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HOUSEHOLDS AND THE PANDEMIC 2019-2022

THE STATE OF HOUSEHOLDS 2024

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Chapter 2 From Necessities to New Norms: How Covid-19 Reshaped Household Expenditure in Malaysia – Theebalakshmi Kunasekaran, Dr Teoh Ai Ni, Shazrul Ariff Suhaimi and Azfar Hanif Azizi.

Chapter 3 From Blackboards to Broadband: Education Outcomes and Digital Learning during Covid-19 – Shereen Hazirah Hishamudin, Dr Teoh Ai Ni and Wan Amirah Wan Usamah.

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ABBREVIATIONS

BNM	:	*Bank Negara Malaysia* (the Central Bank of Malaysia)
BNPL	:	Buy Now Pay Later
BPR	:	*Bantuan Prihatin Rakyat*
CAGR	:	Compound Annual Growth Rate
CPI	:	Consumer Price Index
DELIMa	:	Digital Educational Learning Initiative Malaysia
DOS	:	Department of Statistics Malaysia
EHR	:	Electronic health records
EPF	:	Employees Provident Fund
EPU	:	Economic Planning Unit
FAH	:	Food at home
FAFH	:	Food away from home
GDP	:	Gross Domestic Product
GFC	:	Global Financial Crisis
GLC	:	Government-linked companies
GLIC	:	Government-linked investment companies
GOM	:	Government of Malaysia
GPN	:	*Gred Purata Nasional*
HIS	:	Household Income Survey
HIS@KKM	:	Hospital Information System @ Kementerian Kesihatan Malaysia
HES	:	Household Expenditure Survey
HWP	:	Health White Paper
ICT	:	Information and Communication Technology
ICTHS	:	Information and Communication Technology Use and Access by Individuals and Households Survey
JENDELA	:	*Jalinan Digital Negara*
LAYS	:	Learning adjusted years of schooling
LPM	:	Lembaga Peperiksaan Malaysia
MCO	:	Movement Control Order
MERS	:	Middle East Respiratory Syndrome
MMC	:	Malaysian Medical Council
MNC	:	Multinational Companies
MOE	:	Ministry of Education Malaysia
MOF	:	Ministry of Finance
MOH	:	Ministry of Health
MOHE	:	Ministry of Higher Education
MPI	:	Multidimensional Poverty Index
NAPIC	:	National Property Information Centre
ODL	:	Open and Distance Learning

ABBREVIATIONS

OECD	:	Organisation for Economic Co-operation and Development
PCIDA	:	Prevention and Control of Infectious Diseases Act 1988
PDPA	:	Personal Data Protection Act 2010
PdPR	:	*Program Pengajaran dan Pembelajaran di Rumah*
PIK	:	*Pusat Internet Komuniti*
PISA	:	Programme for International Student Assessment
PLI	:	Poverty Line Income
SARS	:	Severe Acute Respiratory Syndrome
SARES	:	Sarawak Alternative Rural Electrification Scheme
SEL	:	Socio-economic learning
SoH	:	State of Households
SPM	:	*Sijil Pelajaran Malaysia*
SPP	:	*Sistem Pengurusan Pesakit* (Patient Management System)
THIS	:	Total Hospital Information System
UMMC	:	University Malaya Medical Centre
UN	:	United Nations
UNESCO	:	United Nations Educational, Scientific and Cultural Organisation
UNCTAD	:	United Nations Trade and Development
UNICEF	:	United Nations Children's Fund
UK	:	United Kingdom
US	:	United States
WFH	:	Work From Home
WHO	:	World Health Organisation

GLOSSARY

Absolute poverty	A condition characterised by severe deprivation of basic human needs, including food, safe drinking water, sanitation, health, shelter and education. Source: UN (1995)
Consumer price index (CPI)	A measure that tracks the changes in the weighted average of prices of a representative basket of goods and services purchased by consumers in an economy. Source: Hasell and Roser (2023)
Compound annual growth rate (CAGR)	An annualised growth rate derived from a geometric progression ratio which provides a constant growth rate over a specified period. The formula is: CAGR = [(Ending value/Beginning value)(1/Number of time periods) – 1] x 100 Source: Anson, Fabozzi, and Jones (2010)
Disposable income	Refers to the amount of income after deducting current transfer payments including compulsory payments such as taxes, zakat and contributions to social security schemes. Source: DOS (2023b)
Gini coefficient	A measure of inequality in the extent to which the distribution of income (or, in some cases, consumption expenditure) among individuals or households within an economy deviates from a perfectly equal distribution. Values range between 0 and 1, where 0 denotes complete equality while 1 denotes complete inequality. Source: DOS (2020a)
Learning adjusted years of schooling (LAYS)	A metric developed and updated by the World Bank in 2020 as a means of standardising the learning quality and quantity of individual countries in a singular, comparable measurement. Source: Filmer et al. (2020)
Multidimensional Poverty Index (MPI)	A measure that identifies multiple deprivations at the household and individual level in health, education and standard of living. The MPI reflects both the incidence of multidimensional deprivation (a headcount of those in multidimensional poverty) and its intensity (the average deprivation score experienced by poor people). Source: UNDP (2024)
P90/P10 dispersion ratio	Percentile ratios indicate the ratio of incomes of two persons who are at different positions in the disposable income distribution. A P90/P10 dispersion ratio compares the income at the 90th percentile to the one at the tenth percentile. Source: Schettino and Clementi (2022)
Poverty Line Income (PLI)	A measure of income needed by a household to meet basic food and non-food needs for each member. The Food PLI covers daily nutritional requirements as determined by the Ministry of Health (MOH), while the non-food PLI covers essentials like clothing, housing, transport, and other non-food needs based on the expenditure patterns of low-income households. Source: DOS (2020a)

GLOSSARY

Relative poverty	A measure of deprivation based on a comparison with a certain standard of living. The threshold can be defined as a certain percentage under the median income. Individuals or households below that threshold are then categorised as being in relative poverty. Source: DOS (2020a)
Socio-economic learning (SEL)	The process of obtaining a range of holistic skills and qualities such as the capacity to regulate emotions and actions, resolve issues, make ethical decisions and other forms of non-cognitive skills. Source: Bayley et al. (2023)

EXECUTIVE SUMMARY

Background

Since its independence, Malaysia has embarked on a remarkable journey of economic development and transformation. Moving away from an economy that was once heavily reliant on agriculture and commodities, it has successfully diversified into manufacturing and services, becoming one of the most dynamic economies in Southeast Asia. The fifth edition of the State of Households 2024 (SoH 2024), termed the Covid-19 edition, specifically explores short-term trends and narratives influenced by the pandemic, tying these to spatial distributions that affect the state of households at district level. SoH 2024 delves into four parts — (i) household income; (ii) household expenditure; (iii) schooling and digital access; and (iv) health and digitalisation. As in past SoH reports, we used Household Income and Expenditure Survey data from DOS to analyse households, their income and expenditures during the pandemic. These constitute the first two parts of the report. The latter two parts look at two issues that had a major impact on households during the pandemic; schooling and health.

Pandemic Shifts: How Covid-19 Reshaped Household Formation, Income Distribution, Inequality and Wealth in Malaysia

Urbanisation, demographic trends, and changing family structures influenced the shift of household distribution in Malaysia. Mirroring the global trends in its household size, Malaysia's average household size fell from 4.6 in 1995 to 3.8 in 2022. Large households declined, while one-person households increased. Nearly 80% of households were urban in 2022, increased by 10% compared to 2002. Increase in urbanisation trends, driven by economic opportunities, correlates with state gross domestic product (GDP) per capita. Highly urbanised states like Kuala Lumpur and Selangor have higher GDP per capita, while less urbanised states face economic challenges. Sarawak, for instance, despite a high GDP, remains predominantly rural.

Malaysian household incomes showed modest growth but were slowed by the Covid-19 pandemic. Despite the increase in household income in 2022, it grew at a much slower rate compared to the pre-pandemic trend, remaining significantly below potential projections. Specifically, median income was 12% below the pre-Covid-19 trajectory, and mean income was 13% below, indicating a substantial lag in recovery. Additionally, the widening gap between mean and median incomes suggests increasing income inequality, with higher earners benefiting more compared to the rest of the population.

Selangor led household income growth, while urban areas like Putrajaya and Kuala Lumpur saw declines. From 2016 to 2019, all states except Sabah experienced positive real median household income growth. During 2019 – 2022, Putrajaya (-1.3%) and Kuala Lumpur (-2.5%) saw significant declines in real median household income. Conversely, Selangor outperformed other states with an average absolute increase of RM410 and a compound annual growth rate (CAGR) of 5.1%. Districts in Selangor, except Klang and Petaling (-0.7% and 0.21% growth, respectively), were in the top quintile of CAGR growth in Malaysia. The highest growth districts in 2019 – 2022 were Kuala Langat (11%), Sepang (10%), and Ulu Langat (8%). Some districts in Sabah and Sarawak also demonstrated resilience during 2019 – 2022, positioning themselves in the top growth quintile. Interestingly, many districts in Sabah and Sarawak that showed low-quintile growth from 2016 – 2019 showed vast improvement in the 2019 – 2022 period.

The national average real median household disposable income dropped significantly from RM110 during 2016 – 2019 (2.1%) to just RM16 (1.0%) in the 2019 – 2022 period. All states and federal territories across Malaysia had a positive growth and average absolute change during the 2016/2019 period. Between 2019 and 2022, only five states showed an increase in disposable income growth: Selangor (4.6%), Sarawak (0.7%), Johor (0.7%), Pahang (0.4%), and Sabah (0.2%). Notably, Selangor was the standout, with an average absolute increase of RM303—where seven outperforming districts fell within the top highest growth of median household disposable income quintiles.

Household income in 2022, when adjusted for inequality, grew more slowly, with 18 districts, primarily from Peninsular Malaysia, falling into the lowest growth group, resulting in decreased income and increased inequality. Adjusted household income only rose by 7.9% in 2022 compared to the 12% in 2019, mainly due to the lower growth in household income in 2022. Several districts experienced a decrease in adjusted household income in 2022 while its drivers of growth were more diverse as they had multiple combinations in the change and magnitude of household income and Gini coefficient. However, the use of Gini coefficient alone in assessing inequality is not definitive, some states and strata showed a reduction in Gini but an increase in inequalities at the tail ends of the income distribution.

The aftermath of the Covid-19 pandemic saw an increase of households in absolute poverty in contrast to the downward trend of poverty in the years before. While not all districts faced a rise in absolute poverty, urban households were the most affected with poverty rising from 3.8% in 2019 to 4.5% in 2022. Additionally, districts with higher incidences of households in absolute poverty had households with relatively lower access to basic amenities such as access to piped clean water or garbage collection facilities, pointing to strong overlaps between monetary and non-monetary poverty.

Household residual incomes have declined across income deciles, disproportionately affecting both lower- and middle-income households. In the bottom 10th decile, they experienced a -108.2% decline from RM200 (nominally) in 2019 to -RM16 in 2022. This trend is further exacerbated through the Covid-19 related EPF withdrawal schemes, that collectively resulted in over 90% of EPF members under 30 not having enough in basic savings for retirement.

From Necessities to New Norms: How Covid-19 Reshaped Household Expenditure in Malaysia

Nationally, mean and median expenditure as a percentage of household income has continued to rise. This growth is attributed to increases in expenditure among urban households, with a CAGR of 5.6% compared to rural households at 3.6% between 2014 and 2022. During the pandemic period of 2019 – 2022, there has been a trend shift whereby lower-income households recorded a higher share of consumption expenditure than higher-income households.

Households allocate the largest share of their monthly expenditures to three fundamental necessities: housing and utilities (23.2%), food at home (16.3%) and dining out (15.3%), and transportation (11.3%). Housing and utilities have become the largest expenditure category since 2004, surpassing food consumed at home. The share of food to transportation expenses has declined, while spending on food away from home and communication services has increased significantly, reflecting changing consumption behaviours, lifestyles, and the impact of the Covid-19 pandemic.

Food away from home (FAFH), once viewed as a discretionary household expense, is rapidly substituting food at home to become an essential part of the Malaysian diet. In 2022, Malaysian households spent 48% of their total food expenditure on FAFH—the highest share recorded. This shift from food at home to increased spending on food away from home was consistent across urban and rural households but was more pronounced in certain districts and among higher-income households.

Work-from-home (WFH) related expenses surged during the pandemic years as households adapted to remote work and learning. Between 2019 and 2022, real expenditures on housing and utilities grew by 10%, while spending on furnishings and household maintenance increased by 14%. The surge was more pronounced among urban households, which saw a 12.5% increase in housing and utilities expenses and a 17.2% rise in furnishings and maintenance during the pandemic years. Most income deciles, particularly the highest, saw increased growth in housing and utilities expenditure. Meanwhile, lower-income deciles, especially Deciles 1 to 3, recorded higher growth in furnishings and maintenance, with CAGR exceeding 8%, indicating that these households were either striving to improve their living conditions or responding to new needs created by pandemic-induced lockdowns.

Information and communication technology (ICT) related expenditure has steadily increased over the years, with the sharpest increase observed in 2022. This figure increased from RM266.8 in real terms in 2019 to RM 397.4 in 2022. Between 2014 and 2022, there has been higher growth in ICT expenditure among rural households at 26.0% compared to urban households at 22.5% with the steepest increase in the 2019-2022 period. This may be attributed to rural households needing to accommodate for increased WFH and remote-learning policies during the pandemic. Lastly, between 2019 and 2022, the bottom 10% of households had a CAGR of 3.5%, compared to -0.4% for the highest 10%, which shows a disproportionate percentage increase among lower-income households.

The Covid-19 pandemic has significantly reshaped healthcare expenditure patterns among Malaysian households, leading to marked shifts in spending across different regions and income groups. Between 2019 to 2022, poorer households increased their healthcare spending faster than wealthier households, reversing pre-pandemic trends. Rural areas in several states, including Kedah, Kelantan, and Sarawak, saw healthcare expenses grow more rapidly than urban areas, although urban households continued to spend more in absolute terms. Medicines, once the dominant category within healthcare expenditure, saw their share decline as spending on medical products surged (from RM2.3 in 2014 to RM34.5 in 2022, a 1,375% increase), driven by the need for preventive items like face masks and sanitisers.

From Blackboards to Broadband: Education Outcomes and Digital Learning During Covid-19

In 2020, school children in Malaysia attended in-person classes for only six months as a result of school closures. These closures, while necessary to curb the virus's spread, brought about major disruptions to traditional learning environments and exacerbated existing educational inequities. In Malaysia, the impact of school closures on education outcomes is present at the secondary school level. While Sijil Pelajaran Malaysia (SPM) candidates' achievements improved at the national level, there has been a rise in SPM absenteeism post-pandemic. Meanwhile, the gap in student performance between rural and urban areas persists, potentially worsened by digital inequities during virtual learning.

The impact of school closures on education outcomes is observed globally and to varying extents. Global experience showed that school closures have led to several types of losses, including academic loss, often measured through tests, as well as losses in skill development, equal education access and psychological losses, which are more intangible. For academic losses, while school closures show a drop in Programme for International Student Assessment (PISA) scores among all students, the loss is not equal. Students who faced longer school closures showed a larger decrease in scores. Malaysia itself had one of the longest durations of school closures at 41.5 weeks between mid-February 2020 to 1st July 2022. These long disruptions may have contributed to the significant drop in PISA scores in 2022.

While efforts were undertaken to mitigate disruptions from school closures in Malaysia, digital inequalities among students remained a barrier. Findings from PISA 2022 revealed that students faced issues with internet access during the period of online learning. There were also disparities in the types of devices that students could access, with the majority relying on smartphones. These inequalities in digital access had an implication on educational outcomes; students who had difficulty accessing digital devices and faced more frequent internet disruptions exhibited lower PISA scores.

Health and Digitalisation: Solutions for the Pandemic and Beyond

Household access to internet and ICT devices has been consistently increasing over the years. Access to computers has shown the most increase from 71.3% in 2019 to 91.3% in 2022. Despite an urban-rural divide where urban households are more likely than rural households to have access to computers and fixed broadband, smartphones and mobile broadband penetration rates are higher in both urban and rural households. This shows that Malaysia is generally a "mobile-first" nation.

Digital use of services rose during the pandemic, but this use was not sustained evenly across groups. Financial consumer behaviour experienced the most growth between 2017 and 2022 but only remained high post-pandemic among those under 50. Health-related digital use spiked in 2021 and then decreased in 2022, with the rise and fall especially pronounced for those aged 60 and above. This may reflect the introduction of the MySejahtera application during the pandemic which showed the potential of a mobile-centric public digital health platform.

A future-proof health system should meet three design criteria: patient inclusion, data governance and systems integration. Malaysia's 30-year long efforts to digitalise its public healthcare system have faced challenges in areas such as procurement, internet connectivity and supporting infrastructure, interoperability and standards, system and process design, interoperability and standardisation, and data governance. In response to these challenges, the country has transitioned to a more lightweight, mobile and cloud-based approach.

Conclusion

The four chapters of this report explore income, expenditure, digital schooling, and digital health among Malaysian households, offering insights into the pandemic's impact on household and national progress. While it does not provide specific policy recommendations, the analysis — from appreciating the diversity in changes of spatial trends — could serve as discussions for policy interventions and sustainable development plans that align with the aspirations of Malaysia MADANI.

INTRODUCTION

By Yin Shao Loong

The coronavirus disease 2019 (Covid-19) unleashed a pandemic with unprecedented social and economic impacts. The influenza pandemic of 1918 was the 20th century's great viral outbreak, wreaking a death toll of at least 50 million in a world lacking appropriate vaccines, limited international travel and minimal social controls. Over a century later, the Covid-19 pandemic has claimed 7 million lives by August 2024[1]. However, Covid-19 spread in a context of ubiquitous international travel and exacerbating factors for zoonotic disease transmission. These factors were not unexpected, they had long been predicted by virologists – the densely populated areas of East Asia where wildlife, agriculture and humanity underwent lethal convergence[2]. Our generation's pandemic saw 95% of the world's economies suffer a simultaneous contraction in per capita GDP in the first half of 2020[3] as they voluntarily imposed movement restrictions. Over 3 billion adults had their employment disrupted or struggled to work from home. Nearly 1.6 billion youth had their education interrupted with consequences such as lost future productivity and trillions of dollars lost from their lifetime earnings[4]. Economic shutdown induced massive supply shocks that continue to send ripples into the global economy in 2024. Witness the ongoing reconfiguration of global semiconductor supply chains towards localisation and regionalisation in response to supply shocks.

The scars and aftershocks of the pandemic remain with us and while we are eager to push forward to a brighter future it is important for us to understand how past stresses on households create lingering impacts. Impacts such as constrained household incomes, depleted retirement savings and learning losses all threaten to cloud the future economic wellbeing of Malaysian households unless interventions are made in the present. Reducing inequalities and increasing societal wealth have been central concerns of Malaysian development policy since the 1960s. The formulation of more targeted and effective policies as we near high income status depends in part on the effective and innovative use of data.

This fifth edition of the State of Households 2024 (SoH 2024), termed the Covid-19 edition, specifically explores short-term trends and narratives influenced by the pandemic, tying these to spatial distributions that affect the state of households at district level. SoH 2024 has four parts: (i) household income; (ii) household expenditure; (iii) schooling and digital access; and (iv) health and digitalisation. As in past SoH reports, we used Household Income and Expenditure Survey data from DOS to analyse households, their income and expenditures during the pandemic. These constitute the first two parts of the report. The latter two parts look at two issues that had a major impact on households during the pandemic: schooling and health.

The data and analysis in this report tells a Malaysian household story that is inextricably linked to the larger global dynamics of the pandemic as well as policy responses taken at the national level. The rest of this introduction presents a macro view as complementary context for the household analysis that follows.

[1] WHO (2023)
[2] Tooze (2021)
[3] Ibid.
[4] Ibid.

Covid-19 tested the capacity of international and national institutions to respond to a combined public health emergency and induced economic recession. Governments around the world responded in a variety of ways reflecting their predispositions and preparedness. Their actions shaped health, mortality and economic outcomes for their citizens that are still being felt today.

South Korea, Taiwan and China swiftly imposed isolation, contact tracing and mass testing reflecting recent experiences with the MERS (Middle East Respiratory Syndrome) and SARS (Severe Acute Respiratory Syndrome) viruses. The United States, United Kingdom and Sweden took comparatively laissez-faire measures. For a crisis where science-based precautionary action was central, bizarre pseudo-science was floated by leaders in the most advanced economies: drinking bleach, dosing with veterinary drugs, and pursuing herd immunity via infection rather than vaccination. Wearing a mask was seen as a restriction on one's personal freedom rather than a measure to protect others. There was for a time much unproductive spilling of ink on 'liberal democratic' versus 'authoritarian' approaches to containing the pandemic. This was more reflective of escalating tensions between China and the West that have continued to intensify in the present.

Some countries did not confront the pandemic with their national institutions in robust shape. This would have varying impacts on how they weathered the combined health and economic crises. Advanced economies such as the United States and United Kingdom were in the throes of national crises induced by the chaos of the Trump administration and Brexit, respectively. When lockdown was imposed on 18 March 2020, the Malaysian Cabinet was barely over one week old. However, with regard to saving lives Malaysia performed relatively well. In terms of reported deaths to the World Health Organisation (WHO), Malaysia ranked 31st compared to the United States (US), Brazil, India, Russia, Mexico and the United Kingdom (UK), who in descending order represented the greatest absolute deaths[5]. Looking at excess deaths per capita (the total number of deaths above and beyond what would have been expected based on pre-pandemic trends) Malaysia performed better than Asian leaders such as China, South Korea and Taiwan who were all well below the global average. Countries such as the US, Indonesia, Vietnam, Cambodia and India were above the global average for excess deaths[6].

In addition to the economic impacts of national pandemic measures, the conflict between Russia and Ukraine had significant inflationary impacts on food and fuel, which combined with reduced demand from China slowed global economic recovery to just 3.0% in 2022 from 6.3% in 2021[7]. Weaker-than-expected growth from China will likely weigh on future global growth.

In 2020, Malaysia's economy contracted by 5.5% compared to 4.4% growth in 2019 due to the restrictions on economic activity resulting from the containment measures in response to Covid-19 pandemic. Malaysia last experienced economic contraction in 2009 (-1.5%). The economic contraction of 2020 was the greatest since 1998 (-7.4%)[8]. Malaysia was among many countries who had to navigate the tension between limited fiscal space and the need to sustain households and businesses. By June 2021, the total economic stimulus announced since February 2020 and the start of the pandemic amounted to RM530 billion, with nearly 16% of this being fresh fiscal injection. In other words, for every RM1 announced in stimuli, the government only spent RM0.16[9]. Shortfalls in

[5] WHO (2023)
[6] Walker, Rajah, and Gorostiza (2024)
[7] World Bank
[8] Yin and Wan Amirah Wan Usamah (2022)
[9] Ibid.

fiscal stimulus measures, as well as problems with disbursement and awareness meant that households and businesses were sometimes short of aid during the pandemic. A survey conducted from July to August 2021 for the Ministry of Finance (MOF) found that only 19% of households in the bottom 40th percentile of the income spectrum received food basket assistance[10]. 40% of micro and small enterprises were unaware of the assistance provided by the government and financial institutions. Phenomena such as these would have contributed to the economic scarring evidenced in the subsequent chapters of this report.

While there remains some debate over whether the Covid-19 pandemic is officially over, for most Malaysians it is firmly in the past, which is why this report refers to the 2019-2022 period as pre- and post-Covid 19. However, the past shapes the present, and the future that Malaysian households face is a complex one. The economy has rebounded above pre-pandemic levels, and according to Bank Negara Malaysia (BNM) second quarter growth in 2024 advanced by 5.9% while the investment outlook appears positive bolstered by the multi-year energy and industrial plans unveiled in 2023[11].

Geopolitical conflicts – the ongoing US-China rivalry, Russia-Ukraine war and Israel's genocide policy in Gaza – cloud global economic recovery. If Malaysia can secure catalytic investments seeking to derisk from US-China conflict it could mean improved prospects for the households of tomorrow. But that is a tale for future State of Households reports. For now, we invite you to revisit the trials of the pandemic before we return to face the promises of the present and future.

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[10] MOF (2021)
[11] BNM (2024)

CHAPTER 01

PANDEMIC SHIFTS: HOW COVID-19 RESHAPED HOUSEHOLD FORMATION, INCOME DISTRIBUTION, INEQUALITY AND WEALTH IN MALAYSIA

CHAPTER 1

PANDEMIC SHIFTS: HOW COVID-19 RESHAPED HOUSEHOLD FORMATION, INCOME DISTRIBUTION, INEQUALITY AND WEALTH IN MALAYSIA

By Dr Mohd Amirul Rafiq Abu Rahim, Muhammad Nazhan Kamaruzuki, Nik Syafiah Anis Nik Sharifulden, Shazrul Ariff Suhaimi and Wan Amirah Wan Usamah

"Economic welfare cannot be fully understood without considering the distribution of income and wealth"

Kenneth J. Arrow (2012)

1.1 Introduction

Our inaugural SoH 2014 report[12] highlighted Malaysia's impressive economic transformation — where its nominal GDP surged 17.5 times from RM53.3 billion in 1980 to RM984.5 billion in 2013[13], and nominal GDP per capita rose from RM3,841 to RM54,612 over the same period. However, we also emphasised that a high GDP per capita does not necessarily equate to high household incomes, as average income figures can be skewed by the very wealthy. A more accurate measure is the median household income, which represents the midpoint of the income distribution.

This chapter explores the dynamics of household income and wealth distribution, beginning with an analysis of household formation and population trends. We then examine how household income patterns have evolved over the years, before highlighting spatial trends and the present impacts of Covid-19. The discussion then shifts to the trends in poverty and income inequality, evaluating how accurately various measures reflect these realities. Finally, we address the issue of household savings and wealth distribution. While our analysis provides a broader overview of long-term patterns and regional differences, this analysis zeroes in on the pre- and post-pandemic period to assess the pandemic's impact on household wellbeing. Although Covid-19 may not influence all aspects of household wellbeing, understanding the recovery process during 2019 – 2022 is crucial to grasp the interconnected issues facing households in the post-pandemic era.

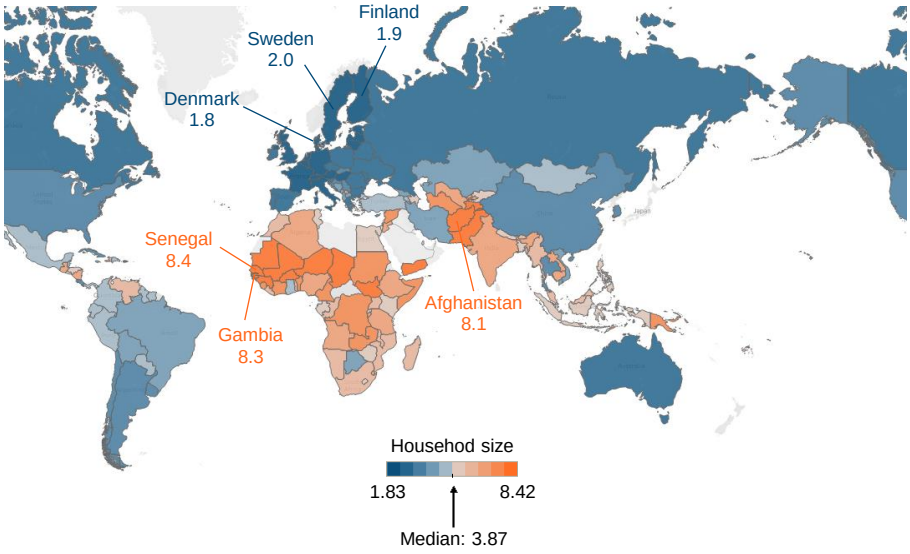
[12] KRI (2014)
[13] Nominal GDP surged 34 times from 1980 to RM1.82 trillion in 2023 – updated figure.

1.2 Household Distributions

Global household sizes have been converging towards smaller units over the past five decades, reflecting changing fertility levels and evolving social norms[14]. Recent analysis by Pohl and Esteve (2024) using the CORESIDENCE database has shown that on average, household sizes are the smallest in East Asia and Europe[15], and the largest in Sub-Saharan Africa and the Arabian Peninsula[16], reaching up to 8.4 people per household in Senegal. About 83% of the world's population lives in countries with household sizes between 2.3 and 5 people.

This decline, approximately 0.5 people per decade, has slowed in countries with small household sizes. This trend is often driven by young adults delaying marriage and having children later in life, as well as older adults living alone. Meanwhile, in other regions, socio-economic conditions continue to sustain larger household sizes, despite ongoing demographic changes[17].

Figure 1.1: Average household size by country, most recent year available since 2000



Source: Esteve et al. (2023)
Note: Countries labelled in the map represents three countries with the highest (dark blue) and lowest (orange) household size.

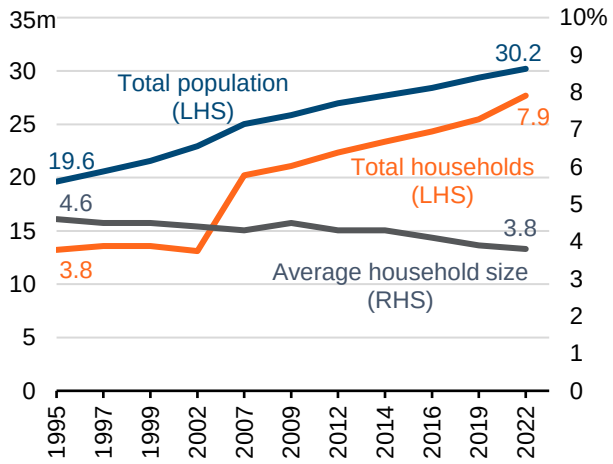
Similar trends of decreasing household sizes have been observed in Malaysia, mirroring global patterns (Figure 1.2). By 2022, Malaysia's total population reached 30.2 million[18], with 7.9 million households. This figure represents a significant increase from 1995, when the total population was 19.6 million and there were 4.6 million households. Over the same period, the total number of households grew faster than the population, with CAGR of 7.2%, outpacing the population growth rate of around 1.6%. Malaysian households will continue to grow, reflecting changes in family structure and socio-economic dynamics within the country[19].

[14] Pohl and Esteve (2024)
[15] Countries with average household size of less than 2.29, i.e. Japan, South Korea, Denmark, Norway, Sweden, Finland and Germany.
[16] Countries with average household size of more than 5.84, i.e. Senegal, Mali, Chad, Niger, Nigeria, Burkina Faso, Cameroon, Angola, Saudi Arabia, Oman and Yemen.
[17] Ibid.
[18] Malaysia's total population in 2024 was estimated at 34.1 million which 90.0 % (30.7 million) comprised of Citizens and 10.0 % (3.4 million) was Non-citizens (DOS, 2024)
[19] NPFDB (2018)

Malaysia's average household size has steadily decreased from 4.6 in 1995 to 3.8 in 2022. As can be observed in Figure 1.3, smaller-sized households have continued to increase, with a notable rise in households with one member. The proportion of households with four or more members declined from 58.7% in 2016 to 52.5% in 2022. This trend is evident in both urban and rural areas, with large urban households decreasing from 58.4% to 51.6% and large rural households from 59.8% to 55.5% during the same period.

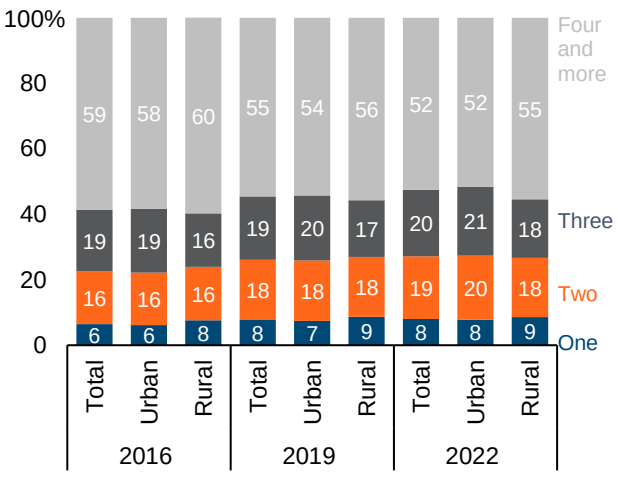
This trend shows that Malaysia is no exception to the experience of other Asian countries. As most Asian countries are experiencing a rapid aging trend, declining marriage and fertility rates, and increased migration, one-person households will continue to increase in the next decades. This rise in smaller households likely reflects a growing preference for more individualised living arrangements especially among the younger and single adults and leaving older adults to live in rural areas[20].

Figure 1.2: Total population, total households and average household size, 1995 – 2022



Source: DOS (2023a); DOS (2024a) and KRI calculations.

