Identifying services provided by medical and health workforce (e.g., airport health services by Occupational Health Specialists, sports health services by Sports Medicine Specialists).</li> <li>Calculating workforce needs by considering service targets and the minimum required availability of medical and health workforce per service.</li> </ol>
3.	Considering Direct Services for Specific Diseases	<ul style="list-style-type: none"> <li>Applied to medical and health workforce whose work is primarily focused on managing specific diseases or cases.</li> <li>The calculation is based on the prevalence of the most frequently managed diseases and the service time per disease case.</li> </ul>	<ol style="list-style-type: none"> <li>Determining the diseases most frequently handled by each type of medical or health professional (e.g., Ophthalmologists: cataracts; Radiation Oncologists: cancer), along with the procedures and service duration per disease case.</li> <li>Estimating total service time by considering disease prevalence, population size, procedures, and service time per disease case.</li> <li>Determining workforce needs by dividing total service time by effective working time.</li> </ol>
4.	Considering services in Puskesmas	<ul style="list-style-type: none"> <li>Conducted specifically for essential medical and health workforce in Puskesmas.</li> <li>Workforce needs calculation begins with basic procedures performed by each type of personnel in Puskesmas, then are adjusted to include services not provided at the Puskesmas.</li> </ul>	<ol style="list-style-type: none"> <li>Inventorizing types of services and basic procedures based on the list of procedures performed in Puskesmas (ILP).</li> <li>Estimating total service time by considering the number of services provided.</li> <li>Determining workforce needs before adjustment by dividing total service time by effective working time.</li> <li>Workforce needs correction to include community members who do not receive services.</li> </ol>
5.	Considering Specific Work Targets	<ul style="list-style-type: none"> <li>Applied to medical and health workforce with specific geographic or target-based responsibilities in their services.</li> <li>Calculations are performed by considering the availability of work targets such as health service facilities (Puskesmas, hospitals, health offices), coverage area (district/city, province), and the procedures and time per procedure performed at each target.</li> </ul>	<ol style="list-style-type: none"> <li>Identifying work targets of medical and health personnel (e.g., Epidemiologists and Entomologists: hospitals, Puskesmas, health offices, districts/cities, outbreak areas, schools, etc.), along with procedures and service duration at each target.</li> <li>Estimating total service time by considering the volume of services delivered across all targets.</li> <li>Determining workforce needs by dividing total service time across all targets by effective working time.</li> </ol>



## Example: Demand/Needs Calculation for Cardiologists

### a. Calculating Total Service Time Demand:

- Defining the most common procedures and duration of each procedure delivered by each type of workforce

No	PROCEDURES	Unit	Time (min)
1	POUKLINIK	total kasus rawat jalan	10
2	VISITASI RAWAT INAP	total hari rawat inap	15
3	Cardiac Cath (22)	total kasus	60
4	Cardiac Electrophysiologic Complex Procedures	total kasus	120
5	Cardiac Electrophysiologic Procedures	total kasus	90
6	Complex Cardiovascular Procedure	total kasus	120
7	Complex congenital heart procedure	total kasus	120
8	Congenital Heart Disease Procedures	total kasus	90
11	Major Cardiovascular Procedures	total kasus	120
12	Major congenital Heart Procedure	total kasus	120
13	Major Device Procedures	total kasus	90
14	Major Non-Invasive Cardiovascular Diagnostic or Procedure	total kasus	30
16	Minor Device Procedures	total kasus	90
17	Minor Non-Invasive Cardiovascular Diagnostic or Procedure	total kasus	30
19	Other Cardiothoracic Procedure	total kasus	30
20	Other circulatory diagnostic or procedure	total kasus	60
21	Other Vascular Procedures	total kasus	90
22	Percutaneous Cardiovascular Complex Procedures	total kasus	120
23	Percutaneous Cardiovascular Procedures	total kasus	90
24	Percutaneous CHD & Structural Procedures	total kasus	90
25	Special procedure heart and lung failure	total kasus	90
28	Vein Procedures	total kasus	120

- Identifying effective working time for each workforce

### Effective Working Minutes in A Year

Total working hour in a year	264
Public holidays per year	14
Annual leave days per year	10
Administration days per year	24
Continuing professional development days per year	12
Effective working days per year	204
Working hours per day	8
Effective working minutes per year	97,920

- Processing data to calculate the number of services by type of procedure by province
- Calculating total service time demand by province

PROCEDURES	Unit	Time/unit (mins)	Aoch		Sumut		... Dist	
			no. of service	Total Time	no. of service	Total Time	no. of service	Total Time
POUKLINIK	total kasus	10	28.531	285.310	58.579	585.790		
VISITASI RAWAT INAP	total hari rawat inap	15	162.051	2.430.765	379.734	5.696.010		
Cardiac Cath (22)	total kasus	60	529	31.740	3.495	209.700		
Cardiac Electrophysiologic Complex Procedures (9)	total kasus	120	2	240	49	5.880		
Cardiac Electrophysiologic Procedures (15)	total kasus	90	-	-	88	7.920		
Complex Cardiovascular Procedure (7)	total kasus	120	14	1.680	61	7.320		
Complex congenital heart procedure (2)	total kasus	120	-	-	-	-		
Congenital Heart Disease Procedures (10)	total kasus	90	4	360	23	2.070		
Major Cardiovascular Procedures (12)	total kasus	120	423	50.760	544	65.280		
Major congenital Heart Procedure (6)	total kasus	120	1	120	120	14.400		
Major Device Procedures (8)	total kasus	90	8	720	99	8.910		
Major Non-Invasive Cardiovascular Diagnostic or Procedure	total kasus	30	1	30	13	390		
Minor Device Procedures (20)	total kasus	90	-	-	117	10.530		
Minor Non-Invasive Cardiovascular Diagnostic or Procedure	total kasus	30	8.754	262.620	62.502	1.875.060		
Other Cardiothoracic Procedure (11)	total kasus	30	1	30	17	510		
Other circulatory diagnostic or procedure (28)	total kasus	60	4.750	285.000	28.746	1.724.760		
Other Vascular Procedures (13)	total kasus	90	1.039	93.510	7.078	637.020		
Percutaneous Cardiovascular Complex Procedures (18)	total kasus	120	-	-	145	17.400		
Percutaneous Cardiovascular Procedures (19)	total kasus	90	24	2.160	30.398	2.735.820		
Percutaneous CHD & Structural Procedures (17)	total kasus	90	-	-	18	1.620		
Special procedure heart and lung failure (1)	total kasus	90	1	90	3	270		
Vein Procedures (14)	total kasus	120	13	1.560	95	11.400		
--	--	0	-	-	-	-		
--	--	0	-	-	-	-		
<b>TOTAL SERVICE TIME DEMAND PER PROVINCE</b>			206.146	3.446.695	571.924	13.618.060		

### b. Calculating Demand at Provincial Level:

- Calculating provincial-level workforce needs by dividing total service time by effective working time.



Prov no*	Province	Time	Demand (before correction 2023)
11	ACEH	3.446.695	35
12	SUMATERA UTARA	13.618.060	139
13	SUMATERA BARAT	7.333.450	75
14	RIAU	6.110.870	62
15	JAMBI	1.590.275	16
16	SUMATERA SELATAN	7.628.245	78
17	BENGKULU	1.165.340	12
18	LAMPUNG	4.572.920	47
19	KEPULAUAN BANGKA BELITUNG	1.232.290	13
21	KEPULAUAN RIAU	1.998.420	20
31	DKI JAKARTA	34.534.365	353
32	JAWA BARAT	49.787.370	508
33	JAWA TENGAH	43.174.790	441
34	DAERAH ISTIMEWA YOGYAKARTA	9.833.715	100
35	JAWA TIMUR	39.946.555	408
36	BANTEN	8.892.460	91
51	BAU	11.804.450	121
52	NUSA TENGGARA BARAT	5.564.995	57
53	NUSA TENGGARA TIMUR	2.185.525	22
61	KALIMANTAN BARAT	3.451.635	35
62	KALIMANTAN TENGAH	1.545.780	16
63	KALIMANTAN SELATAN	3.969.835	41
64	KALIMANTAN TIMUR	7.414.880	76
65	KALIMANTAN UTARA	819.970	8
71	SULAWESI UTARA	4.144.950	42
72	SULAWESI TENGAH	2.088.455	21
73	SULAWESI SELATAN	19.910.245	203
74	SULAWESI TENGGARA	2.894.960	30
75	GORONTALO	956.330	10
76	SULAWESI BARAT	986.295	10
81	MALUKU	1.286.405	13
82	MALUKU UTARA	506.750	5
911	PAPUA BARAT	174.010	2
912	PAPUA BARAT DAYA	392.870	4
941	PAPUA SELATAN	142.400	1
942	PAPUA TENGAH	128.285	1
943	PAPUA PEGUNUNGAN	119.050	1
944	PAPUA	750.710	8
	INDONESIA	306.104.605	3.125

- Next, correction factor is applied to the estimated workforce needs by considering JKN coverage, participants' active status, and referral compliance.

The variables analyzed (by province) for the correction factor include:

1. JKN Coverage (a)
2. Proportion of Active Participants (b)
3. Proportion of Referral-Compliant Participants (c)
4. Proportion of participants non-compliant with referrals due to physician shortages (assumed at 50%) (d). This percentage is calculated in the formula. The remaining 50% is excluded, as it is assumed that non-referral occurs for other reasons.
5. Proportion of Participants not Referred (e) =  $100\% - c$
6. Proportion of Participants not Referred due to physician shortages (f) =  $e * (d/100)$
7. Proportion of Corrected Referral (sum of referral-compliant participants and those not referred due to physician shortages) (g) =  $c + f$
8. Outpatient ratio for BPJS and Non-BPJS Kesehatan (h)



### Correction Factor Formula:

$$\begin{aligned} \text{Correction Factor} &= (100/ \text{JKN coverage}) \times (100/\text{Proportion of active participants}) \times \\ & (100/\text{proportion of corrected referral}) \times (\text{Outpatient ratio for BPJS and} \\ & \text{Non-BPJS Kesehatan}) \\ &= (100/a) \times (100/b) \times (100/g) \times (h) \end{aligned}$$

Prov no*	Provinsi	A	B	C	D	E=100%-C	F=E x (D/100)	G=C+F	H	FK = (100/A) x (100/B) x (100/G) x H
		Cakupan JKN (%)	Prop. Peserta aktif (%)	Prop. Peserta terakreditasi (%)	Prop. tdk terakreditasi masih kurang dr (%)	Prop. Peserta yg tdk terakreditasi (%)	Prop. tdk terakreditasi koreksi (%)	Prop. Rujuk koreksi (%)	Rasio Rujuk BPJS vs Non BPJS	Faktor Koreksi
11	ACEH	90,0	89,6	57,6	50,0	42,4	21,2	78,8	0,80	1,26
12	SUMATERA UTARA	61,6	76,4	71,9	50,0	28,2	14,1	85,9	0,87	2,16
13	SUMATERA BARAT	67,1	78,8	57,8	50,0	42,2	21,1	78,9	0,92	2,20
14	RIAU	57,6	78,8	67,4	50,0	32,6	16,3	83,7	0,77	2,02
15	JAWAI	57,2	72,9	47,7	50,0	42,3	26,2	73,8	0,78	2,53
16	SUMATERA SELATAN	65,0	80,3	64,2	50,0	35,8	17,9	82,1	0,86	2,01
17	BENGKULU	66,3	76,9	47,7	50,0	42,3	26,2	73,8	0,85	2,26
18	LAMPUNG	60,2	72,3	42,4	50,0	57,6	28,8	71,2	0,88	2,83
19	KEPULAUAN BANGKA BELITUNG	67,5	79,4	82,4	50,0	17,6	8,8	91,2	0,92	1,88
21	KEPULAUAN RIAU	63,1	78,3	60,1	50,0	39,9	20,0	80,0	0,59	1,49
31	DKI JAKARTA	90,0	86,7	50,6	50,0	49,4	24,7	75,3	0,94	1,60
32	JAWA BARAT	62,2	76,2	61,6	50,0	38,5	19,2	80,8	0,92	2,41
33	JAWA TENGAH	73,3	81,8	73,4	50,0	26,7	13,3	86,7	0,87	1,68
34	DAERAH ISTIMEWA YOGYAKARTA	75,2	86,6	63,0	50,0	37,0	18,5	81,5	0,77	1,44
35	JAWA TIMUR	67,3	83,0	67,9	50,0	32,1	16,0	84,0	0,93	1,99
36	BANTEN	59,4	73,2	50,6	50,0	49,4	24,7	75,3	0,99	3,01
51	BAJU	77,3	83,0	64,0	50,0	36,0	18,0	82,0	0,85	1,62
52	NUSA TENGGARA BARAT	64,5	74,9	51,5	50,0	48,5	24,3	75,7	0,90	2,45
53	NUSA TENGGARA TIMUR	71,5	82,3	54,5	50,0	45,5	22,7	77,3	0,83	1,82
61	KALIMANTAN BARAT	62,1	78,7	60,3	50,0	39,7	19,9	80,1	0,74	1,88
62	KALIMANTAN TENGAH	64,6	72,1	74,5	50,0	25,5	12,8	87,2	0,81	2,00
63	KALIMANTAN SELATAN	66,3	81,0	62,5	50,0	37,5	18,7	81,3	0,71	1,62
64	KALIMANTAN TIMUR	78,8	77,6	56,5	50,0	43,5	21,7	78,3	0,69	1,45
65	KALIMANTAN UTARA	78,7	80,9	48,0	50,0	42,0	26,0	74,0	0,77	1,63
71	SULAWESI UTARA	77,9	76,4	56,9	50,0	43,2	21,6	78,4	1,03	2,21
72	SULAWESI TENGAH	73,0	78,8	60,9	50,0	39,1	19,6	80,5	1,01	2,19
73	SULAWESI SELATAN	79,0	80,3	71,3	50,0	28,7	14,4	85,6	0,80	1,47
74	SULAWESI TENGGARA	73,6	81,7	59,6	50,0	40,5	20,2	79,3	0,71	1,48
75	GORONTALO	84,6	72,9	80,6	50,0	19,4	9,7	90,3	0,92	1,65
76	SULAWESI BARAT	77,0	78,3	89,1	50,0	10,9	5,5	94,5	0,73	1,28
81	MALIKU	67,5	79,3	48,5	50,0	51,5	25,8	74,2	0,87	2,20
82	MALIKU UTARA	60,9	76,7	49,7	50,0	60,3	30,1	74,9	0,77	2,20
911	PAPUA BARAT	78,2	67,4	33,5	50,0	66,5	33,3	66,8	0,75	2,14
912	PAPUA BARAT DAYA	78,2	67,4	42,1	50,0	58,0	29,0	71,0	0,75	2,01
941	PAPUA SELATAN	75,0	73,4	78,9	50,0	21,1	10,5	89,5	0,48	0,98
942	PAPUA TENGAH	75,0	73,4	48,1	50,0	51,9	26,0	74,0	0,48	1,19
943	PAPUA PEGUNLINGAN	75,0	73,4	49,6	50,0	50,5	25,2	74,8	0,48	1,18
944	PAPUA	75,0	73,4	66,1	50,0	33,9	17,0	83,0	0,48	1,06



- The corrected workforce needs is calculated by multiplying the pre-correction workforce needs by the correction factor.

Prov no*	Province	Total Service Time	Demand (pre-correction 2023)	Correction Factor	Demand (corrected 2023)
11	ACEH	3.446.695	35	1,26	44
12	SUMATERA UTARA	13.618.060	139	2,16	300
13	SUMATERA BARAT	7.333.450	75	2,20	165
14	RIAU	6.110.870	62	2,02	126
15	JAMBI	1.590.275	16	2,53	41
16	SUMATERA SELATAN	7.628.245	78	2,01	156
17	BENGKULU	1.165.340	12	2,26	27
18	LAMPUNG	4.572.920	47	2,83	132
19	KEPULAUAN BANGKA BELITUNG	1.232.290	13	1,88	24
21	KEPULAUAN RIAU	1.998.420	20	1,49	30
31	DKI JAKARTA	34.534.365	353	1,60	563
32	JAWA BARAT	49.787.370	508	2,41	1.225
33	JAWA TENGAH	43.174.790	441	1,68	739
34	DAERAH ISTIMEWA YOGYAKARTA	9.833.715	100	1,44	145
35	JAWA TIMUR	39.946.555	408	1,99	810
36	BANTEN	8.892.460	91	3,01	273
51	BAU	11.804.450	121	1,62	196
52	NUSA TENGGARA BARAT	5.564.995	57	2,45	139
53	NUSA TENGGARA TIMUR	2.185.525	22	1,82	41
61	KALIMANTAN BARAT	3.451.635	35	1,88	66
62	KALIMANTAN TENGAH	1.545.780	16	2,00	32
63	KALIMANTAN SELATAN	3.969.835	41	1,62	66
64	KALIMANTAN TIMUR	7.414.880	76	1,45	110
65	KALIMANTAN UTARA	819.970	8	1,63	14
71	SULAWESI UTARA	4.144.950	42	2,21	94
72	SULAWESI TENGAH	2.088.455	21	2,19	47
73	SULAWESI SELATAN	19.910.245	203	1,47	299
74	SULAWESI TENGGARA	2.894.960	30	1,48	44
75	GORONTALO	956.330	10	1,65	16
76	SULAWESI BARAT	986.295	10	1,28	13
81	MALUKU	1.286.405	13	2,20	29
82	MALUKU UTARA	506.750	5	2,20	11

c. Calculating Demand at National Level:

- By summing the workforce needs across all provinces

Year	Doctor Demand
2023	6.041
2024	6.264
2025	6.512
2026	6.787
2027	7.539
2028	7.869
2029	8.391
2030	9.026
2031	9.708
2032	10.592

2.5.2. Step 2: Calculating Supply Projections

Before calculating supply projections, some data are needed to support the process:

Table 5. Parameter Used in Calculating Supply Projections

Parameter	Data Source
Number of medical and health workforce	SatuSehat SDM - SIP
Number of Graduates	(i) PDDikti (Kemendikti Saintek)
	(ii) Poltekkes Kemenkes Academic System
Attrition Rate	(i) ASN Statistics
	(ii) Kemenpan-RB (1,5%)
	(iii) Study results



Supply projections calculation is conducted through the following steps:

- Identifying the number of gross supply: current existing, addition of new graduates entering the labor market, and the inflow of workforce from abroad who meets the requirements of practice in Indonesia;
- Attrition: reflects the exit of workforce from the labor market on the same period, due to retirement, death, layoffs, transfer to other sectors, and emigration;
- Determining net supply: defined as gross supply minus attrition. The result will serve as a basic stock in the following projection period.

### Example: Supply Calculation for Cardiologists

- Identifying the number of gross supply: current existing, addition of new graduates entering the labor market, and the inflow of workforce from abroad who meets the requirements of practice in Indonesia;
- Attrition: reflects the exit of workforce from the labor market on the same period, due to retirement, death, layoffs, transfer to other sectors, and emigration;
- Determining net supply: defined as gross supply minus attrition. The result will serve as a basic stock in the following projection period.

Year	New Graduates	Attrition	Supply
2023			1.745
2024	210	50	1.905
2025	210	50	2.065
2026	210	50	2.225
2027	210	50	2.385
2028	210	50	2.545
2029	210	50	2.705
2030	210	50	2.865
2031	210	50	3.025
2032	210	50	3.185

### 2.5.3. Step 3: Calculating the Gap

After the projections of supply and demand have been obtained, the gap can be calculated using the following steps:

- Calculate the absolute gap, defined as supply minus demand.
- Calculate the gap percentage, defined as the absolute gap divided by projected demand.

### Example: Gap Calculation for Cardiologists

- Calculating absolute gap: supply minus demand

Year	Demand	Existing	Shortage
2023	6.041	1.745	4.296
2024	6.264	1.929	4.335
2025	6.512	2.110	4.402
2026	6.787	2.288	4.499
2027	7.539	2.464	5.075
2028	7.869	2.637	5.232
2029	8.391	2.807	5.584
2030	9.026	2.975	6.051
2031	9.708	3.140	6.568
2032	10.592	3.303	7.289



b. After that, percentage of gap is obtained from absolute gap divided by demand

Year	Demand	Existing	Shortage	Shortage (%)
2023	6.041	1.745	4.296	71,1%
2024	6.264	1.929	4.335	69,2%
2025	6.512	2.110	4.402	67,6%
2026	6.787	2.288	4.499	66,3%
2027	7.539	2.464	5.075	67,3%
2028	7.869	2.637	5.232	66,5%
2029	8.391	2.807	5.584	66,5%
2030	9.026	2.975	6.051	67,0%
2031	9.708	3.140	6.568	67,7%
2032	10.592	3.303	7.289	68,8%

## 2.6. Review of Workforce Projections Using a Population-Based Approach

In accordance with Government Regulation No. 28 of 2024, workforce planning using a population-based approach may be reviewed annually. Periodic reviews of both demand/needs and supply projections are required to improve precision. During 2025–2026, reviews were conducted for General Practitioners, Dentists, and 14 types of Medical Specialists.

### Review of General Practitioner Projections

The review aimed to refine both demand and supply projections to reflect better ideal workforce needs at national, provincial, and district/city levels:

a. **Demand/Needs:**

- Correction of ideal GP needs in Puskesmas, from a standard of four GPs per Puskesmas to differentiated standards by Puskesmas type (urban, rural, remote, very remote).
- Correction of outpatient consultation time from 15 minutes to 10 minutes.

b. **Supply:**

- Baseline existing (2023) adjusted from active STR to headcount (70% of STR), reflecting actual working GPs, based on analysis of STR vs SIP headcount.
- Annual GP inflow adjusted from 100% of graduates to 70% of graduates.

### Review of Dentist Projections

Similar corrections were made for dentists:

a. **Demand/Needs:**

- Disease prevalence updated from RISKESDAS 2018 to SKI 2023.
- Dentist needs per Puskesmas corrected to three dentists per Puskesmas based on ideal needs by Puskesmas type.
- Inclusion of workforce demand for 10 types of dental specialists.

b. **Supply:**

- Baseline existing (2023) adjusted from STR to headcount (76% of STR), reflecting actual working dentists, based on analysis of STR vs SIP headcount.
- Annual dentist inflow adjusted from 100% of graduates to 76% of graduates.



## **Review of Medical Specialist Projections**

The review was conducted in recognition that previous projections of workforce needs, particularly for medical specialists, were largely based on service utilization data from advanced-referral-level health facilities (FKRTL) within the JKN scheme. While these data reflect actual service demand, interpretation of the demand figures requires further assessment, as they are strongly influenced by the distribution of health facilities, availability of health workers, and patient preferences in choosing service locations.

Access to advanced referral facilities tends to be higher in urban areas and provincial capitals, where more comprehensive facilities and resources are available. As a result, demand appears to be highly concentrated in large cities, even though a substantial proportion of cases originate from other districts that refer patients to these facilities. Therefore, a re-calculation of the intra-provincial distribution of projected demand is necessary, taking into account interregional referral patterns. This step is essential to ensure that future health workforce planning and development accurately reflect regional needs in an equitable and balanced manner.

In addition to refining demand estimates, the review also aimed to produce a more proportional representation of workforce supply. Supply review was conducted by applying a Full-Time Equivalent (FTE) approach, estimating actual workforce capacity based on available working time expressed in full-time staff units, derived from the number of SIP.

Reviews of workforce projections have been conducted in phases. To date, both demand and supply projections have been reviewed for 14 medical specialists: Pediatricians, OB-GYNs, Internists, Surgeons, Anesthesiologists, Radiologists, Clinical Pathologists, Cardiologists, Neurologists, Urologists, Anatomical Pathologists, Neurosurgeons, Radiation Oncologists, and Nuclear Medicine Specialists. Reviews for other medical and health workforce categories will continue progressively.



## CHAPTER 3.

### RESULTS OF THE PROJECTION OF MEDICAL AND HEALTH WORKFORCE NEEDS USING A POPULATION-BASED APPROACH, 2023–2032, IN INDONESIA

#### 3.1. Projections of Medical and Health Workforce Needs Using a Population-Based Approach, 2023–2032, by Type at the National Level

Based on a series of calculations using the supply–demand method, projections of population-based demand, supply, and gaps for medical and health workforces were obtained for 49 categories of medical workforce (general practitioners, dentists, 37 types of medical specialists, and 10 types of dental specialists) as well as 32 categories of health workforce.

The projection results demonstrate a sustained annual increase in the demand for the medical workforce in Indonesia. Using 2023 as the baseline year, the demand for general practitioners was estimated at 211.086. This figure is projected to rise to 245.016 by 2030 and further increase to approximately 255.420 by 2032. A comparison between projected demand and supply indicates that Indonesia is expected to face a shortage of around 93.200 general practitioners by 2032. The projected demand ratio in 2032 corresponds to 0,8 physicians per 1.000 population. In contrast, the supply ratio of general practitioners reached only 0,45 per 1.000 population in 2026 and is projected to increase to 0,54 per 1.000 population by 2032. This level of supply remains substantially lower than that observed in several comparator countries, including China (3,1 in 2023), Singapore (2,8 in 2023), Malaysia (2,3 in 2023), Viet Nam (1,1 in 2023), and the Philippines (0,8 in 2023). Meanwhile, the projected demand for dentists in 2032 is estimated at 179.267, equivalent to a ratio of 0,59 dentists per 1.000 population. This ratio is positioned between those reported in other countries, such as Japan (0,8 in 2022), Malaysia (0,5 in 2024), the Philippines (0,28 in 2024), and Thailand (0,13 in 2024).<sup>17,18</sup>

Using 2023 as the baseline year, the demand for medical specialists was estimated at 79.428. By 2030, demand is projected to reach 126.386 medical specialists and further increase to approximately 140.000 by 2032. A comparison between demand and supply indicates that Indonesia is projected to experience a shortage of approximately 65.000 medical specialists by 2032. The demand ratio in 2032 is equivalent to 0,46 medical specialists per 1.000 population. In contrast, the supply ratio of medical specialists reached only 0,19 per 1.000 population in 2026 and is projected to increase to 0,25 per 1.000 population by 2032. This level of supply remains substantially lower than that observed in other countries, including the United States (3,30 in 2022), the United Kingdom (2,53 in 2023), Australia (1,47 in 2022), Singapore (1,12 in 2023), and Malaysia (0,42 in 2021).

Although the overall number of medical specialists remains insufficient, a more detailed analysis by specialty indicates that several specializations have already exceeded the estimated demand, including Obstetrics and Gynecology specialists (OB-GYNs). The demand for OB-GYNs in 2032 is projected to reach 5.456, corresponding to a ratio of 0,018 per 1.000 population. In contrast, the supply ratio of Sp.OG reached only 0,016 per 1.000 population in 2026 and is projected to increase to 0,021 per 1.000 population by 2032. Despite this projected increase, the supply ratio remains lower than those observed in other countries, such as the United States (0,13 in 2022), the United Kingdom (0,13 in 2022), Japan (0,11 in 2025), Australia (0,09 in 2022), Singapore (0,06 in 2022), the Philippines (0,04 in 2025), Thailand (0,03 in 2025), and Malaysia (0,02 in



2025).<sup>17,19</sup> In addition, several specialties experience the largest shortages, including Family Medicine specialists (KKLP), Cardiologist, Surgeon, and Radiologist. These findings indicate substantial disparities in the fulfillment of demand across different medical specialties.

A similar pattern is also observed within the health workforce. The projections indicate that most categories of the health workforce continue to experience shortages. Situations in which workforce numbers exceed the estimated demand occur only in a limited number of categories, including nurses whose numbers surpassed the estimated demand in 2025, the health promotion workforce which is projected to exceed the estimated demand in 2027, and acupuncture therapists which are projected to exceed the estimated demand in 2030.

The projection results indicate a surplus of 75.316 nurses relative to the demand ratio of 2,11 per 1.000 population in 2032. The supply ratio of nurses reached only 2,17 per 1.000 population in 2026 and is projected to increase to 2,36 per 1.000 population by 2032. Nevertheless, this ratio remains lower than that observed in other countries, including Japan (12,7 in 2023), the Republic of Korea (9,0 in 2023), Australia (7,7 in 2023), Singapore (6,5 in 2023), the Philippines (4,2 in 2023), and Malaysia (4,0 in 2023). In contrast, the midwifery workforce continues to experience a shortage, estimated at 136.915 relative to the demand ratio of 2,06 per 1.000 population in 2032. The supply ratio of midwives reached only 1,35 per 1.000 population in 2026 and is projected to increase to 1,6 per 1.000 population by 2032. Availability levels in other countries include the Philippines (0,66 in 2015), Japan (0,26 in 2022), and Thailand (0,11 in 2015).<sup>17</sup>

Compared with member countries of the World Health Organization Western Pacific Region (WPRO), Indonesia ranked ninth in terms of the supply ratio of medical specialists in 2023. Meanwhile, the supply ratio of general practitioners ranked twenty-first, and that of dentists ranked nineteenth. Midwives ranked second, indicating a higher level of availability compared with nurses, pharmaceutical personnel, physiotherapists, and other health workforce categories.<sup>17</sup>



Table 6. National Projections of Medical and Health Workforce Needs Using a Population-Based Approach, 2023–2032

NO	WORKFORCE TYPE	DESCRIPTION	YEAR									
			2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
1	GENERAL PRACTITIONER	Demand	211.086	215.708	220.401	225.171	230.017	234.939	239.937	245.016	250.175	255.420
		Supply	106.411	113.215	119.863	126.357	132.700	138.893	144.940	150.842	156.601	162.220
		Gap	104.674	102.493	100538	98814	97317	96046	94997	94174	93574	93200
2	DENTIST	Demand	158.835	160.941	163.078	165.241	167.447	169.694	171.997	174.354	176.774	179.267
		Supply	30.134	31.962	33.763	35.537	37.284	39.005	40.700	42.369	44.013	45.633
		Gap	128.701	128.979	129.315	129.704	130.163	130.689	131.297	131.985	132.761	133.634
3	PEDIATRICIAN	Demand	4.687	4.917	5.162	5.416	5.685	5.971	6.280	6.608	6.954	7.336
		Supply	3.627	3.853	4.075	4.294	4.510	4.722	4.931	5.137	5.340	5.540
		Gap	1.060	1.064	1.087	1.122	1.175	1.249	1.349	1.471	1.614	1.796
4	OBSTETRICIAN AND GYNECOLOGIST	Demand	4.434	4.548	4.663	4.778	4.891	5.006	5.118	5.230	5.345	5.456
		Supply	4.792	4.960	5.126	5.289	5.450	5.608	5.764	5.918	6.069	6.218
		Gap	+358	+412	+463	+511	+559	+602	+646	+688	+724	+762
5	INTERNAL MEDICINE SPECIALIST	Demand	5.907	6.345	6.812	7.312	7.844	8.409	9.015	9.665	10.356	11.089
		Supply	4.552	4.860	5.201	5.579	5.997	6.462	6.977	7.548	8.182	8.885
		Gap	1.355	1.485	1.611	1.733	1.847	1.947	2.038	2.117	2.174	2.204
6	SURGEON	Demand	5.254	5.667	6.110	6.589	7.108	7.668	8.276	8.936	9.642	10.407
		Supply	3.127	3.336	3.542	3.745	3.945	4.142	4.336	4.527	4.715	4.900
		Gap	2.127	2.331	2.568	2.844	3.163	3.526	3.940	4.409	4.927	5.507
7	ANESTHESIOLOGIST	Demand	4.334	4.626	4.944	5.287	5.658	6.067	6.509	6.991	7.508	8.084
		Supply	3.311	3.533	3.752	3.968	4.180	4.389	4.595	4.798	4.998	5.195
		Gap	1.023	1.093	1.192	1.319	1.478	1.678	1.914	2.193	2.510	2.889
8	RADIOLOGIST	Demand	3.465	3.735	4.023	4.336	4.677	5.044	5.441	5.871	6.333	6.833
		Supply	2.050	2.173	2.310	2.445	2.578	2.709	2.838	2.965	3.091	3.215
		Gap	1.415	1.562	1.713	1.891	2.099	2.335	2.603	2.906	3.242	3.618
9	CLINICAL PATHOLOGIST	Demand	3.005	3.238	3.489	3.760	4.051	4.369	4.712	5.078	5.478	5.910
		Supply	1.922	2.049	2.174	2.297	2.419	2.539	2.657	2.773	2.887	3.000
		Gap	1.083	1.189	1.315	1.463	1.632	1.830	2.055	2.305	2.591	2.910
10	CARDIOLOGIST	Demand	6.041	6.264	6.512	6.787	7.539	7.869	8.391	9.026	9.708	10.592
		Supply	1.745	1.929	2.110	2.288	2.464	2.637	2.807	2.975	3.140	3.303
		Gap	4.296	4.335	4.402	4.499	5.075	5.232	5.584	6.051	6.568	7.289



NO	WORKFORCE TYPE	DESCRIPTION	YEAR									
			2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
11	RADIATION ONCOLOGIST	Demand	343	345	348	353	361	369	371	374	380	384
		Supply	151	162	173	184	195	212	235	258	281	304
		Gap	192	183	175	169	166	157	136	116	99	80
12	NEUROLOGIST	Demand	2.741	2.809	2.891	2.993	3.207	3.339	3.507	3.722	3.949	4.245
		Supply	2.425	2.599	2.770	2.938	3.104	3.267	3.428	3.587	3.743	3.897
		Gap	316	210	121	55	103	72	79	135	206	348
13	UROLOGIST	Demand	1.045	1.099	1.161	1.228	1.301	1.377	1.461	1.550	1.647	1.758
		Supply	635	677	719	760	801	841	880	919	957	995
		Gap	410	422	442	468	500	536	581	631	690	763
14	PSYCHIATRIST	Demand	3.354	3562	3783	4024	4281	4558	4855	5176	5520	5896
		Supply	1.349	1497	1643	1786	1927	2066	2203	2338	2471	2602
		Gap	2.005	2065	2140	2238	2354	2492	2652	2838	3049	3294
15	THORACIC AND CARDIOVASCULAR SURGEON	Demand	1.345	1369	1392	1417	1443	1457	1455	1480	1506	1532
		Supply	190	203	216	229	242	254	266	278	290	302
		Gap	1.155	1166	1176	1188	1201	1203	1189	1202	1216	1230
16	ANATOMICAL PATHOLOGIST	Demand	2.098	2265	2442	2632	2838	3062	3302	3561	3842	4143
		Supply	788	845	904	962	1020	1077	1133	1188	1242	1295
		Gap	1.310	1420	1538	1670	1818	1985	2169	2373	2600	2848
17	PULMONOLOGIST	Demand	2.563	2717	2878	3047	3227	3416	3616	3831	4058	4300
		Supply	1.518	1663	1806	1947	2086	2223	2358	2491	2622	2751
		Gap	1.045	1054	1072	1100	1141	1193	1258	1340	1436	1549
18	OTOLARYNGOLOGIST	Demand	2.040	2119	2200	2284	2371	2461	2555	2651	2751	2858
		Supply	1.931	2077	2231	2393	2562	2739	2923	3114	3312	3517
		Gap	109	42	+31	+109	+191	+278	+368	+463	+561	+659
19	PEDIATRIC SURGEON	Demand	853	892	932	972	1017	1064	1113	1162	1216	1277
		Supply	157	177	196	215	234	252	270	288	306	323
		Gap	696	715	736	757	783	812	843	874	910	954
20	NUCLEAR MEDICINE SPECIALIST	Demand	99	100	101	102	103	104	105	106	107	108
		Supply	58	62	66	70	74	78	82	86	90	94
		Gap	41	38	35	32	29	26	23	20	17	14
21	NEUROSURGEON	Demand	834	852	874	903	966	1002	1050	1111	1175	1259
		Supply	500	546	592	637	681	725	768	810	852	893



NO	WORKFORCE TYPE	DESCRIPTION	YEAR									
			2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
		Gap	334	306	282	266	285	277	282	301	323	366
22	FORENSIC AND MEDICOLEGAL SPECIALIST	Demand	1.951	1971	1991	2010	2029	2047	2065	2082	2098	2114
		Supply	280	318	355	392	428	463	498	533	567	600
		Gap	1.671	1653	1636	1619	1601	1584	1567	1549	1531	1514
23	OPHTHALMOLOGIST	Demand	3.075	3104	3135	3164	3199	3231	3261	3297	3327	3358
		Supply	2.427	2567	2704	2839	2972	3103	3232	3360	3486	3610
		Gap	648	537	431	325	227	128	29	+63	+159	+252
24	ORTHOPAEDIC AND TRAUMATOLOGY SPECIALIST	Demand	2.730	2804	2880	2956	3032	3108	3189	3272	3355	3439
		Supply	1.395	1482	1610	1736	1860	1982	2102	2220	2337	2452
		Gap	1.335	1322	1270	1220	1172	1126	1087	1052	1018	987
25	CLINICAL NUTRITION SPECIALIST	Demand	1.344	1443	1554	1673	1802	1940	2090	2254	2427	2614
		Supply	418	462	505	547	589	650	710	769	827	885
		Gap	926	981	1049	1126	1213	1290	1380	1485	1600	1729
26	PHYSICAL MEDICINE AND REHABILITATION SPECIALIST	Demand	1.383	1489	1605	1728	1860	2005	2161	2329	2509	2703
		Supply	1.094	1172	1248	1323	1397	1470	1542	1613	1683	1752
		Gap	289	317	357	405	463	535	619	716	826	951
27	CLINICAL PARASITOLOGIST	Demand	460	492	528	565	604	649	697	748	802	860
		Supply	39	44	49	54	59	64	69	74	79	84
		Gap	421	448	479	511	545	585	628	674	723	776
28	CLINICAL MICROBIOLOGIST	Demand	1.252	1347	1451	1562	1681	1808	1949	2100	2260	2438
		Supply	334	407	479	550	620	689	757	824	890	955
		Gap	918	940	972	1012	1061	1119	1192	1276	1370	1483
29	FAMILY MEDICINE SPECIALIST	Demand	14.771	14925	15075	15222	15364	15501	15635	15764	15888	16009
		Supply	592	583	574	566	557	629	699	769	837	905
		Gap	14.179	14342	14501	14656	14806	14873	14935	14995	15051	15104
30	PLASTIC, RECONSTRUCTIVE, AND AESTHETIC SURGEON	Demand	521	528	539	548	555	566	576	583	591	604
		Supply	309	354	399	443	486	529	571	623	673	723
		Gap	212	174	140	105	69	37	5	+39	+82	+119
31	EMERGENCY MEDICINE SPECIALIST	Demand	1.003	1014	1024	1034	1044	1053	1062	1071	1079	1087
		Supply	76	79	82	84	87	90	93	95	98	100
		Gap	927	935	942	950	957	963	969	976	981	987
32		Demand	1.951	1971	1991	2010	2029	2047	2065	2082	2098	2114



NO	WORKFORCE TYPE	DESCRIPTION	YEAR									
			2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
	CLINICAL PHARMACOLOGY SPECIALIST	Supply	76	87	98	108	118	129	139	149	158	168
		Gap	1.875	1884	1894	1902	1911	1919	1926	1933	1940	1946
33	MARINE MEDICINE SPECIALIST	Demand	279	282	284	287	290	292	295	297	300	302
		Supply	45	45	45	45	63	81	99	117	135	153
		Gap	234	237	239	242	227	211	196	180	165	149
34	OCCUPATIONAL MEDICINE SPECIALIST	Demand	1.115	1126	1138	1149	1160	1170	1180	1190	1199	1208
		Supply	160	178	195	212	229	245	262	278	294	309
		Gap	955	949	943	937	931	925	918	912	905	899
35	SPORTS MEDICINE SPECIALIST	Demand	451	465	480	495	511	527	544	562	580	599
		Supply	100	109	117	125	133	141	149	157	165	172
		Gap	351	356	363	370	377	386	395	405	416	427
36	AVIATION MEDICINE SPECIALIST	Demand	300	310	313	316	319	322	324	327	330	332
		Supply	59	68	77	86	95	103	112	120	128	136
		Gap	241	242	236	230	224	219	213	207	202	196
37	ACUPUNCTURE SPECIALIST	Demand	1.368	1382	1395	1408	1423	1437	1453	1466	1479	1495
		Supply	158	172	185	198	211	224	237	249	261	274
		Gap	1.210	1210	1210	1210	1212	1213	1216	1217	1218	1221
38	ANDROLOGY SPECIALIST	Demand	254	268	282	298	316	334	354	376	399	426
		Supply	79	88	97	106	114	122	130	138	146	154
		Gap	175	180	185	192	202	212	224	238	253	272
39	DERMATOLOGY AND VENEREOLOGY SPECIALIST	Demand	2.988	3157	3334	3525	3733	3955	4197	4457	4734	5039
		Supply	2.235	2339	2442	2543	2643	2741	2838	2933	3027	3120
		Gap	753	818	892	982	1090	1214	1359	1524	1707	1919
40	PEDIATRIC DENTIST	Demand	1.699	1831	1972	2126	2290	2466	2659	2866	3090	3331
		Supply	731	783	834	884	934	983	1031	1079	1126	1172
		Gap	968	1048	1138	1242	1356	1483	1628	1787	1964	2159
41	ORAL PATHOLOGIST	Demand	136	142	150	158	166	175	185	195	205	217
		Supply	12	12	12	12	12	12	12	12	12	12
		Gap	124	130	138	146	154	163	173	183	193	205
42	ORAL MEDICINE SPECIALIST	Demand	569	611	655	703	754	807	865	927	996	1068
		Supply	206	225	244	262	280	298	316	333	350	367
		Gap	363	386	411	441	474	509	549	594	646	701



NO	WORKFORCE TYPE	DESCRIPTION	YEAR									
			2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
43	PERIODONTIST	Demand	1.484	1598	1721	1850	1994	2146	2312	2492	2686	2895
		Supply	619	688	756	823	889	954	1018	1081	1143	1204
		Gap	865	910	965	1027	1105	1192	1294	1411	1543	1691
44	PROSTHODONTIST	Demand	1.103	1189	1280	1377	1480	1593	1713	1845	1986	2138
		Supply	572	614	656	697	738	778	817	856	894	932
		Gap	531	575	624	680	742	815	896	989	1092	1206
45	ORAL AND MAXILLOFACIAL RADIOLOGIST	Demand	882	947	1015	1088	1168	1254	1345	1444	1554	1672
		Supply	84	105	125	145	165	185	204	223	242	260
		Gap	798	842	890	943	1003	1069	1141	1221	1312	1412
46	ORAL AND MAXILLOFACIAL SURGEON	Demand	983	1059	1138	1224	1316	1416	1524	1641	1766	1901
		Supply	662	712	761	810	858	905	951	997	1042	1086
		Gap	321	347	377	414	458	511	573	644	724	815
47	DENTAL CONSERVATION SPECIALIST / ENDODONTIST	Demand	1.942	2089	2248	2417	2601	2801	3019	3252	3504	3777
		Supply	1.287	1368	1447	1525	1602	1678	1753	1827	1900	1971
		Gap	655	721	801	892	999	1123	1266	1425	1604	1806
48	FORENSIC ODONTOLOGIST	Demand	162	171	181	192	203	214	226	241	256	272
		Supply	22	25	28	31	34	36	38	40	42	44
		Gap	140	146	153	161	169	178	188	201	214	228
49	ORTHODONTIST	Demand	1.431	1538	1652	1773	1903	2044	2199	2365	2544	2737
		Supply	937	963	1000	1036	1071	1106	1140	1174	1207	1240
		Gap	494	575	652	737	832	938	1059	1191	1337	1497
50	NURSE	Demand	582.987	589.829	596.547	603.117	609.536	615.806	621.910	627.842	633.611	639.220
		Supply	574.225	592.127	609.403	626.074	642.161	657.685	672.666	687.123	701.074	714.536
		Gap	8.762	+2298	+12856	+22957	+32625	+41879	+50756	+59281	+67463	+75316
51	MIDWIFE	Demand	549.238	558.005	566.699	575.295	583.789	592.181	600.466	608.616	616.655	624.572
		Supply	331.786	351.673	370.864	389.384	407.256	424.502	441.144	457.204	472.702	487.657
		Gap	217.452	206.332	195.835	185.911	176.533	167.679	159.322	151.412	143.953	136.915
52	PHARMACIST	Demand	243.730	246.725	249.654	252.527	255.341	258.104	260.792	263.422	265.987	268.485
		Supply	88.885	103.702	118.297	132.672	146.831	160.778	174.516	188.048	201.377	214.506
		Gap	154.845	143.023	131.357	119.855	108.510	97.326	86.276	75.374	64.610	53.979
53		Demand	142.299	143.606	144.878	146.119	147.320	148.489	149.624	150.718	151.775	152.794
		Supply	57.313	64.338	71.258	78.074	84.788	91.401	97.915	104.331	110.651	116.876



NO	WORKFORCE TYPE	DESCRIPTION	YEAR									
			2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
	MEDICAL LABORATORY TECHNOLOGIST	Gap	84.986	79.268	73.620	68.045	62.532	57.088	51.709	46.387	41.124	35.918
54	HEALTH PROMOTION PERSONNEL	Demand	28.895	29.210	29.515	29.814	30.105	30.384	30.657	30.925	31.178	31.427
		Supply	14.485	18.619	22.739	26.846	30.940	35.021	39.089	43.144	47.186	51.215
		Gap	14.410	10.591	6.776	2.968	+835	+4637	+8432	+12219	+16008	+19788
55	NUTRITIONIST	Demand	113.395	114.626	115.829	117.002	118.145	119.260	120.340	121.385	122.396	123.377
		Supply	33.900	37.717	41.306	44.681	47.854	50.838	53.645	56.286	58.770	61.109
		Gap	79.495	76.909	74.523	72.321	70.291	68.422	66.695	65.099	63.626	62.268
56	CLINICAL PSYCHOLOGIST	Demand	9.947	10.202	10.459	10.723	10.984	11.246	11.505	11.764	12.025	12.279
		Supply	3.353	3.594	3.846	4.108	4.382	4.668	4.967	5.280	5.606	5.947
		Gap	6.594	6.608	6.613	6.615	6.602	6.578	6.538	6.484	6.419	6.332
57	SANITARIAN	Demand	66.467	67.268	67.765	68.246	68.715	69.176	69.625	70.051	70.468	70.870
		Supply	23.291	25.811	28.316	30.806	33.281	35.741	38.187	40.618	43.034	45.436
		Gap	43.176	41.457	39.449	37.440	35.434	33.435	31.438	29.433	27.434	25.434
58	EPIDEMIOLOGIST	Demand	32.078	32.607	33.142	33.695	34.259	34.830	35.415	36.011	36.618	37.238
		Supply	9.809	10.362	10.906	11.443	11.971	12.492	13.004	13.509	14.007	14.496
		Gap	22.269	22.245	22.236	22.252	22.288	22.338	22.411	22.502	22.611	22.742
59	PHYSIOTHERAPIST	Demand	34.114	36.601	39.296	42.223	45.417	48.901	52.697	56.839	61.310	66.258
		Supply	20.910	22.596	24.257	25.893	27.505	29.092	30.656	32.196	33.713	35.207
		Gap	13.204	14.005	15.039	16.330	17.912	19.809	22.041	24.643	27.597	31.051
60	OPTOMETRIST	Demand	12.355	12.905	13.422	13.958	14.518	15.099	15.700	16.336	16.985	17.660
		Supply	6.636	7.257	7.870	8.473	9.066	9.651	10.228	10.795	11.354	11.905
		Gap	5.719	5.648	5.552	5.485	5.452	5.448	5.472	5.541	5.631	5.755
61	ANESTHESIOLOGIST ASSISTANT	Demand	9.892	10.566	11.301	12.101	12.974	13.927	14.962	16.092	17.308	18.662
		Supply	3.240	3.736	4.225	4.707	5.181	5.648	6.108	6.561	7.008	7.448
		Gap	6.652	6.830	7.076	7.394	7.793	8.279	8.854	9.531	10.300	11.214
62	OCCUPATIONAL THERAPIST	Demand	3.281	3.503	3.746	4.008	4.296	4.605	4.942	5.314	5.714	6.159
		Supply	1.187	1.469	1.747	2.021	2.291	2.557	2.819	3.077	3.331	3.581
		Gap	2.094	2.034	1.999	1.987	2.005	2.048	2.123	2.237	2.383	2.578
63	CARDIOVASCULAR TECHNICIAN	Demand	850	861	871	884	896	901	900	912	924	936
		Supply	296	336	375	413	451	488	525	561	597	632
		Gap	554	525	496	471	445	413	375	351	327	304



NO	WORKFORCE TYPE	DESCRIPTION	YEAR									
			2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
64	ELEKTROMEDICAL TECHNICIAN	Demand	36.787	36.787	36.817	36.847	36.877	36.907	36.937	36.967	36.997	37.027
		Supply	7.139	8.246	9.370	10.510	11.668	12.843	14.036	15.246	16.475	17.722
		Gap	29.648	28.541	27.447	26.337	25.209	24.064	22.901	21.721	20.522	19.305
65	MEDICAL PHYSICIST	Demand	1.339	1.435	1.539	1.650	1.772	1.907	2.052	2.212	2.384	2.575
		Supply	647	667	687	707	776	844	911	977	1.042	1.106
		Gap	692	768	852	943	996	1.063	1.141	1.235	1.342	1.469
66	ORTHOTISTS-PROSTHETISTS	Demand	1.199	1.284	1.377	1.476	1.587	1.706	1.836	1.979	2.130	2.299
		Supply	227	379	528	675	820	963	1.104	1.242	1.378	1.512
		Gap	972	905	849	801	767	743	732	737	752	787
67	BLOOD BANK TECHNICIAN	Demand	3.591	3.834	4.097	4.388	4.703	5.047	5.421	5.832	6.273	6.765
		Supply	2.572	3.035	3.491	3.941	4.384	4.820	5.250	5.673	6.090	6.501
		Gap	1.019	799	606	447	319	227	171	159	183	264
68	RADIOGRAPHER	Demand	29.429	31.710	34.165	36.821	39.690	42.790	46.148	49.775	53.686	57.927
		Supply	17.660	18.886	20.094	21.284	22.456	23.610	24.747	25.867	26.970	28.056
		Gap	11.769	12.824	14.071	15.537	17.234	19.180	21.401	23.908	26.716	29.871
69	ACUPUNCTURE THERAPIST	Demand	2.253	2.342	2.437	2.534	2.637	2.739	2.849	2.966	3.084	3.209
		Supply	618	990	1.356	1.717	2.072	2.422	2.766	3.106	3.440	3.770
		Gap	1.635	1.352	1.081	817	565	317	83	+140	+356	+561
70	DIETITIAN	Demand	19.551	19.770	19.987	20.205	20.410	20.612	20.808	21.002	21.189	21.371
		Supply	2.193	3.064	3.922	4.767	5.599	6.419	7.227	8.023	8.807	9.579
		Gap	17.358	16.706	16.065	15.438	14.811	14.193	13.581	12.979	12.382	11.792
71	ENTOMOLOGIST	Demand	25.555	25.977	26.405	26.844	27.291	27.746	28.215	28.688	29.170	29.667
		Supply	311	306	302	297	293	288	284	280	276	271
		Gap	25.244	25.671	26.103	26.547	26.998	27.458	27.931	28.408	28.894	29.396
72	TRADITIONAL MEDICINE PRACTITIONER	Demand	1.108	1.121	1.134	1.143	1.150	1.167	1.176	1.190	1.203	1.213
		Supply	247	315	383	449	514	578	642	704	766	826
		Gap	861	806	751	694	636	589	534	486	437	387
73	INTERCONTINENTAL TRADITIONAL MEDICINE PRACTITIONER	Demand	1.371	1.384	1.399	1.414	1.430	1.444	1.459	1.472	1.488	1.502
		Supply	64	111	157	203	248	292	336	379	421	463
		Gap	1.307	1.273	1.242	1.211	1.182	1.152	1.123	1.093	1.067	1.039
74	HERBAL TRADITIONAL	Demand	1.154	1.164	1.177	1.194	1.210	1.218	1.229	1.242	1.253	1.267
		Supply	128	198	267	335	402	468	533	597	660	722



NO	WORKFORCE TYPE	DESCRIPTION	YEAR									
			2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
	MEDICINE PRACTITIONER	Gap	1.026	966	910	859	808	750	696	645	593	545
75	DENTAL AND ORAL THERAPIST	Demand	56.665	61.119	65.935	71.147	76.782	82.876	89.475	96.604	104.303	112.653
		Supply	19.124	20.516	21.887	23.238	24.568	25.878	27.169	28.440	29.692	30.926
		Gap	37.541	40.603	44.048	47.909	52.214	56.998	62.306	68.164	74.611	81.727
76	SPEECH THERAPIST	Demand	4.652	4.826	5.008	5.200	5.398	5.605	5.823	6.047	6.281	6.527
		Supply	1.949	2.261	2.568	2.870	3.168	3.461	3.750	4.035	4.315	4.591
		Gap	2.703	2.565	2.440	2.330	2.230	2.144	2.073	2.012	1.966	1.936
77	PHARMACY TECHNICIAN	Demand	264.514	267.752	270.917	274.033	277.081	280.056	282.973	285.809	288.589	291.283
		Supply	87.785	97.450	106.971	116.348	125.585	134.683	143.645	152.473	161.167	169.732
		Gap	176.729	170.302	163.946	157.685	151.496	145.373	139.328	133.336	127.422	121.551
78	MEDICAL RECORDS PERSONNEL	Demand	94.259	105.924	117.589	129.254	140.919	152.584	164.249	175.914	187.579	199.244
		Supply	25.509	29.766	33.960	38.090	42.159	46.167	50.114	54.003	57.832	61.605
		Gap	68.750	76.158	83.629	91.164	98.760	106.417	114.135	121.911	129.747	137.639
79	DENTAL TECHNICIAN	Demand	1906	1904	1919	1939	1957	1978	1996	2020	2040	2058
		Supply	845	1002	1157	1310	1460	1608	1754	1898	2039	2179
		Gap	1061	902	762	629	497	370	242	122	1	+121
80	AUDIOLOGIST	Demand	1.172	1.212	1.254	1.298	1.346	1.395	1.446	1.498	1.550	1.607
		Supply	108	122	136	150	164	178	191	204	217	230
		Gap	1.064	1.090	1.118	1.148	1.182	1.217	1.255	1.294	1.333	1.377
81	OCCUPATIONAL HEALTH AND SAFETY WORKER	Demand	11.539	13.020	15.015	17.010	19.005	21.000	22.995	24.990	26.985	28.981
		Supply	945	2.931	4.887	6.814	8.711	10.581	12.422	14.236	16.022	17.782
		Gap	10.594	10.089	10.128	10.196	10.294	10.419	10.573	10.754	10.963	11.199



### 3.2. Projection of Medical Workforce Demand Based on Population-Based Approach, 2023–2032, by Type and Province

#### 1. General Practitioner

Based on calculations using the supply–demand method, the demand for general practitioners (GPs) in Indonesia was estimated at 211.086 in 2023. With a supply of 106.411 GPs, this resulted in a shortage of 104.674 (49,6%) in 2023. The demand for GPS is projected to increase annually. By 2025, the demand is estimated to reach 220.401, and expected to continue rising to 245.016 in 2030. By 2032, the demand is projected at 255.420 general practitioners. Each year, approximately 12.000 GPs are expected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage of GPs in 2032, with a deficit of 36,5%.

