

# Cost Drivers in Malaysia's Medical and Health Insurance/Takaful Sector

## A First Look at the Centralized Claims Database

APRIL 2026

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# Executive summary

**Malaysia has seen sharp increases in Medical and Health Insurance/Takaful (MHIT)<sup>1</sup> premiums in recent years, elevating affordability concerns and prompting a broad policy response.** Rising claims costs have outpaced premium growth in recent years, creating financial pressure on insurers to reprice products; and on insureds, especially the older policyholders, to maintain coverage. In this context, the availability of a newly developed central claims database provides an opportunity to move beyond anecdotal evidence and better quantify the sources of medical cost growth the MHIT sector.

**This report provides an empirical assessment of cost drivers in MHIT claims from 2022 to 2024.** The central claims database consolidates claims submitted by licensed insurers and takaful operators and includes financial fields, clinical and administrative information. Using regression-based models, the analysis estimates service-level medical inflation by constructing price indices for comparable baskets of services.<sup>2</sup> The report then decomposes spending growth into price, volume, intensity and setting-mix components to shed light on the channels driving up costs in MHIT. Finally, the report analyses selected efficiency measures to identify areas for immediate improvements.



1 Takaful is a Shariah-compliant mutual insurance. It is an arrangement for joint guarantee, whereby a group of participants agrees to support one another jointly for losses arising from identified risks. Under this arrangement, participants contribute a sum of money as a commitment into a common fund that will be used mutually to assist the members against a specified type of loss or damage.

2 Given the data structure, “service-level medical inflation” refers to the cost growth measured by total billed amount for a specific condition (per ICD-10 code) generated in a specific claim type (outpatient, inpatient, daycare, pre-hospitalization and post-hospitalization).



## KEY FINDINGS

- **Utilization and spending increased rapidly over 2022-2024 period.** Total claims rose across all claim types, with particularly fast growth in pre- and post-hospitalization claims. Billed amounts and insurers' payments increased in parallel.
- **Service-level medical inflation is moderate relative to premium and claims inflation, but uneven across settings.** Inpatient prices for the same service accelerated in 2024 relative to 2023, while outpatient/daycare prices rose more in 2023 and slightly declined in 2024. Pre- and post-hospitalization services show a steadier upward trend across both years.
- **Cost growth between 2022 and 2024 is largely driven by volume (or utilization), accounting for two-thirds of the cost growth, while rising prices contributed one-fourth.** The scale of overall expenditure increases relative to the more modest measured service-level price inflation highlights the importance of increased volume as the key cost driver.
- **There is suggestive evidence that factors such as moral hazard are contributing to utilization.** While a detailed analysis was infeasible given the data, we find that claim amounts are substantially higher when there is potential for moral hazard. In a setting where professional fees are regulated, providers may have incentives to increase volume. This is also consistent with a related finding that the share of hospital supplies and services (HSS) in claim amounts is over 70 percent and rising. These patterns warrant a more detailed examination of the appropriateness of care, as well as the mix of inputs used in the production of healthcare.
- **Alarming, our analysis shows that a large share of inpatient episodes are potentially avoidable.** The share of admissions due to ambulatory care sensitive conditions (ACSCs), which includes diseases such as diarrhoea and gastroenteritis that can be managed at lower levels of care, but also ischemic heart disease and renal failure that can be prevented with longer-term strengthening of preventive and primary care, was 23 percent in 2024. These patterns (especially admissions due to conditions such as diarrhoea and gastroenteritis) are consistent with the presence of moral hazard, especially given that MHIT products are skewed towards inpatient care coverage.

## Policy implications and reform directions

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Malaysia has initiated important responses to ease affordability pressures, including interim premium adjustment measures (2024–2026) and the broader RESET strategy to curb medical cost escalation, strengthen transparency and shift towards value-based care. The findings in this report support several areas for policy consideration:

- **Use the centralized claims database as a routine monitoring tool.** Regular reporting of utilization, unit prices and service mix can strengthen oversight, improve accountability, and enable earlier detection of emerging cost pressures.
- **Enhance price transparency and empower consumers.** Given the large and rising share of HSS in inpatient bills, policy attention to pricing transparency, billing practices, and procurement arrangement could yield meaningful cost containment. The upcoming payment mechanism reform (to transition from fee-for-service payments to diagnosis-related groups, or DRGs, based payments) can mitigate some of the current perverse incentives to increase costs per admission.
- **Prioritize reforms that address appropriate utilization and care pathways, and incentivize outpatient care use.** MHIT products typically do not cover outpatient visits, including routine preventive visits. The observed growth in claims, especially in admissions related to ASCs and pre- and post-hospitalization services, could potentially be influenced by incentive-driven behaviours across both patient utilization and provider service delivery. Potential low-value care delivered in complex settings highlights the need for policies defining clinical pathways and stronger claims governance. They also warrant insurance product redesign to cover cost-effective preventive and outpatient services and to align cost-sharing to generate appropriate incentives.
- **Advance provider payment reforms to reduce incentives for itemized billing.** A phased move away from fee-for-service, toward DRG-based approaches, can better align incentives, but will require supporting data standards, coding quality, and coordination between regulators, payers, and providers. The patterns observed also highlight the need to exercise caution during the rollout to ensure that DRG-based payments support efficiency gains without unintended shifts in utilization patterns.
- **Recognize that MHIT governance is shared and requires coordination across institutions.** Financial regulation and provider regulation jointly shape the incentives and constraints in the private system. Effective implementation of the base MHIT plan and DRGs-based payments, requires stewardship and monitoring of insurers and providers alike.

## Data scope and limitations

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**The findings of this report should be interpreted in light of the central claims database's structure and coverage.** The MHIT data capture insurer-paid claims and do not represent prices and utilization among self-pay patients in the private sector. The absence of a unique patient identifier across insurers limits longitudinal, person-level tracking and episode-based analysis. In addition, variation in coding practices and the level of clinical detail available in claims can constrain precision of estimates. Despite these limitations, the database forms a strong foundation for ongoing monitoring and for informing planned reforms. Future investments to improve the coverage and quality of the database will yield greater benefits.



# 1. Introduction

## 1. Introduction

**The sustained increase of private health insurance coverage in Malaysia is accompanied by growing public concern over its affordability.** Premiums increased rapidly in the post-pandemic years, affecting households' coverage as well as financial protection. To address rising medical inflation, in February 2024, Bank Negara Malaysia (BNM) issued the Policy Document on Medical and Health Insurance/Takaful (MHIT) Business, which introduced requirements for insurers to offer at least one product with copay requirement, and the establishment of a central medical claims data platform to enable industry-wide analysis of medical claims. This was followed by interim measures to ensure continuity of coverage and to control premium increases, applicable from December 2024 to 2026. In the meantime, to address the challenge systematically, the Ministry of Health, the Ministry of Finance and BNM developed the RESET strategy. RESET aims to revamp the MHIT sector. The objectives are to make health insurance coverage more accessible, affordable, transparent and sustainable, while supporting Malaysia's transition toward a value driven healthcare system. Some major components of the strategy are the introduction of a standardized base MHIT product and the transition away from fee-for-service payments towards case-based payments using diagnosis-related groups.

**A challenge in diagnosing medical inflation is that commonly cited indicators, such as claims inflation and medical trend rate, capture different concepts.** Each indicator has its purpose; however, they are not directly comparable (see Table 1 for a summary). Claims inflation, for example, is retrospectively estimated, and it captures changes in prices paid for services, as well as the frequency of utilization. The medical trend is forward-looking; in addition to prices and utilization, it also factors in the costs associated with changes in population risk profiles and new technologies. Consumer price indices (CPI) based metrics measure system level cost growth, whereas claims and premium inflation in the Malaysian context are relevant for the MHIT sector. Not surprisingly, the magnitude of medical inflation itself is a topic of debate (Table 2 presents some medical inflation figures).

**TABLE 1**  
The spectrum of healthcare inflation metrics

Core Metric	Medical CPI (Consumer Price Index)	Expenditure Inflation	Claims Inflation	Medical Trend	Premium Inflation
Relative magnitude	+	++	+++	++++	+++++
Components captured	Price	Price + Volume + Innovation	Price + Volume + Innovation	Price + Volume + Innovation + Risk	Price + Volume + Innovation + Risk + Admin + Profit
Primary Focus	Price growth of a pre-defined basket of medical goods and services in the general economy	Amount spent per person across the entire healthcare system	Amounts paid out by a specific employer or insurance plan for its members	Estimated increase in insurance claims expected for the upcoming plan year	Price of the insurance contract to the employer or individual
Time Horizon	Backward-looking, historical retail price changes	Backward-looking, tracks historical average spending across the country	Backward-looking, tracks actual spending by the plan over the last year	Forward-looking, actuarial estimates predicting future costs	Forward-looking, fixed contracted price for the next 12-month period
Typical data sources	National Statistical Institutes	Government aggregates	Actual claims data from insurers and TPAs	Insurer actuarial models and underwriting algorithms	Insurers and subscribers

<b>Role of volume/ utilization</b>	Excluded, assumes a static “basket” of goods.	Included, captures average nationwide trends in visits and procedures	Included, captures the exact utilization of services	Projected, predicts future usage spikes and demographic aging	Locked-in, price is set based on these volume predictions
<b>Role of innovation</b>	Lagging, takes years to include new, high-cost technologies	Real-time, includes real time aggregate systemic spending on new therapies	Real-time, highly sensitive to the plan’s specific benefits package	Heavily weighted, explicitly prices in the adoption of costly new innovations	Risk-loaded, includes the financial risk that new technologies will be over-utilized
<b>Impact of insurance mechanics</b>	None, measures gross retail prices regardless of coverage	Minimal, looks at total dollars changing hands, regardless of the payer	Moderate, reflects net cost after member copays and deductibles	Maximum, amplified by “deductible leveraging” and risk buffers	Maximum, in addition includes administrative costs, profits
<b>Primary Audience</b>	Ministries of finance, central banks, economists	Ministries of finance and health, public health experts	Insurance benefits managers, service providers	Insurers, employers, HR managers	Insurers, employers, individual subscribers

Note: The table above does not aim to be exhaustive to include all metrics related to healthcare cost growth. There are numerous other metrics – such as input price inflation, drug price inflation – which have other purposes. The metrics presented here are the ones most relevant to the report.

**TABLE 2**  
Some estimates of medical inflation in Malaysia, 2024

Measure	Value	Source
<b>Medical Trend Rate 2024</b>	15%	AON publication
<b>MHIT premium inflation</b> (average yearly growth between 2022 and 2024)	13.2%	MHIT aggregate data provided by ISM
<b>MHIT claims inflation</b> (average yearly growth between 2022 and 2024)	21.6%	Authors’ estimates from centralized MHIT claims database
<b>Health Insurance Sub-Index of Insurance &amp; Financial Services group of CPI</b> (2025 annual estimate)	7.6%	DOSM
<b>Healthcare CPI</b> (2025 annual estimate)	1.2%	DOSM

**For effective policy design, it is more important to develop a thorough understanding of the underlying drivers of medical cost growth.** Healthcare costs are affected by many factors, including pure price increases, greater utilization, shifts in mix of services (outpatient vs. inpatient, for example), changes in risk profiles of the insured, adoption of new medical technologies, provider-induced demand. Policy responses to control costs must address the underlying drivers. Pure price increases may warrant interventions on the supply-side,

## 1. Introduction

for example, policies to reduce prices of pharmaceuticals and medical goods. On the other hand, to curb over-utilization of services, a combination of demand- and supply-side interventions are needed to influence patients' and providers' behaviours, respectively.

**This report presents results from the first external analysis of the newly developed central medical claims database.** As stated earlier, foreseeing the need for data and monitoring, BNM mandated insurers to set up a central medical claims database. On behalf of the licensed MHIT operators, Insurance Services Malaysia (ISM)<sup>3</sup> consolidated de-identified claims. The dataset brings together financial fields (billed amounts, paid amounts, cost-sharing) with clinical and administrative information (patient demographics, diagnosis codes, location), with the aim of enabling a marketwide empirical assessment of MHIT sector. This is not an easy task; there are multiple insurers in Malaysia and data reporting accuracy, completeness of reporting varies. Reporting requirements of certain data fields will become mandatory in the future, as such, the quality of data is expected to improve.

**The main contribution of the report is the nuanced treatment of medical cost growth and its drivers.** The report defines and differentiates different inflation metrics, and provides estimates of claims inflation and premium inflation in the MHIT sector. The report also proposes a methodology and estimates "service-level medical inflation," defined as, cost growth measured by total billed amount for a specific condition (per ICD-10 code) generated in a specific claim type (outpatient, inpatient, daycare, pre-hospitalization and post-hospitalization). This corresponds closely to the conceptualization of diagnosis-related group (DRG) price per episode of care, rather than price of service inputs (such as pharmaceuticals, nursing services, professional fees for doctors, devices) paid in a fee-for-service system. It is a disaggregated price-index estimated at the disease and care-setting level, allowing comparison across services. In the future, use of DRG classification will improve precision and reliability compared to the proposed method, which relies on a single ICD-10 code. The report also provides a framework for the examination of costs drivers, and decomposes cost growth into four components: price, volume, intensity and setting-mix. A further decomposition (for example, the adoption of new technologies affecting prices or volumes) is not feasible with the current data.

**The report aims to inform ongoing reform efforts under the RESET strategy, by grounding policy discussion in evidence.** The analysis and results in this report are most relevant for the MHIT sector, which accounts for 13-15 percent of total current health expenditures (CHE) in Malaysia. The data used do not capture spending by patients who pay out-of-pocket (approximately 35 percent of CHE) and the public sector (approximately 50 percent of CHE). The expected benefits of reforms planned under RESET, such as transparency of prices, interoperable information systems and provider payment mechanisms modernization, extend beyond the MHIT sector. Going forward, complementing the central claims database with self-pay activity could be useful in monitoring the broader impact of planned reforms. The central claims database used in this study also has limitations (discussed in more detail below), and the results should be interpreted in context. Nevertheless, as the report argues, the central claims database provides a strong platform for routine market monitoring and for identifying priority areas for cost containment. This report aims to provide a rapid diagnostic on cost growth in the MHIT sector and its drivers, and it lays out the areas for future investigation.

The rest of the report proceeds as follows. Section 2 provides the overall health sector context in Malaysia and Section 3 describes the data and methodology used in this report. Section 4 describes the overall trends in the MHIT sector, and Section 5 reports estimates of service-level price inflation. Section 6 presents results of the decomposition exercise and Section 7 analyses in more detail some areas for efficiency improvements. The final section concludes with recommendations.

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<sup>3</sup> ISM is an insurance industry-owned data and technology company that provides shared infrastructure – including databases, analytics, and IT solutions – to MHIT operators.

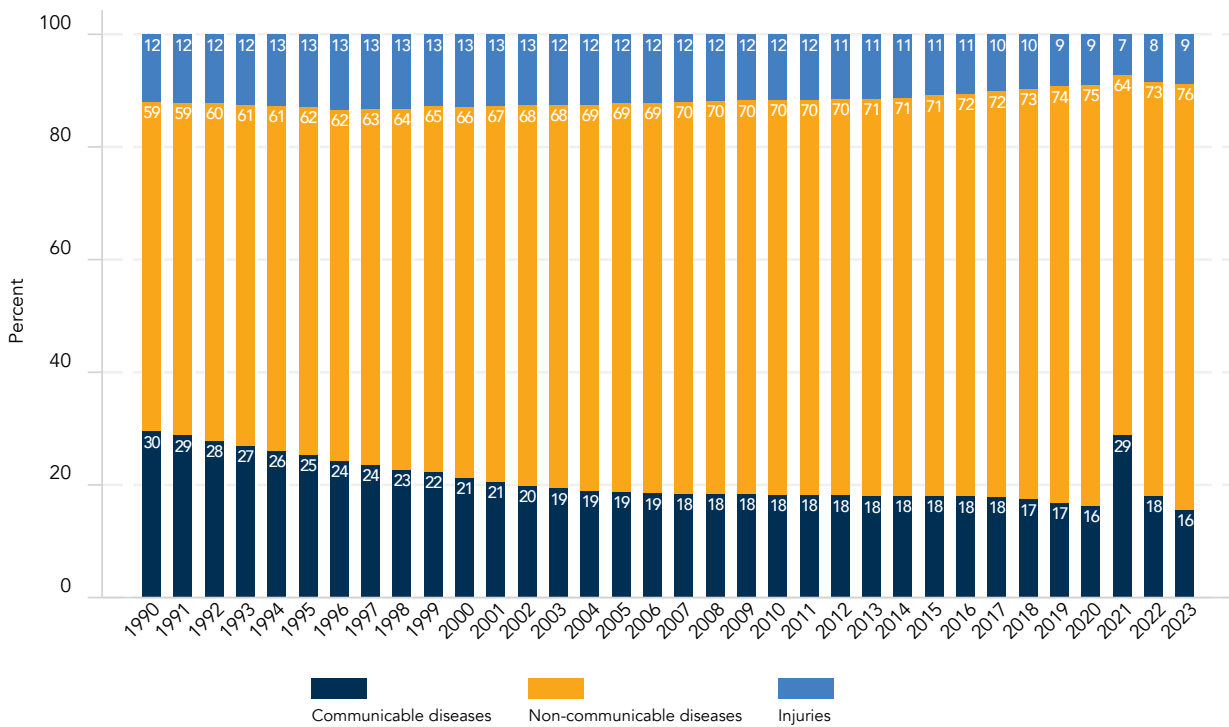


## 2. Healthcare in Malaysia

## Health outcomes and challenges

In the past decades, health outcomes in Malaysia improved, and new challenges have emerged. Child and maternal mortality declined sharply and have remained low, indicating sustained gains. Life expectancy at birth increased from 68 years in 1980 to 76 years in 2023. Meanwhile, the burden of non-communicable diseases (NCDs), such as diabetes, hypertension and cancers, rose in both absolute and relative terms. Healthy life years lost due to NCDs roughly doubled from 1990 to 2020, and NCDs now account for three-quarters of the disease burden (Figure 1). Premature mortality due to NCDs is also relatively high in Malaysia (Figure 2). In comparison to communicable and acute illnesses, NCDs are often chronic in nature, necessitating lifelong management. The ongoing epidemiological transition towards NCDs will further strain Malaysian health system and the broader society in the future.

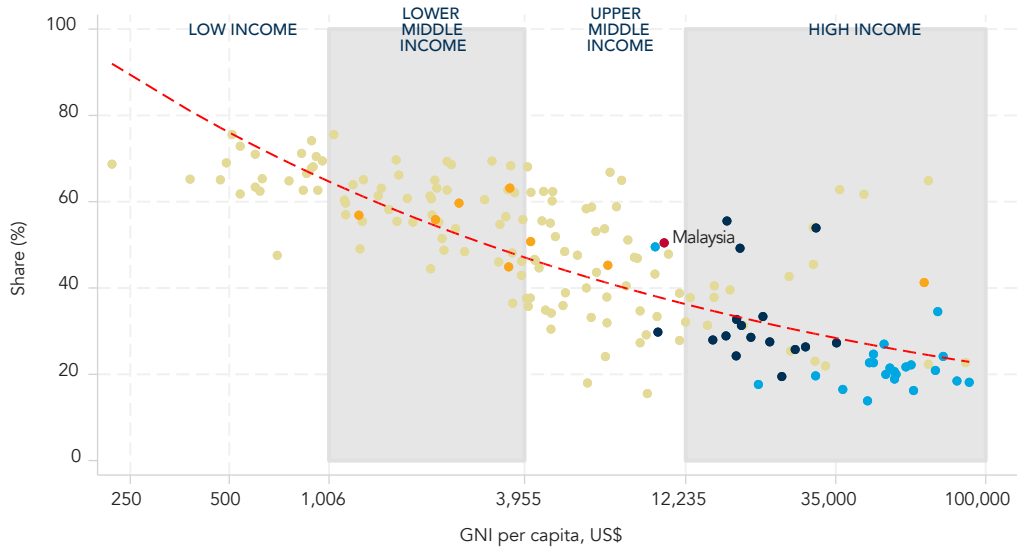
**FIGURE 1**  
Trends in Disability-Adjusted Life Years (DALYs)<sup>4</sup> by cause, 1990–2023



Source: Analysis of Institute for Health Metrics and Evaluation (IHME) data

<sup>4</sup> A Disability-Adjusted Life Year (DALY) is a health metric representing the loss of the equivalent of one year of full health. It is calculated by summing premature mortality (Years of Life Lost, YLL) and disability-induced morbidity (Years Lived with Disability, YLD).

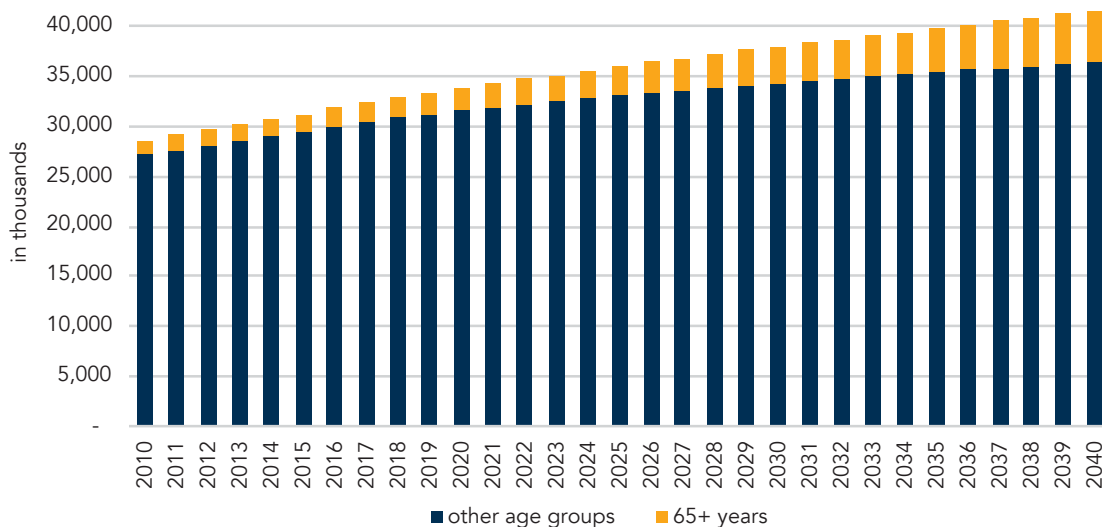
**FIGURE 2**  
Premature mortality from non-communicable diseases (NCDs) by income level, 2021



Source: Authors' analysis World Development Indicators  
Note: orange - regional (ASEAN), dark blue - transitional, light blue - aspirational

**The epidemiological transition is accompanied by a rapid demographic transition characterized by population aging and declining fertility.** The share of the population aged 65 years and above currently stands at 7.7 percent and is projected to rise to around 12 percent by 2040 (Figure 3). Malaysia's total fertility rate has fallen below 1.5 children per woman, well below the replacement level of 2.1 children per woman needed to sustain population size. This is a dramatic decline from about 4.9 children per woman in 1970, and the lowest fertility level observed in the past five decades. These demographic shifts can have profound implications on the health system. As the population ages, the prevalence of chronic diseases, multiple morbidities, and neurodegenerative diseases such as Alzheimer's and Parkinson's will increase. This will create further demand for costly healthcare services.