Figure 1.3: Share of households by household size and strata, 2016 – 2022

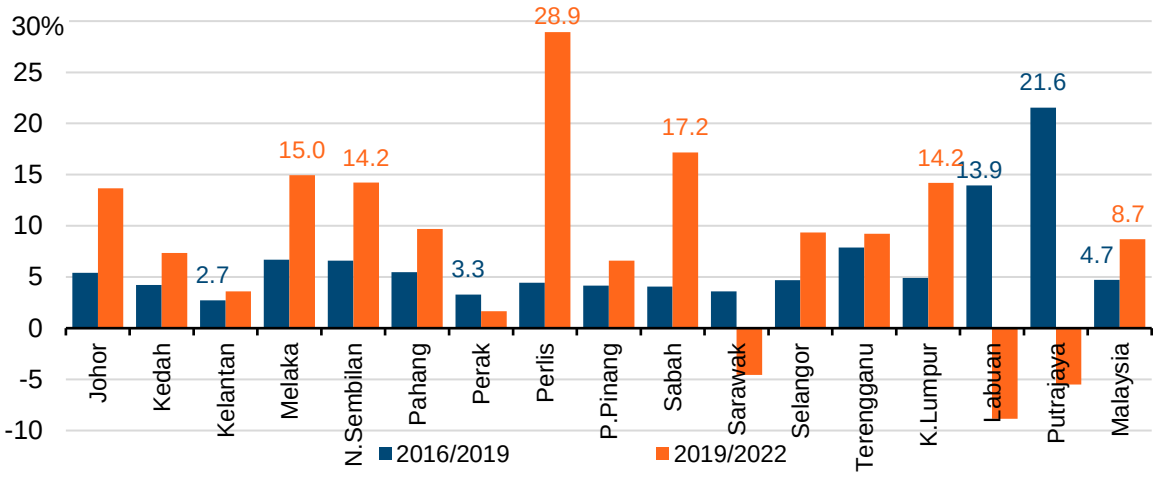


Source: DOS (2020a); DOS (2023b) and KRI calculations.

Figure 1.4 illustrates the growth in the number of households by state for the periods 2016/2019 and 2019/2022. During the 2016/2019 period, Putrajaya and Labuan experienced substantial growth, with 21.6% and 13.9%, respectively. In contrast, some states like Perak (3.3%) and Kelantan (2.7%) showed marginal growth. Moving to the 2019/2022 period, the overall growth trend appears more modest across most states. States like Sabah (17.2%), Melaka (15.0%), Negeri Sembilan and Kuala Lumpur (14.2%) continued to exhibit high growth, likely highlighting ongoing urbanisation and population concentration in major urban centres. Perlis (28.9%) shows highest growth during the period. Interestingly, Labuan, Putrajaya and Sarawak show negative growth in 2022, about -8.9%, -5.5% and -4.6% respectively.

[20] Yeung and Cheung (2015)

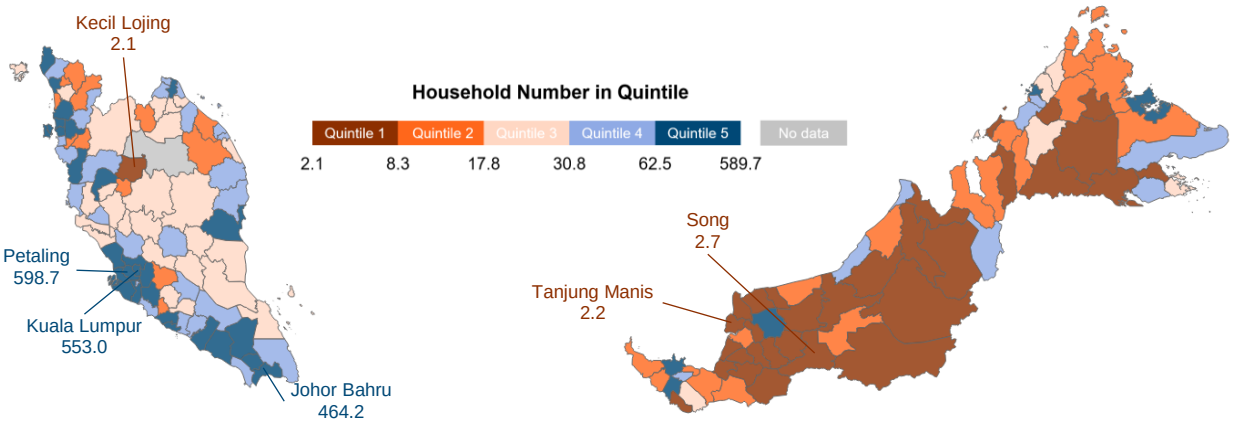
Figure 1.4: Growth in total households by state, 2016/2019 and 2019/2022



Source: DOS (2020a); DOS (2023b) and KRI calculations.

In 2022, Selangor had the largest number of households at 1,774,800, while Labuan on the other end had only 21,600 households. Figure 1.5 further reveals the spatial distribution of households at the district level, being categorised into five quintiles according to their number of households in 2022. Petaling in Selangor had the highest number of households at 589,741, followed by Kuala Lumpur with 553,016 households. On the other end of the spectrum, Kecil Lojing in Kelantan had the smallest number of households at 2,050, followed by Tanjung Manis and Song in Sarawak, with 2,187 and 2,719 households respectively.

Figure 1.5: Total households ('000) by district, 2022



Source: DOS (2023b)
Notes: Districts labelled in the map represent three districts with the highest (dark blue) and lowest (maroon) number of households in 2022. Number of households is presented by quintiles to generate spatial analysis at the district level.

The pattern of growth in number of households varied by district during the periods of 2016/2019 and 2019/2022 (Figure 1.6 and Figure 1.7), predominantly in Sabah and Sarawak. While some districts experienced drastic reversals in growth patterns, urban and industrial areas continued to grow. Between 2016 and 2019, districts like Pakan, Tambunan, and Nabawan experienced substantial household growth, with CAGR ranging from 18.8% to 23.1%.

However, these districts saw significant declines in household numbers between 2019 and 2022, with Song decreasing by a CAGR of 21.2%, Pakan by 18.9%, and Selangau by 10.5%. Conversely, districts such as Kinabatangan, Sandakan, and Penampang in Sabah, which had negative growth from 2016 to 2019, showed notable increases in growth from 2019 to 2022. Number of households in Kinabatangan grew by a CAGR of 9.5%, Sandakan by 10.1%, and Penampang by 9.2%.

Figure 1.6: Growth in total households by district, 2016/2019[21]

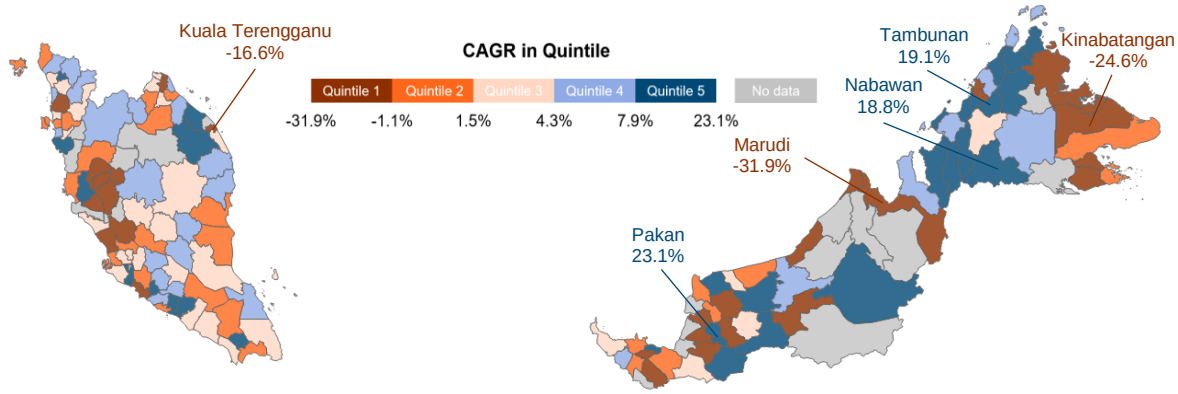
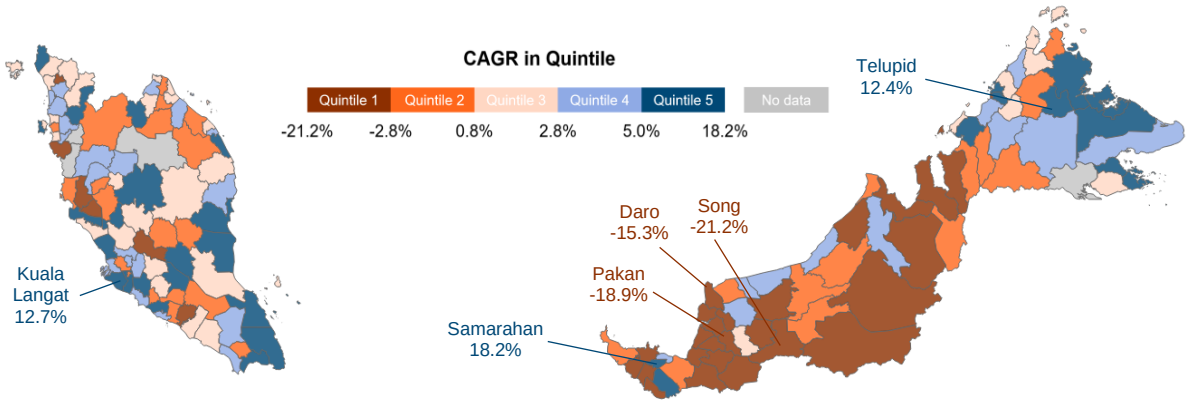


Figure 1.7: Growth in total households by district, 2019/2022



Source: DOS (2017); DOS (2020a); DOS (2023b) and KRI calculations.
Note:

1. Districts labelled in the map represent three districts with the highest (dark blue) and lowest (maroon) growth in number of households.
2. Growth is calculated as a CAGR and presented by quintiles to generate spatial analysis at the district level.

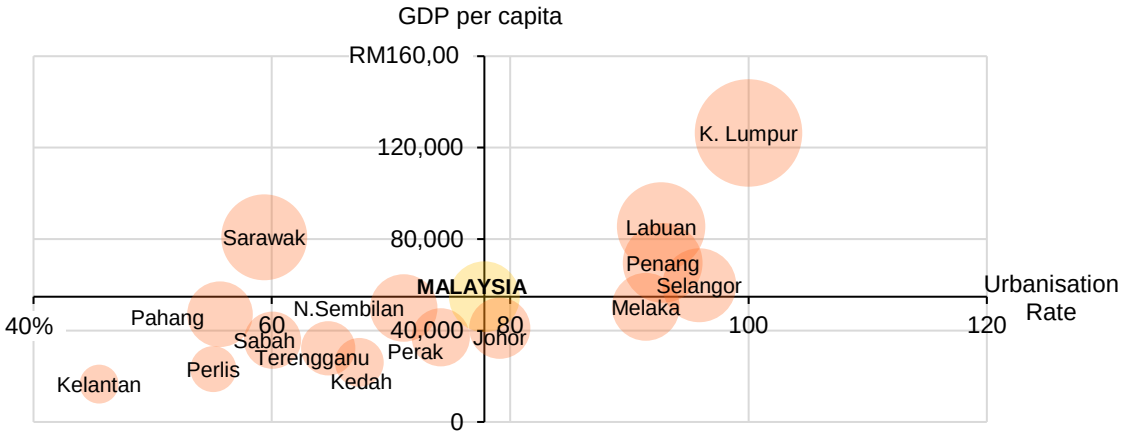
[21] Unless otherwise stated, throughout the report, '2016/2019' and '2019/2022' indicate the average growth rates for the periods 2016 to 2019 and 2019 to 2022, respectively. Meanwhile, '2016 – 2019' and '2019 – 2022' refer to the ranges of years the data covers, such as the period from 2016 to 2019 and from 2019 to 2022.

Transitioning from a predominantly rural society at independence, Malaysia mirrors the broader regional patterns in Asia where urbanisation rates grew significantly. Nearly 77.8% of households in Malaysia in 2022[22] were in urban areas, compared to only 66.7% in 2002[23]. Although the proportion of urban households witnessed a slight decline in 2022, the absolute number of urban households is still growing corresponding to the increase in number of households in the same period. The urban transition in Asia often focuses on the proportion of national population in urban areas, but the sheer numbers migrating from rural to urban areas highlight the challenges, particularly in large cities[24].

Rural-urban migration, driven by economic opportunities, is the primary catalyst for urban growth. This urbanisation correlates strongly with GDP per capita, emphasising the link between urban centres and economic development. Urbanisation not only bridges disparities between rural and urban areas but also significantly impacts national development[25]. The GDP per capita and urbanisation rates by state in Malaysia for 2022 reveals a moderate correlation (r=0.46) between urbanisation and economic prosperity (measured by GDP per capita) (Figure 1.8). States like Kuala Lumpur and Selangor, with higher urbanisation rates, exhibit higher GDP per capita, reflecting concentrated economic activities and opportunities in cities. This pattern highlights the position of urban centres in driving economic growth and at the same time, highlights regional disparities.

Kuala Lumpur, with its 100% urbanisation rate, shows the highest GDP per capita, accentuating its role as the country's economic hub. In contrast, less urbanised states such as Kelantan and Perlis have lower GDP per capita, illustrating economic challenges in rural regions. Sarawak presents some striking findings. Despite having the second-highest GDP per capita in the country, Sarawak's low urbanisation rate highlights a unique contrast. This divergence suggests that while Sarawak is economically prosperous, with significant income generated from its natural resources, the state remains predominantly rural. The urban-rural divide in Sarawak highlights the potential for further development and urbanisation. From another perspective, this suggests untapped opportunities in rural areas as sources of growth and income generation.

Figure 1.8: GDP per capita and urbanisation rate by state, 2022

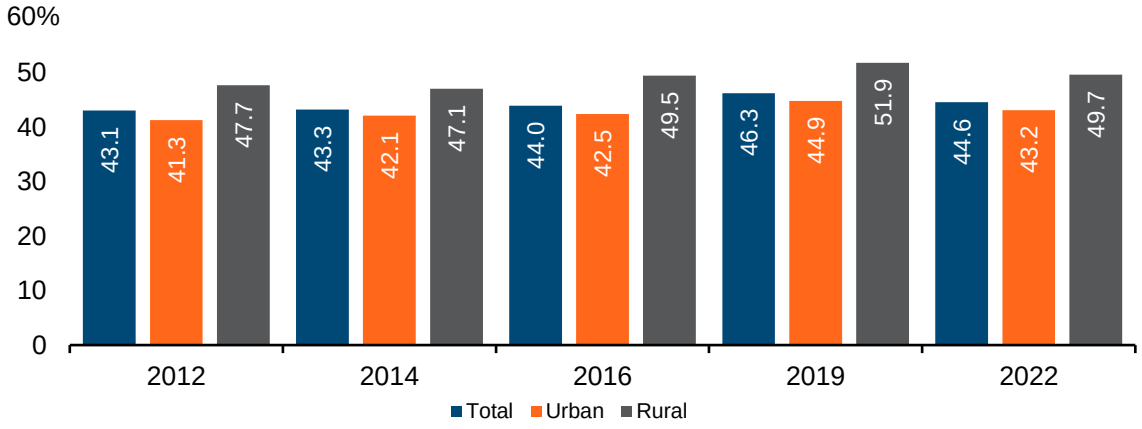


Source: DOS (2023b); DOS (2024b) and KRI calculations.
Note: Bubble size represents GDP per capita in 2022.

[22] DOS (2023b)
[23] DOS (2017a)
[24] These challenges could include overcrowding, pressure on infrastructure and services, housing shortages, and environmental concerns, which arise due to the rapid influx of people into urban centers.
[25] World Bank and IMF (2013)

The persistent proportion of one-income-recipient households is observed in Figure 1.9, especially in rural areas where reliance on a single income may be pronounced. A small but noteworthy shift is also observed for one-income-recipient households for 2022 where it dropped from 46.3% in 2019 to 44.6% in 2022. Therefore, more households having additional income recipients, thereby increasing their income sources as the economy began to recover.

Figure 1.9: Share of households with one income recipient, 2012 – 2022



Source: DOS (2015); DOS (2017); DOS (2020a); DOS (2023b) and KRI calculations.

The shifts in household growth patterns are driven by diverse factors such as job concentration, new economic opportunities, infrastructure development, and economic activities. Urbanisation and industrialisation continue to shape household distributions, with growth in economically active regions and declines in others due to emigration or economic slowdown. These trends highlight the interdependencies between economic conditions and demographic changes, including household structure, particularly in the post-Covid-19 recovery context. Notably, household sizes are decreasing, leading to a rise in single and elderly households with fewer younger members. This shift implies a potential increase in dependency on younger households, which could intensify the burden of care work, would also potentially affecting women's economic prospects. As a result, the evolving household structure could pose challenges and opportunities that must be addressed to support a balanced and inclusive economic future.

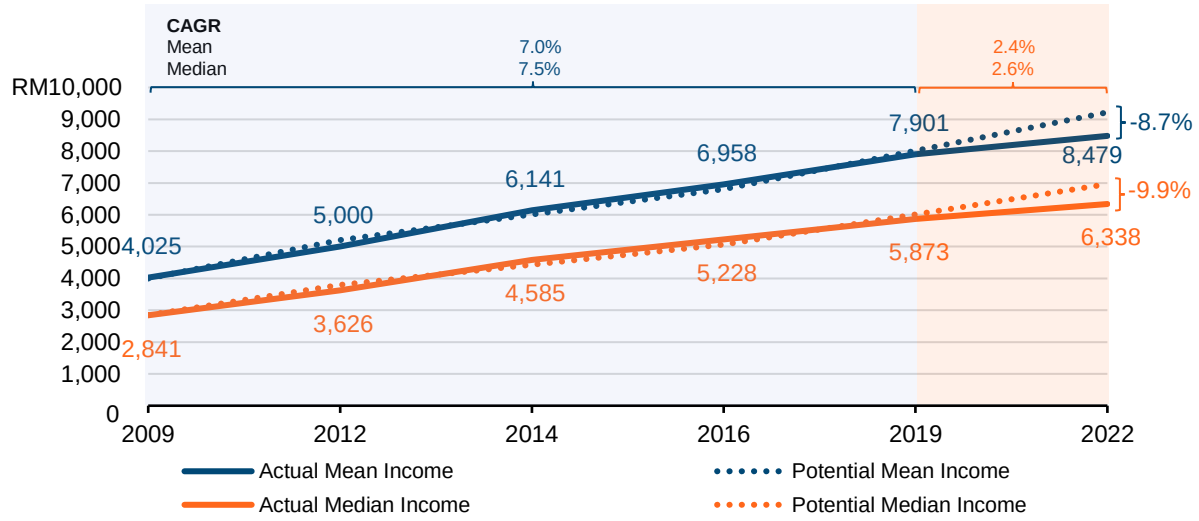
1.3 Household Income and Sources of Household Income

1.3.1. Household income

From 2009 to 2022, household incomes in Malaysia exhibited a consistent upward potential[26] trend in both mean and median incomes, for nominal and real terms, as depicted in Figure 1.10 and Figure 1.11. The CAGR for mean income during this period was 5.9%, while median income grew slightly faster at 6.4%. This growth increased the mean household income from RM4,025 in 2009 to RM8,479 in 2022. Meanwhile, median household income increased from RM2,841 to RM6,338 in the same period, showcasing a substantial relative increase.

When comparing pre- and post-Covid-19 growth, the period from 2009 to 2019 shows a CAGR of 7.0% for mean income and 7.5% for median income. However, in the wake of Covid-19, the growth in mean and median incomes declined nearly threefold, dropping to 2.4% and 2.6%, respectively, from 2019 to 2022.

Figure 1.10: Actual and potential household income, in nominal terms, 2009 – 2022

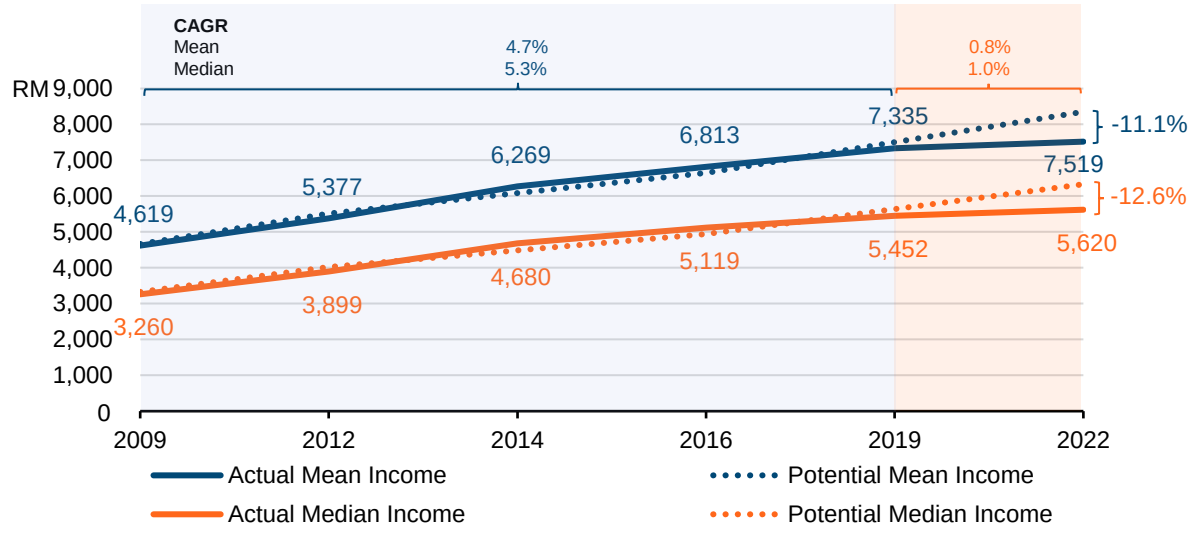


Source: DOS (2013); DOS (2017); DOS (2023b) and KRI calculations.
Note: Potential income in 2022 was calculated by extrapolating the regression line fitted to income data from 2009 to 2019. Our estimation is solely based on time and does not take into account other prevailing factors such as labour, capital, and productivity.

When adjusted for inflation, the real income figures indicate a more modest growth (Figure 1.11). The overall CAGR across 2009 to 2022 for real mean income was 3.8%, while real median income grew at 4.3%. From 2009 to 2022, the real mean income grew from RM4,619 to RM7,519, while the real median income increased from RM3,260 to RM5,620. Comparing pre- and post-Covid-19 growth, the period from 2009 to 2019 saw a CAGR of 4.7% for real mean income and 5.3% for real median income. However, the growth rates for real mean and median incomes declined nearly threefold in post-Covid period, dropping to 0.8% and 1.0%, respectively.

[26] Potential income in 2022 was estimated by extending the trend line from income data between 2009 and 2019.

Figure 1.11: Actual and potential household income, in real terms, 2009 – 2022



Source: DOS (2013); DOS (2017); DOS (2023b) and KRI calculations.
Note: Data is expressed in 2015 prices. Potential income in 2022 was calculated by extrapolating the regression line fitted to income data from 2009 to 2019. Our estimation is solely based on time and does not take into account other prevailing factors such as labour, capital, and productivity.

The distribution of income, however, reveals a widening gap between mean and median incomes. By 2022, the gap between median and mean income was substantial, with median income falling short of the mean by RM2,141 in nominal terms and RM1,899 in real terms. In 2009, it fell short of the mean by RM1,184 in nominal terms and RM1,359 in real terms. Additionally, the potential trend lines indicate that mean income is growing at a slightly faster rate than median income, suggesting more rapid income growth at higher income levels[27].

The lowest income growth was observed during the 2020 – 2022 period, reflecting the economic challenges faced by households, which impacted both nominal and real incomes. While there has been modest growth in household incomes in 2022, both in nominal and real terms, it still falls short of the projected potential—nominal and real incomes in 2022 were approximately 9 – 13% below the pre-Covid-19 trend—emphasising the significant disruption caused by the pandemic.

1.3.2. Household disposable income

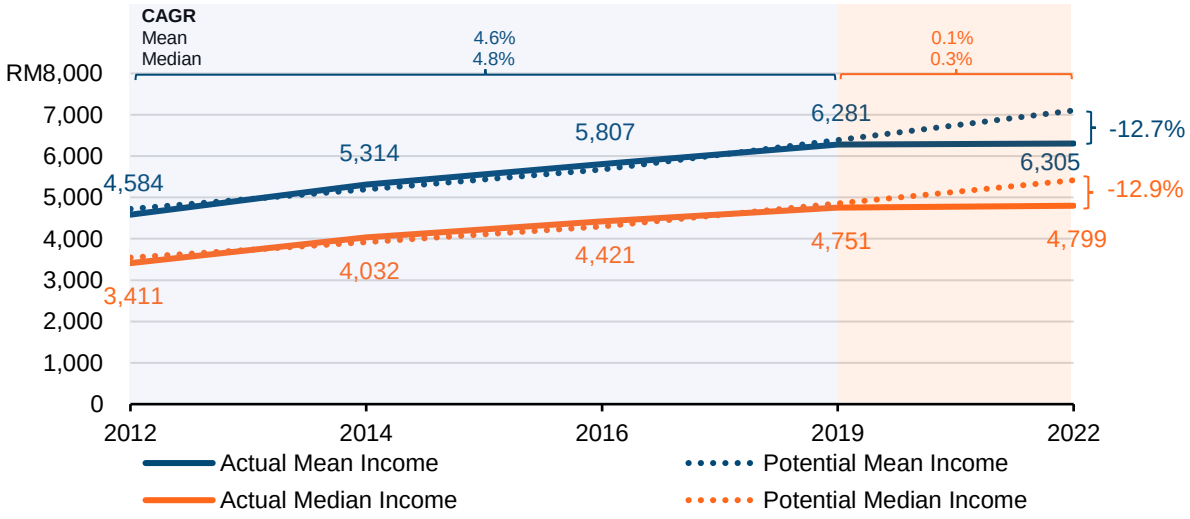
The widening gap between mean and median incomes indicates growing income inequality, which also affects disposable income. Disposable income reflects household income after accounting for payments such as taxes, zakat, contributions to social security schemes, and in-kind current transfers received[28].

[27] Since mean income is more influenced by higher income levels, this suggests that income growth has been more pronounced among higher earners, leading to a widening gap between the mean and median incomes. The steeper slope of the potential mean income trend line compared to the median income trend line further illustrates this divergence in income growth.
[28] DOS (2023b)

As shown in Figure 1.12, real disposable income exhibited an upward trend from 2012 to 2019, before remaining relatively stagnant from 2019 to 2022. Due to the lack of data for 2009, the CAGR for 2012 could not be computed. From 2014 to 2022, the overall CAGR for both real mean and median household disposable income was 2.2%. The CAGR for mean and median disposable household income decreased from 7.7% and 8.7% in 2014 to 0.1% and 0.3% in 2022, respectively. The declining growth rates resulted in a marginal increase in real household disposable income growth, with mean income increasing from RM4,584 to RM6,305 and median income increasing from RM3,411 to RM4,799.

The analysis further reveals fluctuations in the growth rates of disposable income. For example, in the years leading up to 2019, the gap between the actual and potential values for both mean and median disposable income showed mixed differences, with some years being positive and others negative. However, these mixed patterns, where in certain years the actual surpassing the potential and the actual fell short of the potential in some. In 2022, with actual disposable incomes falling below their expected potential values by 12.7% for mean income and 12.9% for median income. This suggests a significant underperformance, likely reflecting the adverse economic conditions and the impact of the pandemic on household purchasing power.

Figure 1.12: Actual and potential household disposable income, in real terms, 2012 – 2022



Source: DOS (2013); DOS (2017); DOS (2023b) and KRI calculations.
Note:

1. Data is expressed in 2015 prices. Potential income in 2022 was calculated by extrapolating the regression line fitted to income data from 2009 to 2019. Our estimation is solely based on time and does not take into account other prevailing factors such as labour, capital, and productivity.
2. CAGR for 2009 – 2012 could not be calculated due to the unavailability of data for 2009.

1.3.3. Changes in income distribution: A spatial insight

Analysing income growth through a spatial lens is essential as it uncovers regional disparities, highlights the uneven impact of economic policies and distributions, and identifies areas requiring targeted interventions. Figure 1.13 and Figure 1.14 present the CAGR and average absolute change of real median household income by state for the periods 2016 – 2019 and 2019 – 2022. From 2016 to 2019, all states experienced positive real income growth, with the exception of Sabah. States like Putrajaya and Kuala Lumpur led with the highest average absolute change in real median household income, possibly driven by Putrajaya's concentration of public service sectors and Kuala Lumpur's central economic activities. Putrajaya's average absolute change was RM388, with Kuala Lumpur trailing slightly at RM302.

Moderate growth was observed in states like Terengganu, Selangor, and Labuan, with average absolute increases between RM100 to RM200. Lower growth rates were evident in states such as Perlis, Melaka, and Perak. Only Sabah faced a negative decline in real median household income in 2016. The period from 2019 to 2022 (Figure 1.14) presents a stark contrast. Urban areas like Putrajaya and Kuala Lumpur, which previously recorded the highest growth, experienced significant declines in real median household income.

Putrajaya saw an average absolute decrease of approximately RM118, while Kuala Lumpur experienced a decrease of around RM240. This indicates the impact of the pandemic on urban economies due to lockdowns, reduced business activities, and job losses. On the other hand, Selangor significantly outperformed other regions, with an average absolute increase of RM409 and CAGR of 5.1%, which contributed positively to the overall national growth rate. Mixed growth patterns were observed in other states such as Johor, Penang, Labuan, Sabah, and Sarawak, with some experiencing declines while others demonstrated resilience with stable or positive growth.

Figure 1.13: Real median household income growth by state, 2016/2019

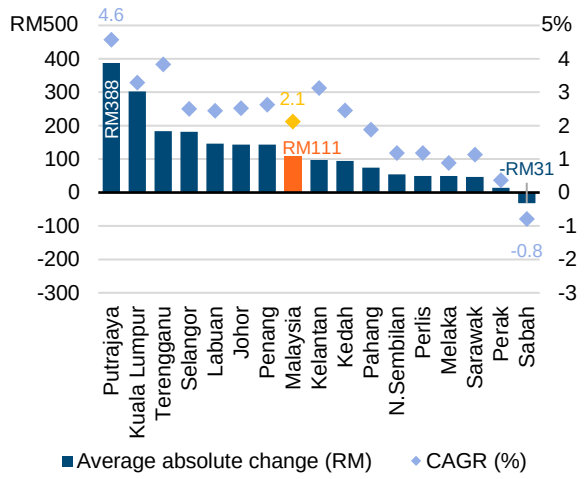
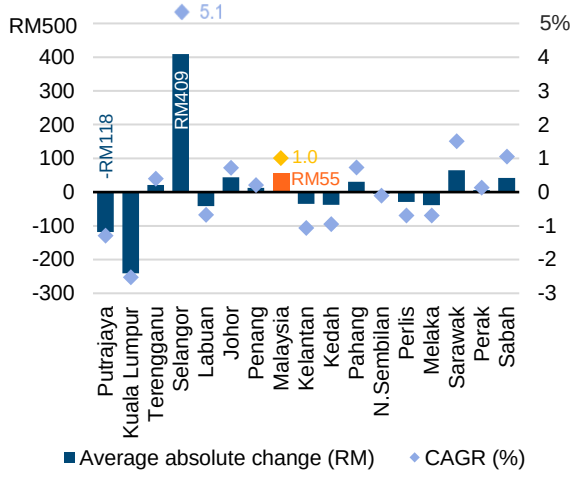


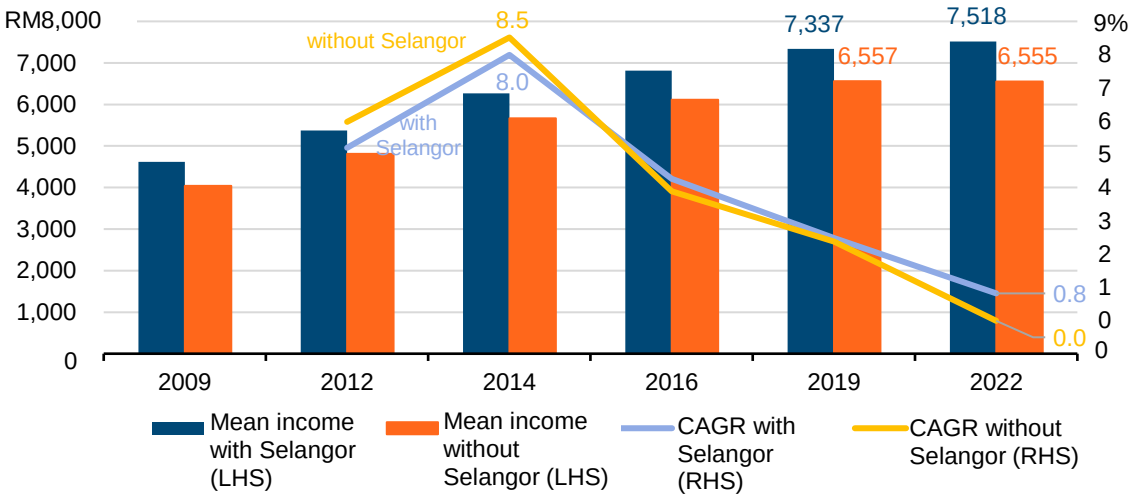
Figure 1.14: Real median household income growth by state, 2019/2022



Source: DOS (2017); DOS (2023b) and KRI calculations.

These contrasting trends highlight the varying impacts of the pandemic across different regions. While urban centers like Kuala Lumpur and Putrajaya struggled with economic contractions, Selangor's robust performance highlights its ability to adapt and thrive in challenging times. Our analysis further excludes Selangor (Figure 1.15) to see the impact to household income. When Selangor is excluded, the national mean household income decreased substantially from RM7,518 to RM6,555 (decrease by 12.9%). Without accounting for Selangor, the national mean household income remained stagnant during the period 2019/2022, with a CAGR of -0.01%. This indicates that household income growth during this period was largely driven by the growth in household income in Selangor alone, while majority of states witnessed minimal or even no improvement in their income levels.