Table 7. Projection of General Practitioners Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	211.086	106.411	104.674	49,6%
2024	215.708	113.215	102.493	47,5%
2025	220.401	119.863	100.538	45,6%
2026	225.171	126.357	98.814	43,9%
2027	230.017	132.700	97.317	42,3%
2028	234.939	138.893	96.046	40,9%
2029	239.937	144.940	94.997	39,6%
2030	245.016	150.842	94.174	38,4%
2031	250.175	156.601	93.574	37,4%
2032	255.420	162.220	93.200	36,5%

Provincial demand for GPs increases annually, driven by population growth, disease prevalence, and the epidemiological burden in each province. The provinces with the highest demand each year are West Java, Central Java, East Java, and North Sumatra.

Table 8. Projection of General Practitioners Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	6.303	6.441	6.580	6.723	6.868	7.015	7.164	7.316	7.470	7.626
NORTH SUMATERA	11.368	11.616	11.869	12.126	12.387	12.652	12.921	13.195	13.472	13.755
WEST SUMATERA	6.071	6.204	6.338	6.475	6.615	6.757	6.900	7.046	7.195	7.346
RIAU	4.554	4.654	4.755	4.858	4.963	5.069	5.177	5.286	5.398	5.512
JAMBI	2.901	2.965	3.030	3.096	3.162	3.230	3.299	3.369	3.439	3.511
SOUTH SUMATERA	6.890	7.041	7.195	7.350	7.508	7.668	7.832	7.998	8.166	8.338
BENGKULU	2.470	2.525	2.580	2.635	2.692	2.750	2.808	2.868	2.929	2.991
LAMPUNG	6.814	6.964	7.115	7.269	7.426	7.585	7.746	7.911	8.077	8.246



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
BANGKA BELITUNG ISLANDS	1.406	1.436	1.468	1.500	1.533	1.565	1.599	1.633	1.667	1.702
RIAU ISLANDS	1.847	1.887	1.928	1.970	2.012	2.055	2.099	2.144	2.188	2.234
DKI JAKARTA	4.017	4.105	4.194	4.285	4.377	4.471	4.566	4.663	4.761	4.861
WEST JAVA	35.474	36.251	37.040	37.841	38.655	39.482	40.322	41.175	42.042	42.923
CENTRAL JAVA	27.611	28.215	28.829	29.452	30.086	30.730	31.384	32.049	32.723	33.409
DI YOGYAKARTA	3.271	3.342	3.415	3.488	3.564	3.640	3.718	3.796	3.876	3.957
EAST JAVA	27.726	28.333	28.949	29.575	30.212	30.858	31.514	32.182	32.859	33.547
BANTEN	8.184	8.363	8.545	8.729	8.917	9.108	9.302	9.498	9.698	9.902
BALI	3.557	3.635	3.714	3.795	3.877	3.960	4.044	4.130	4.216	4.305
WEST NUSA TENGGARA	5.922	6.052	6.184	6.318	6.454	6.592	6.732	6.874	7.019	7.166
EAST NUSA TENGGARA	4.102	4.193	4.284	4.376	4.471	4.566	4.664	4.762	4.863	4.964
WEST KALIMANTAN	3.506	3.582	3.659	3.739	3.820	3.901	3.984	4.068	4.154	4.240
CENTRAL KALIMANTAN	2.317	2.367	2.419	2.471	2.524	2.578	2.633	2.689	2.746	2.804
SOUTH KALIMANTAN	3.687	3.767	3.850	3.933	4.018	4.103	4.191	4.279	4.370	4.461
EAST KALIMANTAN	3.456	3.532	3.608	3.686	3.766	3.846	3.927	4.011	4.095	4.180
NORTH KALIMANTAN	692	708	723	738	755	771	787	803	821	838
NORTH SULAWESI	3.162	3.231	3.301	3.372	3.445	3.519	3.594	3.670	3.747	3.826
CENTRAL SULAWESI	2.043	2.087	2.133	2.178	2.225	2.273	2.321	2.370	2.420	2.470
SOUTH SULAWESI	7.524	7.689	7.857	8.026	8.199	8.375	8.553	8.734	8.918	9.104
SOUTHEAST SULAWESI	2.730	2.790	2.851	2.913	2.976	3.040	3.105	3.171	3.238	3.306
GORONTALO	1.510	1.543	1.576	1.610	1.644	1.679	1.715	1.751	1.789	1.826
WEST SULAWESI	1.128	1.153	1.178	1.203	1.230	1.256	1.282	1.310	1.337	1.365
MALUKU	1.891	1.933	1.975	2.018	2.061	2.105	2.150	2.196	2.241	2.288
NORTH MALUKU	1.206	1.232	1.259	1.287	1.314	1.342	1.371	1.399	1.429	1.459
WEST PAPUA	602	615	629	643	657	671	685	700	715	729
SOUTHWEST PAPUA	984	1.006	1.027	1.050	1.073	1.095	1.119	1.143	1.166	1.191
SOUTH PAPUA	593	606	619	633	647	660	674	688	703	718
CENTRAL PAPUA	838	857	876	895	914	934	954	974	995	1.016
HIGHLAND PAPUA	1.390	1.421	1.452	1.483	1.515	1.548	1.580	1.614	1.647	1.682
PAPUA	1.339	1.369	1.398	1.428	1.459	1.490	1.521	1.554	1.586	1.619



## 2. Dentist

Based on calculations using the supply–demand method, the demand for dentists in Indonesia was estimated at 158.835 in 2023. With a supply of 30.134 dentists, this resulted in a shortage of 128.701 (81,03%) in 2023. The demand for dentists is projected to increase annually. By 2025, the demand is estimated to reach 163.078, and is expected to continue rising to 174.354 in 2030. By 2032, the demand is projected at 179.267 dentists. Each year, approximately 3.000 dentists are expected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage of dentists in 2032, with a deficit of 74,54%.

Table 9. Projection of Dentists Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	158.835	30.134	128.701	81,03%
2024	160.941	31.962	128.979	80,14%
2025	163.078	33.763	129.315	79,30%
2026	165.241	35.537	129.704	78,49%
2027	167.447	37.284	130.163	77,73%
2028	169.694	39.005	130.689	77,01%
2029	171.997	40.700	131.297	76,34%
2030	174.354	42.369	131.985	75,70%
2031	176.774	44.013	132.761	75,10%
2032	179.267	45.633	133.634	74,54%

Provincial demand for dentists increases annually, driven by population growth, disease prevalence, and the epidemiological burden in each province. The provinces with the highest demand each year are West Java, East Java, Central Java, and North Sumatra.

Table 10. Projection of Dentists Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	3598	3648	3699	3751	3803	3857	3913	3970	4030	4091
NORTH SUMATERA	8441	8569	8698	8828	8960	9095	9233	9374	9520	9669
WEST SUMATERA	3642	3698	3755	3813	3872	3933	3995	4059	4126	4194
RIAU	3743	3800	3857	3916	3975	4036	4097	4161	4226	4293
JAMBI	2116	2145	2174	2203	2233	2263	2295	2326	2360	2394
SOUTH SUMATERA	4603	4664	4725	4787	4850	4914	4981	5048	5118	5190
BENGKULU	1363	1380	1397	1413	1432	1449	1468	1487	1506	1527
LAMPUNG	4323	4382	4442	4503	4564	4628	4692	4758	4826	4896
BANGKA BELITUNG ISLANDS	847	860	872	885	898	912	926	940	954	970
RIAU ISLANDS	1140	1157	1176	1193	1212	1231	1251	1270	1291	1311



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
DKI JAKARTA	5728	5763	5791	5820	5849	5879	5912	5945	5981	6020
WEST JAVA	27086	27453	27796	28147	28505	28872	29251	29643	30047	30467
CENTRAL JAVA	18211	18448	18687	18930	19175	19425	19681	19943	20211	20485
DI YOGYAKARTA	2672	2699	2727	2755	2784	2813	2843	2875	2907	2941
EAST JAVA	20348	20571	20796	21023	21254	21489	21730	21978	22232	22492
BANTEN	6475	6564	6648	6733	6820	6910	7002	7098	7197	7299
BALI	2498	2525	2552	2580	2608	2636	2666	2696	2727	2759
WEST NUSA TENGGARA	3332	3393	3452	3515	3577	3642	3708	3776	3845	3918
EAST NUSA TENGGARA	3404	3452	3500	3550	3601	3655	3710	3767	3825	3887
WEST KALIMANTAN	3429	3481	3532	3584	3637	3691	3747	3803	3861	3919
CENTRAL KALIMANTAN	1733	1756	1779	1802	1825	1850	1875	1900	1927	1954
SOUTH KALIMANTAN	2954	2995	3037	3078	3122	3166	3211	3258	3304	3354
EAST KALIMANTAN	2635	2720	2851	2978	3101	3220	3335	3445	3549	3646
NORTH KALIMANTAN	590	597	607	615	624	633	642	650	660	670
NORTH SULAWESI	2059	2079	2100	2122	2144	2166	2189	2213	2238	2264
CENTRAL SULAWESI	2548	2580	2615	2649	2683	2720	2757	2795	2834	2875
SOUTH SULAWESI	7044	7138	7234	7332	7432	7534	7640	7748	7859	7974
SOUTHEAST SULAWESI	2547	2583	2621	2660	2700	2741	2783	2826	2871	2918
GORONTALO	956	968	981	994	1007	1021	1035	1049	1064	1079
WEST SULAWESI	1030	1046	1062	1078	1096	1113	1130	1150	1169	1189
MALUKU	1760	1781	1803	1825	1848	1872	1896	1920	1947	1973
NORTH MALUKU	1063	1076	1089	1102	1117	1130	1146	1161	1177	1193
WEST PAPUA	542	548	554	560	567	573	580	587	595	602
SOUTHWEST PAPUA	623	630	636	643	650	657	665	673	681	689
SOUTH PAPUA	494	500	505	511	517	523	529	536	543	552
CENTRAL PAPUA	1202	1216	1232	1247	1263	1279	1295	1312	1329	1346
HIGHLAND PAPUA	1245	1257	1270	1281	1294	1307	1320	1334	1348	1362
PAPUA	810	819	828	837	847	857	868	879	890	902

### 3. Pediatrician

Based on calculations using the supply–demand method, the demand for pediatricians in Indonesia was estimated at 4.693 in 2023. With a supply of 4.947 pediatricians, this resulted in a surplus of 254 (5,4%) in 2023. The demand for pediatricians is projected to increase annually. By 2025, the demand is estimated to reach 5.037, and expected to continue rising to 6.060 in 2030. By 2032, the demand is projected at 6.574 pediatricians. Each year, approximately 280 pediatricians are expected to graduate, with an attrition rate of 1,5%. Assuming these supply and



attrition patterns remain constant, Indonesia is projected to continue meeting the demand for pediatricians in 2032, with a surplus of 1,8%.

Table 11. Projection of Pediatric Specialists Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	4.693	4.947	+254	+5,4%
2024	4.862	5.153	+291	+6,0%
2025	5.037	5.356	+319	+6,3%
2026	5.220	5.556	+336	+6,4%
2027	5.412	5.753	+341	+6,3%
2028	5.612	5.947	+335	+6,0%
2029	5.826	6.138	+312	+5,4%
2030	6.060	6.326	+266	+4,4%
2031	6.305	6.511	+206	+3,3%
2032	6.574	6.693	+119	+1,8%

Provincial demand for pediatric specialists increases annually, driven by population growth, disease prevalence, and the epidemiological burden in each province. The provinces with the highest demand each year are Riau Islands, Yogyakarta Special Region, Jambi, and Southeast Sulawesi.

Table 12. Projection of Pediatrician Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	97	100	106	112	118	124	130	136	145	154
NORTH SUMATERA	77	80	83	87	91	95	99	103	107	111
WEST SUMATERA	17	17	17	17	17	17	17	17	17	17
RIAU	54	54	54	54	54	54	54	54	54	54
JAMBI	548	577	606	635	665	696	728	766	807	851
SOUTH SUMATERA	16	16	16	16	16	16	16	16	16	16
BENGKULU	140	142	144	146	148	150	152	155	158	164
LAMPUNG	117	121	126	131	136	141	147	153	159	165
BANGKA BELITUNG ISLANDS	57	58	59	60	61	62	63	64	65	66
RIAU ISLANDS	1114	1161	1209	1260	1313	1369	1431	1500	1571	1651
DKI JAKARTA	30	30	30	30	30	30	30	30	30	30
WEST JAVA	38	38	38	38	38	38	38	38	38	38
CENTRAL JAVA	119	123	127	131	135	140	145	152	159	166
DI YOGYAKARTA	579	608	638	668	701	735	772	809	847	891
EAST JAVA	19	19	19	19	19	19	19	19	19	19
BANTEN	15	15	15	15	15	15	15	15	15	15
BALI	52	52	52	52	52	52	52	52	52	53



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
WEST NUSA TENGGARA	76	76	76	76	76	76	76	76	76	76
EAST NUSA TENGGARA	19	19	19	19	19	19	19	19	19	19
WEST KALIMANTAN	39	40	41	42	43	44	45	46	48	50
CENTRAL KALIMANTAN	55	55	55	55	55	55	55	55	55	55
SOUTH KALIMANTAN	111	114	117	121	125	129	133	137	141	145
EAST KALIMANTAN	41	41	41	41	41	41	41	41	41	41
NORTH KALIMANTAN	107	111	115	119	123	128	133	138	143	148
NORTH SULAWESI	69	71	73	75	77	79	82	86	90	94
CENTRAL SULAWESI	8	8	8	8	8	8	8	8	8	8
SOUTH SULAWESI	76	78	80	82	84	86	88	90	92	94
SOUTHEAST SULAWESI	329	344	359	376	394	412	431	452	474	497
GORONTALO	16	16	16	16	16	16	16	16	16	16
WEST SULAWESI	36	36	36	36	36	36	36	36	36	36
MALUKU	21	21	21	21	21	21	21	21	21	21
NORTH MALUKU	12	12	12	12	12	12	12	12	12	12
WEST PAPUA	23	23	23	23	23	23	23	23	23	23
SOUTHWEST PAPUA	186	191	196	202	209	216	223	230	237	245
SOUTH PAPUA	91	96	101	106	111	116	121	126	131	136
CENTRAL PAPUA	251	261	271	281	292	304	317	331	345	359
HIGHLAND PAPUA	22	22	22	22	22	22	22	22	22	22
PAPUA	16	16	16	16	16	16	16	16	16	16

#### 4. Obstetrician and Gynecologist

Based on calculations using the supply–demand method, the demand for obstetrician-gynecologists (OB-GYNs) in Indonesia was estimated at 4.430 in 2023. With a supply of 4.792 OB-GYNs, this resulted in a surplus of 362 (8,2%) in 2023. The demand for OB-GYNs is projected to increase annually. By 2025, the demand is estimated to reach 4.695, and expected to continue rising to 5.306 in 2030. By 2032, the demand is projected at 5.554 OB-GYNs. Each year, approximately 240 OB-GYNs are expected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue meeting the demand for OB-GYNs in 2032, with a surplus of 12,0%.

Table 13. Projection of Obstetrician-Gynecologists Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	4.430	4.792	+362	+8,2%
2024	4.572	4.960	+388	+8,5%
2025	4.695	5.126	+431	+9,2%
2026	4.819	5.289	+470	+9,8%



Year	Demand	Supply	Gap	Gap Percentage
2027	4.941	5.450	+509	+10,3%
2028	5.064	5.608	+544	+10,7%
2029	5.186	5.764	+578	+11,1%
2030	5.306	5.918	+612	+11,5%
2031	5.431	6.069	+638	+11,7%
2032	5.554	6.218	+664	+12,0%

Provincial demand for OB-GYNs increases annually, driven by population growth, disease prevalence, and the epidemiological burden in each province. The provinces with the highest demand each year are West Java, East Java, Central Java, and North Sumatra.

Table 14. Projection of Obstetrician-Gynecologists Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	100	102	104	106	108	110	112	114	116	118
NORTH SUMATERA	281	289	297	306	315	324	333	342	351	360
WEST SUMATERA	106	109	112	115	118	121	124	127	130	133
RIAU	114	117	120	123	126	129	132	135	138	141
JAMBI	63	65	67	69	71	73	75	77	79	81
SOUTH SUMATERA	142	146	150	154	158	162	166	170	174	178
BENGKULU	37	38	39	40	41	42	43	44	45	46
LAMPUNG	156	160	164	168	172	176	180	184	188	192
BANGKA BELITUNG ISLANDS	26	27	28	29	30	31	32	33	34	35
RIAU ISLANDS	37	38	39	40	41	42	43	44	45	46
DKI JAKARTA	140	143	145	147	149	151	153	155	157	159
WEST JAVA	765	784	802	820	838	856	874	891	909	927
CENTRAL JAVA	560	572	584	596	607	619	630	641	653	664
DI YOGYAKARTA	49	50	51	52	53	54	55	56	57	58
EAST JAVA	565	576	587	598	609	620	631	642	653	663
BANTEN	186	190	194	198	202	206	210	214	218	222
BALI	63	64	65	66	67	68	69	70	71	72
WEST NUSA TENGGARA	103	106	109	112	115	118	121	124	127	130
EAST NUSA TENGGARA	116	120	124	128	132	136	140	144	148	152
WEST KALIMANTAN	98	101	104	107	110	113	116	119	122	125
CENTRAL KALIMANTAN	49	51	53	55	57	59	61	63	65	67
SOUTH KALIMANTAN	72	74	76	78	80	82	84	86	88	90
EAST KALIMANTAN	65	69	75	80	85	90	95	99	104	108
NORTH KALIMANTAN	13	13	13	13	13	13	13	13	13	13



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
NORTH SULAWESI	40	41	42	43	44	45	46	47	48	49
CENTRAL SULAWESI	53	54	55	56	57	58	59	60	61	62
SOUTH SULAWESI	161	165	169	173	176	179	182	185	188	191
SOUTHEAST SULAWESI	54	56	58	60	62	64	66	68	70	72
GORONTALO	22	23	23	23	23	23	23	23	23	23
WEST SULAWESI	30	31	32	33	34	35	36	37	38	39
MALUKU	39	41	43	45	46	47	48	49	50	52
NORTH MALUKU	25	26	27	28	29	30	31	32	33	34
WEST PAPUA	20	21	22	23	24	25	26	27	28	29
SOUTHWEST PAPUA	12	12	12	12	12	12	12	12	12	12
SOUTH PAPUA	11	12	13	14	15	16	17	18	19	20
CENTRAL PAPUA	30	35	40	45	50	55	60	65	71	77
HIGHLAND PAPUA	31	37	43	49	56	63	70	77	85	93
PAPUA	14	14	14	15	16	17	18	19	20	21

## 5. Internal Medicine Specialist

Based on calculations using the supply–demand method, the demand for internal medicine specialists (internist) in Indonesia was estimated at 5.907 in 2023. With a supply of 4.552 internists, this resulted in a shortage of 1.355 (22,9%) in 2023. The demand for internists is projected to increase annually. By 2025, the demand is estimated to reach 6.815, and expected to continue rising to 9.671 in 2030. By 2032, the demand is projected at 11.097 internists. From 2024 to 2032, the number of internist graduates is projected to increase each year, with the number of graduates in 2032 estimated at 806 and an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage of internists in 2032, with a deficit of 19,9%.

Table 15. Projection of Internal Medicine Specialists Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	5.907	4.552	1.355	22,9%
2024	6.348	4.860	1.488	23,4%
2025	6.815	5.201	1.614	23,7%
2026	7.315	5.579	1.736	23,7%
2027	7.847	5.997	1.850	23,6%
2028	8.413	6.462	1.951	23,2%
2029	9.020	6.977	2.043	22,6%
2030	9.671	7.548	2.123	22,0%
2031	10.363	8.182	2.181	21,0%
2032	11.097	8.885	2.212	19,9%



Provincial demand for Internist increases annually, driven by population growth, disease prevalence, and the epidemiological burden in each province. The provinces with the highest demand each year are West Java, Central Java, East Java, and Banten.

Table 16. Projection of Internal Medicine Specialists Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	122	132	142	153	165	178	192	207	223	240
NORTH SUMATERA	339	369	397	428	461	496	533	573	616	662
WEST SUMATERA	167	181	195	210	226	243	261	281	302	324
RIAU	220	188	203	219	236	254	274	295	318	342
JAMBI	72	46	50	54	58	62	67	72	77	83
SOUTH SUMATERA	161	174	187	201	216	232	249	267	286	307
BENGKULU	31	33	36	39	42	45	48	52	56	60
LAMPUNG	146	156	168	181	195	209	224	241	259	278
BANGKA BELITUNG ISLANDS	33	32	35	38	41	44	47	51	55	59
RIAU ISLANDS	64	46	50	54	58	62	67	72	77	83
DKI JAKARTA	450	528	564	603	645	689	736	786	839	895
WEST JAVA	936	1219	1306	1399	1498	1604	1716	1836	1965	2101
CENTRAL JAVA	729	857	918	983	1053	1127	1206	1289	1378	1472
DI YOGYAKARTA	104	117	125	134	143	153	164	175	187	200
EAST JAVA	606	697	745	796	850	907	968	1033	1102	1175
BANTEN	393	393	421	451	483	517	554	593	635	680
BALI	227	166	178	190	203	217	232	248	265	283
WEST NUSA TENGGARA	64	70	76	82	88	95	102	110	119	128
EAST NUSA TENGGARA	81	93	100	108	116	125	135	146	157	169
WEST KALIMANTAN	81	57	62	67	72	78	84	91	98	105
CENTRAL KALIMANTAN	64	46	50	54	58	63	68	73	79	85
SOUTH KALIMANTAN	71	65	70	75	81	87	93	100	107	115
EAST KALIMANTAN	78	83	93	104	116	128	141	155	170	185
NORTH KALIMANTAN	23	16	17	18	19	21	23	25	27	29
NORTH SULAWESI	94	101	108	116	124	133	142	152	162	173
CENTRAL SULAWESI	76	81	87	94	101	108	116	125	134	144
SOUTH SULAWESI	145	158	170	183	197	212	227	243	260	278
SOUTHEAST SULAWESI	47	42	45	49	53	57	62	67	72	78
GORONTALO	40	25	27	29	31	33	36	39	42	45
WEST SULAWESI	13	15	16	17	18	19	20	22	24	26
MALUKU	22	29	31	33	36	39	42	45	48	52

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
NORTH MALUKU	48	34	37	40	43	47	51	55	60	65
WEST PAPUA	18	17	18	19	21	23	25	27	29	31
SOUTHWEST PAPUA	22	15	16	17	18	19	20	22	24	26
SOUTH PAPUA	10	9	10	11	12	13	14	15	16	17
CENTRAL PAPUA	7	17	18	19	20	21	23	25	27	29
HIGHLAND PAPUA	8	17	18	19	20	21	23	25	27	29
PAPUA	29	24	26	28	30	32	35	38	41	44

## 6. Surgeon

Based on calculations using the supply–demand method, the demand for surgeons in Indonesia was estimated at 5.257 in 2023. With a supply of 3.127 surgeons, this resulted in a shortage of 2.130 (40,50%) in 2023. The demand for surgeons is projected to increase annually. By 2025, the demand is estimated to reach 6.119, and expected to continue rising to 8.949 in 2030. By 2032, the demand is projected at 10.422 surgeons. Each year, approximately 256 surgeons are expected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage of surgeons in 2032, with a deficit of 53,0%.

Table 17. Projection of Surgeons Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	5.257	3.127	2.130	40,50%
2024	5.673	3.336	2.337	41,20%
2025	6.119	3.542	2.577	42,10%
2026	6.600	3.745	2.855	43,30%
2027	7.119	3.945	3.174	44,60%
2028	7.683	4.142	3.541	46,10%
2029	8.291	4.336	3.955	47,70%
2030	8.949	4.527	4.422	49,40%
2031	9.655	4.715	4.940	51,20%
2032	10.422	4.900	5.522	53,00%

Provincial demand for surgeons increases annually, driven by population growth, disease prevalence, and the epidemiological burden in each province. The provinces with the highest demand each year are West Java, East Java, Central Java, and DKI Jakarta.

Table 18. Projection of Surgeon Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	54	58	63	68	73	79	85	92	99	107
NORTH SUMATERA	250	271	294	319	346	375	407	441	478	518
WEST SUMATERA	109	118	128	139	151	164	178	193	209	227
RIAU	104	113	123	134	146	159	173	188	204	222



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
JAMBI	42	46	50	54	59	64	69	75	81	88
SOUTH SUMATERA	107	116	125	135	146	158	171	185	200	216
BENGKULU	25	27	29	31	33	36	39	42	45	49
LAMPUNG	121	130	140	151	163	176	190	205	221	238
BANGKA BELITUNG ISLANDS	22	24	26	28	30	32	34	37	40	43
RIAU ISLANDS	30	33	36	39	42	46	50	54	59	64
DKI JAKARTA	323	347	372	399	428	460	495	532	572	616
WEST JAVA	999	1078	1162	1253	1351	1456	1571	1695	1829	1975
CENTRAL JAVA	611	659	710	765	825	889	958	1033	1114	1201
DI YOGYAKARTA	113	122	131	141	152	163	175	188	202	217
EAST JAVA	735	790	849	913	982	1057	1137	1223	1316	1416
BANTEN	295	318	342	368	396	427	460	496	535	577
BALI	149	161	173	186	200	215	231	249	268	288
WEST NUSA TENGGARA	146	158	172	187	203	221	241	262	285	310
EAST NUSA TENGGARA	51	56	61	66	71	77	83	90	97	105
WEST KALIMANTAN	51	55	60	65	70	76	82	89	96	104
CENTRAL KALIMANTAN	47	51	55	59	64	69	74	80	86	93
SOUTH KALIMANTAN	57	62	67	72	78	84	91	98	106	115
EAST KALIMANTAN	65	72	81	91	101	112	124	137	151	165
NORTH KALIMANTAN	13	14	15	16	17	18	20	22	24	26
NORTH SULAWESI	152	164	177	191	207	224	242	262	283	306
CENTRAL SULAWESI	80	87	94	101	109	118	127	137	148	160
SOUTH SULAWESI	321	346	372	400	430	462	497	534	574	617
SOUTHEAST SULAWESI	50	54	58	63	68	74	80	87	94	102
GORONTALO	25	27	29	31	33	36	39	42	45	49
WEST SULAWESI	26	28	30	32	34	37	40	43	46	49
MALUKU	29	31	34	37	40	43	46	50	54	58
NORTH MALUKU	16	17	18	20	22	24	26	28	30	33
WEST PAPUA	13	14	15	16	17	18	20	22	24	26
SOUTHWEST PAPUA	7	8	9	10	11	12	13	14	15	16
SOUTH PAPUA	3	3	3	3	3	3	3	3	3	3
CENTRAL PAPUA	3	3	3	3	3	3	3	3	3	3
HIGHLAND PAPUA	4	4	4	4	4	4	4	4	4	4
PAPUA	7	8	9	10	11	12	13	14	15	16



## 7. Anesthesiologist

Based on calculations using the supply–demand method, the demand for anesthesiologists in Indonesia was estimated at 4.369 in 2023. With a supply of 3.311 anesthesiologists, this resulted in a shortage of 1.058 (24,2%) in 2023. The demand for anesthesiologists is projected to increase annually. By 2025, the demand is estimated to reach 4.982, and expected to continue rising to 7.049 in 2030. By 2032, the demand is projected at 8.148 anesthesiologists. Each year, approximately 272 anesthesiologists are expected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage of anesthesiologists in 2032, with a deficit of 36,2%.

Table 19. Projection of Anesthesiologist Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	4.369	3.311	1.058	24,2%
2024	4.663	3.533	1.130	24,2%
2025	4.982	3.752	1.230	24,7%
2026	5.329	3.968	1.361	25,5%
2027	5.703	4.180	1.523	26,7%
2028	6.115	4.389	1.726	28,2%
2029	6.561	4.595	1.966	30,0%
2030	7.049	4.798	2.251	31,9%
2031	7.569	4.998	2.571	34,0%
2032	8.148	5.195	2.953	36,2%

Provincial demand for anesthesiologists increases annually, driven by population growth, disease prevalence, and the epidemiological burden in each province. The provinces with the highest demand each year are West Java, East Java, Central Java, and Banten.

Table 20. Projection Anesthesiologist in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	73	78	83	89	95	102	109	117	125	134
NORTH SUMATERA	244	263	282	303	326	351	378	408	440	476
WEST SUMATERA	107	114	122	131	141	152	164	177	191	206
RIAU	114	122	131	141	152	164	177	191	206	223
JAMBI	35	38	41	44	47	51	55	59	64	69
SOUTH SUMATERA	94	100	107	114	122	131	141	152	163	176
BENGKULU	26	28	30	32	34	37	40	43	46	50
LAMPUNG	112	120	129	138	148	159	171	184	198	214
BANGKA BELITUNG ISLANDS	20	22	24	26	28	30	32	34	37	40
RIAU ISLANDS	39	42	45	48	51	55	59	63	68	73
DKI JAKARTA	207	220	234	249	265	283	303	325	348	375
WEST JAVA	766	817	871	929	993	1063	1138	1221	1310	1410
CENTRAL JAVA	519	554	593	635	681	731	785	844	907	977



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
DI YOGYAKARTA	84	89	95	102	109	117	126	136	146	157
EAST JAVA	645	687	732	781	834	892	954	1022	1095	1175
BANTEN	307	327	348	371	396	423	453	486	521	560
BALI	135	144	154	165	177	190	204	219	235	253
WEST NUSA TENGGARA	114	122	131	141	152	164	177	191	206	223
EAST NUSA TENGGARA	63	67	72	77	82	88	94	101	108	116
WEST KALIMANTAN	49	53	57	61	66	71	76	82	88	95
CENTRAL KALIMANTAN	38	40	43	46	49	53	57	61	66	71
SOUTH KALIMANTAN	56	60	64	69	74	79	85	91	98	106
EAST KALIMANTAN	52	56	62	69	76	84	92	101	110	120
NORTH KALIMANTAN	14	15	16	17	18	19	20	22	24	26
NORTH SULAWESI	74	78	83	89	95	102	109	117	125	134
CENTRAL SULAWESI	50	53	56	60	64	68	73	78	84	90
SOUTH SULAWESI	108	115	122	130	138	147	157	168	179	191
SOUTHEAST SULAWESI	46	49	52	56	60	64	69	74	79	85
GORONTALO	21	22	24	26	28	30	32	34	36	39
WEST SULAWESI	16	17	18	19	20	21	22	24	26	28
MALUKU	26	28	30	32	34	36	39	42	45	48
NORTH MALUKU	23	25	27	29	31	33	36	39	42	45
WEST PAPUA	18	19	20	21	22	23	25	27	29	31
SOUTHWEST PAPUA	12	13	14	15	16	17	18	19	21	23
SOUTH PAPUA	9	9	10	11	12	13	14	15	16	17
CENTRAL PAPUA	17	18	19	20	21	23	25	27	29	31
HIGHLAND PAPUA	16	17	18	19	20	21	22	23	24	25
PAPUA	20	22	23	24	26	28	30	32	34	36

## 8. Radiologist

Based on calculations using the supply–demand method, the demand for radiologists in Indonesia was estimated at 3.465 in 2023. With a supply of 2.050 radiologists, this resulted in a shortage of 1.415 (40,8%) in 2023. The demand for radiologists is projected to increase annually. By 2025, the demand is estimated to reach 3.870, and expected to continue rising to 5.663 in 2030. By 2032, the demand is projected at 6.597 radiologists. In 2024, the number of radiology graduates is estimated at 154, and from 2025 to 2032, approximately 272 radiologists are expected to graduate each year, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage of radiologists in 2032, with a deficit of 51,3%.



Table 21. Projected Demand for Radiologists in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	3.465	2.050	1.415	40,8%
2024	3.590	2.173	1.417	39,5%
2025	3.870	2.310	1.560	40,3%
2026	4.175	2.445	1.730	41,4%
2027	4.505	2.578	1.927	42,8%
2028	4.862	2.709	2.153	44,3%
2029	5.247	2.838	2.409	45,9%
2030	5.663	2.965	2.698	47,6%
2031	6.112	3.091	3.021	49,4%
2032	6.597	3.215	3.382	51,3%

Provincial demand for radiologists increases annually, driven by population growth, disease prevalence, and the epidemiological burden in each province. The provinces with the highest demand each year are West Java, Central Java, East Java, and DKI Jakarta.

Table 22. Projected Demand for Radiologists in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	72	78	84	91	98	106	114	123	133	144
NORTH SUMATERA	215	233	252	273	296	321	348	377	408	442
WEST SUMATERA	72	78	84	91	99	107	116	126	136	147
RIAU	100	108	117	127	138	150	163	177	192	208
JAMBI	25	27	29	31	34	37	40	43	47	51
SOUTH SUMATERA	64	69	74	80	86	93	100	108	117	126
BENGKULU	28	30	32	35	38	41	44	48	52	56
LAMPUNG	91	98	106	114	123	133	144	156	169	183
BANGKA BELITUNG ISLANDS	27	29	31	34	37	40	43	47	51	55
RIAU ISLANDS	36	39	42	45	49	53	57	62	67	72
DKI JAKARTA	256	274	293	314	337	362	389	418	449	483
WEST JAVA	571	615	662	713	768	827	892	962	1037	1119
CENTRAL JAVA	345	372	401	432	466	503	543	586	632	682
DI YOGYAKARTA	78	84	90	97	104	112	121	130	140	151
EAST JAVA	302	324	348	374	402	432	464	499	536	576
BANTEN	250	269	289	311	335	361	389	419	452	488
BALI	93	100	108	116	125	135	145	156	168	181
WEST NUSA TENGGARA	83	90	98	106	115	125	136	148	161	175
EAST NUSA TENGGARA	30	32	35	38	41	44	48	52	56	61
WEST KALIMANTAN	37	40	43	46	50	54	58	63	68	74
CENTRAL KALIMANTAN	32	35	38	41	44	48	52	56	61	66



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
SOUTH KALIMANTAN	57	62	67	72	78	84	91	98	106	115
EAST KALIMANTAN	64	71	80	90	100	111	123	135	149	163
NORTH KALIMANTAN	13	14	15	16	17	18	20	22	24	26
NORTH SULAWESI	59	63	68	73	78	84	90	97	104	112
CENTRAL SULAWESI	66	71	76	82	88	95	102	110	119	128
SOUTH SULAWESI	123	132	142	153	164	176	189	203	218	234
SOUTHEAST SULAWESI	21	23	25	27	29	31	34	37	40	43
GORONTALO	27	29	31	33	36	39	42	45	49	53
WEST SULAWESI	17	18	19	21	23	25	27	29	31	33
MALUKU	18	19	21	23	25	27	29	31	33	36
NORTH MALUKU	11	12	13	14	15	16	17	18	20	22
WEST PAPUA	9	10	11	12	13	14	15	16	17	18
SOUTHWEST PAPUA	7	8	9	10	11	12	13	14	15	16
SOUTH PAPUA	9	10	11	12	13	14	15	16	17	18
CENTRAL PAPUA	6	6	7	8	9	10	11	12	13	14
HIGHLAND PAPUA	6	6	6	6	6	6	6	6	6	6
PAPUA	11	12	13	14	15	16	17	18	19	20

## 9. Clinical Pathologist

Based on calculations using the supply–demand method, the demand for clinical pathologists in Indonesia was estimated at 3.005 in 2023. With a supply of 1.922 clinical pathologists, this resulted in a shortage of 1.083 (36,0%) in 2023. The demand for clinical pathologists is projected to increase annually. By 2025, the demand is estimated to reach 3.487, and expected to continue rising to 5.089 in 2030. By 2032, the demand is projected at 5.925 clinical pathologists. Each year, approximately 272 clinical pathologists are expected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage of clinical pathologists in 2032, with a deficit of 49,4%.

Table 23. Projected Demand for Clinical Pathologists in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	3.005	1.922	1.083	36,0%
2024	3.236	2.049	1.187	36,7%
2025	3.487	2.174	1.313	37,7%
2026	3.757	2.297	1.460	38,9%
2027	4.052	2.419	1.633	40,3%
2028	4.370	2.539	1.831	41,9%
2029	4.716	2.657	2.059	43,7%
2030	5.089	2.773	2.316	45,5%
2031	5.491	2.887	2.604	47,4%



Year	Demand	Supply	Gap	Gap Percentage
2032	5.925	3.000	2.925	49,4%

Provincial demand for clinical pathologists increases annually, driven by population growth, disease prevalence, and the epidemiological burden in each province. The provinces with the highest demand each year are West Java, Central Java, East Java, and DKI Jakarta.

Table 24. Projected Demand for Clinical Pathologists in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	46	50	54	58	63	68	73	79	85	92
NORTH SUMATERA	208	225	244	264	286	310	336	364	394	427
WEST SUMATERA	41	44	48	52	56	61	66	71	77	83
RIAU	46	50	54	58	63	68	74	80	87	94
JAMBI	34	37	40	43	47	51	55	60	65	70
SOUTH SUMATERA	31	33	36	39	42	45	49	53	57	62
BENGKULU	40	43	46	50	54	58	63	68	74	80
LAMPUNG	36	39	42	45	49	53	57	62	67	72
BANGKA BELITUNG ISLANDS	17	18	19	21	23	25	27	29	31	34
RIAU ISLANDS	38	41	44	48	52	56	61	66	71	77
DKI JAKARTA	228	244	261	280	300	322	346	372	400	430
WEST JAVA	522	562	605	652	702	756	815	879	948	1023
CENTRAL JAVA	314	338	364	392	423	456	492	531	573	618
DI YOGYAKARTA	80	86	93	100	108	116	125	135	146	157
EAST JAVA	277	297	319	343	369	397	427	459	493	530
BANTEN	138	148	159	171	184	198	213	230	248	268
BALI	119	128	138	148	159	171	184	198	213	229
WEST NUSA TENGGARA	133	144	156	169	183	199	216	235	255	277
EAST NUSA TENGGARA	42	45	49	53	57	62	67	72	78	84
WEST KALIMANTAN	34	37	40	43	46	50	54	58	63	68
CENTRAL KALIMANTAN	26	28	30	32	35	38	41	44	48	52
SOUTH KALIMANTAN	37	40	43	46	50	54	58	63	68	74
EAST KALIMANTAN	42	46	52	58	65	72	80	88	97	106
NORTH KALIMANTAN	10	11	12	13	14	15	16	17	18	20
NORTH SULAWESI	76	82	88	95	102	110	118	127	137	147
CENTRAL SULAWESI	25	27	29	31	33	36	39	42	45	49
SOUTH SULAWESI	175	188	202	217	233	250	269	289	311	334
SOUTHEAST SULAWESI	31	34	37	40	43	46	50	54	58	63
GORONTALO	21	23	25	27	29	31	33	36	39	42



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
WEST SULAWESI	26	28	30	32	35	38	41	44	47	51
MALUKU	24	26	28	30	32	35	38	41	44	48
NORTH MALUKU	15	16	17	18	20	22	24	26	28	30
WEST PAPUA	15	16	17	18	19	20	22	24	26	28
SOUTHWEST PAPUA	14	15	16	17	18	19	21	23	25	27
SOUTH PAPUA	11	12	13	14	15	16	17	18	20	21
CENTRAL PAPUA	9	10	11	12	13	14	15	16	17	18
HIGHLAND PAPUA	7	7	7	7	7	7	7	7	7	7
PAPUA	17	18	19	21	23	25	27	29	31	33

## 10. Cardiologist

Based on calculations using the supply–demand method, the demand for cardiologists in Indonesia was estimated at 6.041 in 2023. With a supply of 1.745 cardiologists, this resulted in a shortage of 4.296 (71,1%) in 2023. The demand for cardiologists is projected to increase annually. By 2025, the demand is estimated to reach 6.515, and expected to continue rising to 9.027 in 2030. By 2032, the demand is projected at 10.596 cardiologists. Each year, approximately 210 cardiologists are expected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage of cardiologists in 2032, with a deficit of 68,8%.

Table 25. Projected Demand for Cardiologists in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	6.041	1.745	4.296	71,1%
2024	6.267	1.929	4.338	69,2%
2025	6.515	2.110	4.405	67,6%
2026	6.789	2.288	4.501	66,3%
2027	7.542	2.464	5.078	67,3%
2028	7.872	2.637	5.235	66,5%
2029	8.392	2.807	5.585	66,6%
2030	9.027	2.975	6.052	67,0%
2031	9.711	3.140	6.571	67,7%
2032	10.596	3.303	7.293	68,8%

Provincial demand for cardiologists increases annually, driven by population growth, disease prevalence, and the epidemiological burden in each province. The provinces with the highest demand each year are West Java, East Java, Central Java, and DKI Jakarta.