**FIGURE 3**  
Population aged 65+ years, 2010-2040

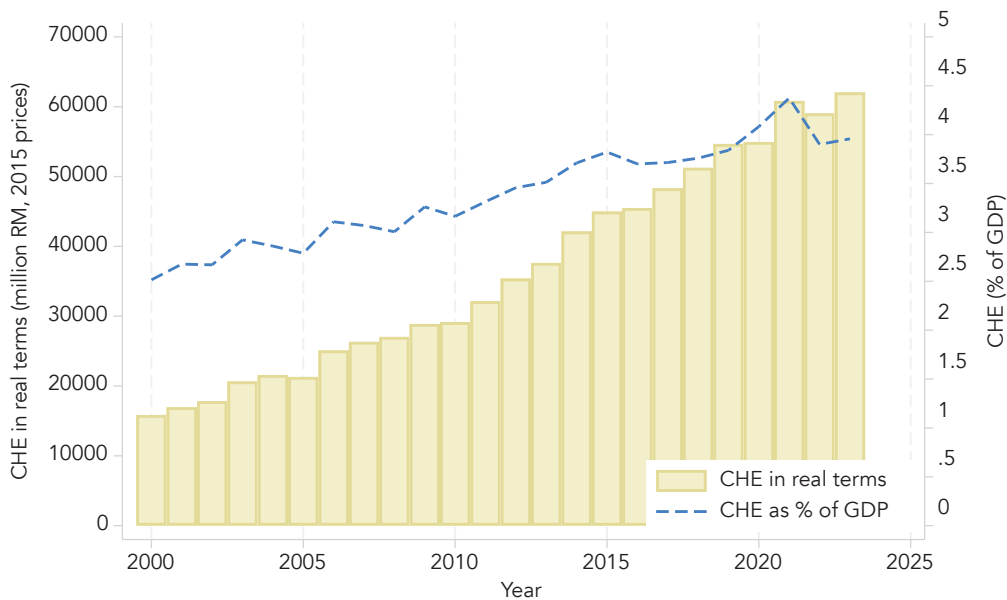


Source: United Nations

## Health spending in Malaysia

Against this backdrop of epidemiological and demographic transition, health spending in Malaysia has increased steadily over the past two decades. Current health expenditure (CHE) reached RM72,143 million in 2023, a substantial growth even in real terms since 2000 (Figure 4). Over the same period, health spending has also increased relative to the size of the economy. CHE as a share of gross domestic product (GDP) rose from about 2.5 percent in 2000 to around 4 percent in 2023, a gradual expansion to meet growing healthcare needs.

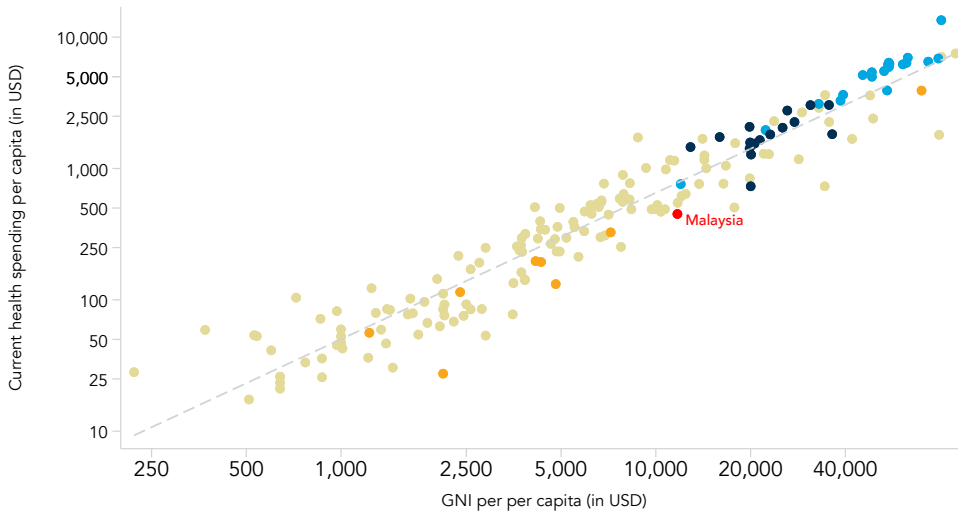
**FIGURE 4**  
Health expenditure as a share of GDP, 2023



Source: Analysis of World Development Indicators

However, current health spending per capita in Malaysia remains below what would be expected given its income level. Figure 5 shows that while Malaysia spends more on health than many of its ASEAN peers (orange), its health spending per capita remains below the global average for countries at similar income levels. Malaysia trails behind high-income countries. As Malaysia transitions to high-income country status, health spending is expected to rise.

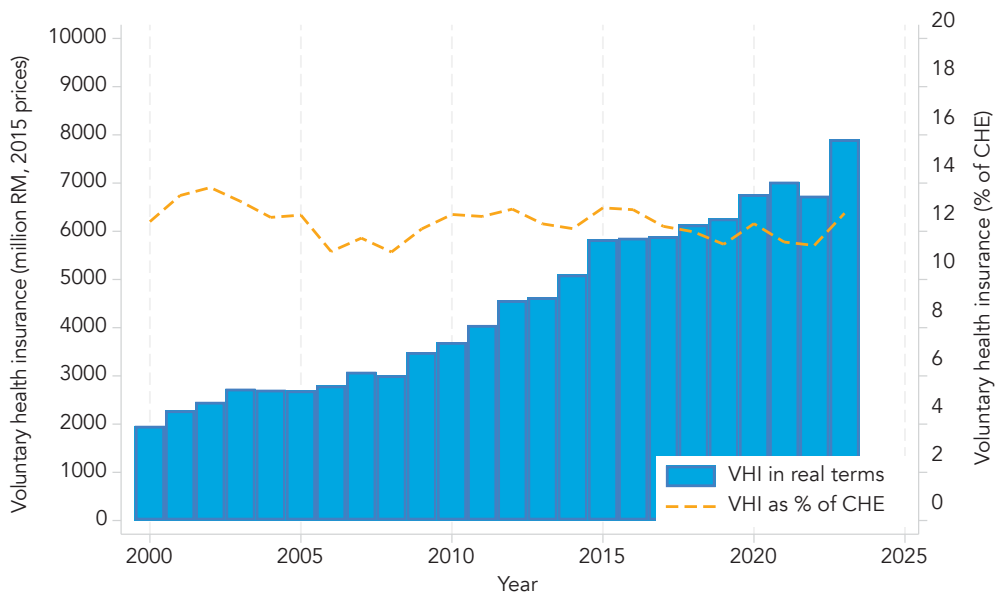
**FIGURE 5**  
**Current health expenditure per capita (in USD), 2023**



Note: orange - regional (ASEAN), dark blue - transitional countries, light blue - aspirational countries  
 Source: Analysis of World Development Indicators

**Malaysia’s healthcare system operates under a mixed financing model.** A subsidized public sector exists alongside a dynamic and expanding private sector. In 2023, public spending accounted for about 50 percent of current health expenditure (CHE), and the remaining half was financed through private sources. A substantial share of private spending remains “un-pooled” with out-of-pocket (OOP) payments accounting for around 35 percent of CHE, and voluntary health insurance (VHI) contributing around 12 percent (Figure 6).

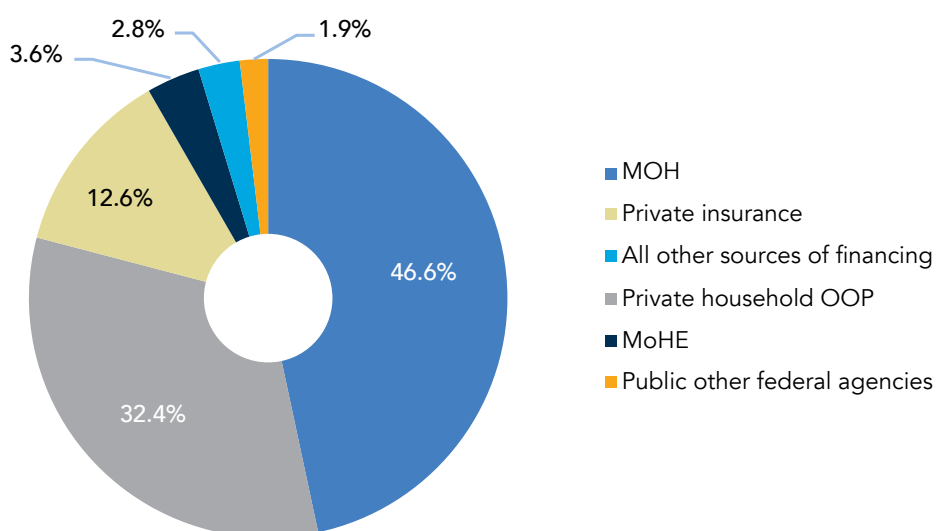
**FIGURE 6**  
**Current health expenditure for voluntary health insurance, 2023**



Source: Analysis of World Development Indicators

**Hospitals remain the primary driver of health spending in Malaysia, accounting for more than half of total health expenditures (53.4 percent) in 2023.** Other areas of expenditures contribute smaller shares, including ambulatory healthcare providers (19.1 percent), health administration (13.4 percent), retail medical goods (7.7 percent), and other services (6.4 percent). The financing of hospital services shows a mixed source, with public funding, primarily from the MOH, accounting for the largest share (46.6 percent), while private spending is substantial and largely concentrated in private hospitals, financed through OOP payments (32.4 percent) and private health insurance (12.6 percent). This pattern highlights a dual system in which public hospitals are mainly tax-funded, while private hospitals rely heavily on household out-of-pocket and private health insurance payments (MOH, 2024).

**FIGURE 7**  
**Health expenditure at all hospitals by sources of financing, 2023**

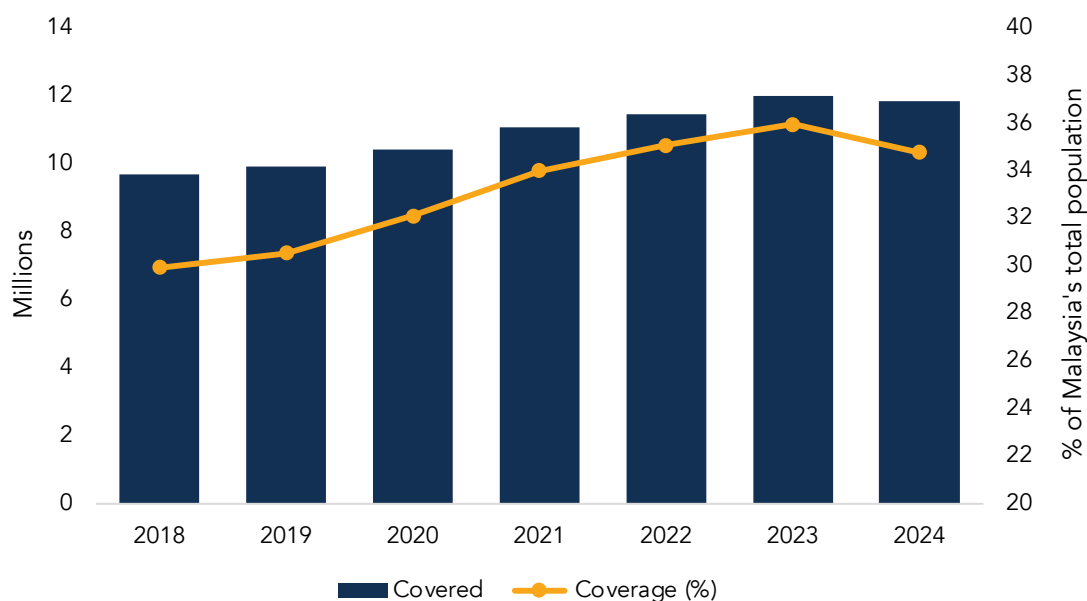


Source: MNHA 2011-2023

**In 2024, based on MHIT data, 11.8 million people had private health insurance (PHI) coverage.** Of the 11.8 million, 7.8 million were enrolled in individual products and 4 million in group products. Using the total population as the denominator, this implies a coverage rate of around 34 percent (Figure 8). However, this estimate is higher than figures reported in national surveys, which typically range from 20 percent to 30 percent. This discrepancy may be driven by several factors, including potential overlap between individual and group memberships, as well as the inclusion of foreigners and temporary residents in MHIT aggregate figures which may not be fully captured in population statistics. Expanding the denominator (total population) to include temporary residents results in a coverage rate of 26.3 percent in 2024.<sup>5</sup> These differences highlight the challenges of deriving reliable private health insurance coverage rate.

<sup>5</sup> This share is estimated from using aggregated ISM data on number of persons covered under MHIT as the numerator and the population figures from DOSM as the denominator.

**FIGURE 8**  
Private health insurance coverage, 2018-2024



Source: Authors' analysis of MHIT and DOSM data

**The purchase of private health insurance (PHI) in Malaysia is voluntary, driven primarily by individual preferences and healthcare needs** (Barraclough and Chee, 2007). PHI coverage varies across population groups. Enrolment is highest among the working-age population, which is primarily due to the prevalence of employer-sponsored group plans. Consequently, coverage declines markedly among the elderly. PHI coverage is also strongly pro-rich, with individuals in the richest income quintile being 3-4 times more likely to have PHI than those in the poorest quintile, which suggest significant socioeconomic disparities in access to private insurance (Nur Zahirah Balqis-Ali et al., 2021).

**The demand for PHI in Malaysia is influenced by a combination of push and pull factors.** The former relates to constraints in the public healthcare system, and the latter to perceived advantages of private healthcare. Public healthcare facilities often experience high patient volumes, longer waiting times, and limited provider choice, which can encourage individuals who can afford it to seek alternatives in the private sector (Chan, 2014; Pillay et al., 2011; Yap et al., 2019). Private hospitals are often perceived to offer better equipment, greater comfort, faster access to care, and more provider choice (Nur Zahirah Balqis-Ali et al., 2023; Yap et al., 2019). Rising incomes and the growth of Malaysia's professional middle class have further increased the demand for private healthcare services (Mohamad Selamat et al., 2020; Nur Zahirah Balqis-Ali et al., 2021). PHI therefore enables households to access private healthcare services so they can bypass waiting times in the public sector. Also, the government encouraged individuals who can afford PHI to obtain coverage as a supplementary means of financing healthcare (Wan, Abdullah & Ng, 2009). Although PHI coverage remains concentrated among higher-income households, an earlier study suggests that the concentration of PHI spending among high-income households, gradually declined. Therefore, PHI is increasingly being purchased by individuals from middle-income groups. This could be a result of the combined of the push and pull factors described above, as well as growing demand for faster access to healthcare services (Ng, 2012).

**The private health financing ecosystem in Malaysia consists of four key actors with distinct but interconnected roles.** The MOH oversees and regulates private hospitals, ensuring standards, licensing, and compliance within the healthcare delivery system. BNM regulates private health insurance and takaful operators (collectively referred to as MHIT, Medical and Health Insurance/Takaful), primarily on product oversight, prudential soundness, pricing governance, and market conduct. Private hospitals and healthcare providers deliver services, while insurers and takaful operators design and manage medical and health insurance products, process claims, and negotiate payment arrangements. Consumers and employers shape demand by purchasing coverage, choosing providers, and influencing the growth of private healthcare and insurance markets.

**The governance of the private healthcare sector in Malaysia is therefore shared across institutions rather than concentrated in a single agency.** BNM's authority is anchored in the Central Bank of Malaysia Act 2009 and strengthened by the Financial Services Act (FSA) 2013 and Islamic Financial Services Act (IFSA) 2013, which provide the legal framework for regulating insurers and takaful operators. Earlier legislation, including the Insurance Act 1996, established licensing and prudential standards for the insurance industry. Under this legal framework, BNM oversees insurer solvency, product governance, and consumer protection, and has issued a series of MHIT guidelines to improve transparency, standardize policy terms, and ensure product sustainability.

**From the medical side, the MOH regulates supply of private health care.** This is a mandate under the Private Healthcare Facilities and Services Act (PHFSA) 1998, which governs private healthcare providers and sets standards for service delivery. The MOH also regulates professional and surgical fees through a fee schedule – 13<sup>th</sup> Schedule, which was last officially revised in 2013. Therefore, PHI operates within a shared governance structure in which financial regulation and healthcare service regulation are overseen by separate institutions. Insurers do not directly control many drivers of medical cost growth, such as professional fees, hospital pricing, technology adoption, and service utilization. Hence, effective PHI governance depends on coordination between BNM, MOH, healthcare providers, and insurers.

**PHI in Malaysia has increasingly faced concerns regarding its financial sustainability and affordability.** Rising PHI premiums have become a contentious social issue, which reflects broader pressures in the private healthcare financing system. An earlier analysis by BNM showed that PHI claims growth has been outpacing premium growth, leading to the repricing of many insurance products in recent years (BNM, 2025). The AON Global Medical Trend Rates Report 2025 (AON, 2025) estimated Malaysia's medical trend rate at 15 percent, significantly higher than the global average of 10 percent. As claims costs rise faster than premiums, insurers have had to reprice policies to maintain financial viability, resulting in substantial premium increases for many policyholders. In response, the MHIT industry has examined the drivers of claim inflation and explored cost-control strategies (BNM, 2025). More recently, policy discussions have included measures such as cost-sharing mechanisms to reduce over-utilization, as well as the development of a centralized claims database to improve cost transparency and enable better industry-wide monitoring of medical claims (Ng et al., 2025).

## Moving forward: the RESET strategy

In response to the sharp rise in medical insurance premiums, BNM introduced a set of interim premium adjustment measures for 2024–2026 to ease affordability pressures and help PHI policyholders maintain continuous coverage (Table 3). These measures aim to moderate short-term premium increases and provide temporary relief to affected policyholders, while broader reforms to address rising healthcare costs and to strengthen the sustainability of the private health insurance market are being developed.

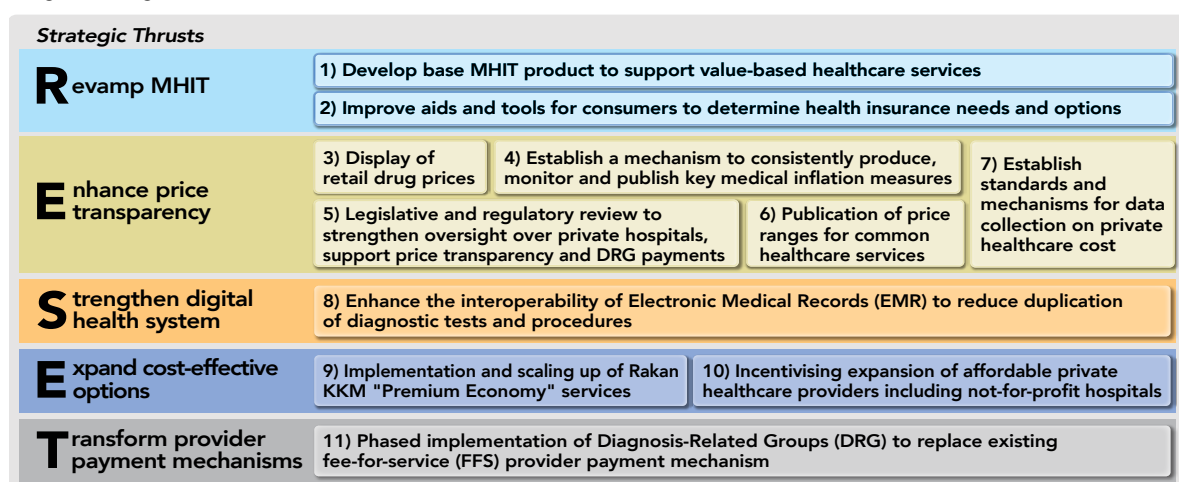
**TABLE 3**  
Interim premium adjustment measures (2024–2026)

No.	Measures
1	Spread out premium adjustments over a minimum of three years
2	Temporary pause in premium adjustments for policyholders aged 60 years and above under minimum plans
3	Policy reinstatement without additional underwriting for policyholders who lapsed or surrendered their policies due to premium adjustments in 2024
4	Provision of alternative MHIT products at the same or lower premiums

Source: Bank Negara Malaysia

Recognizing the broad implications of rising private medical costs, Ministry of Finance (MOF) and MOH established a Joint Ministerial Committee and, together with BNM, introduced the RESET<sup>6</sup> strategy framework in June 2025. The RESET framework outlines five strategic thrusts aimed at curbing escalating medical costs, strengthening value and transparency, and enhancing the long-term sustainability of Malaysia's private healthcare financing system. The RESET Strategy has eleven (11) key strategies (see Figure 9), and one of the initiatives is for BNM to lead the development of a base MHIT plan, which was detailed in a White Paper released in January 2026. The base MHIT plan is envisioned as a standardized benefits plan that each participating insurer and takaful operator must offer to its customers. The initiative aims to make private health coverage more accessible, affordable, transparent, and sustainable, while also supporting Malaysia's transition toward a value driven healthcare system through more coherent benefit designs and improved provider payment mechanisms.

**FIGURE 9**  
Key strategies under RESET



Source: Bank Negara Malaysia

<sup>6</sup> RESET is an acronym for Revamp Medical and Health Insurance/Takaful, Enhance price transparency, Strengthen digital health system, Expand cost-effective options, Transform provider payment mechanisms.

**The base plan aims to provide a more standardized, affordable, and value-driven framework, addressing the fragmentation and cost variability observed in current MHIT plans.** Table 4 compares the key features of the base MHIT plan and plans prevailing in the market. The proposed base plan features fixed premiums, defined coverage limits, structured co-payment, and a shift toward DRG-based payments, with the goal to improve cost control, transparency, and integration across care settings. In contrast, current MHIT plans are usually bundled with investment-linked products, have insurer-determined premiums, and exhibit wide variation in benefits and cost structures, with predominantly fee-for-service payments and limited coordination. In general, the base plan emphasizes standardization, efficiency, and system integration, while current plans reflect greater flexibility but also inconsistency and potential inefficiencies.

**TABLE 4**  
**Base MHIT vs. current MHIT plans**

Key features	Base MHIT Plan	Current MHIT Plans
Product structure	Standardised, standalone medical protection plan (not investment-linked)	Commonly sold as riders to investment-linked products
Premium structure	Premiums set by authorities ("flattened" risk curve)	Premiums determined by each insurer
Annual coverage limits	<ul style="list-style-type: none"> <li>• Standard plan: RM100,000</li> <li>• Higher limit for age &gt;60: RM150,000</li> <li>• Standard-plus plan: RM300,000 with deductible</li> </ul>	Wide variation; often very high limits (marketing-driven)
Co-payment structure	<ul style="list-style-type: none"> <li>• Two-tier system: <ul style="list-style-type: none"> <li>– Tier 1 (In-network providers): RM500 (RM1,000 for age &gt;61) deductible, 0% co-share</li> <li>– Tier 2 (out-of-network providers): same deductible + 20% co-share capped at RM3,000</li> </ul> </li> </ul>	Often no co-payment. For products issued after September 2024, a minimum co-pay of RM500 and/or 5% is applicable
Covered treatment settings	<ul style="list-style-type: none"> <li>• Inpatient + selected outpatient treatments</li> <li>• Pre- &amp; post-hospitalisation, physio, home nursing</li> <li>• Future integration with GP clinics</li> </ul>	<ul style="list-style-type: none"> <li>• Primarily inpatient-focused</li> <li>• Outpatient coverage inconsistent and varies widely by insurer</li> <li>• Limited integration across care settings</li> </ul>
Preventive and wellness care	Optional add-on packages at negotiated discounted rates	Typically bundled only in higher-tier plans; often raises premiums
Payment model	Phased transition to DRG-based payments	Predominantly fee-for-service
Claims governance	Standard claims rules co-developed with specialists and insurers	Claims rules differ across insurers
Use of data and EMR	Interoperable Electronic Medical Records (with consent) to reduce duplicated diagnostics	EMR sharing limited or non-existent; duplication increases costs

**Given the challenges facing the MHIT sector and ongoing reform efforts, this study aims to better understand the drivers of rising healthcare costs.** Its purpose is not only to inform and support the implementation of the RESET Strategy, but also to identify potential policy tools that could help mitigate medical inflation in Malaysia. Specifically, the study conducts a detailed analysis of cost growth in the PHI sector, including a deep dive into insurance claims data to examine patterns of price and utilization. It further decomposes expenditure growth to providing evidence to support more targeted policy responses aimed at improving the sustainability and affordability of PHI.



# 3. Data and methodology

## Data

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**The data used in this study come from centralized MHIT database, a repository of individual claims records compiled by ISM.** The database consolidates data from nearly 6.5 million transactional claims covering the period 2022 to 2024 by all licensed MHIT operators in Malaysia, covering inpatient, daycare, pre- and post-hospitalization, and (some) outpatient treatment episodes. Each observation corresponds to a single claim and the data fields span three broad categories: policy-level characteristics (including product type, co-payment feature, annual benefit limits, and room-and-board entitlements), claimant demographics (date of birth, gender, nationality, and postcode), and claim financials (total billed and gross claim-paid amounts disaggregated by up to 30 benefit types, such as surgical fees, anaesthetist charges, ICU costs, laboratory and imaging, and pharmaceuticals). Diagnosis information is recorded using ICD-10 codes, and each claim is linked to the treating facility and admitting doctor's specialty. A list of all variables and their descriptions is provided in Annex A.