Figure 1.15: Real mean household income and growth, with and without Selangor, 2009 – 2022



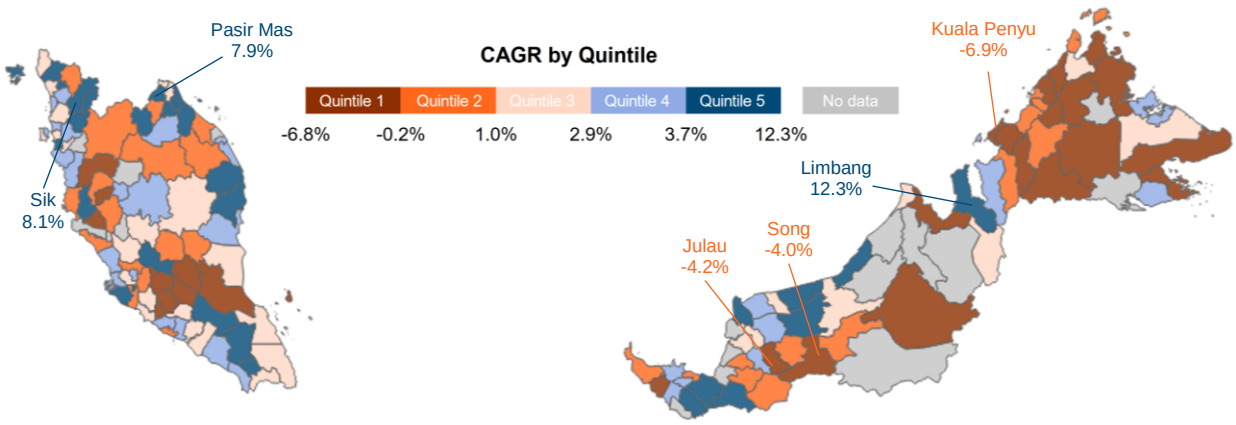
Source: DOS (2013); DOS (2017); DOS (2023b) and KRI calculations.
Note: Data is expressed in 2015 prices. Mean household income without Selangor is derived by subtracting total household income in Selangor from total household income in Malaysia.

The growth at the district level in real median household income for the periods 2016/2019 and 2019/2022 are shown in Figure 1.16 and Figure 1.17 respectively. The growth rates are shown in five colour-coded quintiles, each representing a range of growth rates across districts in Malaysia. To better understand the growth trends between the two periods, the CAGR in Figure 1.17 is benchmarked against the 2016/2019 CAGR.

The analysis reveals moderate growth observed in both Peninsular and East Malaysia for 2016/2019 period (Figure 1.16). In Peninsular Malaysia, the lowest growth (in quintile 1) was recorded by Jempol (-3.7%), Kuala Pilah (-2.0%), Hilir Perak (-1.4%), Jelebu (-1.4%) and a few others experienced drops in income. Most of the lowest growth districts are concentrated in East Malaysia, where districts such as Kuala Penyu (-6.9%), Julau (-4.2%), Song (-4.0%), Pitas (-3.0%) and a few others faced substantial declines.

Conversely, the highest growth districts saw robust increases in median household income for 2016/2019 periods. In Peninsular Malaysia, Sik (8.1%), Pasir Mas (7.9%), Kubang Pasu (7.9%), Kuala Langat (7.2%), Baling (6.7%) and a few other led the way in income growth (quintile 5). Meanwhile, in East Malaysia, districts like Limbang (12.3%), Daro (6.7%), Mukah (6.5%) and Bintulu (6.0%) saw notable increases.

Figure 1.16: Growth in real median household income by district, 2016/2019



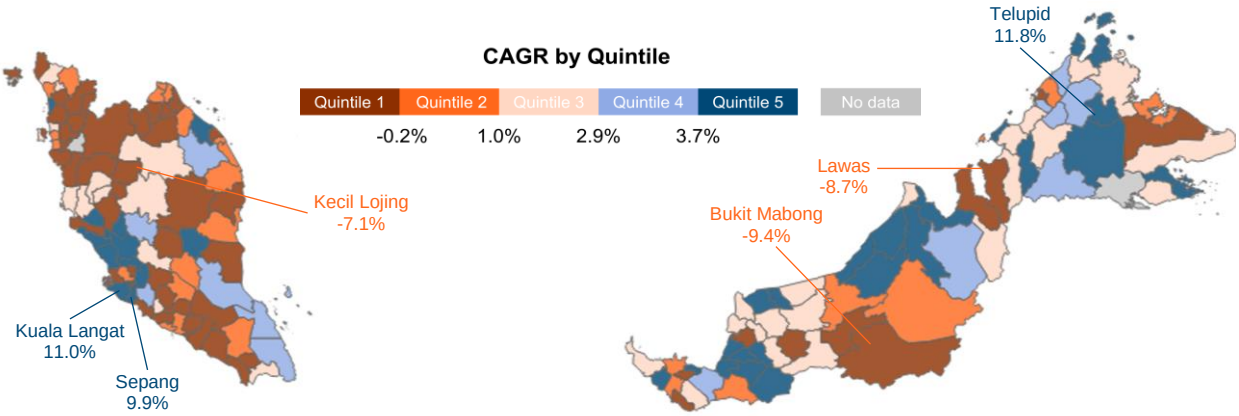
Source: DOS (2017); DOS (2023b) and KRI calculations.
Notes:

1. Data is expressed in 2015 prices. Growth is calculated as a CAGR and presented by quintiles to generate spatial analysis at the district level.
2. CAGR is calculated using each state's respective CPI.
3. The districts labelled in blue represent the top three with the highest growth, while those labelled in orange indicate the three districts with the lowest growth.

The 2019 to 2022 period reveals a reversing trend, with one-third of the districts across Malaysia falling into the 1st quintile, and a significant proportion experiencing negative growth (Figure 1.17). In Peninsular Malaysia, Kecil Lojing (-7.1%) stood out as the district with the most significant decline, followed by Kerian (-5.4%), Langkawi (-4.9%), Bagan Datuk (-4.7%) and Cameron Highlands (-4.6%). In East Malaysia, Bukit Mabong (-9.4%), Lawas (-8.7%), Limbang (-5.6%), and Kapit (-4.9%) experienced the most notable declines, falling into lower quintiles. These districts reflect sharp declines in real median household income.

On the other hand, districts with the highest income growth in Peninsular Malaysia during this period are concentrated in Selangor, such as Kuala Langat (11.0%), Sepang (9.9%), Ulu Langat (8.1%) and Kuala Selangor (7.1%). East Malaysia generally experienced a reversed trend, where Telupid (11.8%), Pakan (9.1%), Beluru (9.1%), Betong (8.6%) and Tongod (8.2%) saw significant increases in median household income. These regions demonstrate resilience and possibly benefited from local economic drivers or government interventions aimed at boosting household incomes.

Figure 1.17: Growth in real median household income by district, 2019/2022



Source: DOS (2017); DOS (2023b) and KRI calculations.
Notes:

1. Data is expressed in 2015 prices. Growth is calculated as a CAGR and presented by quintiles to generate spatial analysis at the district level. CAGR is calculated using each state's respective CPI.
2. Growth in real median household income 2019/2022 is benchmarked against the growth in median household income in 2016/2019.
3. The CAGRs of median household income from 2019 to 2022 range from -9.4 to 11.8.
4. The districts labelled in blue represent the top three with the highest growth, while those labelled in orange indicate the three districts with the lowest growth.

Assessment in terms of disposable income have shown that all states and federal territories across Malaysia had a positive growth and average absolute change between 2016 – 2019 period. The federal territories of Putrajaya, Kuala Lumpur, and Labuan led with the highest percentage and average absolute changes of RM351, RM291, and RM251, respectively. Negeri Sembilan and Sabah recorded the lowest average absolute changes, at RM11 and RM17, respectively.

However, the period from 2019 to 2022 revealed a reversal for the previously top-performing federal territories. Kuala Lumpur, Labuan, and Putrajaya recorded lowest negative growth, with an average absolute change of -RM294, -RM234, and -RM179, respectively. Of the 16 states and federal territories, only five states showed positive growth — the five states were Selangor (4.6%), followed by Sarawak (0.7%), Johor (0.7%), Pahang (0.4%) and Sabah (0.2%). Consequently, the average absolute change in national real median household disposable income decreased significantly, from RM110 during the 2016 – 2019 period to only RM16 in the subsequent period. Notably, Selangor emerged as the only state demonstrating significant growth during 2019 – 2022, with an average absolute increase of RM303.

Figure 1.18: Growth in real median household disposable income by state, 2016/2019

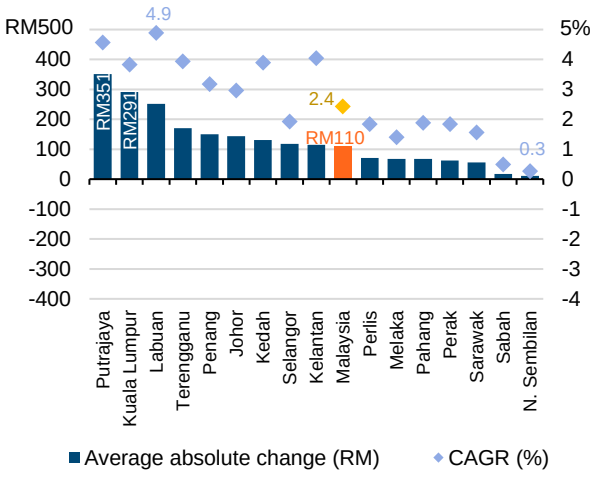
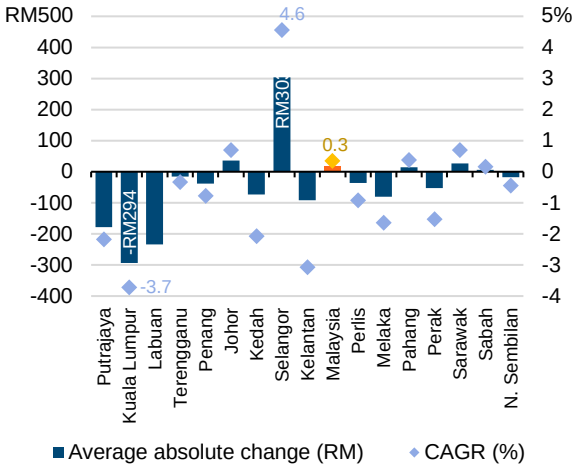


Figure 1.19: Growth in real median household disposable income by state, 2019/2022

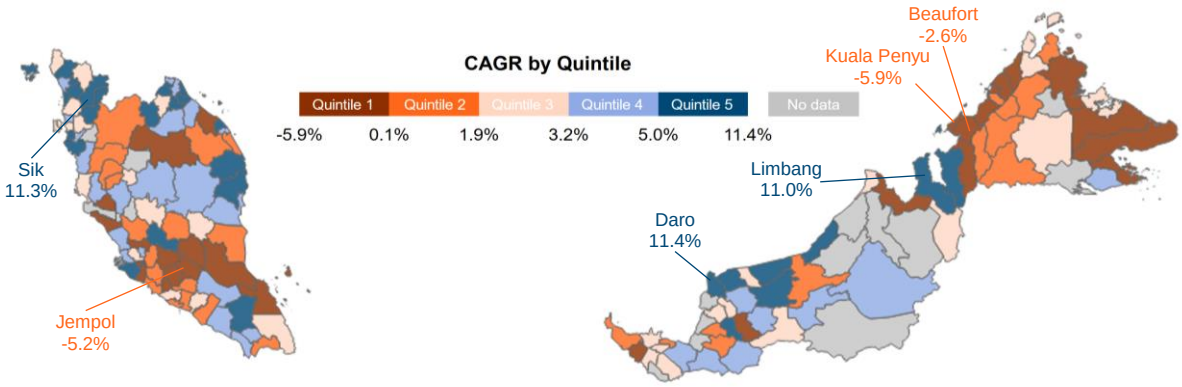


Source: DOS (2017); DOS (2023b) and KRI calculations.

The growth at the district level in real median household disposable income for the periods 2016 – 2019 and 2019 – 2022 are shown in Figure 1.20 and Figure 1.21, respectively. The analysis reveals moderate growth observed in both Peninsular and East Malaysia for 2016/2019 period (Figure 1.20). In Peninsular Malaysia, the lowest growth (in quintile 1) was recorded by Jempol (-5.2%), Gua Musang (-1.2%), Hilir Perak (-1.1%), Gombak (-0.8%) and a few others experienced drops in disposable income. Similarly, in East Malaysia, districts such as Kuala Penyu (-5.9%), Beaufort (-2.6%), Kunak (-2%), Tuaran (1.8%) and a few others faced substantial declines.

Conversely, the highest growth districts saw robust increases in disposable income for 2016/2019 periods. In Peninsular Malaysia, Sik (11.3%), Kubang Pasu (10.1%), Pasir Mas (8.8%), Machang (8.3%), Baling (7.9%) and a few other led the way in income growth (quintile 5). Meanwhile, in East Malaysia, districts like Daro (11.4%), Limbang (11%), Selangau (9.3%) and Mukah (7.1%) saw notable increases.

Figure 1.20: Growth in real median household disposable income by district, 2016/2019



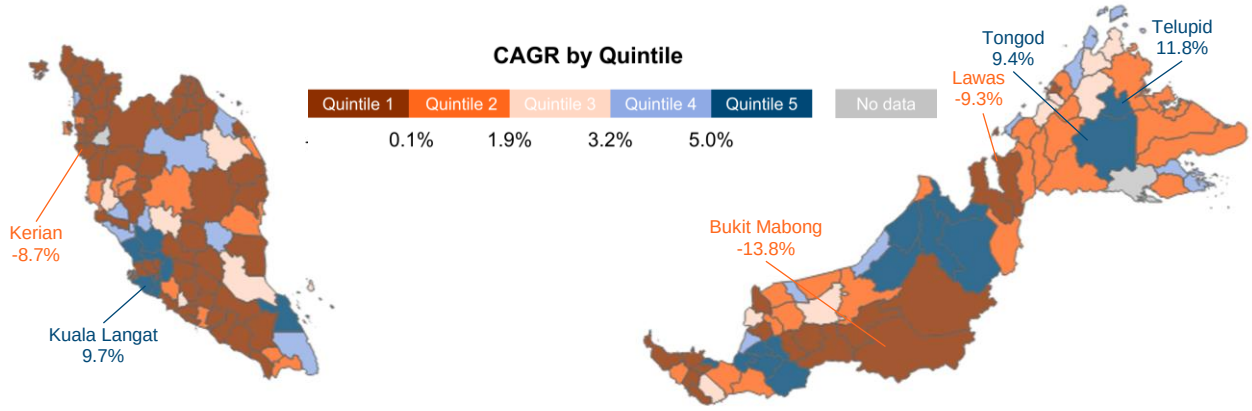
Source: DOS (2017); DOS (2023b) and KRI calculations.
Notes:

1. Data is expressed in 2015 prices. Growth is calculated as a CAGR and presented by quintiles to generate spatial analysis at the district level. CAGR is calculated using each state's respective CPI.
2. The CAGRs of median household income from 2016 to 2019 range from -5.9% to 11.4%.
3. The districts labelled in blue represent the top three with the highest growth, while those labelled in orange indicate the three districts with the lowest growth.

The 2019 to 2022 period reveals a reversing trend, with nearly half of the districts across Malaysia falling into the 1st quintile, and a significant proportion experiencing negative growth (Figure 1.21). In Peninsular Malaysia, Kerian (-8.7%) stands out as the district with the most significant decline, along with Sik (-7%), Langkawi (-6.4%), Cameron Highlands (-6.3%) and Machang (-6.2%) and some other districts falling into quintile 1. In East Malaysia, Bukit Mabong (-13.8%), Lawas (-9.3%), Kerian (8.7%), and Kapit (-6%) experienced the most notable declines, also falling into lower quintiles. These districts reflect sharp declines in real median household disposable income.

On the other hand, the districts showing the highest growth during this period, include Kuala Langat (9.7%), Sepang (8.7%), Kuala Selangor (7%) and Ulu Langat (6.6%) and several others in Peninsular Malaysia. In East Malaysia, Telupid (11.8%), Tongod (9.4%), Betong (8.2%), Pakan (7.5%) and Pusa (7.1%) also saw significant increases. These regions demonstrate resilience and possibly benefited from local economic drivers or government interventions aimed at boosting household incomes.

Figure 1.21: Growth in real median household disposable income by district, 2019/2022



Source: DOS (2017); DOS (2023b) and KRI calculations.
Notes:

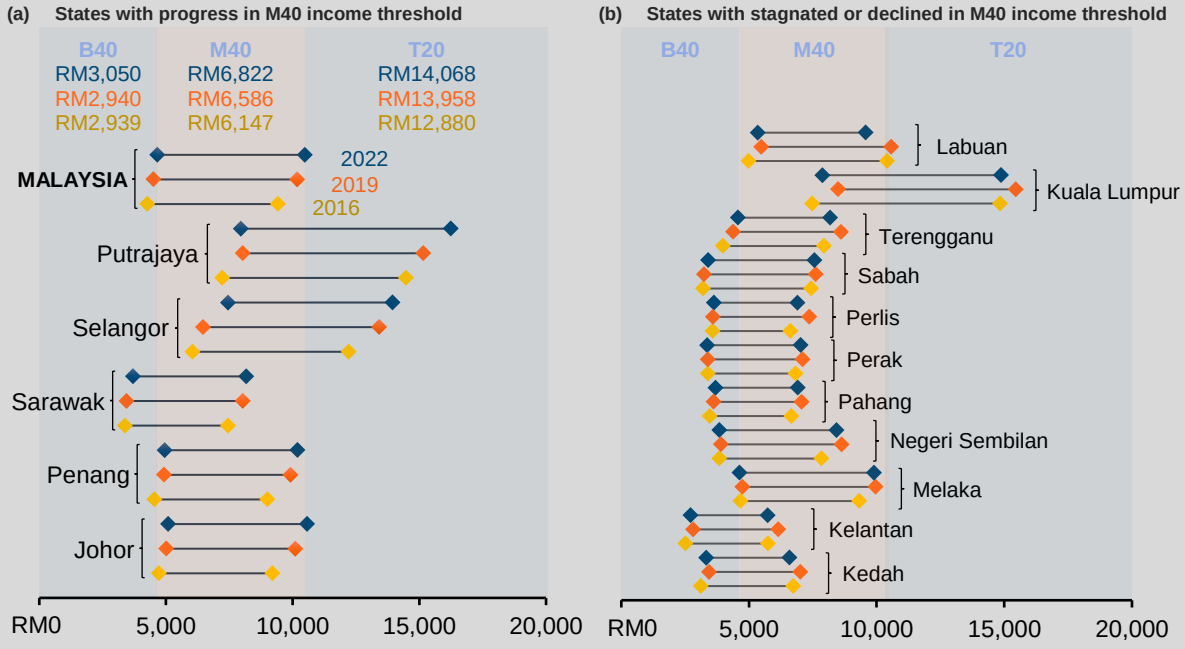
1. Data is expressed in 2015 prices. Growth is calculated as a CAGR and presented by quintiles to generate spatial analysis at the district level. CAGR is calculated using each state's respective CPI.
2. Growth in real median household disposable income 2019/2022 is benchmarked against the growth in median household disposable income in 2016/2019.
3. The CAGRs of median household income from 2019 to 2022 range from -13.8% to 11.8%.
4. The districts labelled in blue represent the top three with the highest growth, while those labelled in orange indicate the three districts with the lowest growth.

Box 1.1: Analysis of M40 Real Income Threshold

The M40 income threshold serves as an indicator for assessing the prosperity of Malaysia's middle-income group. In this article we discuss the changes in trends of household income according to household income threshold. The B40 group saw minimal growth (CAGR) from 2016 – 2019 (0.01%) but experienced a slight improvement between 2019 – 2022 (1.2%). This modest increase in income during the latter period is likely attributable to the cash transfer programmes implemented by the Government to cushion the impact of the pandemic on low-income households. The M40 group had moderate growth between 2016 – 2019 (2.3%) but saw a slowdown to 1.2% for 2019 – 2022. The T20 group, which had the highest growth in 2016 – 2019 (2.7%), experienced a sharp decline to 0.3% in 2019 – 2022.

Figure 1.22 illustrates the changes in the middle-income group (M40) thresholds across Malaysian states from 2016 to 2022, adjusted for inflation. By 2022, the middle income in most states either stagnated or became worse off, with only five states showing an improved M40 income range. States that showed progress (Figure 1.22 (a)) are Putrajaya, Selangor, Sarawak, Penang, and Johor. Putrajaya showed a significant improvement, while Selangor, being a highly developed and industrialised state, demonstrated an improved M40 income range. Sarawak showed notable progress, whereas Penang and Johor benefitted from their strong industrial activities.

Figure 1.22: Real income threshold for M40 households by state, 2016 – 2022



Source: DOS (2017); DOS (2023b) and KRI calculations.
Note: Data is expressed in 2015 prices. Shaded region represents the income threshold for 2022: B40 (<RM4,656); M40 (RM4,656 – RM10,481) & T20 (>RM10,481).

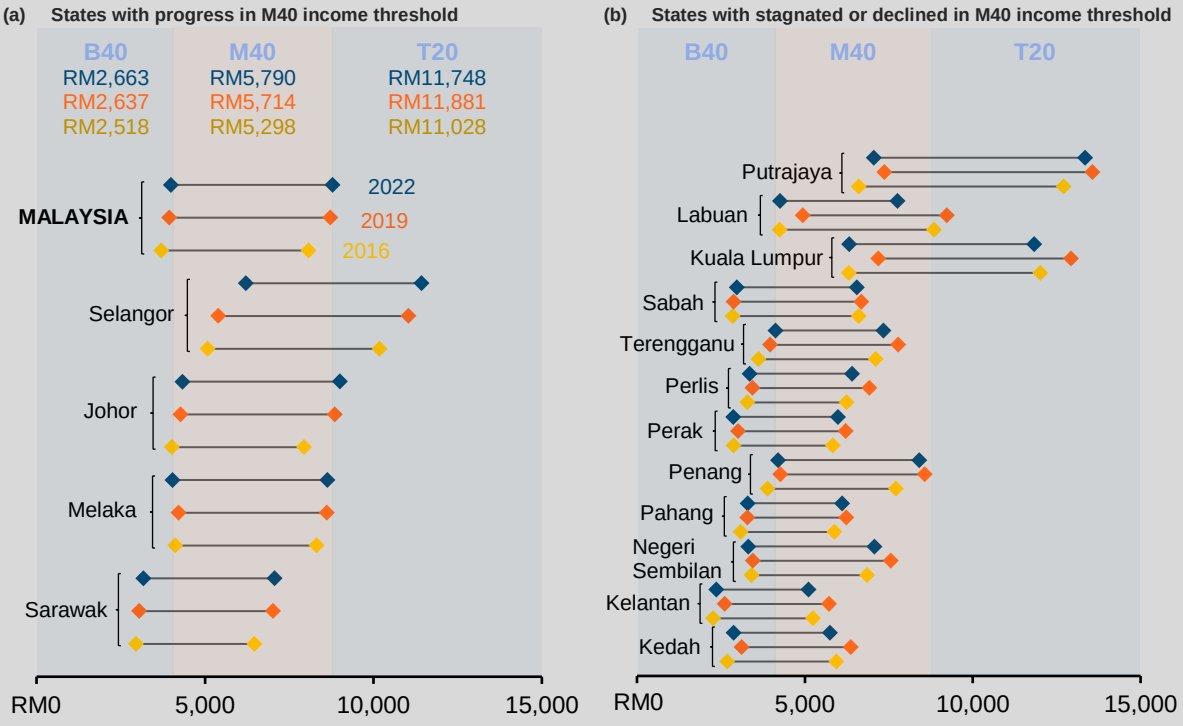
Conversely, Figure 1.22 (b) displays states where the M40 income threshold stagnated or declined. Despite being urban centres, Labuan and Kuala Lumpur experienced stagnant or declining M40 income thresholds. States such as Terengganu, Sabah, Perlis, Perak, and Pahang experienced stagnation or declines, reflecting regional economic challenges and less economic diversification.

Similarly, Negeri Sembilan, Melaka, Kelantan, and Kedah, also saw stagnant or declining M40 income thresholds, highlighting widespread economic difficulties across various parts of Malaysia.

Figure 1.23 shows the changes in real disposable income thresholds for the M40 income group across all states from 2016 to 2022. The B40 group saw a decrease from 1.6% CAGR from 2016 – 2019 to 0.3% for the period of 2019 – 2022. The M40 group experienced a decline from 2.6% to 0.4% CAGR over the same periods. The T20 group, which had a 2.5% in 2016 – 2019, faced a negative growth rate of -0.4% for 2019 – 2022.

Figure 1.23 (a) indicate that only four states—Selangor, Johor, Melaka, and Sarawak—showed improvements. Among these, Selangor significantly surpassed the national M40 disposable income threshold, while Johor, Melaka, and Sarawak demonstrated a marginal improvement throughout the pandemic. Conversely, Figure 1.23 (b) showed that from 2019 to 2022, the majority of states and federal territories in Malaysia experienced a decline in disposable M40 income. The declines were particularly pronounced in Kuala Lumpur and Labuan, whereas the remaining state saw a more modest decrease.

Figure 1.23: Disposable real income threshold for M40 household by state, 2016 – 2022



Source: DOS (2017); DOS (2023b) and KRI calculations.
Note: Data is expressed in 2015 prices. Shaded region represents the income threshold for 2022: B40 (<RM3,990); M40 (RM3,990 – RM8,794) & T20 (>RM8,794).

Based on the analysis, it is evident that the economic pressures exacerbated by the Covid-19 pandemic have impacted the middle-income groups across various states. While certain urbanised and economically diverse regions experienced significant improvements, the majority of states struggled to maintain or improve their economic position.

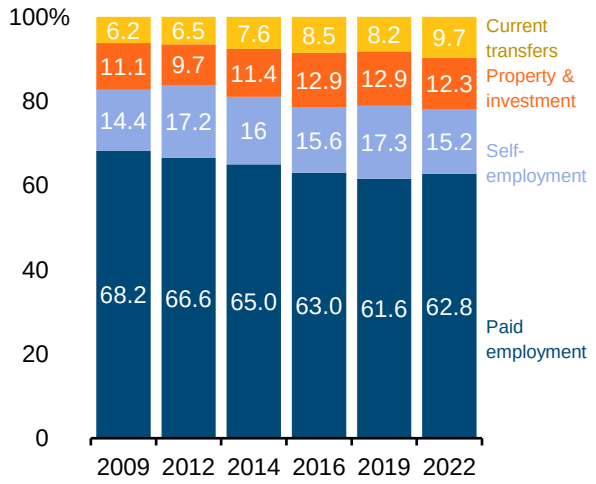
1.3.4. Sources of household income

Figure 1.24 illustrates the percentage distribution of household income sources for the head of households from 2009 to 2022. Over these years, paid employment remains the primary source of income among the head of households, though its share has been trending downward. Income from self-employment has shown a relatively stable trend, accounting for 14.4% in 2009 and 15.2% in 2022. The share of income from property and investment has seen some variations, rising from 11.1% in 2009 to 12.3% in 2022. Current transfers have gradually increased, starting at 6.2% in 2009 and reaching 9.7% in 2022.

Figure 1.25 focuses on the composition of income from current transfers for the period of 2016 – 2022. The share of income from remittances remained fairly stable, around 48.4% to 49.0%[29]. Pension contributions increased from 29.0% in 2016 to 35.9% in 2019 but moderated to 29.1% in 2022. Government aid slightly decreased from 18.3% in 2016 to 15.4% in 2022, while other sources of income remained relatively low and stable, around 3.3% to 6.5%. However, in our assessment of current transfer, it is important to note that other mechanisms such as income from EPF withdrawals were not included. This exclusion is due to the strict definition of income used in the Household Income Survey (HIS)[30].

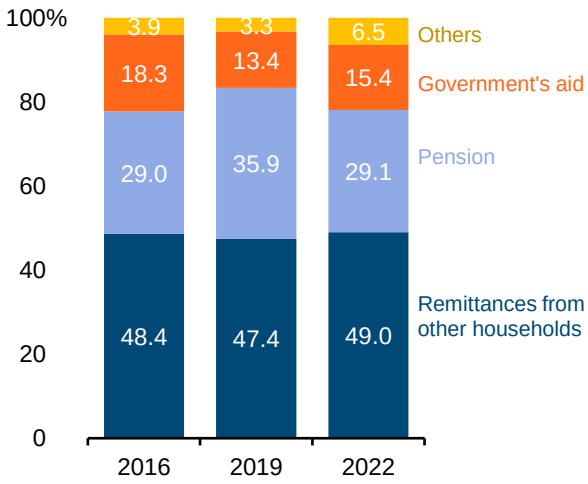
Although government's aid slightly increased by about 2% in 2022 compared to 2019, income from current transfers for households with incomes lower than RM2,000 rose significantly from 38.1% in 2019 to 49.2% in 2022. This increase indicates a high dependency on current transfers during the endemic phase of 2019 – 2022. Additionally, current transfers were significant for households with incomes between RM2,000 and RM3,999 (27.9%) and between RM4,000 and RM5,999 (16.9%). Conversely, the percentage of current transfers received decreased in higher income brackets, indicating less dependency on these transfers among higher-income groups[31].

Figure 1.24: Share of household income by sources of income, 2009 – 2022



Source: DOS (2013); DOS (2017) and DOS (2023b)

Figure 1.25: Share of household income from current transfers, 2016 – 2022



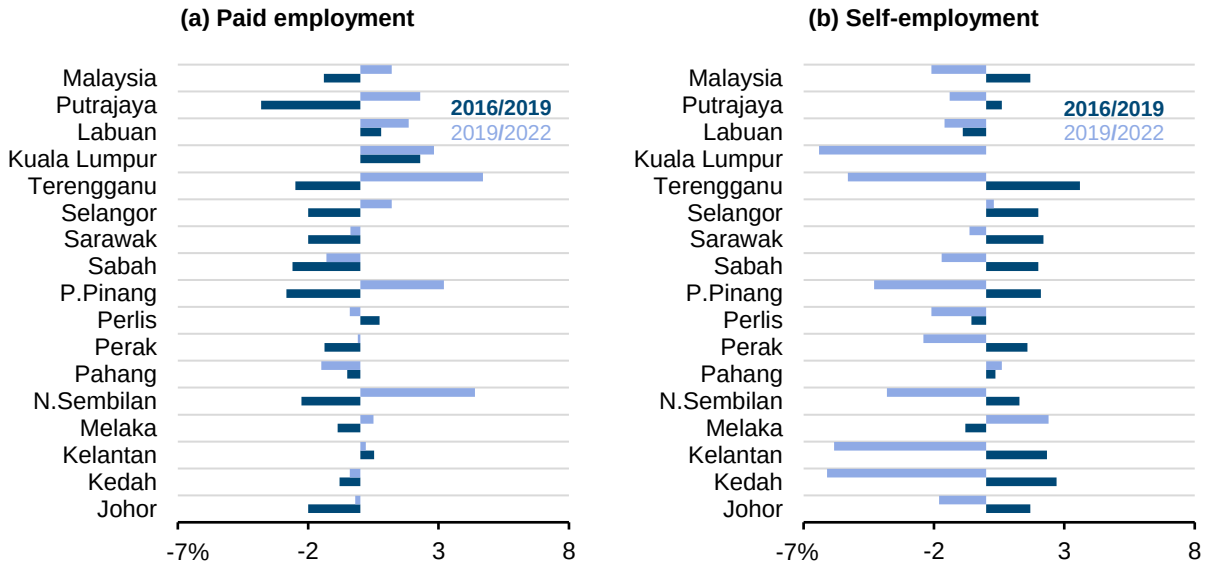
Source: DOS (2017) and DOS (2023b)

[29] While examining the trends in remittances from other households, there is a significant gap in understanding the origins and destinations of these remittances according to income deciles due to data limitations. This restricts further investigation into variations in remittance flows dan make it remains unexplored in SoH 2024.
[30] According to DOS (2023b), lump sum receipts such as retirement payments, EPF withdrawals, and other forms of remuneration from work prior to retirement are not considered as income unless the household involved has no other source of income. The assessment of government intervention during the pandemic, specifically on the EPF withdrawal is discussed in the subsequent section.
[31] Ibid.