Table 26. Projected Demand for Cardiologists in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	44	46	48	50	52	54	58	63	68	74
NORTH SUMATERA	300	311	324	339	377	394	421	453	488	533
WEST SUMATERA	163	169	175	182	202	210	223	240	258	281
RIAU	127	133	140	148	165	174	187	203	220	242
JAMBI	44	46	48	50	56	59	63	68	74	81
SOUTH SUMATERA	156	162	169	176	196	205	219	236	255	279
BENGKULU	27	28	29	30	33	35	37	40	43	47
LAMPUNG	133	138	143	149	166	173	185	199	214	234
BANGKA BELITUNG ISLANDS	24	25	26	27	30	31	33	36	39	43
RIAU ISLANDS	30	31	33	35	39	41	44	48	52	58
DKI JAKARTA	570	592	616	643	718	750	801	863	929	1015
WEST JAVA	1.230	1277	1328	1386	1537	1608	1716	1848	1990	2173
CENTRAL JAVA	739	763	790	820	910	945	1004	1075	1151	1251
DI YOGYAKARTA	140	144	148	152	168	173	183	195	207	224
EAST JAVA	816	840	868	899	995	1032	1094	1169	1250	1355
BANTEN	261	273	286	301	337	355	382	414	449	494
BALI	196	202	209	216	240	249	264	282	301	327
WEST NUSA TENGGARA	139	145	151	158	177	186	200	217	235	259
EAST NUSA TENGGARA	41	43	45	47	52	54	57	61	66	72
WEST KALIMANTAN	66	68	71	74	82	86	92	99	107	117
CENTRAL KALIMANTAN	33	34	36	38	42	44	47	51	55	60
SOUTH KALIMANTAN	66	68	71	74	82	86	92	99	107	117
EAST KALIMANTAN	110	116	125	134	153	164	179	196	215	238
NORTH KALIMANTAN	14	15	16	17	19	20	22	24	26	29
NORTH SULAWESI	94	97	100	104	115	119	126	135	144	156
CENTRAL SULAWESI	46	48	50	52	58	61	65	70	76	83
SOUTH SULAWESI	297	306	317	329	364	379	402	431	462	503
SOUTHEAST SULAWESI	44	46	48	50	56	59	63	68	74	81
GORONTALO	16	17	18	19	21	22	23	25	27	30
WEST SULAWESI	14	15	16	17	19	20	21	23	25	27
MALUKU	29	30	31	32	35	36	38	41	44	48
NORTH MALUKU	11	12	13	14	16	17	18	19	21	23
WEST PAPUA	6	6	6	6	7	7	7	8	9	10
SOUTHWEST PAPUA	8	8	8	8	9	10	11	12	13	14



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
SOUTH PAPUA	1	1	1	1	1	1	1	1	1	1
CENTRAL PAPUA	2	2	2	2	2	2	2	2	2	2
HIGHLAND PAPUA	2	2	2	2	2	2	2	2	2	2
PAPUA	8	8	8	8	9	9	10	11	12	13

## 11. Radiation Oncologist

Based on calculations using the supply–demand method, Indonesia’s demand for radiation oncologists in 2023 was estimated at 343. With a supply of 151 radiation oncologists, this resulted in a gap of 192 radiation oncologists (56,0%) in 2023. The demand for radiation oncologists is projected to increase annually, reaching 348 in 2025, 374 in 2030, and 384 by 2032. During 2024–2027, the number of graduates is estimated at 12 per year, increasing to 18 in 2028 and 24 per year during 2029–2032, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a gap in radiation oncologists by 2032 (20,8%).

Table 27. Projection of Radiation Oncologists Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	343	151	192	56,0%
2024	345	162	183	53,0%
2025	348	173	175	50,3%
2026	353	184	169	47,9%
2027	361	195	166	46,0%
2028	369	212	157	42,5%
2029	371	235	136	36,7%
2030	374	258	116	31,0%
2031	380	281	99	26,1%
2032	384	304	80	20,8%

Provincial demand for radiation oncologists increases annually, driven by population growth, disease prevalence, and each province's epidemiological burden. The provinces with the highest annual demand are Central Java, East Java, West Java, and Banten.

Table 28. Projection of Radiation Oncologists Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	12	12	12	12	13	13	13	13	13	14
NORTH SUMATERA	16	16	16	16	17	17	17	17	18	18
WEST SUMATERA	7	7	7	7	8	8	8	8	8	8
RIAU	8	8	8	9	9	9	9	9	9	9
JAMBI	3	3	3	3	3	3	3	4	4	4
SOUTH SUMATERA	11	11	11	11	11	11	11	12	12	12
BENGKULU	3	3	3	3	3	3	3	3	3	3



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
LAMPUNG	9	9	9	9	9	10	10	10	10	10
BANGKA BELITUNG ISLANDS	2	2	2	2	2	2	2	2	2	2
RIAU ISLANDS	3	3	3	3	3	3	3	3	3	3
DKI JAKARTA	13	13	13	13	13	13	13	13	13	13
WEST JAVA	53	54	55	56	56	57	58	58	59	60
CENTRAL JAVA	56	57	57	58	59	60	60	61	62	62
DI YOGYAKARTA	7	7	7	7	7	7	7	7	7	7
EAST JAVA	55	55	56	57	57	58	59	59	60	60
BANTEN	20	20	20	20	21	21	21	21	22	22
BALI	7	7	7	7	7	7	7	7	8	8
WEST NUSA TENGGARA	5	5	5	5	5	6	6	6	6	6
EAST NUSA TENGGARA	2	2	2	2	2	3	3	3	3	3
WEST KALIMANTAN	4	4	4	4	4	4	4	4	4	4
CENTRAL KALIMANTAN	2	2	2	2	2	2	2	2	2	2
SOUTH KALIMANTAN	6	6	7	7	7	7	7	7	7	7
EAST KALIMANTAN	5	5	5	5	6	6	6	6	6	7
NORTH KALIMANTAN	1	1	1	1	1	1	1	1	1	1
NORTH SULAWESI	3	3	3	3	3	4	4	4	4	4
CENTRAL SULAWESI	2	2	2	2	2	2	2	2	2	3
SOUTH SULAWESI	14	14	14	14	14	15	15	15	15	15
SOUTHEAST SULAWESI	3	3	3	3	3	3	3	3	3	3
GORONTALO	1	1	1	1	1	1	1	1	1	1
WEST SULAWESI	1	1	1	1	1	1	1	1	1	1
MALUKU	1	1	1	1	2	2	2	2	2	2
NORTH MALUKU	2	2	2	2	2	2	2	2	2	2
WEST PAPUA	1	1	1	1	1	1	1	1	1	1
SOUTHWEST PAPUA	1	1	1	1	1	1	1	1	1	1
SOUTH PAPUA	1	1	1	1	1	1	1	1	1	1
CENTRAL PAPUA	1	1	1	2	2	2	2	2	2	2
HIGHLAND PAPUA	1	1	1	1	2	2	2	2	2	2
PAPUA	1	1	1	1	1	1	1	1	1	1



## 12. Neurologist

Based on calculations using the supply–demand method, Indonesia’s demand for neurologists in 2023 was estimated at 2.741 persons. With a supply of 2.425 neurologists, this resulted in a gap of 316 neurologists (11,5%) in 2023. The demand for neurologists is projected to increase annually, reaching 2.885 in 2025, 3.715 in 2030, and 4.329 by 2032. Each year, an estimated 210 graduates, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a gap in neurologists by 2032 (8,1%).

Table 29. Projection of Neurologists Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	2.741	2.425	316	11,5%
2024	2.804	2.599	205	7,3%
2025	2.885	2.770	115	4,0%
2026	2.987	2.938	49	1,6%
2027	3.202	3.104	98	3,1%
2028	3.333	3.267	66	2,0%
2029	3.503	3.428	75	2,1%
2030	3.715	3.587	128	3,4%
2031	3.943	3.743	200	5,1%
2032	4.239	3.897	342	8,1%

Provincial demand for neurologists increases annually, driven by population growth, disease prevalence, and each province's epidemiological burden. The provinces with the highest annual demand are West Java, Central Java, East Java, and the Special Capital Region of Jakarta.

Table 30. Projection of Neurologists Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	29	30	31	32	34	36	38	40	43	46
NORTH SUMATERA	104	107	110	114	122	127	133	141	149	160
WEST SUMATERA	63	65	67	70	76	79	83	88	94	102
RIAU	58	60	62	65	70	73	77	82	88	95
JAMBI	22	23	24	25	27	28	30	32	34	37
SOUTH SUMATERA	109	112	115	119	127	133	140	149	158	170
BENGKULU	9	9	9	9	10	10	10	11	12	13
LAMPUNG	64	66	68	70	75	78	82	87	92	99
BANGKA BELITUNG ISLANDS	9	9	9	9	10	10	11	12	13	14
RIAU ISLANDS	30	31	32	33	36	38	40	43	46	50
DKI JAKARTA	239	244	250	258	277	287	301	319	338	363
WEST JAVA	565	578	594	615	657	684	718	760	805	865
CENTRAL JAVA	344	351	361	373	400	416	436	461	488	524
DI YOGYAKARTA	50	51	52	54	58	60	63	66	70	75
EAST JAVA	293	298	305	314	336	348	364	384	406	434



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
BANTEN	125	129	133	138	148	155	164	175	187	202
BALI	92	94	96	99	106	110	116	123	130	139
WEST NUSA TENGGARA	66	68	70	73	78	82	86	92	98	106
EAST NUSA TENGGARA	20	21	22	23	25	26	27	29	31	33
WEST KALIMANTAN	26	27	28	29	31	32	34	36	38	41
CENTRAL KALIMANTAN	9	9	9	9	10	10	10	11	12	13
SOUTH KALIMANTAN	38	39	40	42	45	47	50	54	58	63
EAST KALIMANTAN	71	75	81	87	96	103	112	122	133	146
NORTH KALIMANTAN	4	4	4	4	4	4	4	4	4	4
NORTH SULAWESI	33	34	35	36	39	40	42	44	46	49
CENTRAL SULAWESI	29	30	31	32	34	36	38	40	43	46
SOUTH SULAWESI	161	165	170	176	188	196	205	217	230	247
SOUTHEAST SULAWESI	15	16	17	18	19	20	21	22	23	25
GORONTALO	5	5	5	5	5	5	5	5	5	5
WEST SULAWESI	5	5	5	5	5	5	5	5	5	5
MALUKU	9	9	9	9	10	10	11	12	13	14
NORTH MALUKU	23	24	25	26	28	29	31	33	35	38
WEST PAPUA	2	2	2	2	2	2	2	2	2	2
SOUTHWEST PAPUA	3	3	3	3	3	3	3	3	3	3
SOUTH PAPUA	1	1	1	1	1	1	1	1	1	1
CENTRAL PAPUA	4	4	4	4	4	4	4	4	4	4
HIGHLAND PAPUA	1	1	1	1	1	1	1	1	1	1
PAPUA	5	5	5	5	5	5	5	5	5	5

### 13. Urologist

Based on calculations using the supply–demand method, Indonesia’s demand for urologists in 2023 was estimated at 1.049 persons. With a supply of 536 urologists, this resulted in a gap of 414 urologists (39,5%) in 2023. The demand for urologists is projected to increase annually, reaching 1.167 in 2025, 1.560 in 2030, and 1.767 by 2032. Each year, an estimated 52 urologists graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a gap in urologists by 2032 (43,70%).

Table 31. Projection of Urologists Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	1.049	635	414	39,50%
2024	1.106	677	429	38,80%
2025	1.167	719	448	38,40%
2026	1.234	760	474	38,40%



Year	Demand	Supply	Gap	Gap Percentage
2027	1.308	801	507	38,80%
2028	1.387	841	546	39,40%
2029	1.470	880	590	40,10%
2030	1.560	919	641	41,10%
2031	1.656	957	699	42,20%
2032	1.767	995	772	43,70%

Provincial demand for urologists increases annually, driven by population growth, disease prevalence, and the epidemiological burden in each province. The provinces with the highest annual demand are West Java, East Java, Central Java, the Special Capital Region of Jakarta, and North Sumatra.

Table 32. Projection of Urologists Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	17	18	19	20	21	22	23	24	25	27
NORTH SUMATERA	62	66	70	74	79	84	90	96	103	111
WEST SUMATERA	16	17	18	19	20	21	22	23	24	26
RIAU	23	24	25	27	29	31	33	35	37	40
JAMBI	9	10	11	12	13	14	15	16	17	18
SOUTH SUMATERA	25	26	27	28	30	32	34	36	38	40
BENGKULU	10	11	12	13	14	15	16	17	18	19
LAMPUNG	29	31	33	35	37	39	42	45	48	51
BANGKA BELITUNG ISLANDS	5	5	5	5	5	5	5	5	5	5
RIAU ISLANDS	6	6	6	6	6	6	6	6	6	6
DKI JAKARTA	62	65	68	72	76	81	86	92	98	105
WEST JAVA	193	204	215	227	240	255	271	289	308	330
CENTRAL JAVA	143	151	159	168	178	189	200	212	225	240
DI YOGYAKARTA	24	25	26	28	30	32	34	36	38	41
EAST JAVA	146	154	162	171	181	191	202	214	227	242
BANTEN	42	45	48	51	54	58	62	67	72	78
BALI	39	41	43	45	48	51	54	57	61	65
WEST NUSA TENGGARA	26	27	29	31	33	35	37	39	42	45
EAST NUSA TENGGARA	12	13	14	15	16	17	18	19	20	21
WEST KALIMANTAN	11	12	13	14	15	16	17	18	19	20
CENTRAL KALIMANTAN	8	9	10	11	12	13	14	15	16	17
SOUTH KALIMANTAN	10	10	11	12	13	14	15	16	17	18
EAST KALIMANTAN	16	17	19	21	23	25	27	29	31	33
NORTH KALIMANTAN	2	3	3	3	3	3	3	3	3	3



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
NORTH SULAWESI	17	18	19	20	21	22	23	25	27	29
CENTRAL SULAWESI	10	10	11	12	13	14	15	16	17	18
SOUTH SULAWESI	44	46	48	50	53	56	59	62	65	69
SOUTHEAST SULAWESI	11	12	13	14	15	16	17	18	19	20
GORONTALO	6	6	6	6	6	6	6	6	6	6
WEST SULAWESI	4	4	4	4	4	4	4	4	4	4
MALUKU	7	8	8	8	8	8	8	8	8	8
NORTH MALUKU	2	2	2	2	2	2	2	2	2	2
WEST PAPUA	3	3	3	3	3	3	3	3	3	3
SOUTHWEST PAPUA	2	2	2	2	2	2	2	2	2	2
SOUTH PAPUA	1	1	1	1	1	1	1	1	1	1
CENTRAL PAPUA	1	1	1	1	1	1	1	1	1	1
HIGHLAND PAPUA	1	1	1	1	1	1	1	1	1	1
PAPUA	2	2	2	2	2	2	2	2	2	2

#### 14. Psychiatrist

Based on calculations using the supply–demand method, Indonesia’s demand for psychiatrists in 2023 was estimated at 3.354. With an available supply of 1.349 psychiatrists, there was a shortage of 2.005 psychiatrists (59,8%) in 2023. The demand for psychiatrists is projected to increase annually, reaching 3.783 in 2025 and continuing to rise to 5.176 in 2030. By 2032, the demand is projected to reach 5.896 psychiatrists. Each year, approximately 168 psychiatrists are expected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to remain unable to meet the demand for psychiatrists by 2032, with an estimated shortage of 55,9%.

Table 33. Projection of Psychiatrists Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	3.354	1.349	2.005	59,8%
2024	3.562	1.497	2.065	58,0%
2025	3.783	1.643	2.140	56,6%
2026	4.024	1.786	2.238	55,6%
2027	4.281	1.927	2.354	55,0%
2028	4.558	2.066	2.492	54,7%
2029	4.855	2.203	2.652	54,6%
2030	5.176	2.338	2.838	54,8%
2031	5.520	2.471	3.049	55,2%
2032	5.896	2.602	3.294	55,9%

Provincial demand for psychiatrists increases each year, driven by population growth, disease prevalence, and the epidemiological burden in each province. The provinces with the highest annual demand are Central Java, West Java, East Java, and DKI Jakarta.



Table 34. Projection of Psychiatrists Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	52	56	60	64	68	73	78	84	90	97
NORTH SUMATERA	53	56	59	62	65	68	72	76	80	84
WEST SUMATERA	47	50	54	58	62	66	71	76	82	88
RIAU	76	81	86	92	98	105	112	120	129	139
JAMBI	3	3	3	3	3	3	3	3	3	3
SOUTH SUMATERA	51	54	57	60	64	68	72	76	81	86
BENGKULU	3	3	3	3	3	3	3	3	3	3
LAMPUNG	55	59	63	68	73	79	85	92	100	108
BANGKA BELITUNG ISLANDS	7	8	9	10	11	12	13	14	15	16
RIAU ISLANDS	10	11	12	13	14	15	16	17	18	19
DKI JAKARTA	391	410	430	452	476	501	529	559	591	627
WEST JAVA	519	550	582	617	655	696	740	787	837	892
CENTRAL JAVA	547	580	615	653	693	736	782	832	885	943
DI YOGYAKARTA	58	62	66	71	76	81	87	93	100	107
EAST JAVA	457	483	511	541	573	607	643	682	723	767
BANTEN	105	111	117	124	131	139	147	156	166	177
BALI	113	122	132	143	155	168	182	198	215	234
WEST NUSA TENGGARA	128	137	147	158	170	183	197	212	228	246
EAST NUSA TENGGARA	7	8	9	10	11	12	13	14	15	16
WEST KALIMANTAN	56	60	64	68	72	77	82	87	93	99
CENTRAL KALIMANTAN	31	33	35	37	40	43	46	49	53	57
SOUTH KALIMANTAN	77	82	87	93	99	106	113	121	129	138
EAST KALIMANTAN	67	71	77	83	90	97	104	112	120	128
NORTH KALIMANTAN	9	10	11	12	13	14	15	16	17	18
NORTH SULAWESI	106	113	121	129	138	148	159	171	183	197
CENTRAL SULAWESI	97	104	111	119	127	136	146	156	167	179
SOUTH SULAWESI	177	190	204	219	235	252	271	292	314	339
SOUTHEAST SULAWESI	18	19	20	22	24	26	28	30	32	35
GORONTALO	3	3	3	3	3	3	3	3	3	3
WEST SULAWESI	16	17	18	19	20	21	22	23	25	27
MALUKU	0	0	0	0	0	0	0	0	0	0
NORTH MALUKU	1	1	1	1	1	1	1	1	1	1
WEST PAPUA	0	0	0	0	0	0	0	0	0	0
SOUTHWEST PAPUA	0	0	0	0	0	0	0	0	0	0



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
SOUTH PAPUA	0	0	0	0	0	0	0	0	0	0
CENTRAL PAPUA	0	0	0	0	0	0	0	0	0	0
HIGHLAND PAPUA	12	13	14	15	16	17	18	19	20	21
PAPUA	2	2	2	2	2	2	2	2	2	2

## 15. Thoracic and Cardiovascular Surgeon

Based on calculations using the supply–demand method, Indonesia’s demand for thoracic and cardiovascular surgeons in 2023 was estimated at 1.345 specialists. With an available supply of 190 thoracic and cardiovascular surgeons, this resulted in a shortage of 1.155 specialists (85,9%) in 2023. The demand for thoracic and cardiovascular surgeons is projected to increase annually, reaching 1.392 in 2025 and continuing to rise to 1.480 in 2030. By 2032, the demand is projected to reach 1.532 thoracic and cardiovascular surgeons. Each year, approximately 16 thoracic and cardiovascular surgeons are expected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage of thoracic and cardiovascular surgeons by 2032, with an estimated gap of 80,3%.

Table 35. Projection of Thoracic and Cardiovascular Surgeons Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	1.345	190	1.155	85,9%
2024	1.369	203	1.166	85,2%
2025	1.392	216	1.176	84,5%
2026	1.417	229	1.188	83,8%
2027	1.443	242	1.201	83,2%
2028	1.457	254	1.203	82,6%
2029	1.455	266	1.189	81,7%
2030	1.480	278	1.202	81,2%
2031	1.506	290	1.216	80,7%
2032	1.532	302	1.230	80,3%

Provincial demand for thoracic and cardiovascular surgeons increases each year, driven by population growth, disease prevalence, and the epidemiological burden in each province. The provinces with the highest annual demand are West Java, East Java, Central Java, and DKI Jakarta.



Table 36. Projection of Thoracic and Cardiovascular Surgeons Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	18	18	18	18	18	18	18	18	18	18
NORTH SUMATERA	76	78	80	82	84	85	85	87	89	91
WEST SUMATERA	44	45	46	47	48	49	49	50	51	52
RIAU	32	33	34	35	36	37	37	38	39	40
JAMBI	8	8	8	8	8	8	8	8	8	8
SOUTH SUMATERA	45	46	47	48	49	50	50	51	52	53
BENGKULU	5	5	5	5	5	5	5	5	5	5
LAMPUNG	35	36	37	38	39	39	39	40	41	42
BANGKA BELITUNG ISLANDS	3	3	3	3	3	3	3	3	3	3
RIAU ISLANDS	7	7	7	7	7	7	7	7	7	7
DKI JAKARTA	170	172	174	176	178	179	178	180	182	184
WEST JAVA	213	217	220	224	228	230	229	233	237	241
CENTRAL JAVA	197	200	203	207	211	213	212	215	218	221
DI YOGYAKARTA	36	37	38	39	40	40	40	41	42	43
EAST JAVA	186	189	192	195	198	199	198	201	204	207
BANTEN	43	44	45	46	47	47	47	48	49	50
BALI	36	37	38	39	40	40	40	41	42	43
WEST NUSA TENGGARA	28	29	30	31	32	33	33	34	35	36
EAST NUSA TENGGARA	6	6	6	6	6	6	6	6	6	6
WEST KALIMANTAN	15	15	15	15	15	15	15	15	15	15
CENTRAL KALIMANTAN	7	7	7	7	7	7	7	7	7	7
SOUTH KALIMANTAN	16	16	16	16	16	16	16	16	16	16
EAST KALIMANTAN	21	22	23	24	25	26	27	28	29	30
NORTH KALIMANTAN	2	2	2	2	2	2	2	2	2	2
NORTH SULAWESI	24	24	24	24	24	24	24	24	24	24
CENTRAL SULAWESI	5	5	5	5	5	5	5	5	5	5
SOUTH SULAWESI	50	51	52	53	54	55	55	56	57	58
SOUTHEAST SULAWESI	5	5	5	5	5	5	5	5	5	5
GORONTALO	4	4	4	4	4	4	4	4	4	4
WEST SULAWESI	1	1	1	1	1	1	1	1	1	1
MALUKU	2	2	2	2	2	2	2	2	2	2
NORTH MALUKU	2	2	2	2	2	2	2	2	2	2
WEST PAPUA	1	1	1	1	1	1	1	1	1	1
SOUTHWEST PAPUA	0	0	0	0	0	0	0	0	0	0



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
SOUTH PAPUA	0	0	0	0	0	0	0	0	0	0
CENTRAL PAPUA	0	0	0	0	0	0	0	0	0	0
HIGHLAND PAPUA	0	0	0	0	0	0	0	0	0	0
PAPUA	2	2	2	2	3	4	5	6	8	10

## 16. Anatomical Pathologist

Based on calculations using the supply–demand method, Indonesia’s demand for anatomical pathologists in 2023 was estimated at 2.051 specialists. With an available supply of 788 anatomical pathologists, this resulted in a shortage of 1.263 specialists (61,6%) in 2023. The demand for anatomical pathologists is projected to increase annually, reaching 2.385 in 2025 and continuing to rise to 3.480 in 2030. By 2032, the demand is projected to reach 4.051 anatomical pathologists. Each year, approximately 72 anatomical pathologists are expected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage of anatomical pathologists by 2032, with an estimated gap of 68,0%.

Table 37. Projection of Anatomical Pathologists Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	2.051	788	1.263	61,6%
2024	2.212	845	1.367	61,8%
2025	2.385	904	1.481	62,1%
2026	2.572	962	1.610	62,6%
2027	2.771	1.020	1.751	63,2%
2028	2.987	1.077	1.910	63,9%
2029	3.224	1.133	2.091	64,9%
2030	3.480	1.188	2.292	65,9%
2031	3.756	1.242	2.514	66,9%
2032	4.051	1.295	2.756	68,0%

Provincial demand for anatomical pathologists increases each year, driven by population growth, disease prevalence, and the epidemiological burden in each province. The provinces with the highest annual demand are West Java, Central Java, East Java, and DKI Jakarta.

Table 38. Projection of Anatomical Pathologists Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	47	51	55	59	64	69	74	80	86	93
NORTH SUMATERA	81	88	95	103	112	121	131	142	154	167
WEST SUMATERA	51	55	60	65	70	76	82	89	96	104
RIAU	56	61	66	71	77	83	90	98	106	115
JAMBI	33	36	39	42	45	49	53	57	62	67
SOUTH SUMATERA	57	62	67	72	78	84	91	98	106	114



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
BENGKULU	20	22	24	26	28	30	32	35	38	41
LAMPUNG	52	56	60	65	70	76	82	89	96	104
BANGKA BELITUNG ISLANDS	14	15	16	17	18	19	21	23	25	27
RIAU ISLANDS	15	16	17	18	19	21	23	25	27	29
DKI JAKARTA	82	88	94	101	108	116	125	134	144	155
WEST JAVA	336	362	390	420	452	487	525	566	610	658
CENTRAL JAVA	294	317	342	369	398	429	463	500	540	583
DI YOGYAKARTA	45	48	52	56	60	65	70	75	81	87
EAST JAVA	223	240	258	277	298	320	344	370	398	428
BANTEN	29	31	33	36	39	42	45	49	53	57
BALI	66	71	76	82	88	95	102	110	118	127
WEST NUSA TENGGARA	59	64	69	75	81	88	96	104	113	123
EAST NUSA TENGGARA	32	35	38	41	44	48	52	56	61	66
WEST KALIMANTAN	39	42	45	49	53	57	62	67	72	78
CENTRAL KALIMANTAN	21	23	25	27	29	31	34	37	40	43
SOUTH KALIMANTAN	26	28	30	32	35	38	41	44	48	52
EAST KALIMANTAN	26	29	33	37	41	45	50	55	61	67
NORTH KALIMANTAN	13	14	15	16	17	18	20	22	24	26
NORTH SULAWESI	59	63	68	73	78	84	90	97	104	112
CENTRAL SULAWESI	36	39	42	45	49	53	57	61	66	71
SOUTH SULAWESI	107	115	124	133	143	154	166	178	191	205
SOUTHEAST SULAWESI	22	24	26	28	30	32	35	38	41	44
GORONTALO	17	18	19	21	23	25	27	29	31	33
WEST SULAWESI	12	13	14	15	16	17	18	19	21	23
MALUKU	30	32	35	38	41	44	47	51	55	59
NORTH MALUKU	13	14	15	16	17	18	20	22	24	26
WEST PAPUA	41	44	47	51	55	59	63	68	73	78
SOUTHWEST PAPUA	5	5	5	5	5	5	5	5	5	5
SOUTH PAPUA	7	8	9	10	11	12	13	14	15	16
CENTRAL PAPUA	6	6	7	8	9	10	11	12	13	14
HIGHLAND PAPUA	5	5	5	5	5	5	5	5	5	5
PAPUA	21	23	25	27	29	31	33	36	39	42



## 17. Pulmonologist

Based on calculations using the supply–demand method, Indonesia’s demand for pulmonologists in 2023 was estimated at 2.563 specialists. With an available supply of 1.518 pulmonologists, this resulted in a shortage of 1.045 specialists (40,8%) in 2023. The demand for pulmonologists is projected to increase annually, reaching 2.878 in 2025 and continuing to rise to 3.831 in 2030. By 2032, the demand is projected to reach 4.300 pulmonologists. Each year, approximately 168 pulmonologists are expected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage of pulmonologists by 2032, with an estimated gap of 36,0%.

Table 39. Projection of Pulmonologists Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	2.563	1.518	1.045	40,8%
2024	2.717	1.663	1.054	38,8%
2025	2.878	1.806	1.072	37,2%
2026	3.047	1.947	1.100	36,1%
2027	3.227	2.086	1.141	35,4%
2028	3.416	2.223	1.193	34,9%
2029	3.616	2.358	1.258	34,8%
2030	3.831	2.491	1.340	35,0%
2031	4.058	2.622	1.436	35,4%
2032	4.300	2.751	1.549	36,0%

Provincial demand for pulmonologists increases each year, driven by population growth, disease prevalence, and the epidemiological burden in each province. The provinces with the highest annual demand are West Java, East Java, Central Java, and DKI Jakarta.

Table 40. Projection of Pulmonologists Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	33	35	37	39	41	44	47	50	53	56
NORTH SUMATERA	164	174	185	197	210	223	237	252	268	285
WEST SUMATERA	70	75	80	85	91	97	103	110	117	125
RIAU	67	71	75	80	85	90	96	102	108	115
JAMBI	30	32	34	36	38	40	42	45	48	51
SOUTH SUMATERA	63	67	71	75	79	84	89	94	100	106
BENGKULU	15	16	17	18	19	20	21	22	23	24
LAMPUNG	42	45	48	51	54	57	61	65	69	73
BANGKA BELITUNG ISLANDS	10	11	12	13	14	15	16	17	18	19
RIAU ISLANDS	22	23	24	26	28	30	32	34	36	38
DKI JAKARTA	172	180	189	198	208	218	229	240	252	265
WEST JAVA	499	527	557	588	622	657	694	734	776	821
CENTRAL JAVA	218	231	245	259	274	290	307	325	344	364



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
DI YOGYAKARTA	52	55	58	61	65	69	73	77	82	87
EAST JAVA	334	353	373	394	416	440	465	492	520	550
BANTEN	62	66	70	74	78	82	87	92	97	103
BALI	56	59	62	66	70	74	78	83	88	93
WEST NUSA TENGGARA	95	101	107	114	121	129	137	146	155	165
EAST NUSA TENGGARA	39	42	45	48	51	54	58	62	66	70
WEST KALIMANTAN	26	28	30	32	34	36	38	40	42	45
CENTRAL KALIMANTAN	16	17	18	19	20	21	22	23	25	27
SOUTH KALIMANTAN	31	33	35	37	39	41	43	46	49	52
EAST KALIMANTAN	27	29	32	35	38	42	46	50	54	58
NORTH KALIMANTAN	4	4	4	4	4	4	4	4	4	4
NORTH SULAWESI	94	100	106	112	119	126	134	142	151	160
CENTRAL SULAWESI	41	44	47	50	53	56	59	63	67	71
SOUTH SULAWESI	167	177	187	198	210	223	236	250	265	281
SOUTHEAST SULAWESI	27	29	31	33	35	37	39	42	45	48
GORONTALO	10	11	12	13	14	15	16	17	18	19
WEST SULAWESI	9	10	11	12	13	14	15	16	17	18
MALUKU	15	16	17	18	19	20	21	22	23	25
NORTH MALUKU	11	12	13	14	15	16	17	18	19	20
WEST PAPUA	2	2	2	2	2	2	2	2	2	2
SOUTHWEST PAPUA	11	12	13	14	15	16	17	18	19	20
SOUTH PAPUA	2	2	2	2	2	2	2	2	2	2
CENTRAL PAPUA	4	4	4	4	4	4	4	4	4	4
HIGHLAND PAPUA	6	6	6	6	6	6	6	6	6	6
PAPUA	17	18	19	20	21	22	23	24	26	28

## 18. Otolaryngologist

Based on calculations using the supply–demand method, Indonesia’s demand for otolaryngologists in 2023 was estimated at 2.040 specialists. With an available supply of 1.931 specialists, 109 specialists (5,3%) were in shortage in 2023. The demand for otolaryngologists is projected to increase annually, while supply is expected to rise as the number of graduates increases. As a result, by 2025, the demand of 2.200 specialists is projected to be met with an available supply of 2.231. By 2032, the surplus gap between demand (2.858) and supply (3.517) is projected to widen to 659 specialists (+23,1%), with an estimated 255 graduates in 2032 and an attrition rate of 1,5%.



Table 41. Projection of Otolaryngologists Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	2.040	1.931	109	5,3%
2024	2.119	2.077	42	2,0%
2025	2.200	2.231	+31	+1,4%
2026	2.284	2.393	+109	+4,8%
2027	2.371	2.562	+191	+8,1%
2028	2.461	2.739	+278	+11,3%
2029	2.555	2.923	+368	+14,4%
2030	2.651	3.114	+463	+17,5%
2031	2.751	3.312	+561	+20,4%
2032	2.858	3.517	+659	+23,1%

Provincial demand for otolaryngologists increases annually, driven by population growth, disease prevalence, and the epidemiological burden in each province. The provinces with the highest annual demand are West Java, Central Java, East Java, and DKI Jakarta.

Table 42. Projection of Otolaryngologists in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	41	43	45	47	49	51	53	55	57	59
NORTH SUMATERA	51	53	55	57	59	61	64	67	70	73
WEST SUMATERA	26	27	28	29	30	31	32	33	34	36
RIAU	36	37	38	40	42	44	46	48	50	52
JAMBI	13	13	13	13	13	13	13	13	13	14
SOUTH SUMATERA	131	136	141	146	152	158	164	170	176	183
BENGKULU	13	14	15	16	17	18	19	20	21	22
LAMPUNG	67	70	73	76	79	82	85	88	91	95
BANGKA BELITUNG ISLANDS	12	13	14	15	16	17	18	19	20	21
RIAU ISLANDS	14	15	16	17	18	19	20	21	22	23
DKI JAKARTA	97	100	103	106	109	112	115	118	122	126
WEST JAVA	361	374	387	401	415	430	445	461	478	496
CENTRAL JAVA	274	284	295	306	318	330	343	356	370	384
DI YOGYAKARTA	45	47	49	51	53	55	57	59	61	63
EAST JAVA	212	220	228	236	244	253	262	272	282	292
BANTEN	137	142	147	152	157	162	168	174	180	187
BALI	66	68	70	72	75	78	81	84	87	90
WEST NUSA TENGGARA	31	32	33	34	35	37	39	41	43	45
EAST NUSA TENGGARA	12	13	14	15	16	17	18	19	20	21
WEST KALIMANTAN	30	31	32	33	34	35	36	37	38	40
CENTRAL KALIMANTAN	12	13	14	15	16	17	18	19	20	21



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
SOUTH KALIMANTAN	31	32	33	34	35	36	37	38	40	42
EAST KALIMANTAN	41	44	48	52	56	60	64	68	72	76
NORTH KALIMANTAN	6	6	6	6	6	6	6	6	6	6
NORTH SULAWESI	45	47	49	51	53	55	57	59	61	63
CENTRAL SULAWESI	21	22	23	24	25	26	27	28	29	30
SOUTH SULAWESI	125	130	135	140	145	150	156	162	168	174
SOUTHEAST SULAWESI	14	15	16	17	18	19	20	21	22	23
GORONTALO	9	9	9	9	9	9	9	9	9	9
WEST SULAWESI	35	36	37	39	41	43	45	47	49	51
MALUKU	3	3	3	3	3	3	3	3	3	3
NORTH MALUKU	3	3	3	3	3	3	3	3	3	3
WEST PAPUA	2	2	2	2	2	2	2	2	2	2
SOUTHWEST PAPUA	2	2	2	2	2	2	2	2	2	2
SOUTH PAPUA	0	0	0	0	0	0	0	0	0	0
CENTRAL PAPUA	1	1	1	1	1	1	1	1	1	1
HIGHLAND PAPUA	1	1	1	1	1	1	1	1	1	1
PAPUA	20	21	22	23	24	25	26	27	28	29

## 19. Pediatric Surgeon

Based on calculations using the supply–demand method, Indonesia’s demand for pediatric surgeons in 2023 was estimated at 853 specialists. With an available supply of 157 pediatric surgeons, this resulted in a shortage of 696 specialists (81,6%) in 2023. The demand for pediatric surgeons is projected to increase annually, reaching 932 in 2025 and continuing to rise to 1.162 in 2030. By 2032, the demand is projected to reach 1.277 pediatric surgeons. Each year, approximately 22 pediatric surgeons are expected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage of pediatric surgeons by 2032, with an estimated gap of 74,7%.

Table 43. Projection of Pediatric Surgeons Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	853	157	696	81,6%
2024	892	177	715	80,2%
2025	932	196	736	79,0%
2026	972	215	757	77,9%
2027	1.017	234	783	77,0%
2028	1.064	252	812	76,3%
2029	1.113	270	843	75,7%
2030	1.162	288	874	75,2%
2031	1.216	306	910	74,8%



Year	Demand	Supply	Gap	Gap Percentage
2032	1.277	323	954	74,7%

Provincial demand for pediatric surgeons increases annually, driven by population growth, disease prevalence, and the epidemiological burden in each province. The provinces with the highest annual demand are West Java, East Java, Central Java, and DKI Jakarta.

Table 44. Projection of Pediatric Surgeons Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	17	18	19	20	21	22	23	24	25	27
NORTH SUMATERA	44	46	48	50	53	56	59	62	65	69
WEST SUMATERA	20	21	22	23	24	25	26	27	28	30
RIAU	13	14	15	16	17	18	19	20	21	22
JAMBI	10	11	12	13	14	15	16	17	18	19
SOUTH SUMATERA	17	18	19	20	21	22	23	24	25	26
BENGKULU	8	8	8	8	8	8	8	8	8	8
LAMPUNG	10	10	10	10	11	12	13	14	15	16
BANGKA BELITUNG ISLANDS	2	2	2	2	2	2	2	2	2	2
RIAU ISLANDS	8	8	8	8	8	8	8	8	8	8
DKI JAKARTA	53	55	57	59	61	63	65	67	69	71
WEST JAVA	135	141	147	153	160	167	175	183	192	202
CENTRAL JAVA	60	63	66	69	73	77	81	85	90	95
DI YOGYAKARTA	9	9	9	9	9	9	9	9	9	10
EAST JAVA	104	109	115	121	127	134	141	148	156	165
BANTEN	21	22	23	24	25	26	27	28	29	30
BALI	31	32	33	34	35	37	39	41	43	45
WEST NUSA TENGGARA	32	34	36	38	40	42	44	46	48	50
EAST NUSA TENGGARA	12	12	12	12	12	12	12	12	12	12
WEST KALIMANTAN	11	11	11	11	11	11	11	11	11	11
CENTRAL KALIMANTAN	10	11	12	13	14	15	16	17	18	19
SOUTH KALIMANTAN	6	6	6	6	6	6	6	6	6	6
EAST KALIMANTAN	14	15	16	17	18	19	20	21	22	23
NORTH KALIMANTAN	2	2	2	2	2	2	2	2	2	2
NORTH SULAWESI	37	39	41	43	45	47	49	51	53	55
CENTRAL SULAWESI	25	27	29	31	33	35	37	39	42	45
SOUTH SULAWESI	81	85	89	93	98	103	109	115	122	130
SOUTHEAST SULAWESI	14	15	16	17	18	19	20	21	22	23
GORONTALO	7	7	7	7	7	7	7	7	7	7



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
WEST SULAWESI	7	7	7	7	7	7	7	7	7	7
MALUKU	11	12	13	14	15	16	17	18	19	20
NORTH MALUKU	10	10	10	10	10	10	10	10	10	10
WEST PAPUA	1	1	1	1	1	1	1	1	1	1
SOUTHWEST PAPUA	4	4	4	4	4	4	4	4	4	4
SOUTH PAPUA	1	1	1	1	1	1	1	1	1	1
CENTRAL PAPUA	1	1	1	1	1	1	1	1	1	1
HIGHLAND PAPUA	2	2	2	2	2	2	2	2	2	2
PAPUA	3	3	3	3	3	3	3	3	3	3

## 20. Nuclear Medicine Specialist

Based on calculations using the supply–demand method, Indonesia’s demand for nuclear medicine specialists in 2023 was estimated at 99 specialists. With an available supply of 58 nuclear medicine specialists, 41 (41,4%) were in shortage in 2023. The demand for nuclear medicine specialists is projected to increase annually, reaching 101 in 2025 and continuing to rise to 106 in 2030. By 2032, the demand is projected to reach 108 nuclear medicine specialists. Each year, approximately 6 nuclear medicine specialists are expected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage of nuclear medicine specialists by 2032, with an estimated gap of 13,0%.

Table 45. Projection of Nuclear Medicine Specialists Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	99	58	41	41,4%
2024	100	62	38	38,0%
2025	101	66	35	34,7%
2026	102	70	32	31,4%
2027	103	74	29	28,2%
2028	104	78	26	25,0%
2029	105	82	23	21,9%
2030	106	86	20	18,9%
2031	107	90	17	15,9%
2032	108	94	14	13,0%

Provincial demand for nuclear medicine specialists increases annually, driven by population growth, disease prevalence, and each province's epidemiological burden. The provinces with the highest annual demand are DKI Jakarta and Central Java.



Table 46. Projection of Nuclear Medicine Specialists Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	2	2	2	2	2	2	2	2	2	2
NORTH SUMATERA	3	3	3	3	3	3	3	3	3	3
WEST SUMATERA	3	3	3	3	3	3	3	3	3	3
RIAU	2	2	2	2	2	2	2	2	2	2
JAMBI	2	2	2	2	2	2	2	2	2	2
SOUTH SUMATERA	3	3	3	3	3	3	3	3	3	3
BENGKULU	2	2	2	2	2	2	2	2	2	2
LAMPUNG	2	2	2	2	2	2	2	2	2	2
BANGKA BELITUNG ISLANDS	2	2	2	2	2	2	2	2	2	2
RIAU ISLANDS	2	2	2	2	2	2	2	2	2	2
DKI JAKARTA	12	13	14	15	16	17	18	19	20	21
WEST JAVA	3	3	3	3	3	3	3	3	3	3
CENTRAL JAVA	6	6	6	6	6	6	6	6	6	6
DI YOGYAKARTA	3	3	3	3	3	3	3	3	3	3
EAST JAVA	3	3	3	3	3	3	3	3	3	3
BANTEN	2	2	2	2	2	2	2	2	2	2
BALI	3	3	3	3	3	3	3	3	3	3
WEST NUSA TENGGARA	2	2	2	2	2	2	2	2	2	2
EAST NUSA TENGGARA	2	2	2	2	2	2	2	2	2	2
WEST KALIMANTAN	2	2	2	2	2	2	2	2	2	2
CENTRAL KALIMANTAN	2	2	2	2	2	2	2	2	2	2
SOUTH KALIMANTAN	2	2	2	2	2	2	2	2	2	2
EAST KALIMANTAN	2	2	2	2	2	2	2	2	2	2
NORTH KALIMANTAN	2	2	2	2	2	2	2	2	2	2
NORTH SULAWESI	3	3	3	3	3	3	3	3	3	3
CENTRAL SULAWESI	2	2	2	2	2	2	2	2	2	2
SOUTH SULAWESI	3	3	3	3	3	3	3	3	3	3
SOUTHEAST SULAWESI	2	2	2	2	2	2	2	2	2	2
GORONTALO	2	2	2	2	2	2	2	2	2	2
WEST SULAWESI	2	2	2	2	2	2	2	2	2	2
MALUKU	2	2	2	2	2	2	2	2	2	2
NORTH MALUKU	2	2	2	2	2	2	2	2	2	2
WEST PAPUA	2	2	2	2	2	2	2	2	2	2
SOUTHWEST PAPUA	2	2	2	2	2	2	2	2	2	2



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
SOUTH PAPUA	2	2	2	2	2	2	2	2	2	2
CENTRAL PAPUA	2	2	2	2	2	2	2	2	2	2
HIGHLAND PAPUA	2	2	2	2	2	2	2	2	2	2
PAPUA	2	2	2	2	2	2	2	2	2	2

## 21. Neurosurgeon

Based on calculations using the supply–demand method, Indonesia’s demand for neurosurgeons in 2023 was estimated at 834 specialists. With an available supply of 500 neurosurgeons, this resulted in a shortage of 334 specialists (40,1%) in 2023. The demand for neurosurgeons is projected to increase annually, reaching 852 in 2025 and continuing to rise to 1.120 in 2030. By 2032, the demand is projected to reach 1.274 neurosurgeons. Each year, approximately 54 neurosurgeons are expected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage of neurosurgeons by 2032, with an estimated gap of 29,9%.

Table 47. Projection of Neurosurgeons Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	834	500	334	40.0%
2024	852	546	306	35.9%
2025	875	592	283	32.3%
2026	900	637	263	29.2%
2027	966	681	285	29.5%
2028	1,004	725	279	27.8%
2029	1,056	768	288	27.3%
2030	1,120	810	310	27.7%
2031	1,186	852	334	28.2%
2032	1,274	893	381	29.9%

Provincial demand for neurosurgeons increases annually, driven by population growth, disease prevalence, and each province's epidemiological burden. The provinces with the highest annual demand are West Java, East Java, Central Java, and Banten.

Table 48. Projection of Neurosurgeons Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	15	15	16	17	18	19	20	21	22	24
NORTH SUMATERA	34	35	36	37	40	42	44	47	50	54
WEST SUMATERA	35	36	37	38	41	43	45	48	51	55
RIAU	21	22	23	24	26	27	29	31	33	36
JAMBI	10	10	10	10	11	12	13	14	15	16
SOUTH SUMATERA	25	26	27	28	30	31	33	35	37	40
BENGKULU	8	8	8	8	9	9	9	10	11	12



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
LAMPUNG	28	29	30	31	33	34	36	38	40	43
BANGKA BELITUNG ISLANDS	4	4	4	4	4	4	4	4	4	4
RIAU ISLANDS	10	10	10	10	11	12	13	14	15	16
DKI JAKARTA	52	53	54	56	60	62	65	69	73	78
WEST JAVA	121	124	127	131	140	146	153	162	172	185
CENTRAL JAVA	96	98	101	104	112	116	122	129	136	146
DI YOGYAKARTA	11	11	11	11	12	12	13	14	15	16
EAST JAVA	106	108	111	114	122	127	133	140	148	158
BANTEN	54	56	58	60	65	68	72	77	82	89
BALI	26	27	28	29	31	32	34	36	38	41
WEST NUSA TENGGARA	19	19	20	21	22	23	24	26	28	30
EAST NUSA TENGGARA	8	8	8	8	9	9	9	10	11	12
WEST KALIMANTAN	11	11	11	11	12	13	14	15	16	17
CENTRAL KALIMANTAN	29	30	31	32	35	36	37	39	41	44
SOUTH KALIMANTAN	9	9	9	9	10	10	11	12	13	14
EAST KALIMANTAN	15	16	17	18	20	22	24	26	28	31
NORTH KALIMANTAN	4	4	4	4	4	4	4	4	4	4
NORTH SULAWESI	12	12	12	12	13	13	14	15	16	17
CENTRAL SULAWESI	9	9	9	9	10	10	11	12	13	14
SOUTH SULAWESI	18	18	19	20	21	22	23	24	25	27
SOUTHEAST SULAWESI	9	9	9	9	10	11	12	13	14	15
GORONTALO	3	3	3	3	3	3	3	3	3	3
WEST SULAWESI	2	2	2	2	2	2	2	2	2	2
MALUKU	8	8	8	8	8	8	8	8	8	9
NORTH MALUKU	4	4	4	4	4	4	4	4	4	4
WEST PAPUA	3	3	3	3	3	3	3	3	3	3
SOUTHWEST PAPUA	4	4	4	4	4	4	4	4	4	4
SOUTH PAPUA	2	2	2	2	2	2	2	2	2	2
CENTRAL PAPUA	2	2	2	2	2	2	2	2	2	2
HIGHLAND PAPUA	2	2	2	2	2	2	2	2	2	2
PAPUA	5	5	5	5	5	5	5	5	5	5

## 22. Forensic and Medicolegal Specialist

Based on the results of calculations using the supply–demand method, Indonesia’s demand for forensic and medicolegal specialists in 2023 was estimated at 1.951 specialists. With an available supply of 230 specialists, this resulted in a shortage of 1.721 specialists (88,2%) in 2023. The demand for forensic and medicolegal specialists is projected to increase annually, reaching 1.991 in 2025 and continuing to rise to 2.082 in 2030. By 2032, demand is projected to reach 2.114 forensic and medicolegal specialists. Each year, approximately 42 specialists are expected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage of forensic and medicolegal specialists by 2032, with an estimated gap of 73,7%.

Table 49. Projection of Forensic and Medicolegal Specialists Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	1.951	230	1.721	88,2%
2024	1.971	269	1.703	86,4%
2025	1.991	307	1.685	84,6%
2026	2.010	344	1.666	82,9%
2027	2.029	381	1.648	81,2%
2028	2.047	417	1.630	79,6%
2029	2.065	453	1.612	78,1%
2030	2.082	488	1.594	76,6%
2031	2.098	523	1.576	75,1%
2032	2.114	557	1.557	73,7%

Provincial demand for forensic and medicolegal specialists increases annually, driven by population growth, disease prevalence, and the epidemiological burden in each province. The provinces with the highest demand each year are West Java, East Java, Central Java, and North Sumatra.