**Prior to the authors accessing the data, the raw data underwent a structured multi-stage cleaning process by ISM to address known data quality challenges inherent in industry-wide submissions.** This included the standardization of claim types, date fields, and policy identifiers across insurers; the removal of duplicate records arising from split payments, resubmissions, and staging artefacts; and the exclusion of cash-benefit-only claims, which do not reflect actual medical service utilization. Financial amounts were recalculated to exclude cash benefits from total billed and paid figures, ensuring that the cost measures used in this study reflect genuine healthcare expenditure. Several derived variables were also constructed, including a surgical indicator (based on the presence of surgical, anaesthetist, or operating theatre charges), length-of-stay, age groups, and a standardized claim-type classification based on the benefit amounts submitted rather than the originally declared claim category.

## Methodology

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**The use of claims-level administrative data enables measurement of service-level prices and utilization across geographic markets and over time, an approach widely used in the empirical literature to analyse medical spending and price growth** (Cooper et. al., 2019). Here, prices are measured as the total payment recorded for each claim. Services are classified into inpatient, outpatient and daycare, and pre- and post-hospitalization categories using the classification system by ISM. Each claim contains a primary diagnosis coded using ICD-10 (or ICD-11), which is subsequently mapped to Global Burden of Disease (GBD)<sup>7</sup> cause categories for a more meaningful disease-level analysis and interpretation (Institute for Health Metrics and Evaluation, 2025). For comparability across periods, we construct a common 'service basket' for each claim type<sup>8</sup> (i.e., inpatient, outpatient, daycare, pre- and post-hospitalization). We restrict the analysis to the top 100 services nationally ranked by cumulative utilization or expenditure share over the study period. We also removed claims with age >65, which account for 6% to exclude outliers that might affect our estimates.

**To calculate relative price index and service-level price inflation, we used a regression-based model.**

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7 Because Malaysia does not operate under a Diagnosis-Related Group (DRG) classification system commonly used in other health systems, services are defined at the diagnosis level (i.e., group of ICD) rather than DRG groupings. This approach adapts index construction methods used in studies of health care price inflation identified in the literature (see Cooper et al 2019)

8 Definitions of each claim type used in this study are based on MHIT Database Reporting Manual produced by ISM. Emergency care is not coded as a distinct claim type: cases admitted via the emergency department are recorded as inpatient claims, while non-admitted emergency visits are captured under outpatient claims in the emergency accidental outpatient bill field.

Specifically, a generalized linear model with a Gamma distribution and log link fitted to claim-level payment data to predict prices. The Gamma-log specification is appropriate because medical spending is strictly positive and highly right-skewed (Jones, 2011). In our regression model, predicted mean prices derived from the regression represent adjusted service level prices that control for differences in case composition and patient characteristics across time and location (i.e., state of residence). Using these predicted prices, we construct price indices following standard index-number approaches. Relative prices are normalized using 2022 as the base year, and we compute Laspeyres, Paasche, and Fisher price indices to measure changes in service prices while holding the composition of services constant. Additional methodological details are provided in the Annex B.

**To examine the drivers of spending growth, we decompose the change in total private health insurance spending between 2022 and 2024 into four components: price, volume, intensity and setting-mix.** Total spending in each year is expressed as the product of the number of beneficiaries, the number of claims per beneficiary, the distribution of services across care settings (inpatient vs. non-inpatient), and the average price per claim. We use chain-substitution decomposition approach to isolate the contribution of each component to overall spending growth. Starting from baseline spending (i.e., 2022), we sequentially update prices, setting distribution, utilization intensity, and beneficiary population to their 2024 values while holding other factors constant. The difference in spending at each step captures the marginal contribution of the respective component. Full methodological details are provided in the Annex C.



## Scopes and limitations

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**Our analysis has several limitations.** The MHIT central claims database captures claim-level information submitted by private insurers and takaful operators; however, it does not contain a unique patient identifier that links individuals across different insurers, insurance plans or years.<sup>9</sup> Instead, claim records are identified only by policy number, which limits the ability to construct complete longitudinal, person-level utilisation panels or to track service substitution across policies. The absence of a unique patient identifier across insurers significantly limits the analytical potential of the claims data, confining to claim-level observations rather than person-level or episode-based analysis. Unique claimants are proxied using a composite variable constructed using company code, policy number, date of birth, gender, and postcode. This approach can over- or under-count distinct individuals where these fields are missing or erroneous. This also limits the possibility to track individual patients over time, especially when patients change insurers, new policies or cancel private insurance.

**The analysis relies solely on claims data, as detailed membership information is lacking.** There is no dataset containing member-level demographic and enrolment characteristics, including distinctions between group and individual plans or key attributes such as nationality (e.g., local versus foreign members). This limits the ability to conduct a comprehensive analysis of utilization patterns. The absence of a complete membership database makes it difficult to calculate key indicators that require total members as the denominator, such as coverage and utilization rates. BNM primarily monitors the financial performance of insurers rather than population coverage.

**Disease coding follows ICD-10, however coding practices are not fully standardized.** There are inconsistencies in the number of characters recorded and seemingly incomplete capture of secondary diagnoses. This is particularly of interest to accurately assessing case complexity. Procedure codes are available for only about 40 percent of submissions, limiting the accuracy of the surgical indicator and constraining procedure-level analyses. In addition, the linkage of pre- and post-hospitalization claims to corresponding inpatient admissions is imperfect when these components are submitted under separate claim numbers, potentially resulting in incomplete capture of episode-level costs for some cases. Some observations are also missing in key variables, including address information (e.g., approximately 13% missing state) and disaggregated cost components, which may affect the completeness of the analysis. These data limitations are expected in the initial phases of the construction of a comprehensive dataset, and ISM has plans in place to improve data quality and completeness going forward.

**The price trends and cost drivers identified in this study reflect only insurer paid MHIT transactions.** A substantial share of private hospital activity is financed by self-pay patients who are not captured in the MHIT dataset and who often face different pricing structures, discounts, or have different care seeking behaviors. The findings should not be interpreted as representing overall private sector medical inflation.

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<sup>9</sup> Malaysia uses a universal national unique ID system called National Registration Identity Card (NRIC). These were not collected in the centralized MHIT database production process to minimize risks related to data confidentiality and privacy.



## 4. Overall trends in the private health insurance sector

#### 4. Overall trends in the private health insurance sector

**Private health insurance premiums in Malaysia have increased steadily over the years.** Total premiums grew vis-à-vis a modest increase in the number of policies and insured members (Table 5). However, the rise in premiums per member suggests that spending growth is not driven solely by enrolment but also by higher average premiums charged per insured individual. Even after adjusting for inflation, real premiums continued to increase in most years, which reflects underlying medical cost pressures in the private health sector. The ratio of members per policy increased modestly over time, while the share of premiums relative to GDP per capita (per capita income) also rose, pointing to increasing affordability pressures (from 1.8 to 2.2 percent). These numbers indicate that private health insurance premiums in Malaysia have grown faster than both inflation and income growth, which could point to affordability issues of private health insurance.

**TABLE 5**  
**Growth and affordability of private health insurance premiums, 2018–2024**

Year	2018	2019	2020	2021	2022	2023	2024
<b>Gross earned premium</b> (in million, RM)	7,505.6	8,151.0	8,727.5	10,194.5	11,080.6	12,147.2	14,188.8
<b>Number of policies</b> (in million)	6.6	6.9	7.2	7.5	7.7	7.8	7.8
<b>Number of insured members</b> (in million)	9.7	9.9	10.4	11.1	11.5	12.0	11.8
<b>Premium per member</b> (nominal RM)	774	821	838	921	967	1012	1198
<b>Real premium per member</b> (2018 prices, RM)	774	815	842	903	917	936	1089
<b>Nominal total premium growth rate</b>	–	8.6%	7.1%	16.8%	8.7%	9.6%	16.8%
<b>Real total premium growth rate</b>	–	7.9%	8.3%	14.0%	5.1%	7.0%	14.7%
<b>Members per policy</b>	1.462	1.436	1.444	1.468	1.491	1.536	1.508
<b>Premium / per capita income</b>	1.8%	1.8%	2.0%	2.0%	1.9%	1.9%	2.2%
<b>Loss ratio (premium collected/Claim paid)</b>	–	–	–	–	78%	91%	89%

Source of CPI and GDP per capita: World Bank (<https://data.worldbank.org/indicator>). Claim paid is based on the MHIT database

**The age composition of insured members with individual coverage shows a shift towards older cohorts within the private health insurance pool in Malaysia.** The share of elderly increased from 5.0 percent in 2021 to 5.9 percent in 2024 (Table 6 and Table 7). As the share of elderly increased, the ratio of aged 60+ population to relatively healthy adult population (those aged 21–40) increased from 11.7 percent to 14.5 percent over the same period. In contrast, the share of younger members declined slightly.<sup>10</sup> While older members still account

<sup>10</sup> In this analysis, we limit the denominator to the prime working-age group because they form the core premium-paying pool in private health insurance, making them the most relevant benchmark for assessing shifts in the risk composition and resulting cost pressures.

for a relatively small proportion of total insured individuals, their faster growth suggests a gradual change in the risk pool composition. This shift is important, as older members generally have higher healthcare utilization and costs, which may contribute to upward pressure on premiums and claims expenditures.

**TABLE 6**  
**Age distribution of insured members, 2021-2024**

	2021	2022	2023	2024
Share of elderly (aged 60+)	5.0%	5.3%	5.6%	5.9%
Share of youth (aged <20)	26.3%	26.0%	25.7%	25.8%
Ratio of elderly to prime working age population (21-40 years)	11.7%	12.6%	13.5%	14.5%

Source: Authors' analysis of MHIT data. Note: Disaggregated data for group policyholders not available.

**TABLE 7**  
**Insurance enrolment growth rate by age groups, 2021-2024**  
(individual policy holders only)

Age group	2021	2022	2023	2024	Annual growth rate (%)
0-20	1,957,402	1,976,132	1,991,700	2,017,505	1.0%
21-40	3,150,197	3,193,753	3,221,934	3,202,496	0.6%
41-59	1,619,514	1,679,229	1,733,512	1,773,738	3.1%
60+	708,017	751,903	798,483	834,076	5.6%
<b>Total</b>	<b>7,435,130</b>	<b>7,601,017</b>	<b>7,745,629</b>	<b>7,827,815</b>	<b>1.7%</b>

Source: Authors' analysis of MHIT data. Note: Disaggregated data for group policyholders not available.

**Meanwhile total number of claims, total billed amount, and claims paid increased substantially between 2022 and 2024.** Table 8 shows the growth in the number of claims, insurer payments, and total billed amounts across different claim types between 2022 and 2024. Both utilization and spending increased over the period. The total number of claims rose across all major service categories, with highest growth in pre-hospitalization services (92 percent) and post-hospitalization services (50 percent), suggesting increasing use of services surrounding hospital episodes. Outpatient claims also grew rapidly (46 percent), while inpatient claims increased by about 41 percent.

**Consistent with the rise in utilization, insurer expenditures also increased significantly.** Payments by insurers grew most strongly for post-hospitalization services (63 percent) and pre-hospitalization services (77 percent), while spending on inpatient services increased by 51 percent. Total billed amounts show a similar pattern, with inpatient services accounting for the largest share of expenditures and increasing by nearly 49 percent over the period.

#### 4. Overall trends in the private health insurance sector

**TABLE 8**

**Total number of claims, billed and paid amount, 2022-2024**

	2022	2023	2024	Change 2022 to 2024 (delta)	Share of total claims in 2024
<b>Number of claims</b>					
Total	1,751,911	2,222,995	2,486,451	41.9%	100%
Inpatient <sup>11</sup>	650,781	842,489	914,395	40.5%	36.8%
Outpatient <sup>12</sup>	139,732	170,713	204,445	46.3%	8.2%
Pre-hospitalization <sup>13</sup>	62,223	88,958	119,405	91.9%	4.8%
Post-hospitalization <sup>14</sup>	592,534	791,805	888,493	49.9%	35.7%
Daycare treatment <sup>15</sup>	306,109	328,207	357,776	16.9%	14.4%
Other	532	823	1,937	264.1%	0.08%
<b>Total claims paid by insurance in billion (RM)</b>					
Total	8.581	10.993	12.648	47.4%	100%
Inpatient	6.588	8.584	9.939	50.9%	78.6%
Outpatient	0.273	0.336	0.395	44.7%	3.1%
Pre-hospitalization	0.030	0.041	0.053	76.7%	0.4%
Post-hospitalization	0.334	0.457	0.544	62.9%	4.3%
Daycare treatment	1.356	1.575	1.716	26.5%	13.6%
Other	0.000	0.000	0.001	50.9%	0.01%
<b>Total billed amount in billion (RM)</b>					
Total	9.388	11.904	13.626	45.1%	100%
Inpatient	7.173	9.253	10.668	48.7%	78.3%
Outpatient	0.302	0.368	0.430	42.4%	3.2%
Pre-hospitalization	0.038	0.051	0.066	73.7%	0.5%
Post-hospitalization	0.401	0.529	0.615	53.4%	4.5%
Daycare treatment	1.474	1.703	1.846	25.2%	13.5%
Other	0.000	0.000	0.001	–	0.01%

Note: All negative values for the expenditures (less than 0.5% were removed). Claim counts may include multiple records under the same claim number due to data structure or processing differences, leading to minor variations versus distinct counts; these are negligible and do not affect overall trends. Source: Authors' analysis of MHIT data.

**Claims and spending are concentrated among the working-age population with the overall distribution remaining largely stable from 2022 to 2024.** Claims and total billed amounts show a broadly stable distribution across age groups (Figure 10) and states (Table 9) over the study period. Most claims and spending are concentrated among the working-age population (25–64), while the 65+ group accounts for a smaller share of claims but a relatively larger share of total bills, reflecting higher treatment costs among the small number of older patients not excluded from coverage. Geographically, claims are concentrated in more urbanized and populous states, particularly Selangor, Johor, and Pulau Pinang, which consistently account for the largest shares of both claims and total bills.

11 Inpatient – Insured undergoes a surgical/treatment which requires an overnight stay at a healthcare facility. Reference: MHIT Database Reporting Manual by ISM (2024).

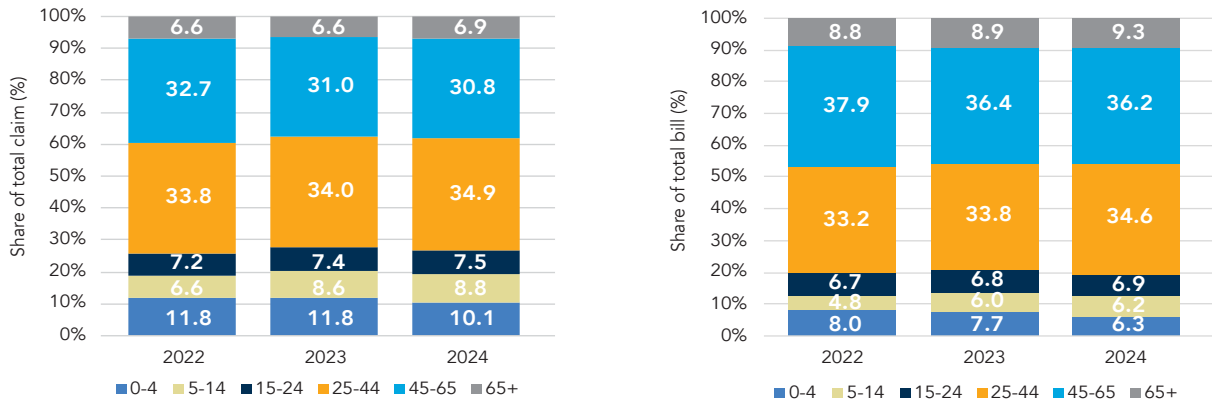
12 Outpatient- Insured undergoes procedure or had a consultation with a doctor before/after hospitalization within a limited period from the admission/ discharge date, or as outpatient for cancer treatment, dialysis, physiotherapy etc. Reference: MHIT Database Reporting Manual, ISM (2024).

13 Pre-hospitalization – Expenses incurred at the hospital prior to admission. Reference: MHIT Database Reporting Manual, ISM (2024).

14 Post-hospitalization- Medical expenditure that are incurred after insured discharged from the hospital. Reference: MHIT Database Reporting Manual, ISM

15 Daycare – Medical treatment that requires hospitalization less than 24 hours. Reference: MHIT Database Reporting Manual, ISM (2024).

**FIGURE 10**  
Distribution of claims and total bill by age group, 2022-2024



**TABLE 9**  
Distribution of claims by state, 2022-2024

State	Total claims			Total bills		
	2022	2023	2024	2022	2023	2024
Selangor	33%	32%	33%	36%	35%	35%
Johor	14%	15%	15%	14%	15%	16%
Pulau Pinang	15%	16%	15%	13%	13%	13%
Kuala Lumpur	7%	8%	8%	8%	8%	9%
Perak	7%	7%	7%	7%	7%	7%
Melaka	6%	6%	5%	6%	6%	5%
Negeri Sembilan	4%	4%	4%	4%	4%	4%
Kedah	4%	4%	4%	3%	4%	3%
Sarawak	3%	3%	3%	2%	2%	2%
Sabah	1%	1%	2%	2%	2%	2%
Pahang	2%	2%	2%	2%	2%	2%
Kelantan	1%	1%	1%	1%	1%	1%
Terengganu	1%	1%	1%	1%	1%	1%
Perlis	0%	0%	0%	0%	0%	0%
Labuan	0%	0%	0%	0%	0%	0%
Putrajaya	0%	0%	0%	0%	0%	0%

Note: State information is missing for 13% of claims. Source: Authors' analysis of MHIT data

**Claims made by foreigners account for about 25 to 30 percent of all claims, and generate higher average total billed amount per claim compared to locals.** The distribution of claims by nationality shows that locals account for most of both total claims and total bills, consistently representing around 75 percent of claims and total charges, while foreigners accounts for about 25 percent of claims of total charges (Table 10). This pattern is consistent with higher total bill per claim among foreigners, which exceeds that of locals across all years (e.g., RM 5,464 vs RM 4,949 in 2024). This suggests that, on average, healthcare episodes involving foreign patients tend to be more costly.

**TABLE 10**  
Distribution of claims by nationality, 2022-2024

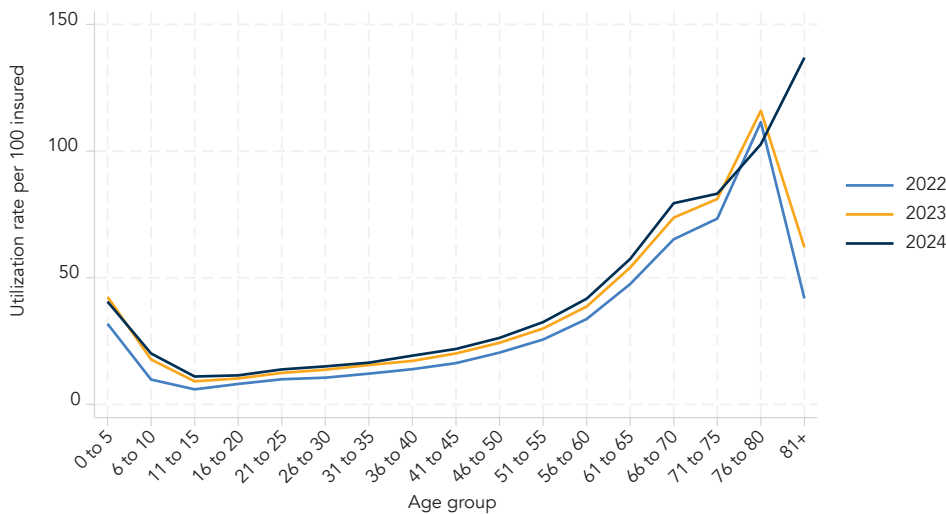
Nationality	Total claims			Total bills (in million RM)		
	2022	2023	2024	2022	2023	2024
Locals	1,378,717 (78%)	1,698,000 (76%)	1,909,758 (77%)	6,453.4 (75%)	8,150.1 (74%)	9,450.7 (75%)
Foreigners	397,772 (22%)	550,606 (24%)	586,076 (23%)	2,136.0 (25%)	2,852.2 (26%)	3,202.5 (25%)

Source: Authors' analysis of MHIT data

#### 4. Overall trends in the private health insurance sector

**The age profiles of utilization and costs suggest a strong life-cycle pattern.** Utilization rate, which is simply the number of claims divided by total insured members, increase with age, rising from young adulthood and accelerating after around age 50 (Figure 11). The increase becomes steep among older age groups, with the highest utilization observed among those aged 70 and above. A similar pattern is observed for the cost curve, defined as total claim expenditures divided by the number of claims (Figure 12). Claim per member increases modestly at younger ages but rises among older members, especially after age 60, which suggests that not only do older insured individuals use services more frequently, but the services they consume are also more expensive. Across the three years shown, both utilization and cost curves shift upward. These patterns highlight that as the insured population ages, both the frequency of claims and the cost per claim increase.

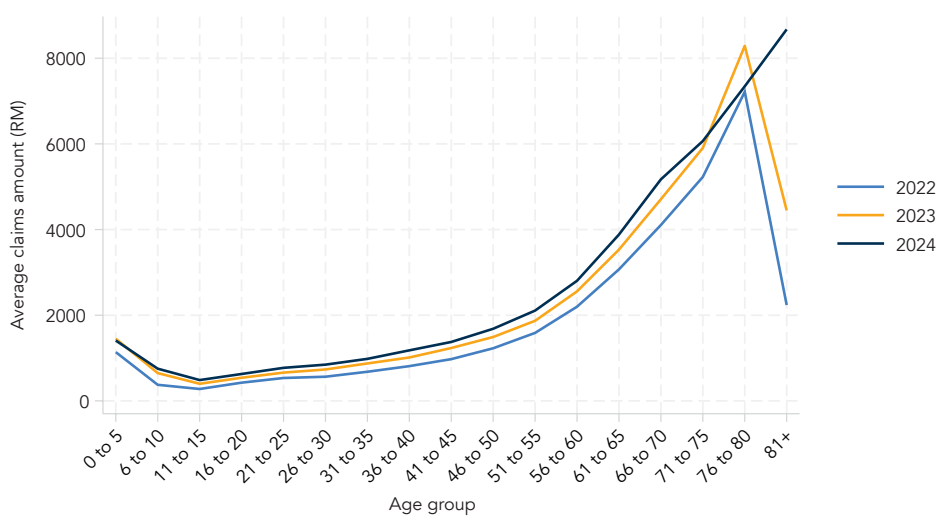
**FIGURE 11**  
Average number of claims by age groups, 2022-2024



Note: This analysis covers individual products only. Age disaggregated overall membership figures for group plan subscribers is not available; therefore, group plan subscribers claims are excluded. Utilization rates may be slightly overstated due to potential overcounting of claims and differences in submission practices (e.g., single vs. multiple claims per admission). These variations are minor and do not materially affect overall patterns.

Source: Authors' analysis of MHIT data

**FIGURE 12**  
Average claims paid amount by age groups, 2022-2024



This analysis covers individual products only. Age disaggregated overall membership figures for group plan subscribers is not available; therefore, group plan subscribers claims are excluded.

Source: Authors' analysis of MHIT data



## 5. Service-level medical inflation

## 5. Service-level medical inflation

### We estimate service-level medical inflation using regression-adjusted price indices from MHIT data to specifically isolate the role of price changes in private health insurance spending growth.