1.3.5. Changes in sources of income distributions: A spatial insight

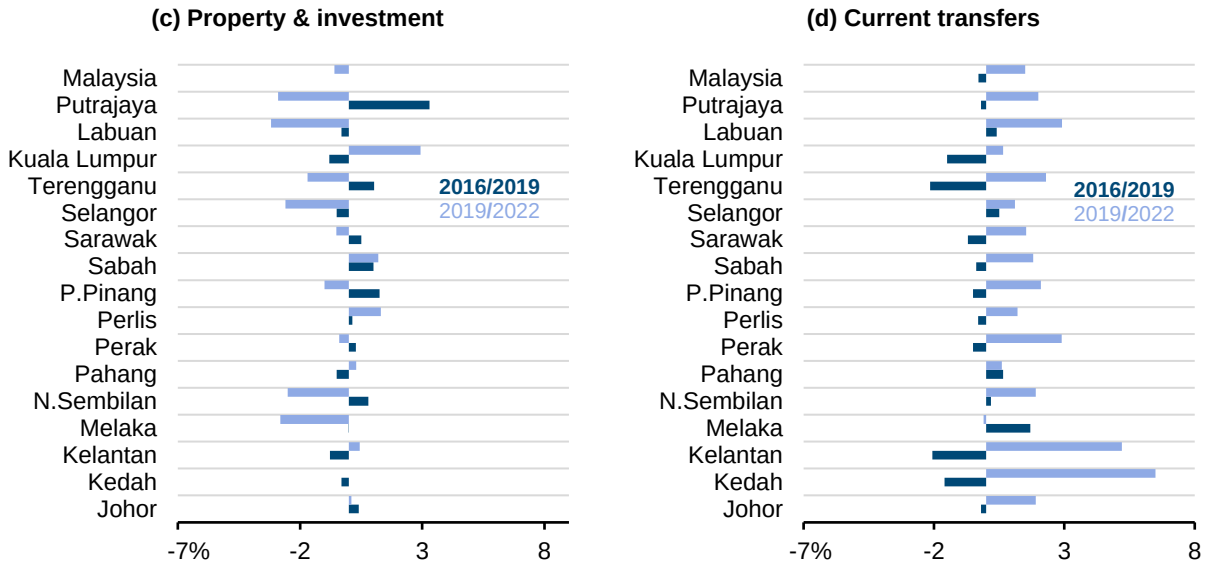
Figure 1.26 shows income differences by sources across states and federal territories for 2016 – 2019 and 2019 – 2022. During 2019 – 2022, income from paid employment trends varied, with some states increasing and others declining. Terengganu and Negeri Sembilan saw the highest growth, at 4.7% and 4.4%, respectively. A more pronounced trend was observed in income from self-employment, where the percentage of income from self-employment predominantly declined across most states in 2019 – 2022. A more notable declines were noted in Kuala Lumpur, Kedah, Kelantan, and Terengganu at -6.4%, -6.1%, -5.8%, and -5.3%, respectively[32]. The Covid-19 pandemic worsened the financial struggles of the self-employed, leading to income declines and business closures[33]. Lockdowns, reduced spending, and the shift in consumer preferences toward online platforms hit self-employed individuals the hardest, particularly in sectors reliant on face-to-face interactions[34].

Figure 1.26: Percentage change of household's income by sources of income and state, 2016/2019 and 2019/2022



Source: DOS (2017a); DOS (2023b) and KRI calculations.

[32] This echoes findings from DOS (2020c), that 46.6% of self-employed individuals lost their jobs during Covid-19, a figure significantly higher than that of other employment statuses such as employers, government-linked company (GLC) employees, and multinational company (MNC) employees.
[33] Nik Zam Nik Wan et al. (2023)
[34] Fang (2021)



Source: DOS (2017); DOS (2023b) and KRI calculations.

Growth in income from property and investments was modest across most states during the period from 2016 to 2019, with Putrajaya, Pulau Pinang, and Sabah leading the way. However, during the period from 2019 to 2022, Labuan, Putrajaya, and Melaka experienced the highest declines. During the 2016 – 2019 period, there was a moderate increase in income from current transfers by states, with the highest increase recorded by Melaka at 1.7%, followed by Pahang at 0.7% and Selangor at 0.5%. However, in the 2019 – 2022 period, many states, especially those with lower-income households such as Kedah (6.5%), Kelantan (5.2%), Perak (2.9%), and Labuan (2.9%), saw significant increases in current transfers. This trend highlights the reliance on government aid and other transfers during the pandemic period from 2019 to 2022. Subsequent section discusses in detail the various intervention by the government to stimulate the economy during the 2020 – 2022 period.

1.4 Household Inequality

1.4.1. Adjusted household income by district

Using adjusted household income can incorporate inter-household income distribution into the analysis of household income at the district level. The combination of income and inequality in a single assessment can be useful in further understanding the welfare changes at the district level. The adjusted household income is a function of both mean household income and Gini coefficient, in the following form below:

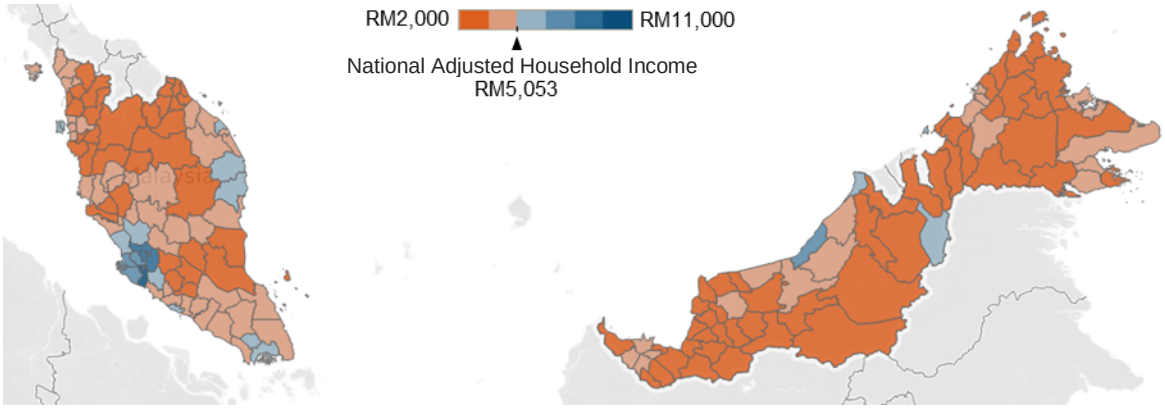
$$\textit{Adjusted household income} = \textit{mean household income}\,(1 - \textit{Gini coefficient})^{35}$$

[35] Although median income is less prone to distortion cause by incomes at extreme ends of the income distribution, the use of mean income is consistent with literature as it is an adjustment for income inequality. Source: KRI (2020)

This shows that when mean household income increases, adjusted household income will also increase provided that the Gini coefficient remains unchanged. However, if the mean household income remains the same while the Gini coefficient increases, this will lead to a decrease in the adjusted household income. Thus, the change in adjusted household income is dependent on the net effect of mean income and inequality change in both magnitude and direction.

Figure 1.27 shows the adjusted household income by district in 2022. Only a few districts have an adjusted household income above the national average (highlighted in blue), and these were mostly clustered around the Kuala Lumpur or Klang Valley region. Other notable districts with higher adjusted household income include Johor Baharu and Kulai; Barat Daya in Pulau Pinang; Kemaman and Dungun in Terengganu; as well as Bintulu and Miri in Sarawak. Their high adjusted household income is reflective of their higher mean household income compared to the other areas in the country, potentially driven by the higher urbanisation and industrialisation rates of these districts.

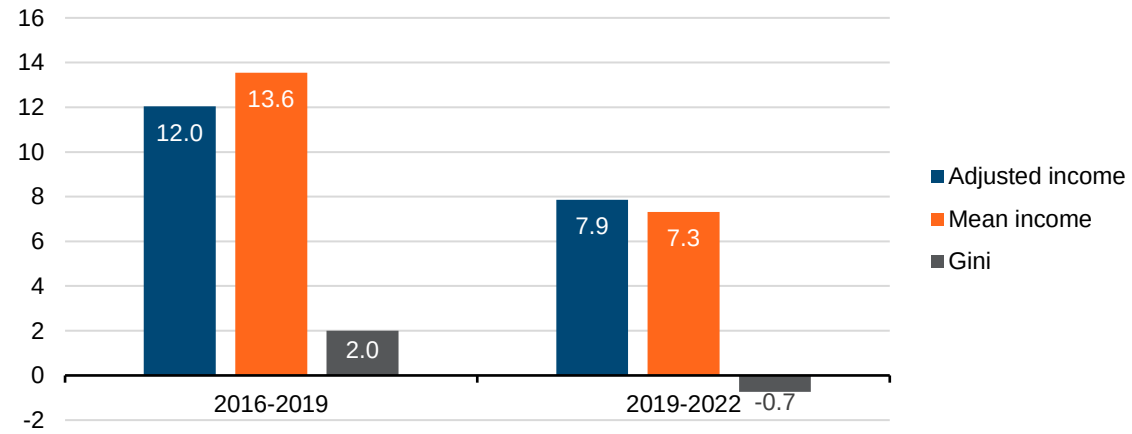
Figure 1.27: Adjusted household income by district, 2022



Source: DOS (2023b) and KRI calculations.

More interesting however, is observing the change in the adjusted household income for the periods 2016 – 2019 and 2019 – 2022 as well as their drivers of growth. At the national level, while Malaysia's adjusted household income rose for both the 2016 – 2019 and 2019 – 2022 periods, the growth in the latter period was markedly lower generally due to the smaller change in mean income (Figure 1.28). Despite the higher change in mean household income, the 2016 – 2019 period experienced an increase in inequality (represented by the increase in the Gini coefficient) while the 2019 – 2022 period saw a slight decrease. This resulted in the change of adjusted household income to be higher than the change in mean income in the 2019 – 2022 period.

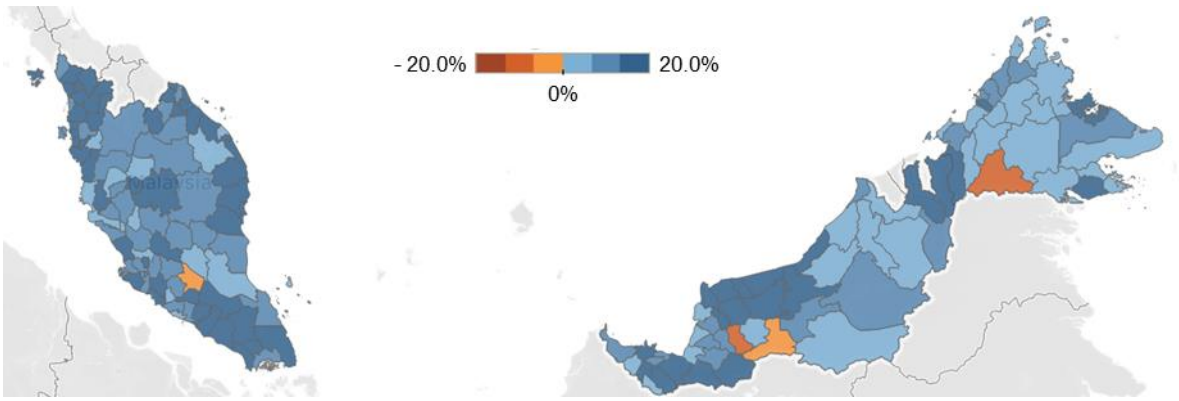
Figure 1.28: Drivers of growth in adjusted household income, 2016 – 2022



Source: DOS (2017); DOS (2023b) and KRI calculations.

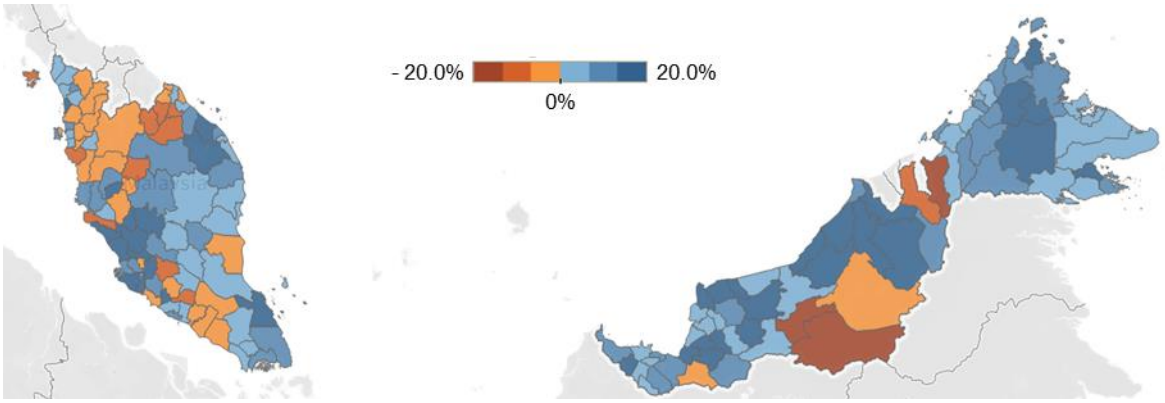
A closer look at the district-level data shows that while there was still an increase in the national adjusted household income for the 2019 – 2022 period, there were several districts that experienced a reduction instead (Figure 1.30). Comparatively, the 2016 – 2019 period showed that almost all districts had an increase in their adjusted household income (Figure 1.29). Even amongst the districts that showed improvements in their adjusted household income during the 2019 – 2022 period, the degree of change was noticeably lower than those experienced by the districts in the 2016 – 2019 period. This is largely due to several districts experiencing a reduction in mean household income after the pandemic.

Figure 1.29: Change in adjusted household income by district, 2016/2019



Source: DOS (2017) and KRI calculations.

Figure 1.30: Change in adjusted household income by district, 2019/2022



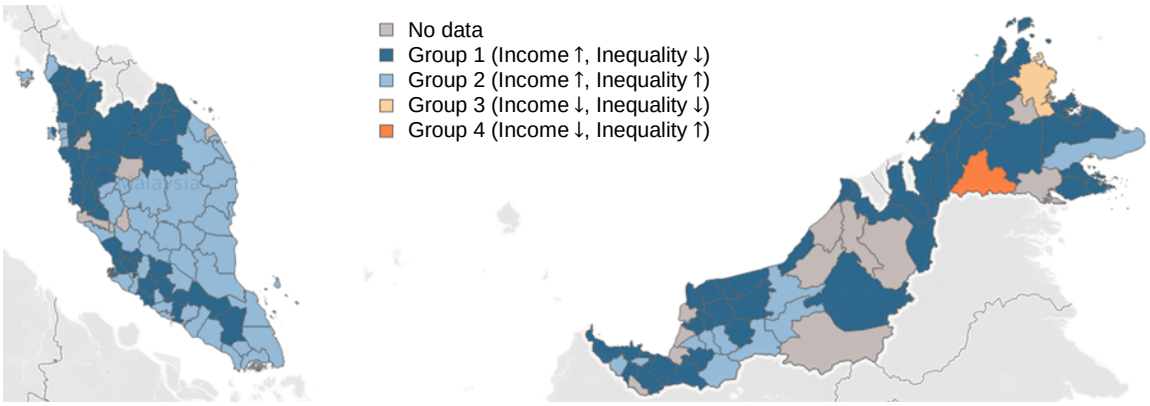
Source: DOS (2017); DOS (2023b) and KRI calculations.

In addition to the change in adjusted household income, it is equally important to examine the drivers of change at the district level for both the 2016 – 2019 and 2019 – 2022 periods. Figure 1.31 and Figure 1.32 categorises the districts into four groupings based on the change in their mean income and inequality (measured by the change in its Gini coefficient) for the 2016/2019 and 2019/2022 periods respectively. Namely, the districts are sorted by those that had:

- a rise in mean income, decrease in inequality (Group 1);
- a rise in both mean income and inequality (Group 2);
- a decrease in both mean income and inequality (Group 3); and
- a decrease in mean income, and increase in inequality (Group 4)

During the 2016 – 2019 period, almost all the districts can be categorised into either group 1 or group 2 as the significant majority of these districts saw an increase in their household mean income. Most of the districts experienced a higher change in their adjusted household income compared to their mean income, as it was accompanied by a reduction in inequality. Conversely, districts in group 2 had lower growth in their adjusted household income than their mean household income growth due to worsening inequality.

Figure 1.31: Driver of change in adjusted household income by district, 2016/2019

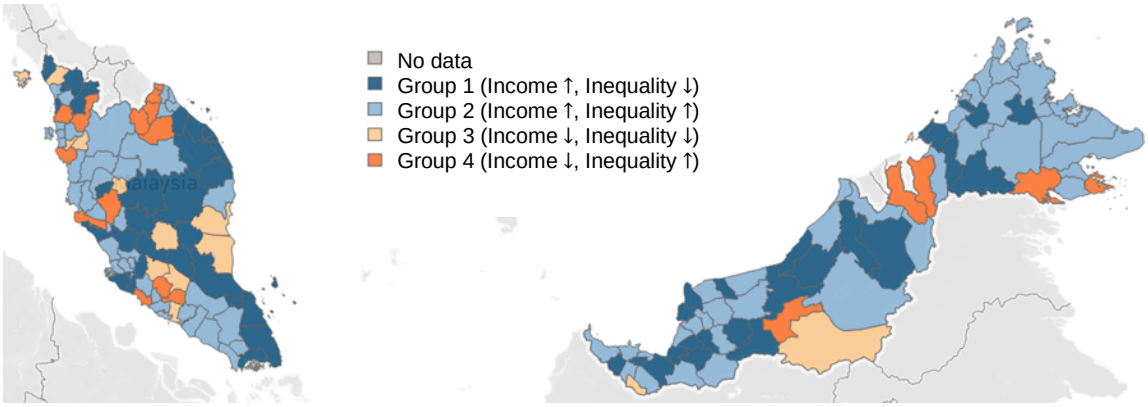


Source: DOS (2020a) and KRI calculations.

However, in the 2019 – 2022 period, the district's driver of change was more diverse in comparison (Figure 1.32). Concerningly, there were 18 districts that experienced a decrease in mean income and an increase in inequality (group 4), which resulted in a drop in their adjusted household income. This may indicate that these districts experienced worsening social welfare in 2022 compared to 2019.

While all the districts categorised in group 1 experienced a growth in their adjusted household income, the impact of the change in mean household income and inequality onto adjusted household income for districts in group 2 and group 3 are dependent on the magnitude of the change. Out of the 76 districts that faced an increase in both income and inequality (group 2) 15 districts had a decrease in adjusted household income. This indicates that the rise in inequality was larger than the growth in mean income. Meanwhile, half of the districts that had a decrease in both mean income and inequality (group 3) had an increase in adjusted household income which showed that the decrease in inequality compensated for the drop in mean income.

Figure 1.32: Driver of change in adjusted household income by district, 2019/2022



Source: DOS (2023b) and KRI calculations.

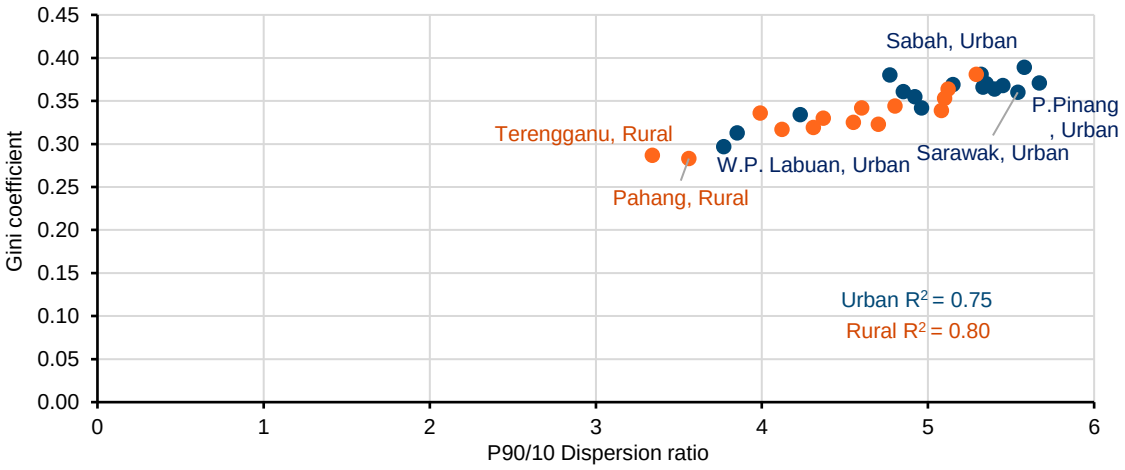
1.4.2. Inequality beyond the Gini coefficient

While the Gini coefficient is known to be sensitive to the inequalities of the middle-income distribution, it is less responsive to inequalities that occur at the tail ends of the income distribution. Thus, looking at the adjusted household income alone may miss out on extreme inequalities and potentially resulting in misleading assessments on inequality. Hence, we also observe the relationship between the Gini coefficient and the dispersion ratio between the top and lower end of the percentile distribution (P90/10) by state and strata (Figure 1.33).

In general, Figure 1.33 shows that there is a strong positive correlation between the Gini coefficient and the P90/10 dispersion ratio. However, the state and strata with the lowest Gini coefficient (Pahang, rural) does not equate to it having the lowest P90/10 dispersion ratio. Similarly, the state and strata that had the highest P90/10 dispersion ratio did not have the highest Gini coefficient.

This shows that while there is a correlation between the two indicators of inequality, there are still limitations in only using one measure to observe inequality. Furthermore, when comparing the correlation of the Gini and P90/10 dispersion ratio between the urban and rural areas, it is observed that urban areas had a lower correlation value. This may point to urban areas having higher inequalities at the tail ends of the income distribution compared to its rural counterparts.

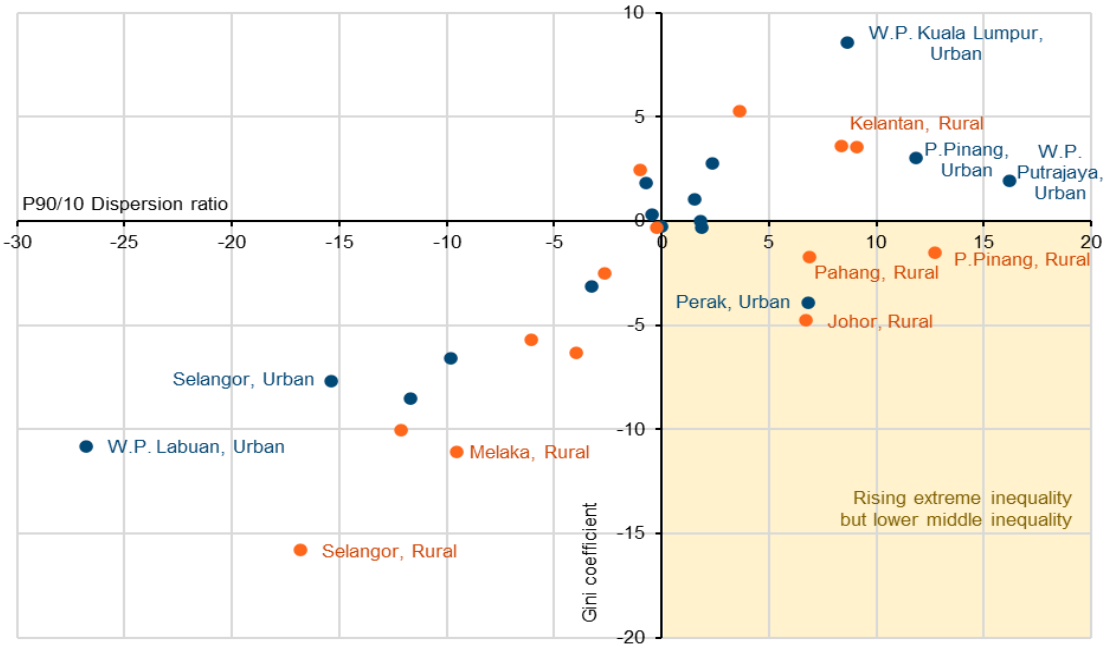
Figure 1.33: Gini coefficient and P90/10 dispersion ratio by state and strata, 2022



Source: DOS (2023b) and KRI calculations.

This is further observed when plotting the change in the Gini coefficient and the dispersion ratio by state and strata (Figure 1.34). While the large majority of the states and strata show a similar positive correlation pattern (e.g. a reduction in Gini also shows a reduction in the P90/10 dispersion ratio), there are some notable exceptions. For example, the rural areas of Pulau Pinang, Pahang and Johor as well as the urban areas of Perak showed a decrease in the Gini coefficient but had an increase in the P90/10 dispersion ratio. This indicates that while inequality in the middle of the income distribution reduced from 2019 to 2022, inequality between the top 10% and bottom 10% of the income distribution increased.

Figure 1.34: Percentage change in Gini coefficient and P90/10 dispersion ratio by state and strata, 2019/2022



Source: DOS (2023b) and KRI calculations.

1.4.3. Measuring income inequality and welfare

This subsection explores the nuances of income, inequality, and household welfare. Examining the drivers of change in adjusted household income at the district level can bring greater insight into what contributed to social welfare changes within that period. It should be cautioned that higher adjusted household income should not be conflated with overall welfare improvements. Such judgements should only be made after considering the quality of income growth, inequality reduction, and the national policy direction.

Furthermore, this subsection highlights that inequality reduction measures should reflect the areas of the income distribution that matter most. It also points to the limitations of using Gini alone in measuring inequality within the district. A decreasing Gini coefficient but increasing P90/10 dispersion ratio may indicate that while majority of the households are becoming more 'equal', it is driven by slower growth rather than a convergence towards higher household income. Furthermore, it may also indicate that those who are in the top income deciles are progressing much better economically than the improvements made by households in the lower deciles. Thus, a combination of inequality measures should be used to better assess inequality reduction in Malaysia, particularly in urban areas which may show more extreme inequalities.

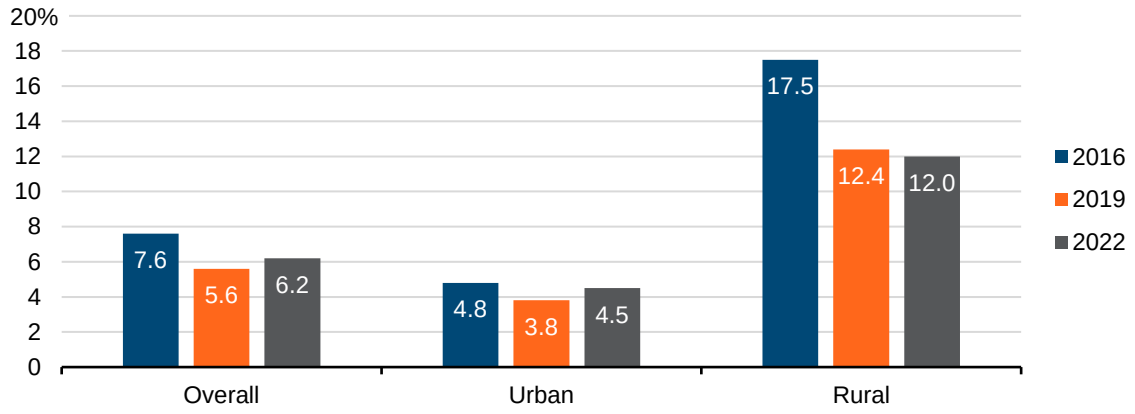
1.4.4. Household poverty

Malaysia has made significant progress in eradicating hardcore poverty over the past few decades. In 2020, the government announced the new poverty line income (PLI) to better reflect current social welfare needs. This new PLI refined the items in the food basket and increased the number of items in the non-food basket from 106 to 146 items[36]. The changes made to the PLI methodology are also in line with the expenditure patterns of the B20 income group[37]. Under the current PLI methodology, the absolute poverty rate was at 7.6% in 2016 and 5.6% in 2019 from 0.4% and 0.2% respectively using the previous PLI methodology.

While absolute poverty in the 2016 – 2019 period declined, the Covid-19 pandemic has worsened poverty rates and reversed improvements made in the absolute poverty reductions in 2019. In 2022, the number of households in Malaysia in absolute poverty rose to 6.2%. This increase was driven by the incidence of absolute poverty in urban households, rising to 4.5% in 2022 compared to 3.8% in 2019. Comparatively, rural households experienced a slight decrease in absolute poverty in that same period.

[36] KRI (2021)
[37] Ibid.

Figure 1.35: Proportion of households in absolute poverty by strata, 2016 – 2022



Source: DOS (2017); DOS (2023b) and KRI calculations.

Though there are multiple measurements that can be used to assess income poverty, this subsection will focus on absolute poverty. The PLI, and thus absolute poverty, measures the household's ability to afford basic needs. One limitation of the PLI is that it is not benchmarked against society's average living standards, and thus even households that are above the PLI may also struggle to afford this standard of living. That being said, narrowing the focus on households in absolute poverty enables for the government to provide better support with regards to the nature of their deprivation — particularly to those who are unable to access basic needs.

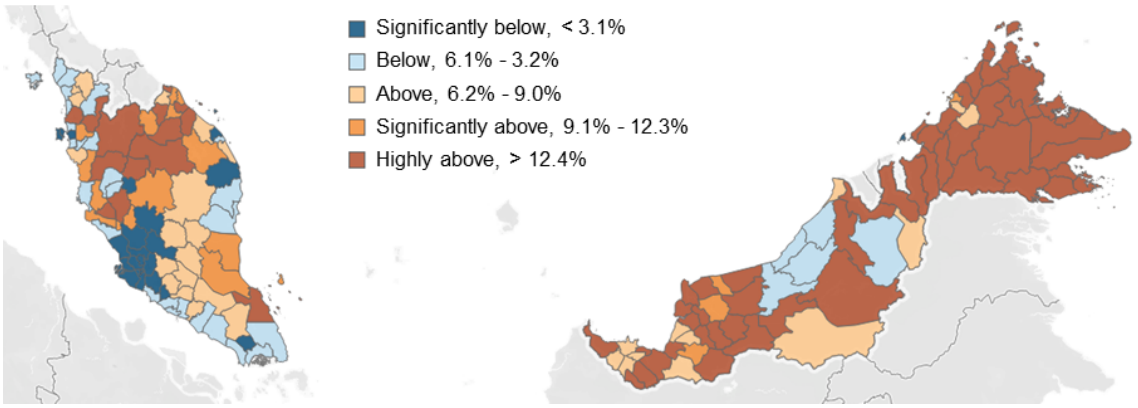
1.4.5. Spatial distribution of poverty in Malaysia

Examining the incidence of households in absolute poverty at the district level can provide a more detailed picture of Malaysia's socio-economic landscape. Though the national rate of poor households is at 6.2% in 2022, 107 districts had an incidence that was higher than the national average of poor household. Among them, 62 districts had a prevalence of poor households that was twice the national average (*highly above*) while 17 districts were significantly above the national average of poor households.

The prevalence of households in absolute poverty was noticeably higher in East Malaysia. Particularly, a large majority of the districts in Sabah had a prevalence of poor households that were significantly above or highly above the national average. For Sarawak, while majority of its districts showed higher proportion of households in absolute poverty, there is a notable exception in Bintulu and its neighbouring districts — which showed lower incidence of poverty. This may be driven by the oil and gas activities in Bintulu, which in turn provide higher income employment opportunities.

For Peninsular Malaysia, the districts along the west coast showed lower incidences of absolute poverty. On the other hand, districts in the central and east coast region had absolute poverty rates higher than the national average. Most noticeably, the districts in Selangor, Kuala Lumpur, Putrajaya, as well as several districts neighbouring Selangor had significantly lower incidences of poverty compared to the national average. The range of the proportion of households in absolute poverty among the districts in Peninsular Malaysia is also very wide, with the lowest being Sepang at 0.0% whilst the highest is Kecil Lojing at 43.8%.

Figure 1.36: Proportion of households in absolute poverty by district, 2022 (%)

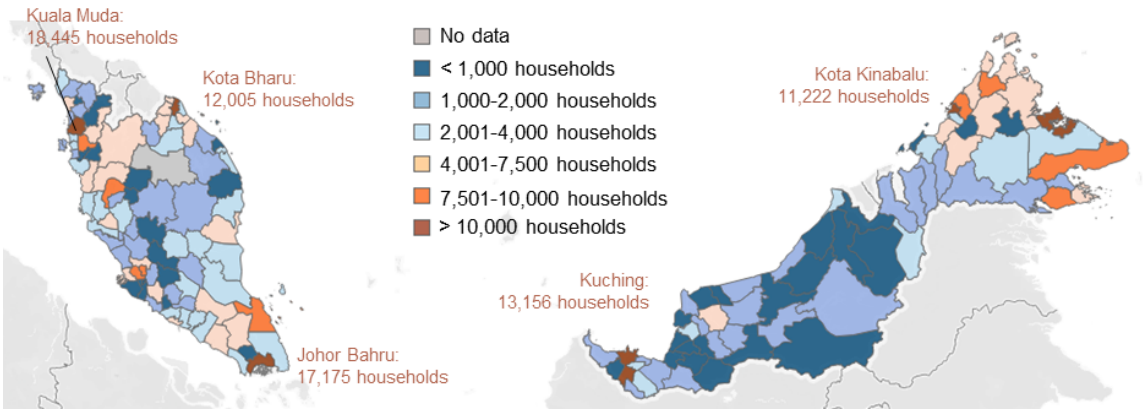


Source: DOS (2023b) and KRI calculations.
Note: The categorisation of the districts is compared against the national absolute poverty rate, whether it is above or below 6.2% and its magnitude.

The distribution of households in absolute poverty follows a similar pattern to the distribution of the adjusted household income whereby districts with higher adjusted household income also showed much lower proportions of households in poverty. As such it highlights that improvements in household income and inequality can correlate to the reduction in poverty. As regional economic challenges and low economic diversification contribute to the stagnation or decline in household incomes in affected districts, addressing poverty also requires diversified economic strategies.