Table 50. Projection of Forensic and Medicolegal Specialists Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	38	39	39	40	40	41	41	42	42	43
NORTH SUMATERA	108	109	111	112	113	115	116	117	118	119
WEST SUMATERA	40	41	41	42	43	43	44	44	45	45
RIAU	47	47	48	48	49	49	50	50	51	51
JAMBI	26	26	26	27	27	27	28	28	28	28
SOUTH SUMATERA	61	62	63	63	64	64	65	65	66	67
BENGKULU	15	15	15	15	15	16	16	16	16	16
LAMPUNG	65	66	67	67	68	69	69	70	71	71
BANGKA BELITUNG ISLANDS	11	11	11	11	11	11	11	12	12	12
RIAU ISLANDS	15	15	16	16	16	16	16	17	17	17
DKI JAKARTA	75	75	75	75	75	75	74	74	74	74
WEST JAVA	349	352	355	358	361	364	366	369	371	374



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
CENTRAL JAVA	263	265	268	270	272	274	276	278	280	282
DI YOGYAKARTA	26	26	27	27	27	27	27	27	27	27
EAST JAVA	291	293	295	297	298	300	302	303	304	306
BANTEN	86	87	88	89	89	90	91	91	92	93
BALI	31	31	31	31	32	32	32	32	32	32
WEST NUSA TENGGARA	39	40	40	41	41	42	42	43	44	44
EAST NUSA TENGGARA	39	40	40	41	41	42	43	43	44	44
WEST KALIMANTAN	39	40	40	41	41	42	42	43	43	44
CENTRAL KALIMANTAN	19	20	20	20	20	21	21	21	21	22
SOUTH KALIMANTAN	30	30	30	31	31	31	32	32	32	33
EAST KALIMANTAN	27	28	30	31	33	34	35	36	37	38
NORTH KALIMANTAN	5	5	5	5	5	5	6	6	6	6
NORTH SULAWESI	19	19	19	19	19	19	20	20	20	20
CENTRAL SULAWESI	22	22	22	22	23	23	23	23	23	24
SOUTH SULAWESI	66	66	67	68	68	69	70	70	71	71
SOUTHEAST SULAWESI	19	20	20	20	21	21	21	21	22	22
GORONTALO	9	9	9	9	9	9	9	9	9	9
WEST SULAWESI	10	11	11	11	11	11	11	11	12	12
MALUKU	13	14	14	14	14	14	15	15	15	15
NORTH MALUKU	9	10	10	10	10	10	10	10	10	10
WEST PAPUA	4	4	4	5	5	5	5	5	5	5
SOUTHWEST PAPUA	4	4	4	4	4	4	4	4	4	5
SOUTH PAPUA	4	4	4	4	4	4	4	4	4	4
CENTRAL PAPUA	10	10	11	11	11	11	11	11	11	11
HIGHLAND PAPUA	10	10	10	11	11	11	11	11	11	11
PAPUA	7	7	8	8	8	8	8	8	8	8

### 23. Ophthalmologist

Based on calculations using the supply–demand method, Indonesia’s demand for ophthalmologists in 2023 was estimated at 3.075 specialists. With an available supply of 2.427 specialists, 648 specialists (21,1%) were in shortage in 2023. The demand for ophthalmologists is projected to increase annually, reaching 3.135 in 2025 and continuing to rise to 3.297 in 2030. By 2032, demand is projected to reach 3.358 ophthalmologists. Each year, approximately 176 ophthalmologists are expected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to meet the demand for ophthalmologists by 2032, resulting in a 7.5% surplus.



Table 51. Projection of Ophthalmologists Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	3.075	2.427	648	21,07%
2024	3.104	2.567	537	17,30%
2025	3.135	2.704	431	13,75%
2026	3.164	2.839	325	10,27%
2027	3.199	2.972	227	7,10%
2028	3.231	3.103	128	3,96%
2029	3.261	3.232	29	0,89%
2030	3.297	3.360	+63	+1,91%
2031	3.327	3.486	+159	+4,78%
2032	3.358	3.610	+252	+7,50%

Provincial demand for ophthalmologists increases annually, driven by population growth, disease prevalence, and the epidemiological burden in each province. The provinces with the highest demand each year are West Java, East Java, West Java, and North Sumatra.

Table 52. Projection of Ophthalmologists Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	60	61	62	62	63	64	64	65	65	66
NORTH SUMATERA	170	171	173	175	177	178	180	182	184	186
WEST SUMATERA	64	64	65	65	66	67	67	68	69	69
RIAU	73	74	75	75	76	77	78	79	79	80
JAMBI	41	41	41	42	42	43	43	44	44	44
SOUTH SUMATERA	96	97	98	99	100	101	102	103	104	105
BENGKULU	23	23	23	24	24	24	24	25	25	25
LAMPUNG	103	104	105	106	107	108	109	110	111	112
BANGKA BELITUNG ISLANDS	17	17	17	17	17	18	18	18	18	18
RIAU ISLANDS	24	24	24	24	25	25	25	25	26	26
DKI JAKARTA	118	119	120	121	122	124	125	126	127	129
WEST JAVA	550	555	561	567	572	578	584	590	595	601
CENTRAL JAVA	414	418	422	427	431	435	440	444	448	453
DI YOGYAKARTA	41	42	42	42	43	43	44	44	45	45
EAST JAVA	458	463	467	472	477	481	486	491	496	501
BANTEN	136	137	138	140	141	143	144	146	147	148
BALI	49	49	50	50	51	51	52	52	53	53
WEST NUSA TENGGARA	61	62	63	63	64	64	65	66	66	67
EAST NUSA TENGGARA	61	62	63	63	64	65	65	66	67	67



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
WEST KALIMANTAN	62	63	63	64	65	65	66	66	67	68
CENTRAL KALIMANTAN	31	31	31	32	32	32	32	33	33	33
SOUTH KALIMANTAN	47	47	48	48	48	49	49	50	50	51
EAST KALIMANTAN	43	44	44	44	45	45	46	46	47	47
NORTH KALIMANTAN	8	8	8	8	8	8	9	9	9	9
NORTH SULAWESI	30	30	30	30	31	31	31	32	32	32
CENTRAL SULAWESI	34	34	35	35	35	36	36	36	37	37
SOUTH SULAWESI	103	104	105	106	107	109	110	111	112	113
SOUTHEAST SULAWESI	30	31	31	31	32	32	32	33	33	33
GORONTALO	13	14	14	14	14	14	14	14	14	15
WEST SULAWESI	16	16	17	17	17	17	17	18	18	18
MALUKU	21	21	22	22	22	22	22	23	23	23
NORTH MALUKU	15	15	15	15	15	16	16	16	16	16
WEST PAPUA	12	12	12	12	12	12	12	12	13	13
SOUTHWEST PAPUA	6	6	6	6	7	7	7	7	7	7
SOUTH PAPUA	6	6	6	6	6	6	6	6	6	6
CENTRAL PAPUA	16	16	16	17	17	17	17	17	17	18
HIGHLAND PAPUA	16	16	16	16	17	17	17	17	17	17
PAPUA	7	7	7	7	7	7	7	7	7	7

## 24. Orthopaedic and Traumatology Specialist

Based on calculations using the supply–demand method, Indonesia’s demand for orthopaedic and traumatology specialists in 2023 was estimated at 2.739 specialists. With an available supply of 1.395 specialists, this resulted in a shortage of 1.335 specialists (48,9%) in 2023. The demand for orthopaedic and traumatology specialists is projected to increase annually, reaching 2.880 in 2025 and continuing to rise to 3.272 in 2030. By 2032, demand is projected to reach 3.439 orthopaedic and traumatology specialists. Each year, approximately 150 specialists are expected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage of orthopaedic and traumatology specialists by 2032, with an estimated gap of 28,7%.



Table 53. Projection of Orthopaedic and Traumatology Specialists Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	2.730	1.395	1.335	48,9%
2024	2.804	1.482	1.322	47,2%
2025	2.880	1.610	1.270	44,1%
2026	2.956	1.736	1.220	41,3%
2027	3.032	1.860	1.172	38,7%
2028	3.108	1.982	1.126	36,2%
2029	3.189	2.102	1.087	34,1%
2030	3.272	2.220	1.052	32,2%
2031	3.355	2.337	1.018	30,3%
2032	3.439	2.452	987	28,7%

Provincial demand for orthopaedic and traumatology specialists increases annually, driven by population growth, disease prevalence, and the epidemiological burden in each province. The provinces with the highest annual demand are West Java, Central Java, East Java, and Banten.

Table 54. Projection of Orthopaedic and Traumatology Specialists Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	44	45	46	47	48	49	51	53	55	57
NORTH SUMATERA	54	56	58	60	62	64	66	68	70	72
WEST SUMATERA	78	81	84	87	90	93	96	99	102	105
RIAU	69	71	73	75	77	79	82	85	88	91
JAMBI	13	13	13	13	13	13	13	13	13	13
SOUTH SUMATERA	72	74	76	78	80	82	85	88	91	94
BENGKULU	6	6	6	6	6	6	6	6	6	6
LAMPUNG	59	61	63	65	67	69	71	73	75	77
BANGKA BELITUNG ISLANDS	12	12	12	12	12	12	12	12	12	12
RIAU ISLANDS	14	14	14	14	14	14	14	14	14	14
DKI JAKARTA	142	145	148	151	154	157	160	163	166	169
WEST JAVA	568	583	598	613	628	643	658	674	690	707
CENTRAL JAVA	451	463	475	487	499	511	523	536	549	562
DI YOGYAKARTA	44	45	46	47	48	49	50	51	52	53
EAST JAVA	389	398	407	416	426	436	446	456	466	476
BANTEN	142	146	150	154	158	162	167	172	177	182
BALI	125	128	131	134	137	140	143	146	149	152
WEST NUSA TENGGARA	45	46	48	50	52	54	56	58	60	62



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
EAST NUSA TENGGARA	24	25	26	27	28	29	30	31	32	33
WEST KALIMANTAN	33	34	35	36	37	38	39	40	41	42
CENTRAL KALIMANTAN	18	19	20	21	22	23	24	25	26	27
SOUTH KALIMANTAN	47	48	49	50	51	52	54	56	58	60
EAST KALIMANTAN	47	50	54	58	61	64	67	70	73	76
NORTH KALIMANTAN	5	5	5	5	5	5	5	5	5	5
NORTH SULAWESI	23	24	25	26	27	28	29	30	31	32
CENTRAL SULAWESI	24	25	26	27	28	29	30	31	32	33
SOUTH SULAWESI	112	115	118	121	124	127	130	133	136	139
SOUTHEAST SULAWESI	24	25	26	27	28	29	30	31	32	33
GORONTALO	6	6	6	6	6	6	6	6	6	6
WEST SULAWESI	4	4	4	4	4	4	4	4	4	4
MALUKU	20	21	22	23	24	25	26	27	28	29
NORTH MALUKU	5	5	5	5	5	5	5	5	5	5
WEST PAPUA	1	1	1	1	1	1	1	1	1	1
SOUTHWEST PAPUA	3	3	3	3	3	3	3	3	3	3
SOUTH PAPUA	1	1	1	1	1	1	1	1	1	1
CENTRAL PAPUA	1	1	1	1	1	1	1	1	1	1
HIGHLAND PAPUA	1	1	1	1	1	1	1	1	1	1
PAPUA	4	4	4	4	4	4	4	4	4	4

## 25. Clinical Nutrition Specialist

Based on calculations using the supply–demand method, Indonesia’s demand for clinical nutrition specialists in 2023 was estimated at 1.344 specialists. With an available supply of 418 specialists, 926 specialists (68,9%) were in shortage in 2023. The demand for clinical nutrition specialists is projected to increase annually, reaching 1.554 in 2025 and continuing to rise to 2.254 in 2030. By 2032, demand is projected to reach 2.614 clinical nutrition specialists. From 2024 to 2027, approximately 50 new clinical nutrition specialists are expected to graduate each year, increasing to 70 graduates annually from 2028 to 2032, with an annual attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage of clinical nutrition specialists by 2032, with an estimated gap of 66,1%.



Table 55. Projection of Clinical Nutrition Specialists Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	1.344	418	926	68,9%
2024	1.443	462	981	67,9%
2025	1.554	505	1.049	67,5%
2026	1.673	547	1.126	67,3%
2027	1.802	589	1.213	67,3%
2028	1.940	650	1.290	66,5%
2029	2.090	710	1.380	66,0%
2030	2.254	769	1.485	65,9%
2031	2.427	827	1.600	65,9%
2032	2.614	885	1.729	66,1%

Provincial demand for clinical nutrition specialists increases annually, driven by population growth, disease prevalence, and each province's epidemiological burden. The provinces with the highest annual demand are West Java, East Java, Central Java, and Banten.

Table 56. Projection of Clinical Nutrition Specialists Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	30	32	35	38	41	44	47	51	55	59
NORTH SUMATERA	64	69	75	81	88	95	103	112	121	131
WEST SUMATERA	38	41	44	48	52	56	61	66	71	77
RIAU	39	42	45	49	53	57	62	67	73	79
JAMBI	15	16	17	18	19	21	23	25	27	29
SOUTH SUMATERA	36	39	42	45	49	53	57	62	67	72
BENGKULU	11	12	13	14	15	16	17	18	19	21
LAMPUNG	44	48	52	56	61	66	71	77	83	90
BANGKA BELITUNG ISLANDS	9	10	11	12	13	14	15	16	17	18
RIAU ISLANDS	13	14	15	16	17	18	19	21	23	25
DKI JAKARTA	89	95	102	109	117	126	135	145	156	168
WEST JAVA	263	283	305	328	353	380	410	442	476	514
CENTRAL JAVA	153	165	178	192	207	223	241	260	281	303
DI YOGYAKARTA	19	20	22	24	26	28	30	32	34	37
EAST JAVA	168	180	193	207	223	240	258	277	298	320
BANTEN	98	105	113	122	131	141	152	164	177	191
BALI	32	34	37	40	43	46	50	54	58	62
WEST NUSA TENGGARA	26	28	30	33	36	39	42	46	50	54
EAST NUSA TENGGARA	15	16	17	18	19	21	23	25	27	29
WEST KALIMANTAN	19	21	23	25	27	29	31	34	37	40



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
CENTRAL KALIMANTAN	10	11	12	13	14	15	16	17	18	19
SOUTH KALIMANTAN	15	16	17	18	19	21	23	25	27	29
EAST KALIMANTAN	20	22	25	28	31	34	38	42	46	50
NORTH KALIMANTAN	3	3	3	3	3	3	3	3	3	3
NORTH SULAWESI	19	20	22	24	26	28	30	32	34	37
CENTRAL SULAWESI	18	19	20	22	24	26	28	30	32	34
SOUTH SULAWESI	39	42	45	48	52	56	60	65	70	75
SOUTHEAST SULAWESI	8	9	10	11	12	13	14	15	16	17
GORONTALO	6	6	6	6	6	6	6	6	6	6
WEST SULAWESI	4	4	4	4	4	4	4	4	4	4
MALUKU	6	6	6	6	6	6	6	6	6	6
NORTH MALUKU	5	5	5	5	5	5	5	5	5	5
WEST PAPUA	2	2	2	2	2	2	2	2	2	2
SOUTHWEST PAPUA	3	3	3	3	3	3	3	3	3	3
SOUTH PAPUA	1	1	1	1	1	1	1	1	1	1
CENTRAL PAPUA	1	1	1	1	1	1	1	1	1	1
HIGHLAND PAPUA	0	0	0	0	0	0	0	0	0	0
PAPUA	3	3	3	3	3	3	3	3	3	3

## 26. Physical Medicine and Rehabilitation Specialist

Based on calculations using the supply–demand method, Indonesia’s demand for physical medicine and rehabilitation specialists in 2023 was estimated at 1.383 specialists. With an available supply of 1.094 specialists, 289 specialists (20.9%) were in shortage in 2023. The demand for physical medicine and rehabilitation specialists is projected to increase annually, reaching 1.605 in 2025 and continuing to rise to 2.329 in 2030. By 2032, demand is projected to reach 2.703 physical medicine and rehabilitation specialists. Each year, approximately 94 specialists are expected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage of physical medicine and rehabilitation specialists by 2032, with an estimated gap of 35,2%.

Table 57. Projection of Physical Medicine and Rehabilitation Specialists Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	1.383	1.094	289	20,9%
2024	1.489	1.172	317	21,3%
2025	1.605	1.248	357	22,2%
2026	1.728	1.323	405	23,4%
2027	1.860	1.397	463	24,9%
2028	2.005	1.470	535	26,7%



Year	Demand	Supply	Gap	Gap Percentage
2029	2.161	1.542	619	28,6%
2030	2.329	1.613	716	30,7%
2031	2.509	1.683	826	32,9%
2032	2.703	1.752	951	35,2%

Provincial demand for physical medicine and rehabilitation specialists increases annually, driven by population growth, disease prevalence, and each province's epidemiological burden. The provinces with the highest annual demand are West Java, East Java, Central Java, and DKI Jakarta.

Table 58. Projection of Physical Medicine and Rehabilitation Specialists Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	9	10	11	12	13	14	15	16	17	18
NORTH SUMATERA	63	68	74	80	87	94	102	110	119	129
WEST SUMATERA	40	43	47	51	55	60	65	70	76	82
RIAU	58	63	68	74	80	87	94	102	111	120
JAMBI	13	14	15	16	17	18	20	22	24	26
SOUTH SUMATERA	18	19	21	23	25	27	29	31	33	36
BENGKULU	4	4	4	4	4	4	4	4	4	4
LAMPUNG	26	28	30	32	35	38	41	44	48	52
BANGKA BELITUNG ISLANDS	4	4	4	4	4	4	4	4	4	4
RIAU ISLANDS	15	16	17	18	19	21	23	25	27	29
DKI JAKARTA	76	81	87	93	100	107	115	124	133	143
WEST JAVA	315	339	365	393	423	456	492	530	571	616
CENTRAL JAVA	188	203	219	236	254	274	296	319	344	371
DI YOGYAKARTA	16	17	18	19	20	22	24	26	28	30
EAST JAVA	220	236	253	272	292	314	338	363	390	419
BANTEN	61	66	71	76	82	88	95	102	110	119
BALI	57	61	66	71	76	82	88	95	102	110
WEST NUSA TENGGARA	18	20	22	24	26	28	30	33	36	39
EAST NUSA TENGGARA	8	9	10	11	12	13	14	15	16	17
WEST KALIMANTAN	11	12	13	14	15	16	17	18	19	21
CENTRAL KALIMANTAN	5	5	5	5	5	5	5	5	5	5
SOUTH KALIMANTAN	28	30	32	35	38	41	44	48	52	56
EAST KALIMANTAN	34	38	43	48	53	59	65	72	79	86
NORTH KALIMANTAN	4	4	4	4	4	4	4	4	4	4
NORTH SULAWESI	14	15	16	17	18	19	20	22	24	26



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
CENTRAL SULAWESI	10	11	12	13	14	15	16	17	18	19
SOUTH SULAWESI	39	42	45	48	52	56	60	65	70	75
SOUTHEAST SULAWESI	3	3	3	3	3	3	3	3	3	3
GORONTALO	8	9	10	11	12	13	14	15	16	17
WEST SULAWESI	5	5	5	5	5	5	5	5	5	5
MALUKU	2	2	2	2	2	2	2	2	2	2
NORTH MALUKU	7	8	9	10	11	12	13	14	15	16
WEST PAPUA	0	0	0	0	0	0	0	0	0	0
SOUTHWEST PAPUA	1	1	1	1	1	1	1	1	1	1
SOUTH PAPUA	1	1	1	1	1	1	1	1	1	1
CENTRAL PAPUA	0	0	0	0	0	0	0	0	0	0
HIGHLAND PAPUA	0	0	0	0	0	0	0	0	0	0
PAPUA	2	2	2	2	2	2	2	2	2	2

## 27. Clinical Parasitologist

Based on calculations using the supply–demand method, Indonesia’s demand for clinical parasitologists in 2023 was estimated at 460. With an available supply of 39 specialists, this resulted in a shortage of 421 specialists (91,5%) in 2023. The demand for clinical parasitologists is projected to increase annually, reaching 528 in 2025 and continuing to rise to 748 in 2030. By 2032, demand is projected to reach 860 clinical parasitologists. Each year, approximately 6 clinical parasitologists are expected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage of clinical parasitologists by 2032, with an estimated gap of 90,2%.

Table 59. Projection of Clinical Parasitologists Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	460	39	421	91,5%
2024	492	44	448	91,1%
2025	528	49	479	90,7%
2026	565	54	511	90,4%
2027	604	59	545	90,2%
2028	649	64	585	90,1%
2029	697	69	628	90,1%
2030	748	74	674	90,1%
2031	802	79	723	90,2%
2032	860	84	776	90,2%

Provincial demand for clinical parasitologists increases annually, driven by population growth, disease prevalence, and each province's epidemiological burden. The provinces with the highest annual demand are West Java, North Sumatra, Central Java, and East Java.



Table 60. Projection of Clinical Parasitologists Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	6	6	6	6	6	6	6	6	6	6
NORTH SUMATERA	54	58	63	68	74	80	87	94	102	111
WEST SUMATERA	2	2	2	2	2	2	2	2	2	2
RIAU	6	6	6	6	6	7	8	9	10	11
JAMBI	8	9	10	11	12	13	14	15	16	17
SOUTH SUMATERA	8	9	10	11	12	13	14	15	16	17
BENGKULU	0	0	0	0	0	0	0	0	0	0
LAMPUNG	6	6	6	6	6	6	6	6	6	6
BANGKA BELITUNG ISLANDS	0	0	0	0	0	0	0	0	0	0
RIAU ISLANDS	1	1	1	1	1	1	1	1	1	1
DKI JAKARTA	22	24	26	28	30	32	34	37	40	43
WEST JAVA	105	113	122	131	141	152	164	177	191	206
CENTRAL JAVA	55	59	64	69	74	80	86	93	100	108
DI YOGYAKARTA	10	11	12	13	14	15	16	17	18	19
EAST JAVA	45	48	52	56	60	65	70	75	81	87
BANTEN	15	16	17	18	19	20	22	24	26	28
BALI	18	19	20	22	24	26	28	30	32	34
WEST NUSA TENGGARA	2	2	2	2	2	2	2	2	2	2
EAST NUSA TENGGARA	8	9	10	11	12	13	14	15	16	17
WEST KALIMANTAN	8	9	10	11	12	13	14	15	16	17
CENTRAL KALIMANTAN	1	1	1	1	1	1	1	1	1	1
SOUTH KALIMANTAN	5	5	5	5	5	5	5	5	5	5
EAST KALIMANTAN	2	2	2	2	2	2	2	2	2	2
NORTH KALIMANTAN	0	0	0	0	0	0	0	0	0	0
NORTH SULAWESI	35	38	41	44	47	51	55	59	63	68
CENTRAL SULAWESI	6	6	6	6	6	6	6	6	6	6
SOUTH SULAWESI	16	17	18	19	20	22	24	26	28	30
SOUTHEAST SULAWESI	3	3	3	3	3	3	3	3	3	3
GORONTALO	0	0	0	0	0	0	0	0	0	0
WEST SULAWESI	0	0	0	0	0	0	0	0	0	0
MALUKU	5	5	5	5	5	5	5	5	5	5
NORTH MALUKU	3	3	3	3	3	3	3	3	3	3
WEST PAPUA	2	2	2	2	2	2	2	2	2	2
SOUTHWEST PAPUA	1	1	1	1	1	1	1	1	1	1



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
SOUTH PAPUA	0	0	0	0	0	0	0	0	0	0
CENTRAL PAPUA	1	1	1	1	1	1	1	1	1	1
HIGHLAND PAPUA	0	0	0	0	0	0	0	0	0	0
PAPUA	1	1	1	1	1	1	1	1	1	1

## 28. Clinical Microbiologist

Based on calculations using the supply–demand method, Indonesia’s demand for clinical microbiologists in 2023 was estimated at 1.252. With an available supply of 334 specialists, this resulted in a shortage of 918 specialists (73,3%) in 2023. The demand for clinical microbiologists is projected to increase annually, reaching 1.451 in 2025 and continuing to rise to 2.100 in 2030. By 2032, demand is projected to reach 2.438 clinical microbiologists. Each year, approximately 78 specialists are expected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage of clinical microbiologists by 2032, with an estimated gap of 60,8%.

Table 61. Projection of Clinical Microbiologists Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	1.252	334	918	73,3%
2024	1.347	407	940	69,8%
2025	1.451	479	972	66,9%
2026	1.562	550	1.012	64,8%
2027	1.681	620	1.061	63,1%
2028	1.808	689	1.119	61,9%
2029	1.949	757	1.192	61,2%
2030	2.100	824	1.276	60,8%
2031	2.260	890	1.370	60,6%
2032	2.438	955	1.483	60,8%

Provincial demand for clinical microbiologists increases annually, driven by population growth, disease prevalence, and each province's epidemiological burden. The provinces with the highest annual demand are West Java, North Sumatra, Central Java, and East Java.

Table 62. Projection of Clinical Microbiologists in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	18	19	21	23	25	27	29	31	33	36
NORTH SUMATERA	141	153	166	180	195	211	229	248	269	292
WEST SUMATERA	17	18	19	21	23	25	27	29	31	34
RIAU	30	32	35	38	41	44	48	52	56	61
JAMBI	16	17	18	19	21	23	25	27	29	31
SOUTH SUMATERA	18	19	21	23	25	27	29	31	33	36



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
BENGKULU	5	5	5	5	5	5	5	5	5	5
LAMPUNG	5	5	5	5	5	5	5	5	5	5
BANGKA BELITUNG ISLANDS	2	2	2	2	2	2	2	2	2	2
RIAU ISLANDS	20	22	24	26	28	30	32	35	38	41
DKI JAKARTA	66	71	76	81	87	93	100	108	116	125
WEST JAVA	254	274	295	318	342	368	397	428	461	497
CENTRAL JAVA	144	155	167	180	194	209	226	244	263	284
DI YOGYAKARTA	34	37	40	43	46	50	54	58	63	68
EAST JAVA	120	129	139	149	160	172	185	199	214	230
BANTEN	52	56	60	65	70	75	81	87	94	101
BALI	48	52	56	60	65	70	75	81	87	94
WEST NUSA TENGGARA	41	44	48	52	56	61	66	72	78	85
EAST NUSA TENGGARA	14	15	16	17	18	19	21	23	25	27
WEST KALIMANTAN	11	12	13	14	15	16	17	18	19	21
CENTRAL KALIMANTAN	4	4	4	4	4	4	4	4	4	4
SOUTH KALIMANTAN	5	5	5	5	5	5	5	5	5	5
EAST KALIMANTAN	2	2	2	2	2	2	2	2	2	2
NORTH KALIMANTAN	0	0	0	0	0	0	0	0	0	0
NORTH SULAWESI	35	38	41	44	47	51	55	59	63	68
CENTRAL SULAWESI	6	6	6	6	6	6	6	6	6	6
SOUTH SULAWESI	16	17	18	19	20	22	24	26	28	30
SOUTHEAST SULAWESI	3	3	3	3	3	3	3	3	3	3
GORONTALO	0	0	0	0	0	0	0	0	0	0
WEST SULAWESI	0	0	0	0	0	0	0	0	0	0
MALUKU	5	5	5	5	5	5	5	5	5	5
NORTH MALUKU	3	3	3	3	3	3	3	3	3	3
WEST PAPUA	2	2	2	2	2	2	2	2	2	2
SOUTHWEST PAPUA	1	1	1	1	1	1	1	1	1	1
SOUTH PAPUA	0	0	0	0	0	0	0	0	0	0
CENTRAL PAPUA	1	1	1	1	1	1	1	1	1	1
HIGHLAND PAPUA	0	0	0	0	0	0	0	0	0	0
PAPUA	1	1	1	1	1	1	1	1	1	1

## 29. Family Medicine Specialist

Based on calculations using the supply–demand method, Indonesia’s demand for family medicine specialists in 2023 was estimated at 14.771 specialists. With an available supply of 592 specialists, this resulted in a shortage of 14.179 specialists (95,9%) in 2023. The demand for family medicine specialists is projected to increase annually, reaching 15.075 in 2025 and rising to 15.764 in 2030. By 2032, demand is projected to reach 16.009 family medicine specialists. Each year, approximately 80 specialists are expected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage of family medicine specialists by 2032, with an estimated gap of 94,4%.

Table 63. Projection of Family Medicine Specialists in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	14.771	592	14.179	95,9%
2024	14.925	583	14.342	96,1%
2025	15.075	574	14.501	96,2%
2026	15.222	566	14.656	96,3%
2027	15.364	557	14.807	96,4%
2028	15.501	629	14.872	95,9%
2029	15.635	699	14.936	95,5%
2030	15.764	769	14.995	95,1%
2031	15.888	837	15.051	94,7%
2032	16.009	905	15.104	94,4%

## 30. Plastic, Reconstructive, and Aesthetic Surgeon

Based on calculations using the supply–demand method, Indonesia’s demand for plastic, reconstructive, and aesthetic surgeons in 2023 was estimated at 521 specialists. With a supply of 309 specialists, this resulted in a shortage of 212 specialists (41,0%) in 2023. The demand for plastic, reconstructive, and aesthetic surgeons is projected to increase annually. By 2025, demand is estimated at 539 and is expected to rise to 583 by 2030. In 2032, the projected demand is estimated at 604 plastic, reconstructive, and aesthetic surgeons. Each year, approximately 50 specialists are projected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue meeting demand for plastic, reconstructive, and aesthetic surgeons by 2032, with an estimated surplus of 20,0%.

Table 64. Projection of Plastic, Reconstructive, and Aesthetic Surgeons in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	521	309	212	41%
2024	528	354	174	33%
2025	539	399	140	26%
2026	548	443	105	19%
2027	555	486	69	12%
2028	566	529	37	7%
2029	576	571	5	1%



Year	Demand	Supply	Gap	Gap Percentage
2030	583	623	+40	+7%
2031	591	673	+82	+14%
2032	604	723	+119	+20%

Provincial demand for plastic, reconstructive, and aesthetic surgeons increases annually, driven by population growth, disease prevalence, and the epidemiological burden in each province. The provinces with the highest annual demand are West Java, Central Java, East Java, and North Sumatra.

Table 65. Projection of Plastic, Reconstructive, and Aesthetic Surgeons Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	23	24	24	24	25	25	26	26	26	27
NORTH SUMATERA	29	29	30	30	31	31	32	32	33	33
WEST SUMATERA	25	25	25	26	26	27	27	28	28	29
RIAU	17	17	18	18	18	19	19	19	20	20
JAMBI	5	5	5	5	5	5	6	6	6	6
SOUTH SUMATERA	7	7	7	7	7	7	7	8	8	8
BENGKULU	2	2	2	2	2	2	2	2	2	2
LAMPUNG	10	10	10	10	10	11	11	11	11	11
BANGKA BELITUNG ISLANDS	3	3	3	3	3	3	3	3	3	3
RIAU ISLANDS	5	5	5	5	5	5	5	5	5	5
DKI JAKARTA	25	26	26	27	27	28	28	29	29	29
WEST JAVA	127	128	131	134	135	138	141	142	144	147
CENTRAL JAVA	63	64	65	66	67	69	70	71	72	73
DI YOGYAKARTA	11	11	11	12	12	12	12	12	13	13
EAST JAVA	56	56	58	59	60	61	62	63	63	65
BANTEN	24	24	25	25	25	26	26	27	27	28
BALI	13	13	13	13	14	14	14	14	14	15
WEST NUSA TENGGARA	3	3	3	3	3	3	3	3	3	3
EAST NUSA TENGGARA	4	4	4	4	4	4	4	4	4	5
WEST KALIMANTAN	5	6	6	6	6	6	6	6	6	6
CENTRAL KALIMANTAN	2	2	2	2	2	2	2	2	2	2
SOUTH KALIMANTAN	4	4	4	4	4	4	4	4	4	4
EAST KALIMANTAN	9	9	9	9	9	9	10	10	10	10
NORTH KALIMANTAN	1	1	1	1	1	1	1	1	1	1
NORTH SULAWESI	5	5	5	6	6	6	6	6	6	6



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
CENTRAL SULAWESI	8	8	9	9	9	9	9	9	10	10
SOUTH SULAWESI	22	22	23	23	24	24	25	25	25	26
SOUTHEAST SULAWESI	3	3	3	3	3	3	3	3	3	3
GORONTALO	1	1	1	1	1	1	1	1	1	1
WEST SULAWESI	6	7	7	7	7	7	7	7	7	8
MALUKU	1	1	1	1	1	1	1	1	1	1
NORTH MALUKU	1	1	1	1	1	1	1	1	1	1
WEST PAPUA	0	0	0	0	0	0	0	0	0	0
SOUTHWEST PAPUA	0	0	0	0	0	0	0	0	0	0
SOUTH PAPUA	0	0	0	0	0	0	0	0	0	0
CENTRAL PAPUA	0	0	0	0	0	0	0	0	1	1
HIGHLAND PAPUA	0	0	0	0	0	0	0	0	0	0
PAPUA	1	2	2	2	2	2	2	2	2	2

### 31. Emergency Medicine Specialist

Based on calculations using the supply–demand method, Indonesia’s demand for emergency medicine specialists in 2023 was estimated at 1.003 specialists. With a supply of 76 specialists, this resulted in a shortage of 927 specialists (92,4%) in 2023. The demand for emergency medicine specialists is projected to increase annually, reaching 1.024 in 2025, 1.071 in 2030, and 1.087 by 2032. Each year, approximately 4 emergency medicine specialists are projected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage of emergency medicine specialists by 2032 (90,8%).

Table 66. Projection of Emergency Medicine Specialists Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	1.003	76	927	92,4%
2024	1.014	79	935	92,2%
2025	1.024	82	942	92,0%
2026	1.034	84	949	91,8%
2027	1.044	87	956	91,7%
2028	1.053	90	963	91,5%
2029	1.062	93	969	91,3%
2030	1.071	95	976	91,1%
2031	1.079	98	981	90,9%
2032	1.087	100	987	90,8%



### 32. Clinical Pharmacology Specialist

Based on calculations using the supply–demand method, Indonesia’s demand for clinical pharmacology specialists in 2023 was estimated at 1.951 specialists. With a supply of 76 specialists, this resulted in a shortage of 1.875 specialists (96,1%) in 2023. The demand for clinical pharmacology specialists is projected to increase annually, reaching 1.991 in 2025, 2.082 in 2030, and 2.114 by 2032. Each year, approximately 12 clinical pharmacology specialists are projected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage of clinical pharmacology specialists by 2032 (92,1%).

Table 67. Projection of Clinical Pharmacology Specialist Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	1.951	76	1.875	96,1%
2024	1.971	87	1.884	95,6%
2025	1.991	98	1.894	95,1%
2026	2.010	108	1.902	94,6%
2027	2.029	118	1.911	94,2%
2028	2.047	129	1.919	93,7%
2029	2.065	139	1.926	93,3%
2030	2.082	149	1.933	9,9%
2031	2.098	158	1.940	92,5%
2032	2.114	168	1.946	92,1%

### 33. Marine Medicine Specialist

Based on calculations using the supply–demand method, Indonesia’s demand for marine medicine specialists in 2023 was estimated at 279 specialists. With a supply of 45 specialists, this resulted in a shortage of 234 specialists (83,9%) in 2023. The demand for marine medicine specialists is projected to increase annually, reaching 284 in 2025, 297 in 2030, and 302 by 2032. Each year, approximately 18 marine medicine specialists are projected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage of marine medicine specialists by 2032 (49,4%).

Table 68. Projection of Marine Medicine Specialist Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	279	45	234	83,9%
2024	282	45	237	84,0%
2025	284	45	239	84,2%
2026	287	45	242	84,3%
2027	290	63	227	78,3%
2028	292	81	211	72,3%
2029	295	99	196	66,4%
2030	297	117	180	60,7%
2031	300	135	165	54,9%
2032	302	153	149	49,4%



### 34. Occupational Medicine Specialist

Based on calculations using the supply–demand method, Indonesia’s demand for occupational medicine specialists in 2023 was estimated at 1.115 specialists. With a supply of 160 specialists, this resulted in a shortage of 955 specialists (85,7%) in 2023. The demand for Occupational Medicine Specialists is projected to increase annually, reaching 1.138 in 2025, 1.190 in 2030, and 1.208 by 2032. Each year, approximately 20 Occupational Medicine Specialists are projected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage of Occupational Medicine Specialists by 2032 (74,4%).

Table 69. Projection of Occupational Medicine Specialist Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	1.115	160	955	85,7%
2024	1.126	178	948	84,2%
2025	1.138	195	943	82,9%
2026	1.149	212	937	81,6%
2027	1.160	229	931	80,3%
2028	1.170	245	925	79,1%
2029	1.180	262	918	77,8%
2030	1.190	278	912	76,6%
2031	1.199	294	905	75,5%
2032	1.208	309	899	74,4%

### 35. Sports Medicine Specialist

Based on the supply–demand calculation results, the estimated need for Sports Medicine Specialists in Indonesia was 451 physicians in 2023. With 100 Sports Medicine Specialists available, a shortage of 351 physicians (77,8%) was identified in 2023. The demand for Sports Medicine Specialists is projected to increase annually. In 2025, the demand is projected to reach 480 specialists and continue to increase to 562 specialists in 2030. By 2032, the demand is projected to reach 599 Sports Medicine Specialists. It is estimated that 10 Sports Medicine Specialists graduate each year, with an annual attrition rate of 1,5%. If this supply-and-attrition pattern remains unchanged, Indonesia is projected to still not meet the demand for Sports Medicine Specialists by 2032, with an estimated shortage of 71.3%.

Table 70. Projection of Sports Medicine Specialist Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	451	100	351	77,8%
2024	465	109	356	76,7%
2025	480	117	363	75,6%
2026	495	125	370	74,7%
2027	511	133	377	73,9%
2028	527	141	386	73,2%
2029	544	149	395	72,6%



Year	Demand	Supply	Gap	Gap Percentage
2030	562	157	405	72,1%
2031	580	165	416	71,6%
2032	599	172	427	71,3%

### 36. Aviation Medicine Specialist

Based on calculations using the supply–demand method, Indonesia’s demand for aviation medicine specialists in 2023 was estimated at 300 specialists. With a supply of 59 specialists, this resulted in a shortage of 241 specialists (80,3%) in 2023. The demand for aviation medicine specialists is projected to increase annually, reaching 313 in 2025, 327 in 2030, and 332 by 2032. Each year, approximately 10 aviation medicine specialists are projected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage of aviation medicine specialists by 2032 (58,9%).

Table 71. Projection of Aviation Medicine Specialist Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	300	59	241	80,3%
2024	310	68	242	78,0%
2025	313	77	236	75,4%
2026	316	86	230	72,8%
2027	319	95	224	70,3%
2028	322	103	219	67,9%
2029	324	112	213	65,6%
2030	327	120	207	63,3%
2031	330	128	202	61,1%
2032	332	136	196	58,9%

### 37. Acupuncture Specialist

Based on the results of calculations using the supply–demand method, Indonesia’s demand for acupuncture specialists in 2023 was estimated at 1.368 specialists. With a supply of 158 specialists, this resulted in a shortage of 1.210 specialists (88,5%) in 2023. The demand for acupuncture specialists is projected to increase annually, reaching 1.395 in 2025, 1.466 in 2030, and 1.495 by 2032. Each year, approximately 16 acupuncture specialists are projected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage of acupuncture specialists by 2032 (81,7%).

Table 72. Projection of Acupuncture Specialist Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	1.368	158	1.210	88,5%
2024	1.382	172	1.210	87,6%
2025	1.395	185	1.210	86,7%
2026	1.408	198	1.210	85,9%



Year	Demand	Supply	Gap	Gap Percentage
2027	1.423	211	1.212	85,2%
2028	1.437	224	1.213	84,4%
2029	1.453	237	1.216	83,7%
2030	1.466	249	1.217	83,0%
2031	1.479	261	1.218	82,4%
2032	1.495	274	1.221	81,7%

Provincial demand for acupuncture specialists increases annually, driven by population growth, disease prevalence, and the epidemiological burden in each province. The provinces with the highest annual demand are West Java, Central Java, East Java, and North Sumatra.

Table 73. Projection of Acupuncture Specialist Needs in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	48	49	49	50	50	51	51	52	52	53
NORTH SUMATERA	99	100	101	102	103	104	105	106	107	108
WEST SUMATERA	38	38	38	39	39	40	40	40	41	41
RIAU	54	54	55	55	56	56	57	57	58	59
JAMBI	19	19	19	19	19	20	20	20	20	20
SOUTH SUMATERA	42	42	42	43	43	44	44	45	45	45
BENGKULU	12	12	12	12	12	12	13	13	13	13
LAMPUNG	43	44	44	45	45	46	46	47	47	47
BANGKA BELITUNG ISLANDS	9	9	9	9	9	9	9	9	9	9
RIAU ISLANDS	19	19	19	19	20	20	20	20	20	21
DKI JAKARTA	45	45	46	46	47	47	48	48	48	49
WEST JAVA	291	294	297	300	303	306	309	312	315	318
CENTRAL JAVA	169	170	172	174	176	177	179	181	183	184
DI YOGYAKARTA	20	21	21	21	21	21	22	22	22	22
EAST JAVA	135	137	138	139	141	142	144	145	146	148
BANTEN	80	81	82	83	84	84	85	86	87	88
BALI	25	25	25	25	26	26	26	26	27	27
WEST NUSA TENGGARA	18	18	18	18	18	19	19	19	19	19
EAST NUSA TENGGARA	15	15	15	16	16	16	16	16	16	17
WEST KALIMANTAN	24	24	25	25	25	25	26	26	26	26
CENTRAL KALIMANTAN	9	10	10	10	10	10	10	10	10	10
SOUTH KALIMANTAN	22	22	23	23	23	23	24	24	24	24
EAST KALIMANTAN	21	21	21	21	21	22	22	22	22	23
NORTH KALIMANTAN	3	3	4	4	4	4	4	4	4	4



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
NORTH SULAWESI	16	17	17	17	17	17	17	18	18	18
CENTRAL SULAWESI	17	17	17	17	18	18	18	18	18	19
SOUTH SULAWESI	37	38	38	38	39	39	39	40	40	41
SOUTHEAST SULAWESI	10	10	10	10	10	10	10	10	10	10
GORONTALO	5	5	5	5	5	5	5	5	5	5
WEST SULAWESI	6	6	6	6	6	6	7	7	7	7
MALUKU	4	4	4	4	4	5	5	5	5	5
NORTH MALUKU	5	5	5	5	5	5	5	5	6	6
WEST PAPUA	1	1	1	1	1	1	1	1	1	1
SOUTHWEST PAPUA	2	2	2	2	2	2	2	2	2	2
SOUTH PAPUA	1	1	1	1	1	1	1	1	1	1
CENTRAL PAPUA	1	1	1	1	1	1	1	1	1	1
HIGHLAND PAPUA	0	0	0	0	0	0	0	0	0	0
PAPUA	3	3	3	3	3	3	3	3	4	4

### 38. Andrology Specialist

Based on calculations using the supply–demand method, Indonesia’s demand for andrology specialists in 2023 was estimated at 254 physicians. With a supply of 79 andrology specialists, this resulted in a shortage of 175 physicians (68,9%) in 2023. The demand for andrology specialists is projected to increase annually, reaching 282 in 2025, 376 in 2030, and 426 by 2032. Each year, approximately 10 andrology specialists are projected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage of andrology specialists by 2032 (63,9%).

Table 74. Projection of Andrology Specialist Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	254	79	175	68,9%
2024	268	88	180	67,2%
2025	282	97	185	65,6%
2026	298	106	192	64,4%
2027	316	114	202	63,9%
2028	334	122	212	63,5%
2029	354	130	224	63,3%
2030	376	138	238	63,3%
2031	399	146	253	63,4%
2032	426	154	272	63,9%

Provincial demand for andrology specialists increases annually, driven by population growth, disease prevalence, and the epidemiological burden in each province. The provinces with the highest annual demand are Central Java, West Java, East Java, and DKI Jakarta.



Table 75. Projection of Andrology Specialist Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	6	6	6	6	6	6	6	6	6	6
NORTH SUMATERA	17	18	19	21	23	25	27	29	31	34
WEST SUMATERA	5	5	5	5	5	5	5	5	5	5
RIAU	6	6	6	6	6	6	7	8	9	10
JAMBI	2	2	2	2	2	2	2	2	2	2
SOUTH SUMATERA	8	9	10	11	12	13	14	15	16	17
BENGKULU	1	1	1	1	1	1	1	1	1	1
LAMPUNG	6	6	6	6	6	6	6	6	6	7
BANGKA BELITUNG ISLANDS	1	1	1	1	1	1	1	1	1	1
RIAU ISLANDS	1	1	1	1	1	1	1	1	1	1
DKI JAKARTA	23	25	27	29	31	33	36	39	42	45
WEST JAVA	30	32	34	37	40	43	46	50	54	58
CENTRAL JAVA	41	44	47	50	54	58	62	67	72	78
DI YOGYAKARTA	6	6	6	6	6	6	6	6	6	6
EAST JAVA	31	33	35	37	40	43	46	49	53	57
BANTEN	9	10	11	12	13	14	15	16	17	18
BALI	8	9	10	11	12	13	14	15	16	17
WEST NUSA TENGGARA	4	4	4	4	4	4	4	4	4	4
EAST NUSA TENGGARA	4	4	4	4	4	4	4	4	4	4
WEST KALIMANTAN	2	2	2	2	2	2	2	2	2	2
CENTRAL KALIMANTAN	2	2	2	2	2	2	2	2	2	2
SOUTH KALIMANTAN	3	3	3	3	3	3	3	3	3	3
EAST KALIMANTAN	3	3	3	3	3	3	3	3	3	3
NORTH KALIMANTAN	1	1	1	1	1	1	1	1	1	1
NORTH SULAWESI	6	6	6	6	6	6	6	6	6	6
CENTRAL SULAWESI	3	3	3	3	3	3	3	3	3	3
SOUTH SULAWESI	14	15	16	17	18	19	20	21	22	24
SOUTHEAST SULAWESI	2	2	2	2	2	2	2	2	2	2
GORONTALO	1	1	1	1	1	1	1	1	1	1
WEST SULAWESI	1	1	1	1	1	1	1	1	1	1
MALUKU	2	2	2	2	2	2	2	2	2	2
NORTH MALUKU	1	1	1	1	1	1	1	1	1	1
WEST PAPUA	2	2	2	2	2	2	2	2	2	2
SOUTHWEST PAPUA	1	1	1	1	1	1	1	1	1	1

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
SOUTH PAPUA	0	0	0	0	0	0	0	0	0	0
CENTRAL PAPUA	0	0	0	0	0	0	0	0	0	0
HIGHLAND PAPUA	0	0	0	0	0	0	0	0	0	0
PAPUA	1	1	1	1	1	1	1	1	1	1

### 39. Dermatology and Venereology Specialist

Based on calculations using the supply–demand method, Indonesia’s demand for dermatology, venereology specialists in 2023 was estimated at 2.988 physicians. With a supply of 2.235 specialists, this resulted in a shortage of 753 physicians (25,2%) in 2023. The demand for dermatology, venereology specialists is projected to increase annually, reaching 3.334 in 2025, 4.457 in 2030, and 5.039 by 2032. Each year, approximately 138 specialists are projected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage of dermatology, venereology specialists by 2032 (38,1%).

Table 76. Projection of Dermatology and Venereology Specialists Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	2.988	2.235	753	25,2%
2024	3.157	2.339	818	25,9%
2025	3.334	2.442	892	26,8%
2026	3.525	2.543	982	27,9%
2027	3.733	2.643	1.090	29,2%
2028	3.955	2.741	1.214	30,7%
2029	4.197	2.838	1.359	32,4%
2030	4.457	2.933	1.524	34,2%
2031	4.734	3.027	1.707	36,1%
2032	5.039	3.120	1.919	38,1%

Provincial demand for dermatology and venereology specialists increases annually, driven by population growth, disease prevalence, and the epidemiological burden in each province. The provinces with the highest annual demand are Central Java, Bali, DKI Jakarta, and East Java.

Table 77. Projection of Dermatology and Venereology Specialists Needs in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	156	164	173	183	193	204	216	229	243	258
NORTH SUMATERA	170	179	189	200	212	225	239	254	269	286
WEST SUMATERA	124	132	140	149	159	169	180	192	205	219
RIAU	119	126	133	141	149	158	168	178	189	201



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
JAMBI	32	34	36	38	40	42	44	46	49	52
SOUTH SUMATERA	118	125	132	140	149	158	168	179	190	203
BENGKULU	29	31	33	35	37	39	42	45	48	51
LAMPUNG	49	52	55	58	62	66	70	74	79	84
BANGKA BELITUNG ISLANDS	30	32	34	36	38	40	42	44	46	49
RIAU ISLANDS	21	22	23	24	25	26	28	30	32	34
DKI JAKARTA	182	192	202	213	225	238	252	268	285	304
WEST JAVA	157	165	173	182	192	202	213	225	238	252
CENTRAL JAVA	219	231	244	258	273	289	306	325	345	367
DI YOGYAKARTA	57	60	63	67	71	75	80	85	90	96
EAST JAVA	177	187	197	208	220	233	247	262	278	296
BANTEN	184	193	202	211	221	232	244	256	269	283
BALI	209	220	232	245	259	274	290	307	325	345
WEST NUSA TENGGARA	79	83	88	93	98	104	110	117	124	132
EAST NUSA TENGGARA	50	53	56	60	64	68	72	77	82	88
WEST KALIMANTAN	50	53	56	59	62	65	69	73	77	81
CENTRAL KALIMANTAN	42	44	46	48	51	54	57	60	63	67
SOUTH KALIMANTAN	81	86	91	96	102	108	115	122	130	139
EAST KALIMANTAN	109	118	130	143	157	172	188	205	223	242
NORTH KALIMANTAN	30	32	34	36	38	40	43	46	49	52
NORTH SULAWESI	61	65	69	73	78	83	89	95	102	109
CENTRAL SULAWESI	58	62	66	70	75	80	85	91	97	104
SOUTH SULAWESI	218	231	244	258	273	290	308	327	348	371
SOUTHEAST SULAWESI	32	34	36	38	40	43	46	49	52	55
GORONTALO	23	24	25	26	27	28	29	30	32	34
WEST SULAWESI	22	23	24	25	27	29	31	33	35	37
MALUKU	15	16	17	18	19	20	21	23	25	27
NORTH MALUKU	12	13	14	15	16	17	18	19	20	21
WEST PAPUA	4	4	4	4	4	4	4	4	4	4
SOUTHWEST PAPUA	9	9	9	9	9	10	11	12	13	14
SOUTH PAPUA	5	5	5	5	5	5	5	5	5	5
CENTRAL PAPUA	5	5	5	5	5	5	5	6	7	8
HIGHLAND PAPUA	4	4	4	4	4	4	4	4	4	4
PAPUA	46	48	50	52	54	56	58	60	62	65



#### 40. Pediatric Dentist

Based on calculations using the supply–demand method, Indonesia’s demand for pediatric dentists in 2023 was estimated at 1.699 physicians. With a supply of 731 pediatric dentists, this resulted in a shortage of 968 physicians (57,0%) in 2023. The demand for pediatric dentists is projected to increase annually, reaching 1.972 in 2025, 2.866 in 2030, and 3.331 by 2032. Each year, approximately 63 pediatric dentists are projected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage of pediatric dentists by 2032 (64,8%).