Service inflation refers to the change in the price of comparable healthcare services over time, holding constant the composition of services, diseases, and patient characteristics. This measure differs from official inflation statistics reported by DOSM. The official estimates of DOSM are medical inflation using the CPI, which captures retail price changes faced by the representative Malaysian household across a broad basket of healthcare goods and services. The report estimates price growth observed in private health insurance claims, which is subscribed by a smaller share of the population and covers mostly expensive inpatient services. While both measures track price changes in healthcare, CPI-based estimates reflect consumer-facing prices, whereas the approach used in this study captures service-level provider prices within the insured healthcare market. The two measures are conceptually related but not directly comparable. Our estimates are designed to isolate price changes for specific services within the private health insurance sector.

**We estimate service-level medical inflation separately by claim type.** This choice was made because the inputs required in the production of healthcare varies by whether services were received in inpatient or outpatient settings. Therefore, estimations is done separately for inpatient services, outpatient and daycare services, and pre- and post-hospitalization services. For illustration, Table 11 presents the regression-adjusted predicted prices for 50 diseases within the inpatient service basket, ranked by their share of total inpatient claims. The full list of the predicted prices for the 100 services included in the common basket (i.e., inpatient, outpatient/daycare, and pre- and post-hospitalization) is reported in the Annex D. These predicted prices reflect the estimated cost of comparable services after controlling for patient characteristics, payment modality, and geographic factors. The advantage of using this methodology is that price changes can be tracked to the service level. This enables the identification of specific services that could be more vulnerable to price changes, and warrant attention.

**TABLE 11**  
**Predicted price for 50 selected inpatient service baskets (in RM)**

Disease category	Share to total claim (2022-2024)	2022	2023	2024
Lower respiratory infections	14.9%	8,874 (8,807–8,941)	8,897 (8,841–8,954)	9,314 (9,257–9,372)
Other unintentional injuries	9.5%	11,972 (11,869–12,075)	11,855 (11,764–11,946)	11,852 (11,765–11,939)
Diarrheal diseases	7.6%	6,717 (6,645–6,789)	7,022 (6,958–7,085)	7,264 (7,207–7,320)
Upper respiratory infections	5.5%	8,473 (8,371–8,575)	8,508 (8,427–8,590)	8,791 (8,706–8,876)
Other unspecified infectious diseases	4.0%	8,499 (8,386–8,612)	8,036 (7,945–8,126)	8,644 (8,541–8,747)
Upper digestive system diseases	4.0%	7,370 (7,276–7,464)	7,365 (7,277–7,453)	7,968 (7,877–8,059)
Gout	3.6%	11,952 (11,781–12,124)	11,535 (11,388–11,682)	12,060 (11,918–12,203)
Low back pain	3.6%	12,223 (12,050–12,395)	12,321 (12,165–12,476)	12,772 (12,618–12,926)
Urinary diseases and male infertility	3.3%	9,637 (9,501–9,773)	9,981 (9,849–10,113)	10,469 (10,337–10,602)
Ischemic heart disease	3.1%	14,897 (14,655–15,138)	14,784 (14,567–15,001)	15,315 (15,104–15,527)
Dengue	3.1%	7,276 (7,143–7,410)	7,598 (7,501–7,694)	8,000 (7,897–8,103)

## 5. Service-level medical inflation

General signs and symptoms	2.5%	8,032 (7,895–8,168)	7,906 (7,791–8,020)	8,395 (8,276–8,515)
Other neoplasms	2.4%	12,706 (12,493–12,918)	13,504 (13,288–13,721)	14,309 (14,090–14,527)
Gynecological diseases	2.4%	10,686 (10,506–10,866)	10,917 (10,745–11,088)	11,690 (11,514–11,866)
Other digestive diseases	2.4%	8,951 (8,802–9,099)	9,224 (9,078–9,369)	9,775 (9,629–9,922)
Adverse effects of medical treatment	2.2%	8,333 (8,190–8,475)	8,133 (8,008–8,259)	7,932 (7,806–8,059)
Bacterial skin diseases	2.0%	8,855 (8,692–9,018)	8,852 (8,702–9,002)	9,260 (9,114–9,406)
Inflammatory bowel disease	1.5%	6,798 (6,668–6,928)	7,187 (7,039–7,334)	7,906 (7,749–8,063)
Other chronic respiratory diseases	1.5%	11,629 (11,370–11,889)	11,839 (11,615–12,063)	12,081 (11,858–12,304)
Other sense organ diseases	1.5%	6,340 (6,203–6,478)	6,697 (6,565–6,830)	6,828 (6,704–6,952)
Other neglected tropical diseases	1.4%	7,618 (7,435–7,802)	7,926 (7,778–8,074)	8,328 (8,166–8,489)
Appendicitis	1.3%	14,598 (14,281–14,914)	14,833 (14,520–15,146)	15,561 (15,249–15,872)
Gallbladder and biliary diseases	1.2%	13,753 (13,425–14,080)	13,937 (13,628–14,246)	14,699 (14,388–15,011)
Endocrine, metabolic, blood, and immune disorders	1.0%	10,464 (10,191–10,737)	10,906 (10,646–11,166)	11,367 (11,110–11,623)
Primary hypertension	1.0%	8,169 (7,947–8,391)	8,585 (8,377–8,793)	8,934 (8,725–9,142)
Stroke	0.8%	15,801 (15,341–16,261)	15,977 (15,543–16,410)	16,342 (15,915–16,769)
Diabetes mellitus	0.7%	11,041 (10,688–11,394)	11,283 (10,970–11,597)	12,097 (11,783–12,410)
Chronic kidney disease	0.7%	9,812 (9,497–10,127)	10,473 (10,163–10,783)	11,626 (11,303–11,950)
Breast cancer	0.7%	12,311 (11,908–12,714)	12,695 (12,309–13,080)	13,857 (13,446–14,267)
Other neurological disorders	0.6%	13,059 (12,601–13,517)	13,144 (12,732–13,557)	13,812 (13,402–14,222)
Neck pain	0.6%	12,498 (12,063–12,934)	12,679 (12,284–13,075)	12,050 (11,692–12,409)
Headache disorders	0.6%	7,248 (6,990–7,505)	7,342 (7,100–7,584)	7,721 (7,493–7,948)
Otitis media	0.5%	8,572 (8,239–8,906)	8,738 (8,451–9,024)	8,265 (8,004–8,526)
Other skin and subcutaneous diseases	0.4%	6,945 (6,682–7,209)	7,227 (6,967–7,486)	7,470 (7,215–7,725)
Colon and rectum cancer	0.4%	17,505 (16,787–18,223)	14,698 (14,173–15,223)	17,636 (16,998–18,274)
Inguinal, femoral, and abdominal hernia	0.4%	8,974 (8,638–9,310)	9,493 (9,151–9,835)	9,922 (9,555–10,290)
Viral skin diseases	0.4%	6,721 (6,487–6,954)	6,972 (6,727–7,216)	7,110 (6,814–7,406)

## 5. Service-level medical inflation

Other cardiovascular and circulatory diseases	0.4%	10,152 (9,706–10,599)	10,225 (9,825–10,625)	10,870 (10,467–11,273)
Blindness and vision loss	0.4%	10,877 (10,397–11,357)	11,151 (10,697–11,604)	11,471 (11,009–11,934)
Poisonings	0.3%	7,013 (6,656–7,371)	7,395 (7,106–7,683)	7,337 (7,053–7,622)
Osteoarthritis	0.2%	15,576 (14,601–16,552)	14,812 (14,078–15,545)	13,974 (13,377–14,571)
Tracheal, bronchus, and lung cancer	0.2%	18,385 (17,394–19,376)	19,246 (18,275–20,217)	20,606 (19,599–21,613)
Asthma	0.2%	7,313 (6,920–7,706)	7,909 (7,505–8,313)	7,249 (6,866–7,631)
Idiopathic epilepsy	0.2%	9,899 (9,335–10,464)	11,654 (11,050–12,259)	11,206 (10,658–11,755)
Dermatitis	0.2%	8,432 (7,865–8,999)	9,226 (8,726–9,726)	9,555 (9,121–9,989)
Leukemia	0.2%	27,473 (25,889–29,058)	29,074 (27,435–30,713)	29,074 (27,536–30,612)
Paralytic ileus and intestinal obstruction	0.2%	14,068 (13,277–14,859)	13,049 (12,321–13,776)	14,320 (13,529–15,111)
Hemoglobinopathies and hemolytic anemias	0.2%	9,115 (8,554–9,677)	9,051 (8,559–9,543)	10,674 (10,097–11,250)
Non-Hodgkin lymphoma	0.2%	19,945 (18,684–21,207)	20,284 (19,063–21,506)	20,802 (19,622–21,983)
Varicella and herpes zoster	0.2%	10,424 (9,611–11,238)	10,595 (10,010–11,180)	10,698 (10,124–11,273)

Source: Predicted prices using Generalized Linear Model.

**Our analysis suggests modest service-level medical inflation.** In our analysis, price changes are aggregated using Laspeyres, Paasche, and Fisher index formula. Table 12-14 presents regression-adjusted price indices and year-on-year inflation rates for inpatient, outpatient/day care, and pre- and post-hospitalization services using Laspeyres, Paasche, and Fisher formulas. We observed consistency across index methods and our results are not sensitive to alternative weighting approaches.

**For inpatient services, price growth remained relatively modest in 2023 but accelerated in 2024.** Inflation increased from less than 1 percent in 2023 to slightly above 4 percent in 2024 across all index measures. Averaged over the two-year period, inpatient prices grew by roughly 2.6 percent annually. We observe different patterns for outpatient and day-care services. For outpatient services, prices increased more strongly in 2023, with inflation exceeding 4 percent, but this increase was not sustained in the following year. In 2024, price growth stabilized and slightly declined. The two-year average indicates modest price growth of around 2 percent per year. For pre- and post-hospitalization services, price increases were more gradual but persistent across both years. Inflation rose from around 2.4 percent in 2023 to about 3.4 percent in 2024, with very similar estimates across index formulas.

**These results indicate that service-level medical inflation in Malaysia's private health insurance sector has been moderate but uneven across service categories.** Inpatient services experienced the most notable acceleration in price growth in the most recent year, while outpatient prices showed signs of short-term stabilization. Pre- and post-hospitalization services exhibited the most consistent upward trend, pointing to steadily increasing costs in services associated with the continuum of hospital care. See Annex B for the mathematical intuition and Annex D for the results of relative prices by disease groups and by year.

**TABLE 12**  
Inpatient inflation and relative prices

Year	Laspeyres		Paasche		Fisher	
	Price index	YoY Inflation	Price index	YoY Inflation	Price index	YoY Inflation
2022	100	–	100	–	100	–
2023	100.85	0.85	100.8	0.8	100.83	0.83
2024	105.2	4.32	105.11	4.27	105.16	4.3

**TABLE 13**  
Outpatient/daycare inflation and relative prices

Year	Laspeyres		Paasche		Fisher	
	Price index	YoY Inflation	Price index	YoY Inflation	Price index	YoY Inflation
2022	100	–	100	–	100	–
2023	104.89	4.89	104.17	4.17	104.53	4.53
2024	104.38	-0.49	103.79	-0.37	104.08	-0.43

**TABLE 14**  
Pre- and post-hospitalization inflation and relative prices

Year	Laspeyres		Paasche		Fisher	
	Price index	YoY Inflation	Price index	YoY Inflation	Price index	YoY Inflation
2022	100	–	100	–	100	–
2023	102.42	2.42	102.48	2.48	102.45	2.45
2024	105.86	3.37	106.06	3.49	105.96	3.43



## 6. Drivers of cost growth and decomposition

**To inform policies to address cost growth in MHIT sector, it is necessary to examine the exact sources driving costs.** Mechanically, cost is a product of prices and quantities, therefore, overall spending can increase with changes in prices or quantities. In practice, prices also affect quantities and vice versa. Prices are influenced by cost of inputs, such as, doctors' fees, pharmaceutical costs, etc. Regulatory factors such as regulation of professional fees and payment mechanisms in use directly affect prices, and they may also generate incentives for increase or decrease quantities. Quantities measure volume of health services, which includes both utilization and intensity. In an insurance setting, besides underlying population health needs, there is evidence of moral hazard driving utilization (Pauly, 1968; Newhouse, 1993; Finkelstein, 2014). Moral hazard refers to the situation where having insurance changes people's behaviour in a way that increases healthcare spending. When people are protected from the full cost of medical care, they may use more services (demand-side moral hazard) and doctors may also provide more services (provider-induced demand, or supply-side moral hazard).

**Changing demographics and patients' risk profile and the technology-mix used in health service production are also important components of cost growth.** A more aged population is likely to demand more and complex services. The adoption of new technologies (such as, GLP-1 drugs for obesity and advancements in robotic surgery) will increase costs, at least in the short-run.<sup>16</sup> Newhouse (1992), a seminal paper in the field, decomposes healthcare spending growth in the United States, and shows that medical innovation, enabled by insurance and rising income, is the dominant force behind healthcare spending growth. The paper finds that rising prices alone was not the main cause, instead most of cost growth was explained by which services were being purchased. In Table 15 below, we summarize the key components that drive cost growth in insurance markets such as the MHIT sector.

**TABLE 15**  
**Framework for analysing cost growth in insurance markets**

Component	Focus areas	Description	Key drivers
<b>Demographics and risk profile</b>	Patient acuity, aging, chronic disease	Changes in the health status of the insured population, for example, sicker patients requiring more complex care	Epidemiological and demographic change, increased access and incomes, adverse selection
<b>Price and unit cost</b>	Input prices, including professional fees, drug pricing, labor costs	"Sticker price" of services, including hospital rate hikes, rising healthcare worker wages, the cost of specialty pharmaceuticals	Price regulation, payment mechanisms, hospital/insurer market power, pharmaceutical policy, etc.
<b>Volume and utilization</b>	Admissions, visit frequency, intensity of use	Which services are being used and how often, often driven by an aging population, increased access to care	Patient- and provider- induced demand (moral hazard), price related drivers can also indirectly drive volume
<b>Technology mix</b>	New therapies, AI, diagnostic intensity	Shifts towards more expensive treatments (for example, GLP-1 drugs for obesity or advanced robotic methods) vs. traditional methods	Inadequate HTA function, market competition, patient- and provider-induced demand
<b>Admin and operational costs</b>	Claims management, data security, compliance, profits	Insurers' internal costs, including billing, regulatory compliance, profit margins	Claims and billing complexity, regulatory burden, hospital's profit expectation

<sup>16</sup> In the long-run, such technologies may lower costs. For example, by lowering the incidence of obesity, GLP-1 drugs could also lower obesity-related health spending in the long-run. In addition, new technologies also become cheaper over time.

**The current MHIT data allow us to decompose cost growth between 2022 and 2024 into four components – prices, volume, use intensity and setting-mix.** These capture, holding other factors constant:

- **Prices:** Change in prices (billed amount) per service
- **Volume:** Utilization by new users, including those who are newly insured, and those who were insured but did not use services in prior years
- **Use intensity:** Increased frequency or complexity of services by patients
- **Setting-mix:** Shifts from in-patient to daycare or out-patient settings

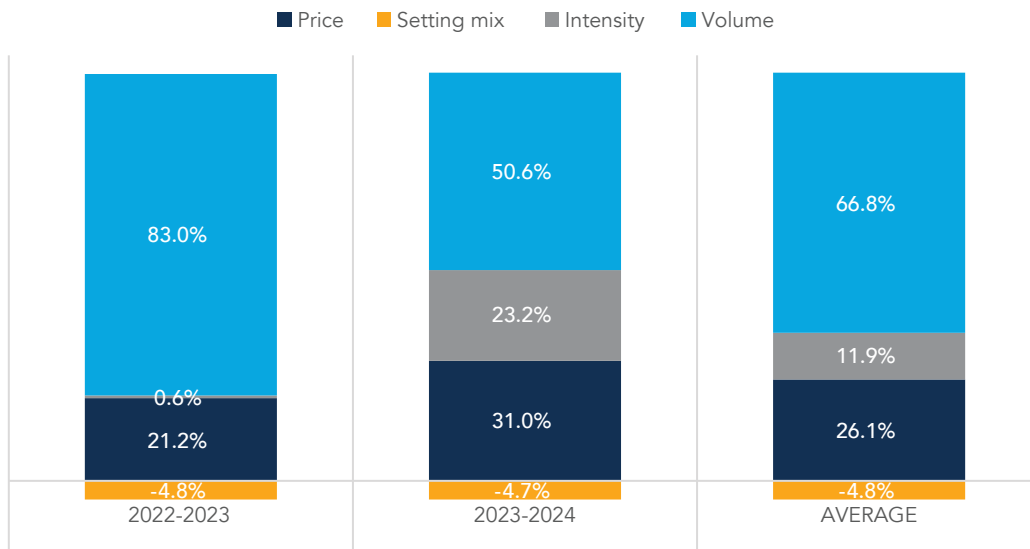
Volume captures utilization increases along the extensive margin – more people using healthcare services. Use intensity includes insured people using healthcare services with greater frequency or intensity, i.e. the intensive margin. In the central claims database, it is not possible to isolate the effect of demographic changes for several reasons. First, we do not have access to a database of subscribers, instead we have only the database of insured people who generated claims. Second, the data span only three years; changes due to demographics materialize over a longer time period. Change in the setting mix, for example, shifting care from inpatient to outpatient or daycare, alters costs because these settings have different cost structures and reimbursement rates. As more services move toward lower-cost settings like outpatient and daycare, overall average treatment prices typically decline even if the volume of care remains constant. Other mechanisms, such as moral hazard and competitive dynamics between hospitals and insurers, are likely to be important but are harder to pin down empirically with the current data (and the timeframe of the production of this report). We instead offer a structured discussion and present suggestive evidence where possible. These latter channels remain promising areas for further investigation and should be kept in view in future work and ongoing policy considerations.

**To decompose total cost into its components, we apply a sequential chain rule substitution decomposition.**

Total spending in each year was expressed as the sum across demographic groups (defined by age and sex) of the number of beneficiaries, average claims per beneficiary, the distribution of claims across care settings (inpatient and non-inpatient), and the average price per claim. This identity frames spending as the product of population size, utilization of intensity, setting distribution, and price. To quantify the contribution of each component to overall spending growth, we applied a sequential chain substitution decomposition, starting from 2022 baseline spending and updating one factor at a time, first prices, then setting mix, followed by utilization, and finally beneficiary demographics, while holding the others constant. The incremental change at each step represents the effect attributable to that component, and by construction, the sum of these effects equals total spending growth between 2022 and 2024. This approach has direct policy relevance: by identifying whether growth is primarily driven by price increases, greater utilization intensity, shifts toward higher-cost settings, or expansion of the insured population. With such information, policymakers and insurers can better target interventions, such as provider payment reforms, utilization management, network design, or risk adjustment, rather than relying on blunt premium adjustments alone. Please refer to Annex C for details of the methodology.

**The decomposition shows that this growth was primarily driven by volume.** The volume effect accounted for 66.8 percent of total spending growth between 2022 and 2024, making it the dominant driver (Figure 13). This indicates that expenditure expansion was largely due to an increase in the number of claim-generating beneficiaries within age–sex groups. The price effect accounted for 26.1 percent of total cost growth, reflecting increases in spending per event while holding beneficiary volume and utilization intensity constant. This suggests that per claim costs exerted meaningful upward pressure on total spending, even in the absence of volume expansion. The intensity (use per beneficiary) effect contributed only marginally to overall growth, indicating limited changes in the number of claims per beneficiary or in service complexity per case.

**FIGURE 13**  
Results of decomposition analysis



**In contrast, the setting mix effect slightly offset total growth, reducing overall spending growth.** This suggests a modest shift toward lower-cost care settings or redistribution of cases across service types that partially mitigated cost pressures. Overall, the results indicate that private insurance spending growth during this period was overwhelmingly volume-driven, with pricing dynamics playing a secondary but non-negligible role, and minimal contribution from changes in utilization intensity.

**While the current data do not allow robust analysis of other factors, such analysis could be possible as the MHIT database evolves.** The centralized MHIT database contain rich information that can be exploited in the future to shed greater light on the drivers of cost growth. There is a wide economics literature examining aspects such as competition among insurers and hospitals, adverse selection and moral hazard, etc. and their impacts on the insurance sector. Below we highlight some key areas of inquiry that should be considered in the future.

- **Input price growth**

The production of health services needs a range of inputs, including pharmaceuticals, medical supplies, diagnostic services, capital equipment, and skilled labour. When price of inputs rise, providers often pass higher costs on to patients and/or insurers. For a detailed analysis, itemized billing data is required, which is not available in the current database. The database has provision for disaggregated billed amounts by hospital room and board, ICU fees, physician fees, anaesthesiologist fees and hospital supplies and services (HSS). HSS breakdown is further disaggregated into supplies (dressings, splints, casts, etc.), laboratory charges (diagnostic procedures such as X-rays, electrocardiograms, etc.), drugs and medicines, and others (physiotherapy, blood and blood plasma, etc.). As discussed earlier, the data are currently incomplete, however starting in 2026, insurers are mandated to provide the breakdowns.

HSS charges accounted for 70 percent of total costs in inpatient MHIT claims, and there is evidence that its share is increasing. Across all hospitals in the centralized MHIT database, HSS represented 70 percent of total charges in 2022, increasing to 72 percent in 2023, and to 74 percent in 2024 (Table 16). We also estimate the share of HSS by parsing hospitals into three categories, by total claim volume. On one hand, relative to smaller hospitals, larger ones (proxied by claims volume) may be able to reduce HSS costs through procurement efficiency. On the other hand, larger hospitals could be treating more complex patients or offering more

## 6. Drivers of cost growth and decomposition

premium services. The data suggest that between 2022 and 2024, the share of HSS rose faster for hospitals with higher claim volume. As the centralized MHIT database matures, there will be increased opportunity to analyse the relative effect of input price growth in total cost growth. In the meantime, to improve transparency and reduce unjustified price variation, Malaysia has introduced mechanisms such as the mandatory display of drug prices in private healthcare facilities, including private hospitals, allowing patients to compare prices and encouraging more accountable pricing practices.<sup>17</sup>

**TABLE 16**  
**Share of HSS to total hospital bill (Inpatient only)**

	Low claim volume hospital	Medium claim volume hospital	High claim volume hospital	Total
2022	71.0%	71.9%	71.4%	71.5%
2023	71.7%	72.2%	72.3%	72.1%
2024	73.1%	74.7%	75.3%	74.2%

Source: Authors' analysis of MHIT database

### • Competition among insurers and hospitals

Market structure and bargaining power between insurers and hospitals can significantly influence healthcare prices. When hospitals (insurers) face increased competition, their ability to negotiate prices with insurers (hospitals) is lower. Evidence from other countries shows that hospitals in more concentrated markets charge substantially higher prices than those in competitive markets (Cooper et al. 2019), even after accounting for differences in quality and patient characteristics. The dataset contains hospital identifiers which allow the construction of indices of concentration such as the Herfindahl–Hirschman Index (HHI),<sup>18</sup>. This measure captures the degree of provider concentration, where higher values indicate fewer hospitals dominating the market. Our preliminary analysis based on MHIT claims shows that there is substantial variation in concentration across Malaysian states. Large and more urbanized markets such as Selangor, Johor, Kuala Lumpur, and Pulau Pinang exhibit relatively low HHIs, suggesting more competitive provider markets. In contrast, several smaller states, such as Kelantan, Terengganu, Sabah, and Pahang, display high levels of concentration, suggesting fewer competing hospitals. These patterns suggest that hospital competition varies significantly across states, which may influence price levels. A robust analysis is not possible with the central claims data because it does not contain utilization by self-pay patients, which may be substantive. This remains an important area for future research.

### • Price regulation

In healthcare, price regulation typically set limits to the prices providers can charge for medical services. By regulating prices, governments can directly constrain cost growth and reduce variation in charges across providers. This typically works when regulation applies to all components - professional fees, pharmaceuticals, inpatient room and board, etc. When prices are unregulated, providers charges are often determined through market negotiations between providers (hospitals, physicians) and payers (insurers, patients) (Barber, et al., 2019). In Malaysia, professional fees for private providers are regulated by MoH through a fee schedule on doctors' consultation and procedural charges (Private Healthcare Facilities and Services Act 1998). The Act

17 The mandatory display of drug prices at private general practitioner (GP) clinics, hospitals, and community pharmacies will be enforced under the Price Control and Anti-Profitteering Act 2011 (Act 723)

18 HHI was calculated based on the distribution of claims across hospitals within each state. Specifically, we compute the market share of each hospital in a state using its share of total claims and then sum the squared market shares across all hospitals in that state

sets limits on doctors' and surgical fees; however, it does not extend regulatory oversight to other components such as laboratory tests, imaging, pharmaceuticals, and nursing services (Ng et al., 2024; Yap, et al., 2019). When professional fees are regulated, but other costs are not, there may be strong incentives for healthcare professionals to ensure their target income by extracting profits from increasing volume of HSS and other services with high margins. This is another area of analysis, and subsequently policy intervention, that should be considered in the future.