However, when observing the distribution of households in absolute poverty by the number of households (Figure 1.37), a different pattern emerges when the population density is taken into account. While the proportion of households in Kuala Lumpur and Petaling in absolute poverty were significantly below the national absolute poverty rate, they had a higher number of households in poverty at 7,742 and 9,436 households respectively. This is because while there were low proportions of households in absolute poverty, the high number of households in that district reflect a higher number of households in poverty. Conversely, despite the proportion of households in absolute poverty in most districts of East Malaysia was significantly above the national average, these districts often had lower absolute numbers of households in poverty compared to other regions.

Figure 1.37: Number of households in absolute poverty by district, 2022



Source: DOS (2023b) and KRI calculations.

While Figure 1.36 showed incidences of household in absolute poverty were more widespread between the districts, Figure 1.37 highlights that the number of households that are in poverty tends to be higher in high density districts. Concerningly, despite being the capital of their respective states, Johor Bahru (17,175 households), Kuching (13,156 households), Kota Bharu (12,005 households), and Kota Kinabalu (11,222 households) had more than ten thousand households in absolute poverty within their district.

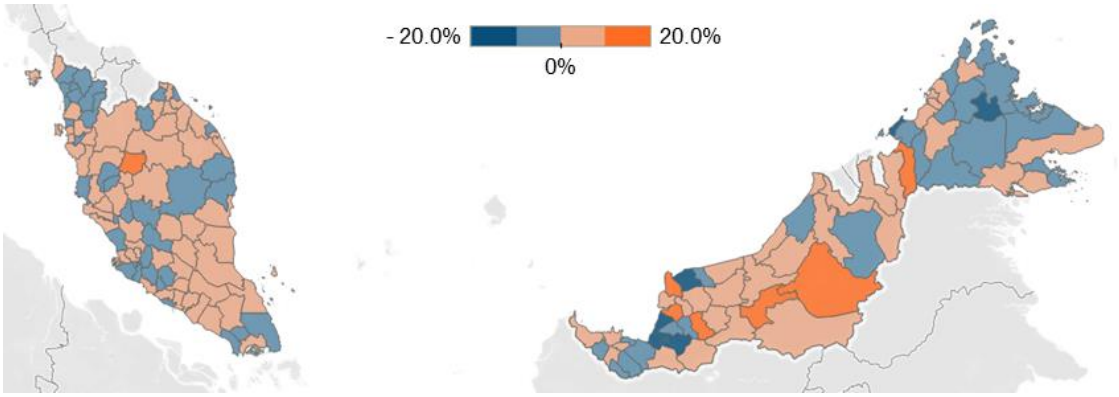
It should also be noted that there are some districts that experience both high proportion and number of its households in absolute poverty. Examples of these include Kuala Muda (13.8%, 18,445 households) and Sandakan (17.7%, 11,440 households). This may indicate that poverty is a much more rampant concern within these districts, especially if it is coupled with low access to basic amenities which will be discussed in further detail in the next subsection.

Change in absolute poverty across districts

From 2019 to 2022, national absolute poverty went up by 0.6% or by 82.9 thousand household. Majority of the districts experienced a rise in the proportion of households in absolute poverty (Figure 1.38), reflective of the change in national absolute poverty rates in that same period. As many as 84 districts saw the proportion of households in absolute poverty increase by less than 10%, while six districts had an increase by more than 10% namely, Julau (18.2%), Kapit (16.8%), Daro (14.0%), Sarikei (11.8%), Sipitang (11.6%), and Kecil Lojing (10.5%).

However, it should be noted that there were several districts that saw a decrease in poverty levels instead. Particularly, most of the districts in Sabah saw a reduction in the number of households in absolute poverty. Among those that saw a drop in proportion of households in absolute poverty, there were seven districts that had more than 10% decrease in absolute poverty. They were Pusa (-21.4%), Telupid (-19.9%), Kabong (-14.4%), Betong (-12.6%), Kuala Penyu (-12.1%), Kuala Krai (-11.9%), and Matu (-11.2%).

Figure 1.38: Prevalence of households in absolute poverty by district, 2019/2022

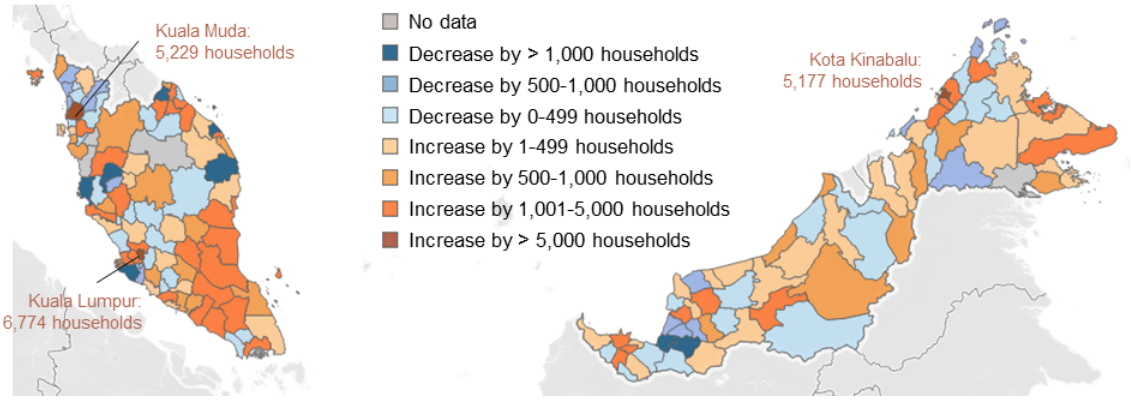


Source: DOS (2023b) and KRI calculations.

There were also several districts that had a small increase in the proportion of households in absolute poverty which nonetheless resulted in significant increases of households in absolute poverty for that region. Such districts include Kuala Lumpur, which had a change of 1.2% but an increase of 6,774 households in absolute poverty, and Johor Bahru (0.4% change, 4,963 household increase). Again, the high density of households in these districts result in higher changes in the number of households despite the low percentage change.

Meanwhile, there were some districts where despite showing a decrease in the proportion of households in absolute poverty, they still saw a rise in the number of households falling into poverty. An example of this is Kinabatangan where despite the proportion decreasing by 7.8% from 2019 to 2022, there was an increase of 397 households in absolute poverty for that same period. This is explained by the growth in the number of households within that district—where the reduction in the proportion is mainly driven by the increase in the base number rather than actual reduction in poverty.

Figure 1.39: Change in number of households in absolute poverty by district, 2019/2022



Source: DOS (2023b) and KRI calculations.

1.4.6. Beyond income poverty: A spatial analysis of access to selected basic amenities

Aside from income poverty indicators, such as absolute and relative poverty, Malaysia also examines poverty using the Multidimensional Poverty Index (MPI) which was first introduced in 2015. The MPI consists of four dimensions, namely education, health, living conditions, and income. A few of the indicators in calculating the MPI were also captured in the 2022 Basic Amenities survey[38]. Thus, this subsection will evaluate further these selected indicators at the district-level.

Table 1.1 Summary of Malaysia's Multidimensional Poverty Index

Dimension	Indicator	Deprivation cut-off
Education	Years of schooling	Less than 6 years of education
	School attendance	Any children aged 6 – 16 is not attending school
Health	Clean water access	Other than treated pipe water inside house and public standpipe
	Healthcare facility access	Distance more than 5 kilometres away and no mobile health facility
Standard of Living	Living place condition	Dilapidated or deteriorating
	Room crowdedness	Average of more than 2 household members per bedroom
	Toilet	Other than pour or flush toilet
	Garbage collection facility	None
	Transportation	All members in the household don't have public or private transportation
	Basic communication tool	Does not have consistent fixed line phone or mobile phone
Income	Monthly household income	Income below the poverty line income (PLI)

Source: GOM (2018)

[38] GOM (2018)

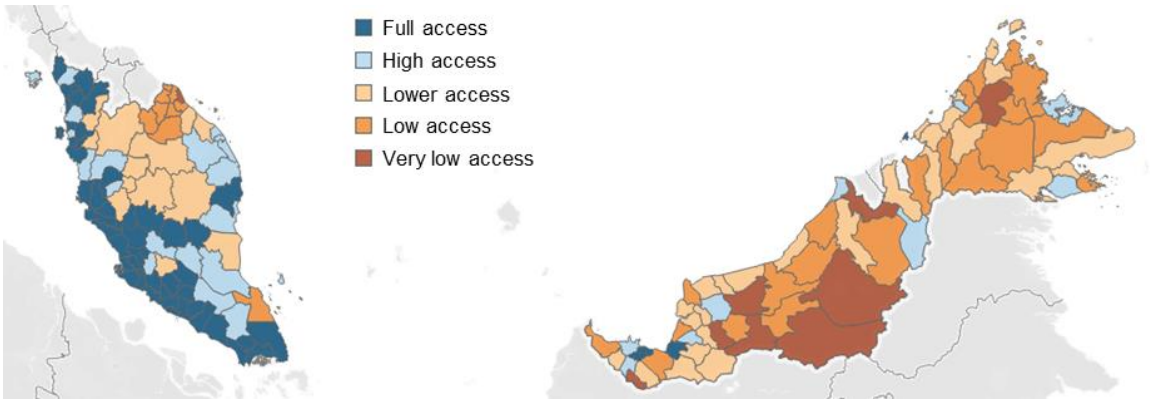
Health-related accessibility

The health dimension in Malaysia's MPI consists of two indicators: access to clean water and access to healthcare facilities. For access to clean water, a household is considered to be deprived if their source of clean water is not from piped water inside the house or from a public water pipe/ standpipe. The proportion of households with access to clean water is mapped by district in the Figure 1.40 below.

The majority of households along the west coast of Peninsular Malaysia have *full access* to clean water (defined by 100% of the households in that district have access to piped water at home or a public standpipe). Meanwhile, the remaining districts along the Peninsular Malaysia's west coast has *high access* to clean water, whereby at least 97.5% of the households in that district have some form of access to clean piped water. Within Peninsular Malaysia, access to clean water is noticeably lower in the northern east coast and central areas. Particularly, most of the districts in Kelantan had *low access* to clean water (where between 50.0% – 84.1% of households have access to clean water) while concerningly the Kota Bharu district had *very low access* as less than 50% of households has access to piped water.

Overall, access to clean water is significantly lower across East Malaysia as only four districts had full accessibility to clean piped water, namely: Labuan, Asajaya, Samarahan, and Pusa. Accessibility to clean water were generally higher in the districts along the coastline of East Malaysia compared to the other districts in Sabah and Sarawak. This is reflective of the location of districts that have higher rates of urbanisation and industrialisation.

Figure 1.40: Proportion of households with access to clean water by district, 2022



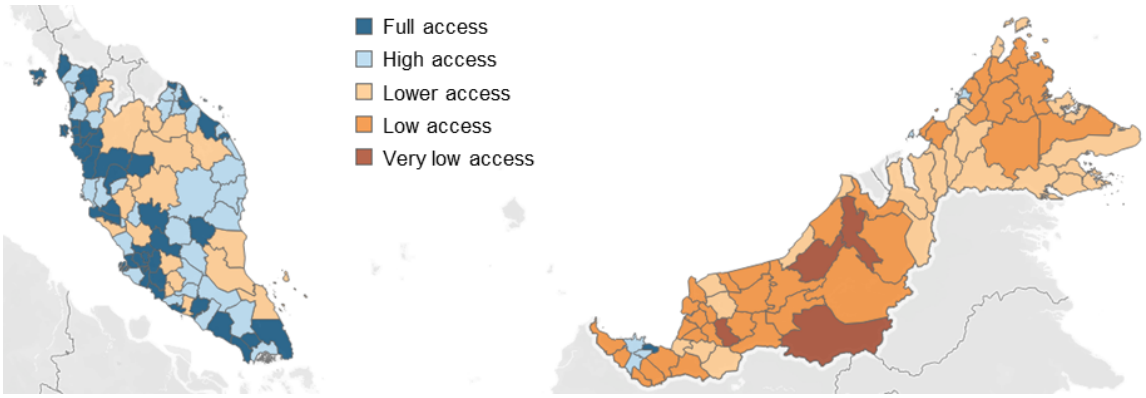
Source: DOS (2023b) and KRI calculations.
Notes:
1. The grouping of access is based on the distribution of the proportion of household with access to piped water by district. The median distribution is at 97.5% of households within a district have access to piped water.
2. The group is defined as follows: (i) Full access is 100%, (ii) High access is between 97.5 – 99.9%, (iii) Lower access is between 84.1 – 97.4%, (iv) Low access is between 50.0 – 84.0%, and (iv) very low access is below 50%.

A significant majority of households that have access to clean water are receiving it through piped water at home. In fact, very few households (less than 3%) that have access to piped water rely on a public standpipe. The only exception to this is Pusa, Sarawak where despite its households have full access to clean piped water, only 74.2% of these households have piped water at home.

The other indicator in the health dimension of Malaysia's MPI is access to healthcare facilities. Based on this definition, a household is considered to be deprived if they are located more than 5km away and they have no mobile health facility available within that radius. Mapping this out by district, we can observe that access to healthcare is significantly lower in East Malaysia (Figure 1.41).

Meanwhile, access to healthcare facilities is higher in Peninsular Malaysia with majority of the districts with *full access* located along the west coast and southern region. Most of the districts where more than 97.1% had access to public healthcare (*high access*) were located in Peninsular Malaysia. Notably, at least 80.2% of the households of each district in Peninsular Malaysia had public healthcare services within 5km radius of their home. On the other hand, in East Malaysia, majority of the districts showed *low access*, where between 50.0% to 80.1% of the households in the district had a public healthcare facility within 5km of their home.

Figure 1.41: Proportion of households with access to healthcare facilities less than 5km away by district, 2022



Source: DOS (2023b) and KRI calculations.
Notes:
1. The grouping of access is based on the distribution of the proportion of household with access to public health facilities within 5km of their residence. The median distribution is at 97.1% of households within a district have public health facilities less than 5km away.
2. The group is defined as follows: (i) Full access is 100%, (ii) High access is between 97.1 – 99.9%, (iii) Lower access is between 80.2 – 97.0%, (iv) Low access is between 50.0 – 80.1%, and (iv) very low access is below 50%.

The combination of low access to piped water and public healthcare facilities indicates that many districts in East Malaysia face challenges in health-related accessibility. The distribution of these health-related facilities is disproportionate, tending to be concentrated in the west coast of Peninsular Malaysia. This is reflective in the distribution of the number of households in Malaysia, which are more concentrated in this region. However, efforts to increase accessibility in less densely populated districts should be emphasized as they are often reflective of areas with high proportion of households in absolute poverty.

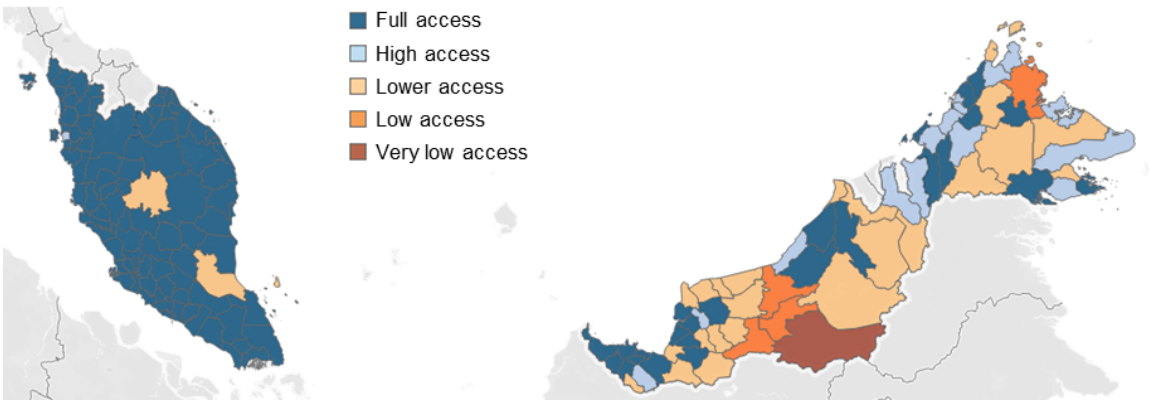
Decent standards of living

Next, we examine household access to electricity and garbage collection facilities by district. Between the two, only accessibility to garbage collection facilities is an indicator for Malaysia's MPI, under the standards of living dimension. While access to electricity is not part of the MPI, we believe it is important to examine as it is a prerequisite to other forms of accessibility such as basic communication tools or household appliances (e.g., refrigerator). This is also in line with the seventh sustainable development goal (SDG7) which ensures access to affordable, reliable, sustainable, and modern energy for all.

As of 2022, 99.7% of households in Malaysia have access to electricity. However, Figure 1.42 highlights that several districts that still face challenges with electricity access. Almost all districts in Peninsular Malaysia (apart from Lipis and Rompin) had *full access*, where all the households in that district has access to electricity. The lower access to electricity in Lipis and Rompin may be due to the combination of hilly, forested regions alongside with low population density which may make the extension of electricity grids difficult and costly. Meanwhile, in East Malaysia, districts that are close to or have high urbanisation had *full* or *high access* compared to the other districts.

Positively, even among the districts that have *lower access* (in comparison to other districts in Malaysia), more than 90% of the households have electricity access. There were only three districts that have *low access* (between 90% to 75% of households have electricity) and one district with *very low access*; namely the Bukit Mabong district where only 40.2% of the households have access to electricity. However, the Sarawak government has been making considerable efforts in providing alternative forms of electrification through the Sarawak Alternative Rural Electrification Scheme (SARES).

Figure 1.42: Proportion of households with access to electricity by district, 2022

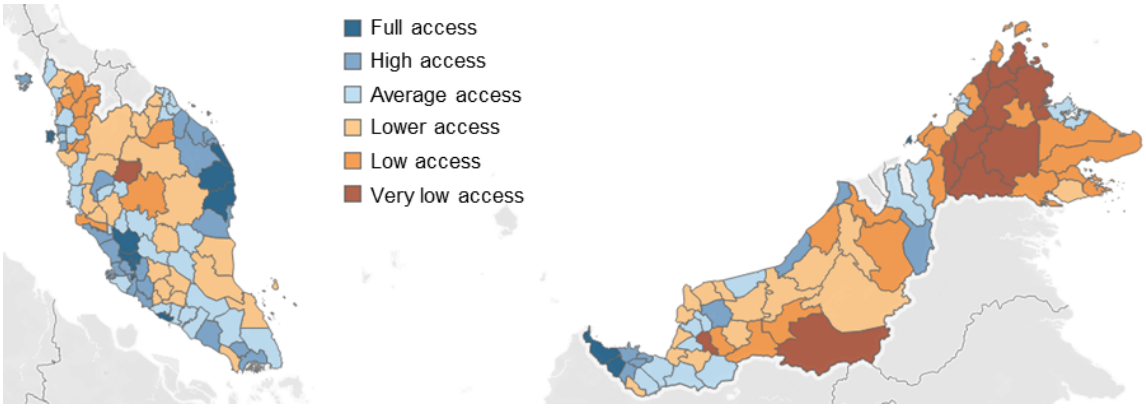


Source: DOS (2023b) and KRI calculations.
Notes:
1. The grouping of access is based on the distribution of the proportion of household with access to electricity. The median distribution is at 100% of households within a district have access to electricity.
2. The group is defined as follows: (i) Full access is 100%, (ii) High access is between 98.0 – 99.9%, (iii) Lower access is between 90.0 – 97.9%, (iv) Low access is between 75.0 – 89.9%, and (iv) very low access is below 75%.

Accessibility to garbage collection facilities remains to be a challenge for many districts. Figure 1.43 shows the proportion of households that have access to garbage collection at home or in their residential area[39], by district. Only 13 of 160 districts had *full access* to garbage collection facilities. Furthermore, amongst the districts with full access, only Putrajaya had full access to garbage collection at their living quarters.

Among the states, Sabah showed the highest rate of deprivation from garbage collection facilities, with most of its districts having *low access* (between 55% – 25% of households) or *very low access* (less than 25% of households) to garbage collection. Regardless, there are several districts across Malaysia whereby less than half of its households have access to garbage collection, with a few districts that have no access to garbage collection at all. These districts are Kecil Lojing and Bukit Mabong, where none of the households have access to garbage collection within 100 meters of their living quarters.

Figure 1.43: Proportion of households with access to garbage collection facilities by district, 2022



Source: DOS (2023b) and KRI calculations.
Notes:

1. The grouping of access is based on the distribution of the proportion of household with access to garbage collection within 100m of their residence. The median distribution is at 81.0% of households within a district have garbage collection facilities. While the third and first quantile is at 95.7% and 55.0% respectively.
2. The group is defined as follows: (i) Full access is 100%, (ii) High access is between 95.7 – 99.9%, (iii) Average access is between 81.0% – 95.6%, (iv)Lower access is between 55.0% – 81.0%, (iv) Low access is between 25.0 – 54.9%, and (iv) very low access is below 25%.

Like the distribution of other basic amenities, districts with full or high access to garbage collection facilities are in areas with high urbanisation or industrialisation. Concerningly however, the availability of garbage collection facilities for households were the lowest compared to the other basic amenities. Garbage collection facilities themselves are crucial to households for various reasons, including but not limited to, public health concerns, environmental protection, and quality of life. Additionally, the frequency of garbage collection facilities (which is not captured in the basic amenities survey) is another important factor when examining the adequacy of garbage collection facilities for the households.

[39] Garbage collection in residential area is determined by having a collection area less than 100 meters from their living quarters.

For Malaysia, the responsibility of solid waste management services (thus including garbage collection facilities) falls under the local authorities[40]. Meanwhile, the federal government role is limited to policy and finances facilities, equipment, and waste collection vehicles based on the applications from the local authorities. Thus, regions with lower financial resources or those with no local authorities may result in low or no access to garbage collection. It is also important to note that the financial capabilities of local authorities are intertwined with the revenue generation and economic activities happening within their jurisdictions. Hence, federal and state grants can help address the needs and gaps of basic living standards in districts that have low economic capabilities.

While Malaysia aspires of introducing integrated waste management facilities, controlling waste imports and exports, minimising single-use plastics and packaging materials, and achieving a 40% recycling rate[41], basic access to garbage collection remains a challenge for multiple households and districts.

1.4.7. Capturing poverty in Malaysia

While there are several methods in calculating poverty, this subsection focuses on absolute poverty and access to selected basic amenities to provide a snapshot of income and non-income poverty, respectively, across the districts in Malaysia. What we found is that examining the change in absolute poverty through both the incidence change in proportion and number of households provides a greater understanding in Malaysia's state of households across the districts. Stating rates of absolute poverty may understate the extent of poverty within the district though may allow for comparisons between districts. Similarly, looking at only the number of households in poverty may mask the welfare deprivation experienced by the district as a whole.

The year 2022 saw a rise of households in absolute poverty, likely a consequence of the Covid-19 pandemic. Concerningly, households in urban areas were more affected with the largest rise of households in absolute poverty were from Kuala Lumpur with 6,774. While the proportion increase was not significant in Kuala Lumpur (1.2% increase), the high density of Kuala Lumpur indicates a higher number of household change. Meanwhile, there were also cases where despite the district having a decrease in proportion of household in absolute poverty, they still experienced a rise in the number of households in poverty.

Additionally, we found that districts with higher incidences of households in absolute poverty are also districts that have relatively lower access to basic amenities. Thus, pointing to a strong overlap between households who are experiencing both monetary and non-monetary poverty. This is even more concerning in districts where it faces both high proportion and number of households in absolute poverty while facing low basic amenities access. An example of this is Lahad Datu where the household's income poverty is among the highest between the districts while having consistently lower access to various basic amenities.

[40] GOM (1976)
[41] GOM (2021)

Assessing various poverty indicators at the district level provides a more complex and multifaceted understanding of poverty experienced by different households. However, there are still limitations in the measurement of non-income poverty with current MPI indicators as it does not capture qualitative aspects of poverty such as food security, nutrition, quality of schooling, advanced healthcare, or digital connectivity, among others.

As Malaysia aspires to become a high-income nation, the indicators of the MPI needs to be more ambitious, going beyond basic needs such as water and electricity. While these essential services must be addressed, the MPI should also include indicators that reflect higher standards of living. Thus, multiple data sources and a broader range of non-monetary poverty can provide better clarity on the state of poverty among households, particularly in targeting and addressing joint deprivations in multidimensional poverty.

1.5 Household Savings and Wealth

Malaysian household savings and wealth are essential indicators of the country's economic stability, (economic) resilience, and growth. This section analyses the state of households' savings and wealth by examining their ability to own basic amenities such as homes, private vehicles, and electronic devices. Furthermore, it also examines household residual income, also referred to as discretionary income, as it represents the 'flow' of savings for the household. Lastly, this section will also provide an insight into the 'stock' of wealth, represented by the individuals' savings in their respective EPF accounts[42].

1.5.1. Housing and household equipment ownership

This section will highlight home ownership and household equipment ownership as indicators of a household's financial wellbeing and their ability to accrue wealth. A distinction for the subsections has been deliberately made as home ownership represents an increasingly significant share of household expenses as houses remain unaffordable for many Malaysians.

Home ownership

Owning a home remains an aspirational goal[43] for many Malaysian households. However, homeownership also accounts for an increasing share of their financial commitments as median house prices continue to outpace median household incomes[44]. This stems from the price of housing in Malaysia, categorised as 'seriously unaffordable', with a median multiple indicator[45] of 4.3 in 2022[46].

[42] As of March 2024, only 60% or 10.2 million Malaysian workers are currently covered by any form of social protection under EPF. This percentage is currently lower than the global average which stood at 68%. The majority of those who are not covered are those that work in the informal sector which include freelancers, gig workers as well as the self-employed. Source: Umavathi Ramayah (2024)
[43] According to a 2022 survey conducted by the Centre, 44.3% of respondents aspire to buy their own home as compared to 12.0% who have considered long-term rental as an option. Source: Fikri Fisal, Ziad Razak, and Nelleita Omar (2022)
[44] KRI (2024)
[45] The median multiple indicator is a measure for housing affordability. A housing market that has a median house price that is three times or less than the median gross annual household income is considered affordable. Source: Theebalakshmi Kunasekaran (2023)
[46] Theebalakshmi Kunasekaran (2023)

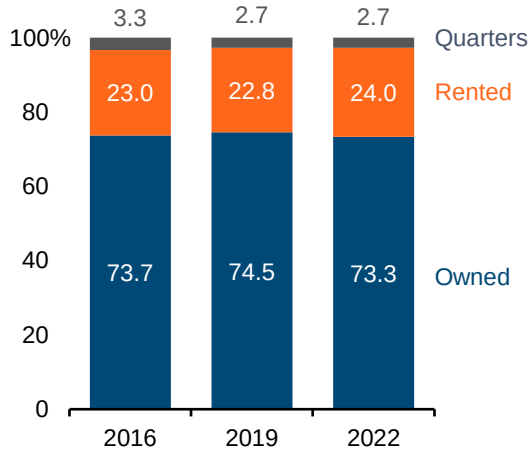
This can be seen through an examination of median house price and household income between 2012 and 2022 whereby house prices grew at a CAGR of 6.9%[47] compared to household income at 2.6%[48], within the same time period.

Nonetheless, the HIS data in Figure 1.44 and Figure 1.45 highlights a trend between urban and rural households in terms of home ownership of owned, rented, and quarters property. Although home ownership trends have been stagnant in both communities, rural households have shown higher instances of owned property, increasing from 85.6% in 2016 to 87.6% in 2022. On the other hand, urban household property ownership has been quite stagnant, and shows decreasing trend from 74.5% in 2019 to 73.3% in 2022. This is also marked with the rise of rented properties among urban households, rising from 22.8% in 2019 to 24.0% in 2022.

The higher cost of housing in urban areas compared to semi-rural or rural regions can be seen in data recorded in the National Property Information Centre (NAPIC)'s Residential Prices Quarterly Update in Q1 2024. Property within urban centres, even those deemed low-cost or 'affordable,' is becoming more expensive in terms of both purchase prices and rental costs. For example, in Selangor, the median price of a low-cost house in the district of Petaling is RM340,000, compared to RM211,000 in the neighbouring district of Sepang[49]. The rise in vacant housing between 2010 and 2020 further exemplifies this trend, with the percentage of vacant living quarters increasing from 15.0% to 19.4%[50].

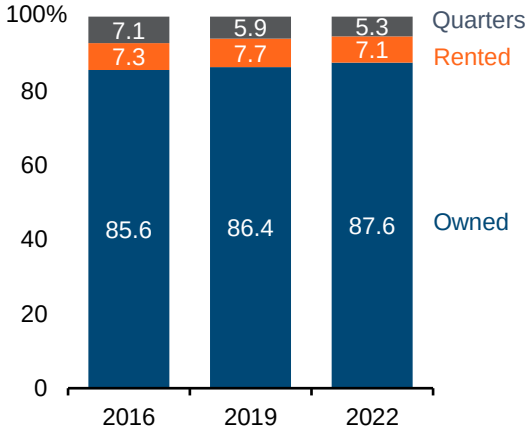
Consequently, prospective homeowners are forced to move to more distant areas to find affordable housing. However, this decision incurs additional monetary costs and non-monetary costs such as the time and distance spent commuting to work. For example, this situation is particularly challenging for those commuting from areas such as Seremban or Rawang, which can be as far as 70 km from the city centre[51]. As a result, Klang Valley workers lost an estimated 44 hours in their commutes, equivalent to RM308 a month in 2022[52].

Figure 1.44: Type of homeownership among urban households, 2016 – 2022



Source: DOS (2023c)

Figure 1.45: Type of homeownership among rural households, 2016 – 2022



Source: DOS (2023c)

[47] NAPIC (2024)
[48] DOS (2023c)
[49] NAPIC (2024)
[50] DOS (2022)
[51] Suraya Ismail (2019)
[52] Nor 'Asyikin Mat Hayin and Muhamaad Razis Ismail (2022)

Household equipment ownership

In Section 1.4.6, we have conducted analyses on different trends surrounding basic amenities with regards to education, health and quality of life. However, as we move towards higher income status, household equipment ownership can also be an increasingly important measure of households' quality of living. These include items such as a car, motorcycle, microwave oven, water filter, laptop, TV, smartphone, and internet subscription[53]. These items are then categorised into three distinct groups: transport, communication and digital devices, and household appliances.

There have been distinct trends that can be seen nationally and by strata. These differences may be attributed to policies that have been implemented to ease credit, increases in disposable income or even changing lifestyles in the case of the decline of televisions. Nationally, Figure 1.46 shows that the largest percentage growth was recorded in the purchasing of water filters as well as motorcycles, at 16.5% and 13.9% respectively. This growth may be attributed to the ease of credit, increased discretionary spending by households due to changing lifestyles, and measures designed to stimulate the economy during the economic downturn.

Measures were introduced by BNM to ease cash flow constraints for individuals and businesses following the implementation of the various Movement Control Orders (MCOs)[54]. These were introduced in the form of an automatic deferment of all eligible loan/financing repayments. These measures included an automatic deferment of all eligible loan/financing repayments. Refer to Box 1.2 for a brief list of Covid-19 related relief programs in Malaysia.

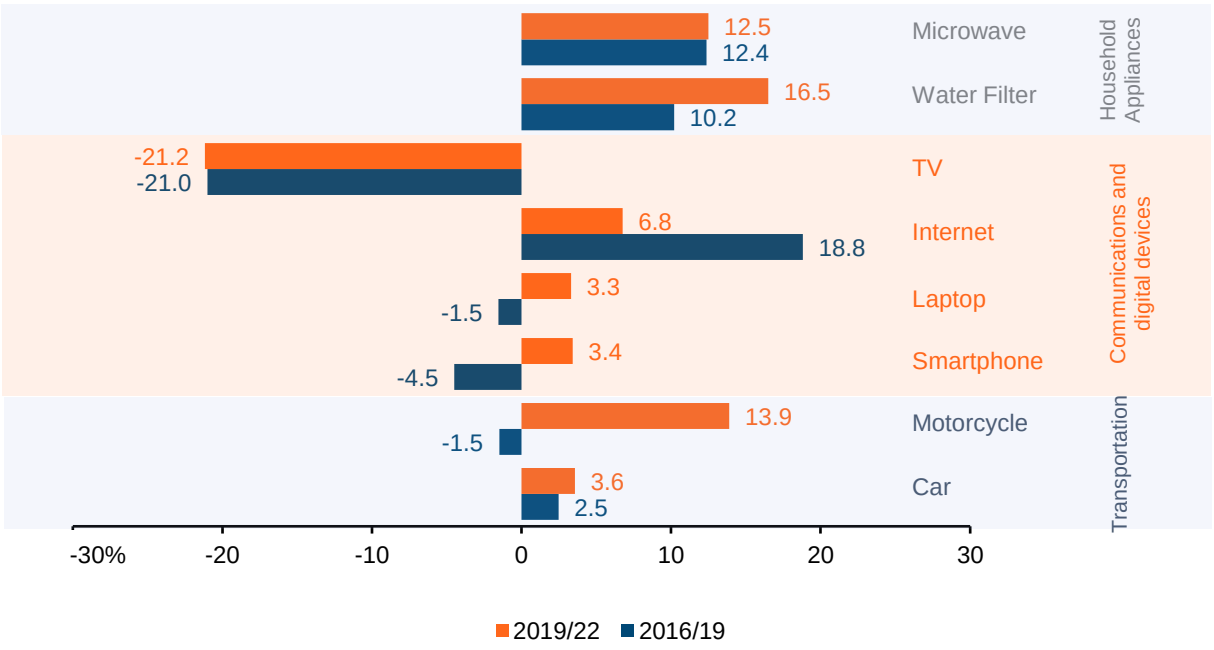
During the height of the MCO lockdown periods, only essential services were allowed to operate, leading to the rapid expansion of food delivery services. The number of riders increased by over 30,000 between March and July of 2020[55], necessitating private transportation such as cars and motorcycles. Additionally, the Malaysian automotive industry received further government intervention, including a tax exemption on passenger vehicles like cars and motorcycles from June 2020 to June 2022[56].