Table 78. Projection of Pediatric Dentists Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	1699	731	968	57,0%
2024	1831	783	1.048	57,2%
2025	1972	834	1.138	57,7%
2026	2126	884	1.242	58,4%
2027	2290	934	1.356	59,2%
2028	2466	983	1.483	60,1%
2029	2659	1031	1.628	61,2%
2030	2866	1079	1.787	62,4%
2031	3090	1126	1.964	63,6%
2032	3331	1172	2.159	64,8%

Provincial demand for pediatric dentists increases annually, driven by population growth, disease prevalence, and the epidemiological burden in each province. The provinces with the highest annual demand are East Java, West Java, DKI Jakarta, and South Sulawesi.

Table 79. Projection of Pediatric Dentists Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	7	9	10	11	12	13	14	15	16	17
NORTH SUMATERA	5	10	11	12	13	14	15	16	17	18
WEST SUMATERA	28	56	61	66	71	77	83	90	97	105
RIAU	48	95	103	112	121	131	142	154	167	181
JAMBI	3	6	6	6	6	6	7	8	9	10
SOUTH SUMATERA	4	8	9	10	11	12	13	14	15	16
BENGKULU	1	2	2	2	2	2	2	2	2	2
LAMPUNG	3	8	9	10	11	12	13	14	15	16
BANGKA BELITUNG ISLANDS	1	2	2	2	2	2	2	2	2	2
RIAU ISLANDS	5	8	9	10	11	12	13	14	15	16
DKI JAKARTA	112	158	169	181	194	208	223	240	258	278
WEST JAVA	120	275	296	319	344	370	399	430	464	501
CENTRAL JAVA	40	68	73	79	85	92	99	107	115	124



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
DI YOGYAKARTA	76	101	109	117	126	136	147	158	170	183
EAST JAVA	152	290	311	334	359	386	415	446	479	515
BANTEN	60	164	176	189	203	219	236	254	274	296
BALI	10	15	16	17	18	19	20	22	24	26
WEST NUSA TENGGARA	43	92	100	109	118	128	139	151	164	178
EAST NUSA TENGGARA	24	41	44	48	52	56	61	66	71	77
WEST KALIMANTAN	20	38	41	44	48	52	56	61	66	71
CENTRAL KALIMANTAN	2	4	4	4	4	4	4	4	4	4
SOUTH KALIMANTAN	5	8	9	10	11	12	13	14	15	16
EAST KALIMANTAN	35	46	52	58	65	72	80	88	97	106
NORTH KALIMANTAN	8	12	13	14	15	16	17	18	20	22
NORTH SULAWESI	27	57	61	66	71	76	82	88	95	102
CENTRAL SULAWESI	13	26	28	30	32	34	37	40	43	46
SOUTH SULAWESI	109	162	174	187	201	216	232	249	268	288
SOUTHEAST SULAWESI	36	51	55	60	65	70	76	82	89	96
GORONTALO	3	6	6	6	6	6	6	6	6	6
WEST SULAWESI	1	1	1	1	1	1	1	1	1	1
MALUKU	1	2	2	2	2	2	2	2	2	2
NORTH MALUKU	1	2	2	2	2	2	2	2	2	2
WEST PAPUA	1	2	2	2	2	2	2	2	2	2
SOUTHWEST PAPUA	1	2	2	2	2	2	2	2	2	2
SOUTH PAPUA	1	1	1	1	1	1	1	1	1	1
CENTRAL PAPUA	1	1	1	1	1	1	1	1	1	1
HIGHLAND PAPUA	1	1	1	1	1	1	1	1	1	1
PAPUA	1	1	1	1	1	1	1	1	1	1

#### 41. Oral Pathologist

Based on the results of calculations using the supply–demand method, Indonesia’s demand for oral pathologists in 2023 was estimated at 136 specialists. With a supply of 12 specialists, this resulted in a shortage of 124 specialists (91,2%) in 2023. The demand for oral pathologists is projected to increase annually, reaching 150 in 2025, 195 in 2030, and 217 by 2032. Each year, approximately 12.000 specialists are projected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage of oral pathologists by 2032 (94,5%).



Table 80. Projection of Oral Pathologists Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	136	12	124	91,2%
2024	142	12	130	91,5%
2025	150	12	138	92,0%
2026	158	12	146	92,4%
2027	166	12	154	92,8%
2028	175	12	163	93,1%
2029	185	12	173	93,5%
2030	195	12	183	93,8%
2031	205	12	193	94,1%
2032	217	12	205	94,5%

Provincial demand for oral pathologists increases annually, driven by population growth, disease prevalence, and the epidemiological burden in each province. The provinces with the highest annual demand are East Java, West Java, Central Java, and DKI Jakarta.

Table 81. Projection of Oral Pathologists Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	1	1	1	1	1	1	1	1	1	1
NORTH SUMATERA	5	5	5	5	5	5	5	5	5	5
WEST SUMATERA	4	4	4	4	4	4	4	4	4	4
RIAU	2	2	2	2	2	2	2	2	2	2
JAMBI	1	1	1	1	1	1	1	1	1	1
SOUTH SUMATERA	5	5	5	5	5	5	5	5	5	5
BENGKULU	1	1	1	1	1	1	1	1	1	1
LAMPUNG	1	1	1	1	1	1	1	1	1	1
BANGKA BELITUNG ISLANDS	1	1	1	1	1	1	1	1	1	1
RIAU ISLANDS	1	1	1	1	1	1	1	1	1	1
DKI JAKARTA	17	18	19	20	21	23	25	27	29	31
WEST JAVA	19	20	22	24	26	28	30	32	34	37
CENTRAL JAVA	19	20	22	24	26	28	30	32	34	37
DI YOGYAKARTA	2	2	2	2	2	2	2	2	2	2
EAST JAVA	25	27	29	31	33	35	38	41	44	47
BANTEN	3	3	3	3	3	3	3	3	3	3
BALI	2	2	2	2	2	2	2	2	2	2
WEST NUSA TENGGARA	1	1	1	1	1	1	1	1	1	1
EAST NUSA TENGGARA	2	2	2	2	2	2	2	2	2	2
WEST KALIMANTAN	2	2	2	2	2	2	2	2	2	2



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
CENTRAL KALIMANTAN	1	1	1	1	1	1	1	1	1	1
SOUTH KALIMANTAN	2	2	2	2	2	2	2	2	2	2
EAST KALIMANTAN	5	6	7	8	9	10	11	12	13	14
NORTH KALIMANTAN	0	0	0	0	0	0	0	0	0	0
NORTH SULAWESI	1	1	1	1	1	1	1	1	1	1
CENTRAL SULAWESI	0	0	0	0	0	0	0	0	0	0
SOUTH SULAWESI	2	2	2	2	2	2	2	2	2	2
SOUTHEAST SULAWESI	1	1	1	1	1	1	1	1	1	1
GORONTALO	1	1	1	1	1	1	1	1	1	1
WEST SULAWESI	1	1	1	1	1	1	1	1	1	1
MALUKU	1	1	1	1	1	1	1	1	1	1
NORTH MALUKU	1	1	1	1	1	1	1	1	1	1
WEST PAPUA	1	1	1	1	1	1	1	1	1	1
SOUTHWEST PAPUA	1	1	1	1	1	1	1	1	1	1
SOUTH PAPUA	1	1	1	1	1	1	1	1	1	1
CENTRAL PAPUA	1	1	1	1	1	1	1	1	1	1
HIGHLAND PAPUA	1	1	1	1	1	1	1	1	1	1
PAPUA	1	1	1	1	1	1	1	1	1	1

## 42. Oral Medicine Specialist

Based on the results of calculations using the supply–demand method, Indonesia’s demand for oral medicine specialists in 2023 was estimated at 136 specialists. With a supply of 12 oral medicine specialists, this resulted in a shortage of 124 specialists (91,2%) in 2023. The demand for oral medicine specialists is projected to increase annually, reaching 150 in 2025, 195 in 2030, and 217 by 2032. Each year, approximately 12.000 oral medicine specialists are projected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage of oral medicine specialists by 2032 (94,5%).

Table 82. Projection of Oral Medicine Specialists Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	569	206	363	63,8%
2024	611	225	386	63,2%
2025	655	244	411	62,7%
2026	703	262	441	62,7%
2027	754	280	474	62,9%
2028	807	298	509	63,1%
2029	865	316	549	63,5%



Year	Demand	Supply	Gap	Gap Percentage
2030	927	333	594	64,1%
2031	996	350	646	64,9%
2032	1068	367	701	65,6%

Provincial demand for oral medicine specialists increases annually, driven by population growth, disease prevalence, and the epidemiological burden in each province. The provinces with the highest demand each year are South Sulawesi, West Java, DKI Jakarta, and East Java.

Table 83. Projection of Oral Medicine Specialists Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	8	9	10	11	12	13	14	15	16	17
NORTH SUMATERA	14	15	16	17	18	19	21	23	25	27
WEST SUMATERA	8	9	10	11	12	13	14	15	16	17
RIAU	6	6	6	6	6	7	8	9	10	11
JAMBI	4	4	4	4	4	4	4	4	4	4
SOUTH SUMATERA	13	14	15	16	17	18	19	21	23	25
BENGKULU	4	4	4	4	4	4	4	4	4	4
LAMPUNG	7	8	9	10	11	12	13	14	15	16
BANGKA BELITUNG ISLANDS	4	4	4	4	4	4	4	4	4	4
RIAU ISLANDS	7	8	9	10	11	12	13	14	15	16
DKI JAKARTA	56	60	64	69	74	79	85	91	98	105
WEST JAVA	73	79	85	92	99	107	115	124	134	145
CENTRAL JAVA	11	12	13	14	15	16	17	18	19	21
DI YOGYAKARTA	15	16	17	18	19	20	22	24	26	28
EAST JAVA	55	59	63	68	73	78	84	90	97	104
BANTEN	18	19	20	22	24	26	28	30	32	35
BALI	9	10	11	12	13	14	15	16	17	18
WEST NUSA TENGGARA	19	21	23	25	27	29	31	34	37	40
EAST NUSA TENGGARA	9	10	11	12	13	14	15	16	17	18
WEST KALIMANTAN	5	5	5	5	5	5	5	5	5	5
CENTRAL KALIMANTAN	4	4	4	4	4	4	4	4	4	4
SOUTH KALIMANTAN	9	10	11	12	13	14	15	16	17	18
EAST KALIMANTAN	6	7	8	9	10	11	12	13	14	15
NORTH KALIMANTAN	4	4	4	4	4	4	4	4	4	4
NORTH SULAWESI	38	41	44	47	51	55	59	63	68	73
CENTRAL SULAWESI	27	29	31	33	36	39	42	45	49	53
SOUTH SULAWESI	92	99	107	115	124	133	143	154	166	178



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
SOUTHEAST SULAWESI	18	19	21	23	25	27	29	31	34	37
GORONTALO	3	3	3	3	3	3	3	3	3	3
WEST SULAWESI	3	3	3	3	3	3	3	3	3	3
MALUKU	4	4	4	4	4	4	4	4	4	4
NORTH MALUKU	2	2	2	2	2	2	2	2	2	2
WEST PAPUA	3	3	3	3	3	3	3	3	3	3
SOUTHWEST PAPUA	3	3	3	3	3	3	3	3	3	3
SOUTH PAPUA	2	2	2	2	2	2	2	2	2	2
CENTRAL PAPUA	2	2	2	2	2	2	2	2	2	2
HIGHLAND PAPUA	2	2	2	2	2	2	2	2	2	2
PAPUA	2	2	2	2	2	2	2	2	2	2

### 43. Periodontist

Based on the results of calculations using the supply–demand method, Indonesia’s demand for periodontists in 2023 was estimated at 1.484 specialists. With a supply of 619 periodontists, this resulted in a shortage of 865 specialists (58,3%) in 2023. The demand for periodontists is projected to increase annually, reaching 1.721 in 2025, 2.492 in 2030, and 2.895 by 2032. Each year, approximately 78 periodontists are projected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage of periodontists by 2032 (58,4%).

Table 84. Projection of Periodontists Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	1484	619	865	58,3%
2024	1598	688	910	56,9%
2025	1721	756	965	56,1%
2026	1850	823	1.027	55,5%
2027	1994	889	1.105	55,4%
2028	2146	954	1.192	55,5%
2029	2312	1018	1.294	56,0%
2030	2492	1081	1.411	56,6%
2031	2686	1143	1.543	57,4%
2032	2895	1204	1.691	58,4%

Provincial demand for periodontists increases annually, driven by population growth, disease prevalence, and the epidemiological burden in each province. The provinces with the highest demand each year are West Java, East Java, Central Java, and North Sumatra.



Table 85. Projection of Periodontists Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	22	24	26	28	30	32	35	38	41	44
NORTH SUMATERA	107	116	126	136	147	159	172	186	201	218
WEST SUMATERA	19	21	23	25	27	29	31	34	37	40
RIAU	66	71	77	83	90	98	106	115	125	136
JAMBI	20	22	24	26	28	30	33	36	39	42
SOUTH SUMATERA	27	29	31	33	36	39	42	45	49	53
BENGKULU	3	3	3	3	3	3	3	3	3	3
LAMPUNG	55	59	64	69	75	81	88	95	103	111
BANGKA BELITUNG ISLANDS	9	10	11	12	13	14	15	16	17	18
RIAU ISLANDS	47	51	55	59	64	69	75	81	88	95
DKI JAKARTA	90	96	103	110	118	127	136	146	157	169
WEST JAVA	254	274	295	318	342	368	397	428	461	497
CENTRAL JAVA	135	146	157	169	182	196	211	228	246	265
DI YOGYAKARTA	60	65	70	75	81	87	94	101	109	118
EAST JAVA	181	194	208	223	240	258	277	298	320	344
BANTEN	69	74	80	86	93	100	108	116	125	135
BALI	28	30	32	34	37	40	43	46	50	54
WEST NUSA TENGGARA	81	88	95	103	112	122	132	143	155	168
EAST NUSA TENGGARA	4	4	4	4	4	4	4	4	4	4
WEST KALIMANTAN	4	4	4	4	4	4	4	4	4	4
CENTRAL KALIMANTAN	5	5	5	5	5	5	5	5	5	5
SOUTH KALIMANTAN	11	12	13	14	15	16	17	18	19	21
EAST KALIMANTAN	30	33	37	41	46	51	56	62	68	74
NORTH KALIMANTAN	7	8	9	10	11	12	13	14	15	16
NORTH SULAWESI	33	35	38	41	44	47	51	55	59	63
CENTRAL SULAWESI	29	31	33	36	39	42	45	49	53	57
SOUTH SULAWESI	33	36	39	42	45	48	52	56	60	65
SOUTHEAST SULAWESI	19	21	23	25	27	29	31	34	37	40
GORONTALO	6	6	6	6	6	6	6	6	6	6
WEST SULAWESI	3	3	3	3	3	3	3	3	3	3
MALUKU	4	4	4	4	4	4	4	4	4	4
NORTH MALUKU	5	5	5	5	5	5	5	5	5	5
WEST PAPUA	4	4	4	4	4	4	4	4	4	4
SOUTHWEST PAPUA	4	4	4	4	4	4	4	4	4	4



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
SOUTH PAPUA	2	2	2	2	2	2	2	2	2	2
CENTRAL PAPUA	3	3	3	3	3	3	3	3	3	3
HIGHLAND PAPUA	3	3	3	3	3	3	3	3	3	3
PAPUA	2	2	2	2	2	2	2	2	2	2

#### 44. Prosthodontist

Based on the results of calculations using the supply–demand method, Indonesia’s demand for prosthodontists in 2023 was estimated at 1.103 specialists. With a supply of 572 prosthodontists, this resulted in a shortage of 531 specialists (48,1%) in 2023. The demand for prosthodontists is projected to increase annually, reaching 1.280 in 2025, 1.845 in 2030, and 2.138 by 2032. Each year, approximately 51 prosthodontists are projected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage of prosthodontists by 2032 (56,4%).

Table 86. Projection of Prosthodontists Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	1103	572	531	48,1%
2024	1189	614	575	48,4%
2025	1280	656	624	48,8%
2026	1377	697	680	49,4%
2027	1480	738	742	50,1%
2028	1593	778	815	51,2%
2029	1713	817	896	52,3%
2030	1845	856	989	53,6%
2031	1986	894	1.092	55,0%
2032	2138	932	1.206	56,4%

Provincial demand for prosthodontists increases annually, driven by population growth, disease prevalence, and the epidemiological burden in each province. The provinces with the highest demand each year are West Java, East Java, Central Java, and North Sumatra.

Table 87. Projection of Prosthodontists Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	10	11	12	13	14	15	16	17	18	19
NORTH SUMATERA	97	105	114	123	133	144	156	169	183	198
WEST SUMATERA	11	12	13	14	15	16	17	18	19	21
RIAU	22	24	26	28	30	33	36	39	42	46
JAMBI	4	4	4	4	4	4	4	4	4	4
SOUTH SUMATERA	9	10	11	12	13	14	15	16	17	18



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
BENGKULU	2	2	2	2	2	2	2	2	2	2
LAMPUNG	9	10	11	12	13	14	15	16	17	18
BANGKA BELITUNG ISLANDS	3	3	3	3	3	3	3	3	3	3
RIAU ISLANDS	9	10	11	12	13	14	15	16	17	18
DKI JAKARTA	94	101	108	116	124	133	143	154	166	179
WEST JAVA	161	173	186	200	215	232	250	270	291	314
CENTRAL JAVA	142	153	165	178	192	207	223	241	260	281
DI YOGYAKARTA	13	14	15	16	17	18	19	20	22	24
EAST JAVA	160	172	185	199	214	230	247	266	286	307
BANTEN	36	39	42	45	48	52	56	60	65	70
BALI	34	37	40	43	46	49	53	57	61	66
WEST NUSA TENGGARA	43	47	51	55	60	65	71	77	84	91
EAST NUSA TENGGARA	19	21	23	25	27	29	31	34	37	40
WEST KALIMANTAN	16	17	18	19	21	23	25	27	29	31
CENTRAL KALIMANTAN	5	5	5	5	5	5	5	5	5	5
SOUTH KALIMANTAN	8	9	10	11	12	13	14	15	16	17
EAST KALIMANTAN	18	20	23	26	29	32	35	39	43	47
NORTH KALIMANTAN	4	4	4	4	4	4	4	4	4	4
NORTH SULAWESI	36	39	42	45	48	52	56	60	65	70
CENTRAL SULAWESI	30	32	34	37	40	43	46	50	54	58
SOUTH SULAWESI	75	81	87	94	101	109	117	126	135	145
SOUTHEAST SULAWESI	10	11	12	13	14	15	16	17	18	19
GORONTALO	5	5	5	5	5	5	5	5	5	5
WEST SULAWESI	2	2	2	2	2	2	2	2	2	2
MALUKU	3	3	3	3	3	3	3	3	3	3
NORTH MALUKU	3	3	3	3	3	3	3	3	3	3
WEST PAPUA	2	2	2	2	2	2	2	2	2	2
SOUTHWEST PAPUA	2	2	2	2	2	2	2	2	2	2
SOUTH PAPUA	2	2	2	2	2	2	2	2	2	2
CENTRAL PAPUA	1	1	1	1	1	1	1	1	1	1
HIGHLAND PAPUA	2	2	2	2	2	2	2	2	2	2
PAPUA	1	1	1	1	1	1	1	1	1	1



#### 45. Oral And Maxillofacial Radiologist

Based on the results of calculations using the supply–demand method, Indonesia’s demand for oral and maxillofacial radiologists in 2023 was estimated at 882 specialists. With a supply of 84 oral and maxillofacial radiologists, this resulted in a shortage of 798 specialists (90,5%) in 2023. The demand for oral and maxillofacial radiologists is projected to increase annually, reaching 1.015 in 2025, 1.444 in 2030, and 1.672 by 2032. Each year, approximately 22 oral and maxillofacial radiologists are projected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage of oral and maxillofacial radiologists by 2032 (84,4%).

Table 88. Projection of Oral And Maxillofacial Radiologist Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	882	84	798	90,5%
2024	947	105	842	88,9%
2025	1015	125	890	87,7%
2026	1088	145	943	86,7%
2027	1168	165	1.003	85,9%
2028	1254	185	1.069	85,2%
2029	1345	204	1.141	84,8%
2030	1444	223	1.221	84,6%
2031	1554	242	1.312	84,4%
2032	1672	260	1.412	84,4%

Provincial demand for oral and maxillofacial radiologists increases annually, driven by population growth, disease prevalence, and each province's epidemiological burden. The provinces with the highest annual demand are West Java, Central Java, East Java, and North Sumatra.

Table 89. Projection of Oral And Maxillofacial Radiologist Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	14	15	16	17	18	19	21	23	25	27
NORTH SUMATERA	73	79	86	93	101	109	118	128	139	151
WEST SUMATERA	10	11	12	13	14	15	16	17	18	19
RIAU	33	36	39	42	45	49	53	57	62	67
JAMBI	9	10	11	12	13	14	15	16	17	18
SOUTH SUMATERA	34	37	40	43	46	50	54	58	63	68
BENGKULU	4	4	4	4	4	4	4	4	4	4
LAMPUNG	37	40	43	46	50	54	58	63	68	74
BANGKA BELITUNG ISLANDS	4	4	4	4	4	4	4	4	4	4
RIAU ISLANDS	4	4	4	4	4	4	4	4	4	4
DKI JAKARTA	69	74	79	85	91	98	105	113	121	130



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
WEST JAVA	164	177	190	205	221	238	257	277	299	323
CENTRAL JAVA	82	88	95	102	110	119	128	138	149	161
DI YOGYAKARTA	21	23	25	27	29	31	33	36	39	42
EAST JAVA	74	79	85	91	98	105	113	121	130	140
BANTEN	65	70	75	81	87	94	101	109	118	127
BALI	18	19	20	22	24	26	28	30	32	34
WEST NUSA TENGGARA	24	26	28	30	33	36	39	42	46	50
EAST NUSA TENGGARA	5	5	5	5	5	5	5	5	5	5
WEST KALIMANTAN	6	6	6	6	6	6	6	6	6	6
CENTRAL KALIMANTAN	6	6	6	6	6	6	6	6	6	6
SOUTH KALIMANTAN	4	4	4	4	4	4	4	4	4	4
EAST KALIMANTAN	17	19	21	23	26	29	32	35	39	43
NORTH KALIMANTAN	4	4	4	4	4	4	4	4	4	4
NORTH SULAWESI	14	15	16	17	18	19	20	22	24	26
CENTRAL SULAWESI	12	13	14	15	16	17	18	19	20	22
SOUTH SULAWESI	21	23	25	27	29	31	33	35	38	41
SOUTHEAST SULAWESI	9	10	11	12	13	14	15	16	17	18
GORONTALO	3	3	3	3	3	3	3	3	3	3
WEST SULAWESI	4	4	4	4	4	4	4	4	4	4
MALUKU	6	6	6	6	6	6	6	6	6	6
NORTH MALUKU	7	8	9	10	11	12	13	14	15	16
WEST PAPUA	6	6	6	6	6	6	6	6	6	6
SOUTHWEST PAPUA	5	5	5	5	5	5	5	5	5	5
SOUTH PAPUA	3	3	3	3	3	3	3	3	3	3
CENTRAL PAPUA	4	4	4	4	4	4	4	4	4	4
HIGHLAND PAPUA	4	4	4	4	4	4	4	4	4	4
PAPUA	3	3	3	3	3	3	3	3	3	3

#### 46. Oral and Maxillofacial Surgeon

Based on the results of calculations using the supply–demand method, Indonesia’s demand for oral and maxillofacial surgeons in 2023 was estimated at 983 specialists. With a supply of 662 specialists, this resulted in a shortage of 321 specialists (32,7%) in 2023. The demand for oral and maxillofacial surgeons is projected to increase annually, reaching 1.138 in 2025, 1.641 in 2030, and 1.901 by 2032. Each year, approximately 60 specialists are projected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage of oral and maxillofacial surgeons by 2032 (42,9%).



Table 90. Projection of Oral and Maxillofacial Surgeon Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	983	662	321	32,7%
2024	1059	712	347	32,8%
2025	1138	761	377	33,1%
2026	1224	810	414	33,8%
2027	1316	858	458	34,8%
2028	1416	905	511	36,1%
2029	1524	951	573	37,6%
2030	1641	997	644	39,2%
2031	1766	1042	724	41,0%
2032	1901	1086	815	42,9%

Provincial demand for oral and maxillofacial surgeons increases annually, driven by population growth, disease prevalence, and the epidemiological burden in each province. The provinces with the highest demand each year are East Java, West Java, Banten, and DKI Jakarta.

Table 91. Projection of Oral and Maxillofacial Surgeons Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	10	11	12	13	14	15	16	17	18	19
NORTH SUMATERA	17	18	20	22	24	26	28	30	33	36
WEST SUMATERA	13	14	15	16	17	18	20	22	24	26
RIAU	14	15	16	17	18	20	22	24	26	28
JAMBI	4	4	4	4	4	4	4	4	4	4
SOUTH SUMATERA	11	12	13	14	15	16	17	18	19	21
BENGKULU	17	18	19	21	23	25	27	29	31	33
LAMPUNG	14	15	16	17	18	19	21	23	25	27
BANGKA BELITUNG ISLANDS	4	4	4	4	4	4	4	4	4	4
RIAU ISLANDS	3	3	3	3	3	3	3	3	3	3
DKI JAKARTA	67	72	77	83	89	96	103	111	119	128
WEST JAVA	147	159	171	184	198	213	230	248	268	289
CENTRAL JAVA	63	68	73	79	85	92	99	107	115	124
DI YOGYAKARTA	52	56	60	65	70	75	81	87	94	101
EAST JAVA	179	192	206	221	238	256	275	296	318	342
BANTEN	102	110	118	127	137	148	160	172	185	200
BALI	14	15	16	17	18	19	20	22	24	26
WEST NUSA TENGGARA	19	21	23	25	27	29	32	35	38	41
EAST NUSA TENGGARA	25	27	29	31	34	37	40	43	47	51
WEST KALIMANTAN	20	22	24	26	28	30	32	35	38	41



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
CENTRAL KALIMANTAN	9	10	11	12	13	14	15	16	17	18
SOUTH KALIMANTAN	10	11	12	13	14	15	16	17	18	19
EAST KALIMANTAN	22	24	27	30	33	37	41	45	50	55
NORTH KALIMANTAN	4	4	4	4	4	4	4	4	4	4
NORTH SULAWESI	23	25	27	29	31	34	37	40	43	47
CENTRAL SULAWESI	8	9	10	11	12	13	14	15	16	17
SOUTH SULAWESI	59	64	69	74	80	86	92	99	106	114
SOUTHEAST SULAWESI	19	21	23	25	27	29	31	34	37	40
GORONTALO	7	8	9	10	11	12	13	14	15	16
WEST SULAWESI	3	3	3	3	3	3	3	3	3	3
MALUKU	6	6	6	6	6	6	6	6	6	6
NORTH MALUKU	2	2	2	2	2	2	2	2	2	2
WEST PAPUA	3	3	3	3	3	3	3	3	3	3
SOUTHWEST PAPUA	3	3	3	3	3	3	3	3	3	3
SOUTH PAPUA	2	2	2	2	2	2	2	2	2	2
CENTRAL PAPUA	2	2	2	2	2	2	2	2	2	2
HIGHLAND PAPUA	2	2	2	2	2	2	2	2	2	2
PAPUA	4	4	4	4	4	4	4	4	4	4

#### 47. Dental Conservation Specialist / Endodontist

Based on the results of calculations using the supply–demand method, Indonesia’s demand for dental conservation specialist / endodontist in 2023 was estimated at 2.800 specialists. With a supply of 1.287 specialists, this resulted in a shortage of 1.513 specialists (54,0%) in 2023. The demand for endodontists is projected to increase annually, reaching 3.253 in 2025, 4.741 in 2030, and 5.517 by 2032. Each year, approximately 100 specialists are projected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage of endodontists by 2032 (64,3%).

Table 92. Projection of Dental Conservation Specialists Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	2800	1287	1.513	54,0%
2024	3017	1368	1.649	54,7%
2025	3253	1447	1.806	55,5%
2026	3506	1525	1.981	56,5%
2027	3779	1602	2.177	57,6%
2028	4074	1678	2.396	58,8%
2029	4395	1753	2.642	60,1%
2030	4741	1827	2.914	61,5%



Year	Demand	Supply	Gap	Gap Percentage
2031	5113	1900	3.213	62,8%
2032	5517	1971	3.546	64,3%

Provincial demand for endodontists increases annually, driven by population growth, disease prevalence, and the epidemiological burden in each province. The provinces with the highest demand each year are West Java, DKI Jakarta, East Java, and Riau.

Table 93. Projection of Dental Conservation Specialists Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	15	16	17	18	19	21	23	25	27	29
NORTH SUMATERA	44	48	52	56	61	66	71	77	83	90
WEST SUMATERA	143	155	168	182	197	213	231	250	271	293
RIAU	259	280	303	328	355	385	417	452	490	532
JAMBI	8	9	10	11	12	13	14	15	16	17
SOUTH SUMATERA	14	15	16	17	18	19	21	23	25	27
BENGKULU	4	4	4	4	4	4	4	4	4	4
LAMPUNG	7	8	9	10	11	12	13	14	15	16
BANGKA BELITUNG ISLANDS	9	10	11	12	13	14	15	16	17	18
RIAU ISLANDS	14	15	16	17	18	19	21	23	25	27
DKI JAKARTA	350	375	402	431	462	496	533	573	616	663
WEST JAVA	446	480	516	556	599	645	695	749	807	871
CENTRAL JAVA	163	176	190	205	221	238	257	277	299	323
DI YOGYAKARTA	166	179	193	208	224	241	260	280	302	326
EAST JAVA	300	322	346	372	400	430	462	497	534	574
BANTEN	165	178	191	206	222	239	257	277	299	323
BALI	25	27	29	31	33	36	39	42	45	48
WEST NUSA TENGGARA	93	101	110	119	129	140	152	165	179	194
EAST NUSA TENGGARA	66	71	77	83	90	97	105	114	123	133
WEST KALIMANTAN	55	60	65	70	76	82	89	96	104	113
CENTRAL KALIMANTAN	18	19	21	23	25	27	29	31	34	37
SOUTH KALIMANTAN	24	26	28	30	32	35	38	41	44	48
EAST KALIMANTAN	52	57	64	72	80	89	98	108	119	130
NORTH KALIMANTAN	15	16	17	18	20	22	24	26	28	30
NORTH SULAWESI	83	89	96	103	111	119	128	138	148	159
CENTRAL SULAWESI	24	26	28	30	32	34	37	40	43	46
SOUTH SULAWESI	120	129	139	149	160	172	185	199	214	230



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
SOUTHEAST SULAWESI	79	85	92	100	108	117	126	136	147	159
GORONTALO	8	9	10	11	12	13	14	15	16	17
WEST SULAWESI	5	5	5	5	5	5	5	5	5	5
MALUKU	4	4	4	4	4	4	4	4	4	4
NORTH MALUKU	6	7	8	9	10	11	12	13	14	15
WEST PAPUA	2	2	2	2	2	2	2	2	2	2
SOUTHWEST PAPUA	4	4	4	4	4	4	4	4	4	4
SOUTH PAPUA	4	4	4	4	4	4	4	4	4	4
CENTRAL PAPUA	1	1	1	1	1	1	1	1	1	1
HIGHLAND PAPUA	1	1	1	1	1	1	1	1	1	1
PAPUA	4	4	4	4	4	4	4	4	4	4

#### 48. Forensic Odontologist

Based on the results of calculations using the supply–demand method, Indonesia’s demand for forensic odontologists in 2023 was estimated at 65 specialists. With a supply of 22 specialists, this resulted in a shortage of 43 specialists (66,2%) in 2023. The demand for forensic odontologists is projected to increase annually, reaching 69 in 2025, 79 in 2030, and 84 by 2032. Each year, approximately 12.000 specialists are projected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage of forensic odontologists by 2032 (47,6%).

Table 94. Projection of Forensic Odontologists Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	65	22	43	66,2%
2024	67	25	42	62,7%
2025	69	28	41	59,4%
2026	71	31	40	56,3%
2027	73	34	39	53,4%
2028	75	36	39	52,0%
2029	77	38	39	50,6%
2030	79	40	39	49,4%
2031	81	42	39	48,1%
2032	84	44	40	47,6%

Provincial demand for forensic odontologists increases annually, driven by population growth, disease prevalence, and the epidemiological burden in each province. The provinces with the highest demand each year are DKI Jakarta, West Java, East Java, and Central Java.



Table 95. Projection of Forensic Odontologists Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	1	1	1	1	1	1	1	1	1	1
NORTH SUMATERA	1	1	1	1	1	1	1	1	1	1
WEST SUMATERA	1	1	1	1	1	1	1	1	1	1
RIAU	1	1	1	1	1	1	1	1	1	1
JAMBI	1	1	1	1	1	1	1	1	1	1
SOUTH SUMATERA	1	1	1	1	1	1	1	1	1	1
BENGKULU	1	1	1	1	1	1	1	1	1	1
LAMPUNG	1	1	1	1	1	1	1	1	1	1
BANGKA BELITUNG ISLANDS	1	1	1	1	1	1	1	1	1	1
RIAU ISLANDS	1	1	1	1	1	1	1	1	1	1
DKI JAKARTA	12	13	14	15	16	17	18	19	20	22
WEST JAVA	7	8	9	10	11	12	13	14	15	16
CENTRAL JAVA	3	3	3	3	3	3	3	3	3	3
DI YOGYAKARTA	1	1	1	1	1	1	1	1	1	1
EAST JAVA	6	6	6	6	6	6	6	6	6	6
BANTEN	2	2	2	2	2	2	2	2	2	2
BALI	1	1	1	1	1	1	1	1	1	1
WEST NUSA TENGGARA	1	1	1	1	1	1	1	1	1	1
EAST NUSA TENGGARA	1	1	1	1	1	1	1	1	1	1
WEST KALIMANTAN	1	1	1	1	1	1	1	1	1	1
CENTRAL KALIMANTAN	1	1	1	1	1	1	1	1	1	1
SOUTH KALIMANTAN	2	2	2	2	2	2	2	2	2	2
EAST KALIMANTAN	1	1	1	1	1	1	1	1	1	1
NORTH KALIMANTAN	1	1	1	1	1	1	1	1	1	1
NORTH SULAWESI	1	1	1	1	1	1	1	1	1	1
CENTRAL SULAWESI	1	1	1	1	1	1	1	1	1	1
SOUTH SULAWESI	3	3	3	3	3	3	3	3	3	3
SOUTHEAST SULAWESI	1	1	1	1	1	1	1	1	1	1
GORONTALO	1	1	1	1	1	1	1	1	1	1
WEST SULAWESI	1	1	1	1	1	1	1	1	1	1
MALUKU	1	1	1	1	1	1	1	1	1	1
NORTH MALUKU	1	1	1	1	1	1	1	1	1	1
WEST PAPUA	1	1	1	1	1	1	1	1	1	1
SOUTHWEST PAPUA	1	1	1	1	1	1	1	1	1	1

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
SOUTH PAPUA	1	1	1	1	1	1	1	1	1	1
CENTRAL PAPUA	1	1	1	1	1	1	1	1	1	1
HIGHLAND PAPUA	1	1	1	1	1	1	1	1	1	1
PAPUA	0	0	0	0	0	0	0	0	0	0

#### 49. Orthodontist

Based on the results of calculations using the supply–demand method, Indonesia’s demand for orthodontists in 2023 was estimated at 1.431 specialists. With a supply of 937 specialists, this resulted in a shortage of 494 specialists (34,5%) in 2023. The demand for orthodontists is projected to increase annually, reaching 1.652 in 2025, 2.365 in 2030, and 2.737 by 2032. Each year, approximately 51 specialists are projected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage of orthodontists specialists by 2032 (54,7%).

Table 96. Projection of Orthodontists Specialist Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	1431	937	494	34,5%
2024	1538	963	575	37,4%
2025	1652	1000	652	39,5%
2026	1773	1036	737	41,6%
2027	1903	1071	832	43,7%
2028	2044	1106	938	45,9%
2029	2199	1140	1.059	48,2%
2030	2365	1174	1.191	50,4%
2031	2544	1207	1.337	52,6%
2032	2737	1240	1.497	54,7%

Provincial demand for orthodontists specialists increases annually, driven by population growth, disease prevalence, and the epidemiological burden in each province. The provinces with the highest demand each year are DKI Jakarta, East Java, Banten, and Central Java.

Table 97. Projection of Orthodontists Specialist Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	15	16	17	18	19	21	23	25	27	29
NORTH SUMATERA	44	48	52	56	61	66	71	77	83	90
WEST SUMATERA	22	24	26	28	30	32	35	38	41	44
RIAU	8	9	10	11	12	13	14	15	16	17
JAMBI	1	1	1	1	1	1	1	1	1	1
SOUTH SUMATERA	14	15	16	17	18	19	21	23	25	27



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
BENGKULU	4	4	4	4	4	4	4	4	4	4
LAMPUNG	7	8	9	10	11	12	13	14	15	16
BANGKA BELITUNG ISLANDS	9	10	11	12	13	14	15	16	17	18
RIAU ISLANDS	14	15	16	17	18	19	21	23	25	27
DKI JAKARTA	350	375	402	431	462	496	533	573	616	663
WEST JAVA	27	29	31	33	36	39	42	45	49	53
CENTRAL JAVA	163	176	190	205	221	238	257	277	299	323
DI YOGYAKARTA	13	14	15	16	17	18	19	20	22	24
EAST JAVA	300	322	346	372	400	430	462	497	534	574
BANTEN	165	178	191	206	222	239	257	277	299	323
BALI	25	27	29	31	33	36	39	42	45	48
WEST NUSA TENGGARA	13	14	15	16	17	18	20	22	24	26
EAST NUSA TENGGARA	5	5	5	5	5	5	5	5	5	5
WEST KALIMANTAN	1	1	1	1	1	1	1	1	1	1
CENTRAL KALIMANTAN	18	19	21	23	25	27	29	31	34	37
SOUTH KALIMANTAN	24	26	28	30	32	35	38	41	44	48
EAST KALIMANTAN	5	6	7	8	9	10	11	12	13	14
NORTH KALIMANTAN	0	0	0	0	0	0	0	0	0	0
NORTH SULAWESI	5	5	5	5	5	5	5	5	5	5
CENTRAL SULAWESI	24	26	28	30	32	34	37	40	43	46
SOUTH SULAWESI	120	129	139	149	160	172	185	199	214	230
SOUTHEAST SULAWESI	3	3	3	3	3	3	3	3	3	3
GORONTALO	1	1	1	1	1	1	1	1	1	1
WEST SULAWESI	5	5	5	5	5	5	5	5	5	5
MALUKU	4	4	4	4	4	4	4	4	4	4
NORTH MALUKU	6	7	8	9	10	11	12	13	14	15
WEST PAPUA	2	2	2	2	2	2	2	2	2	2
SOUTHWEST PAPUA	4	4	4	4	4	4	4	4	4	4
SOUTH PAPUA	4	4	4	4	4	4	4	4	4	4
CENTRAL PAPUA	1	1	1	1	1	1	1	1	1	1
HIGHLAND PAPUA	1	1	1	1	1	1	1	1	1	1
PAPUA	4	4	4	4	4	4	4	4	4	4

### 3.3. Projection of Health Workforce Demand Based on Population-Based Approach, 2023–2032, by Type and Province

#### 1. Nurse

Based on the results of calculations using the supply–demand method, Indonesia’s nursing workforce requirement in 2023 was estimated at 582.987 nurses. With an available supply of 574.225 nurses, this resulted in a shortage of 8.762 nurses (1,5%) in 2023. The demand for nurses is projected to increase annually. By 2025, the required number of nurses is estimated to reach 596.547 and is expected to continue rising to 627.842 by 2030. In 2032, the projected demand is estimated at 639.220 nurses. Each year, it is projected that approximately 40.000 nurses graduate, with an attrition rate of 3,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue meeting its nursing workforce needs by 2032, with an estimated surplus of 11,78%.

Table 98. Projection of Nurses Workforce Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	582.987	574.225	-8.762	-1,50%
2024	589.829	592.127	+2.298	+0,39%
2025	596.547	609.403	+12.856	+2,16%
2026	603.117	626.074	+22.957	+3,81%
2027	609.536	642.161	+32.625	+5,35%
2028	615.806	657.685	+41.879	+6,80%
2029	621.910	672.666	+50.756	+8,16%
2030	627.842	687.123	+59.281	+9,44%
2031	633.611	701.074	67.463	10,65%
2032	639.220	714.536	75.316	11,78%

Provincial demand for nurses increases annually, driven by population growth, disease prevalence, and the epidemiological burden in each province. The provinces with the highest nursing workforce demand each year are West Java, East Java, Central Java, and North Sumatra.

Table 99. Projection of Nurses Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	12.356	12.532	12.707	12.879	13.048	13.215	13.380	13.541	13.700	13.856
NORTH SUMATERA	32.036	32.497	32.950	33.395	33.831	34.259	34.677w w	35.086	35.486	35.878
WEST SUMATERA	12.578	12.768	12.956	13.143	13.328	13.512	13.694	13.873	14.050	14.225
RIAU	13.313	13.500	13.684	13.865	14.042	14.217	14.388	14.555	14.720	14.881
JAMBI	7.536	7.638	7.739	7.837	7.933	8.028	8.119	8.209	8.297	8.382
SOUTH SUMATERA	16.619	16.819	17.014	17.205	17.392	17.574	17.752	17.925	18.094	18.259
BENGKULU	4.353	4.414	4.473	4.532	4.590	4.647	4.703	4.757	4.811	4.863
LAMPUNG	18.368	18.599	18.826	19.048	19.266	19.478	19.686	19.889	20.087	20.282



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
BANGKA BELITUNG ISLANDS	3.193	3.239	3.284	3.328	3.372	3.415	3.458	3.499	3.540	3.579
RIAU ISLANDS	4.881	4.956	5.031	5.105	5.178	5.249	5.319	5.388	5.456	5.523
DKI JAKARTA	22.281	22.338	22.354	22.367	22.376	22.380	22.380	22.376	22.371	22.364
WEST JAVA	102.121	103.238	104.211	105.168	106.109	107.036	107.946	108.840	109.722	110.591
CENTRAL JAVA	82.772	83.651	84.510	85.348	86.162	86.952	87.717	88.456	89.169	89.858
DI YOGYAKARTA	8.561	8.627	8.690	8.752	8.812	8.870	8.926	8.980	9.033	9.085
EAST JAVA	85.847	86.555	87.239	87.900	88.537	89.149	89.737	90.299	90.836	91.345
BANTEN	24.558	24.839	25.085	25.327	25.565	25.800	26.031	26.258	26.482	26.705
BALI	8.793	8.863	8.931	8.996	9.060	9.122	9.181	9.239	9.293	9.345
WEST NUSA TENGGARA	13.015	13.230	13.444	13.655	13.865	14.073	14.278	14.481	14.683	14.883
EAST NUSA TENGGARA	11.140	11.328	11.515	11.701	11.887	12.072	12.256	12.438	12.619	12.800
WEST KALIMANTAN	11.168	11.325	11.481	11.633	11.782	11.928	12.071	12.210	12.346	12.480
CENTRAL KALIMANTAN	5.259	5.334	5.409	5.482	5.554	5.625	5.694	5.761	5.827	5.891
SOUTH KALIMANTAN	8.635	8.751	8.865	8.977	9.087	9.195	9.301	9.405	9.507	9.607
EAST KALIMANTAN	8.573	8.883	9.382	9.858	10.309	10.735	11.134	11.501	11.832	12.126
NORTH KALIMANTAN	1.631	1.655	1.678	1.701	1.723	1.746	1.767	1.789	1.809	1.830
NORTH SULAWESI	6.378	6.436	6.492	6.546	6.599	6.651	6.700	6.749	6.795	6.840
CENTRAL SULAWESI	6.775	6.860	6.944	7.027	7.109	7.189	7.267	7.345	7.420	7.494
SOUTH SULAWESI	21.246	21.504	21.759	22.012	22.261	22.505	22.746	22.981	23.211	23.436
SOUTHEAST SULAWESI	5.604	5.701	5.796	5.892	5.986	6.080	6.173	6.265	6.356	6.446
GORONTALO	2.955	2.994	3.033	3.071	3.109	3.146	3.182	3.217	3.252	3.286
WEST SULAWESI	3.024	3.073	3.122	3.170	3.219	3.267	3.315	3.363	3.410	3.457
MALUKU	3.571	3.623	3.674	3.724	3.774	3.824	3.873	3.921	3.969	4.015
NORTH MALUKU	2.584	2.623	2.662	2.700	2.737	2.774	2.811	2.846	2.881	2.916
WEST PAPUA	1.217	1.239	1.260	1.282	1.303	1.324	1.345	1.365	1.385	1.405
SOUTHWEST PAPUA	1.129	1.146	1.164	1.181	1.198	1.214	1.230	1.246	1.261	1.276
SOUTH PAPUA	1.063	1.080	1.097	1.114	1.131	1.148	1.166	1.184	1.202	1.221
CENTRAL PAPUA	2.890	2.935	2.979	3.021	3.061	3.101	3.139	3.176	3.211	3.246
HIGHLAND PAPUA	2.881	2.923	2.964	3.003	3.040	3.076	3.110	3.142	3.173	3.201
PAPUA	2.083	2.113	2.143	2.172	2.201	2.230	2.258	2.287	2.315	2.343

## 2. Midwives

Based on the results of calculations using the supply–demand method, Indonesia’s midwifery workforce demand in 2023 was estimated at 549.238 midwives. With a supply of 331.786 midwives, this resulted in a shortage of 217.452 midwives (39,59%) in 2023. The demand for midwives is projected to increase annually, reaching 566.699 in 2025, 608.616 in 2030, and 624.572 by 2032. Each year, approximately 35.000 midwives are projected to graduate, with an



attrition rate of 3,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage in the midwifery workforce by 2032 (21,92%).

Table 100. Projection of Midwives Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	549.238	331.786	-217.452	-39,59%
2024	558.005	351.673	-206.332	-36,98%
2025	566.699	370.864	-195.835	-34,56%
2026	575.295	389.384	-185.911	-32,32%
2027	583.789	407.256	-176.533	-30,24%
2028	592.181	424.502	-167.679	-28,32%
2029	600.466	441.144	-159.322	-26,53%
2030	608.616	457.204	-151.412	-24,88%
2031	616.655	472.702	-143.953	-23,34%
2032	624.572	487.657	-136.915	-21,92%

Provincial demand for midwives increases annually, driven by population growth, disease prevalence, and the epidemiological burden in each province. The provinces with the highest midwifery workforce requirements each year are West Java, East Java, Central Java, and North Sumatra.