- **Provider payment mechanisms**

In the private sector, health services are largely billed under a fee-for-service (FFS) model, where hospitals and physicians charge separately for consultations, procedures, diagnostics, consumables, and other ancillary services. This payment structure tends to encourage greater service intensity and itemised billing, potentially contributing to higher healthcare costs (Robinson et al., 2013). Under the government's RESET strategy, there are plans to gradually introduce DRG based payments in the private healthcare sector. DRG payments provide a fixed bundled payment for a defined episode of care, rather than reimbursing each individual service separately. This approach is intended to improve cost transparency, encourage more efficient resource use, and reduce incentives for excessive or unnecessary services. The reform will be implemented gradually, with initial coverage of selected procedures and conditions and a gradual expansion over time. Industry stakeholders expect that 20-30 percent of procedures could eventually be reimbursed under DRG arrangements in the early phase, with broader adoption as the system matures. The gradual transition to DRGs from FFS presents an opportunity to analyse the role of provider payment mechanisms on cost growth and should be considered. See Table 17 for an overview of different provider payment mechanisms and the incentives generated.

**TABLE 17**  
**Different provider payment methods and its impact on costs**

Provider payment mechanism	How does the payment work?	Provider incentive	Impact on total costs
Fee-for-service (FFS)	Providers are paid for each service, test, or procedure performed	Increase service volume and intensity	Higher total costs due to more services delivered
Diagnosis-Related Groups (DRGs)	Fixed payment per diagnosis or hospital episode	Control treatment costs within the payment amount for each case	Encourages efficiency within a group, but may lead to shorter stays, service substitution, and shifts from outpatient to inpatient
Bundled payments	Single payment covering all services within an episode of care	Coordinate care and reduce unnecessary services	Reduces duplication and can lower total costs
Global budget/capitation	Fixed per capita budget allocation over a period	Control both volume and costs of care	Strong cost control but risk of under-provision of services

• **Technological innovation**

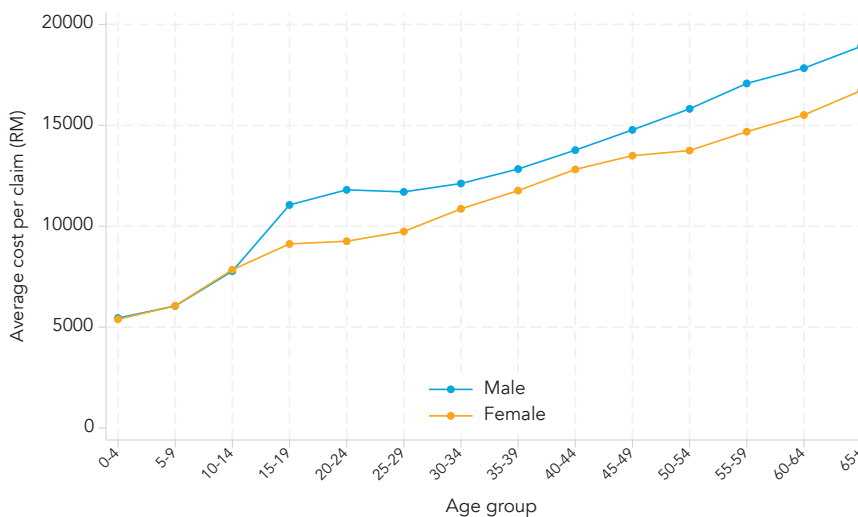
**New medical technologies can affect prices in either direction.** On one hand, new diagnostic equipment, surgical devices, and advanced treatment technologies often require substantial capital investment, specialized training, and ongoing maintenance, which can increase healthcare costs. Earlier empirical works in the US suggest up to 50 percent increase in health spending in the last decades is driven by technology (Smith, Newhouse, and Freeland, 2009). However, some technologies can also improve efficiency by shortening hospital stays, reducing complications, or replacing more invasive and costly procedures (Skinner and Staiger, 2015). The overall effect of technology on prices therefore depends on whether innovation increase service intensity or improve productivity and efficiency (Newhouse, 1992; Cutler & McClellan, 2001).

**In Malaysia’s private healthcare sector, the adoption of new technologies is not governed by a formal Health Technology Assessment (HTA).** In contrast, in the public sector, the adoption of advanced imaging equipment, medical devices, and innovative treatment technologies must undergo rigorous HTA process. In the private sector, investment decisions are largely driven by market demand, competitive positioning, and expectations of financial returns. Evidence from other countries reveal that private hospitals often introduce new technologies (without cost-effective evaluation) to attract patients, differentiate services, and expand high revenue clinical offerings. This market-driven adoption raises capital and operating costs, which are subsequently reflected in higher hospital charges.

• **Demographic characteristics**

**A rapid demographic transition will influence health spending through increase in utilization of services both along the intensive and extensive margins.** As populations age, the burden of chronic diseases and multi-morbidity increases, leading to the need for more frequent diagnostic tests, procedures, and follow-up visits within each episode of care. Older patients also tend to require more complex treatments and longer hospital stays, which increases the intensity of services delivered per claim. Gender differences in health needs and utilization patterns can contribute to variation in service intensity. Figure 14 shows the average cost per claim increases steadily with age for both males and females. Given the short timeframe of the data, it is difficult to credibly isolate the cost effect of demographic changes. Nevertheless, as Malaysia transitions towards an aged society, demographic shifts will contribute to rising healthcare spending even when the number of beneficiaries remains constant over time.

**FIGURE 14**  
Average cost per claim by age and sex (Inpatient)



- **Adverse selection**

**If sicker people purchase MHIT products more than the non-sick, total claims will increase.** This phenomenon – adverse selection – occurs when individuals with a higher expected need for healthcare are more likely to enrol in or maintain health insurance than healthier individuals because they possess better information about their health risks than insurers. In voluntary insurance markets, people who anticipate higher medical expenses, such as those with chronic conditions or ongoing treatment needs, have stronger incentives to purchase comprehensive coverage, while healthier individuals may delay enrolment or opt for less coverage. This imbalance leads to a risk pool that is disproportionately composed of high-risk individuals, increasing the average cost of claims for insurers. As claims costs rise, insurers may respond by increasing premiums or adjusting benefits, which can further discourage low-risk individuals from participating and reinforce the cycle of rising costs (Cutler and Zeckhauser, 1998; Pauly and Nicholson, 1999).

**In MHIT sector, coverage is attained through group and/or individual insurance schemes, which differ in how risks are pooled and premiums are determined.** Group insurances are offered by employers, which pools employees within a larger and more diverse risk group, allowing insurers to spread healthcare costs across both healthier and higher-risk individuals. In 2024, about 67 percent of the insured population had group plans. Individual policies are more prone to adverse selection. To address this, private health insurance products in Malaysia follow a risk-rated pricing structure, where premiums vary based on factors such as age, gender, smoking status, health condition, and occupational risk (Jarrah, 2018). This approach helps mitigate adverse selection; wherein higher-risk individuals are more likely to purchase coverage. Through underwriting assessments, insurers evaluate the risk profile of applicants and set premiums that are commensurate with the expected level of risk (Hiew, 2025; Kefeli and Jones, 2012). Individuals with pre-existing conditions or advanced age often face higher premiums, exclusions, or outright denial of coverage. Those diagnosed with cancer or living with HIV, for example, encounter significant barriers in obtaining PHI (Kong et al, 2020).

**TABLE 18**  
**Distribution of claims by age and sex (Group and individual plans)**

Population type	Group	Individual
Elderly (Aged 65 and above)	2%	10%
Under 5	10%	10%
Male	53%	47%

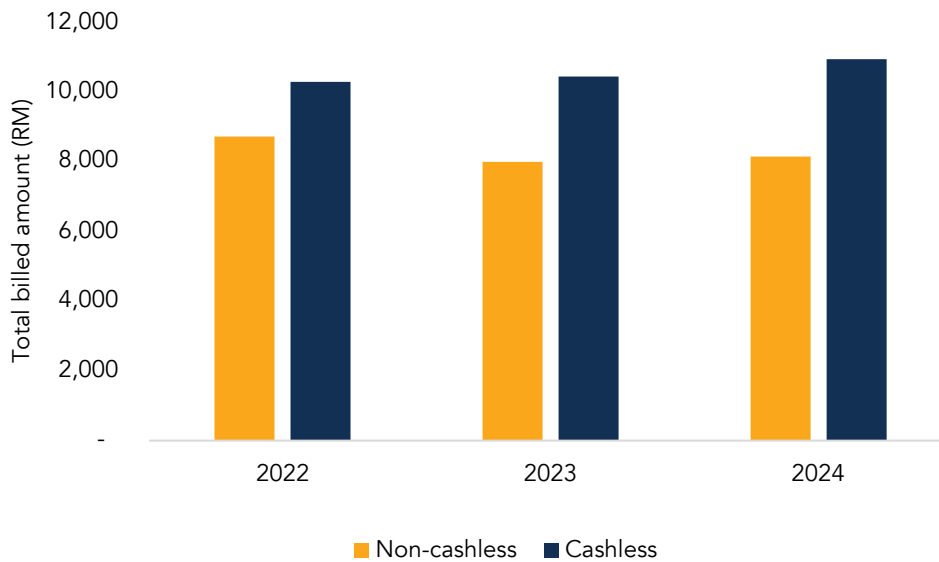
- **Moral hazard**

**It is common in health insurance settings for moral hazard to drive utilization unnecessarily.** Patient moral hazard occurs when individuals consume more healthcare services because they are insulated from the full cost of care by insurance coverage. When patients face little or no out-of-pocket payment, they may have weaker incentives to limit unnecessary consultations, diagnostic tests, or procedures. Patient side moral hazard can also occur ex-ante, that is, patients with insurance have fewer incentives to engage in preventive behaviours. Co-payments, deductibles and policies requiring upfront payments by beneficiaries who claim reimbursement can help to reduce the risk of patient moral hazard through financial risk or inconvenience. Provider moral hazard results from providers who respond to the presence of insurance by recommending additional services or higher-cost treatments that uninsured patients might not agree to if they had to pay out-of-pocket, particularly in FFS payment environments where facility (and professional) revenue increases with service volume.

## 6. Drivers of cost growth and decomposition

**Moral hazard can lead to higher utilisation and more intensive care than what would occur in the absence of insurance.** The centralized MHIT database provides suggestive evidence for the existence of moral hazard. Policies can be “cashless” or “non-cashless” where the latter refers to the system where the policyholder pays for medical expenses upfront and then wait for reimbursement. Most inpatient claims were settled through cashless arrangements, accounting for 93 percent of all claims, while only 7 percent were non-cashless. In cashless policies, the insurance company directly settles the bill with the healthcare provider. In non-cashless policies, patients may have incentives to reduce costs due to liquidity concerns and risk of insurance claims denial, which leads to a reduction of patient side moral hazard. There is also the possibility that providers do not know the true insurance status of the patient and take precautions to control costs, i.e. a reduction in provider side moral hazard. Figure 15 shows that policies with non-cashless feature (patients pay first and obtain reimbursements later) generate relatively lower total billed amount. Although it is not possible to ascertain the source of moral hazard (patient side vs. provider induced), there is suggestive evidence on moral hazard contributing to cost growth. This should be investigated further in the future.

**FIGURE 15**  
**Total billed amount for cashless and non-cashless claims**



Note: Predicted charges from GLM regression, adjusting for age, sex, state, disease category, surgical procedure



# 7. Efficiency of spending

## 7. Efficiency of spending

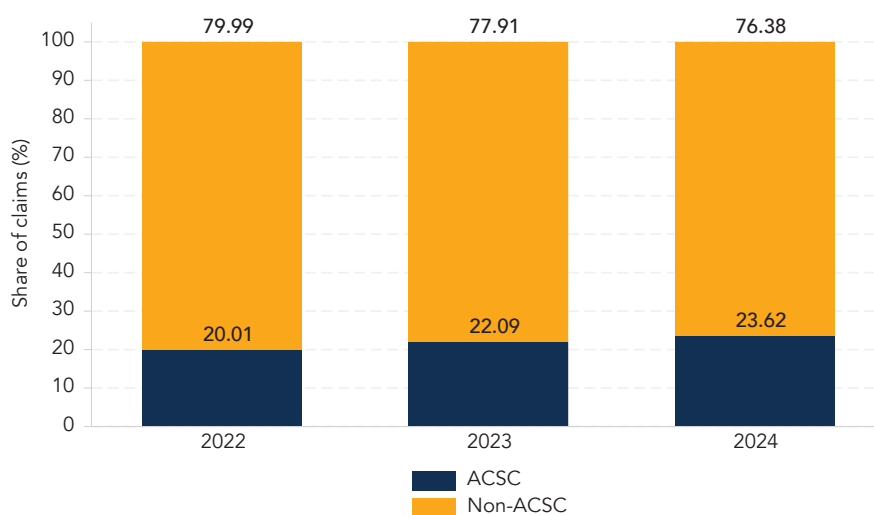
### The rapid cost growth in MHIT is largely driven by volume, which raises the question of what drives volume.

While a thorough investigation of this important question is not feasible given the data and time constraints, we are able to perform some results on the efficiency of the MHIT sector. We analyse two common indicators of efficiency – the share of hospitalizations attributable to ambulatory care sensitive conditions (ACSC) and the variation in average length of stay (ALOS) within diseases. ACSCs are conditions for which effective and timely outpatient care can prevent the need for hospitalization. High rates of ACSC admissions often suggest gaps in primary care access, continuity of care, or disease management, particularly for chronic conditions such as diabetes, hypertension, and asthma. Reducing avoidable hospitalizations for these conditions can improve system efficiency and contain costs (Purdy, Griffin and Sharp, 2009). Another mechanism for bending the cost curve is by reducing inefficient use of resources. ALOS drives resource use, including bed occupancy, staffing, diagnostics, and treatment costs. A situation where patients with similar characteristics experience substantially different lengths of stay across facilities may signal inefficiencies in care processes, discharge planning, or clinical management.

### The share ACSCs related admissions in MHIT is growing and accounted for 23.6 percent of all inpatient admissions in 2024.

The upward trend suggests that a rising proportion of hospital utilization may be attributable to conditions that could potentially be managed at the primary care level (Figure 16). Often care of ACSCs can be shifted to lower levels of care through successive strengthening of prevention, primary care, early detection and management (for example, ischemic heart disease). In other cases (such as diarrhea and gastroenteritis), ACSC related hospitalizations also reflect poor gatekeeping, lack of outpatient care coverage by insurance (which is typically the case in current MHIT products), patient- and provider side moral hazard. Such patterns indicate opportunities for strengthening preventive care, chronic disease management, and outpatient services to reduce unnecessary inpatient spending.

**FIGURE 16**  
Share of ACSC to total inpatient admissions



### Hospitalizations due to ACSCs contribute to a significant number of inpatient episodes and total costs.

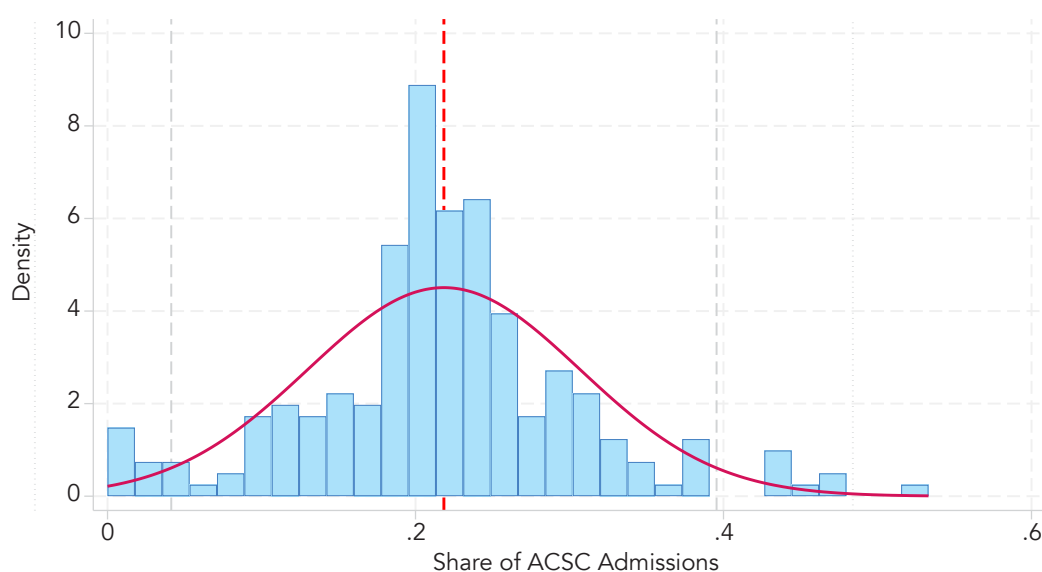
ACSCs account for a substantial share of inpatient episodes and costs, with the top five conditions alone contributing about 80 percent of total ACSC admissions. Diarrheal diseases account for the largest number of cases (168,343), followed by upper and lower respiratory infections (Table 19). In terms of spending, ischemic heart disease represents the highest cost burden (RM 1,140 million), despite fewer episodes, indicating a higher cost per case. These findings show that both high-volume infectious conditions and high-cost chronic conditions are key drivers of potentially avoidable hospitalization.

**TABLE 19**  
Value of top ACSCs, 2022-2024

Condition/Disease	Number of episodes	Total inpatient costs (in million RM)
Diarrheal diseases	168,343	910
Upper respiratory infections	96,929	856
Lower respiratory infections	93,840	564
Ischemic heart disease	52,012	1,140
Primary hypertension	23,274	224

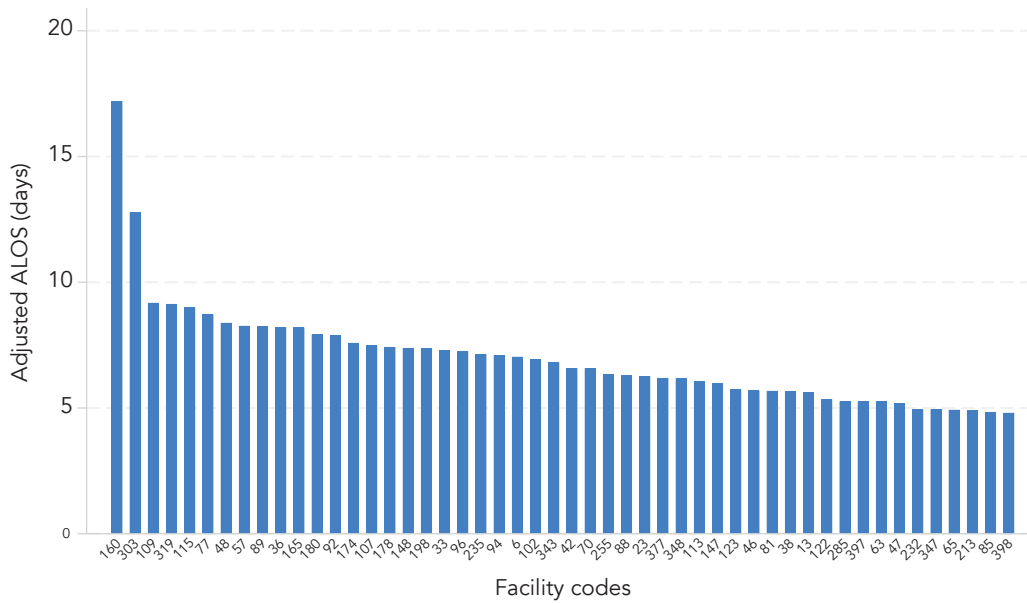
**There is substantial variation in the share of ACSC related hospitalization across hospitals.** Figure 17 shows the distribution of share of ACSC related hospitalizations in each hospitals by claim volume (restricted to facilities with at least 50 claims). The distribution is bell-shaped, while the median hospital generates about 22–23 percent potentially avoidable hospitalizations, there are hospitals that produce far less. In some cases, hospitals' share of ACSC related hospitalizations exceed 40 percent.

**FIGURE 17**  
Distribution of share of ACSC across facilities

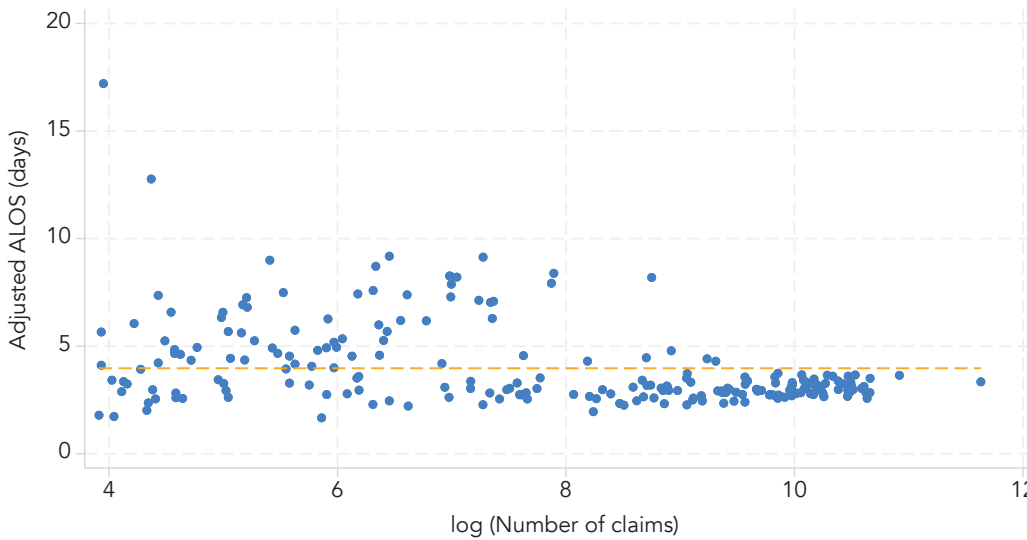


**Similarly, the variation in ALOS is substantial across hospitals.** Figure 18 plots ALOS among top-50 facilities with the highest age-sex adjusted ALOS among hospitals with at least 50 claims. Some facilities have adjusted ALOS exceeding 17 days, while for others, ALOS fall between 5 and 9 days. Such large differences after adjusting for demographic factors, suggest that certain hospitals may be generating longer-than-necessary hospital stays. Figure 19 benchmarks ALOS across all facilities relative to claim volume. The scatterplot shows that smaller-volume facilities tend to exhibit greater variation and some extremely high ALOS, while higher-volume hospitals cluster more tightly around the average of roughly 3-4 days (indicated by the dashed line). Part of this difference may simply reflect the fact that in smaller hospitals, a few unusually long stays can significantly affect the average. At the same time, it may also suggest real differences in how care is delivered, such as less standardized processes or weaker systems for managing patient flow in lower-volume facilities. These findings suggest opportunity to improve efficiency and reduce unnecessary inpatient spending.

**FIGURE 18**  
Average length of stay (ALOS) in top 50 hospitals



**FIGURE 19**  
ALOS by hospital size (proxied by number of claims)





## 8. Summary and recommendations

**The results from this report suggest that cost pressures in Malaysia’s MHIT sector is primarily a problem of utilization and incentives.** Measured service-level medical inflation appears modest relative to the growth in claims paid and total billed amounts, implying that utilization growth is central to the affordability challenge. Potentially avoidable inpatient episodes provide a clear signal for misaligned incentives and gaps in clinical pathways. The sizable share of admissions associated with ACSCs suggests further opportunities to include coverage for preventive and primary care services in MHIT products.