On the other hand, household appliances such as water filters and microwaves may have experienced increased growth due to lockdown measures as well as the increasing popularity of a subscription-based or 'Buy Now and Pay Later (BNPL)' schemes. Some of the measures induced many households to opt to cook at home due to movement restrictions, lower financial costs as well as the effort to maintain a healthy diet and lifestyle during a pandemic[57].

Lastly, television ownership rates declined notably by 21.2%. A global phenomenon has seen many individuals opting for more accessible mediums such as smartphones or tablets instead of traditional television sets[58]. The decline spans all age groups, not just the younger ones. Media consumption has shifted predominantly online, with 80% of all media time among 16 – 24 year olds and 50% among the 55 – 64 age group[59].

[53] DOS (2023c)
[54] BNM (2020)
[55] Sheridan Mahavera (2020)
[56] Wong (2022)
[57] Norshariani Abd Rahman (2020)
[58] Kemp (2024)
[59] Ibid.

Figure 1.46: Percentage growth of household equipment ownership among total households, 2016/2019 and 2019/2022

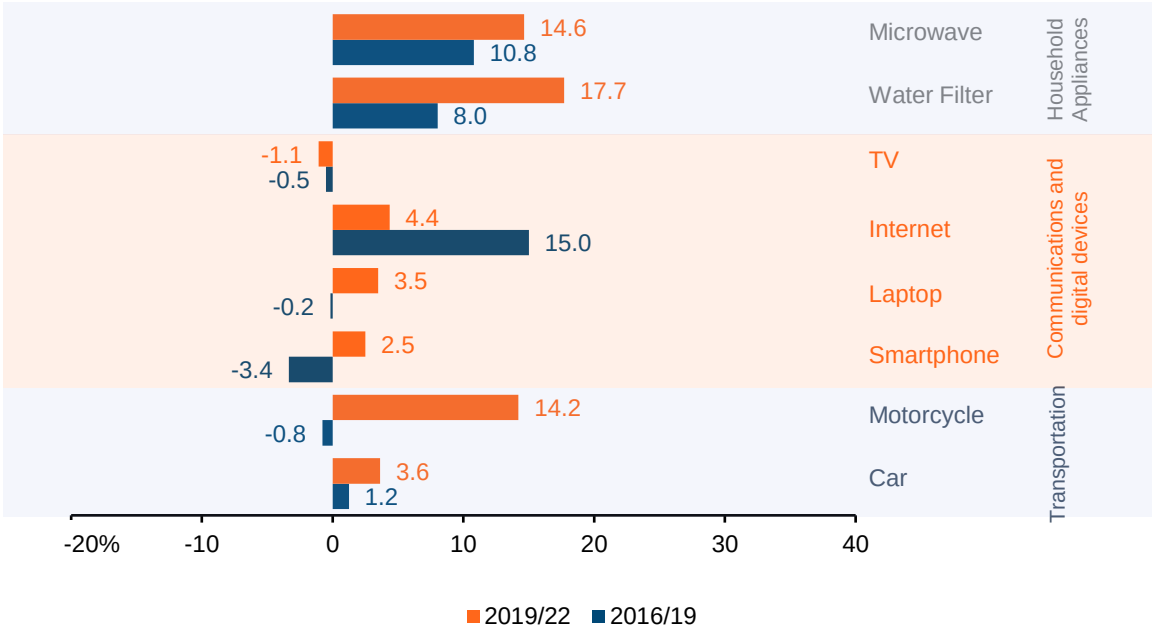


Source: DOS (2023c)

Between urban and rural communities, although the growth trends experienced remained largely the same across all basic amenities, the degree of growth differed. For example, there was a noticeable increase in communications and digital devices such as smartphones, laptops and internet subscriptions among rural communities as seen in Figure 1.48. These devices had a high growth of 7.4%, 12.2% and 18.6% respectively. This is mainly attributed to the need for these devices by households for use as part of work as per WFH policies and distance-learning in the case of students. This will be further explored in Section 3 as we assess the impact that Covid-19 had on education.

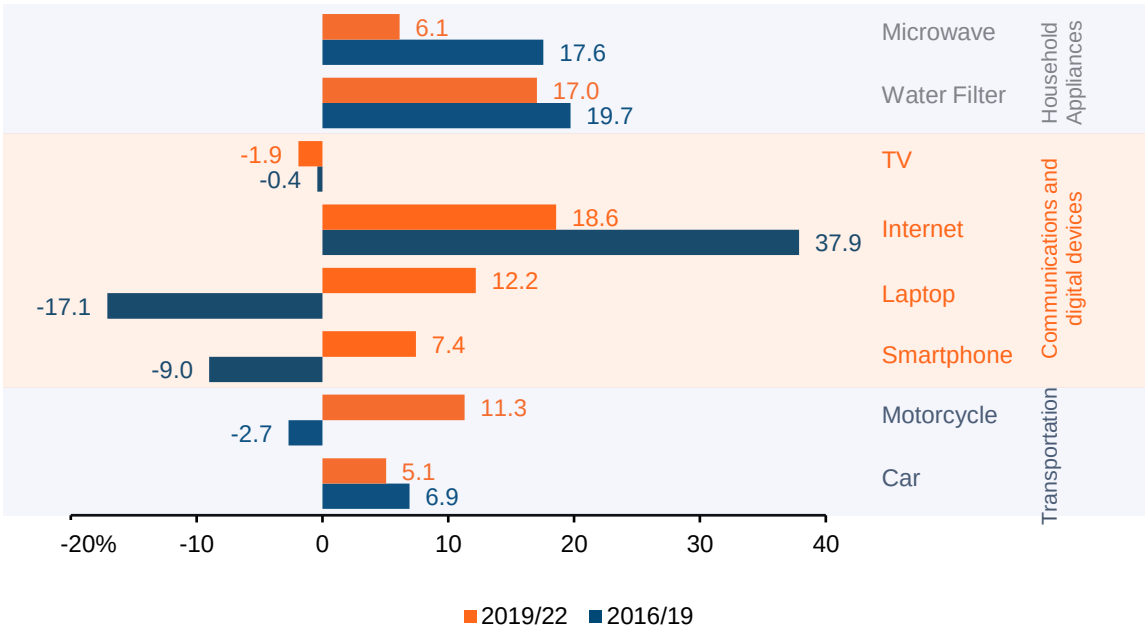
Lastly, household appliances also experienced high growth among urban households in Figure 1.48 with water filters growing at 17.7% and microwaves at 14.6% because of rising household incomes. This has allowed these families, particularly in urban areas, to increase their standard of living and quality of life through purchases such as the items listed above.

Figure 1.47: Percentage growth of household equipment ownership among urban households, 2016/2019 and 2019/2022



Source: DOS (2023c)

Figure 1.48: Percentage growth of household equipment ownership among rural households, 2016/2019 and 2019/2022



Source: DOS (2023c)

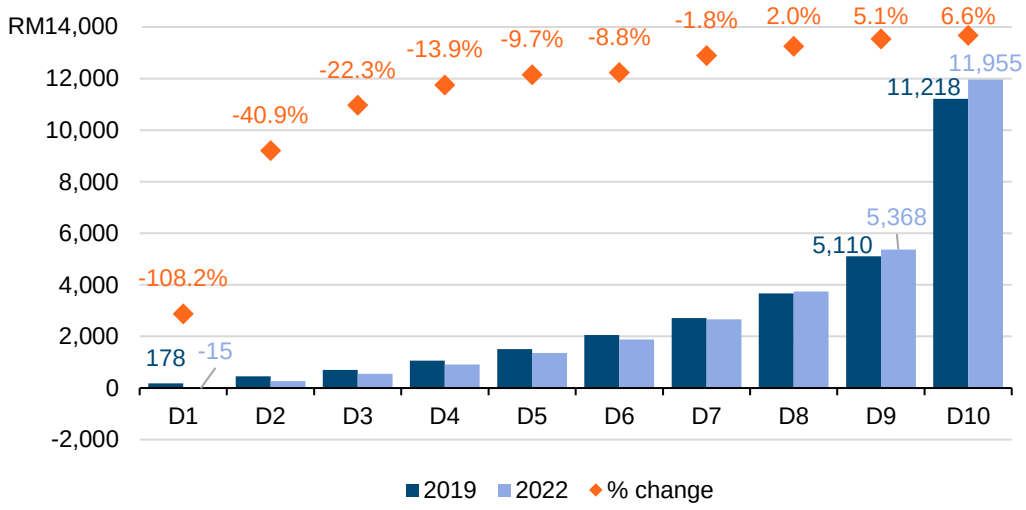
Household residual income

Although there are no official statistics capturing the complete landscape regarding household savings, household residual income[60] can be used as a proxy representing the 'flow' of money channelled into household savings.

According to Figure 1.49, residual income has declined across income deciles, disproportionately affecting lower- and middle-income households. In the case of income decile 1 (D1), they have experienced a -108.2% reduction in mean residual household income from RM177 in 2019 to -RM14 in 2022. Individuals from these income groups are the ones that are entirely dependent on government relief programmes.

This trend persists across D1 to D7, which experienced a mean residual household income reduction. Positive growth can only be seen in D8 – D10 where it gets progressively higher from 2.0% for D8 households to 6.6% in D10 households, thereby widening the income gap between the rich and the rest of the economy. This is consistent with global trends whereby the pandemic did have a negative impact in increasing the inequality present between the rich and the poor.

Figure 1.49: Real mean residual gross household income by income decile, 2019/2022



Source: DOS (2023b)

Wealth – EPF savings

As income continues to be accumulated, it will be reserved in the form of 'stock' for the individual, acting as a proxy or as an indicator of household wealth. This subsection outlines the EPF savings of individual contributors, according to income decile and various age groups (<30 year old, 30 – 54 year olds, 55+ year olds) from 2019 to 2022. However, there is a main caveat with this dataset as it would mostly capture individuals currently working in the private sector (estimated at 60% of the labour market[61]), excluding those working in the public and the informal sector.

[60] Household residual income is defined as excess of income over consumption expenditure. These amounts are in gross terms before the deduction of payments such as social security contributions and inter-household transfers. Source: KRI (2020)
[61] Umavathi Ramayah (2024)

According to EPF's estimation, an individual needs to have a minimum of RM35,000 by age 30 in order to achieve basic retirement savings of RM240,000 by age 55[62]. Using this metric, the data shows that over 90% of members under 30 do not have enough basic savings of RM240,000 by retirement age. As seen in the Table 1.2 below, only those that are in D10 in the <30 year age group have the required amount needed for basic retirement. This highlights the structural issue of low starting salaries among those beginning to enter the job market as they cannot achieve the basic EPF contribution for retirement.

On the other hand, for those that are in the 30 – 54-year age group, they would require a minimum of RM240,000 by the age of 55. The trend still persists as only contributors from the D10 group have the required basic savings outlined by EPF. However, within this age group, there may have been withdrawals made from their 'Account 2' which allows for limited withdrawal for purposes such as further education, first home, etc.

Table 1.2: Average savings (absolute) by age group and savings decile, 2022

Decile	<30 years	30 – 54 years	55+ years
D1	RM107	145	121
D2	397	638	416
D3	993	2,399	897
D4	1,902	7,501	1,854
D5	2,983	19,259	3,950
D6	4,128	39,039	8,447
D7	6,070	67,712	18,752
D8	9,920	107,217	43,406
D9	18,285	168,761	112,704
D10	49,061	425,512	643,245

Source: EPF (2024)

The pandemic also had a noticeable impact on EPF savings when examining the percentage change in average EPF savings from 2019 to 2022 (Figure 1.50). This change is primarily due to various relief programmes introduced in 2020 to 2022 that allowed for the partial withdrawal of EPF savings. These include: *i-Lestari*, *i-Sinar*, *i-Citra* and the 2022 *Pengeluaran Khas*. According to Figure 1.50, the 55+ age group, having reached the age of retirement, were least affected by the various withdrawal schemes as they were mainly ineligible as they already had the ability to withdraw prior to the introduction of the schemes.

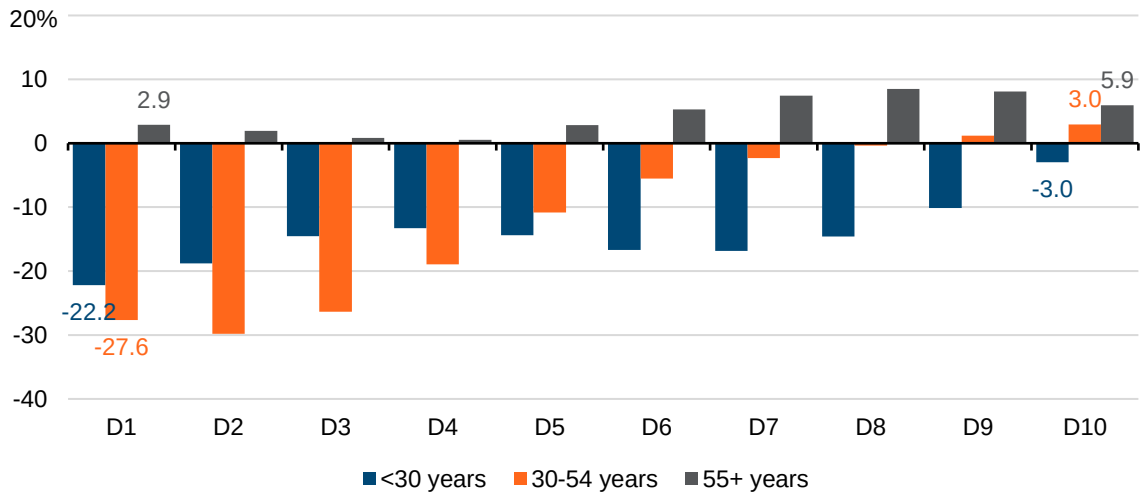
It is interesting to note that the 30 – 54 year old age group were the most impacted primarily due to the financial commitments they would have at that point in time. The disruption brought about by the pandemic had an adverse effect on the EPF savings for individuals in D1 to D8 as they experienced an overall decline in EPF savings from 2019 to 2022.

[62] EPF (n.d.)

This is supported by survey results from Muhammad Amirul Ashraf Abd Ghani et al. (2023) which indicate that a substantial proportion of i-Lestari and i-Sinar withdrawals were channelled into daily expenses, utility bills, loan/debt repayment as well as the education for children during the MCO period[63]. Heads of households were forced to withdraw their savings to meet their financial commitments, even as the loan moratorium was in effect. Furthermore, there were also distinctions in withdrawal by strata, as those that were living in rural areas were more likely to participate in the early withdrawal. The study highlighted that these individuals would often have lower incomes, greater dependents and would have experienced greater degrees of salary reduction as compared to their urbanites that may have the opportunity to continue to work from home[64].

Lastly, those that were less than 30 years old were slightly less impacted as compared to their older counterparts as they generally would have lesser financial commitments in terms of housing/vehicle loans, dependents, etc.

Figure 1.50: Percentage change in average EPF savings by saving decile and age group, 2019/2022



Source: EPF (2024)

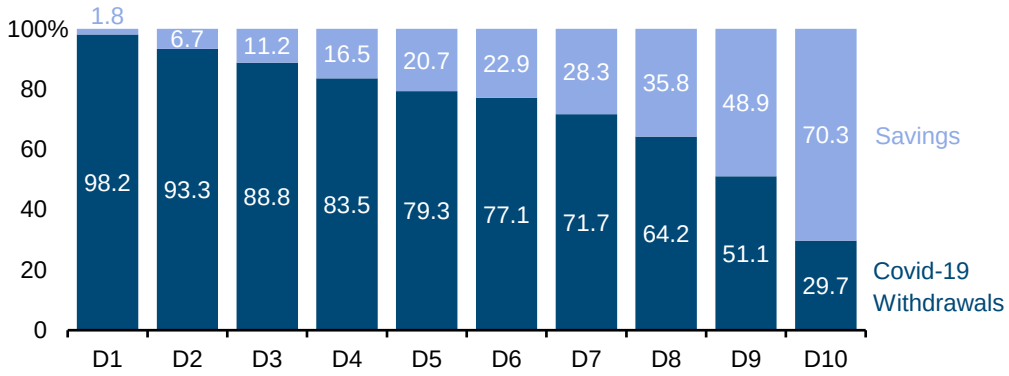
Furthermore, the Covid-19 related EPF withdrawals also further widened the existing disparity between different income groups as it disproportionately affected lower-income EPF contributors. This can be seen in Figure 1.51. Among those that are less than 30 years old, those in D1 withdrew 98.2% of their savings through the four schemes as compared to 79.3% of those in the D5 savings decile and 29.7% of those in the D10 decile.

This trend is even more apparent when examining Figure 1.52 as D1 withdrew 98.0% as compared to D5 at 50.3% and D10 at 6.8%. These individuals are becoming increasingly more vulnerable and would be unable to support themselves in a similar way if a similar event such as the pandemic would reoccur. In addition, this group also has a higher probability of retiring without an adequate amount in savings.

[63] Muhammad Amirul Ashraf Abd Ghani et al. (2023)
[64] Ibid.

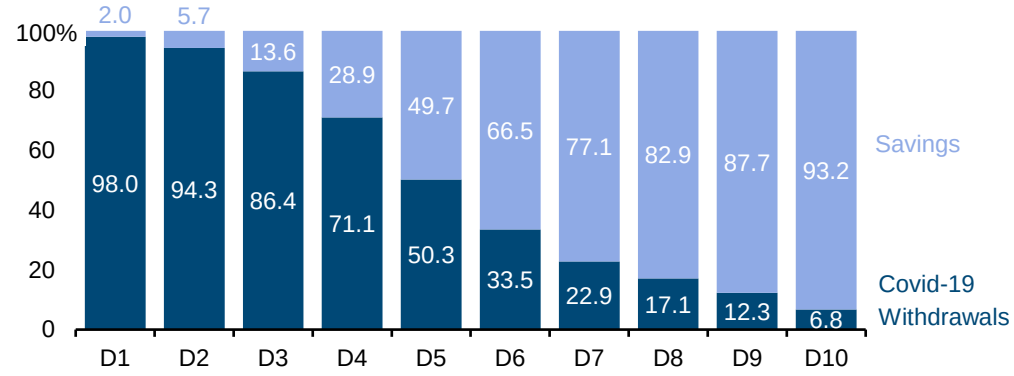
Lastly, Figure 1.53 shows a similar trend in the oldest age bracket whereby lower-income contributors are the ones most likely to withdraw almost all of their available savings through the special withdrawal schemes. However, there is a caveat that at age 55 and above, its members may already have withdrawn a significant portion of the savings to sustain themselves after retirement.

Figure 1.51: Covid-19 related EPF withdrawals as a percentage of 2022 savings among members aged below 30 year olds by savings decile, 2020 – 2022



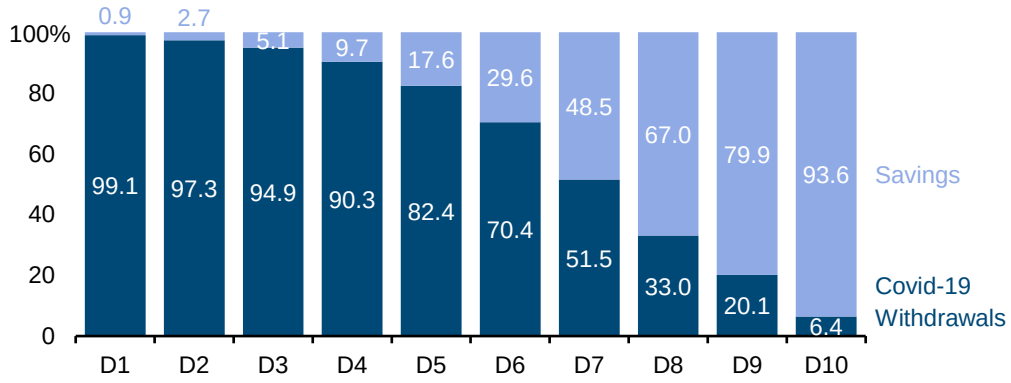
Source: EPF (2024)

Figure 1.52: Covid-19 related EPF withdrawals as a percentage of 2022 savings among members aged 30 – 54 year olds by savings decile, 2020 – 2022



Source: EPF (2024)

Figure 1.53: Covid-19 related EPF withdrawals as a percentage of 2022 savings among members aged 55+ year olds by savings decile, 2020 – 2022



Source: EPF (2024)

1.5.2. Low savings and future considerations

As highlighted in this subsection, the issue of low savings, attributed to the structural issue surrounding stagnant wages, remains a key concern for policymakers. It is particularly concerning that 90% of those below 30 do not have enough basic savings to afford retirement at RM250,000 by 55. Although it can be argued that their wages may improve through career progression, there is a compounding effect attributed to low starting salaries, as it typically results in slower wage growth and even increased instances of job mismatches. However, with the increase in the contribution share for EPF's Account 1 from 70% to 75%, they have projected that 65% of its members may have the means to achieve basic savings by 2035[65].

Moreover, the target of RM250,000 for retirement must be discussed as it assumes that the individual would use RM1,000 per month for 20 years. As the average Malaysian's life expectancy increases, the target of RM250,000 may be insufficient and would require re-examination as this figure has not been revised since 2019[66]. Individuals approaching their respective retirement ages and beyond may face increased adversities such as health and disability risks[67] alongside the depletion of their retirement savings.

It is also important to note that those working in the informal sector may face even dire prospects regarding their retirement as they are currently not obligated to contribute to the EPF. These individuals, who are already facing issues regarding lower average income, may also have little to no safety net for retirement in comparison to those in formal employment. Although there has been growth for voluntary self-contribution schemes, the uptake is considerably lower at 730,066 voluntary contributors in 2022[68]. Therefore, increased outreach is needed to improve awareness among those in the informal sector about the overall importance and benefits of self-contribution in EPF, as these individuals are at risk once they reach the age of retirement.

Box 1.2: Malaysia's 2020/21 response to the Covid-19 pandemic

In response to the Covid-19 pandemic, the Malaysian government introduced various relief and stimulus packages in 2020 and 2021 in order to dampen the negative effect that the pandemic had on the economy. Lockdown measures were designed to contain the spread of the virus amongst the populace, which included movement restrictions, economic activities limited to essential services, vaccination drives, etc. In parallel, the government also unveiled a total of nine different stimulus packages. These were valued at RM530 billion, with RM82.9 billion or 15.6% being direct fiscal injection. These include:

Table 3: List of Covid-19-related relief packages introduced by Malaysia

Name	Total Size (RM billion)	Fiscal Injection (RM billion, %)
2020 Economic Stimulus Package	20	-
PRIHATIN	230	25
PRIHATIN SME+	10	10
PENJANA	35	10
KITA PRIHATIN	10	10

[65] Yeap (2024)
[66] Ibid.
[67] BNM (2023)
[68] EPF (2023)

PERMAI	15	1.9
PEMERKASA	20	11
PEMERKASA PLUS	40	5
PEMULIH	150	10
TOTAL	530	82.9

These measures were largely centred around three main principles, which were (1) social assistance, (2) revitalising businesses, and (3) stimulation of the economy. Notable examples include a six-month loan moratorium, a reduction in contribution to EPF, wage subsidy programmes, micro-financing opportunities, etc.

An important component to highlight were the EPF withdrawal programmes (i-Lestari, i-Citra, i-Sinar, and *2022 Pengeluaran Khas*). Altogether, these four withdrawal programmes resulted in over RM145 billion in savings that were collectively taken out of Account 1 and 2 of EPF contributors. Over 52 percent of those under the age of 55 have savings of less than RM10,000 and over 25 percent under the age of 55 have a savings of less than RM1,000.

Whilst these stimulus programmes had the effect of assisting households with their expenses in the short-term, it resulted in a near depletion of their retirement savings, especially among lower-income households. There is a trade-off that is undertaken between their current consumption needs with their future well-being as it will take a considerable amount of time for them to recuperate their lost savings.

Source: Yin and Wan Amirah Wan Usamah (2022); Wong (2022)

1.6 Concluding Remarks

This chapter examines the trends in household formation, income, inequality, poverty, and wealth, focusing on the pandemic years from 2019 – 2022. Our discussions on pre- and post-pandemic periods underscore the importance of understanding how the recovery process impacts interconnected issues of household wellbeing, particularly in addressing regional disparities and long-term economic challenges.

The dynamics of household distribution in Malaysia reflect broader population trends and the effects of urbanisation. As the total number of households has grown faster than the population (from 3.8 million in 1995 to 7.9 million in 2022), average household sizes have become smaller (from 4.6 members per household in 2016 to 3.8 members in 2022), with a noticeable decline in the proportion of larger households. This shift is driven by aging populations, declining marriage and fertility rates, and a preference for more individualised living arrangements. In rural areas, one-income-recipient households remain common (about half of the total households); however, as the economy began to recover, more households generally have additional income recipients (an increase from 48.1% in 2019 to 50.3% in 2022).

Urbanisation plays a key role in shaping economic opportunities, with higher urbanisation rates often linked to stronger GDP growth. States with higher urbanisation rate tend to experience more robust economic expansion, while less urbanised states face additional challenges. Despite having high GDP per capita, some less urbanised regions remain heavily dependent on natural resources. To ensure long-term sustainability, these regions should focus on transitioning and diversifying their economies from reliance on natural resources to manufacturing and high-value-added services sectors. This shift could serve as a model for other less urbanised areas, promoting balanced and sustainable economic development nationwide.

Despite a moderate increase in household income in 2022, it remains significantly below pre-pandemic potential projections. While income did rise, it grew at a much slower rate compared to the pre-pandemic trend. Specifically, median income was 12% below the pre-Covid-19 trajectory, and mean income was 13% below, indicating a substantial lag in recovery. Additionally, the widening gap between mean and median incomes suggests increasing income inequality, with higher income earners benefiting more compared to the rest of the population.

While the household national income growth between 2019 to 2022 was significantly bolstered by Selangor, and it helped cushion a broader decline—this does not paint the full picture. The real challenge lies in addressing the uneven distribution of income contraction at the district level, which makes effective policy targeting increasingly difficult. Most states saw a decline in real median household income growth in 2019 to 2022, but Selangor was a notable exception that significantly supported the national average. Without Selangor, there will be a substantial decrease in the national mean household income for 2022, dropping from RM7,518 to RM6,555—a 12.9% reduction. A third of districts have experienced negative income growth, with some regions facing decline in income and increase in inequality. Notably, 18 districts across Kelantan, Kedah, Negeri Sembilan, Perak, Sabah, and Sarawak saw both a drop in mean income and a rise in inequality.

Absolute poverty during the period of 2019 and 2022 reveals a reversal of pre-pandemic gains. The absolute poverty rate decreased from 7.6% in 2016 to 5.6% in 2019 but rose to 6.2% by 2022. Urban areas saw an increase in poverty from 3.8% in 2019 to 4.5% in 2022, while rural areas experienced a slight decrease (from 12.4% to 12%). At district level, our analysis reveals that while some districts, such as Kota Kinabalu, Kuala Muda and Kuala Lumpur, have high numbers of households in absolute poverty, many districts in East Malaysia have a higher proportion of poor households relative to the national average, despite having lower total numbers due to smaller population sizes.

While official statistics on household savings are lacking, household residual income can serve as a proxy for understanding savings trends. Analysis shows a decline in residual income for lower-income households and an increase for higher-income households. Specifically, the lowest income decile (D1) saw a notable decline in mean residual income, from RM177 in 2019 to -RM14 in 2022. In contrast, higher income deciles (D8 to D10) experienced positive growth, ranging from 2.0% to 6.6%. This trend has widened the income gap between the wealthy and the rest, emphasizing how the pandemic has exacerbated inequality.

As income grows, it accumulates into household wealth, notably through EPF savings. There is a regressive pattern in average EPF savings among contributors: over 90% of individuals under 30 do not meet the EPF's minimum savings requirement, with only those in the highest income decile (D10) achieving this target. For individuals aged 30 – 54, a higher savings target of RM240,000 by age 55 is similarly only met by those in D10.

Covid-19-related EPF withdrawals have exacerbated income disparities, with lower-income contributors disproportionately affected. Individuals under 30 in the lowest income decile (D1) withdrew 98.2% of their savings, compared to 79.3% in D5 and just 29.7% in D10. Among those aged 30 – 54, D1 withdrew 98.0% of their savings versus 50.3% in D5 and 6.8% in D10. This trend highlights the increasing vulnerability of lower-income individuals, risking inadequate savings for future emergencies or retirement.

In conclusion, the uneven growth in income across districts in Malaysia presents significant challenges for effective policy targeting, particularly in addressing income contraction at district level. For instance, while tax reform and subsidy rationalisation are seen as important measures to increase government revenue, they must account for the uneven recovery of household incomes, ensuring that vulnerable households are shielded from rising living costs. Additionally, targeted interventions, such as strengthening wage policies with higher minimum wages, improved wage transparency, and better wage-setting mechanisms, are essential for addressing structural issue of wage stagnation in Malaysia. Consistent upward revisions to the minimum wage or better-targeted wage policy, especially for fresh graduates and lower-income groups, will help close the income gap, secure financial stability, and provide sufficient savings for retirement.

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CHAPTER 02

FROM NECESSITIES TO NEW NORMS: HOW COVID-19 RESHAPED HOUSEHOLD EXPENDITURE IN MALAYSIA

CHAPTER 2

FROM NECESSITIES TO NEW NORMS: HOW COVID-19 RESHAPED HOUSEHOLD EXPENDITURE IN MALAYSIA

By Theebalakshmi Kunasekaran, Dr Teoh Ai Ni, Shazrul Ariff Suhaimi and Azfar Hanif Azizi

"Every man is rich or poor according to the degree in which he can afford to enjoy the necessaries, conveniences, and amusements of human life."

Adam Smith (1776)

2.1 Introduction

During the pandemic, households globally generally recorded a decline in expenditure due to the numerous lockdowns or movement restrictions introduced by governments[69]. These particularly affected social spending such as dining out at restaurants, sports-related activities as well as cultural activities[70]. For example, in the UK, household spending plummeted by 22.2% in the first two quarters of the pandemic and it took almost two years for it to recover to pre-pandemic levels. Comparatively, in the aftermath of the Global Financial Crisis (GFC), it took roughly five years for UK households' expenditure to return to its pre-GFC level[71]. The difference in recovery is mainly attributed to the welfare policies introduced by the British government to protect household incomes through programmes such as the Coronavirus Job Retention Scheme[72] as well as the Self-Employed Income Support Scheme[73].

Is the aforementioned trend replicated in Malaysia as well? This section analyses the general consumption trends of Malaysian households by outlining real mean household expenditures, conducting a spatial analysis of household consumption at the district level, and exploring consumption by strata and income decile. Additionally, this section will include an analysis of how household spending patterns (by expenditure categories) have evolved over time, highlighting shifts in spending choices among households by strata and income.

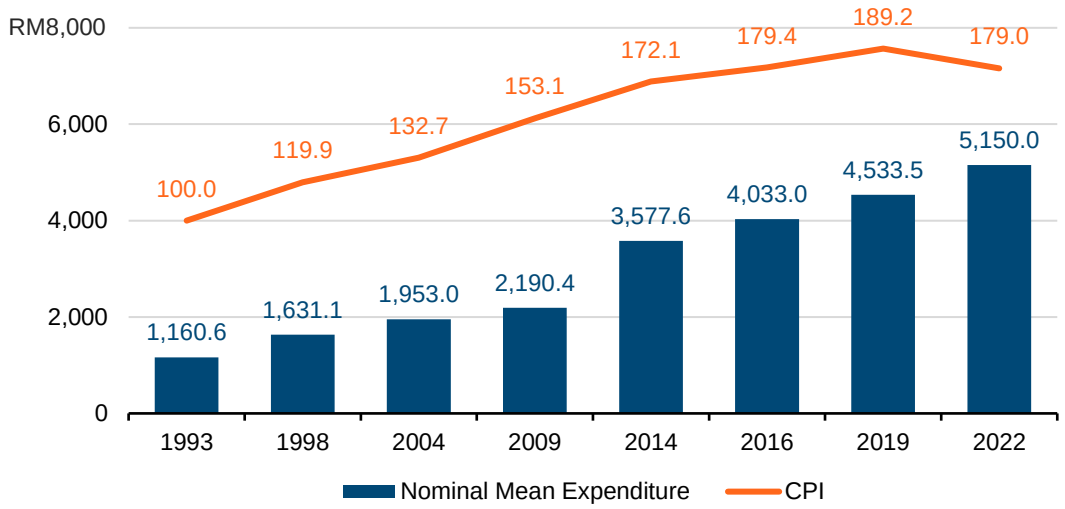
2.2 Evolution of Household Consumption Expenses

Figure 2.1 outlines the nominal mean expenditure of Malaysian households and the consumer price index[74] (CPI) from 1993 to 2022. Between 1993 and 2022, overall household expenses rose nominally from RM1,160.60 to RM5,150. In parallel, CPI, which is the measure of inflation, has been steadily increasing in the same time period, from 100.0 in 1993 as the base year to 189.2 in 2019.