Table 101. Projection of Midwives Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	11.886	12.097	12.308	12.517	12.725	12.931	13.136	13.339	13.540	13.740
NORTH SUMATERA	33.384	33.976	34.562	35.141	35.715	36.282	36.842	37.395	37.940	38.480
WEST SUMATERA	12.078	12.301	12.524	12.746	12.968	13.189	13.410	13.629	13.847	14.064
RIAU	12.867	13.093	13.317	13.538	13.758	13.976	14.191	14.404	14.615	14.824
JAMBI	8.217	8.358	8.498	8.636	8.773	8.908	9.042	9.173	9.302	9.430
SOUTH SUMATERA	19.091	19.394	19.694	19.990	20.282	20.570	20.855	21.135	21.412	21.686
BENGKULU	4.740	4.823	4.905	4.987	5.068	5.148	5.227	5.305	5.382	5.458
LAMPUNG	21.471	21.824	22.174	22.521	22.864	23.203	23.538	23.869	24.196	24.519
BANGKA BELITUNG ISLANDS	3.181	3.238	3.295	3.351	3.407	3.462	3.517	3.571	3.625	3.677
RIAU ISLANDS	3.897	3.971	4.045	4.118	4.190	4.262	4.333	4.404	4.474	4.543
DKI JAKARTA	14.808	14.913	14.990	15.065	15.137	15.206	15.272	15.335	15.397	15.458
WEST JAVA	99.493	100.983	102.341	103.689	105.029	106.359	107.680	108.991	110.295	111.592
CENTRAL JAVA	70.801	71.858	72.904	73.937	74.955	75.956	76.941	77.907	78.856	79.786
DI YOGYAKARTA	5.069	5.130	5.191	5.251	5.310	5.368	5.426	5.482	5.538	5.593
EAST JAVA	72.014	72.936	73.842	74.733	75.607	76.464	77.304	78.125	78.927	79.709
BANTEN	22.040	22.378	22.686	22.993	23.297	23.600	23.900	24.198	24.495	24.792
BALI	5.637	5.704	5.771	5.836	5.901	5.964	6.026	6.087	6.147	6.205



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
WEST NUSA TENGARA	14.795	15.093	15.391	15.689	15.986	16.282	16.578	16.872	17.166	17.459
EAST NUSA TENGARA	14.668	14.959	15.251	15.543	15.835	16.128	16.420	16.712	17.004	17.295
WEST KALIMANTAN	12.609	12.831	13.051	13.269	13.484	13.697	13.907	14.114	14.318	14.520
CENTRAL KALIMANTAN	6.555	6.671	6.786	6.901	7.014	7.126	7.236	7.345	7.451	7.557
SOUTH KALIMANTAN	9.532	9.695	9.857	10.017	10.175	10.332	10.488	10.642	10.794	10.945
EAST KALIMANTAN	7.401	7.697	8.159	8.604	9.030	9.437	9.822	10.181	10.511	10.809
NORTH KALIMANTAN	1.514	1.541	1.568	1.595	1.622	1.648	1.675	1.700	1.726	1.751
NORTH SULAWESI	3.635	3.683	3.729	3.776	3.821	3.866	3.910	3.953	3.995	4.037
CENTRAL SULAWESI	6.568	6.674	6.780	6.884	6.988	7.091	7.194	7.294	7.394	7.493
SOUTH SULAWESI	19.922	20.237	20.551	20.864	21.175	21.484	21.790	22.092	22.391	22.686
SOUTHEAST SULAWESI	7.057	7.201	7.346	7.490	7.633	7.777	7.920	8.062	8.204	8.346
GORONTALO	2.356	2.395	2.434	2.473	2.512	2.550	2.589	2.626	2.663	2.700
WEST SULAWESI	4.029	4.107	4.186	4.264	4.343	4.422	4.501	4.580	4.659	4.738
MALUKU	3.975	4.044	4.113	4.183	4.251	4.320	4.388	4.456	4.523	4.589
NORTH MALUKU	2.928	2.982	3.035	3.088	3.140	3.192	3.244	3.295	3.345	3.395
WEST PAPUA	1.340	1.368	1.396	1.424	1.451	1.478	1.505	1.532	1.559	1.585
SOUTHWEST PAPUA	1.243	1.266	1.289	1.311	1.333	1.355	1.377	1.398	1.419	1.439
SOUTH PAPUA	1.006	1.024	1.043	1.062	1.080	1.099	1.119	1.138	1.159	1.179
CENTRAL PAPUA	2.734	2.784	2.832	2.878	2.924	2.969	3.012	3.054	3.096	3.136
HIGHLAND PAPUA	2.726	2.772	2.818	2.861	2.904	2.945	2.984	3.022	3.058	3.093
PAPUA	1.971	2.004	2.037	2.070	2.102	2.135	2.167	2.199	2.232	2.264

### 3. Pharmacist

Based on calculations using the supply–demand method, the estimated demand for pharmacists in Indonesia in 2023 was 243.730. With a supply of 88.885 pharmacists, this resulted in a shortage of 154.845 pharmacists (63,53%) in 2023. The demand for pharmacists is projected to increase annually, reaching 249.654 in 2025, 263.422 in 2030, and 268.485 by 2032. Each year, approximately 17.000 pharmacists are projected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage in the pharmacist workforce by 2032 (20,11%).

Table 102. Projection of Pharmacists Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	243.730	88.885	-154.845	-63,53%
2024	246.725	103.702	-143.023	-57,97%
2025	249.654	118.297	-131.357	-52,62%
2026	252.527	132.672	-119.855	-47,46%
2027	255.341	146.831	-108.510	-42,50%



Year	Demand	Supply	Gap	Gap Percentage
2028	258.104	160.778	-97.326	-37,71%
2029	260.792	174.516	-86.276	-33,08%
2030	263.422	188.048	-75.374	-28,61%
2031	265.987	201.377	-64.610	-24,29%
2032	268.485	214.506	-53.979	-20,11%

Provincial demand for pharmacists increases annually, driven by population growth, disease prevalence, and the epidemiological burden in each province. The provinces with the highest pharmacist workforce requirements each year are West Java, East Java, Central Java, and North Sumatra.

Table 103. Projection of Pharmacists Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	2.978	3.022	3.067	3.110	3.153	3.196	3.238	3.279	3.320	3.360
NORTH SUMATERA	6.296	6.392	6.486	6.579	6.671	6.761	6.849	6.935	7.020	7.103
WEST SUMATERA	3.044	3.091	3.138	3.184	3.231	3.276	3.322	3.366	3.411	3.454
RIAU	2.589	2.627	2.665	2.703	2.739	2.776	2.811	2.846	2.880	2.914
JAMBI	1.451	1.471	1.492	1.512	1.532	1.551	1.570	1.589	1.607	1.625
SOUTH SUMATERA	3.857	3.905	3.953	3.999	4.045	4.089	4.133	4.175	4.217	4.258
BENGKULU	935	949	962	975	988	1.001	1.013	1.025	1.037	1.049
LAMPUNG	4.297	4.354	4.410	4.465	4.519	4.572	4.624	4.674	4.724	4.773
BANGKA BELITUNG ISLANDS	753	764	775	786	797	807	817	828	837	847
RIAU ISLANDS	1.090	1.107	1.124	1.141	1.157	1.174	1.190	1.206	1.221	1.236
DKI JAKARTA	4.183	4.198	4.205	4.212	4.217	4.222	4.226	4.230	4.233	4.236
WEST JAVA	23.281	23.554	23.794	24.031	24.264	24.495	24.722	24.945	25.166	25.384
CENTRAL JAVA	19.976	20.196	20.412	20.622	20.827	21.026	21.219	21.407	21.588	21.763
DI YOGYAKARTA	1.824	1.839	1.853	1.867	1.880	1.893	1.906	1.918	1.930	1.942
EAST JAVA	20.103	20.279	20.449	20.614	20.774	20.928	21.076	21.218	21.354	21.484
BANTEN	5.657	5.725	5.784	5.843	5.900	5.957	6.014	6.069	6.124	6.178
BALI	1.970	1.987	2.004	2.020	2.036	2.052	2.067	2.082	2.096	2.110
WEST NUSA TENGGARA	4.240	4.311	4.381	4.451	4.520	4.589	4.657	4.724	4.791	4.857
EAST NUSA TENGGARA	2.747	2.795	2.842	2.890	2.937	2.984	3.030	3.077	3.123	3.169
WEST KALIMANTAN	2.352	2.387	2.421	2.454	2.487	2.520	2.551	2.582	2.613	2.642
CENTRAL KALIMANTAN	946	961	975	989	1.003	1.016	1.029	1.042	1.055	1.067
SOUTH KALIMANTAN	1.839	1.865	1.890	1.915	1.939	1.963	1.986	2.009	2.032	2.054
EAST KALIMANTAN	1.566	1.624	1.716	1.805	1.889	1.969	2.043	2.112	2.175	2.231
NORTH KALIMANTAN	273	278	282	286	290	294	298	302	306	309



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
NORTH SULAWESI	1.169	1.180	1.191	1.202	1.212	1.222	1.232	1.242	1.251	1.260
CENTRAL SULAWESI	996	1.009	1.023	1.036	1.049	1.062	1.075	1.088	1.100	1.112
SOUTH SULAWESI	3.489	3.534	3.580	3.624	3.668	3.712	3.755	3.797	3.838	3.879
SOUTHEAST SULAWESI	885	901	918	934	950	966	982	998	1.013	1.029
GORONTALO	731	741	750	760	770	779	788	797	806	815
WEST SULAWESI	583	593	603	612	622	632	642	652	662	671
MALUKU	561	570	578	587	596	604	613	621	630	638
NORTH MALUKU	338	344	350	355	361	367	372	378	383	388
WEST PAPUA	174	177	180	184	187	191	194	197	200	204
SOUTHWEST PAPUA	161	164	167	169	172	175	177	180	182	185
SOUTH PAPUA	113	115	117	119	121	123	125	127	130	132
CENTRAL PAPUA	306	312	317	322	327	332	337	342	346	351
HIGHLAND PAPUA	305	310	315	320	325	329	334	338	342	346
PAPUA	221	224	228	232	235	239	242	246	250	253

#### 4. Medical Laboratory Technologist

Based on calculations using the supply–demand method, the estimated demand for Indonesia’s medical laboratory technologists in 2023 was 142.299 personnel. With a supply of 57.313 MLTs, this resulted in a shortage of 84.986 personnel (59,72%) in 2023. The demand for medical laboratory technologists is projected to increase annually, reaching 144.878 in 2025, 150.718 in 2030, and 152.794 by 2032. Each year, approximately 8.300 MLTs are projected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage in the medical laboratory technologist workforce by 2032 (23,51%).

Table 104. Projection of Medical Laboratory Technologists Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	142.299	57.313	-84.986	-59,72%
2024	143.606	64.338	-79.268	-55,20%
2025	144.878	71.258	-73.620	-50,82%
2026	146.119	78.074	-68.045	-46,57%
2027	147.320	84.788	-62.532	-42,45%
2028	148.489	91.401	-57.088	-38,45%
2029	149.624	97.915	-51.709	-34,56%
2030	150.718	104.331	-46.387	-30,78%
2031	151.775	110.651	-41.124	-27,10%
2032	152.794	116.876	-35.918	-23,51%



Provincial demand for medical laboratory technologists increases annually, driven by population growth, disease prevalence, and the epidemiological burden in each province. The provinces with the highest medical laboratory technologist workforce demand each year are West Java, East Java, Central Java, and North Sumatra.

Table 105. Projection of Medical Laboratory Technologists Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	3.399	3.436	3.472	3.508	3.543	3.577	3.611	3.644	3.676	3.708
NORTH SUMATERA	8.166	8.259	8.350	8.439	8.526	8.611	8.694	8.774	8.852	8.929
WEST SUMATERA	2.901	2.934	2.967	3.000	3.032	3.064	3.096	3.127	3.158	3.188
RIAU	2.955	2.988	3.020	3.051	3.082	3.112	3.141	3.169	3.197	3.225
JAMBI	1.586	1.601	1.616	1.631	1.645	1.659	1.673	1.686	1.698	1.711
SOUTH SUMATERA	4.298	4.339	4.378	4.416	4.453	4.489	4.524	4.557	4.590	4.622
BENGKULU	1.308	1.321	1.334	1.346	1.358	1.370	1.382	1.393	1.404	1.415
LAMPUNG	3.897	3.936	3.973	4.010	4.046	4.081	4.115	4.149	4.181	4.212
BANGKA BELITUNG ISLANDS	734	742	750	758	765	772	780	787	793	800
RIAU ISLANDS	1.015	1.027	1.039	1.051	1.062	1.073	1.084	1.094	1.105	1.115
DKI JAKARTA	5.798	5.806	5.803	5.800	5.795	5.790	5.783	5.776	5.768	5.760
WEST JAVA	25.386	25.617	25.814	26.008	26.197	26.383	26.564	26.742	26.917	27.088
CENTRAL JAVA	17.849	18.003	18.153	18.299	18.439	18.575	18.705	18.831	18.951	19.066
DI YOGYAKARTA	2.145	2.157	2.168	2.179	2.190	2.200	2.209	2.219	2.227	2.236
EAST JAVA	19.567	19.693	19.813	19.928	20.038	20.143	20.243	20.337	20.425	20.508
BANTEN	5.957	6.012	6.060	6.107	6.153	6.198	6.242	6.286	6.328	6.370
BALI	2.074	2.086	2.098	2.109	2.120	2.131	2.141	2.150	2.160	2.168
WEST NUSA TENGGARA	2.674	2.711	2.747	2.783	2.819	2.854	2.889	2.924	2.958	2.991
EAST NUSA TENGGARA	2.828	2.861	2.894	2.927	2.960	2.992	3.024	3.056	3.088	3.119
WEST KALIMANTAN	2.747	2.777	2.807	2.836	2.864	2.891	2.918	2.944	2.969	2.993
CENTRAL KALIMANTAN	1.426	1.441	1.455	1.468	1.481	1.494	1.507	1.519	1.531	1.543
SOUTH KALIMANTAN	2.288	2.311	2.334	2.356	2.377	2.398	2.419	2.439	2.458	2.477
EAST KALIMANTAN	2.190	2.254	2.359	2.458	2.553	2.641	2.724	2.799	2.867	2.926
NORTH KALIMANTAN	484	489	494	499	503	508	513	517	521	525
NORTH SULAWESI	1.833	1.844	1.855	1.866	1.876	1.886	1.895	1.904	1.913	1.921
CENTRAL SULAWESI	2.005	2.024	2.042	2.060	2.078	2.095	2.112	2.129	2.145	2.160
SOUTH SULAWESI	4.741	4.784	4.827	4.868	4.909	4.949	4.989	5.027	5.064	5.100
SOUTHEAST SULAWESI	1.514	1.530	1.546	1.562	1.578	1.594	1.609	1.624	1.639	1.654
GORONTALO	764	771	778	786	792	799	806	812	819	825
WEST SULAWESI	759	768	777	786	795	804	812	821	830	838



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
MALUKU	1.087	1.096	1.105	1.114	1.123	1.131	1.140	1.149	1.157	1.165
NORTH MALUKU	735	742	749	755	762	768	774	780	786	792
WEST PAPUA	563	570	577	584	590	597	603	609	615	621
SOUTHWEST PAPUA	517	522	527	533	538	543	548	552	557	561
SOUTH PAPUA	532	538	543	549	554	560	566	572	578	584
CENTRAL PAPUA	1.287	1.302	1.317	1.330	1.344	1.356	1.368	1.380	1.391	1.402
HIGHLAND PAPUA	1.306	1.320	1.333	1.345	1.357	1.369	1.379	1.389	1.399	1.407
PAPUA	984	994	1.004	1.014	1.023	1.032	1.042	1.051	1.060	1.069

## 5. Health Promotion Personnel

Based on the results of calculations using the supply–demand method, Indonesia’s health promotion workforce demand in 2023 was estimated at 28.895 personnel. With a supply of 14.485 health promotion personnel, this resulted in a shortage of 14.410 personnel (49,87%) in 2023. The demand for the health promotion workforce is projected to increase annually, reaching 29.515 in 2025, 30.925 in 2030, and 31.427 by 2032. Each year, approximately 4.400 health promotion graduates are projected to enter the workforce, with an attrition rate of 0,3%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage in the health promotion personnel by 2032 (62,96%).

Table 106. Projection of Health Promotion Personnel Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	28.895	14.485	-14.410	-49,87%
2024	29.210	18.619	-10.591	-36,26%
2025	29.515	22.739	-6.776	-22,96%
2026	29.814	26.846	-2.968	-9,96%
2027	30.105	30.940	835	2,77%
2028	30.384	35.021	4.637	15,26%
2029	30.657	39.089	8.432	27,50%
2030	30.925	43.144	12.219	39,51%
2031	31.178	47.186	16.008	51,34%
2032	31.427	51.215	19.788	62,96%

Provincial demand for the health promotion workforce increases annually, driven by population growth, disease prevalence, and the epidemiological burden in each province. The provinces with the highest health promotion workforce demand each year are West Java, East Java, Central Java, and North Sumatra.



Table 107. Projection of Health Promotion Workforce Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	505	512	518	525	532	538	544	550	556	562
NORTH SUMATERA	1.615	1.637	1.658	1.679	1.699	1.719	1.739	1.757	1.776	1.794
WEST SUMATERA	605	613	622	630	638	646	655	662	670	678
RIAU	691	700	709	718	726	734	743	751	758	766
JAMBI	388	393	398	403	407	412	416	420	424	428
SOUTH SUMATERA	803	812	821	829	838	846	853	861	868	875
BENGKULU	217	220	222	225	228	230	233	235	238	240
LAMPUNG	800	810	819	828	837	845	853	862	869	877
BANGKA BELITUNG ISLANDS	152	154	156	158	160	161	163	165	167	169
RIAU ISLANDS	201	204	207	210	213	215	218	221	223	226
DKI JAKARTA	891	892	892	892	891	891	890	889	888	887
WEST JAVA	5.382	5.437	5.483	5.528	5.573	5.617	5.659	5.701	5.742	5.783
CENTRAL JAVA	4.001	4.040	4.078	4.114	4.150	4.184	4.217	4.249	4.279	4.308
DI YOGYAKARTA	443	446	448	451	454	456	458	461	463	465
EAST JAVA	4.606	4.640	4.672	4.702	4.732	4.760	4.786	4.811	4.835	4.858
BANTEN	1.307	1.321	1.332	1.344	1.355	1.366	1.377	1.388	1.398	1.408
BALI	479	482	485	488	491	494	497	500	502	504
WEST NUSA TENGGARA	651	661	671	681	691	701	711	720	730	739
EAST NUSA TENGGARA	562	571	580	589	598	606	615	624	632	641
WEST KALIMANTAN	593	601	609	616	623	630	637	644	651	657
CENTRAL KALIMANTAN	288	292	296	300	303	307	310	314	317	320
SOUTH KALIMANTAN	440	445	450	456	461	466	471	475	480	485
EAST KALIMANTAN	461	477	504	529	552	575	595	614	631	647
NORTH KALIMANTAN	72	73	74	75	76	77	78	79	79	80
NORTH SULAWESI	232	234	235	237	239	240	242	244	245	246
CENTRAL SULAWESI	331	335	339	342	346	350	353	357	360	363
SOUTH SULAWESI	921	932	942	952	962	971	981	990	999	1.008
SOUTHEAST SULAWESI	265	269	273	278	282	286	290	294	298	302
GORONTALO	134	136	137	139	141	142	144	145	147	148
WEST SULAWESI	139	141	143	145	147	149	152	154	156	158
MALUKU	189	191	194	196	199	201	203	206	208	210
NORTH MALUKU	126	128	130	131	133	135	136	138	140	141
WEST PAPUA	50	51	52	53	53	54	55	56	57	57
SOUTHWEST PAPUA	46	47	48	48	49	50	50	51	51	52



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
SOUTH PAPUA	37	37	38	39	39	40	40	41	41	42
CENTRAL PAPUA	100	102	103	105	106	107	108	109	111	112
HIGHLAND PAPUA	100	101	103	104	105	106	107	108	109	110
PAPUA	72	73	74	75	76	77	78	79	80	81

## 6. Nutritionist

Based on the results of calculations using the supply–demand method, Indonesia’s nutritionists demand in 2023 was estimated at 113.395 personnel. With a supply of 33.900 nutritionists, this resulted in a shortage of 79.495 personnel (70,1%) in 2023. The demand for nutritionists is projected to increase annually, reaching 115.829 in 2025, 121.385 in 2030, and 123.377 by 2032. Each year, approximately 6.500 nutritionists are projected to graduate, with an attrition rate of 6,15%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage in the nutritionists by 2032 (54,7%).

Table 108. Projection of Nutritionists Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	113.395	33.900	-79.495	-70,10%
2024	114.626	37.717	-76.909	-67,10%
2025	115.829	41.306	-74.523	-64,34%
2026	117.002	44.681	-72.321	-61,81%
2027	118.145	47.854	-70.291	-59,50%
2028	119.260	50.838	-68.422	-57,37%
2029	120.340	53.645	-66.695	-55,42%
2030	121.385	56.286	-65.099	-53,63%
2031	122.396	58.770	-63.626	-51,98%
2032	123.377	61.109	-62.268	-50,47%

Provincial demand for nutritionists increases annually, driven by population growth, disease prevalence, and the epidemiological burden in each province. The provinces with the highest nutritionists demand each year are West Java, East Java, Central Java, and North Sumatra.

Table 109. Projection of Nutritionists Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	2.720	2.758	2.794	2.830	2.866	2.900	2.935	2.968	3.001	3.033
NORTH SUMATERA	5.704	5.781	5.857	5.931	6.003	6.074	6.143	6.210	6.276	6.340
WEST SUMATERA	2.444	2.479	2.513	2.547	2.581	2.615	2.648	2.680	2.712	2.744
RIAU	2.365	2.397	2.428	2.458	2.488	2.517	2.546	2.573	2.601	2.628
JAMBI	1.352	1.369	1.386	1.403	1.419	1.435	1.450	1.465	1.479	1.493
SOUTH SUMATERA	3.070	3.104	3.137	3.170	3.201	3.232	3.262	3.291	3.319	3.346



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
BENGKULU	809	820	830	840	850	860	870	879	888	897
LAMPUNG	3.343	3.382	3.421	3.459	3.496	3.532	3.568	3.602	3.635	3.668
BANGKA BELITUNG ISLANDS	560	568	575	583	590	597	604	610	617	623
RIAU ISLANDS	839	851	863	875	887	899	910	921	932	942
DKI JAKARTA	4.079	4.085	4.084	4.082	4.080	4.077	4.073	4.069	4.064	4.059
WEST JAVA	20.934	21.148	21.332	21.513	21.690	21.865	22.035	22.203	22.368	22.530
CENTRAL JAVA	16.880	17.047	17.209	17.366	17.519	17.666	17.809	17.946	18.077	18.204
DI YOGYAKARTA	1.749	1.761	1.772	1.783	1.794	1.804	1.813	1.823	1.832	1.840
EAST JAVA	17.106	17.231	17.352	17.467	17.578	17.684	17.785	17.881	17.972	18.057
BANTEN	5.007	5.059	5.105	5.150	5.193	5.236	5.279	5.320	5.361	5.401
BALI	1.561	1.572	1.582	1.593	1.602	1.612	1.621	1.630	1.638	1.646
WEST NUSA TENGGARA	2.670	2.712	2.754	2.796	2.836	2.877	2.917	2.956	2.995	3.034
EAST NUSA TENGGARA	2.025	2.057	2.090	2.122	2.154	2.186	2.217	2.249	2.280	2.311
WEST KALIMANTAN	2.124	2.152	2.180	2.207	2.233	2.259	2.284	2.308	2.332	2.355
CENTRAL KALIMANTAN	979	992	1.005	1.017	1.030	1.042	1.054	1.065	1.076	1.087
SOUTH KALIMANTAN	1.615	1.635	1.654	1.674	1.692	1.711	1.729	1.746	1.764	1.780
EAST KALIMANTAN	1.644	1.702	1.796	1.885	1.970	2.050	2.124	2.192	2.253	2.307
NORTH KALIMANTAN	296	300	304	307	311	315	319	322	326	329
NORTH SULAWESI	1.129	1.138	1.147	1.155	1.164	1.172	1.179	1.187	1.194	1.201
CENTRAL SULAWESI	1.319	1.334	1.350	1.365	1.380	1.394	1.408	1.422	1.435	1.449
SOUTH SULAWESI	3.991	4.035	4.080	4.123	4.166	4.209	4.250	4.290	4.329	4.368
SOUTHEAST SULAWESI	1.019	1.036	1.052	1.069	1.085	1.101	1.117	1.133	1.148	1.164
GORONTALO	577	584	591	598	605	612	618	625	631	637
WEST SULAWESI	577	586	595	604	613	621	630	639	647	656
MALUKU	658	667	676	685	693	702	711	719	727	735
NORTH MALUKU	449	456	462	468	474	481	486	492	498	503
WEST PAPUA	212	216	220	223	227	230	234	237	240	244
SOUTHWEST PAPUA	202	205	208	211	214	216	219	222	224	227
SOUTH PAPUA	163	165	168	170	173	175	177	180	182	185
CENTRAL PAPUA	454	461	467	473	479	484	490	495	500	504
HIGHLAND PAPUA	442	448	453	459	464	469	473	478	482	485
PAPUA	328	333	337	341	345	349	353	357	361	365

## 7. Clinical Psychologist

Based on the results of calculations using the supply–demand method, Indonesia’s clinical psychologist workforce demand in 2023 was estimated at 9.947 personnel. With a supply of 3.353 clinical psychologists, this resulted in a shortage of 6.594 personnel (66,29%) in 2023. The demand for clinical psychologists is projected to increase annually, reaching 10.459 in 2025, 11.764 in 2030, and 12.279 by 2032. Each year, approximately 347–537 clinical psychologists are projected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage in the clinical psychologists by 2032 (51,57%).

Table 110. Projection of Clinical Psychologists in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	9.947	3.353	-6.594	-66,29%
2024	10.202	3.594	-6.608	-64,77%
2025	10.459	3.846	-6.613	-63,23%
2026	10.723	4.108	-6.615	-61,69%
2027	10.984	4.382	-6.602	-60,11%
2028	11.246	4.668	-6.578	-58,49%
2029	11.505	4.967	-6.538	-56,83%
2030	11.764	5.280	-6.484	-55,12%
2031	12.025	5.606	-6.419	-53,38%
2032	12.279	5.947	-6.332	-51,57%

Provincial demand for clinical psychologists increases annually, driven by population growth, disease prevalence, and the epidemiological burden in each province. The provinces with the highest clinical psychologist workforce requirements each year are West Java, East Java, Central Java, and North Sumatra.

Table 111. Projection of Clinical Psychologists in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	356	365	375	384	394	403	413	423	433	442
NORTH SUMATERA	602	616	630	645	659	673	687	701	715	729
WEST SUMATERA	273	280	287	293	300	306	313	320	326	333
RIAU	233	239	245	251	257	263	269	275	281	287
JAMBI	201	208	215	223	231	238	246	253	261	269
SOUTH SUMATERA	342	350	358	367	375	384	392	400	409	417
BENGKULU	174	179	184	189	194	199	204	209	214	219
LAMPUNG	311	320	329	339	348	358	368	377	387	396
BANGKA BELITUNG ISLANDS	62	64	66	67	69	70	72	73	75	76
RIAU ISLANDS	93	96	99	102	105	108	111	114	117	120
DKI JAKARTA	43	44	44	45	45	46	46	47	47	47



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
WEST JAVA	1.076	1.100	1.122	1.145	1.167	1.189	1.212	1.234	1.256	1.279
CENTRAL JAVA	861	881	901	922	942	962	982	1.002	1.022	1.041
DI YOGYAKARTA	119	121	123	125	127	129	131	133	135	137
EAST JAVA	951	972	993	1.013	1.034	1.054	1.075	1.095	1.114	1.134
BANTEN	248	253	258	263	268	273	277	282	287	292
BALI	118	120	122	125	127	130	132	135	137	139
WEST NUSA TENGGARA	172	176	180	185	190	194	199	203	208	213
EAST NUSA TENGGARA	423	434	445	456	467	478	489	500	512	523
WEST KALIMANTAN	243	249	255	262	268	275	281	287	294	300
CENTRAL KALIMANTAN	198	204	210	216	223	229	235	241	248	254
SOUTH KALIMANTAN	235	241	247	253	259	266	272	278	284	290
EAST KALIMANTAN	179	188	201	213	226	238	249	260	271	280
NORTH KALIMANTAN	57	58	59	61	62	64	65	67	68	70
NORTH SULAWESI	195	199	203	207	211	215	219	223	227	231
CENTRAL SULAWESI	214	218	222	227	231	235	239	243	248	252
SOUTH SULAWESI	465	475	485	494	504	514	523	533	542	552
SOUTHEAST SULAWESI	297	306	315	323	332	341	350	359	368	377
GORONTALO	91	93	95	97	99	102	104	106	108	110
WEST SULAWESI	95	98	101	104	107	110	114	117	120	123
MALUKU	235	242	249	257	264	272	279	287	294	302
NORTH MALUKU	146	150	154	158	161	165	169	173	177	180
WEST PAPUA	75	78	81	83	86	89	92	94	97	100
SOUTHWEST PAPUA	94	97	100	103	107	110	113	117	120	123
SOUTH PAPUA	81	84	87	91	94	98	101	105	109	113
CENTRAL PAPUA	125	130	135	140	146	151	156	162	167	172
HIGHLAND PAPUA	147	153	159	165	171	177	183	189	195	201
PAPUA	117	121	125	130	134	138	143	147	152	156

## 8. Sanitarian

Based on the results of calculations using the supply–demand method, Indonesia’s sanitarian workforce demand in 2023 was estimated at 66.467 personnel. With a supply of 23.291 sanitarians, this resulted in a shortage of 43.176 personnel (64,96%) in 2023. The demand for sanitarians is projected to increase annually, reaching 67.765 in 2025, 70.051 in 2030, and 70.870 by 2032. Each year, approximately 2.800 sanitarians are projected to graduate, with an attrition rate of 0,6%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage of the sanitarians by 2032 (35,89%).

Table 112. Projection of Sanitarians Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	66.467	23.291	-43.176	-64,96%
2024	67.268	25.811	-41.457	-61,63%
2025	67.765	28.316	-39.449	-58,21%
2026	68.246	30.806	-37.440	-54,86%
2027	68.715	33.281	-35.434	-51,57%
2028	69.176	35.741	-33.435	-48,33%
2029	69.625	38.187	-31.438	-45,15%
2030	70.051	40.618	-29.433	-42,02%
2031	70.468	43.034	-27.434	-38,93%
2032	70.870	45.436	-25.434	-35,89%

Provincial demand for sanitarians increases annually, driven by population growth, disease prevalence, and each province's epidemiological burden. The provinces with the highest sanitarians demand each year are West Java, East Java, Central Java, and North Sumatra.

Table 113. Projection of Sanitarians Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	2.020	2.040	2.057	2.074	2.090	2.106	2.122	2.138	2.153	2.168
NORTH SUMATERA	2.931	2.956	2.978	3.000	3.021	3.042	3.062	3.082	3.101	3.119
WEST SUMATERA	1.620	1.636	1.650	1.664	1.678	1.692	1.706	1.720	1.733	1.746
RIAU	1.123	1.133	1.141	1.149	1.157	1.164	1.172	1.179	1.186	1.193
JAMBI	862	869	875	880	886	891	896	901	905	910
SOUTH SUMATERA	1.560	1.572	1.581	1.590	1.598	1.607	1.615	1.623	1.631	1.638
BENGKULU	768	777	782	787	792	797	802	806	811	815
LAMPUNG	1.461	1.473	1.483	1.492	1.501	1.509	1.518	1.526	1.534	1.541
BANGKA BELITUNG ISLANDS	241	245	246	248	249	251	252	253	255	256
RIAU ISLANDS	382	386	389	392	394	397	400	402	405	407
DKI JAKARTA	1.605	1.608	1.607	1.605	1.604	1.602	1.600	1.597	1.595	1.592
WEST JAVA	9.866	9.943	10.008	10.071	10.132	10.193	10.252	10.310	10.366	10.422
CENTRAL JAVA	8.086	8.148	8.206	8.262	8.317	8.369	8.420	8.468	8.514	8.559
DI YOGYAKARTA	892	896	900	904	908	911	914	917	920	923
EAST JAVA	8.011	8.054	8.095	8.134	8.171	8.206	8.240	8.271	8.301	8.329
BANTEN	2.365	2.385	2.401	2.417	2.432	2.448	2.463	2.477	2.491	2.506
BALI	813	814	815	816	818	819	821	822	823	825
WEST TENGGERA NUSA	1.506	1.530	1.548	1.566	1.584	1.601	1.618	1.635	1.651	1.668
EAST TENGGERA NUSA	2.788	2.852	2.882	2.912	2.941	2.971	3.000	3.030	3.059	3.087
WEST KALIMANTAN	1.601	1.619	1.633	1.646	1.659	1.672	1.685	1.697	1.709	1.721



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
CENTRAL KALIMANTAN	870	877	883	889	895	900	906	911	916	921
SOUTH KALIMANTAN	1.152	1.161	1.169	1.177	1.185	1.192	1.200	1.207	1.214	1.221
EAST KALIMANTAN	1.058	1.084	1.123	1.161	1.196	1.230	1.261	1.289	1.315	1.337
NORTH KALIMANTAN	257	259	261	263	264	266	268	270	271	273
NORTH SULAWESI	744	749	751	753	755	758	760	762	763	765
CENTRAL SULAWESI	1.147	1.161	1.169	1.176	1.184	1.192	1.199	1.206	1.213	1.220
SOUTH SULAWESI	2.910	2.934	2.955	2.976	2.996	3.016	3.035	3.054	3.073	3.090
SOUTHEAST SULAWESI	1.200	1.211	1.221	1.231	1.240	1.250	1.259	1.268	1.278	1.287
GORONTALO	416	419	422	424	427	430	432	435	437	440
WEST SULAWESI	565	572	577	583	588	594	599	605	610	616
MALUKU	1.033	1.048	1.055	1.062	1.070	1.077	1.084	1.091	1.098	1.104
NORTH MALUKU	529	537	541	544	547	550	554	557	560	563
WEST PAPUA	422	442	447	451	455	459	464	467	471	475
SOUTHWEST PAPUA	388	407	410	413	417	420	423	426	429	432
SOUTH PAPUA	440	463	468	472	476	480	485	489	494	498
CENTRAL PAPUA	1.007	1.071	1.082	1.092	1.102	1.112	1.121	1.129	1.138	1.146
HIGHLAND PAPUA	1.048	1.111	1.121	1.130	1.139	1.148	1.156	1.163	1.170	1.176
PAPUA	780	826	833	840	847	854	861	868	875	881

## 9. Epidemiologists

Based on the results of calculations using the supply–demand method, Indonesia’s epidemiologists workforce demand in 2023 was estimated at 32.078 personnel. With a supply of 9.809 epidemiologists, this resulted in a shortage of 22.269 personnel (69,4%) in 2023. The demand for epidemiologists is projected to increase annually, reaching 33.142 in 2025, 36.011 in 2030, and 37.238 by 2032. Each year, approximately 700 epidemiologists are projected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage in the epidemiologist workforce by 2032 (61,1%).

Table 114. Projection of Epidemiologists Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	32.078	9.809	22.269	69,4%
2024	32.607	10.362	22.245	68,2%
2025	33.142	10.906	22.236	67,1%
2026	33.695	11.443	22.252	66,0%
2027	34.259	11.971	22.288	65,1%
2028	34.830	12.492	22.338	64,1%
2029	35.415	13.004	22.411	63,3%



Year	Demand	Supply	Gap	Gap Percentage
2030	36.011	13.509	22.502	62,5%
2031	36.618	14.007	22.611	61,7%
2032	37.238	14.496	22.742	61,1%

Provincial demand for health epidemiologists increases annually, driven by population growth, disease prevalence, and the epidemiological burden in each province. The provinces with the highest epidemiologist workforce requirements each year are West Java, East Java, Central Java, and North Sumatra.

Table 115. Projection of Epidemiologists Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	1.030	1.046	1.062	1.079	1.096	1.113	1.131	1.149	1.167	1.186
NORTH SUMATERA	1.941	1.975	2.010	2.046	2.082	2.119	2.157	2.196	2.236	2.276
WEST SUMATERA	842	856	870	884	899	913	928	944	959	975
RIAU	748	760	773	787	800	814	828	842	857	872
JAMBI	599	608	618	628	638	648	658	668	679	690
SOUTH SUMATERA	1.023	1.040	1.057	1.074	1.091	1.109	1.127	1.146	1.165	1.184
BENGKULU	487	494	501	509	516	524	532	540	548	556
LAMPUNG	916	931	946	961	977	993	1.010	1.027	1.044	1.061
BANGKA BELITUNG ISLANDS	228	232	236	240	244	248	252	256	261	265
RIAU ISLANDS	319	324	330	335	341	347	353	359	365	371
DKI JAKARTA	543	557	571	586	602	617	634	650	667	685
WEST JAVA	3.419	3.480	3.542	3.605	3.670	3.736	3.804	3.873	3.943	4.015
CENTRAL JAVA	2.842	2.892	2.943	2.995	3.049	3.103	3.159	3.216	3.274	3.333
DI YOGYAKARTA	465	474	483	493	502	512	522	532	543	553
EAST JAVA	3.223	3.281	3.341	3.402	3.464	3.528	3.593	3.659	3.727	3.796
BANTEN	881	898	914	931	949	967	985	1.004	1.023	1.043
BALI	472	481	490	499	509	519	529	539	549	560
WEST NUSA TENGGARA	519	528	536	545	553	562	572	581	591	600
EAST NUSA TENGGARA	1.144	1.161	1.179	1.197	1.215	1.234	1.253	1.272	1.292	1.312
WEST KALIMANTAN	722	733	745	757	769	782	794	807	821	834
CENTRAL KALIMANTAN	567	575	583	592	601	610	619	628	637	647
SOUTH KALIMANTAN	681	691	702	713	725	736	748	760	772	784
EAST KALIMANTAN	584	594	603	614	624	634	645	656	667	679
NORTH KALIMANTAN	187	190	193	196	200	203	206	209	213	216
NORTH SULAWESI	605	615	625	636	646	657	668	679	690	702
CENTRAL SULAWESI	597	606	615	625	635	644	655	665	675	686



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
SOUTH SULAWESI	1.400	1.423	1.447	1.471	1.495	1.520	1.545	1.571	1.597	1.624
SOUTHEAST SULAWESI	812	824	836	848	861	874	886	900	913	927
GORONTALO	278	282	286	291	295	300	305	309	314	319
WEST SULAWESI	265	269	273	277	281	286	290	295	299	304
MALUKU	631	641	651	660	671	681	691	702	713	724
NORTH MALUKU	405	411	417	424	430	437	443	450	457	464
WEST PAPUA	239	243	246	250	253	257	261	265	269	273
SOUTHWEST PAPUA	340	345	350	355	361	366	371	377	382	388
SOUTH PAPUA	220	223	226	229	233	236	240	243	247	250
CENTRAL PAPUA	396	402	408	414	420	426	432	439	445	452
HIGHLAND PAPUA	554	562	569	577	586	594	602	611	619	628
PAPUA	954	960	965	970	976	981	987	992	998	1.004

## 10. Physiotherapist

Based on the results of calculations using the supply–demand method, Indonesia’s physiotherapists demand in 2023 was estimated at 34.114 personnel. With a supply of 20.910 physiotherapists, this resulted in a shortage of 13.204 personnel (38,7%) in 2023. The demand for physiotherapists is projected to increase annually, reaching 39.296 in 2025, 56.839 in 2030, and 66.258 by 2032. Each year, approximately 2.000 physiotherapists are projected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage in the physiotherapist workforce by 2032 (46,9%).

Table 116. Projection of Physiotherapists Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	34.114	20.910	13.204	38,7%
2024	36.601	22.596	14.005	38,3%
2025	39.296	24.257	15.039	38,3%
2026	42.223	25.893	16.330	38,7%
2027	45.417	27.505	17.912	39,4%
2028	48.901	29.092	19.809	40,5%
2029	52.697	30.656	22.041	41,8%
2030	56.839	32.196	24.643	43,4%
2031	61.310	33.713	27.597	45,0%
2032	66.258	35.207	31.051	46,9%

Provincial demand for physiotherapists increases annually, driven by population growth, disease prevalence, and the epidemiological burden in each province. The provinces with the highest physiotherapists demand each year are Central Java, West Java, East Java, and Banten.



Table 117. Projection of Physiotherapists Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	178	191	205	220	236	253	272	292	314	338
NORTH SUMATERA	1.100	1187	1281	1383	1495	1618	1752	1897	2054	2229
WEST SUMATERA	1.069	1146	1229	1319	1417	1523	1637	1761	1895	2043
RIAU	925	997	1076	1162	1256	1360	1474	1599	1735	1886
JAMBI	234	253	274	297	323	351	382	416	453	494
SOUTH SUMATERA	644	690	740	795	855	920	991	1067	1149	1240
BENGKULU	100	108	117	126	136	147	159	173	188	204
LAMPUNG	994	1070	1152	1242	1340	1447	1564	1692	1831	1985
BANGKA BELITUNG ISLANDS	183	196	210	225	241	258	277	297	319	343
RIAU ISLANDS	251	269	288	309	332	356	382	411	442	476
DKI JAKARTA	3.747	4009	4286	4590	4925	5294	5696	6140	6619	7162
WEST JAVA	5.062	5432	5829	6260	6730	7248	7813	8430	9096	9842
CENTRAL JAVA	6.381	6834	7319	7846	8419	9042	9720	10459	11254	12121
DI YOGYAKARTA	641	687	737	792	851	915	985	1061	1143	1233
EAST JAVA	4.246	4535	4848	5187	5555	5955	6390	6863	7371	7931
BANTEN	1.738	1872	2018	2177	2353	2546	2760	2995	3250	3536
BALI	1.173	1255	1344	1439	1543	1656	1779	1912	2055	2213
WEST NUSA TENGGARA	609	655	705	760	821	888	960	1039	1124	1217
EAST NUSA TENGGARA	169	183	198	214	232	251	272	295	320	348
WEST KALIMANTAN	140	150	161	173	186	200	215	232	250	270
CENTRAL KALIMANTAN	245	265	286	309	334	362	393	427	464	505
SOUTH KALIMANTAN	717	774	837	906	983	1068	1161	1263	1374	1498
EAST KALIMANTAN	635	700	787	879	977	1081	1191	1309	1439	1573
NORTH KALIMANTAN	64	69	75	81	88	96	105	115	125	137
NORTH SULAWESI	450	483	519	559	603	651	703	760	822	890
CENTRAL SULAWESI	199	213	229	246	264	284	306	330	356	384
SOUTH SULAWESI	1.585	1693	1808	1931	2062	2202	2354	2516	2690	2881
SOUTHEAST SULAWESI	59	64	69	75	81	88	95	103	112	122
GORONTALO	78	85	92	100	109	118	128	139	151	165
WEST SULAWESI	75	80	86	92	98	105	112	120	129	138
MALUKU	60	64	68	72	77	82	87	93	99	106
NORTH MALUKU	199	217	237	259	283	310	340	373	409	450
WEST PAPUA	2	2	2	2	2	2	2	2	2	2
SOUTHWEST PAPUA	48	52	56	60	65	70	75	81	87	94

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
SOUTH PAPUA	33	35	37	39	41	43	46	49	52	55
CENTRAL PAPUA	0	0	0	0	0	0	0	0	0	0
HIGHLAND PAPUA	9	9	9	9	9	9	9	9	9	9
PAPUA	72	77	82	88	95	102	110	119	128	138

## 11. Optometrist

Based on calculations using the supply–demand method, Indonesia’s demand for optometrists in 2023 was estimated at 12.355 personnel. With a supply of 6.636 optometrists, this resulted in a shortage of 5.719 personnel (46,3%) in 2023. The demand for optometrists is projected to increase annually, reaching 13.422 in 2025, 16.336 in 2030, and 17.660 by 2032. Each year, approximately 721 optometrists are projected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage in the optometrist workforce by 2032 (32,6%).

Table 118. Projection of Optometrists Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	12.355	6.636	5.719	46,3%
2024	12.905	7.257	5.648	43,8%
2025	13.422	7.870	5.552	41,4%
2026	13.958	8.473	5.485	39,3%
2027	14.518	9.066	5.452	37,6%
2028	15.099	9.651	5.448	36,1%
2029	15.700	10.228	5.472	34,9%
2030	16.336	10.795	5.541	33,9%
2031	16.985	11.354	5.631	33,2%
2032	17.660	11.905	5.755	32,6%

Provincial demand for optometrists increases annually, driven by population growth, disease prevalence, and the epidemiological burden in each province. The provinces with the highest optometrist workforce requirements each year are West Java, East Java, Central Java, and Banten.

Table 119. Projection of Optometrists Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	235	305	317	330	343	357	371	386	401	417
NORTH SUMATERA	596	619	644	670	697	725	754	784	815	848
WEST SUMATERA	409	425	442	460	478	497	517	538	559	582
RIAU	447	465	483	502	523	543	565	588	611	636
JAMBI	198	206	214	223	232	241	251	261	271	282



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
SOUTH SUMATERA	278	289	301	313	325	338	352	366	381	396
BENGKULU	72	75	78	81	84	87	91	95	98	102
LAMPUNG	424	441	458	477	496	516	536	558	580	603
BANGKA BELITUNG ISLANDS	74	76	80	83	86	89	93	97	101	105
RIAU ISLANDS	154	160	167	173	180	187	195	203	211	219
DKI JAKARTA	562	585	608	632	658	684	711	740	769	800
WEST JAVA	2055	2.137	2.223	2.311	2.404	2.500	2.600	2.704	2.812	2.925
CENTRAL JAVA	1752	1.822	1.895	1.971	2.050	2.132	2.217	2.306	2.398	2.494
DI YOGYAKARTA	212	220	229	238	248	258	268	279	290	302
EAST JAVA	2013	2.094	2.177	2.264	2.355	2.449	2.547	2.649	2.755	2.865
BANTEN	503	523	544	565	588	612	636	661	688	715
BALI	334	347	361	376	391	406	423	440	457	475
WEST NUSA TENGGARA	258	268	279	290	302	314	326	339	353	367
EAST NUSA TENGGARA	101	105	109	113	118	122	127	132	138	143
WEST KALIMANTAN	194	201	209	218	226	235	245	255	265	275
CENTRAL KALIMANTAN	63	65	68	71	74	77	80	83	86	89
SOUTH KALIMANTAN	190	197	205	213	222	231	240	250	260	270
EAST KALIMANTAN	254	264	274	285	297	309	321	334	347	361
NORTH KALIMANTAN	22	23	24	25	26	27	28	29	30	31
NORTH SULAWESI	171	178	185	193	200	208	217	226	235	244
CENTRAL SULAWESI	116	120	125	130	135	141	146	152	158	165
SOUTH SULAWESI	356	370	385	400	416	433	450	468	487	506
SOUTHEAST SULAWESI	73	76	79	82	85	89	92	96	100	104
GORONTALO	57	59	61	64	66	69	72	75	78	81
WEST SULAWESI	33	34	35	37	38	40	41	43	45	46
MALUKU	33	35	36	37	39	41	42	44	46	47
NORTH MALUKU	39	41	42	44	46	48	50	52	54	56
WEST PAPUA	5	5	6	6	6	6	6	7	7	7
SOUTHWEST PAPUA	31	32	34	35	36	38	39	41	42	44
SOUTH PAPUA	4	4	5	5	5	5	5	6	6	6
CENTRAL PAPUA	12	13	13	14	14	15	15	16	17	17
HIGHLAND PAPUA	2	2	2	2	2	2	2	3	3	3
PAPUA	23	24	25	25	27	28	29	30	31	32

## 12. Anesthesiologist Assistants

Based on the results of calculations using the supply–demand method, Indonesia’s anesthesiologist assistants demand in 2023 was estimated at 9.892 personnel. With a supply of 3.240 anesthesiologist assistants, this resulted in a shortage of 6.652 personnel (67,2%) in 2023. The demand for anesthesiologist assistants is projected to increase annually, reaching 11.301 in 2025, 16.092 in 2030, and 18.662 by 2032. Each year, approximately 545 anesthesiologist assistants are projected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage of anesthesiologist assistants by 2032 (60,1%).

Table 120. Projection of Anesthesiologist Assistants Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	9.892	3.240	6.652	67,2%
2024	10.566	3.736	6.830	64,6%
2025	11.301	4.225	7.076	62,6%
2026	12.101	4.707	7.394	61,1%
2027	12.974	5.181	7.793	60,1%
2028	13.927	5.648	8.279	59,4%
2029	14.962	6.108	8.854	59,2%
2030	16.092	6.561	9.531	59,2%
2031	17.308	7.008	10.300	59,5%
2032	18.662	7.448	11.214	60,1%

Provincial demand for anesthesiologist assistants increases annually, driven by population growth, disease prevalence, and the epidemiological burden in each province. The provinces with the highest anesthesia personnel workforce requirements each year are East Java, Central Java, West Java, and DKI Jakarta.