**The current payment arrangements could be amplifying low-value care use.** MHIT products’ focus on inpatient care combined with itemized billing, creates incentives to deliver care in higher-cost settings where additional billable items can be added within episodes. Better and transparent information on prices, inputs, and utilization can improve accountability; nonetheless, these must be combined with operational levers that generate the right incentives. These include shifts away from FFS payments and narrowly focused benefits package.

**The centralized claims database is a foundational asset, but its usefulness depends on data quality and completeness.** The data limitations described in this report constrain episode- and patient-level monitoring. Going forward, targeted upgrades to the central claims database can extend its purpose beyond a reporting tool to become a reform instrument.

**Meanwhile, the success of planned reforms hinges on coordination between regulators, providers, payers and patients.** As regulation and monitoring of insurers and healthcare providers fall under the purview of different institutions, cost containment will require strong interinstitutional coordination, aligned incentives, shared metrics and joint enforcement.

## Recommendations

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Malaysia has already initiated important responses to affordability pressures, including interim premium adjustment measures (2024–2026) and the broader RESET framework to curb medical cost escalation and to strengthen transparency and value. The findings in this report support additional directions to ensure the success of planned reforms:

- **Develop a routine MHIT sector monitoring dashboard.** Building on ISM’s effort of the central claims database, BNM and MoH could consider routinely (monthly or quarterly) publishing information on claim volumes, average claims amounts, setting mix shifts, high-growth diagnoses and health facilities. Such dashboard can provide early warning for utilization surges and outliers.
- **Define a small set of priority indicators to monitor cost control.** Insurers, with MOH’s and healthcare providers’ input, could adopt a few “watchlist” indicators such as services with fastest utilization growth, facilities with higher than average HSS shares, and facilities with outlier ACSC related admissions. With a prioritized set of indicators, monitoring can be more targeted and impactful, rather than relying on broad approaches.
- **Standardize data quality and reporting rules.** To enhance the value of the central claims database, ISM with the support of regulators, should ensure that hospitals and insurers make continuous effort to improve data quality and completeness. To encourage compliance, completeness scores for insurers and hospitals alike can be made public (potentially as part of the monitoring dashboard). Such interventions will lead to higher data reliability which is necessary for monitoring and contracting.

- **Enable episode-based and patient-level analytics by improving identifiers.** ISM, with the support of state agencies should implement a privacy-preserving unique patient key (or equivalent) to connect claims across time, insurers and settings. This should be further linked with care accessed by the same patients in the public sector. Over time, such efforts can enable the monitoring of health outcomes.
- **Rebalance coverage toward cost-effective outpatient and preventive care.** MHIT operations should pilot insurance products that include outpatient benefits for high-burden chronic conditions with defined clinical pathways and modest cost-sharing. While costs may increase in the near-term, in the long-term, such products can generate fewer claims and inpatient episodes by reducing avoidable admissions and downstream costs.
- **Introduce pathway-based utilization management for ACSCs.** For ACSC conditions that are manageable at lower levels of care (such as diarrhoea and gastroenteritis), insurers and providers should adopt clearly defined care pathways. To maximize impact, these could be combined with reduced insurance payments when there are clear and unjustified deviations from defined pathways. This will help curb low-value care while protecting clinically necessary care.
- **Prepare the private healthcare market for DRGs-based payments with guardrails.** The transformation away from fee-for-service hinges on the availability of data for DRGs payments design and implementation. MOH, with BNM, should specify minimum coding standards, grouping logic, documentation standards that allow monitoring of both volume growth and adherence to clinical guidelines under DRGs. Implementation protocols should include routine audits, provider feedback, and corrective actions to ensure DRG financing supports the transition away from itemized billing while avoiding unintended increases in service volumes.

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## Annex A. MHIT central claims database structure

No.	Variable	Type	Column Label
1	Comcode	Numeric	Company Code
2	Polnum	Character	Policy / Certificate Number
3	CoPay_Fea	Numeric	Co-Payment Feature
4	Product	Numeric	Product Type
5	PolType	Numeric	Policy Type
6	IPLimit	Numeric	Inpatient Benefit Limit
7	Begprd	Character	Policy Start Date
8	Endprd	Character	Policy End Date
9	AnnLimit	Numeric	Annual Limit
10	Colns_CoTakaful	Numeric	Co-Insurance / Co-Takaful
11	Deduct_Disability	Numeric	Deductible Amount Per Disability
12	Deduct_Year	Numeric	Deductible Amount Per Policy Year
13	Hosp_RnB	Numeric	Hospital Daily Room & Board Benefit
14	Clnum	Character	Claim Number
15	DOB	Character	Date of Birth
16	Gender	Numeric	Gender
17	Nationality	Numeric	Nationality
18	Postcode	Character	Postcode
19	Status_of_Claims	Numeric	Claims Status
20	CIType	Character	Claims Type
21	Date_of_Admission	Character	Admission Date
22	Date_of_Discharge	Character	Discharge Date
23	Date_of_Treatment	Character	Treatment Date
24	Date_ClaimsApproved	Character	Claims Approved Date
25	Fac_Name	Character	Facility Name
26	Fac_Postcode	Character	Facility Postcode
27	RnB_Bed	Numeric	Room & Board Bed Type
28	AdmitDoc_Specialty	Character	Admitting Doctors Specialty
29	TPA_Code	Character	TPA Code
30	Payment_Method	Numeric	Payment Method
31	Final_Diag_Code	Character	Final / Discharge Diagnosis Code
32	Final_Diag_Des	Character	Final / Discharge Diagnosis Description
33	Procedure_Code	Character	Procedure Code
34	Procedure_Des	Character	Procedure Description
35	CoPay_Amt	Numeric	Co-Payment Amount

36	Total_Bill_Amt	Numeric	Total Billed Amount
37	Hosp_RnB_Bill_Amt	Numeric	Hospital Room & Board Billed Amount
38	ICU_Bill_Amt	Numeric	Intensive Care Unit Billed Amount
39	Surgical_Bill_Amt	Numeric	Surgical Billed Amount
40	OT_Bill_Amt	Numeric	Operating Theatre Billed Amount
41	Anae_Bill_Amt	Numeric	Anaesthetists Fee Billed Amount
42	InHosp_Phy_Bill_Amt	Numeric	In-Hospital Physician Visit Billed Amount
43	HSS_Total_Bill_Amt	Numeric	Total Hospital Supplies & Services Billed Amount
44	HSS_Nursing_Bill_Amt	Numeric	Hospital Supplies & Services - Nursing Billed Amount
45	HSS_Supplies_Bill_Amt	Numeric	Hospital Supplies & Services - Supplies Billed Amount
46	HSS_Lab_Bill_Amt	Numeric	Hospital Supplies & Services - Laboratory & Imaging Billed Amount
47	HSS_DM_Bill_Amt	Numeric	Hospital Supplies & Services - Drugs and Medicines Billed Amount
48	HSS_Others_Bill_Amt	Numeric	Hospital Supplies & Services - Others Billed Amount
49	Pre_Total_Bill_Amt	Numeric	Total Pre-Hospitalisation Treatment Billed Amount
50	Pre_Diag_Bill_Amt	Numeric	Pre-Hospitalisation - Diagnostic Tests Billed Amount
51	Pre_Consult_Bill_Amt	Numeric	Pre-Hospitalisation - Consultation Fee Billed Amount
52	Pre_Meds_Bill_Amt	Numeric	Pre-Hospitalisation - Medicine Billed Amount
53	Pre_Others_Bill_Amt	Numeric	Pre-Hospitalisation - Others Billed Amount
54	Post_Total_Bill_Amt	Numeric	Total Post-Hospitalisation Treatment Billed Amount
55	Post_Diag_Bill_Amt	Numeric	Post-Hospitalisation - Diagnostic Tests Billed Amount
56	Post_Consult_Bill_Amt	Numeric	Post-Hospitalisation - Consultation Fee Billed Amount
57	Post_Meds_Bill_Amt	Numeric	Post-Hospitalisation - Medicine Billed Amount
58	Post_Others_Bill_Amt	Numeric	Post-Hospitalisation - Others Billed Amount
59	DayCare_Bill_Amt	Numeric	Day Surgery / Daycare Procedure Billed Amount
60	OP_Cancer_Bill_Amt	Numeric	Outpatient Cancer Treatment Billed Amount
61	OP_Kidney_Bill_Amt	Numeric	Outpatient Kidney Dialysis Treatment Billed Amount
62	OP_EmerAccident_Bill_Amt	Numeric	Emergency Accidental Outpatient Treatment Billed Amount
63	Organ_Bill_Amt	Numeric	Organ Transplant Billed Amount
64	Ambulance_Bill_Amt	Numeric	Ambulance Fee Billed Amount
65	Others_Bill_Amt	Numeric	Others Billed Amount
66	Total_CP_Amt	Numeric	Total Gross CP Amount
67	Hosp_RnB_Paid_Amt	Numeric	Hospital Room & Board Gross CP Amount
68	ICU_Paid_Amt	Numeric	Intensive Care Unit Gross CP Amount
69	Surgical_Paid_Amt	Numeric	Surgical Gross CP Amount
70	OT_Paid_Amt	Numeric	Operating Theatre Gross CP Amount
71	Anae_Paid_Amt	Numeric	Anaesthetists Fee Gross CP Amount
72	InHosp_Phy_Paid_Amt	Numeric	In-Hospital Physician Visit Gross CP Amount
73	HSS_Total_Paid_Amt	Numeric	Total Hospital Supplies & Services Gross CP Amount

Annex

74	HSS_Nursing_Paid_Amt	Numeric	Hospital Supplies & Services - Nursing Gross CP Amount
75	HSS_Supplies_Paid_Amt	Numeric	Hospital Supplies & Services - Supplies Gross CP Amount
76	HSS_Lab_Paid_Amt	Numeric	Hospital Supplies & Services - Laboratory & Imaging Gross CP Amount
77	HSS_DM_Paid_Amt	Numeric	Hospital Supplies & Services - Drugs and Medicines Gross CP Amount
78	HSS_Others_Paid_Amt	Numeric	Hospital Supplies & Services - Others Gross CP Amount
79	Pre_Total_Paid_Amt	Numeric	Total Pre-Hospitalisation Treatment Gross CP Amount
80	Pre_Diag_Paid_Amt	Numeric	Pre-Hospitalisation - Diagnostic Tests Gross CP Amount
81	Pre_Consult_Paid_Amt	Numeric	Pre-Hospitalisation - Consultation Fee Gross CP Amount
82	Pre_Meds_Paid_Amt	Numeric	Pre-Hospitalisation - Medicine Gross CP Amount
83	Pre_Others_Paid_Amt	Numeric	Pre-Hospitalisation - Others Gross CP Amount
84	Post_Total_Paid_Amt	Numeric	Total Post-Hospitalisation Treatment Gross CP Amount
85	Post_Diag_Paid_Amt	Numeric	Post-Hospitalisation - Diagnostic Tests Gross CP Amount
86	Post_Consult_Paid_Amt	Numeric	Post-Hospitalisation - Consultation Fee Gross CP Amount
87	Post_Meds_Paid_Amt	Numeric	Post-Hospitalisation - Medicine Gross CP Amount
88	Post_Others_Paid_Amt	Numeric	Post-Hospitalisation - Others Gross CP Amount
89	DayCare_Paid_Amt	Numeric	Day Surgery / Daycare Procedure Gross CP Amount
90	OP_Cancer_Paid_Amt	Numeric	Outpatient Cancer Treatment Gross CP Amount
91	OP_Kidney_Paid_Amt	Numeric	Outpatient Kidney Dialysis Treatment Gross CP Amount
92	OP_Emergency_Paid_Amt	Numeric	Emergency Accidental Outpatient Treatment Gross CP Amount
93	Organ_Paid_Amt	Numeric	Organ Transplant Gross CP Amount
94	Ambulance_Paid_Amt	Numeric	Ambulance Fee Gross CP Amount
95	Others_Paid_Amt	Numeric	Others Gross CP Amount
96	DailyGuard_Paid_Amt	Numeric	Daily Guardian Benefit Gross CP Amount
97	Govern_DailyCash_Paid_Amt	Numeric	Government Hospital Daily Cash Allowance Gross CP Amount

## Annex B. Methodology for relative price and service-level medical inflation

We use administrative claims data from the MHIT database covering calendar years 2022–2024. The dataset contains 6.5 million claim-level observations for commercial private insurance enrollees across multiple states in Malaysia. The unit of analysis is a claim, including financial data (i.e., paid amount, total bill, co-pay), diagnosis (i.e., ICD 10) and procedure codes, state, year, mode of payment (i.e., cashless or non-cashless), product type (i.e., group or individual) demographic characteristics, and among others.

All prices are measured as the total price recorded for each claim. The use of claims-level data allows precise measurement of service-level prices across geographic markets and over time. Services are classified into inpatient, outpatient and daycare, and pre- and post-hospitalization categories using classification by ISM in the claims database received by the World Bank. Each claim contains a primary diagnosis coded using ICD-10, which we crosswalk to Global Burden of Disease (GBD) cause categories using the standard GBD mapping to facilitate disease-level interpretation.

To ensure comparability across time, we construct a common service basket separately for each service category. Specifically, we restrict the analysis to the top 100 services nationally, ranked by cumulative utilization or expenditure share over the study period. A service is included if it appears in all study years (2022–2024) and falls within this top 100 ranking (see Annex D for the top diseases for inpatient and outpatient). Restricting the basket to the most frequently utilized services reduces noise from rare procedures and ensures that measured price changes reflect meaningful components of spending.

Because Malaysia does not operate under a Diagnosis-Related Group (DRG) classification system, services are defined at the procedure or diagnosis-code level rather than DRG groupings, adapting the index construction approach used in prior U.S. studies to the Malaysian institutional setting.

### Regression-based price estimation

To estimate standardized prices, we fit a generalized linear model (GLM) with Gamma family and log link to claim-level payment data. Let  $P_j$  denote the allowed amount for claim  $j$ . Each claim belongs to GBD Level 3 disease group  $g$ , year  $t$ , and state  $s$ . The Gamma-log GLM is appropriate because: (1) claim-level payments are strictly positive and (2) the distribution is highly right-skewed.

We model the conditional mean of payments as:

$$E[P_j|g,t,s, X_j] = \exp(a + \beta_g + \gamma_t + \delta_{gt} + \theta_s + \omega_1 \text{Cashless}_j + \omega_2 \text{Female}_j + \omega_3 \text{Age}_j + \omega_4 \text{Surgery}_j)$$

where:

$\beta_g$  are GBD Level 3 disease group fixed effects,

$\gamma_t$  are year fixed effects,

$\delta_{gt}$  are disease group × year interaction effects,

$\theta_s$  are state fixed effects,

$X_j$  includes claim-level covariates (cashless indicator, sex, age, surgery),

the log link ensures strictly positive predictions and accommodates right-skewed payments.

### Price Index Construction and Inflation

Following estimation of the Gamma log-link GLM, we obtain predicted mean prices for each GBD Level 3 disease group  $g$  and year  $t$ , denoted:

$$\hat{p}_{gt} = E[P | g, t]$$

These predicted values represent regression-adjusted mean prices on the original payment scale. To standardize prices across time, we compute relative prices using 2022 as the base year:

$$r_{gt} = \frac{\hat{p}_{gt}}{\hat{p}_{g,2022}}$$

This expresses each disease group's price in year relative to its own base-year level.

### Laspeyres Price Index

Let  $q_{g,2022}$  denote the quantity (number of claims) for disease group  $g$  in the base year (2022). The Laspeyres price index for year  $t$  is defined as:

$$L_t = \frac{\sum_{g \in S} q_{g,2022} \hat{p}_{gt}}{\sum_{g \in S} q_{g,2022} \hat{p}_{g,2022}},$$

where  $S$  denotes the set of 100 common disease groups included in the analysis.

The Laspeyres index holds quantities fixed at base-year levels and measures how total spending would change solely due to price changes. For comparison, we also compute the Paasche index and Fisher Index (see references elsewhere).

### Year-on-Year Inflation

All indices are normalized such that 2022 = 1. Year-on-year inflation is calculated as:

$$\text{Inflation}_t = \frac{I_t}{I_{t-1}} - 1,$$

where  $I_t$  denotes either the Laspeyres, Paasche, or Fisher index.

## Annex C. Decomposition of PHI spending growth

We decompose the change in total private health insurance spending between 2022 and 2024 into four components: price, setting-mix, utilization (use), and demographics.

Total spending in year  $t$  is defined as:

$$S_t = \sum_g B_{g,t} U_{g,t} \left( \sum_s s h_{g,s,t} P_{g,s,t} \right)$$

where:

$g$  indexes demographic groups defined by age, sex

$s$  indexes care setting (i.e., inpatient, non-inpatient)

$B_{g,t}$  denotes the number of beneficiaries in group  $g$  in year  $t$

$U_{g,t}$  denotes average claims per beneficiary (utilization intensity) in group  $g$

$s h_{g,s,t}$  denotes the share of claims occurring in setting  $s$  within group  $g$

$P_{g,s,t}$  denotes the average price per claim in setting  $s$  for group  $g$

This identity expresses spending as the product of population size, utilization intensity, setting distribution, and price. Note that population size is not insured member, but insured member with a claim in the given year.

### Chain Substitution Decomposition

To isolate the contribution of each component to total spending growth between 2022 and 2024, we apply a sequential chain substitution approach.

Define baseline spending in 2022 as:

$$S_0 = S(B_{2022}, U_{2022}, sh_{2022}, P_{2022}).$$

We then sequentially update one component at a time while holding the others fixed.

#### Step 1: Price Effect

$$S_1 = S(B_{2022}, U_{2022}, sh_{2022}, P_{2024})$$

$$\text{Price Effect} = S_1 - S_0$$

This captures the change in spending attributable solely to changes in prices, holding population, utilization, and setting distribution constant at 2022 levels.

**Step 2: Setting-Mix Effect**

$$S_2 = S(B_{2022}, U_{2022}, sh_{2024}, P_{2024})$$
$$\text{Setting Effect} = S_2 - S_1$$

This measures the contribution of shifts between inpatient and non-inpatient care settings.

**Step 3: Utilization (Use) Effect**

$$S_3 = S(B_{2022}, U_{2024}, sh_{2024}, P_{2024})$$
$$\text{Use Effect} = S_3 - S_2$$

This captures changes in claims per beneficiary, conditional on prices and setting mix.

**Step 4: Demographic Effect**

This reflects changes in the size and composition of the insured population.

$$S_4 = S(B_{2024}, U_{2024}, sh_{2024}, P_{2024})$$
$$\text{Demographic Effect} = S_4 - S_3$$

This reflects changes in the size and composition of the insured population.

**Total Change**

Total spending growth between 2022 and 2024 is:

$$\Delta S = S_4 - S_0.$$

By construction:

$$\Delta S = \text{Price Effect} + \text{Setting Effect} + \text{Use Effect} + \text{Demographic Effect}.$$

## Annex D. Predicted prices and relative price index

### Predicted prices (inpatient)

Disease	2022 (RM)	2023 (RM)	2024 (RM)
Tuberculosis	11,375 (10,543–12,207)	13,649 (12,703–14,596)	14,600 (13,610–15,589)
Diarrheal diseases	6,717 (6,645–6,789)	7,022 (6,958–7,085)	7,264 (7,207–7,320)
Lower respiratory infections	8,874 (8,807–8,941)	8,897 (8,841–8,954)	9,314 (9,257–9,372)
Upper respiratory infections	8,473 (8,371–8,575)	8,508 (8,427–8,590)	8,791 (8,706–8,876)
Otitis media	8,572 (8,239–8,906)	8,738 (8,451–9,024)	8,265 (8,004–8,526)
Meningitis	20,529 (18,270–22,788)	21,198 (19,185–23,211)	25,302 (23,026–27,577)
Encephalitis	26,286 (23,538–29,034)	30,977 (27,791–34,163)	32,136 (29,115–35,157)
Varicella and herpes zoster	10,424 (9,611–11,238)	10,595 (10,010–11,180)	10,698 (10,124–11,273)
Dengue	7,276 (7,143–7,410)	7,598 (7,501–7,694)	8,000 (7,897–8,103)
Other neglected tropical diseases	7,618 (7,435–7,802)	7,926 (7,778–8,074)	8,328 (8,166–8,489)
Maternal disorders	10,875 (9,848–11,903)	11,250 (10,166–12,334)	9,309 (8,378–10,241)
Neonatal disorders	7,940 (6,916–8,965)	8,202 (7,162–9,243)	13,330 (11,458–15,202)
Iodine deficiency	10,476 (9,601–11,350)	12,705 (11,866–13,543)	12,450 (11,202–13,697)
Dietary iron deficiency	8,112 (7,447–8,777)	8,212 (7,645–8,780)	8,829 (8,322–9,337)
Sexually transmitted infections excluding HIV	11,451 (10,599–12,303)	11,213 (10,421–12,005)	11,863 (11,066–12,659)
Acute hepatitis	11,804 (10,631–12,978)	10,558 (9,638–11,478)	11,300 (10,397–12,202)
Other unspecified infectious diseases	8,499 (8,386–8,612)	8,036 (7,945–8,126)	8,644 (8,541–8,747)
Esophageal cancer	18,485 (15,599–21,371)	24,383 (21,265–27,501)	25,394 (21,872–28,915)
Stomach cancer	20,031 (17,616–22,445)	21,310 (19,210–23,411)	16,675 (15,224–18,126)
Liver cancer	19,260 (17,415–21,104)	19,132 (17,588–20,675)	20,617 (18,975–22,259)
Tracheal, bronchus, and lung cancer	18,385 (17,394–19,376)	19,246 (18,275–20,217)	20,606 (19,599–21,613)
Breast cancer	12,311 (11,908–12,714)	12,695 (12,309–13,080)	13,857 (13,446–14,267)
Cervical cancer	14,076 (12,921–15,231)	13,815 (12,804–14,826)	16,386 (15,110–17,663)
Uterine cancer	13,388 (12,264–14,512)	14,224 (13,040–15,407)	15,855 (14,589–17,120)
Prostate cancer	13,708 (12,099–15,316)	14,727 (13,045–16,409)	18,155 (16,218–20,092)
Colon and rectum cancer	17,505 (16,787–18,223)	14,698 (14,173–15,223)	17,636 (16,998–18,274)
Lip and oral cavity cancer	14,401 (12,938–15,865)	14,687 (13,286–16,088)	15,163 (13,776–16,550)
Nasopharynx cancer	10,810 (9,991–11,629)	11,224 (10,431–12,018)	12,590 (11,630–13,551)
Pancreatic cancer	21,882 (19,682–24,083)	17,301 (15,652–18,950)	18,628 (17,005–20,251)
Ovarian cancer	16,877 (15,726–18,029)	15,253 (14,238–16,268)	15,724 (14,740–16,709)
Testicular cancer	13,662 (11,918–15,405)	11,183 (9,840–12,527)	12,852 (11,232–14,472)
Kidney cancer	23,186 (20,215–26,156)	20,106 (17,636–22,576)	20,326 (17,876–22,776)
Bladder cancer	9,972 (8,658–11,286)	10,555 (9,321–11,789)	12,504 (11,013–13,995)
Brain and central nervous system cancer	27,385 (24,891–29,879)	25,542 (23,469–27,614)	32,370 (29,726–35,014)
Thyroid cancer	12,884 (11,627–14,141)	13,038 (11,903–14,173)	14,396 (13,196–15,597)
Hodgkin lymphoma	19,787 (17,384–22,190)	14,276 (12,668–15,885)	14,897 (13,429–16,365)