[69] IMF (n.d.)
[70] Eurostat (2021)
[71] Office for National Statistics (2022)
[72] UK Government (2022a)
[73] UK Government (2022b)
[74] The Consumer Price Index or CPI measures the cost of purchasing a basket of 13 main groups of goods and services. This classification is done in accordance to the UN's Classification of Individual Consumption According to Purpose (COICOP). The changes in the cost of this basket represents the rate of inflation. Source: DOS (n.d.a)

However, in the post-pandemic period in 2022, it has moderated slightly to 179.0. Although overall inflation has reduced in 2022, households nationally have continued to increase their expenditures which may suggest behavioural or lifestyle changes as household incomes have increased.

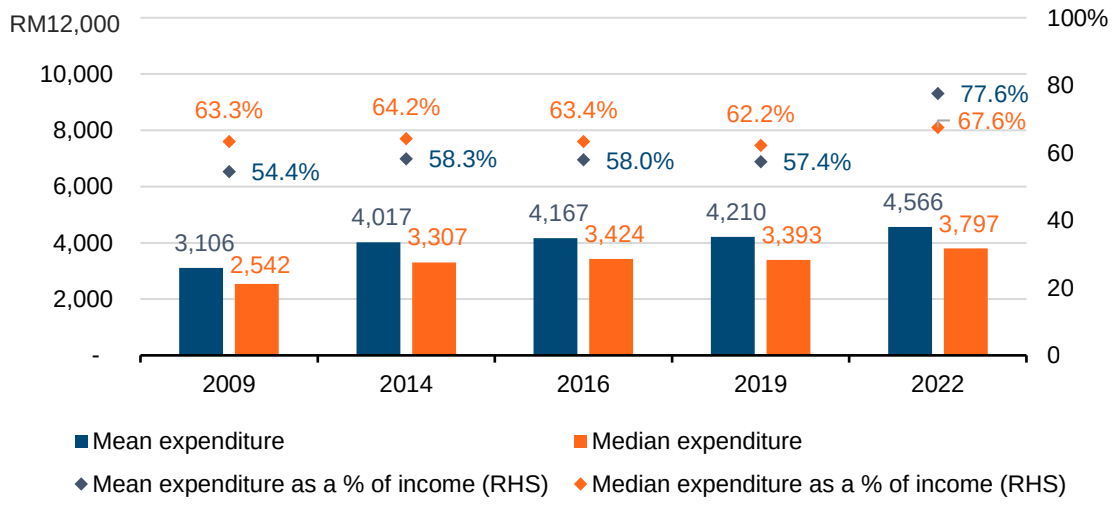
Figure 2.1: Nominal mean household expenditure, 1993 – 2022



Source: DOS (2011); DOS (2015); DOS (2017); DOS (2020); DOS (2023); DOS (n.d.b) and KRI calculations.

As households continue to increase their overall income, their household expenses also follow suit and have recorded a rise (Figure 2.2). Mean and median expenditure as a percentage of household income increased between the 2009 and 2022 periods, from 54.4% and 63.3% in 2009 to 77.6% and 67.6% by the end of 2022. This trend may have future implications, as the potential for increased household savings and the accumulation of wealth may be impacted as households continually allocate a higher share of their income on monthly expenses.

Figure 2.2: Real mean and median household expenditure, 2009 – 2022



Source: DOS (2011); DOS (2015); DOS (2017); DOS (2020); DOS (2023) and KRI calculations.
Note: Real expenditure is expressed in 2015 prices.

2.2.1. Spatial analysis of household consumption expenditure

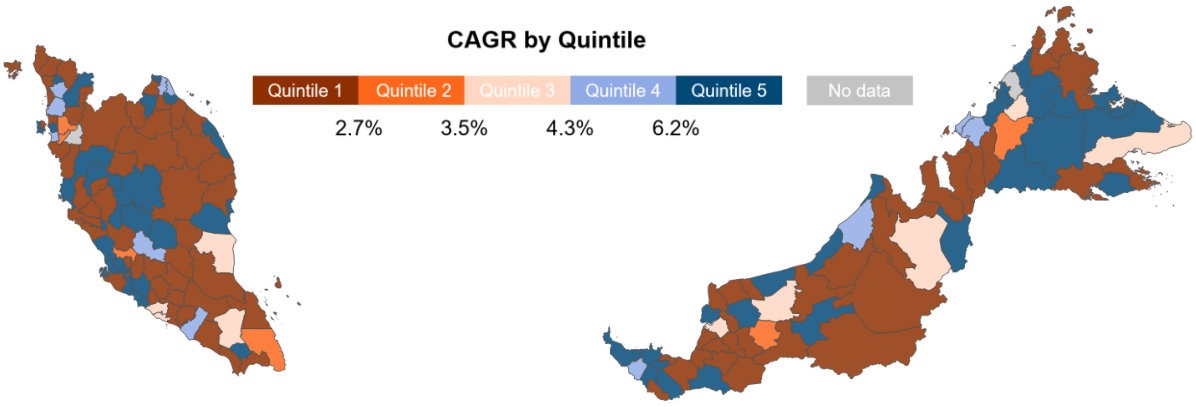
Against the backdrop of increased urbanisation[75] and the rising cost of living[76], households nationwide will find it difficult to accommodate their ever-increasing monthly expenses.

Figure 2.3 highlights the distribution of CAGR in districts across all growth percentiles in five quintiles, with the transition from red to blue indicating lower to higher growth in expenditure. Overall, there has been a mixed pattern of growth in Peninsular Malaysia, Sabah, and Sarawak. For example, the CAGR in real mean expenditure has generally shown higher growth in urban areas such as Petaling (Selangor), Seremban (Negeri Sembilan), Kuching (Sarawak), and Kota Kinabalu (Sabah).

However, rural areas have also recorded higher expenditure such as areas in Pokok Sena (Kedah); Raub (Pahang); Tanah Merah and Tumpat (Kelantan) which diminish the assumption that rising costs of living in urban centres are the main drivers for higher expenditure as these rural districts have recorded real growth of over 4.4%.

Conversely, there are only a handful of districts that recorded moderate growth between 3.5% and 4.3% in expenditure nationally and these include Alor Gajah, Melaka Tengah (Melaka); Pekan (Pahang); Selangau (Sarawak); Tambunan and Lahad Datu (Sabah). Lastly, we can examine that many districts have experienced low growth, which is apparent in East Coast states, as well as Sarawak and Negeri Sembilan, where they experienced low growth of below 2.7% in the 2019 to 2022 period.

Figure 2.3 Growth in real mean expenditure by district, 2019/2022



Source: DOS (2023) and KRI calculations.
Note:

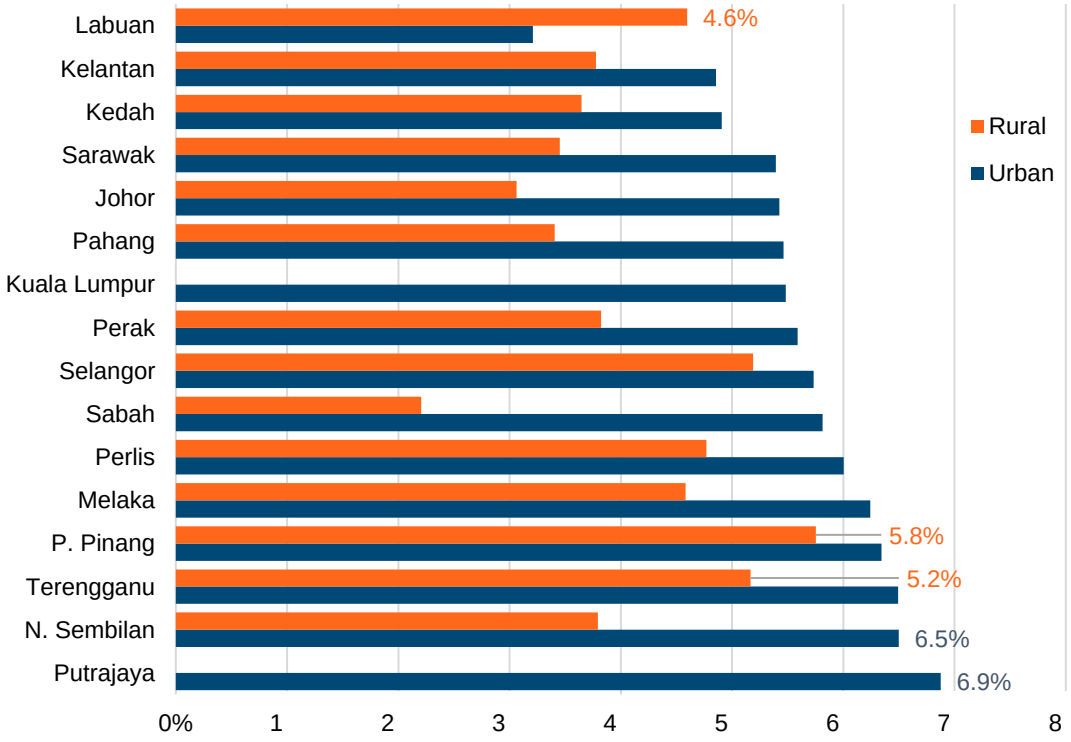
1. Growth is calculated as CAGR and presented by quintiles to generate spatial analysis at the district level. The real data used to calculate growth are expressed in 2015 prices.
2. The benchmarked CAGRs are derived using household mean expenditure at the state level from 2014 to 2019 to generate the pre-pandemic CAGR distribution. Due to data unavailability at the district level prior to 2019, we used household expenditure at the state level from 2014 to 2019 to generate the pre-pandemic CAGR distribution, as shown in the legend above.
3. The CAGRs of real mean household expenditure by district from 2019 to 2022 range from -16.7% to 28.1%.

[75] DOS (2022)
[76] BNM (2021a)

Figure 2.4 outlines the growth in real household expenditures according to state and strata. Generally, urban households have experienced higher growth rates as compared to rural households within that particular state. However, there is an outlier to this trend when examining Labuan, whereby rural household expenditure exceeded urban households within the state at 4.6%, respectively, compared to 3.2% of urban households.

However, these are not the highest growth nationally among urban households, as it can be attributed to two states, namely Negeri Sembilan and Putrajaya, as they collectively recorded 6.5% and 6.9%, respectively, for 2014 to 2022. On the other hand, two other states with the highest growth among rural households were Terengganu and Pulau Pinang, which had growth of 5.8% and 5.2%, respectively, for the same period.

Figure 2.4: Growth in real mean expenditure by state and strata, 2014 – 2022



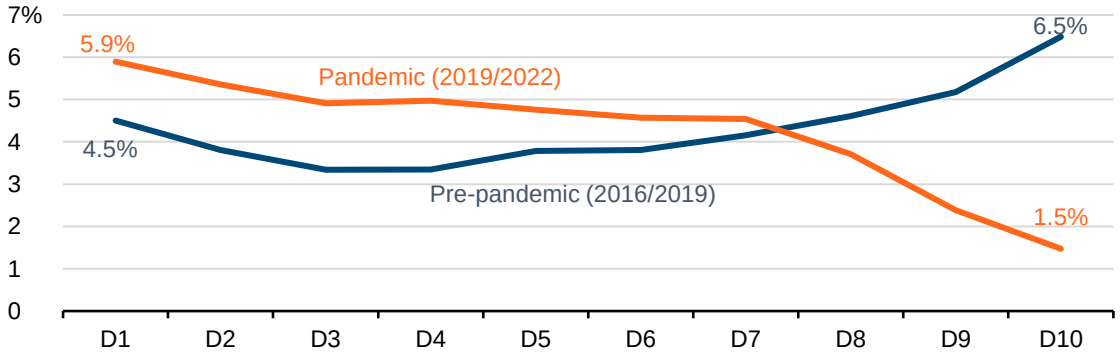
Source: DOS (2015); DOS (2017); DOS (2020); DOS (2023) and KRI calculations.
Note: Real expenditure is in 2015 prices; Kuala Lumpur and Putrajaya do not have any rural districts within the state.

2.2.2. Household consumption expenditure by income decile

Next, we dive into the household consumption expenditure recorded by income decile in order to identify which income groups were impacted during the two observed periods of 'pre-pandemic (2016 – 2019)' as well as 'pandemic (2019 – 2022)'. During the pre-pandemic period, the trend observed is that generally, household consumption expenditure increased as household income increased. However, among lower-income households (bottom 30%), the CAGR was actually higher than middle-income households, with D1 expenses growing at 4.5% from 2016 – 2019 as compared to D4 at 3.3% in the same time period. The CAGR then increases as household income rises, resulting in a CAGR of 6.5% for the top 10% of households.

On the other hand, during the pandemic period, a reversed trend can be seen whereby the lowest 10% had the highest CAGR at 5.9%, moderating gradually to D7 households at 4.5%. This could be attributed to the rise in costs of both basic necessities such as food and utilities as well as items previously categorised as non-essential such as computers, which were now increasingly used due to WFH and remote-learning policies. On the other hand, consumption among high-income households (top 20% of households) grew at the lowest rate, with D9 households recording a CAGR of 2.4% and D10 households recording a CAGR of 1.5%. This could be attributed to the curtailing of many luxury and social expenditures such as travelling or dining out, which may contribute to lower percentage growth among high-income households.

Figure 2.5: Growth of real household consumption expenditure by income decile, 2016 – 2022



Source: DOS (2017); DOS (2020); DOS (2023) and KRI calculations.
Note: Growth calculated based on real data expressed in 2015 prices.

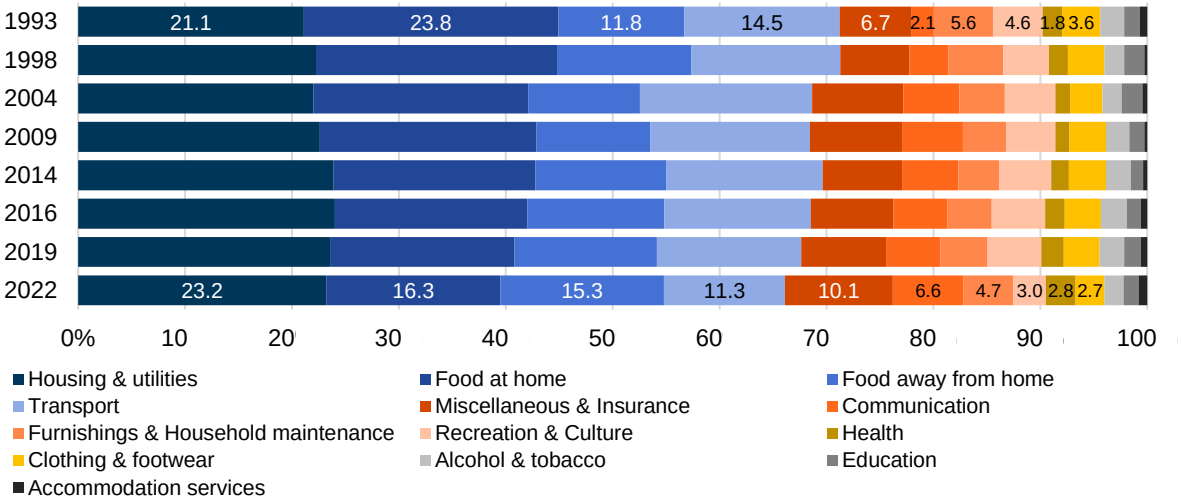
2.3 The Shifting Spending Patterns of Malaysian Households

In this subsection, we will explore how household spending patterns have evolved over time. This analysis helps us understand household spending choices, shifting preferences, and the evolving socio-economic conditions of Malaysian households.

Figure 2.6 shows the share of different expenditure categories that households have spent on since 1993. Generally, households allocate the largest share of their monthly expenditures to three fundamental necessities: housing and utilities, transportation, and food, including both at home and dining out. The findings also reveal that, over the decades, Malaysian households have experienced some changes in their spending patterns with certain categories growing or shrinking in their share of overall household expenditures.

Prior to 2004, food consumed at home constituted the largest share of household expenditures, making up about 22% – 24% of monthly expenses. However, since 2004, spending on housing and utilities has surpassed food expenses and has remained the largest category, recently accounting for 23% of monthly household expenditures.

Figure 2.6: Share of mean household consumption expenditure by category, 1993 – 2022



Source: DOS (2011); DOS (2015); DOS (2017); DOS (2020); DOS (2023) and KRI calculations.
Note: The expenditure data from HES 2016 – 2022 were adjusted to the latest revision made in the Malaysia Classification of Individual Consumption According to Purpose (MCOICOP) 2021, as compared to earlier years which used MCOICOP versions of UN COICOP 1999. Hence, data comparison should be interpreted with caution. In HES 2022, Insurance and Financial Services were introduced as an additional expenditure category compared to being included under Miscellaneous in the previous years. For this analysis, miscellaneous and insurance are grouped together to enable time series comparison.

Meanwhile, the share of food consumed at home declined by 7.5 percentage points, reaching 16.3% in 2022. At the same time, the reduction in food at home expenses has coincided with a gradual increase in the share of food consumed away from home, which rose by 3.5 percentage points to 15.3% in 2022. This shift reflects changing food consumption patterns, with food away from home now accounting for almost as much as food consumed at home.

Although transportation was one of the largest shares of consumption expenditures in the early 1990s, its share has declined over the years, decreasing by 3.2 percentage points to 11.3% in 2022. Additionally, the share of communication expenses exhibited the most significant growth, increasing by 4.5 percentage points to 6.6% in 2022. These trends, including the shrinking share of essential expenditure categories like food at home and transportation, along with a growing share of eating out and communication, suggest that households are diversifying their expenditures across various categories as incomes have risen over the years. Moreover, certain expenses like communication have gradually become necessities due to factors such as online learning and remote work, which will be further discussed in the next section.

2.3.1. Trends in household consumption expenditures: From basic needs to lifestyle choices

In the latest Household Expenditure Survey (HES) report, DOS classified consumption expenditures into three categories: basic needs, other basic needs, and choices[77]. We have adopted this classification to analyse trends in households' real expenditures by category, as shown in Figure 2.7.

[77] Refer to page 42 and 43 of HES Report Malaysia 2022. Source: DOS (2023)

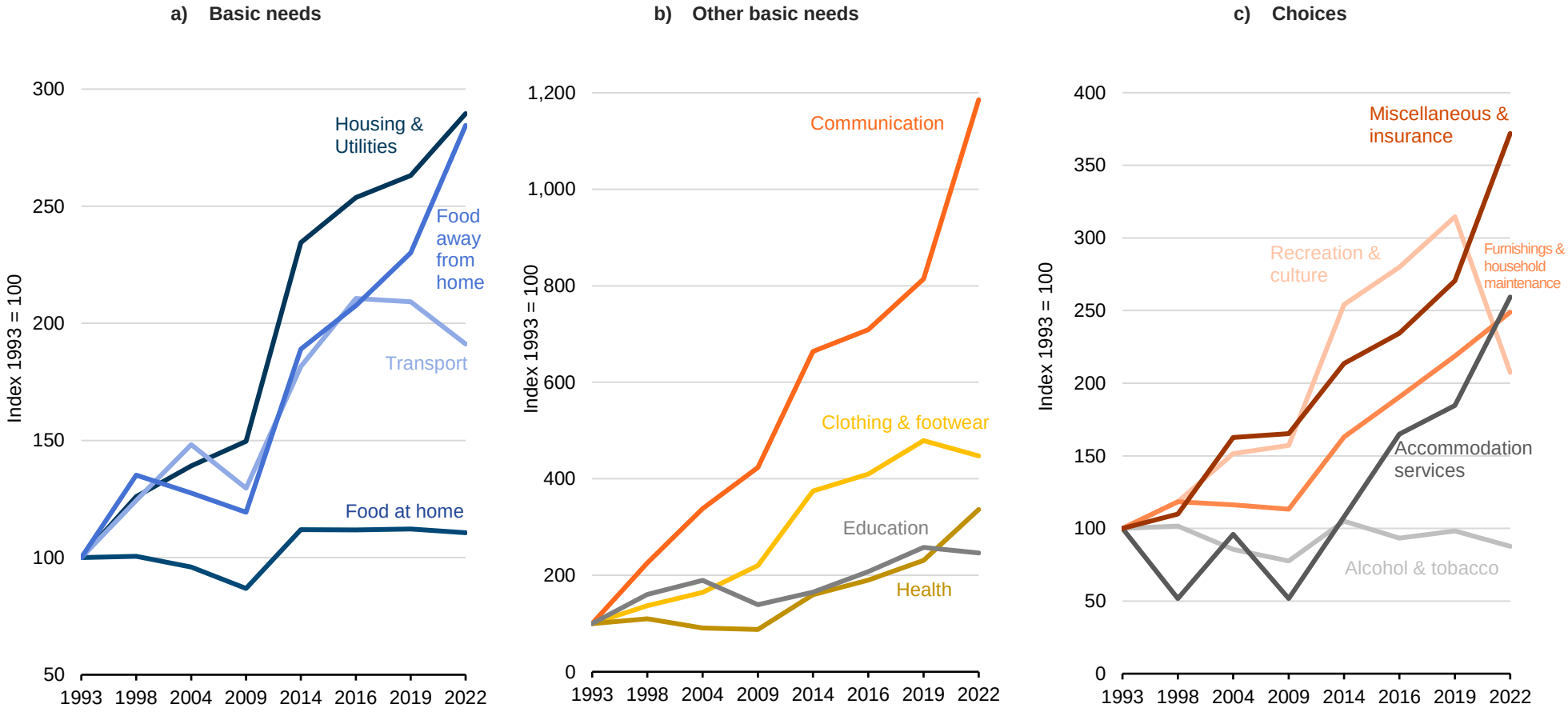
Figure 2.7a shows the real expenditures for categories classified as 'basic needs': housing and utilities, food and transport. There is an increasing trend in real expenses of food away from home and housing and utilities, with sharp increases of 22% and 10%, respectively between 2019 and 2022. This change reflects the impact of the Covid-19 pandemic, during which households have increased spending on takeout and delivery options following restaurant closures. Along with rising house prices, the shift to remote work also likely contributed to higher housing and utility expenses. Meanwhile, real spending on transport began to plateau in 2019, with a dip of approximately 9% observed in 2022. This is possibly due to travel restrictions during the MCO period, which limited household travel spending.

DOS classifies communication, clothing and footwear, health, and education categories as 'other basic needs,' as shown in Figure 2.7b. A significant rise (about 12 times) in real spending on communication expenses even before the pandemic underscores its growing importance in modern lifestyles. This trend accelerated during lockdowns as households relied heavily on digital communication platforms for work and entertainment. Education spending saw a slight dip of approximately 5%, likely due to the shift towards remote learning and the impact of changes in the school teaching system, such as the abolishment of major public exams like UPSR and PMR, which may have reduced tuition fees for some students. Real health-related consumption also saw significant growth with households increasing their real health expenses by 46% or 1.5 times more post-pandemic, possibly driven by increased healthcare needs during the pandemic, for example, the purchase of medications and medical products like facemasks.

Figure 2.7c illustrates the real expenditures in categories classified as 'choices' for households, which are less essential and subject to household preferences. Among these 'choices' categories, miscellaneous and insurance[78] expenses have shown the highest real growth, increasing nearly fourfold since the early 1990s. While spending on recreation and culture generally increased over time, households spent 1.5 times less (a dip of 34%) in this category post-pandemic, potentially due to lockdown measures, the reduction of cultural and celebration events and public adherence to social distancing guidelines.

[78] In HES 2022, Insurance and Financial Services were introduced as G12, an additional expenditure category following MCOIC0P 2021 revisions whereas Personal Care, Social Protection and Miscellaneous Goods and Services were renamed as G13. To enable data comparison from 1993 – 2022, G12 has been grouped together with G13 and labelled as Miscellaneous and Insurance to follow the expenditure groupings in HES prior to 2022. Source: DOS (2023)

Figure 2.7: Indices of the real expenditures by category, 1993 – 2022



Source: DOS (2011); DOS (2015); DOS (2017); DOS (2020); DOS (2023) and KRI calculations.
Note: The index is calculated based on real expenditure expressed in 2015 prices. To enable a time series comparison from 1993 to 2022, G13 Insurances and Financial services, introduced as an additional expenditure category in HES 2022, have been grouped together with G12 Personal, care, social protections, & miscellaneous goods and services and labelled as Miscellaneous and Insurance to follow the expenditure groupings in HES prior to 2022. Source: DOS (2023)

2.3.2. Urban-rural gap in selected expenditure categories

To understand the differences in consumption patterns between urban and rural households, we analysed their spending with an added income dimension. Figure 2.8 compares the urban-rural gap in real expenditures across different income deciles for selected categories from 2014 – 2022[79].

Housing and utilities expenses are higher among urban households compared to rural households across all income deciles. On average, urban households spend twice as much on housing-related expenses as rural households. There is a significant gap in real housing expenditure between urban and rural households, particularly in the higher income deciles. For instance, urban households in D10 spent RM847 more on housing-related expenses in 2014 compared to their rural counterparts. This gap widened to nearly RM1,250 by 2022. The growing disparity in housing expenses, especially in the highest income deciles, suggests that urban households are spending substantially more than rural households, possibly due to higher housing prices and rents in urban areas.

An interesting trend is observed in food expenditures among urban and rural households, which includes both at-home consumption and dining out. In 2014, lower and middle-income deciles in rural areas spent only marginally more on food than their urban counterparts, except households in the top-income deciles. However, the expenditure gap was not as pronounced as the one observed in 2022. In 2022, only D10 households in urban areas spent a greater amount on food, about RM155, compared to their rural counterparts. For the rest of the deciles, rural households spent slightly more on food, with differences ranging from RM14 to RM98.

When observing higher food expenditures in rural households, one might assume that food prices are higher in rural areas. However, this assumption was not supported when we further analyzed the CPI data for food-at-home expenses. Food prices in urban areas have consistently recorded higher CPIs than rural areas over the years. For example, the CPI for food at home in urban areas was 147.9 compared to 135.2 in rural areas[80]. Moreover, a similar trend was observed for food away from home, as proxied by restaurant and accommodation inflation data. Hence, higher food expenditures among rural households may be attributed to larger household sizes. Rural areas have a higher average household size of 4.0 compared to 3.8 in urban areas[81]. With more household members, rural households naturally incur larger food expenses. A more detailed analysis of food and housing expenditures will be discussed in the next section.

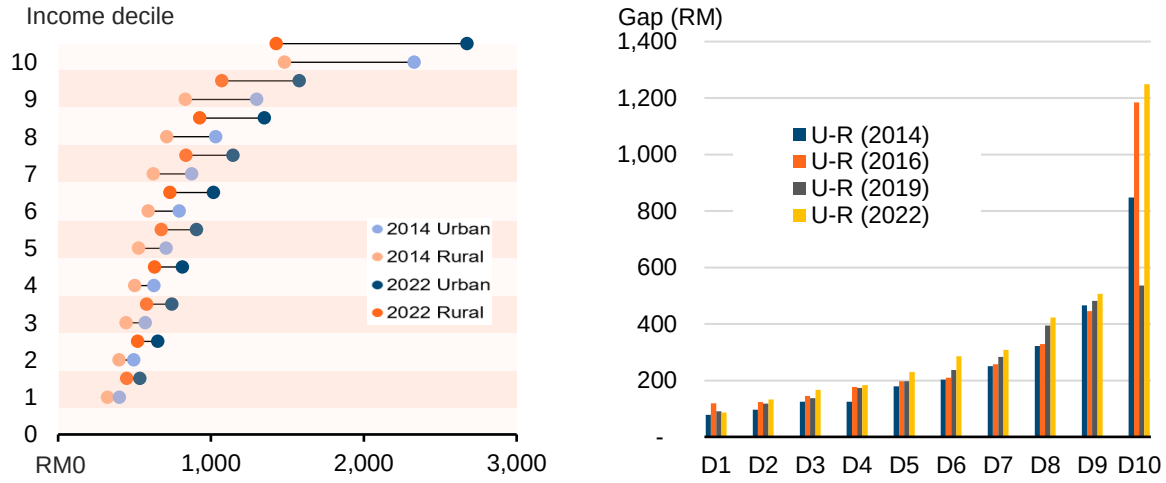
Transport expenditures have been decreasing as a share of households' expenditures over the years. However, a deeper analysis by income decile and strata reveals that rural households tend to spend marginally more on transportation compared to urban households. In 2014, the gap was almost negligible; but it grew over time, with rural households in the middle and higher-income deciles reporting slightly higher spending than their urban counterparts. For example, in 2022, rural households in D9 spent RM154 more on transportation than urban households in the same decile. Only in the D10 did urban households spend slightly more on transport, with a difference of RM168 compared to rural households in the same cohort.

[79] Data from 2014 – 2022 have been adjusted for the recent revisions in MCOICOP 2021. Source: DOS (n.d.a)
[80] Refer to CPI by State & Division (2-digit) data by DOS. Source: DOS (n.d.b)
[81] DOS (2023)

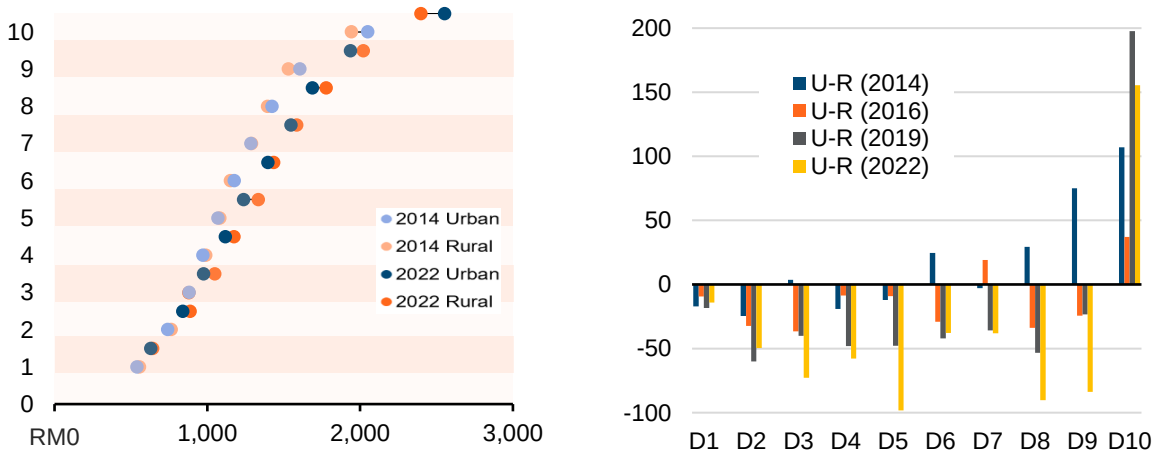
Looking at the recreation, sport and cultural expenses, urban households continue to spend more on these activities, averaging twice as much as rural households. However, a narrowing gap is seen in 2022, particularly in the higher deciles. In 2014, urban households in the D9 spent RM50 more on recreation, but this trend reversed in 2022, with rural households of the same cohort spending RM21 more than their urban counterparts in this category. The analysis of the urban-rural gap in recreation spending suggests a general increase in spending on leisure activities over the years, although recreational expenses growth slowed down during the pandemic period. The narrowing gap indicates an increased preference for leisure, potentially implying an improved quality of life, especially for rural households. This shift might be attributed to increased affordability and access to such services in rural areas as well as the tax exemption on domestic tourism expenses of up to RM1,000 announced by the government to stimulate local travel and tourism industry during the pandemic[82].