Table 121. Projection of Anesthesiologist Assistants Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	430	460	493	529	569	613	661	714	771	836
NORTH SUMATERA	502	536	573	613	657	704	755	811	871	937
WEST SUMATERA	268	287	307	329	353	379	407	438	471	507
RIAU	312	331	352	374	398	424	452	482	514	550
JAMBI	71	75	80	85	90	96	102	109	116	124
SOUTH SUMATERA	297	319	343	370	400	433	469	509	552	601
BENGKULU	50	53	57	61	65	70	75	80	86	92
LAMPUNG	256	272	290	309	330	353	378	406	436	470
BANGKA BELITUNG ISLANDS	50	53	56	59	62	66	70	74	78	83
RIAU ISLANDS	59	62	65	68	72	76	80	84	88	92
DKI JAKARTA	735	784	836	893	955	1023	1098	1180	1269	1369



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
WEST JAVA	1.148	1233	1325	1426	1537	1660	1796	1947	2111	2295
CENTRAL JAVA	1.303	1394	1494	1603	1722	1851	1992	2145	2310	2492
DI YOGYAKARTA	153	163	174	186	199	213	229	246	264	284
EAST JAVA	1.485	1570	1661	1759	1865	1979	2100	2230	2368	2520
BANTEN	657	702	750	803	861	924	993	1069	1151	1243
BALI	388	423	461	503	550	602	659	722	791	869
WEST NUSA TENGGARA	141	150	160	170	181	193	207	222	238	256
EAST NUSA TENGGARA	132	141	150	160	171	183	196	210	224	240
WEST KALIMANTAN	112	121	131	142	154	168	183	200	219	240
CENTRAL KALIMANTAN	107	114	122	131	140	150	161	173	186	201
SOUTH KALIMANTAN	185	201	219	240	263	289	318	350	385	425
EAST KALIMANTAN	156	170	189	209	230	252	274	297	322	347
NORTH KALIMANTAN	24	26	28	31	34	37	41	45	50	55
NORTH SULAWESI	138	150	164	179	195	213	233	255	279	306
CENTRAL SULAWESI	124	131	138	145	153	162	171	181	191	202
SOUTH SULAWESI	273	288	304	321	339	358	379	401	424	449
SOUTHEAST SULAWESI	71	76	81	87	93	100	107	115	124	134
GORONTALO	60	63	66	69	73	77	81	85	89	94
WEST SULAWESI	24	26	28	30	32	34	36	38	40	42
MALUKU	39	41	43	45	48	51	54	57	60	64
NORTH MALUKU	28	30	32	34	36	38	40	42	44	47
WEST PAPUA	19	20	22	24	26	28	30	32	34	37
SOUTHWEST PAPUA	23	24	25	26	27	28	29	30	31	32
SOUTH PAPUA	16	17	18	19	20	21	22	23	25	26
CENTRAL PAPUA	9	10	11	12	13	14	15	16	17	18
HIGHLAND PAPUA	13	14	15	16	17	18	19	20	21	22
PAPUA	34	36	38	41	44	47	50	54	58	61

### 13. Occupational Therapist

Based on the results of calculations using the supply–demand method, Indonesia’s occupational therapists demand in 2023 was estimated at 3.281 personnel. With a supply of 1.187 occupational therapists, this resulted in a shortage of 2.094 personnel (63,8%) in 2023. The demand for occupational therapists is projected to increase annually, reaching 3.746 in 2025, 5.314 in 2030, and 6.159 by 2032. Each year, approximately 300 occupational therapists are projected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage of occupational therapists by 2032 (41,9%).



Table 122. Projection of Occupational Therapists Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	3.281	1.187	2.094	63,8%
2024	3.503	1.469	2.034	58,1%
2025	3.746	1.747	1.999	53,4%
2026	4.008	2.021	1.987	49,6%
2027	4.296	2.291	2.005	46,7%
2028	4.605	2.557	2.048	44,5%
2029	4.942	2.819	2.123	43,0%
2030	5.314	3.077	2.237	42,1%
2031	5.714	3.331	2.383	41,7%
2032	6.159	3.581	2.578	41,9%

Provincial demand for occupational therapists also shows an increasing trend each year, driven by population growth, disease prevalence, and the epidemiological burden in each province. The provinces with the highest occupational therapist workforce demand each year are Central Java, West Java, DKI Jakarta, and East Java.

Table 123. Projection of Occupational Therapists Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	39	42	45	48	52	56	60	65	70	76
NORTH SUMATERA	66	70	75	80	86	92	99	106	114	123
WEST SUMATERA	80	86	92	99	106	114	122	131	141	152
RIAU	109	116	123	131	139	148	158	169	180	193
JAMBI	18	19	20	21	22	23	24	26	28	30
SOUTH SUMATERA	28	30	32	34	37	40	43	47	51	56
BENGKULU	11	12	13	14	15	16	17	18	19	20
LAMPUNG	35	37	39	42	45	48	51	55	59	64
BANGKA BELITUNG ISLANDS	13	14	15	16	17	18	19	20	21	22
RIAU ISLANDS	22	23	24	25	26	27	28	29	30	32
DKI JAKARTA	399	425	453	484	517	554	594	639	687	741
WEST JAVA	437	469	504	542	584	631	683	740	802	872
CENTRAL JAVA	721	771	827	887	953	1.024	1.102	1.187	1.278	1.379
DI YOGYAKARTA	88	94	100	107	115	123	132	142	153	165
EAST JAVA	352	372	394	417	442	469	498	529	562	598
BANTEN	118	126	135	144	154	165	177	191	206	222
BALI	55	60	65	71	78	85	93	102	112	123
WEST NUSA TENGGARA	61	65	69	73	78	83	89	95	102	110
EAST NUSA TENGGARA	6	6	6	6	6	6	6	6	6	6
WEST KALIMANTAN	11	12	13	14	15	16	17	19	21	23



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
CENTRAL KALIMANTAN	29	31	33	35	38	41	44	47	51	55
SOUTH KALIMANTAN	79	86	94	103	113	124	136	150	165	182
EAST KALIMANTAN	95	103	115	127	140	153	167	181	196	211
NORTH KALIMANTAN	7	8	9	10	11	12	13	14	15	17
NORTH SULAWESI	78	85	93	101	110	120	131	143	157	172
CENTRAL SULAWESI	77	81	85	90	95	100	106	112	118	125
SOUTH SULAWESI	173	183	193	204	216	228	241	255	270	286
SOUTHEAST SULAWESI	6	6	6	6	6	6	6	6	6	6
GORONTALO	7	7	7	7	7	7	7	7	7	7
WEST SULAWESI	7	7	7	7	7	7	7	7	7	7
MALUKU	5	5	5	5	5	5	5	5	5	5
NORTH MALUKU	32	34	36	38	40	42	44	47	50	53
WEST PAPUA	0	0	0	0	0	0	0	0	0	0
SOUTHWEST PAPUA	3	3	3	3	3	3	3	3	3	3
SOUTH PAPUA	3	3	3	3	3	3	3	3	3	3
CENTRAL PAPUA	0	0	0	0	0	0	0	0	0	0
HIGHLAND PAPUA	2	2	2	2	2	2	2	2	2	2
PAPUA	9	10	11	12	13	14	15	16	17	18

#### 14. Cardiovascular Technician

Based on the results of calculations using the supply–demand method, Indonesia’s cardiovascular technicians demand in 2023 was estimated at 850 personnel. With a supply of 296 cardiovascular technicians, this resulted in a shortage of 554 personnel (65,2%) in 2023. The demand for cardiovascular technicians is projected to increase annually, reaching 871 in 2025, 912 in 2030, and 936 by 2032. Each year, approximately 44 cardiovascular technicians are projected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage in the cardiovascular technician workforce by 2032 (32,5%).

Table 124. Projection of Cardiovascular Technicians Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	850	296	554	65,2%
2024	861	336	525	61,0%
2025	871	375	496	56,9%
2026	884	413	471	53,3%
2027	896	451	445	49,7%
2028	901	488	413	45,8%
2029	900	525	375	41,7%



Year	Demand	Supply	Gap	Gap Percentage
2030	912	561	351	38,5%
2031	924	597	327	35,4%
2032	936	632	304	32,5%

Provincial demand for cardiovascular technicians also shows an increasing trend each year, driven by population growth, disease prevalence, and the epidemiological burden in each province. The provinces with the highest cardiovascular technician workforce requirements each year are West Java, East Java, Central Java, and DKI Jakarta.

Table 125. Projection of Cardiovascular Technicians Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	11	11	11	11	11	11	11	11	11	11
NORTH SUMATERA	47	48	49	50	51	52	52	53	54	55
WEST SUMATERA	23	24	25	26	27	27	27	28	29	30
RIAU	20	20	20	20	20	20	20	20	20	20
JAMBI	7	7	7	7	7	7	7	7	7	7
SOUTH SUMATERA	25	25	25	25	25	25	25	25	25	25
BENGKULU	4	4	4	4	4	4	4	4	4	4
LAMPUNG	26	26	26	27	28	28	28	29	30	31
BANGKA BELITUNG ISLANDS	1	1	1	1	1	1	1	1	1	1
RIAU ISLANDS	5	5	5	5	5	5	5	5	5	5
DKI JAKARTA	82	83	84	85	86	86	86	87	88	89
WEST JAVA	153	156	158	161	164	165	164	167	170	173
CENTRAL JAVA	135	137	139	142	144	145	144	146	148	150
DI YOGYAKARTA	25	25	25	25	25	25	25	25	25	25
EAST JAVA	139	141	143	145	147	148	148	150	152	154
BANTEN	26	26	26	26	26	26	26	26	26	26
BALI	22	22	22	22	22	22	22	22	22	22
WEST NUSA TENGGARA	13	13	13	13	13	13	13	13	13	13
EAST NUSA TENGGARA	4	4	4	4	4	4	4	4	4	4
WEST KALIMANTAN	8	8	8	8	8	8	8	8	8	8
CENTRAL KALIMANTAN	3	3	3	3	3	3	3	3	3	3
SOUTH KALIMANTAN	10	10	10	10	10	10	10	10	10	10
EAST KALIMANTAN	12	13	14	15	16	17	18	19	20	21
NORTH KALIMANTAN	1	1	1	1	1	1	1	1	1	1
NORTH SULAWESI	13	13	13	13	13	13	13	13	13	13
CENTRAL SULAWESI	3	3	3	3	3	3	3	3	3	3
SOUTH SULAWESI	24	24	24	24	24	24	24	24	24	24



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
SOUTHEAST SULAWESI	3	3	3	3	3	3	3	3	3	3
GORONTALO	2	2	2	2	2	2	2	2	2	2
WEST SULAWESI	0	0	0	0	0	0	0	0	0	0
MALUKU	1	1	1	1	1	1	1	1	1	1
NORTH MALUKU	1	1	1	1	1	1	1	1	1	1
WEST PAPUA	0	0	0	0	0	0	0	0	0	0
SOUTHWEST PAPUA	0	0	0	0	0	0	0	0	0	0
SOUTH PAPUA	0	0	0	0	0	0	0	0	0	0
CENTRAL PAPUA	0	0	0	0	0	0	0	0	0	0
HIGHLAND PAPUA	0	0	0	0	0	0	0	0	0	0
PAPUA	1	1	1	1	1	1	1	1	1	1

## 15. Electromedical Technician

Based on the results of calculations using the supply–demand method, Indonesia’s electromedical technicians demand in 2023 was estimated at 36.787 personnel. With a supply of 7.139 electromedical technicians, this resulted in a shortage of 29.648 personnel (80,59%) in 2023. The demand for electromedical technicians is projected to increase annually, reaching 36.817 in 2025, 36.967 in 2030, and 37.027 by 2032. Each year, approximately 1.000 electromedical technicians are projected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage in the electromedical personnel workforce by 2032 (52,1%).

Table 126. Projection of Electromedical Technicians Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	36.787	7.139	29.648	80,6%
2024	36.787	8.246	28.541	77,6%
2025	36.817	9.370	27.447	74,5%
2026	36.847	10.510	26.337	71,5%
2027	36.877	11.668	25.209	68,4%
2028	36.907	12.843	24.064	65,2%
2029	36.937	14.036	22.901	62,0%
2030	36.967	15.246	21.721	58,8%
2031	36.997	16.475	20.522	55,5%
2032	37.027	17.722	19.305	52,1%

Demand for electromedical technicians at the provincial level also shows an upward trend each year, driven by population growth, disease prevalence, and the epidemiological burden in each province. Provinces with the highest annual demand include West Java, East Java, DKI Jakarta, and Central Java.



Table 127. Projection of Electromedical Technicians Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	952	952	952	952	952	952	952	952	952	952
NORTH SUMATERA	2.480	2.480	2.490	2.500	2.510	2.520	2.530	2.540	2.550	2.560
WEST SUMATERA	787	787	787	787	787	787	787	787	787	787
RIAU	682	682	682	682	682	682	682	682	682	682
JAMBI	358	358	358	358	358	358	358	358	358	358
SOUTH SUMATERA	905	905	905	905	905	905	905	905	905	905
BENGKULU	240	240	240	240	240	240	240	240	240	240
LAMPUNG	797	797	797	797	797	797	797	797	797	797
BANGKA BELITUNG ISLANDS	256	256	256	256	256	256	256	256	256	256
RIAU ISLANDS	372	372	372	372	372	372	372	372	372	372
DKI JAKARTA	4.042	4.042	4.042	4.042	4.042	4.042	4.042	4.042	4.042	4.042
WEST JAVA	5.053	5.053	5.063	5.073	5.083	5.093	5.103	5.113	5.123	5.133
CENTRAL JAVA	4.034	4.034	4.034	4.034	4.034	4.034	4.034	4.034	4.034	4.034
DI YOGYAKARTA	1.063	1.063	1.063	1.063	1.063	1.063	1.063	1.063	1.063	1.063
EAST JAVA	4.656	4.656	4.666	4.676	4.686	4.696	4.706	4.716	4.726	4.736
BANTEN	1.496	1.496	1.496	1.496	1.496	1.496	1.496	1.496	1.496	1.496
BALI	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089	1.089
WEST NUSA TENGGARA	495	495	495	495	495	495	495	495	495	495
EAST NUSA TENGGARA	454	454	454	454	454	454	454	454	454	454
WEST KALIMANTAN	703	703	703	703	703	703	703	703	703	703
CENTRAL KALIMANTAN	326	326	326	326	326	326	326	326	326	326
SOUTH KALIMANTAN	704	704	704	704	704	704	704	704	704	704
EAST KALIMANTAN	727	727	727	727	727	727	727	727	727	727
NORTH KALIMANTAN	110	110	110	110	110	110	110	110	110	110
NORTH SULAWESI	510	510	510	510	510	510	510	510	510	510
CENTRAL SULAWESI	392	392	392	392	392	392	392	392	392	392
SOUTH SULAWESI	1.510	1.510	1.510	1.510	1.510	1.510	1.510	1.510	1.510	1.510
SOUTHEAST SULAWESI	368	368	368	368	368	368	368	368	368	368
GORONTALO	176	176	176	176	176	176	176	176	176	176
WEST SULAWESI	120	120	120	120	120	120	120	120	120	120
MALUKU	230	230	230	230	230	230	230	230	230	230
NORTH MALUKU	164	164	164	164	164	164	164	164	164	164
WEST PAPUA	90	90	90	90	90	90	90	90	90	90
SOUTHWEST PAPUA	66	66	66	66	66	66	66	66	66	66
SOUTH PAPUA	64	64	64	64	64	64	64	64	64	64



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
CENTRAL PAPUA	86	86	86	86	86	86	86	86	86	86
HIGHLAND PAPUA	44	44	44	44	44	44	44	44	44	44
PAPUA	186	186	186	186	186	186	186	186	186	186

## 16. Medical Physicists

Based on the results of calculations using the supply–demand method, Indonesia’s medical physicist workforce demand in 2023 was estimated at 1.339 personnel. With a supply of 647 medical physicists, this resulted in a shortage of 692 personnel (51,68%) in 2023. The demand for medical physicists is projected to increase annually, reaching 1.539 in 2025, 2.212 in 2030, and 2.575 by 2032. Each year, approximately 50 new medical physicists are projected to graduate between 2024 and 2026, increasing to 80 graduates per year from 2027 to 2032, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage in the medical physicist workforce by 2032 (57%).

Table 128. Projection of Medical Physicists Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	1.339	647	692	51,7%
2024	1.435	667	768	53,5%
2025	1.539	687	852	55,7%
2026	1.650	707	943	57,2%
2027	1.772	776	996	56,2%
2028	1.907	844	1.063	55,7%
2029	2.052	911	1.141	55,6%
2030	2.212	977	1.235	55,8%
2031	2.384	1.042	1.342	56,3%
2032	2.575	1.106	1.469	57,0%

Demand for medical physicists at the provincial level also shows an annual upward trend, driven by population growth, disease prevalence, and the epidemiological burden in each province. Provinces with the highest demand each year include DKI Jakarta, Central Java, East Java, and North Sumatera.

Table 129. Projection of Medical Physicists Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	0	0	0	0	0	0	0	0	0	0
NORTH SUMATERA	112	121	131	141	152	164	178	193	209	227
WEST SUMATERA	4	4	4	4	4	4	4	4	4	4
RIAU	29	31	33	36	39	42	46	50	54	59
JAMBI	0	0	0	0	0	0	0	0	0	0
SOUTH SUMATERA	76	81	87	93	100	108	116	125	135	146



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
BENGKULU	0	0	0	0	0	0	0	0	0	0
LAMPUNG	43	46	50	54	58	63	68	74	80	87
BANGKA BELITUNG ISLANDS	0	0	0	0	0	0	0	0	0	0
RIAU ISLANDS	0	0	0	0	0	0	0	0	0	0
DKI JAKARTA	324	347	371	397	426	458	493	531	572	619
WEST JAVA	65	70	75	81	87	94	101	109	118	128
CENTRAL JAVA	306	328	351	376	403	433	465	500	538	579
DI YOGYAKARTA	110	118	127	136	146	157	169	182	196	211
EAST JAVA	132	141	151	162	174	187	201	216	232	250
BANTEN	0	0	0	0	0	0	0	0	0	0
BALI	79	85	91	97	104	112	120	129	139	150
WEST NUSA TENGGARA	35	38	41	44	48	52	56	61	66	71
EAST NUSA TENGGARA	0	0	0	0	0	0	0	0	0	0
WEST KALIMANTAN	0	0	0	0	0	0	0	0	0	0
CENTRAL KALIMANTAN	0	0	0	0	0	0	0	0	0	0
SOUTH KALIMANTAN	0	0	0	0	0	0	0	0	0	0
EAST KALIMANTAN	3	3	3	3	3	3	3	3	3	3
NORTH KALIMANTAN	0	0	0	0	0	0	0	0	0	0
NORTH SULAWESI	20	21	23	25	27	29	31	34	37	40
CENTRAL SULAWESI	0	0	0	0	0	0	0	0	0	0
SOUTH SULAWESI	1	1	1	1	1	1	1	1	1	1
SOUTHEAST SULAWESI	0	0	0	0	0	0	0	0	0	0
GORONTALO	0	0	0	0	0	0	0	0	0	0
WEST SULAWESI	0	0	0	0	0	0	0	0	0	0
MALUKU	0	0	0	0	0	0	0	0	0	0
NORTH MALUKU	0	0	0	0	0	0	0	0	0	0
WEST PAPUA	0	0	0	0	0	0	0	0	0	0
SOUTHWEST PAPUA	0	0	0	0	0	0	0	0	0	0
SOUTH PAPUA	0	0	0	0	0	0	0	0	0	0
CENTRAL PAPUA	0	0	0	0	0	0	0	0	0	0
HIGHLAND PAPUA	0	0	0	0	0	0	0	0	0	0
PAPUA	0	0	0	0	0	0	0	0	0	0

## 17. Orthotists and Prosthetists

Based on the results of calculations using the supply–demand method, Indonesia’s orthotists-prosthetists demand in 2023 was estimated at 1.199 personnel. With a supply of 227 orthotists-prosthetists, this resulted in a shortage of 972 personnel (81,07%) in 2023. The demand for orthotists-prosthetists is projected to increase annually, reaching 1.377 in 2025, 1.979 in 2030, and 2.299 by 2032. Each year, approximately 155 orthotists-prosthetists are projected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage in the orthotists-prosthetists workforce by 2032 (34,2%).

Table 130. Projection of Orthotists and Prosthetists Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	1.199	227	972	81,1%
2024	1.284	379	905	70,5%
2025	1.377	528	849	61,7%
2026	1.476	675	801	54,3%
2027	1.587	820	767	48,3%
2028	1.706	963	743	43,5%
2029	1.836	1.104	732	39,9%
2030	1.979	1.242	737	37,2%
2031	2.130	1.378	752	35,1%
2032	2.299	1.512	787	34,2%

Demand for orthotists-prosthetists personnel at the provincial level is also increasing each year, driven by population growth, disease prevalence, and the epidemiological burden in each province. Provinces with the highest annual demand include West Java, Central Java, DKI Jakarta, and East Java.

Table 131. Projection of Orthotists and Prosthetists Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	7	8	9	10	11	12	13	14	15	16
NORTH SUMATERA	22	24	26	28	30	32	35	38	41	44
WEST SUMATERA	28	30	32	34	37	40	43	46	49	53
RIAU	36	39	42	45	49	53	57	62	67	73
JAMBI	4	4	4	4	4	4	4	4	4	4
SOUTH SUMATERA	8	9	10	11	12	13	14	15	16	17
BENGKULU	10	11	12	13	14	15	16	17	18	20
LAMPUNG	16	17	18	19	21	23	25	27	29	31
BANGKA BELITUNG ISLANDS	5	5	5	5	5	5	5	5	5	5
RIAU ISLANDS	15	16	17	18	19	20	21	23	25	27
DKI JAKARTA	160	171	183	196	210	226	243	262	282	305
WEST JAVA	219	235	252	271	291	313	337	364	393	425



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
CENTRAL JAVA	199	213	228	244	262	281	302	325	350	377
DI YOGYAKARTA	26	28	30	32	34	37	40	43	46	50
EAST JAVA	138	147	157	168	180	193	207	222	238	256
BANTEN	44	47	51	55	59	64	69	75	81	88
BALI	25	27	29	31	33	35	38	41	44	47
WEST NUSA TENGGERA	8	9	10	11	12	13	14	15	16	17
EAST NUSA TENGGERA	3	3	3	3	3	3	3	3	3	3
WEST KALIMANTAN	5	5	5	5	5	5	5	5	5	5
CENTRAL KALIMANTAN	12	13	14	15	16	17	18	20	22	24
SOUTH KALIMANTAN	51	55	60	65	71	77	84	91	99	108
EAST KALIMANTAN	44	48	54	60	67	74	82	90	99	108
NORTH KALIMANTAN	2	2	2	2	2	2	2	2	2	2
NORTH SULAWESI	31	33	35	38	41	44	48	52	56	61
CENTRAL SULAWESI	17	18	19	20	22	24	26	28	30	32
SOUTH SULAWESI	45	48	51	54	58	62	66	71	76	81
SOUTHEAST SULAWESI	1	1	1	1	1	1	1	1	1	1
GORONTALO	3	3	3	3	3	3	3	3	3	3
WEST SULAWESI	1	1	1	1	1	1	1	1	1	1
MALUKU	1	1	1	1	1	1	1	1	1	1
NORTH MALUKU	5	5	5	5	5	5	5	5	5	6
WEST PAPUA	1	1	1	1	1	1	1	1	1	1
SOUTHWEST PAPUA	1	1	1	1	1	1	1	1	1	1
SOUTH PAPUA	4	4	4	4	4	4	4	4	4	4
CENTRAL PAPUA	0	0	0	0	0	0	0	0	0	0
HIGHLAND PAPUA	0	0	0	0	0	0	0	0	0	0
PAPUA	2	2	2	2	2	2	2	2	2	2

## 18. Blood Bank Technician

Based on the results of calculations using the supply–demand method, Indonesia’s blood bank technicians demand in 2023 was estimated at 3.591 personnel. With a supply of 2.572 blood bank technicians, this resulted in a shortage of 1.019 personnel (28,38%) in 2023. The demand for blood bank technicians is projected to increase annually, reaching 4.097 in 2025, 5.832 in 2030, and 6.765 by 2032. Each year, approximately 502 blood bank technicians are projected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage of the blood bank technicians by 2032 (3,9%).



Table 132. Projection of Blood Bank Technicians Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	3.591	2.572	1.019	28,44%
2024	3.834	3.035	799	20,9%
2025	4.097	3.491	606	14,8%
2026	4.388	3.941	447	10,2%
2027	4.703	4.384	319	6,8%
2028	5.047	4.820	227	4,5%
2029	5.421	5.250	171	3,2%
2030	5.832	5.673	159	2,8%
2031	6.273	6.090	183	2,9%
2032	6.765	6.501	264	3,9%

Demand for blood bank technicians at the provincial level is also projected to increase annually, driven by population growth, disease prevalence rates, and the epidemiological burden in each province. Provinces with the highest demand annually are Central Java, West Java, East Java, and DKI Jakarta.

Table 133. Projection of Blood Bank Technicians Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	57	61	65	70	75	81	87	94	102	111
NORTH SUMATERA	159	170	182	195	209	224	240	258	277	298
WEST SUMATERA	90	96	103	110	118	127	136	146	157	169
RIAU	82	87	92	98	104	111	118	126	134	143
JAMBI	22	23	24	26	28	30	32	34	36	38
SOUTH SUMATERA	105	113	122	132	143	155	168	182	197	215
BENGKULU	17	18	19	20	21	22	24	26	28	30
LAMPUNG	131	139	148	158	169	181	194	209	225	243
BANGKA BELITUNG ISLANDS	24	25	26	27	29	31	33	35	37	39
RIAU ISLANDS	24	25	26	27	28	29	30	32	34	36
DKI JAKARTA	406	433	462	493	527	564	605	650	699	754
WEST JAVA	508	546	587	632	681	735	795	862	934	1.015
CENTRAL JAVA	578	618	662	710	763	820	882	950	1,023	1,104
DI YOGYAKARTA	101	108	115	123	132	142	153	164	176	190
EAST JAVA	485	513	543	575	610	647	686	729	774	824
BANTEN	183	196	210	225	241	259	278	299	322	348
BALI	112	122	133	145	158	173	189	207	227	249
WEST NUSA TENGGARA	48	51	54	58	62	66	71	76	81	87
EAST NUSA TENGGARA	34	36	38	41	44	47	50	53	57	61
WEST KALIMANTAN	37	40	43	47	51	56	61	67	73	80



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
CENTRAL KALIMANTAN	25	27	29	31	33	35	38	41	44	47
SOUTH KALIMANTAN	42	46	50	55	60	66	73	80	88	97
EAST KALIMANTAN	48	52	58	64	70	77	84	91	99	107
NORTH KALIMANTAN	22	24	26	29	32	35	39	43	47	52
NORTH SULAWESI	54	59	64	70	76	83	91	100	110	121
CENTRAL SULAWESI	27	28	30	32	34	36	38	40	42	44
SOUTH SULAWESI	86	91	96	101	107	113	120	127	134	142
SOUTHEAST SULAWESI	15	16	17	18	19	20	21	23	25	27
GORONTALO	20	21	22	23	24	25	26	27	28	29
WEST SULAWESI	5	5	5	5	5	5	5	5	5	5
MALUKU	12	13	14	15	16	17	18	19	20	21
NORTH MALUKU	8	8	8	8	8	8	8	8	8	8
WEST PAPUA	6	6	6	6	6	6	6	6	6	6
SOUTHWEST PAPUA	4	4	4	4	4	4	4	4	4	4
SOUTH PAPUA	3	3	3	3	3	3	3	3	3	3
CENTRAL PAPUA	2	2	2	2	2	2	2	2	2	2
HIGHLAND PAPUA	2	2	2	2	2	2	2	2	2	2
PAPUA	7	7	7	8	9	10	11	12	13	14

## 19. Radiographer

Based on the results of calculations using the supply–demand method, Indonesia’s radiographers demand in 2023 was estimated at 29.429 personnel. With a supply of 17.660 radiographers, this resulted in a shortage of 11.769 personnel (39,99%) in 2023. The demand for radiographers is projected to increase annually, reaching 34.165 in 2025, 49.775 in 2030, and 57.927 by 2032. Each year, approximately 1.491 radiographers are projected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage in the radiographer workforce by 2032 (51,6%).

Table 134. Projection of Radiographers Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	29.429	17.660	11.769	40.0%
2024	31.710	18.886	12.824	40.4%
2025	34.165	20.094	14.071	41.2%
2026	36.821	21.284	15.537	42.2%
2027	39.690	22.456	17.234	43.4%
2028	42.790	23.610	19.180	44.8%
2029	46.148	24.747	21.401	46.4%
2030	49.775	25.867	23.908	48.0%



Year	Demand	Supply	Gap	Gap Percentage
2031	53.686	26.970	26.716	49.8%
2032	57.927	28.056	29.871	51.6%

Demand for radiographers at the provincial level is also projected to increase annually, driven by population growth, disease prevalence rates, and the epidemiological burden in each province. Provinces with the highest demand annually are West Java, East Java, Central Java, and DKI Jakarta.

Table 135. Projection of Radiographers Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	150	162	175	189	204	220	237	256	276	298
NORTH SUMATERA	1.331	1.441	1.561	1.691	1.831	1.983	2.148	2.326	2.519	2.731
WEST SUMATERA	564	611	662	717	777	841	911	987	1.069	1.158
RIAU	625	677	733	794	860	932	1.010	1.095	1.187	1.288
JAMBI	191	207	224	243	263	285	309	335	363	393
SOUTH SUMATERA	504	544	587	633	684	739	798	862	931	1.005
BENGKULU	84	91	98	106	115	124	134	145	157	170
LAMPUNG	720	778	840	907	980	1.059	1.145	1.238	1.338	1.448
BANGKA BELITUNG ISLANDS	128	138	149	161	174	188	203	220	238	258
RIAU ISLANDS	184	199	215	232	251	271	293	317	343	371
DKI JAKARTA	2.930	3.141	3.364	3.606	3.869	4.151	4.458	4.792	5.151	5.542
WEST JAVA	6.205	6.683	7.191	7.745	8.341	8.983	9.684	10.439	11.253	12.142
CENTRAL JAVA	3.818	4.116	4.437	4.783	5.156	5.563	6.002	6.476	6.988	7.540
DI YOGYAKARTA	399	430	463	499	537	579	624	673	725	782
EAST JAVA	3.877	4.164	4.472	4.803	5.163	5.550	5.966	6.413	6.894	7.411
BANTEN	1.892	2.036	2.189	2.355	2.534	2.729	2.939	3.168	3.415	3.685
BALI	653	703	756	813	875	942	1.015	1.093	1.177	1.268
WEST NUSA TENGGARA	477	517	561	609	661	718	780	847	920	999
EAST NUSA TENGGARA	141	152	164	177	191	207	224	242	262	283
WEST KALIMANTAN	203	220	238	257	278	301	326	353	382	413
CENTRAL KALIMANTAN	123	133	144	156	168	181	196	212	229	248
SOUTH KALIMANTAN	495	534	577	623	673	728	787	851	920	995
EAST KALIMANTAN	430	475	534	598	666	739	817	900	991	1.084
NORTH KALIMANTAN	50	54	58	63	68	74	80	87	94	102
NORTH SULAWESI	1.036	1.114	1.198	1.288	1.385	1.490	1.603	1.725	1.856	1.997
CENTRAL SULAWESI	406	437	471	508	548	591	637	687	741	799



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
SOUTH SULAWESI	1.228	1.321	1.421	1.528	1.643	1.766	1.898	2.040	2.193	2.357
SOUTHEAST SULAWESI	156	169	183	198	214	231	250	270	292	316
GORONTALO	99	107	116	125	135	146	158	170	183	198
WEST SULAWESI	112	121	131	141	152	164	177	191	206	222
MALUKU	76	82	89	96	104	112	121	131	141	152
NORTH MALUKU	47	51	55	60	65	70	76	82	89	97
WEST PAPUA	6	6	6	6	6	6	6	6	6	6
SOUTHWEST PAPUA	20	22	24	26	28	30	32	35	38	41
SOUTH PAPUA	8	9	10	11	12	13	14	15	16	17
CENTRAL PAPUA	4	4	4	4	4	4	4	4	4	4
HIGHLAND PAPUA	16	17	18	19	20	21	22	23	24	26
PAPUA	41	44	47	51	55	59	64	69	75	81

## 20. Acupuncture Therapist

Based on the results of calculations using the supply–demand method, Indonesia’s acupuncture therapists demand in 2023 was estimated at 2.253 personnel. With a supply of 618 acupuncture therapists, this resulted in a shortage of 1.635 personnel (72,5%) in 2023. The demand for acupuncture therapists is projected to increase annually. By 2025, demand is estimated to reach 2.437 and is expected to continue rising to 2.966 by 2030. In 2032, the projected demand is estimated at 3.209 acupuncture therapists. Each year, approximately 381 acupuncturists are projected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to be able to meet its acupuncture therapist workforce demand by 2032, with an estimated surplus of 17,48%.

Table 136. Projection of Acupuncture Therapists Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	2.253	618	1.635	72,57%
2024	2.342	990	1.352	57,73%
2025	2.437	1.356	1.081	44,36%
2026	2.534	1.717	817	32,24%
2027	2.637	2.072	565	21,43%
2028	2.739	2.422	317	11,57%
2029	2.849	2.766	83	2,91%
2030	2.966	3.106	+140	+4,72%
2031	3.084	3.440	+356	+11,54%
2032	3.209	3.770	+561	+17,48%

Demand for acupuncture therapists at the provincial level also demonstrates an increasing trend each year, driven by population growth, disease prevalence rates, and the epidemiological burden



in each province. Provinces with the highest demand on an annual basis include West Java, Central Java, East Java, and North Sumatera.

Table 137. Projection of Acupuncture Therapists Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	76	79	83	86	89	93	97	100	105	109
NORTH SUMATERA	159	166	172	179	186	194	201	210	218	227
WEST SUMATERA	65	68	70	73	76	79	82	86	89	93
RIAU	88	91	95	99	103	107	111	115	120	125
JAMBI	31	32	34	35	37	38	40	41	43	44
SOUTH SUMATERA	69	72	75	78	81	84	87	91	95	98
BENGKULU	20	20	21	22	23	24	25	26	27	28
LAMPUNG	68	71	74	77	80	83	86	90	93	97
BANGKA BELITUNG ISLANDS	14	14	15	15	16	16	17	18	19	19
RIAU ISLANDS	30	31	32	33	35	36	37	39	40	42
DKI JAKARTA	77	80	83	86	90	93	97	101	105	109
WEST JAVA	465	483	503	523	544	566	588	612	636	662
CENTRAL JAVA	290	302	314	326	340	353	367	382	397	413
DI YOGYAKARTA	36	37	38	40	42	43	45	47	49	51
EAST JAVA	234	243	253	263	273	284	296	308	320	333
BANTEN	122	126	132	137	142	148	154	160	166	173
BALI	41	43	45	46	48	50	52	54	56	59
WEST NUSA TENGGARA	32	33	35	36	38	39	41	42	44	46
EAST NUSA TENGGARA	24	25	26	27	28	29	30	31	33	34
WEST KALIMANTAN	39	41	42	44	46	48	50	52	54	56
CENTRAL KALIMANTAN	16	17	17	18	19	20	20	21	22	23
SOUTH KALIMANTAN	38	39	41	42	44	46	47	49	51	53
EAST KALIMANTAN	36	38	39	41	43	44	46	48	50	52
NORTH KALIMANTAN	5	6	6	6	6	7	7	7	7	8
NORTH SULAWESI	25	26	27	29	30	31	32	33	35	36
CENTRAL SULAWESI	30	31	32	34	35	36	38	39	41	43
SOUTH SULAWESI	64	66	69	72	74	77	81	84	87	91
SOUTHEAST SULAWESI	15	16	16	17	18	18	19	20	21	22
GORONTALO	7	7	7	8	8	8	9	9	9	10
WEST SULAWESI	9	10	10	11	11	11	12	12	13	13
MALUKU	7	8	8	8	9	9	9	10	10	10
NORTH MALUKU	9	9	10	10	10	11	11	12	12	13



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
WEST PAPUA	1	1	1	1	1	1	1	2	2	2
SOUTHWEST PAPUA	3	3	3	3	3	4	4	4	4	4
SOUTH PAPUA	1	1	1	1	1	1	1	2	2	2
CENTRAL PAPUA	1	1	1	1	1	1	1	1	1	1
HIGHLAND PAPUA	1	1	1	1	1	1	1	1	1	1
PAPUA	5	5	6	6	6	6	7	7	7	7

## 21. Dietitians

Based on the results of calculations using the supply–demand method, Indonesia’s dietitians demand in 2023 was estimated at 19.551 personnel. With a supply of 2.193 dietitians, this resulted in a shortage of 17.358 personnel (88,8%) in 2023. The demand for dietitians is projected to increase annually, reaching 19.987 in 2025, 21.002 in 2030, and 21.371 by 2032. Each year, approximately 602 dietitians are projected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage of dietitians by 2032 (55,2%).

Table 138. Projection of Dietitians Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	19.551	2.193	17.358	88,8%
2024	19.770	3.064	16.706	84,5%
2025	19.987	3.922	16.065	80,4%
2026	20.205	4.767	15.438	76,4%
2027	20.410	5.599	14.811	72,6%
2028	20.612	6.419	14.193	68,9%
2029	20.808	7.227	13.581	65,3%
2030	21.002	8.023	12.979	61,8%
2031	21.189	8.807	12.382	58,4%
2032	21.371	9.579	11.792	55,2%

Demand for dietitians at the provincial level is also projected to increase annually, driven by population growth, disease prevalence, and the epidemiological burden in each province. Provinces with the highest demand on an annual basis include West Java, Central Java, East Java, and North Sumatera.

Table 139. Projection of Dietitians Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	527	535	542	550	557	564	571	578	584	591
NORTH SUMATERA	952	966	979	992	1.005	1.018	1.030	1.042	1.054	1.065
WEST SUMATERA	506	513	521	528	536	543	550	557	564	571



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
RIAU	369	374	379	384	389	394	398	403	408	412
JAMBI	217	220	223	226	229	231	234	236	239	241
SOUTH SUMATERA	465	471	476	481	486	491	496	501	505	510
BENGKULU	132	133	135	137	139	140	142	144	145	147
LAMPUNG	621	629	636	644	651	658	665	672	678	685
BANGKA BELITUNG ISLANDS	106	108	109	111	112	114	115	116	118	119
RIAU ISLANDS	170	173	175	178	180	183	185	187	190	192
DKI JAKARTA	724	726	726	726	727	727	727	727	726	726
WEST JAVA	3.521	3.559	3.592	3.625	3.658	3.689	3.720	3.751	3.781	3.811
CENTRAL JAVA	3.212	3.245	3.277	3.308	3.339	3.368	3.397	3.424	3.450	3.476
DI YOGYAKARTA	326	328	331	333	335	337	339	341	343	345
EAST JAVA	2.969	2.992	3.015	3.037	3.058	3.078	3.098	3.116	3.134	3.151
BANTEN	728	736	743	750	757	763	770	777	783	789
BALI	346	348	351	354	356	359	361	363	366	368
WEST NUSA TENGGARA	647	657	667	678	688	698	708	718	728	737
EAST NUSA TENGGARA	359	365	371	377	382	388	394	400	406	411
WEST KALIMANTAN	294	298	302	306	310	314	317	321	325	328
CENTRAL KALIMANTAN	99	100	101	103	104	105	107	108	109	110
SOUTH KALIMANTAN	217	220	223	225	228	231	233	236	238	241
EAST KALIMANTAN	260	269	285	299	312	325	337	348	358	367
NORTH KALIMANTAN	50	51	52	53	53	54	55	55	56	56
NORTH SULAWESI	230	232	234	236	238	240	241	243	245	246
CENTRAL SULAWESI	175	177	179	181	183	185	187	189	191	193
SOUTH SULAWESI	649	657	664	672	679	686	693	700	707	714
SOUTHEAST SULAWESI	141	143	146	148	150	153	155	157	159	162
GORONTALO	116	117	119	120	122	123	124	126	127	128
WEST SULAWESI	88	89	90	92	93	95	96	97	99	100
MALUKU	77	78	79	80	81	82	83	85	86	87
NORTH MALUKU	56	57	58	59	60	60	61	62	63	64
WEST PAPUA	31	32	32	33	33	34	34	35	35	36
SOUTHWEST PAPUA	29	29	30	30	31	31	31	32	32	33
SOUTH PAPUA	17	17	17	18	18	18	19	19	19	19
CENTRAL PAPUA	46	46	47	48	48	49	50	50	51	52
HIGHLAND PAPUA	46	46	47	48	48	49	49	50	50	51



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
PAPUA	33	34	34	35	35	35	36	36	37	37

## 22. Entomologist

Based on the results of calculations using the supply–demand method, Indonesia’s health entomologist workforce demand in 2023 was estimated at 25.555 personnel. With a supply of 311 entomologists, this resulted in a shortage of 25.244 personnel (98,8%) in 2023. The demand for entomologists is projected to increase annually, reaching 26.405 in 2025, 28.688 in 2030, and 29.667 by 2032. Each year, no new entomologists are projected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage in the health entomologist workforce by 2032 (99,1%).

Table 140. Projection of Entomologists Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	25.555	311	25.244	98,8%
2024	25.977	306	25.671	98,8%
2025	26.405	302	26.103	98,9%
2026	26.844	297	26.547	98,9%
2027	27.291	293	26.998	98,9%
2028	27.746	288	27.458	99,0%
2029	28.215	284	27.931	99,0%
2030	28.688	280	28.408	99,0%
2031	29.170	276	28.894	99,0%
2032	29.667	271	29.396	99,1%

Demand for entomologists at the provincial level is also projected to increase annually, driven by population growth, disease prevalence rates, and the epidemiological burden in each province. Provinces with the highest demand annually are West Java, East Java, Central Java, and North Sumatera.

Table 141. Projection of Entomologists Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	820	833	846	860	873	887	901	915	930	945
NORTH SUMATERA	1546	1574	1601	1630	1659	1688	1719	1749	1781	1813
WEST SUMATERA	671	682	693	704	716	728	740	752	764	777
RIAU	596	606	616	627	637	648	660	671	683	695
JAMBI	477	485	492	500	508	516	524	532	541	550
SOUTH SUMATERA	815	828	842	855	869	884	898	913	928	943
BENGKULU	388	394	399	405	411	417	424	430	436	443
LAMPUNG	729	741	754	766	779	791	805	818	832	846



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
BANGKA BELITUNG ISLANDS	182	185	188	191	194	197	201	204	208	211
RIAU ISLANDS	254	258	263	267	272	276	281	286	291	296
DKI JAKARTA	433	444	455	467	479	492	505	518	532	546
WEST JAVA	2724	2772	2822	2872	2924	2976	3030	3085	3141	3199
CENTRAL JAVA	2264	2304	2344	2386	2429	2472	2516	2562	2608	2656
DI YOGYAKARTA	371	378	385	392	400	408	416	424	432	441
EAST JAVA	2568	2614	2661	2710	2760	2810	2862	2915	2969	3024
BANTEN	702	715	728	742	756	770	785	800	815	831
BALI	376	383	390	398	405	413	421	429	438	446
WEST NUSA TENGGARA	414	420	427	434	441	448	455	463	470	478
EAST NUSA TENGGARA	911	925	939	954	968	983	998	1014	1029	1045
WEST KALIMANTAN	575	584	594	603	613	623	633	643	654	664
CENTRAL KALIMANTAN	451	458	465	472	479	486	493	500	508	515
SOUTH KALIMANTAN	542	551	560	568	577	586	596	605	615	625
EAST KALIMANTAN	465	473	481	489	497	505	514	523	531	541
NORTH KALIMANTAN	149	152	154	156	159	162	164	167	169	172
NORTH SULAWESI	482	490	498	506	515	523	532	541	550	559
CENTRAL SULAWESI	475	483	490	498	506	513	521	530	538	546
SOUTH SULAWESI	1116	1134	1153	1172	1191	1211	1231	1251	1272	1294
SOUTHEAST SULAWESI	647	656	666	676	686	696	706	717	727	738
GORONTALO	221	225	228	232	235	239	243	246	250	254
WEST SULAWESI	211	214	218	221	224	228	231	235	238	242
MALUKU	503	511	518	526	534	542	551	559	568	577
NORTH MALUKU	323	328	332	337	343	348	353	358	364	370
WEST PAPUA	191	193	196	199	202	205	208	211	214	217
SOUTHWEST PAPUA	271	275	279	283	287	292	296	300	305	309
SOUTH PAPUA	175	178	180	183	185	188	191	194	196	199
CENTRAL PAPUA	316	320	325	330	335	340	345	350	355	360
HIGHLAND PAPUA	441	447	454	460	466	473	480	487	493	500
PAPUA	760	764	769	773	777	782	786	791	795	800



### 23. Traditional Health Practitioner

Based on the results of calculations using the supply–demand method, Indonesia’s traditional health practitioner demand in 2023 was estimated at 1.108 personnel. With a supply of 247 traditional health practitioners, this resulted in a shortage of 861 personnel (77,71%) in 2023. The demand for traditional health practitioners is projected to increase annually, reaching 1.134 in 2025, 1.190 in 2030, and 1.213 by 2032. Each year, approximately 72 traditional health practitioners are projected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage in the traditional health practitioner workforce by 2032 (31,9%).

Table 142. Projection of Traditional Health Practitioners Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	1.108	247	861	77,7%
2024	1.121	315	806	71,9%
2025	1.134	383	751	66,2%
2026	1.143	449	694	60,7%
2027	1.150	514	636	55,3%
2028	1.167	578	589	50,5%
2029	1.176	642	534	45,4%
2030	1.190	704	486	40,8%
2031	1.203	766	437	36,3%
2032	1.213	826	387	31,9%

Demand for traditional health practitioners at the provincial level is also projected to increase annually, driven by population growth, disease prevalence rates, and the epidemiological burden in each province. Provinces with the highest demand on an annual basis include West Java, Central Java, East Java, and North Sumatera.

Table 143. Projection of Traditional Health Practitioners Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	38	38	39	39	39	40	40	41	41	41
NORTH SUMATERA	79	80	81	82	82	83	84	85	86	87
WEST SUMATERA	31	31	32	32	32	32	33	33	33	34
RIAU	43	43	43	44	44	45	45	46	46	47
JAMBI	15	16	16	16	16	16	16	17	17	17
SOUTH SUMATERA	34	35	35	35	36	36	37	37	37	38
BENGKULU	10	10	10	10	10	10	10	10	10	11
LAMPUNG	35	35	35	36	36	37	37	37	38	38
BANGKA BELITUNG ISLANDS	7	7	7	7	7	7	7	7	7	7
RIAU ISLANDS	15	15	15	15	15	15	15	16	16	16
DKI JAKARTA	37	38	38	39	39	39	40	40	41	41



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
WEST JAVA	231	233	236	238	240	243	245	248	250	253
CENTRAL JAVA	139	141	142	144	145	147	148	149	151	152
DI YOGYAKARTA	16	16	17	17	17	17	17	18	18	18
EAST JAVA	113	114	115	116	117	118	119	121	122	123
BANTEN	61	62	63	63	64	65	65	66	67	67
BALI	20	20	20	20	20	21	21	21	21	21
WEST NUSA TENGGARA	15	15	16	16	16	16	16	16	17	17
EAST NUSA TENGGARA	12	13	13	13	13	13	13	13	14	14
WEST KALIMANTAN	20	20	20	20	20	21	21	21	21	21
CENTRAL KALIMANTAN	8	8	8	8	8	9	9	9	9	9
SOUTH KALIMANTAN	18	18	19	19	19	19	19	20	20	20
EAST KALIMANTAN	17	18	18	18	18	18	19	19	19	19
NORTH KALIMANTAN	3	3	3	3	3	3	3	3	3	3
NORTH SULAWESI	13	13	13	13	13	14	14	14	14	14
CENTRAL SULAWESI	14	15	15	15	15	15	15	15	16	16
SOUTH SULAWESI	31	31	32	32	32	33	33	33	34	34
SOUTHEAST SULAWESI	8	8	8	8	8	8	8	8	8	8
GORONTALO	4	4	4	4	4	4	4	4	4	4
WEST SULAWESI	5	5	5	5	5	5	5	5	5	5
MALUKU	4	4	4	4	4	4	4	4	4	4
NORTH MALUKU	4	4	4	4	5	5	5	5	5	5
WEST PAPUA	1	1	1	1	1	1	1	1	1	1
SOUTHWEST PAPUA	1	1	1	1	1	2	2	2	2	2
SOUTH PAPUA	1	1	1	1	1	1	1	1	1	1
CENTRAL PAPUA	1	1	1	1	1	1	1	1	1	1
HIGHLAND PAPUA	1	1	1	1	1	1	1	1	1	1
PAPUA	3	3	3	3	3	3	3	3	3	3

## 24. Intercontinental Traditional Medicine Practitioner

Based on the results of calculations using the supply–demand method, Indonesia’s intercontinental traditional medicine practitioners workforce demand in 2023 was estimated at 1.371 personnel. With a supply of 64 intercontinental traditional medicine practitioners, this resulted in a shortage of 1.307 personnel (95,33%) in 2023. The demand for intercontinental traditional medicine practitioners is projected to increase annually, reaching 1.399 in 2025, 1.472 in 2030, and 1.502 by 2032. Each year, approximately 48 intercontinental traditional medicine practitioners are projected to graduate, with an attrition rate of 1,5%. Assuming these supply and



attrition patterns remain constant, Indonesia is projected to continue facing a shortage in the intercontinental traditional medicine practitioner workforce by 2032 (69,2%).