Annex

Non-Hodgkin lymphoma	19,945 (18,684–21,207)	20,284 (19,063–21,506)	20,802 (19,622–21,983)
Multiple myeloma	20,270 (16,650–23,890)	21,951 (18,746–25,157)	26,415 (22,402–30,428)
Leukemia	27,473 (25,889–29,058)	29,074 (27,435–30,713)	29,074 (27,536–30,612)
Other malignant neoplasms	16,473 (15,258–17,689)	19,686 (18,230–21,141)	19,649 (18,133–21,166)
Other neoplasms	12,706 (12,493–12,918)	13,504 (13,288–13,721)	14,309 (14,090–14,527)
Ischemic heart disease	14,897 (14,655–15,138)	14,784 (14,567–15,001)	15,315 (15,104–15,527)
Stroke	15,801 (15,341–16,261)	15,977 (15,543–16,410)	16,342 (15,915–16,769)
Hypertensive heart disease	9,015 (7,371–10,659)	9,368 (7,715–11,020)	10,247 (8,843–11,651)
Cardiomyopathy and myocarditis	11,442 (10,408–12,475)	11,905 (10,904–12,907)	11,632 (10,654–12,610)
Atrial fibrillation and flutter	13,655 (12,203–15,107)	14,463 (12,985–15,940)	18,730 (16,951–20,509)
Lower extremity peripheral arterial disease	17,429 (14,329–20,529)	17,082 (14,191–19,973)	14,463 (12,042–16,884)
Endocarditis	20,647 (15,614–25,681)	32,584 (25,322–39,845)	37,258 (29,007–45,508)
Non-rheumatic valvular heart disease	27,379 (21,390–33,368)	25,752 (20,405–31,099)	23,900 (18,882–28,917)
Other cardiovascular and circulatory diseases	10,152 (9,706–10,599)	10,225 (9,825–10,625)	10,870 (10,467–11,273)
Chronic obstructive pulmonary disease	9,522 (8,307–10,736)	9,833 (8,596–11,069)	9,401 (8,183–10,618)
Asthma	7,313 (6,920–7,706)	7,909 (7,505–8,313)	7,249 (6,866–7,631)
Other chronic respiratory diseases	11,629 (11,370–11,889)	11,839 (11,615–12,063)	12,081 (11,858–12,304)
Cirrhosis and other chronic liver diseases	13,112 (12,194–14,030)	13,368 (12,484–14,251)	12,129 (11,322–12,937)
Appendicitis	14,598 (14,281–14,914)	14,833 (14,520–15,146)	15,561 (15,249–15,872)
Paralytic ileus and intestinal obstruction	14,068 (13,277–14,859)	13,049 (12,321–13,776)	14,320 (13,529–15,111)
Inguinal, femoral, and abdominal hernia	8,974 (8,638–9,310)	9,493 (9,151–9,835)	9,922 (9,555–10,290)
Inflammatory bowel disease	6,798 (6,668–6,928)	7,187 (7,039–7,334)	7,906 (7,749–8,063)
Gallbladder and biliary diseases	13,753 (13,425–14,080)	13,937 (13,628–14,246)	14,699 (14,388–15,011)
Pancreatitis	15,254 (13,984–16,524)	13,566 (12,568–14,565)	15,955 (14,844–17,065)
Other digestive diseases	8,951 (8,802–9,099)	9,224 (9,078–9,369)	9,775 (9,629–9,922)
Idiopathic epilepsy	9,899 (9,335–10,464)	11,654 (11,050–12,259)	11,206 (10,658–11,755)
Other neurological disorders	13,059 (12,601–13,517)	13,144 (12,732–13,557)	13,812 (13,402–14,222)
Other mental disorders	8,957 (7,165–10,749)	9,215 (7,734–10,695)	9,166 (8,075–10,257)
Diabetes mellitus	11,041 (10,688–11,394)	11,283 (10,970–11,597)	12,097 (11,783–12,410)
Acute glomerulonephritis	8,498 (7,110–9,886)	7,810 (6,713–8,907)	7,954 (6,975–8,933)
Chronic kidney disease	9,812 (9,497–10,127)	10,473 (10,163–10,783)	11,626 (11,303–11,950)
Urinary diseases and male infertility	9,637 (9,501–9,773)	9,981 (9,849–10,113)	10,469 (10,337–10,602)
Gynecological diseases	10,686 (10,506–10,866)	10,917 (10,745–11,088)	11,690 (11,514–11,866)
Hemoglobinopathies and hemolytic anemias	9,115 (8,554–9,677)	9,051 (8,559–9,543)	10,674 (10,097–11,250)
Endocrine, metabolic, blood, and immune disorders	10,464 (10,191–10,737)	10,906 (10,646–11,166)	11,367 (11,110–11,623)
Rheumatoid arthritis	9,000 (8,006–9,993)	8,229 (7,451–9,007)	9,582 (8,716–10,448)
Osteoarthritis	15,576 (14,601–16,552)	14,812 (14,078–15,545)	13,974 (13,377–14,571)
Low back pain	12,223 (12,050–12,395)	12,321 (12,165–12,476)	12,772 (12,618–12,926)
Neck pain	12,498 (12,063–12,934)	12,679 (12,284–13,075)	12,050 (11,692–12,409)
Gout	11,952 (11,781–12,124)	11,535 (11,388–11,682)	12,060 (11,918–12,203)
Other musculoskeletal disorders	10,226 (8,259–12,193)	12,856 (10,892–14,821)	10,577 (9,019–12,134)
Dermatitis	8,432 (7,865–8,999)	9,226 (8,726–9,726)	9,555 (9,121–9,989)

Psoriasis	13,219 (11,833–14,605)	14,336 (13,085–15,588)	14,920 (13,750–16,090)
Fungal skin diseases	10,584 (8,211–12,958)	8,825 (7,111–10,539)	9,176 (7,748–10,604)
Viral skin diseases	6,721 (6,487–6,954)	6,972 (6,727–7,216)	7,110 (6,814–7,406)
Urticaria	6,001 (5,578–6,424)	6,292 (5,894–6,691)	5,925 (5,603–6,247)
Decubitus ulcer	14,765 (12,369–17,161)	13,414 (11,192–15,635)	17,126 (14,532–19,720)
Other skin and subcutaneous diseases	6,945 (6,682–7,209)	7,227 (6,967–7,486)	7,470 (7,215–7,725)
Age-related and other hearing loss	7,814 (7,285–8,343)	8,103 (7,585–8,621)	7,472 (7,010–7,934)
Other sense organ diseases	6,340 (6,203–6,478)	6,697 (6,565–6,830)	6,828 (6,704–6,952)
Oral disorders	8,190 (7,673–8,706)	7,979 (7,488–8,469)	8,076 (7,567–8,585)
Poisonings	7,013 (6,656–7,371)	7,395 (7,106–7,683)	7,337 (7,053–7,622)
Adverse effects of medical treatment	8,333 (8,190–8,475)	8,133 (8,008–8,259)	7,932 (7,806–8,059)
Other unintentional injuries	11,972 (11,869–12,075)	11,855 (11,764–11,946)	11,852 (11,765–11,939)
Typhoid and paratyphoid	9,112 (8,247–9,978)	9,165 (8,144–10,187)	9,678 (9,072–10,284)
Headache disorders	7,248 (6,990–7,505)	7,342 (7,100–7,584)	7,721 (7,493–7,948)
Bacterial skin diseases	8,855 (8,692–9,018)	8,852 (8,702–9,002)	9,260 (9,114–9,406)
Blindness and vision loss	10,877 (10,397–11,357)	11,151 (10,697–11,604)	11,471 (11,009–11,934)
Upper digestive system diseases	7,370 (7,276–7,464)	7,365 (7,277–7,453)	7,968 (7,877–8,059)
Soft tissue and other extraosseous sarcomas	15,426 (13,556–17,296)	16,547 (14,686–18,409)	23,826 (21,317–26,335)
Malignant neoplasm of bone and articular cartilage	18,380 (16,135–20,625)	18,966 (16,675–21,256)	19,267 (17,081–21,452)
Primary hypertension	8,169 (7,947–8,391)	8,585 (8,377–8,793)	8,934 (8,725–9,142)
General S/S	8,032 (7,895–8,168)	7,906 (7,791–8,020)	8,395 (8,276–8,515)

### Predicted prices (outpatient)

Disease	2022 (RM)	2023 (RM)	2024 (RM)
Tuberculosis	3,692 (2,875–4,509)	3,831 (2,870–4,793)	3,862 (2,965–4,759)
Diarrheal diseases	2,547 (2,377–2,718)	2,956 (2,766–3,146)	2,939 (2,770–3,108)
Lower respiratory infections	2,484 (2,314–2,654)	2,867 (2,689–3,044)	1,942 (1,837–2,047)
Upper respiratory infections	1,397 (1,314–1,480)	1,462 (1,386–1,538)	1,130 (1,074–1,185)
Otitis media	3,195 (2,762–3,629)	3,315 (2,883–3,748)	3,095 (2,738–3,451)
Varicella and herpes zoster	1,935 (628–3,241)	4,044 (1,965–6,124)	1,666 (884–2,448)
Dengue	2,039 (1,708–2,370)	2,150 (1,900–2,401)	2,425 (2,146–2,704)
Other neglected tropical diseases	2,846 (2,148–3,544)	2,398 (1,975–2,821)	1,896 (1,485–2,308)
Maternal disorders	1,745 (1,294–2,196)	1,624 (1,299–1,948)	3,130 (2,191–4,069)
Iodine deficiency	4,254 (3,681–4,827)	3,371 (3,110–3,631)	3,715 (3,388–4,041)
Dietary iron deficiency	2,339 (1,881–2,797)	2,270 (1,883–2,657)	2,361 (2,017–2,706)
Sexually transmitted infections excluding HIV	4,252 (2,829–5,676)	2,517 (1,714–3,320)	2,625 (1,739–3,511)
Acute hepatitis	4,392 (2,455–6,329)	3,888 (2,107–5,669)	5,527 (3,237–7,817)
Other unspecified infectious diseases	2,692 (2,409–2,975)	2,564 (2,313–2,815)	2,652 (2,397–2,907)
Esophageal cancer	7,380 (6,060–8,699)	8,787 (7,368–10,207)	10,589 (8,675–12,503)
Stomach cancer	8,754 (7,585–9,923)	9,359 (8,240–10,478)	9,600 (8,429–10,770)
Liver cancer	10,997 (9,575–12,418)	10,161 (9,025–11,297)	11,047 (9,816–12,278)

Annex

Larynx cancer	6,533 (4,547–8,520)	6,009 (4,176–7,843)	5,547 (4,013–7,081)
Tracheal, bronchus, and lung cancer	12,188 (11,501–12,875)	12,287 (11,633–12,942)	11,977 (11,403–12,551)
Breast cancer	6,136 (5,992–6,280)	6,515 (6,370–6,659)	6,588 (6,452–6,725)
Cervical cancer	5,864 (5,371–6,357)	6,660 (6,140–7,180)	7,532 (6,959–8,106)
Uterine cancer	5,961 (5,327–6,596)	6,112 (5,458–6,765)	5,813 (5,257–6,370)
Prostate cancer	7,465 (6,538–8,391)	8,612 (7,651–9,573)	8,149 (7,301–8,996)
Colon and rectum cancer	6,867 (6,566–7,167)	4,867 (4,704–5,030)	6,866 (6,607–7,126)
Lip and oral cavity cancer	5,684 (4,924–6,443)	6,942 (6,123–7,760)	7,345 (6,405–8,285)
Nasopharynx cancer	5,216 (4,950–5,483)	5,241 (4,984–5,499)	5,480 (5,211–5,750)
Other pharynx cancer	5,862 (4,227–7,498)	5,635 (3,891–7,380)	7,484 (5,439–9,530)
Gallbladder and biliary tract cancer	7,299 (5,427–9,172)	8,285 (6,344–10,226)	9,012 (7,182–10,841)
Pancreatic cancer	8,059 (7,074–9,044)	8,458 (7,457–9,459)	8,231 (7,363–9,100)
Malignant skin melanoma	12,763 (8,895–16,631)	17,136 (12,844–21,427)	16,741 (12,664–20,819)
Non-melanoma skin cancer	4,737 (3,260–6,215)	4,776 (3,470–6,081)	5,957 (4,496–7,417)
Ovarian cancer	6,586 (6,118–7,054)	7,260 (6,767–7,753)	7,851 (7,338–8,365)
Testicular cancer	3,060 (2,379–3,741)	3,466 (2,803–4,130)	4,021 (3,208–4,834)
Kidney cancer	18,124 (14,873–21,376)	18,301 (15,501–21,102)	18,830 (16,041–21,619)
Bladder cancer	4,060 (3,411–4,709)	4,138 (3,466–4,810)	4,991 (4,251–5,731)
Brain and central nervous system cancer	6,831 (5,907–7,755)	7,960 (6,887–9,033)	7,808 (6,863–8,753)
Thyroid cancer	3,302 (2,725–3,878)	3,809 (3,172–4,446)	4,005 (3,376–4,634)
Hodgkin lymphoma	6,617 (5,719–7,515)	10,252 (8,946–11,559)	7,339 (6,450–8,227)
Non-Hodgkin lymphoma	5,308 (4,803–5,813)	6,783 (6,155–7,411)	7,371 (6,642–8,101)
Multiple myeloma	5,774 (4,798–6,750)	7,268 (6,056–8,479)	6,734 (5,665–7,803)
Leukemia	6,024 (5,500–6,548)	6,520 (5,975–7,065)	7,310 (6,728–7,892)
Other malignant neoplasms	7,237 (6,543–7,931)	8,102 (7,354–8,850)	9,414 (8,543–10,285)
Other neoplasms	4,617 (4,460–4,774)	4,796 (4,639–4,953)	4,866 (4,711–5,020)
Ischemic heart disease	4,859 (4,506–5,212)	5,023 (4,646–5,400)	4,584 (4,261–4,907)
Stroke	4,330 (3,732–4,928)	2,904 (2,519–3,290)	3,650 (3,143–4,157)
Cardiomyopathy and myocarditis	2,798 (1,800–3,795)	3,288 (1,926–4,651)	2,945 (1,900–3,990)
Other cardiovascular and circulatory diseases	5,372 (4,667–6,078)	6,951 (5,946–7,955)	5,657 (4,881–6,434)
Asthma	1,490 (1,049–1,931)	1,521 (1,056–1,985)	956 (713–1,198)
Other chronic respiratory diseases	2,959 (2,691–3,227)	3,066 (2,798–3,334)	2,439 (2,257–2,621)
Cirrhosis and other chronic liver diseases	5,497 (4,283–6,711)	4,636 (3,673–5,598)	4,460 (3,527–5,394)
Appendicitis	2,665 (2,314–3,017)	2,789 (2,399–3,178)	2,034 (1,740–2,329)
Paralytic ileus and intestinal obstruction	3,616 (2,700–4,532)	3,638 (2,654–4,621)	3,872 (2,738–5,007)
Inguinal, femoral, and abdominal hernia	3,856 (3,372–4,339)	4,198 (3,653–4,742)	4,104 (3,573–4,635)
Inflammatory bowel disease	4,721 (4,388–5,054)	4,962 (4,627–5,296)	5,081 (4,765–5,397)
Gallbladder and biliary diseases	3,938 (3,494–4,382)	4,817 (4,217–5,418)	3,811 (3,369–4,253)
Pancreatitis	6,259 (4,448–8,069)	5,213 (3,772–6,654)	5,612 (4,108–7,117)
Other digestive diseases	3,492 (3,376–3,609)	3,777 (3,652–3,902)	3,803 (3,682–3,923)
Idiopathic epilepsy	2,733 (1,868–3,598)	3,211 (2,213–4,208)	3,046 (2,231–3,860)
Other neurological disorders	3,698 (3,369–4,026)	3,407 (3,110–3,704)	3,264 (3,000–3,527)

Depressive disorders	860 (279–1,440)	594 (328–860)	623 (403–843)
Other mental disorders	1,428 (746–2,110)	1,118 (721–1,515)	1,393 (840–1,945)
Diabetes mellitus	2,838 (2,575–3,101)	3,689 (3,384–3,994)	3,941 (3,660–4,221)
Acute glomerulonephritis	3,534 (417–6,650)	3,616 (1,086–6,147)	3,834 (1,919–5,749)
Chronic kidney disease	1,875 (1,822–1,928)	1,834 (1,787–1,881)	1,520 (1,488–1,553)
Urinary diseases and male infertility	3,546 (3,403–3,688)	3,943 (3,791–4,094)	3,742 (3,604–3,880)
Gynecological diseases	4,061 (3,908–4,214)	4,655 (4,486–4,824)	4,765 (4,601–4,929)
Hemoglobinopathies and hemolytic anemias	3,170 (2,511–3,829)	3,114 (2,465–3,764)	3,781 (3,073–4,489)
Endocrine, metabolic, blood, and immune disorders	3,792 (3,547–4,037)	4,501 (4,235–4,767)	4,358 (4,114–4,602)
Rheumatoid arthritis	5,191 (4,457–5,925)	5,594 (4,851–6,338)	5,987 (5,272–6,702)
Osteoarthritis	3,552 (3,124–3,980)	4,318 (3,839–4,797)	3,535 (3,224–3,847)
Low back pain	1,988 (1,916–2,060)	2,101 (2,029–2,172)	1,767 (1,714–1,821)
Neck pain	2,749 (2,461–3,038)	2,578 (2,331–2,824)	2,205 (2,023–2,388)
Gout	2,943 (2,861–3,026)	2,924 (2,848–3,001)	2,639 (2,578–2,699)
Other musculoskeletal disorders	3,605 (745–6,465)	4,965 (2,179–7,751)	4,830 (2,440–7,220)
Congenital birth defects	3,438 (1,614–5,262)	3,659 (1,983–5,336)	2,879 (1,591–4,168)
Dermatitis	1,671 (1,249–2,092)	1,851 (1,428–2,274)	2,170 (1,731–2,608)
Psoriasis	6,630 (5,341–7,918)	7,020 (5,790–8,249)	7,210 (5,994–8,426)
Viral skin diseases	2,080 (1,672–2,488)	2,153 (1,762–2,545)	2,205 (1,794–2,615)
Urticaria	1,489 (960–2,017)	2,030 (1,329–2,730)	2,075 (1,386–2,764)
Other skin and subcutaneous diseases	2,981 (2,834–3,129)	3,277 (3,112–3,443)	3,180 (3,025–3,336)
Age-related and other hearing loss	2,917 (2,275–3,559)	3,311 (2,586–4,035)	2,861 (2,218–3,504)
Other sense organ diseases	3,513 (3,378–3,649)	3,684 (3,549–3,819)	3,534 (3,411–3,657)
Oral disorders	4,526 (3,777–5,275)	3,331 (2,789–3,873)	3,120 (2,646–3,595)
Road injuries	1,120 (693–1,547)	1,077 (727–1,428)	2,802 (1,677–3,928)
Falls	1,331 (1,036–1,626)	1,150 (956–1,344)	1,061 (848–1,274)
Poisonings	1,353 (781–1,925)	2,168 (1,445–2,891)	1,428 (928–1,928)
Exposure to mechanical forces	1,161 (723–1,599)	1,622 (986–2,257)	1,136 (719–1,553)
Adverse effects of medical treatment	810 (779–841)	1,236 (1,180–1,293)	1,087 (1,047–1,128)
Animal contact	752 (587–916)	931 (738–1,123)	974 (749–1,199)
Other unintentional injuries	1,683 (1,649–1,716)	1,744 (1,711–1,777)	1,550 (1,522–1,577)
Headache disorders	1,668 (1,386–1,951)	1,651 (1,386–1,917)	1,609 (1,372–1,846)
Bacterial skin diseases	2,203 (2,079–2,327)	2,526 (2,377–2,675)	2,195 (2,076–2,313)
Blindness and vision loss	6,818 (6,667–6,969)	7,187 (7,032–7,341)	7,240 (7,088–7,392)
Upper digestive system diseases	3,850 (3,772–3,928)	4,131 (4,048–4,213)	4,242 (4,159–4,326)
Eye cancer	7,594 (3,968–11,220)	6,470 (3,789–9,151)	4,779 (2,321–7,236)
Soft tissue and other extraosseous sarcomas	6,352 (5,181–7,523)	5,630 (4,711–6,549)	6,142 (5,166–7,119)
Malignant neoplasm of bone and articular cartilage	7,650 (5,795–9,505)	6,221 (4,919–7,523)	3,928 (3,037–4,819)
Primary hypertension	1,899 (1,661–2,137)	2,089 (1,798–2,379)	1,925 (1,672–2,179)
General S/S	2,750 (2,592–2,907)	2,914 (2,760–3,068)	2,689 (2,558–2,820)

## Predicted prices (pre- and post- hospitalization)

Disease	2022 (RM)	2023 (RM)	2024 (RM)
Tuberculosis	987 (879–1,096)	1,002 (891–1,114)	889 (801–977)
Diarrheal diseases	399 (387–411)	407 (397–416)	407 (399–416)
Lower respiratory infections	456 (448–465)	486 (479–493)	497 (490–504)
Upper respiratory infections	601 (584–618)	623 (610–636)	683 (669–697)
Otitis media	579 (538–619)	636 (600–673)	707 (670–744)
Meningitis	1,001 (762–1,239)	876 (692–1,060)	887 (730–1,043)
Encephalitis	1,365 (1,064–1,667)	964 (789–1,139)	1,167 (974–1,360)
Varicella and herpes zoster	542 (433–651)	532 (458–605)	536 (467–605)
Dengue	353 (337–369)	343 (334–353)	345 (335–354)
Other neglected tropical diseases	480 (447–514)	477 (453–501)	483 (457–509)
Maternal disorders	553 (404–703)	351 (268–435)	379 (299–460)
Dietary iron deficiency	584 (491–677)	591 (518–663)	541 (487–595)
Other nutritional deficiencies	640 (368–911)	810 (487–1,133)	544 (384–703)
Sexually transmitted infections excluding HIV	578 (496–660)	668 (579–758)	598 (525–671)
Acute hepatitis	828 (686–971)	781 (662–900)	716 (618–814)
Other unspecified infectious diseases	549 (530–569)	509 (495–523)	530 (515–544)
Esophageal cancer	1,077 (736–1,418)	1,698 (1,258–2,137)	2,463 (1,822–3,104)
Stomach cancer	1,293 (967–1,620)	1,852 (1,461–2,242)	1,842 (1,473–2,212)
Liver cancer	2,244 (1,806–2,683)	1,687 (1,409–1,966)	2,185 (1,812–2,557)
Tracheal, bronchus, and lung cancer	2,954 (2,668–3,241)	2,857 (2,587–3,128)	2,972 (2,718–3,226)
Breast cancer	1,423 (1,359–1,486)	1,514 (1,450–1,579)	1,783 (1,711–1,854)
Cervical cancer	1,200 (1,044–1,357)	1,689 (1,457–1,922)	1,695 (1,469–1,921)
Uterine cancer	1,181 (1,010–1,351)	1,079 (931–1,226)	1,042 (902–1,181)
Prostate cancer	1,711 (1,446–1,977)	1,700 (1,443–1,957)	1,780 (1,504–2,055)
Colon and rectum cancer	1,283 (1,184–1,381)	1,298 (1,206–1,389)	1,559 (1,460–1,659)
Lip and oral cavity cancer	1,268 (1,071–1,465)	1,481 (1,241–1,720)	1,525 (1,285–1,765)
Nasopharynx cancer	1,888 (1,693–2,083)	1,786 (1,611–1,961)	2,168 (1,942–2,394)
Pancreatic cancer	1,979 (1,492–2,467)	1,923 (1,465–2,381)	1,931 (1,570–2,292)
Non-melanoma skin cancer	895 (569–1,222)	773 (515–1,031)	1,214 (866–1,562)
Ovarian cancer	1,166 (1,023–1,308)	1,475 (1,297–1,653)	1,818 (1,616–2,020)
Testicular cancer	1,039 (710–1,368)	2,008 (1,415–2,602)	1,471 (1,044–1,898)
Kidney cancer	2,092 (1,556–2,629)	1,681 (1,309–2,053)	2,703 (2,118–3,288)
Bladder cancer	827 (627–1,026)	880 (689–1,072)	1,030 (810–1,250)
Brain and central nervous system cancer	2,134 (1,730–2,539)	2,477 (2,065–2,888)	3,805 (3,191–4,419)
Thyroid cancer	804 (667–942)	878 (746–1,010)	1,046 (890–1,202)
Hodgkin lymphoma	1,681 (1,307–2,056)	1,785 (1,434–2,135)	1,413 (1,150–1,677)
Non-Hodgkin lymphoma	1,410 (1,245–1,575)	1,452 (1,281–1,623)	1,554 (1,382–1,725)
Multiple myeloma	2,089 (1,422–2,756)	2,525 (1,728–3,322)	2,858 (2,091–3,625)
Leukemia	2,318 (2,030–2,606)	2,387 (2,118–2,657)	2,614 (2,335–2,893)

Other malignant neoplasms	1,784 (1,539–2,029)	1,647 (1,430–1,865)	1,548 (1,346–1,750)
Other neoplasms	652 (636–667)	625 (611–639)	606 (593–619)
Ischemic heart disease	1,059 (1,025–1,094)	1,064 (1,034–1,095)	1,092 (1,063–1,121)
Stroke	1,103 (1,047–1,159)	1,093 (1,042–1,143)	1,139 (1,089–1,189)
Hypertensive heart disease	589 (405–773)	711 (513–910)	926 (701–1,151)
Cardiomyopathy and myocarditis	1,146 (920–1,372)	1,201 (993–1,410)	1,179 (980–1,378)
Atrial fibrillation and flutter	893 (714–1,071)	825 (680–971)	903 (757–1,050)
Lower extremity peripheral arterial disease	872 (584–1,161)	701 (492–910)	884 (604–1,164)
Non-rheumatic valvular heart disease	714 (454–974)	927 (501–1,353)	1,128 (673–1,584)
Other cardiovascular and circulatory diseases	577 (532–623)	607 (564–650)	714 (665–764)
Chronic obstructive pulmonary disease	588 (427–748)	679 (485–872)	842 (595–1,090)
Asthma	554 (483–626)	633 (555–711)	699 (614–783)
Other chronic respiratory diseases	733 (705–762)	788 (761–814)	821 (795–847)
Cirrhosis and other chronic liver diseases	934 (797–1,071)	890 (769–1,011)	805 (699–911)
Appendicitis	418 (398–439)	380 (363–397)	394 (377–410)
Paralytic ileus and intestinal obstruction	909 (783–1,034)	702 (609–796)	572 (500–644)
Inguinal, femoral, and abdominal hernia	412 (381–442)	396 (370–421)	367 (342–391)
Inflammatory bowel disease	522 (496–548)	532 (506–557)	584 (558–610)
Gallbladder and biliary diseases	528 (502–555)	545 (520–571)	504 (482–526)
Pancreatitis	710 (575–845)	757 (630–884)	805 (682–927)
Other digestive diseases	454 (442–466)	434 (423–444)	447 (437–458)
Idiopathic epilepsy	1,234 (1,075–1,393)	1,254 (1,116–1,391)	1,268 (1,136–1,400)
Other neurological disorders	693 (656–729)	692 (658–726)	683 (653–714)
Other mental disorders	794 (376–1,211)	741 (493–989)	867 (663–1,070)
Diabetes mellitus	711 (675–747)	790 (754–826)	789 (758–820)
Acute glomerulonephritis	964 (730–1,199)	1,157 (903–1,412)	1,167 (935–1,398)
Chronic kidney disease	884 (834–934)	914 (867–960)	988 (940–1,037)
Urinary diseases and male infertility	602 (583–621)	571 (555–587)	558 (543–573)
Gynecological diseases	618 (600–635)	617 (602–633)	621 (606–635)
Hemoglobinopathies and hemolytic anemias	1,030 (886–1,174)	986 (875–1,097)	1,347 (1,200–1,495)
Endocrine, metabolic, blood, and immune disorders	741 (708–773)	753 (723–783)	816 (785–846)
Rheumatoid arthritis	1,267 (992–1,543)	1,392 (1,143–1,641)	1,485 (1,251–1,719)
Osteoarthritis	739 (662–815)	749 (689–809)	580 (543–616)
Low back pain	534 (522–546)	590 (579–601)	599 (589–610)
Neck pain	566 (535–597)	583 (555–610)	521 (500–543)
Gout	559 (548–571)	595 (584–605)	612 (602–622)
Other musculoskeletal disorders	1,765 (1,154–2,376)	1,737 (1,273–2,201)	1,811 (1,358–2,265)
Congenital birth defects	650 (433–866)	970 (644–1,296)	738 (486–991)
Dermatitis	1,491 (1,305–1,676)	1,639 (1,480–1,797)	2,313 (2,126–2,501)
Psoriasis	2,350 (1,909–2,791)	3,114 (2,581–3,648)	3,776 (3,192–4,360)
Fungal skin diseases	760 (451–1,068)	836 (529–1,144)	1,387 (1,017–1,756)

## Annex

Viral skin diseases	354 (320–388)	371 (339–403)	363 (330–395)
Urticaria	692 (580–804)	657 (567–746)	725 (638–811)
Decubitus ulcer	1,354 (979–1,728)	995 (759–1,232)	1,328 (1,051–1,606)
Other skin and subcutaneous diseases	419 (400–437)	407 (390–423)	389 (374–403)
Age-related and other hearing loss	597 (526–667)	645 (573–716)	599 (537–661)
Other sense organ diseases	481 (465–498)	499 (484–514)	515 (501–530)
Oral disorders	583 (515–651)	608 (540–677)	546 (483–609)
Poisonings	348 (308–388)	380 (348–413)	351 (322–380)
Adverse effects of medical treatment	511 (489–533)	490 (473–508)	505 (487–523)
Other unintentional injuries	563 (555–571)	594 (587–602)	599 (592–606)
Typhoid and paratyphoid	473 (350–596)	413 (296–531)	454 (375–533)
Headache disorders	613 (563–663)	634 (587–681)	716 (669–762)
Bacterial skin diseases	492 (477–506)	526 (512–540)	523 (511–535)
Blindness and vision loss	406 (396–416)	421 (412–431)	426 (417–435)
Upper digestive system diseases	576 (564–587)	570 (560–580)	573 (563–583)
Soft tissue and other extraosseous sarcomas	1,770 (1,356–2,185)	1,348 (1,074–1,621)	1,943 (1,530–2,355)
Malignant neoplasm of bone and articular cartilage	2,293 (1,617–2,969)	1,331 (1,017–1,645)	988 (737–1,240)
Primary hypertension	717 (680–754)	764 (729–799)	778 (746–810)
General S/S	639 (613–665)	616 (596–636)	654 (634–675)

## Relative price index (inpatient)

Disease	Baseline (GBD=1)	2022	2023	2024
Tuberculosis	1	1.00	1.20	1.28
Diarrheal diseases	1	1.00	1.05	1.08
Lower respiratory infections	1	1.00	1.00	1.05
Upper respiratory infections	1	1.00	1.00	1.04
Otitis media	1	1.00	1.02	0.96
Meningitis	1	1.00	1.03	1.23
Encephalitis	1	1.00	1.18	1.22
Varicella and herpes zoster	1	1.00	1.02	1.03
Dengue	1	1.00	1.04	1.10
Other neglected tropical diseases	1	1.00	1.04	1.09
Maternal disorders	1	1.00	1.03	0.86
Neonatal disorders	1	1.00	1.03	1.68
Iodine deficiency	1	1.00	1.21	1.19
Dietary iron deficiency	1	1.00	1.01	1.09
Sexually transmitted infections excluding HIV	1	1.00	0.98	1.04
Acute hepatitis	1	1.00	0.89	0.96
Other unspecified infectious diseases	1	1.00	0.95	1.02
Esophageal cancer	1	1.00	1.32	1.37
Stomach cancer	1	1.00	1.06	0.83

Liver cancer	1	1.00	0.99	1.07
Tracheal, bronchus, and lung cancer	1	1.00	1.05	1.12
Breast cancer	1	1.00	1.03	1.13
Cervical cancer	1	1.00	0.98	1.16
Uterine cancer	1	1.00	1.06	1.18
Prostate cancer	1	1.00	1.07	1.32
Colon and rectum cancer	1	1.00	0.84	1.01
Lip and oral cavity cancer	1	1.00	1.02	1.05
Nasopharynx cancer	1	1.00	1.04	1.16
Pancreatic cancer	1	1.00	0.79	0.85
Ovarian cancer	1	1.00	0.90	0.93
Testicular cancer	1	1.00	0.82	0.94
Kidney cancer	1	1.00	0.87	0.88
Bladder cancer	1	1.00	1.06	1.25
Brain and central nervous system cancer	1	1.00	0.93	1.18
Thyroid cancer	1	1.00	1.01	1.12
Hodgkin lymphoma	1	1.00	0.72	0.75
Non-Hodgkin lymphoma	1	1.00	1.02	1.04
Multiple myeloma	1	1.00	1.08	1.30
Leukemia	1	1.00	1.06	1.06
Other malignant neoplasms	1	1.00	1.19	1.19
Other neoplasms	1	1.00	1.06	1.13
Ischemic heart disease	1	1.00	0.99	1.03
Stroke	1	1.00	1.01	1.03
Hypertensive heart disease	1	1.00	1.04	1.14
Cardiomyopathy and myocarditis	1	1.00	1.04	1.02
Atrial fibrillation and flutter	1	1.00	1.06	1.37
Lower extremity peripheral arterial disease	1	1.00	0.98	0.83
Endocarditis	1	1.00	1.58	1.80
Non-rheumatic valvular heart disease	1	1.00	0.94	0.87
Other cardiovascular and circulatory diseases	1	1.00	1.01	1.07
Chronic obstructive pulmonary disease	1	1.00	1.03	0.99
Asthma	1	1.00	1.08	0.99
Other chronic respiratory diseases	1	1.00	1.02	1.04
Cirrhosis and other chronic liver diseases	1	1.00	1.02	0.93
Appendicitis	1	1.00	1.02	1.07
Paralytic ileus and intestinal obstruction	1	1.00	0.93	1.02
Inguinal, femoral, and abdominal hernia	1	1.00	1.06	1.11
Inflammatory bowel disease	1	1.00	1.06	1.16
Gallbladder and biliary diseases	1	1.00	1.01	1.07
Pancreatitis	1	1.00	0.89	1.05

## Annex

Other digestive diseases	1	1.00	1.03	1.09
Idiopathic epilepsy	1	1.00	1.18	1.13
Other neurological disorders	1	1.00	1.01	1.06
Other mental disorders	1	1.00	1.03	1.02
Diabetes mellitus	1	1.00	1.02	1.10
Acute glomerulonephritis	1	1.00	0.92	0.94
Chronic kidney disease	1	1.00	1.07	1.18
Urinary diseases and male infertility	1	1.00	1.04	1.09
Gynecological diseases	1	1.00	1.02	1.09
Hemoglobinopathies and hemolytic anemias	1	1.00	0.99	1.17
Endocrine, metabolic, blood, and immune disorders	1	1.00	1.04	1.09
Rheumatoid arthritis	1	1.00	0.91	1.06
Osteoarthritis	1	1.00	0.95	0.90
Low back pain	1	1.00	1.01	1.04
Neck pain	1	1.00	1.01	0.96
Gout	1	1.00	0.97	1.01
Other musculoskeletal disorders	1	1.00	1.26	1.03
Dermatitis	1	1.00	1.09	1.13
Psoriasis	1	1.00	1.08	1.13
Fungal skin diseases	1	1.00	0.83	0.87
Viral skin diseases	1	1.00	1.04	1.06
Urticaria	1	1.00	1.05	0.99
Decubitus ulcer	1	1.00	0.91	1.16
Other skin and subcutaneous diseases	1	1.00	1.04	1.08
Age-related and other hearing loss	1	1.00	1.04	0.96
Other sense organ diseases	1	1.00	1.06	1.08
Oral disorders	1	1.00	0.97	0.99
Poisonings	1	1.00	1.05	1.05
Adverse effects of medical treatment	1	1.00	0.98	0.95
Other unintentional injuries	1	1.00	0.99	0.99
Typhoid and paratyphoid	1	1.00	1.01	1.06
Headache disorders	1	1.00	1.01	1.07
Bacterial skin diseases	1	1.00	1.00	1.05
Blindness and vision loss	1	1.00	1.03	1.05
Upper digestive system diseases	1	1.00	1.00	1.08
Soft tissue and other extrasosseous sarcomas	1	1.00	1.07	1.54
Malignant neoplasm of bone and articular cartilage	1	1.00	1.03	1.05
Primary hypertension	1	1.00	1.05	1.09
General S/S	1	1.00	0.98	1.05

## Relative price index (outpatient)

Disease	Baseline (GBD=1)	2022	2023	2024
Tuberculosis	1	1.00	1.04	1.05
Diarrheal diseases	1	1.00	1.16	1.15
Lower respiratory infections	1	1.00	1.15	0.78
Upper respiratory infections	1	1.00	1.05	0.81
Otitis media	1	1.00	1.04	0.97
Varicella and herpes zoster	1	1.00	2.09	0.86
Dengue	1	1.00	1.05	1.19
Other neglected tropical diseases	1	1.00	0.84	0.67
Maternal disorders	1	1.00	0.93	1.79
Iodine deficiency	1	1.00	0.79	0.87
Dietary iron deficiency	1	1.00	0.97	1.01
Sexually transmitted infections excluding HIV	1	1.00	0.59	0.62
Acute hepatitis	1	1.00	0.89	1.26
Other unspecified infectious diseases	1	1.00	0.95	0.98
Esophageal cancer	1	1.00	1.19	1.43
Stomach cancer	1	1.00	1.07	1.10
Liver cancer	1	1.00	0.92	1.00
Larynx cancer	1	1.00	0.92	0.85
Tracheal, bronchus, and lung cancer	1	1.00	1.01	0.98
Breast cancer	1	1.00	1.06	1.07
Cervical cancer	1	1.00	1.14	1.28
Uterine cancer	1	1.00	1.03	0.98
Prostate cancer	1	1.00	1.15	1.09
Colon and rectum cancer	1	1.00	0.71	1.00
Lip and oral cavity cancer	1	1.00	1.22	1.29
Nasopharynx cancer	1	1.00	1.00	1.05
Other pharynx cancer	1	1.00	0.96	1.28
Gallbladder and biliary tract cancer	1	1.00	1.14	1.23
Pancreatic cancer	1	1.00	1.05	1.02
Malignant skin melanoma	1	1.00	1.34	1.31
Non-melanoma skin cancer	1	1.00	1.01	1.26
Ovarian cancer	1	1.00	1.10	1.19
Testicular cancer	1	1.00	1.13	1.31
Kidney cancer	1	1.00	1.01	1.04
Bladder cancer	1	1.00	1.02	1.23
Brain and central nervous system cancer	1	1.00	1.17	1.14
Thyroid cancer	1	1.00	1.15	1.21
Hodgkin lymphoma	1	1.00	1.55	1.11
Non-Hodgkin lymphoma	1	1.00	1.28	1.39

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Multiple myeloma	1	1.00	1.26	1.17
Leukemia	1	1.00	1.08	1.21
Other malignant neoplasms	1	1.00	1.12	1.30
Other neoplasms	1	1.00	1.04	1.05
Ischemic heart disease	1	1.00	1.03	0.94
Stroke	1	1.00	0.67	0.84
Cardiomyopathy and myocarditis	1	1.00	1.18	1.05
Other cardiovascular and circulatory diseases	1	1.00	1.29	1.05
Asthma	1	1.00	1.02	0.64
Other chronic respiratory diseases	1	1.00	1.04	0.82
Cirrhosis and other chronic liver diseases	1	1.00	0.84	0.81
Appendicitis	1	1.00	1.05	0.76
Paralytic ileus and intestinal obstruction	1	1.00	1.01	1.07
Inguinal, femoral, and abdominal hernia	1	1.00	1.09	1.06
Inflammatory bowel disease	1	1.00	1.05	1.08
Gallbladder and biliary diseases	1	1.00	1.22	0.97
Pancreatitis	1	1.00	0.83	0.90
Other digestive diseases	1	1.00	1.08	1.09
Idiopathic epilepsy	1	1.00	1.17	1.11
Other neurological disorders	1	1.00	0.92	0.88
Depressive disorders	1	1.00	0.69	0.72
Other mental disorders	1	1.00	0.78	0.98
Diabetes mellitus	1	1.00	1.30	1.39
Acute glomerulonephritis	1	1.00	1.02	1.09
Chronic kidney disease	1	1.00	0.98	0.81
Urinary diseases and male infertility	1	1.00	1.11	1.06
Gynecological diseases	1	1.00	1.15	1.17
Hemoglobinopathies and hemolytic anemias	1	1.00	0.98	1.19
Endocrine, metabolic, blood, and immune disorders	1	1.00	1.19	1.15
Rheumatoid arthritis	1	1.00	1.08	1.15
Osteoarthritis	1	1.00	1.22	1.00
Low back pain	1	1.00	1.06	0.89
Neck pain	1	1.00	0.94	0.80
Gout	1	1.00	0.99	0.90
Other musculoskeletal disorders	1	1.00	1.38	1.34
Congenital birth defects	1	1.00	1.06	0.84
Dermatitis	1	1.00	1.11	1.30
Psoriasis	1	1.00	1.06	1.09
Viral skin diseases	1	1.00	1.04	1.06
Urticaria	1	1.00	1.36	1.39
Other skin and subcutaneous diseases	1	1.00	1.10	1.07

Age-related and other hearing loss	1	1.00	1.13	0.98
Other sense organ diseases	1	1.00	1.05	1.01
Oral disorders	1	1.00	0.74	0.69
Road injuries	1	1.00	0.96	2.50
Falls	1	1.00	0.86	0.80
Poisonings	1	1.00	1.60	1.06
Exposure to mechanical forces	1	1.00	1.40	0.98
Adverse effects of medical treatment	1	1.00	1.53	1.34
Animal contact	1	1.00	1.24	1.30
Other unintentional injuries	1	1.00	1.04	0.92
Headache disorders	1	1.00	0.99	0.96
Bacterial skin diseases	1	1.00	1.15	1.00
Blindness and vision loss	1	1.00	1.05	1.06
Upper digestive system diseases	1	1.00	1.07	1.10
Eye cancer	1	1.00	0.85	0.63
Soft tissue and other extrasosseous sarcomas	1	1.00	0.89	0.97
Malignant neoplasm of bone and articular cartilage	1	1.00	0.81	0.51
Primary hypertension	1	1.00	1.10	1.01
General S/S	1	1.00	1.06	0.98

### Relative price index (pre- and post- hospitalization)

Disease	Baseline (GBD=1)	2022	2023	2024
Tuberculosis	1	1.00	1.02	0.90
Diarrheal diseases	1	1.00	1.02	1.02
Lower respiratory infections	1	1.00	1.07	1.09
Upper respiratory infections	1	1.00	1.04	1.14
Otitis media	1	1.00	1.10	1.22
Meningitis	1	1.00	0.88	0.89
Encephalitis	1	1.00	0.71	0.85
Varicella and herpes zoster	1	1.00	0.98	0.99
Dengue	1	1.00	0.97	0.98
Other neglected tropical diseases	1	1.00	0.99	1.01
Maternal disorders	1	1.00	0.63	0.69
Dietary iron deficiency	1	1.00	1.01	0.93
Other nutritional deficiencies	1	1.00	1.27	0.85
Sexually transmitted infections excluding HIV	1	1.00	1.16	1.03
Acute hepatitis	1	1.00	0.94	0.86
Other unspecified infectious diseases	1	1.00	0.93	0.96
Esophageal cancer	1	1.00	1.58	2.29
Stomach cancer	1	1.00	1.43	1.42

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Liver cancer	1	1.00	0.75	0.97
Tracheal, bronchus, and lung cancer	1	1.00	0.97	1.01
Breast cancer	1	1.00	1.06	1.25
Cervical cancer	1	1.00	1.41	1.41
Uterine cancer	1	1.00	0.91	0.88
Prostate cancer	1	1.00	0.99	1.04
Colon and rectum cancer	1	1.00	1.01	1.22
Lip and oral cavity cancer	1	1.00	1.17	1.20
Nasopharynx cancer	1	1.00	0.95	1.15
Pancreatic cancer	1	1.00	0.97	0.98
Non-melanoma skin cancer	1	1.00	0.86	1.36
Ovarian cancer	1	1.00	1.27	1.56
Testicular cancer	1	1.00	1.93	1.42
Kidney cancer	1	1.00	0.80	1.29
Bladder cancer	1	1.00	1.07	1.25
Brain and central nervous system cancer	1	1.00	1.16	1.78
Thyroid cancer	1	1.00	1.09	1.30
Hodgkin lymphoma	1	1.00	1.06	0.84
Non-Hodgkin lymphoma	1	1.00	1.03	1.10
Multiple myeloma	1	1.00	1.21	1.37
Leukemia	1	1.00	1.03	1.13
Other malignant neoplasms	1	1.00	0.92	0.87
Other neoplasms	1	1.00	0.96	0.93
Ischemic heart disease	1	1.00	1.00	1.03
Stroke	1	1.00	0.99	1.03
Hypertensive heart disease	1	1.00	1.21	1.57
Cardiomyopathy and myocarditis	1	1.00	1.05	1.03
Atrial fibrillation and flutter	1	1.00	0.92	1.01
Lower extremity peripheral arterial disease	1	1.00	0.80	1.01
Non-rheumatic valvular heart disease	1	1.00	1.30	1.58
Other cardiovascular and circulatory diseases	1	1.00	1.05	1.24
Chronic obstructive pulmonary disease	1	1.00	1.15	1.43
Asthma	1	1.00	1.14	1.26
Other chronic respiratory diseases	1	1.00	1.07	1.12
Cirrhosis and other chronic liver diseases	1	1.00	0.95	0.86
Appendicitis	1	1.00	0.91	0.94
Paralytic ileus and intestinal obstruction	1	1.00	0.77	0.63
Inguinal, femoral, and abdominal hernia	1	1.00	0.96	0.89
Inflammatory bowel disease	1	1.00	1.02	1.12
Gallbladder and biliary diseases	1	1.00	1.03	0.95
Pancreatitis	1	1.00	1.07	1.13

Other digestive diseases	1	1.00	0.96	0.99
Idiopathic epilepsy	1	1.00	1.02	1.03
Other neurological disorders	1	1.00	1.00	0.99
Other mental disorders	1	1.00	0.93	1.09
Diabetes mellitus	1	1.00	1.11	1.11
Acute glomerulonephritis	1	1.00	1.20	1.21
Chronic kidney disease	1	1.00	1.03	1.12
Urinary diseases and male infertility	1	1.00	0.95	0.93
Gynecological diseases	1	1.00	1.00	1.00
Hemoglobinopathies and hemolytic anemias	1	1.00	0.96	1.31
Endocrine, metabolic, blood, and immune disorders	1	1.00	1.02	1.10
Rheumatoid arthritis	1	1.00	1.10	1.17
Osteoarthritis	1	1.00	1.01	0.78
Low back pain	1	1.00	1.11	1.12
Neck pain	1	1.00	1.03	0.92
Gout	1	1.00	1.06	1.09
Other musculoskeletal disorders	1	1.00	0.98	1.03
Congenital birth defects	1	1.00	1.49	1.14
Dermatitis	1	1.00	1.10	1.55
Psoriasis	1	1.00	1.33	1.61
Fungal skin diseases	1	1.00	1.10	1.83
Viral skin diseases	1	1.00	1.05	1.03
Urticaria	1	1.00	0.95	1.05
Decubitus ulcer	1	1.00	0.74	0.98
Other skin and subcutaneous diseases	1	1.00	0.97	0.93
Age-related and other hearing loss	1	1.00	1.08	1.00
Other sense organ diseases	1	1.00	1.04	1.07
Oral disorders	1	1.00	1.04	0.94
Poisonings	1	1.00	1.09	1.01
Adverse effects of medical treatment	1	1.00	0.96	0.99
Other unintentional injuries	1	1.00	1.06	1.06
Typhoid and paratyphoid	1	1.00	0.87	0.96
Headache disorders	1	1.00	1.03	1.17
Bacterial skin diseases	1	1.00	1.07	1.06
Blindness and vision loss	1	1.00	1.04	1.05
Upper digestive system diseases	1	1.00	0.99	1.00
Soft tissue and other extraosseous sarcomas	1	1.00	0.76	1.10
Malignant neoplasm of bone and articular cartilage	1	1.00	0.58	0.43
Primary hypertension	1	1.00	1.07	1.08
General S/S	1	1.00	0.96	1.02



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