Table 144. Projection of Intercontinental Traditional Medicine Practitioners Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	1.371	64	1.307	95,3%
2024	1.384	111	1.273	92,0%
2025	1.399	157	1.242	88,8%
2026	1.414	203	1.211	85,6%
2027	1.430	248	1.182	82,7%
2028	1.444	292	1.152	79,8%
2029	1.459	336	1.123	77,0%
2030	1.472	379	1.093	74,2%
2031	1.488	421	1.067	71,7%
2032	1.502	463	1.039	69,2%

Provincial demand for intercontinental traditional medicine practitioners is also projected to increase annually, driven by population growth, disease prevalence, and epidemiological burden in each province. The provinces with the highest annual demand for intercontinental traditional medicine practitioners are West Java, Central Java, East Java, and North Sumatra.

Table 145. Projection of Intercontinental Traditional Medicine Practitioners Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	47	48	48	49	49	49	50	50	51	51
NORTH SUMATERA	98	99	100	101	102	103	104	106	107	108
WEST SUMATERA	38	39	39	40	40	40	41	41	42	42
RIAU	53	53	54	55	55	56	56	57	57	58
JAMBI	19	19	20	20	20	20	20	20	21	21
SOUTH SUMATERA	43	43	44	44	44	45	45	46	46	47
BENGKULU	12	12	12	12	12	13	13	13	13	13
LAMPUNG	43	43	44	44	45	45	46	46	47	47
BANGKA BELITUNG ISLANDS	8	8	8	8	9	9	9	9	9	9
RIAU ISLANDS	18	18	18	19	19	19	19	19	20	20
DKI JAKARTA	46	47	47	48	48	49	49	50	50	51
WEST JAVA	287	289	292	295	298	301	304	307	310	313
CENTRAL JAVA	173	174	176	178	180	182	183	185	187	189
DI YOGYAKARTA	20	20	21	21	21	21	22	22	22	22
EAST JAVA	139	140	142	143	145	146	148	149	151	152
BANTEN	76	77	78	79	79	80	81	82	83	83



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
BALI	24	25	25	25	25	26	26	26	26	27
WEST NUSA TENGARA	19	19	19	19	20	20	20	20	20	21
EAST NUSA TENGARA	15	16	16	16	16	16	16	17	17	17
WEST KALIMANTAN	24	24	25	25	25	25	26	26	26	26
CENTRAL KALIMANTAN	10	10	10	10	10	11	11	11	11	11
SOUTH KALIMANTAN	23	23	23	23	24	24	24	24	25	25
EAST KALIMANTAN	22	22	22	22	23	23	23	23	23	24
NORTH KALIMANTAN	3	3	3	3	4	4	4	4	4	4
NORTH SULAWESI	16	16	16	16	17	17	17	17	17	17
CENTRAL SULAWESI	18	18	18	18	19	19	19	19	19	20
SOUTH SULAWESI	38	39	39	40	40	40	41	41	42	42
SOUTHEAST SULAWESI	10	10	10	10	10	10	10	10	10	10
GORONTALO	4	5	5	5	5	5	5	5	5	5
WEST SULAWESI	6	6	6	6	6	6	6	6	6	6
MALUKU	5	5	5	5	5	5	5	5	5	5
NORTH MALUKU	5	5	5	6	6	6	6	6	6	6
WEST PAPUA	1	1	1	1	1	1	1	1	1	1
SOUTHWEST PAPUA	2	2	2	2	2	2	2	2	2	2
SOUTH PAPUA	1	1	1	1	1	1	1	1	1	1
CENTRAL PAPUA	1	1	1	1	1	1	1	1	1	1
HIGHLAND PAPUA	1	1	1	1	1	1	1	1	1	1
PAPUA	3	3	3	3	3	3	4	4	4	4

## 25. Traditional Herbal Medicine Practitioner

Based on the results of calculations using the supply–demand method, Indonesia’s traditional herbal medicine practitioners workforce demand in 2023 was estimated at 1.154 personnel. With a supply of 128 traditional herbal medicine practitioners, this resulted in a shortage of 1.026 personnel (88,91%) in 2023. The demand for traditional herbal medicine practitioners is projected to increase annually, reaching 1.177 in 2025, 1.242 in 2030, and 1.267 by 2032. Each year, approximately 72 traditional herbal medicine practitioners are projected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage in the traditional herbal medicine practitioner workforce by 2032 (43,0%).



Table 146. Projection of Traditional Herbal Medicine Practitioners Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	1.154	128	1.026	88,9%
2024	1.164	198	966	83,0%
2025	1.177	267	910	77,3%
2026	1.194	335	859	71,9%
2027	1.210	402	808	66,8%
2028	1.218	468	750	61,6%
2029	1.229	533	696	56,6%
2030	1.242	597	645	51,9%
2031	1.253	660	593	47,3%
2032	1.267	722	545	43,0%

Provincial demand for traditional herbal medicine practitioners is also projected to increase annually, driven by population growth, disease prevalence, and epidemiological burden in each province. The provinces with the highest traditional herbal medicine practitioner workforce demand each year are West Java, Central Java, East Java, and North Sumatra.

Table 147. Projection of Traditional Herbal Medicine Practitioners Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	31	31	31	32	32	32	32	33	33	33
NORTH SUMATERA	70	70	71	72	72	73	74	75	75	76
WEST SUMATERA	28	28	28	29	29	29	30	30	30	31
RIAU	34	34	34	35	35	35	36	36	36	37
JAMBI	15	15	15	16	16	16	16	16	16	17
SOUTH SUMATERA	35	35	36	36	36	37	37	37	38	38
BENGKULU	9	9	9	9	10	10	10	10	10	10
LAMPUNG	37	37	38	38	39	39	39	40	40	40
BANGKA BELITUNG ISLANDS	6	7	7	7	7	7	7	7	7	7
RIAU ISLANDS	11	11	12	12	12	12	12	12	12	12
DKI JAKARTA	42	43	43	44	44	44	45	45	46	46
WEST JAVA	222	224	226	228	231	233	235	238	240	242
CENTRAL JAVA	157	158	160	161	163	165	166	168	170	171
DI YOGYAKARTA	18	18	18	18	19	19	19	19	19	20
EAST JAVA	152	154	155	157	159	160	162	163	165	167
BANTEN	57	58	59	59	60	60	61	62	62	63



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
BALI	19	19	20	20	20	20	20	21	21	21
WEST NUSA TENGARA	20	20	20	20	21	21	21	21	21	22
EAST NUSA TENGARA	18	18	18	18	18	18	19	19	19	19
WEST KALIMANTAN	21	21	21	22	22	22	22	22	23	23
CENTRAL KALIMANTAN	10	10	10	10	10	10	10	10	11	11
SOUTH KALIMANTAN	18	18	19	19	19	19	19	20	20	20
EAST KALIMANTAN	17	17	17	18	18	18	18	18	18	19
NORTH KALIMANTAN	3	3	3	3	3	3	3	3	3	3
NORTH SULAWESI	12	12	12	12	13	13	13	13	13	13
CENTRAL SULAWESI	13	14	14	14	14	14	14	14	15	15
SOUTH SULAWESI	36	37	37	37	38	38	38	39	39	40
SOUTHEAST SULAWESI	10	10	10	10	10	10	10	10	10	10
GORONTALO	4	4	4	5	5	5	5	5	5	5
WEST SULAWESI	5	5	5	6	6	6	6	6	6	6
MALUKU	6	6	6	6	6	6	6	6	6	6
NORTH MALUKU	5	5	5	6	6	6	6	6	6	6
WEST PAPUA	1	1	1	1	1	2	2	2	2	2
SOUTHWEST PAPUA	2	2	2	2	2	2	2	2	2	2
SOUTH PAPUA	1	1	1	1	2	2	2	2	2	2
CENTRAL PAPUA	3	3	3	4	4	4	4	4	4	4
HIGHLAND PAPUA	3	3	3	3	4	4	4	4	4	4
PAPUA	3	3	4	4	4	4	4	4	4	4

## 26. Dental and Oral Therapists

Based on the results of calculations using the supply–demand method, Indonesia's dental and oral therapist workforce demand in 2023 was estimated at 56.665 personnel. With a supply of 19.124 dental and oral therapists, this resulted in a shortage of 37.541 personnel (66,2%) in 2023. The demand for dental and oral therapists is projected to increase annually, reaching 65.935 in 2025, 96.604 in 2030, and 112.653 by 2032. Each year, approximately 1.679 dental and oral therapists are projected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage in the dental and oral therapist workforce by 2032 (72,5%).

Table 148. Projection of Dental and Oral Therapists Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	56.665	19.124	37.541	66,2%
2024	61.119	20.516	40.603	66,4%
2025	65.935	21.887	44.048	66,8%
2026	71.147	23.238	47.909	67,3%
2027	76.782	24.568	52.214	68,0%
2028	82.876	25.878	56.998	68,8%
2029	89.475	27.169	62.306	69,6%
2030	96.604	28.440	68.164	70,6%
2031	104.303	29.692	74.611	71,5%
2032	112.653	30.926	81.727	72,5%

Provincial demand for dental and oral therapists is also projected to increase annually, driven by population growth, disease prevalence, and epidemiological burden in each province. The provinces with the highest dental and oral therapist workforce demand each year are West Java, Central Java, East Java, and North Sumatra.

Table 149. Projection of Dental and Oral Therapists Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	1.094	1.180	1.273	1.374	1.483	1.600	1.726	1.862	2.009	2.170
NORTH SUMATERA	4.369	4.732	5.125	5.550	6.011	6.510	7.050	7.635	8.269	8.964
WEST SUMATERA	801	867	939	1.017	1.101	1.192	1.291	1.398	1.514	1.640
RIAU	2.416	2.617	2.834	3.069	3.324	3.603	3.906	4.234	4.590	4.980
JAMBI	809	876	949	1.028	1.113	1.205	1.306	1.416	1.535	1.664
SOUTH SUMATERA	2.117	2.284	2.464	2.659	2.872	3.102	3.350	3.618	3.907	4.220
BENGKULU	453	490	530	573	619	670	725	784	848	918
LAMPUNG	2.415	2.608	2.817	3.042	3.288	3.554	3.842	4.153	4.489	4.857
BANGKA BELITUNG ISLANDS	349	378	409	443	479	518	560	606	656	710
RIAU ISLANDS	167	180	194	210	227	245	265	286	309	334
DKI JAKARTA	3.561	3.817	4.088	4.382	4.702	5.045	5.418	5.824	6.261	6.737
WEST JAVA	10.431	11.234	12.088	13.019	14.021	15.101	16.279	17.549	18.918	20.413
CENTRAL JAVA	5.539	5.971	6.437	6.939	7.480	8.071	8.709	9.397	10.139	10.940
DI YOGYAKARTA	1.123	1.209	1.302	1.402	1.510	1.628	1.755	1.892	2.040	2.199
EAST JAVA	4.944	5.310	5.703	6.125	6.584	7.078	7.609	8.180	8.794	9.454
BANTEN	3.854	4.147	4.458	4.797	5.162	5.559	5.987	6.454	6.957	7.507
BALI	944	1.016	1.093	1.176	1.265	1.361	1.466	1.579	1.701	1.832
WEST TENGGERA NUSA	1.336	1.448	1.571	1.705	1.850	2.009	2.182	2.370	2.574	2.795
EAST TENGGERA NUSA	519	561	606	655	708	766	829	897	971	1.051
WEST KALIMANTAN	341	369	399	431	466	504	545	590	638	690



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
CENTRAL KALIMANTAN	311	336	363	392	423	457	494	534	577	624
SOUTH KALIMANTAN	1.082	1.167	1.260	1.361	1.471	1.590	1.719	1.858	2.008	2.171
EAST KALIMANTAN	1.251	1.381	1.554	1.739	1.937	2.148	2.374	2.614	2.878	3.149
NORTH KALIMANTAN	156	169	183	198	215	233	253	275	298	324
NORTH SULAWESI	846	909	977	1.050	1.129	1.215	1.307	1.406	1.513	1.628
CENTRAL SULAWESI	934	1.006	1.083	1.167	1.258	1.356	1.462	1.576	1.699	1.832
SOUTH SULAWESI	1.552	1.670	1.797	1.932	2.077	2.233	2.400	2.580	2.774	2.982
SOUTHEAST SULAWESI	659	713	771	834	902	975	1.054	1.139	1.231	1.332
GORONTALO	280	302	326	352	380	410	442	477	515	556
WEST SULAWESI	169	183	198	214	231	249	269	290	313	338
MALUKU	336	363	392	423	457	493	532	574	619	669
NORTH MALUKU	255	276	299	324	351	380	412	447	485	527
WEST PAPUA	186	201	216	232	250	269	289	311	334	358
SOUTHWEST PAPUA	223	242	262	284	307	332	359	388	420	456
SOUTH PAPUA	143	154	166	179	194	210	228	248	269	288
CENTRAL PAPUA	220	238	258	279	302	327	355	385	418	453
HIGHLAND PAPUA	303	324	346	369	393	419	446	475	505	538
PAPUA	177	191	205	222	240	259	280	303	328	353

## 27. Speech Therapists

Based on the results of calculations using the supply–demand method, Indonesia’s speech therapist workforce demand in 2023 was estimated at 4.652 personnel. With a supply of 1.949 speech therapists, this resulted in a shortage of 2.703 personnel (58,1%) in 2023. The demand for speech therapists is projected to increase annually, reaching 5.008 in 2025, 6.047 in 2030, and 6.527 by 2032. Each year, approximately 341 speech therapists are projected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage in the speech therapist workforce by 2032 (29,7%).

Table 150. Projection of Speech Therapists Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	4.652	1.949	2.703	58,1%
2024	4.826	2.261	2.565	53,1%
2025	5.008	2.568	2.440	48,7%
2026	5.200	2.870	2.330	44,8%
2027	5.398	3.168	2.230	41,3%
2028	5.605	3.461	2.144	38,2%
2029	5.823	3.750	2.073	35,6%



Year	Demand	Supply	Gap	Gap Percentage
2030	6.047	4.035	2.012	33,3%
2031	6.281	4.315	1.966	31,3%
2032	6.527	4.591	1.936	29,7%

Provincial demand for speech therapists is also projected to increase annually, driven by population growth, disease prevalence, and epidemiological burden in each province. The provinces with the highest annual demand for speech therapists are West Java, DKI Jakarta, Central Java, and Banten.

Table 151. Projection of Speech Therapists Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	30	31	32	33	34	35	36	37	38	40
NORTH SUMATERA	143	149	155	162	169	176	183	191	199	208
WEST SUMATERA	176	184	192	201	210	219	229	239	250	262
RIAU	66	69	72	75	78	81	84	87	91	95
JAMBI	35	36	37	38	39	40	42	44	46	48
SOUTH SUMATERA	182	189	196	203	211	219	227	236	245	255
BENGKULU	92	96	100	104	108	112	117	122	127	132
LAMPUNG	162	168	174	181	188	195	203	211	219	228
BANGKA BELITUNG ISLANDS	24	25	26	27	28	29	30	31	32	33
RIAU ISLANDS	44	46	48	50	52	54	56	58	60	62
DKI JAKARTA	571	587	603	620	637	655	675	695	716	739
WEST JAVA	695	719	743	769	796	824	853	884	916	950
CENTRAL JAVA	519	538	558	579	601	624	648	673	699	726
DI YOGYAKARTA	200	207	215	223	231	240	249	258	268	278
EAST JAVA	411	426	441	457	473	491	509	528	548	568
BANTEN	327	338	349	361	374	387	401	415	430	446
BALI	84	87	90	93	96	99	103	107	111	115
WEST NUSA TENGGARA	73	76	79	82	86	90	94	98	102	106
EAST NUSA TENGGARA	27	28	29	30	31	32	33	34	35	37
WEST KALIMANTAN	19	20	21	22	23	24	25	26	27	28
CENTRAL KALIMANTAN	32	33	34	35	37	39	41	43	45	47
SOUTH KALIMANTAN	124	129	134	139	144	150	156	162	168	175
EAST KALIMANTAN	198	210	227	245	263	282	301	320	340	359
NORTH KALIMANTAN	15	16	17	18	19	20	21	22	23	24
NORTH SULAWESI	23	24	25	26	27	28	29	30	31	32
CENTRAL SULAWESI	33	34	35	36	37	38	40	42	44	46



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
SOUTH SULAWESI	106	110	114	118	122	127	132	137	142	147
SOUTHEAST SULAWESI	17	18	19	20	21	22	23	24	25	26
GORONTALO	24	25	26	27	28	29	30	31	32	33
WEST SULAWESI	10	10	10	10	10	10	10	10	10	10
MALUKU	20	21	22	23	24	25	26	27	28	29
NORTH MALUKU	28	29	30	31	32	33	34	35	36	37
WEST PAPUA	40	42	44	46	48	50	52	54	57	60
SOUTHWEST PAPUA	29	30	31	32	33	34	35	36	37	38
SOUTH PAPUA	13	13	14	15	16	17	18	19	20	21
CENTRAL PAPUA	24	25	26	27	28	29	30	31	32	33
HIGHLAND PAPUA	15	16	17	18	19	20	21	22	23	24
PAPUA	21	22	23	24	25	26	27	28	29	30

## 28. Pharmacy Technician

Based on the results of calculations using the supply–demand method, Indonesia’s pharmacy technicians demand in 2023 was estimated at 264.514 personnel. With a supply of 87.785 pharmacy technicians, this resulted in a shortage of 176.729 personnel (66,8%) in 2023. The demand for pharmacy technicians is projected to increase annually, reaching 270.917 in 2025, 285.809 in 2030, and 291.283 by 2032. Each year, approximately 7.744 pharmacy technicians are projected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage in the pharmacy technician workforce by 2032 (41,7%).

Table 152. Projection of Pharmacy Technicians Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	264.514	87.785	176.729	66,8%
2024	267.752	97.450	170.302	63,6%
2025	270.917	106.971	163.946	60,5%
2026	274.033	116.348	157.685	57,5%
2027	277.081	125.585	151.496	54,7%
2028	280.056	134.683	145.373	51,9%
2029	282.973	143.645	139.328	49,2%
2030	285.809	152.473	133.336	46,7%
2031	288.589	161.167	127.422	44,1%
2032	291.283	169.732	121.551	41,7%

Provincial demand for pharmacy technicians is also projected to increase annually, driven by population growth, disease prevalence, and epidemiological burden in each province. The provinces with the highest pharmaceutical vocational personnel workforce demand each year are West Java, Central Java, East Java, and North Sumatra.



Table 153. Projection of Pharmacy Technicians Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	3.349	3.399	3.449	3.498	3.547	3.594	3.642	3.688	3.734	3.779
NORTH SUMATERA	6.779	6.882	6.983	7.083	7.182	7.278	7.373	7.466	7.557	7.646
WEST SUMATERA	3.463	3.517	3.570	3.623	3.675	3.727	3.778	3.829	3.880	3.929
RIAU	2.743	2.784	2.824	2.863	2.902	2.941	2.978	3.015	3.052	3.087
JAMBI	1.537	1.559	1.581	1.602	1.623	1.643	1.663	1.683	1.702	1.721
SOUTH SUMATERA	4.022	4.073	4.122	4.171	4.218	4.264	4.310	4.354	4.397	4.440
BENGKULU	996	1.010	1.024	1.038	1.052	1.065	1.079	1.092	1.104	1.117
LAMPUNG	4.639	4.700	4.760	4.820	4.878	4.935	4.990	5.045	5.099	5.151
BANGKA BELITUNG ISLANDS	814	825	837	849	861	872	883	894	905	915
RIAU ISLANDS	1.160	1.178	1.196	1.214	1.232	1.249	1.266	1.283	1.300	1.316
DKI JAKARTA	4.647	4.664	4.672	4.679	4.685	4.691	4.695	4.699	4.702	4.706
WEST JAVA	25.498	25.796	26.059	26.318	26.574	26.825	27.073	27.318	27.560	27.798
CENTRAL JAVA	21.868	22.109	22.344	22.575	22.799	23.016	23.228	23.432	23.630	23.821
DI YOGYAKARTA	2.034	2.051	2.066	2.082	2.097	2.111	2.125	2.139	2.152	2.165
EAST JAVA	21.766	21.955	22.140	22.318	22.490	22.656	22.817	22.970	23.118	23.258
BANTEN	5.976	6.047	6.110	6.171	6.232	6.293	6.352	6.410	6.468	6.525
BALI	2.290	2.310	2.329	2.349	2.367	2.385	2.403	2.420	2.436	2.452
WEST NUSA TENGGARA	4.666	4.744	4.822	4.899	4.975	5.050	5.125	5.199	5.272	5.345
EAST NUSA TENGGARA	2.929	2.980	3.030	3.080	3.131	3.181	3.230	3.280	3.329	3.378
WEST KALIMANTAN	2.446	2.483	2.518	2.553	2.587	2.621	2.654	2.686	2.717	2.748
CENTRAL KALIMANTAN	949	963	978	992	1.005	1.019	1.032	1.045	1.058	1.070
SOUTH KALIMANTAN	1.875	1.901	1.926	1.952	1.976	2.001	2.025	2.048	2.071	2.094
EAST KALIMANTAN	1.695	1.757	1.857	1.953	2.044	2.130	2.211	2.286	2.353	2.414
NORTH KALIMANTAN	291	295	300	304	309	313	317	321	325	329
NORTH SULAWESI	1.300	1.312	1.324	1.336	1.348	1.359	1.370	1.380	1.391	1.401
CENTRAL SULAWESI	1.036	1.050	1.064	1.078	1.091	1.105	1.118	1.131	1.144	1.157
SOUTH SULAWESI	3.767	3.816	3.864	3.912	3.960	4.007	4.053	4.098	4.143	4.186
SOUTHEAST SULAWESI	923	940	957	974	991	1.007	1.024	1.040	1.057	1.073
GORONTALO	780	791	801	811	821	831	841	851	860	869
WEST SULAWESI	617	628	638	649	659	670	680	691	701	711
MALUKU	593	602	611	621	630	639	648	657	666	674
NORTH MALUKU	361	368	374	380	386	392	398	403	409	415
WEST PAPUA	195	199	203	206	210	214	218	221	225	228
SOUTHWEST PAPUA	181	184	187	190	193	196	199	202	205	207



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
SOUTH PAPUA	123	125	128	130	132	134	137	139	142	144
CENTRAL PAPUA	335	341	346	352	358	363	368	373	378	383
HIGHLAND PAPUA	334	339	345	350	355	360	365	369	374	378
PAPUA	241	245	249	253	257	261	265	269	273	277

## 29. Medical Records Personnel

Based on calculations using the supply–demand method, Indonesia's medical record personnel workforce demand in 2023 was estimated at 94.259 personnel. With a supply of 25.509 medical record personnel, this resulted in a shortage of 68.750 personnel (72,9%) in 2023. The demand for medical record personnel is projected to increase annually, reaching 117.589 in 2025, 175.914 in 2030, and 199.244 by 2032. Each year, approximately 4.640 medical record personnel are projected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage in the medical record personnel workforce by 2032 (69,1%).

Table 154. Projection of Medical Records Personnel Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	94.259	25.509	68.750	72,9%
2024	105.924	29.766	76.158	71,9%
2025	117.589	33.960	83.629	71,1%
2026	129.254	38.090	91.164	70,5%
2027	140.919	42.159	98.760	70,1%
2028	152.584	46.167	106.417	69,7%
2029	164.249	50.114	114.135	69,5%
2030	175.914	54.003	121.911	69,3%
2031	187.579	57.832	129.747	69,2%
2032	199.244	61.605	137.639	69,1%

Provincial demand for medical record personnel is also projected to increase annually, driven by population growth, disease prevalence, and epidemiological burden in each province. The provinces with the highest medical record personnel workforce demand each year are Bangka Belitung Islands, DKI Jakarta, Riau Islands, and Papua.

Table 155. Projection of Medical Records Personnel Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	2.608	3.062	3.516	3.970	4.424	4.878	5.332	5.786	6.240	6.694
NORTH SUMATERA	1.934	2.164	2.394	2.624	2.854	3.084	3.314	3.544	3.774	4.004
WEST SUMATERA	3.600	3.812	4.024	4.236	4.448	4.660	4.872	5.084	5.296	5.508
RIAU	1.040	1.250	1.460	1.670	1.880	2.090	2.300	2.510	2.720	2.930
JAMBI	1.892	2.037	2.182	2.327	2.472	2.617	2.762	2.907	3.052	3.197



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
SOUTH SUMATERA	5.223	5.378	5.533	5.688	5.843	5.998	6.153	6.308	6.463	6.618
BENGKULU	646	800	954	1.108	1.262	1.416	1.570	1.724	1.878	2.032
LAMPUNG	1.385	1.653	1.921	2.189	2.457	2.725	2.993	3.261	3.529	3.797
BANGKA BELITUNG ISLANDS	11.858	12.593	13.328	14.063	14.798	15.533	16.268	17.003	17.738	18.473
RIAU ISLANDS	9.223	10.226	11.229	12.232	13.235	14.238	15.241	16.244	17.247	18.250
DKI JAKARTA	10.908	11.981	13.054	14.127	15.200	16.273	17.346	18.419	19.492	20.565
WEST JAVA	1.951	2.297	2.643	2.989	3.335	3.681	4.027	4.373	4.719	5.065
CENTRAL JAVA	1.934	2.259	2.584	2.909	3.234	3.559	3.884	4.209	4.534	4.859
DI YOGYAKARTA	1.364	1.596	1.828	2.060	2.292	2.524	2.756	2.988	3.220	3.452
EAST JAVA	1.910	2.153	2.396	2.639	2.882	3.125	3.368	3.611	3.854	4.097
BANTEN	418	524	630	736	842	948	1.054	1.160	1.266	1.372
BALI	673	864	1.055	1.246	1.437	1.628	1.819	2.010	2.201	2.392
WEST NUSA TENGGARA	921	1.055	1.189	1.323	1.457	1.591	1.725	1.859	1.993	2.127
EAST NUSA TENGGARA	2.474	2.804	3.134	3.464	3.794	4.124	4.454	4.784	5.114	5.444
WEST KALIMANTAN	1.238	1.432	1.626	1.820	2.014	2.208	2.402	2.596	2.790	2.984
CENTRAL KALIMANTAN	839	1.035	1.231	1.427	1.623	1.819	2.015	2.211	2.407	2.603
SOUTH KALIMANTAN	1.442	1.682	1.922	2.162	2.402	2.642	2.882	3.122	3.362	3.602
EAST KALIMANTAN	2.321	2.766	3.211	3.656	4.101	4.546	4.991	5.436	5.881	6.326
NORTH KALIMANTAN	748	866	984	1.102	1.220	1.338	1.456	1.574	1.692	1.810
NORTH SULAWESI	548	663	778	893	1.008	1.123	1.238	1.353	1.468	1.583
CENTRAL SULAWESI	421	498	575	652	729	806	883	960	1.037	1.114
SOUTH SULAWESI	839	916	993	1.070	1.147	1.224	1.301	1.378	1.455	1.532
SOUTHEAST SULAWESI	446	507	568	629	690	751	812	873	934	995
GORONTALO	695	799	903	1.007	1.111	1.215	1.319	1.423	1.527	1.631
WEST SULAWESI	2.134	2.444	2.754	3.064	3.374	3.684	3.994	4.304	4.614	4.924
MALUKU	587	704	821	938	1.055	1.172	1.289	1.406	1.523	1.640
NORTH MALUKU	4.250	4.818	5.386	5.954	6.522	7.090	7.658	8.226	8.794	9.362
WEST PAPUA	1.524	1.833	2.142	2.451	2.760	3.069	3.378	3.687	3.996	4.305
SOUTHWEST PAPUA	1.727	2.025	2.323	2.621	2.919	3.217	3.515	3.813	4.111	4.409
SOUTH PAPUA	1.632	1.960	2.288	2.616	2.944	3.272	3.600	3.928	4.256	4.584
CENTRAL PAPUA	2.251	2.699	3.147	3.595	4.043	4.491	4.939	5.387	5.835	6.283
HIGHLAND PAPUA	2.687	3.091	3.495	3.899	4.303	4.707	5.111	5.515	5.919	6.323
PAPUA	5.968	6.678	7.388	8.098	8.808	9.518	10.228	10.938	11.648	12.358

### 30. Dental Technician

Based on the results of calculations using the supply–demand method, Indonesia’s dental technician workforce demand in 2023 was estimated at 1.906 personnel. With a supply of 845 dental technicians, this resulted in a shortage of 1.061 personnel (55,7%) in 2023. The demand for dental technicians is projected to increase annually, reaching 1.919 in 2025, 2.020 in 2030, and 2.058 by 2032. Each year, approximately 170 dental technicians are projected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage in the dental technician workforce by 2032 (34,5%).

Table 156. Projection of Dental Technicians Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	1.906	845	1.061	55,7%
2024	1.904	904	1.000	52,5%
2025	1.919	963	956	49,8%
2026	1.939	1.020	919	47,4%
2027	1.957	1.077	880	45,0%
2028	1.978	1.133	845	42,7%
2029	1.996	1.188	808	40,5%
2030	2.020	1.242	778	38,5%
2031	2.040	1.295	745	36,5%
2032	2.058	1.348	710	34,5%

Provincial demand for dental technicians is also projected to increase annually, driven by population growth, disease prevalence, and epidemiological burden in each province. The provinces with the highest annual demand for dental technicians are West Java, East Java, Central Java, and Banten.

Table 157. Projection of Dental Technicians Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	49	49	50	50	51	51	52	52	53	53
NORTH SUMATERA	88	89	90	91	92	93	94	95	96	97
WEST SUMATERA	64	65	65	66	66	67	68	68	69	70
RIAU	74	75	75	76	77	78	78	79	80	81
JAMBI	21	21	21	22	22	22	22	23	23	23
SOUTH SUMATERA	43	44	44	45	45	46	46	47	47	48
BENGKULU	15	16	16	16	16	16	16	17	17	17
LAMPUNG	55	56	56	57	57	58	59	59	60	60
BANGKA BELITUNG ISLANDS	13	13	13	13	14	14	14	14	14	14
RIAU ISLANDS	25	25	25	26	26	26	26	27	27	27
DKI JAKARTA	86	87	88	89	90	91	91	92	93	94
WEST JAVA	350	353	357	360	364	367	371	375	379	382



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
CENTRAL JAVA	237	240	242	244	247	249	252	254	257	259
DI YOGYAKARTA	40	40	41	41	41	42	42	43	43	43
EAST JAVA	247	250	252	255	257	260	262	265	268	270
BANTEN	115	116	117	119	120	121	122	123	125	126
BALI	37	37	38	38	38	39	39	40	40	40
WEST NUSA TENGGARA	29	30	30	30	31	31	31	31	32	32
EAST NUSA TENGGARA	10	11	11	11	11	11	11	11	11	11
WEST KALIMANTAN	33	33	33	34	34	34	35	35	35	36
CENTRAL KALIMANTAN	17	17	17	17	17	18	18	18	18	18
SOUTH KALIMANTAN	27	27	28	28	28	28	29	29	29	30
EAST KALIMANTAN	39	40	40	40	41	41	42	42	42	43
NORTH KALIMANTAN	5	6	6	6	6	6	6	6	6	6
NORTH SULAWESI	15	15	15	15	15	15	15	16	16	16
CENTRAL SULAWESI	19	19	19	19	19	20	20	20	20	20
SOUTH SULAWESI	71	72	72	73	74	74	75	76	77	78
SOUTHEAST SULAWESI	15	16	16	16	16	16	16	17	17	17
GORONTALO	4	4	4	4	4	4	4	4	4	4
WEST SULAWESI	8	8	8	8	8	8	8	8	8	9
MALUKU	14	7	7	7	7	7	7	7	7	7
NORTH MALUKU	12	6	6	6	6	7	7	7	7	7
WEST PAPUA	3	1	1	1	1	1	1	2	2	2
SOUTHWEST PAPUA	3	2	2	2	2	2	2	2	2	2
SOUTH PAPUA	3	2	2	2	2	2	2	2	2	2
CENTRAL PAPUA	8	4	4	4	4	4	4	4	4	4
HIGHLAND PAPUA	7	3	3	3	3	3	3	4	4	4
PAPUA	5	5	5	5	5	6	6	6	6	6

### 31. Audiologist

Based on the results of calculations using the supply–demand method, Indonesia’s audiologist workforce demand in 2023 was estimated at 1.172 personnel. With a supply of 108 audiologists, this resulted in a shortage of 1.064 personnel (90,8%) in 2023. The demand for audiologists is projected to increase annually, reaching 1.254 in 2025, 1.498 in 2030, and 1.607 by 2032. Each year, approximately 16 audiologists are projected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage in the audiologist workforce by 2032 (85,7%).



Table 158. Projection of Audiologists Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	1.172	108	1.064	90,8%
2024	1.212	122	1.090	89,9%
2025	1.254	136	1.118	89,1%
2026	1.298	150	1.148	88,4%
2027	1.346	164	1.182	87,8%
2028	1.395	178	1.217	87,2%
2029	1.446	191	1.255	86,8%
2030	1.498	204	1.294	86,4%
2031	1.550	217	1.333	86,0%
2032	1.607	230	1.377	85,7%

Provincial demand for audiologists is also projected to increase annually, driven by population growth, disease prevalence, and epidemiological burden in each province. The provinces with the highest audiologist workforce demand each year are West Java, Central Java, Banten, and East Java.

Table 159. Projection of Audiologists Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	20	21	22	23	24	25	26	27	28	29
NORTH SUMATERA	55	57	59	61	64	67	70	73	76	79
WEST SUMATERA	38	40	42	44	46	48	50	52	54	56
RIAU	16	17	18	19	20	21	22	23	24	25
JAMBI	6	6	6	6	6	6	6	6	6	6
SOUTH SUMATERA	39	40	41	43	45	47	49	51	53	55
BENGKULU	10	10	10	10	10	10	10	10	10	10
LAMPUNG	35	36	37	38	39	41	43	45	47	49
BANGKA BELITUNG ISLANDS	6	6	6	6	6	6	6	6	6	6
RIAU ISLANDS	7	7	7	7	7	7	7	7	7	7
DKI JAKARTA	63	65	67	69	71	73	75	77	79	82
WEST JAVA	200	207	214	221	229	237	245	254	263	273
CENTRAL JAVA	147	152	158	164	170	176	183	190	197	205
DI YOGYAKARTA	22	23	24	25	26	27	28	29	30	31
EAST JAVA	92	95	98	102	106	110	114	118	122	127
BANTEN	93	96	99	102	106	110	114	118	122	127
BALI	40	41	42	43	45	47	49	51	53	55
WEST NUSA TENGGARA	15	16	17	18	19	20	21	22	23	24
EAST NUSA TENGGARA	6	6	6	6	6	6	6	6	6	6
WEST KALIMANTAN	13	14	15	16	17	18	19	20	21	22



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
CENTRAL KALIMANTAN	7	7	7	7	7	7	7	7	7	7
SOUTH KALIMANTAN	19	20	21	22	23	24	25	26	27	28
EAST KALIMANTAN	22	23	25	27	29	31	33	35	37	39
NORTH KALIMANTAN	2	2	2	2	2	2	2	2	2	2
NORTH SULAWESI	18	19	20	21	22	23	24	25	26	27
CENTRAL SULAWESI	20	21	22	23	24	25	26	27	28	29
SOUTH SULAWESI	80	83	86	89	92	95	99	103	107	111
SOUTHEAST SULAWESI	10	10	10	10	10	10	10	10	10	10
GORONTALO	8	8	8	8	8	8	8	8	8	8
WEST SULAWESI	10	10	10	10	10	10	10	10	10	10
MALUKU	5	5	5	5	5	5	5	5	5	5
NORTH MALUKU	5	5	5	5	5	5	5	5	5	5
WEST PAPUA	7	7	7	7	7	7	7	7	7	7
SOUTHWEST PAPUA	5	5	5	5	5	5	5	5	5	5
SOUTH PAPUA	2	2	2	2	2	2	2	2	2	2
CENTRAL PAPUA	4	4	4	4	4	4	4	4	4	4
HIGHLAND PAPUA	2	2	2	2	2	2	2	2	2	2
PAPUA	23	24	25	26	27	28	29	30	31	32

### 32. Occupational Health and Safety Worker

Based on the results of calculations using the supply–demand method, Indonesia’s occupational health and safety workforce demand in 2023 was estimated at 11.539 personnel. With a supply of 945 occupational health and safety personnel, this resulted in a shortage of 10.594 personnel (91,8%) in 2023. The demand for occupational health and safety personnel is projected to increase annually, reaching 15.015 in 2025, 24.990 in 2030, and 28.981 by 2032. Each year, approximately 2.000 occupational health and safety personnel are projected to graduate, with an attrition rate of 1,5%. Assuming these supply and attrition patterns remain constant, Indonesia is projected to continue facing a shortage in the occupational health and safety workforce by 2032 (38,6%).

Table 160. Projection of Occupational Health and Safety Workers Demand in Indonesia, 2023–2032

Year	Demand	Supply	Gap	Gap Percentage
2023	11.539	945	10.594	91,8%
2024	13.020	2.931	10.089	77,5%
2025	15.015	4.887	10.128	67,4%
2026	17.010	6.814	10.196	59,9%
2027	19.005	8.711	10.294	54,2%



Year	Demand	Supply	Gap	Gap Percentage
2028	21.000	10.581	10.419	49,6%
2029	22.995	12.422	10.573	46,0%
2030	24.990	14.236	10.754	43,0%
2031	26.985	16.022	10.963	40,6%
2032	28.981	17.782	11.199	38,6%

Provincial demand for occupational health and safety personnel increases annually, driven by population growth, industrial development, and each province's occupational risk burden. The provinces with the highest annual demand for occupational health and safety workers are West Java, East Java, Central Java, and North Sumatra.

Table 161. Projection of Occupational Health and Safety Workers Demand in Indonesia by Province

Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
ACEH	403	459	538	617	696	775	854	933	1.012	1.091
NORTH SUMATERA	669	740	844	948	1.052	1.156	1.260	1.364	1.468	1.572
WEST SUMATERA	319	369	438	507	576	645	714	783	852	921
RIAU	271	309	359	409	459	509	559	609	659	709
JAMBI	237	271	316	361	406	451	496	541	586	631
SOUTH SUMATERA	396	450	521	592	663	734	805	876	947	1.018
BENGKULU	205	237	279	321	363	405	447	489	531	573
LAMPUNG	352	391	445	499	553	607	661	715	769	823
BANGKA BELITUNG ISLANDS	81	103	132	161	190	219	248	277	306	335
RIAU ISLANDS	111	128	152	176	200	224	248	272	296	320
DKI JAKARTA	64	74	90	106	122	138	154	170	186	202
WEST JAVA	1.197	1.300	1.430	1.560	1.690	1.820	1.950	2.080	2.210	2.341
CENTRAL JAVA	995	1.131	1.302	1.473	1.644	1.815	1.986	2.157	2.328	2.499
DI YOGYAKARTA	140	159	183	207	231	255	279	303	327	351
EAST JAVA	1.088	1.220	1.390	1.560	1.730	1.900	2.070	2.240	2.410	2.580
BANTEN	281	311	349	387	425	463	501	539	577	615
BALI	143	173	212	251	290	329	368	407	446	485
WEST NUSA TENGGARA	199	225	261	297	333	369	405	441	477	513
EAST NUSA TENGGARA	470	522	596	670	744	818	892	966	1.040	1.114
WEST KALIMANTAN	277	317	371	425	479	533	587	641	695	749
CENTRAL KALIMANTAN	239	283	341	399	457	515	573	631	689	747
SOUTH KALIMANTAN	271	306	354	402	450	498	546	594	642	690
EAST KALIMANTAN	214	248	292	336	380	424	468	512	556	600
NORTH KALIMANTAN	70	84	103	122	141	160	179	198	217	236



Province	Demand									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
NORTH SULAWESI	222	257	307	357	407	457	507	557	607	657
CENTRAL SULAWESI	238	268	311	354	397	440	483	526	569	612
SOUTH SULAWESI	535	609	707	805	903	1.001	1.099	1.197	1.295	1.393
SOUTHEAST SULAWESI	346	398	467	536	605	674	743	812	881	950
GORONTALO	111	132	159	186	213	240	267	294	321	348
WEST SULAWESI	108	124	146	168	190	212	234	256	278	300
MALUKU	260	286	323	360	397	434	471	508	545	582
NORTH MALUKU	164	188	222	256	290	324	358	392	426	460
WEST PAPUA	138	157	185	213	241	269	297	325	353	381
SOUTHWEST PAPUA	121	137	161	185	209	233	257	281	305	329
SOUTH PAPUA	94	104	118	132	146	160	174	188	202	216
CENTRAL PAPUA	168	184	208	232	256	280	304	328	352	376
HIGHLAND PAPUA	251	267	291	315	339	363	387	411	435	459
PAPUA	91	99	112	125	138	151	164	177	190	203



## CHAPTER 4.

### POLICY RECOMMENDATIONS

The publication of the National Planning for Medical and Health Workforce: Needs Projection through a Population-Based Approach, 2023–2032 may serve as a key reference for both the Central Government and Local Governments in policy formulation and decision-making, including but not limited to the following:

- 1) For the Central Government
  - a) Develop an integrated National Health Workforce Intelligence System, linking SISDMK, SIRS, and SIMPUS (SATU SEHAT–MoH), PDDikti (Ministry of Higher Education, Science, and Technology), BPJS Kesehatan systems (e-Claim and pCare), Population Administration System (SIK) and SIPKD (Ministry of Home Affairs), the National Financial System (SIKN–Ministry of Finance), e-Formasi (Ministry of Administrative and Bureaucratic Reform), SIASN (National Civil Service Agency), and other relevant national information systems.
  - b) Align quotas of health education institutions and the establishment of new study programs with regional distribution needs through a systematic and integrated process involving three key ministries—Ministry of Health, Ministry of Higher Education, Science, and Technology, and Ministry of Home Affairs—particularly for medical specialists, general practitioners, dentists, and other priority health workers, in line with the transformation of primary health care and advanced health care services, including the integration of specialist education expansion through both university-based and hospital-based schemes.
  - c) Accelerate affirmative policies, particularly scholarships (prioritizing local candidates) and education quotas for medical specialists, general practitioners, and dentists, especially in DTPK and other less-attractive regions that continue to experience workforce shortages in hospitals, Puskesmas, and public health laboratories. These policies should be synchronized with placement mechanisms through service bonds or work-binding schemes.
  - d) Implement affirmative utilization policies for priority medical and health workforce through Presidential Instructions or Joint Ministerial Decrees, particularly for DTPK and less-attractive areas, using various schemes such as civil servant recruitment, special assignments by central and local governments, recruitment through BLU/BLUD mechanisms, and other applicable arrangements. Specialist distribution regulations should be based on objective and equitable needs mapping for each province and district/city, implemented in an integrated and real-time manner, while considering geographic characteristics, health facility development plans, service burden, local fiscal capacity, and other specific contextual factors.
  - e) Strengthen the synergy of financial incentive policies with the National Health Insurance financing scheme and other financing mechanisms, particularly for specialists, ensuring flexibility, transparency, accountability, and equity to enhance attraction and retention in DTPK and less-attractive areas.
  - f) Reform career systems, remuneration, and non-financial incentives for medical and health workforce, including opportunities for specialist education for doctors and dentists, accelerated career pathways, provision of official housing and vehicles, security guarantees in high-risk areas, and other equitable incentives, to



improve retention in hospitals, Puskesmas, and public health laboratories that remain critically understaffed.

- g) Develop policies to enhance service quality and workforce competencies through teleconsultation and tele-education systems, including the strengthening of facility mentorship arrangements, particularly for health facilities in DTPK and other regions lacking medical specialists.
- h) Use the projections as a reference for population-based licensing policies (range-based practice license quotas), particularly for strategic medical workforce such as specialists, doctors, dentists, and selected health workforce, as part of workforce distribution control.
- i) Use the projections as a reference for identifying competency development needs and granting specific competency registration certificates (STR-KT) for specialists and other priority health workers, aligned with the transformation of primary and advanced health care services, including vertical and horizontal competency-sharing policies.
- j) Use the projections as a basis for decision-making on competency standards, practice standards, service standards, determination of ideal workloads, competency- and workload-based performance evaluation standards, and the strengthening of credentialing systems and accreditation of health care institutions.

## 2) For Local Governments

- a) Use the projections as a reference for establishing workforce fulfillment performance indicators in Provincial and District/City Medium-Term Development Plans (RPJMD) and Health Office Strategic Plans, as well as for developing roadmaps for health workforce fulfillment at both provincial and district/city levels.
- b) Use the projections as a reference for comparative performance assessments of medical and health workforce across hospitals, Puskesmas, and public health laboratories within or across provinces, to accurately identify facilities experiencing shortages or surpluses, and to support the setting of institutional and individual performance targets.
- c) Use the projections as a reference for accelerating the fulfillment of medical specialists, general practitioners, dentists, and other priority health workers based on regional needs (province and district/city) to support the transformation of primary and advanced health care services.
- d) Use the projections as a reference for determining the issuance of practice licenses (SIP). Where shortages of certain specialists are identified at the district/city level, local governments may apply affirmative licensing policies; conversely, where workforce surpluses exist, restrictions on licensing issuance may be applied.
- e) Use the projections as evidence-based justification for scholarship provision funded by local government budgets (APBD) or other local funding sources, and as a basis for cooperation with partner universities, particularly for priority medical and health workforce still in shortage, and for negotiating education quotas with the Central Government. This ensures that scholarships are targeted, strategic, measurable, and implemented in a phased and sustainable manner in line with the health workforce roadmap.
- f) Use the projections as a basis for the distribution and redistribution of medical and health workforce based on workload, referring to health facility staffing standards



- and service workload indicators (e.g., BOR, patient visits, service coverage, and geographic size).
- g) Use the projections as a basis for drafting more transparent, accountable, and equitable employment contracts or service-bond arrangements.
  - h) Use the projections as a reference for developing local career systems, equitable remuneration policies, and non-financial incentives to enhance attraction and retention of medical and health workforce in remote and very remote Puskesmas, as well as hospitals located in DTPK and other less-attractive areas.
  - i) Use the projections as a basis for BLUD development and service expansion in hospitals, Puskesmas, and public health laboratories.
  - j) Use the projections as a basis for workforce procurement policies, including submission of civil servant position proposals to the Ministry of Administrative and Bureaucratic Reform, determination of the number and types of locally recruited special personnel, setting of recruitment quotas through BLUDs, and other mechanisms in accordance with prevailing laws and regulations.
  - k) Use the projections as a reference for identifying health facilities that require regulatory frameworks for competency sharing and task shifting, to optimize service delivery in hospitals, Puskesmas, and public health laboratories.



## CHAPTER 5.

### CONCLUSION

This book presents projections of medical and health workforce demands through a population-based approach for 2023-2032, which shows that:

1. The demand for medical and health workforce is increasing in line with demographic changes, an increase in non-communicable diseases, and expanded access to health services.
2. The supply of medical and health workforce cannot yet meet demand, especially for a number of priority medical workforce such as cardiologists, surgeons, anesthesiologists, radiologists, clinical pathologists, and internists.
3. The maldistribution of medical and health workforce is a major challenge, as medical and health workforce is concentrated in urban areas and Java, and there is a large deficit in eastern Indonesia.
4. A population-based projection approach provides more precise estimates, as it takes into account variations in epidemiological burden, service capacity, and demographics between regions.

In general, the projection results emphasize the need to strengthen health workforce planning through increased production capacity, redistribution mechanisms, and the integration of national and sub-national planning.

This document is expected to serve as a technical reference for the Central Government, Local Governments, and stakeholders in formulating evidence-based policies to strengthen health workforce capacity. In accordance with the mandate of Law No. 17 of 2023 and Government Regulation No. 28 of 2024, projections of health workforce demand must be reviewed periodically to ensure they align with epidemiological dynamics, service capacity, and health policy developments. The projections of medical and health workforce demand for 2023–2032 at the district/city level can be accessed via the following link:

- 1) Health Workforce Projections: <https://s.kemkes.go.id/proyeksitengahkesehatan>
- 2) Medical Workforce Projections: <https://s.kemkes.go.id/proyeksitengahamedis>

Lastly, we sincerely hope this book makes a real contribution to strengthening the health system through more targeted health human resource planning. May this book serve as a foundation for cross-sector collaboration to ensure that the requirements of the medical and health workforce are met equitably and sustainably throughout Indonesia.



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MINISTRY OF HEALTH  
DIRECTORATE GENERAL OF HEALTH WORKFORCE  
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