Figure 2.8: Urban-rural gap in real expenditures of selected categories and income deciles, 2014 – 2022

a) Urban-rural gap (RM) in Housing & Utilities

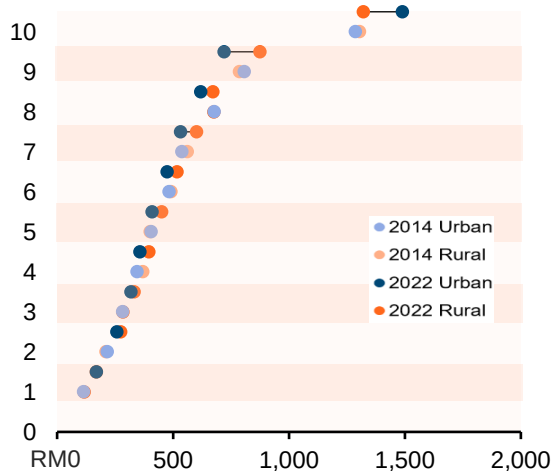


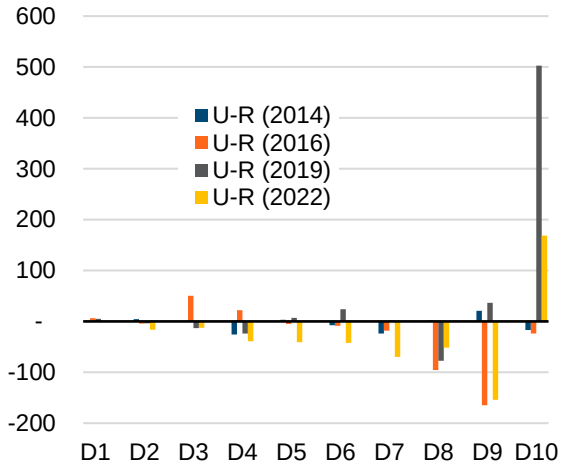
b) Urban-rural gap (RM) in Food



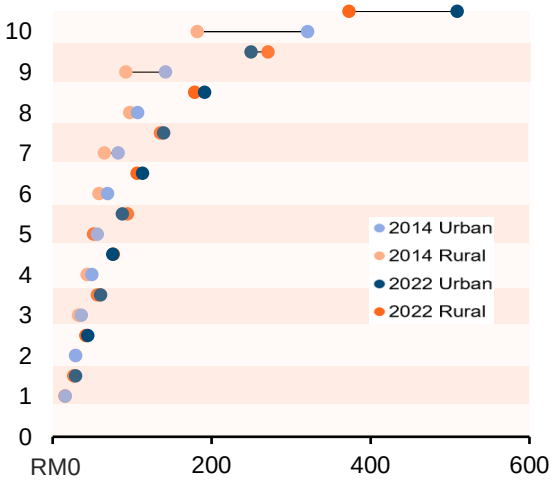
[82] Strategic Programme to Empower the People and the Economy (PEMERKASA) stimulus package. Source: Crowe (2021)

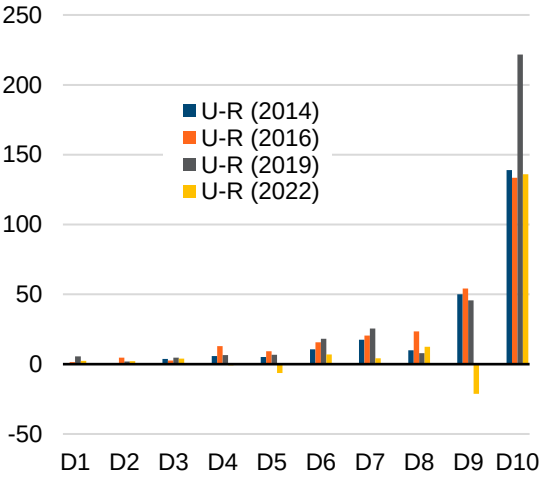
c) Urban-rural gap (RM) in Transport



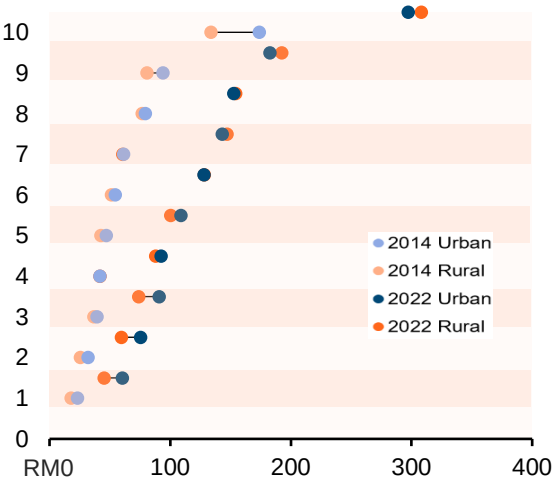


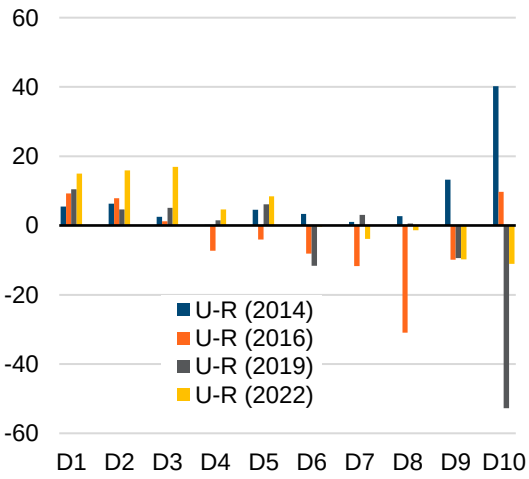
d) Urban-rural gap (RM) in Recreation & Culture



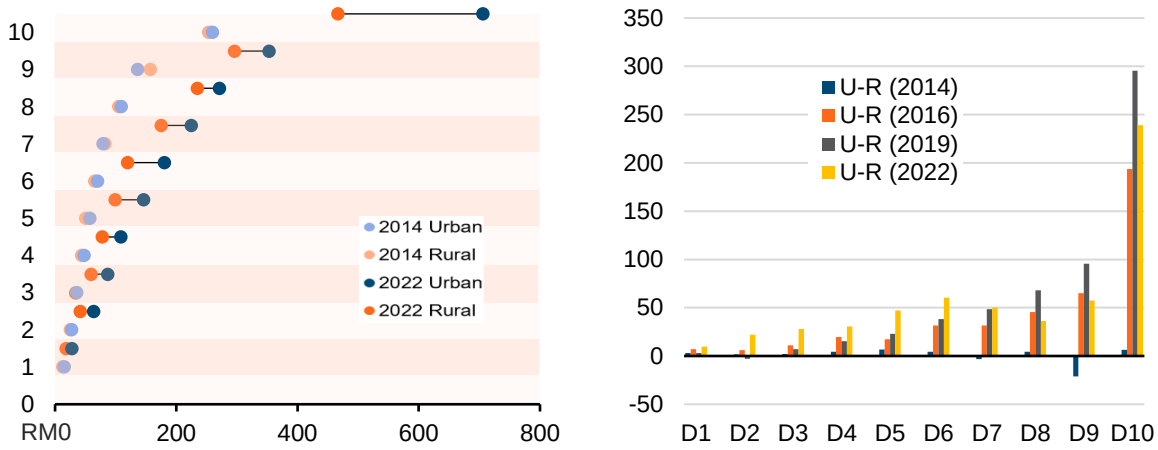


e) Urban-rural gap (RM) in Health





f) Urban-rural gap (RM) in Insurance



Source: DOS (2015); DOS (2017); DOS (2020); DOS (2023) and KRI calculations.

Additionally, the consumption trends of urban and rural households for health and insurance over the years revealed an important finding: a growing awareness of healthcare among households, especially in the middle and top-income deciles, regardless of where they are living. There is a marginal increase in absolute consumption for both urban and rural households from 2014 to 2022.

However, the gap between urban and rural households has been narrowing across the income deciles, particularly for middle and higher-income deciles. On average, urban households in 2014 spent 1.7 times more on health-related expenses than their rural counterparts, but this gap decreased to 1.5 in 2022. Despite the urban-rural convergence, this trend informs us that health-related expenses have become a higher priority for households, particularly among middle and top-income households in rural areas. For these rural households, their additional income compared to lower income groups provides financial flexibility, allowing them to prioritize healthcare spending. This shift in spending priorities, especially in the aftermath of the pandemic, reflects healthcare's growing importance across all income levels and strata.

However, beyond income, household dynamics—such as household size and the age group of household members—are also important factors in understanding this trend. These dynamics can influence healthcare needs, making it essential to consider these aspects alongside income when analysing household health expenditures. A more detailed analysis of health expenditures will be discussed in the next section.

Meanwhile, expenses on insurance and financial products are more prevalent among higher-income deciles, especially those in urban areas compared to rural areas. The gap has been widening over the years, with the top decile spending RM239 more than rural households in 2022, compared to just a difference of RM6 in 2014. This trend highlights two key aspects: 1) an increasing reliance on private hospital care, driven by long waiting lists in public hospitals, making insurance a crucial avenue for accessing private healthcare services; and 2) the growing popularity of insurance and financial products as an alternative long-term savings or investment tools among the top income deciles.

2.4 Unravelling Covid-19's Impact on Household Spending

The Covid-19 pandemic severely disrupted daily lives and induced significant shifts in the way consumers shop and spend. The introduction of lockdowns and other public health measures that saw the closure of non-essential sectors such as retail, hospitality, recreational and schools significantly affected social spending and restricted household activities. Cooking at home replaced dining out, working from home substituted workplace visits, and remote learning took over in-person schooling. Households also adjusted their health spending behaviours during this period of public health crisis.

After two years of uncertainties and disruptions due to the pandemic, Malaysia began the transition into endemic in April 2022[83], marking the start of economic recovery and return to the 'new normal.' Although fiscal and monetary policies helped in facilitating the recovery of household spending levels as restrictions eased, the extent to which the changes in consumer behaviours that were experienced during the pandemic may have affected spending patterns is uncertain.

In this section, we focus on three key expenditure groups that have seen significant changes in consumer behaviour during the pandemic: food, WFH-related and health expenditures. This section first investigates the overall impact of pandemic-induced changes on household spending on these key expenditure items, before delving further into district, strata and income-level differences.

2.4.1. The shift in food expenditure patterns

During the pandemic and lockdown, food and beverage establishments were ordered to close, and travel for groceries and necessities was limited[84]. As a result, dining on-premises was temporarily restricted, and people prepared their own meals at home more frequently. During this period, off-premises dining through options such as takeout, delivery and "drive-thru" also gained popularity, offering people the alternatives to order food from the comfort of their own homes. Online food delivery services, in particular, saw a significant rise in usage and became a primary means to acquire food from restaurants during the pandemic[85].

Although food spending has largely returned to pre-pandemic patterns, some of the pandemic-driven shifts in the way Malaysian households obtain food seem to remain. Specifically, technology adoption that was accelerated during the pandemic presented new ways for Malaysian households to obtain groceries and food. Online food delivery services have now become an established means to purchase food[86], making food away from home (FAFH) easier to access without the need to travel any distance.

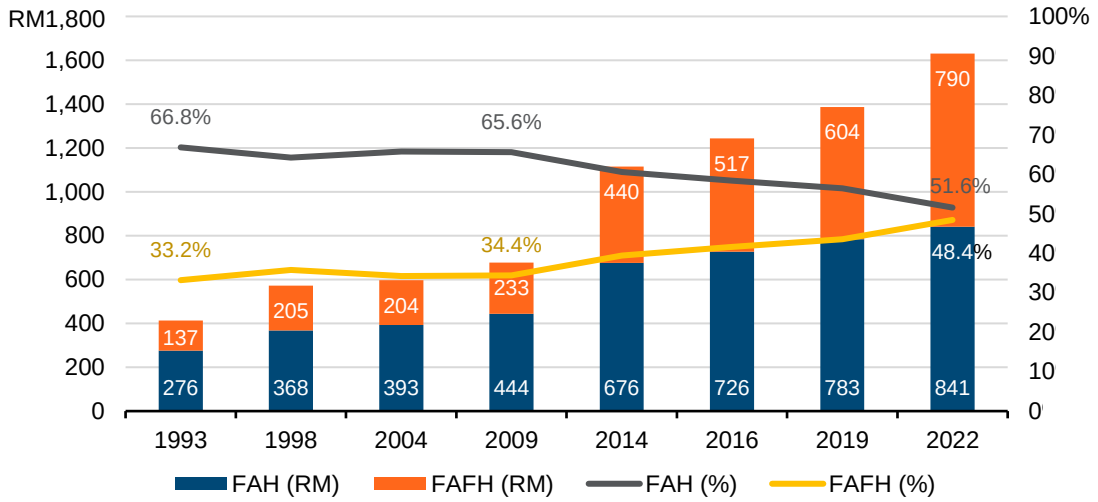
In the early 1990s, Malaysian households spent an average of RM413 on food—over two-thirds, or 66.8%, of it were spent on purchasing food from grocery stores and supermarkets for home preparation and consumption, otherwise known as food at home (FAH). FAFH, which consists of food items obtained from commercial formal (e.g. restaurants and cafés) and informal food service establishments (e.g. street vendors) and from noncommercial institutions (e.g. canteens and schools) made up the remaining one-third of the total food spending. Although FAFH has gained popularity

[83] MOH (2022)
[84] MOH (2021)
[85] Grab (2021)
[86] Grab (2022); Grab (2023)

over the decades, FAH remained the primary source of food for Malaysian households during the period of 1993 to 2019.

However, such a trend may soon be reversed. In 2022, Malaysian households spent an average of RM1,631 on food; FAH and FAFH constituted nearly equal parts of it (Figure 2.9). Out of the total food expenditure, 48% was spent on FAFH—the highest share in comparison to previous years. This indicates that the significant shift from FAH spending to increased FAFH expenditure is likely to develop into a long-term trend among Malaysian households, making FAFH an essential part of Malaysian diet.

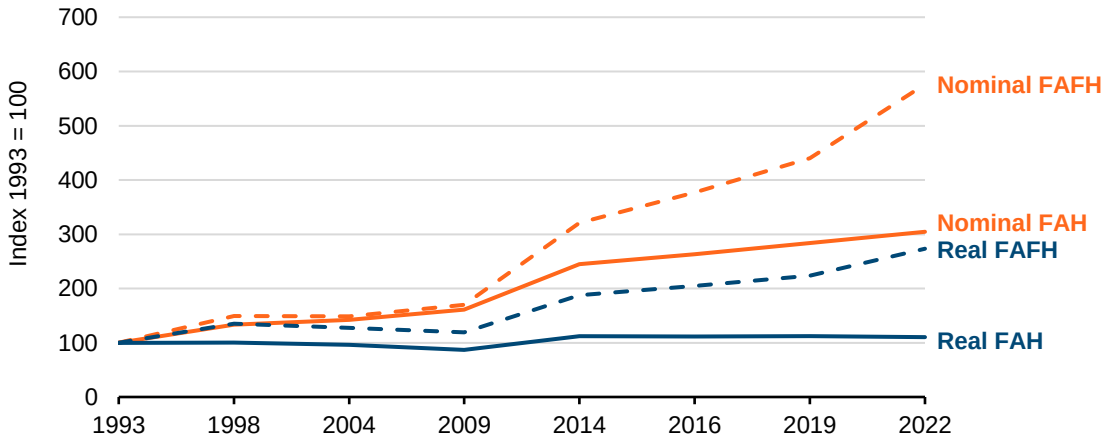
Figure 2.9: Nominal and percent FAH and FAFH expenditures of Malaysian households, 1993 – 2022



Source: DOS (2011); DOS (2015); DOS (2017); DOS (2020); DOS (2023) and KRI calculations.

In both nominal and real terms, household consumption expenditure and quantity of FAFH have been growing faster than that of FAH, as illustrated in Figure 2.10. Between 2019 to 2022, this growth was notably higher, likely driven by the post-pandemic domination of online food deliveries. While the money spent on FAH continued to increase, the actual consumption quantity (real expenditure) remained relatively constant over the past decade.

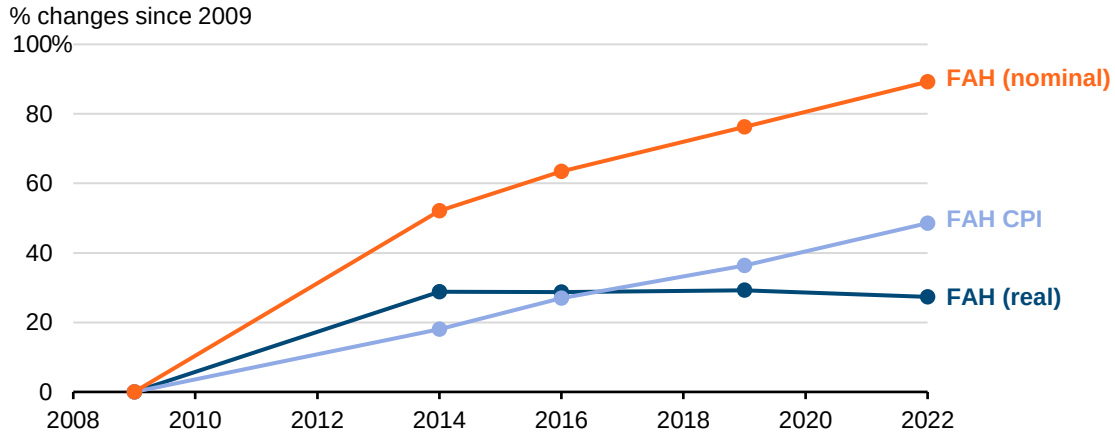
Figure 2.10: Index of nominal and real FAH and FAFH expenditures, 1993 – 2022



Source: DOS (2011); DOS (2015); DOS (2017); DOS (2020); DOS (2023) and KRI calculations.
Note: Real expenditure is in 2015 prices.

As food prices increased, FAH spending rose as well. Since 2009, FAH prices have increased considerably by 48.6%, while nominal FAH spending increased more significantly by 89.3% (Figure 2.11). However, inflation-adjusted or real FAH spending started to stagnate in 2016 and then trended downward by a meagre 1.8% post-pandemic in 2022. The widening gap between nominal and real FAH expenditure suggests that Malaysian households have been spending more money on FAH than previous years but for similar quantities in return.

Figure 2.11: Change in real FAH expenditure and prices since 2009, 2009 – 2022



Source: DOS (2011); DOS (2015); DOS (2017); DOS (2020); DOS (2023); DOS (n.d.b) and KRI calculations.
Note: Real expenditure is in 2015 prices.

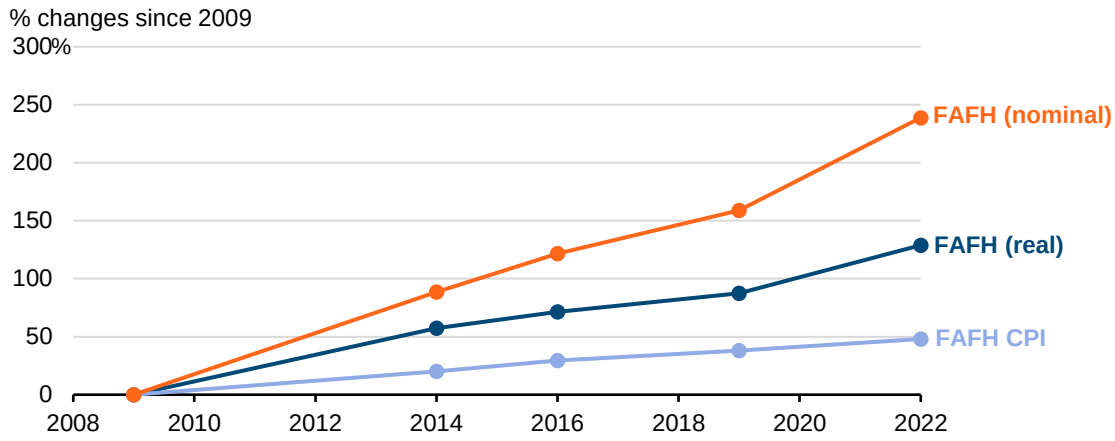
On the contrary, Malaysian households' spending on FAFH remained strong. In fact, FAFH spending, in both nominal and real terms, has been growing at a higher rate than its inflation, with a sharp rise post-pandemic. This implies that Malaysian households are spending more on FAFH in monetary value and quantity. The distinctive rise in FAFH expenditure from 2019 to 2022 is largely driven by the increased access to food via online deliveries post-pandemic, alongside rapid urbanization that promotes the expansion of food retail sector.

The diverging trends in FAH and FAFH expenditure, despite similar inflation rates, suggest that the shift in food spending patterns among Malaysian households is not simply driven by food prices but by a combination of other factors. With urbanisation and shifts in the food environment, food service establishments including full- and limited-service restaurants are becoming more available and accessible[87], making FAFH options wider and easier to acquire.

Meanwhile, the demand for FAFH, once viewed as a discretionary or luxury expense, continues to grow. The rise in household purchasing power allows higher-income consumers to afford eating out more often. As labor force participation, particularly among women, and the share of dual-earner households increase, the opportunity cost of time also rises[88], making time-intensive meal preparation at home less desirable but FAFH a more convenient alternative.

[87] Teoh (2024)
[88] Goh and Choong (2020)

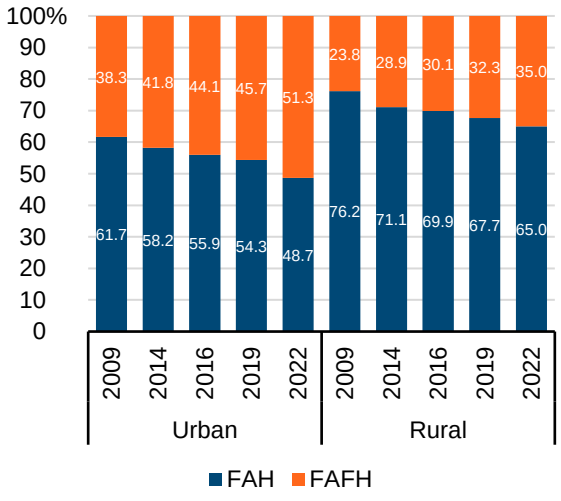
Figure 2.12: Change in real FAFH expenditure and prices since 2009, 2009 – 2022



Source: DOS (2011); DOS (2015); DOS (2017); DOS (2020); DOS (2023); DOS (n.d.b) and KRI calculations.
Note: Real expenditure is in 2015 prices.

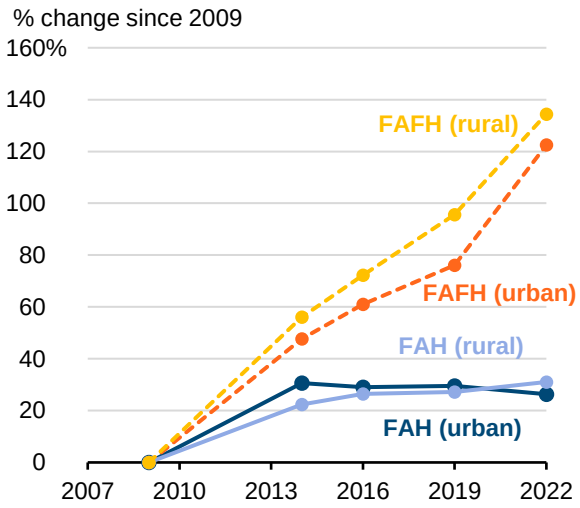
Urbanisation is a key contributing factor to the increased significance of FAFH in Malaysian diet. In 2022, urban households spent more than half (51.3%) of their total food spending (nominal) on FAFH. The figure for rural households was smaller, at 35%. Although urban households consumed greater quantities of FAFH than rural households, it is noteworthy that both have been experiencing similar momentum in their shift from FAH to FAFH. Their spending on FAH, however, varied. In 2022, rural households continued to spend more on FAH, both in nominal and real terms. For urban households, their real FAH expenditure declined by 3.2% even though they continued to spend more nominally compared to 2019, reflecting the greater impact of food inflation in urban areas.

Figure 2.13: Share of nominal food expenditure by strata, 2009 – 2022



Source: DOS (2011); DOS (2015); DOS (2017); DOS (2020); DOS (2023) and KRI calculations.

Figure 2.14: Change in real food expenditure since 2009, by strata, 2009 – 2022



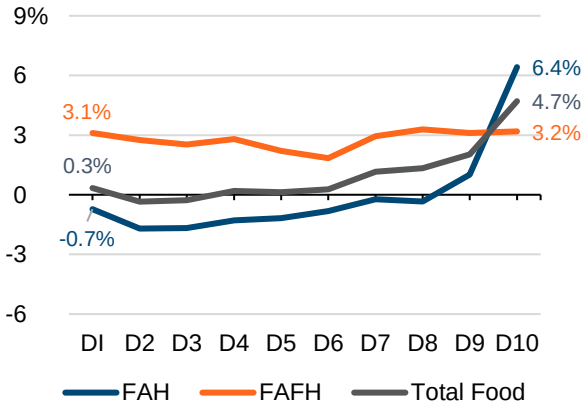
Source: DOS (2011); DOS (2015); DOS (2017); DOS (2020); DOS (2023) and KRI calculations.
Note: Percentage change calculated based on real expenditure expressed in 2015 prices.

Post-pandemic, Malaysian households of different income levels exhibited varying degrees of change in food expenditure patterns. During the pre-pandemic period (2016 – 2019), FAFH expenditure growth patterns were largely similar across all income deciles (see Figure 2.15). Regardless of income levels, Malaysian households generally experienced growth rates ranging from 2 to 3% in FAFH expenditure. Concomitantly, most households, except for those from the two top income deciles, generally cut down on their FAH consumption quantity.

In 2022, a distinct income gradient in food expenditure patterns emerged. As household incomes increased, the CAGRs of FAH and FAFH spending also decoupled (Figure 2.16). Higher-income households were more likely to spend more on FAFH and less on FAH. This marked change in food spending priority was particularly evident among households from the top three income deciles; these households displayed not just slower but negative growth in FAH spending, while showing higher growth in FAFH expenditure than the lower income deciles. Notably, households from the middle-income deciles (D5 and D6) also demonstrated high growth in real FAFH spending.

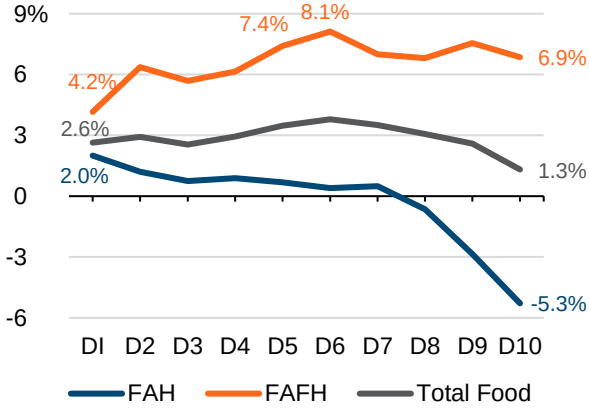
By contrast, lower-income households continued to spend more on both FAH and FAFH, albeit at a higher rate for the latter. The widening gap between these two types of food spending as household income rises implies that higher-income households are more likely to afford eating out more frequently to substitute home-cooked meals. Unlike higher-income households, those with lower income may still prioritise home-cooked meals while also expanding their budget for dining out and other forms of FAFH.

Figure 2.15: Growth in real food expenditure by income decile, 2016/2019



Source: DOS (2017); DOS (2020), KRI calculations.
Note: Growth calculated based on real expenditure expressed in 2015 prices.

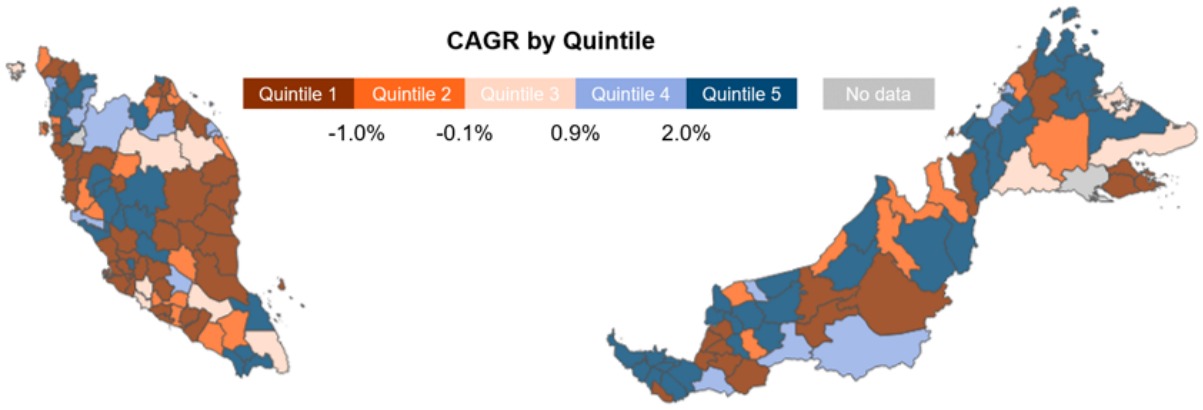
Figure 2.16: Growth in real food expenditure by income decile, 2019/2022



Source: DOS (2020); DOS (2023), KRI calculations.
Note: Growth calculated based on real expenditure expressed in 2015 prices.

The shift from FAH to greater FAFH spending was observed in most, but not all, districts in Malaysia. Figure 2.17 shows that the declining trend of FAH spending was more consistently observed across districts in Peninsular Malaysia than in Sabah and Sarawak. As compared to the pre-pandemic rates, majority of the districts in Central region, Southern region and East Coast of the Peninsula saw a decline in the growth of real FAH spending in 2022. Most, if not all, of the districts in Selangor, Pulau Pinang and Melaka demonstrated a decline. In contrast, Kedah stood out, with most of its districts recording high growth in FAH spending. In Sabah and Sarawak, growth rates varied more significantly across districts. Nevertheless, slightly over half of the districts, including major cities (Miri, Sibu, Kuching and Kota Kinabalu), demonstrated growth in FAH spending.

Figure 2.17: Growth in real food at home expenditure by district, 2019/2022

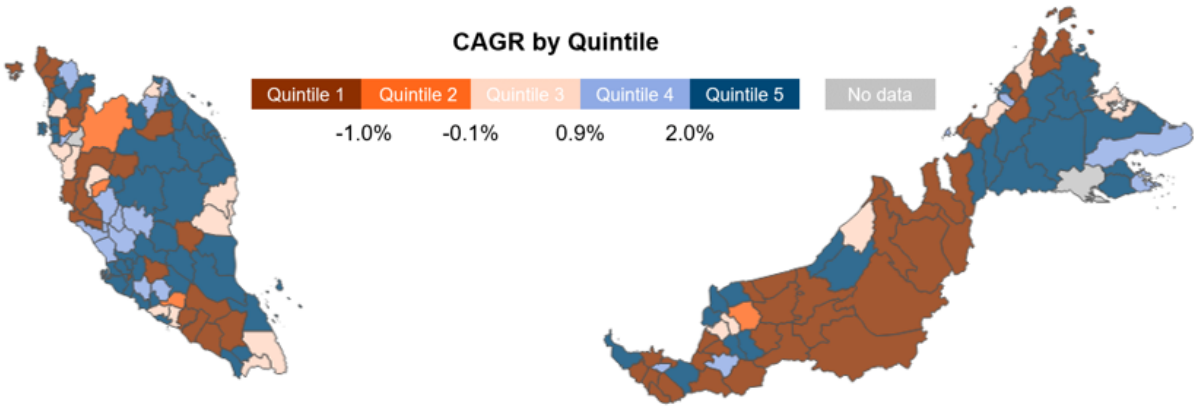


Source: DOS (2023) and KRI calculations.
Note:

1. Growth is calculated as CAGR and presented by quintiles to generate spatial analysis at the district level. Real data used to calculate growth is expressed in 2015 prices.
2. The benchmarked CAGRs are derived using state expenditure growth from 2014 – 2019 to generate the pre-pandemic distribution. Due to data unavailability at the district level prior to 2019, household expenditure at the state level from 2014 – 2019 used to have sufficient data points to generate the pre-pandemic distribution.
3. The CAGRs of FAH by district from 2019 to 2022 range from -9.4% to 13.7%.

Districts that experienced a decline in FAH spending generally had moderate to strong growth in FAFH spending. Most of the districts in the Peninsular, specifically the East Coast and Central region, and Sabah showed a significant growth in FAFH expenditure from 2019 to 2022, as illustrated in Figure 2.18. Remarkably, all districts in Selangor and Pulau Pinang showed strong FAFH growth. The divergence between FAH and FAFH spending was also commonly observed in most cities, including Kota Bharu (Kelantan), Seremban (Negeri Sembilan), Timur Laut and Barat Daya (Penang, where Georgetown, Balik Pulau and Bayan Lepas are located), Petaling, Klang and Gombak (Selangor), Melaka Tengah (Melaka) and Tawau (Sabah). Perak and Sarawak, however, showed the opposite trend, whereby most of the districts were characterized by declining FAFH spending.

Figure 2.18: Growth in real food away from home expenditure by district, 2019/2022



Source: DOS (2023) and KRI calculations.
Note:

1. Growth is calculated as CAGR and presented by quintiles to generate spatial analysis at the district level. Real data used to calculate growth is expressed in 2015 prices.
2. The benchmarked CAGRs are derived using state expenditure growth from 2014 – 2019 to generate the pre-pandemic distribution. Due to data unavailability at the district level prior to 2019, household expenditure at the state level from 2014 – 2019 used to have sufficient data points to generate the pre-pandemic distribution.
3. The CAGRs of FAFH by district from 2019 to 2022 range from -20.9% to 24.5%.

2.4.2. The work from home (WFH) influence on household expenditure

The Covid-19 pandemic has accentuated the remote working arrangement, commonly known as work from home, which permits employees to work outside their usual office premises; this could be from their residences, cafes or places alike. During the pandemic, only workers in the designated "essential" sectors were allowed to work physically due to movement restrictions to control the virus outbreak. The rest of the workforce had to operate from home to ensure businesses were still operating as usual, albeit some employers faced significant challenges in providing the necessary tools and materials to enable their employees to work from home. Businesses that had already advanced in technological adoption managed to survive during this crisis by facilitating work from home arrangements and transitioning to online platforms, while some had to close down.

A survey by DOS in 2020 showed that only 44% of workers were able to work from home during the crisis while 16% had to reduce their working hours[89]. To enable work from home, employees needed to arrange several requirements, including a suitable home workspace, which meant investing in desks and chairs, stable internet connections, and communication devices such as computers, laptops, mobile phones, etc. Not only was the workforce affected, but the education system was also disrupted, requiring students to have similar devices to enable learning from home.

Given the prevalence of working from home during and post-pandemic, this subsection will explore the effects of the new working norm on household expenses. Three expenditure categories perceived to be relevant to working from home were selected for this analysis: housing and utilities, furnishings and household maintenance, and information and communication. As most households spent more time at home during the pandemic, this could potentially increase the utility bills and the need for more household appliances and devices to enable work from home, justifying the selection of these categories.

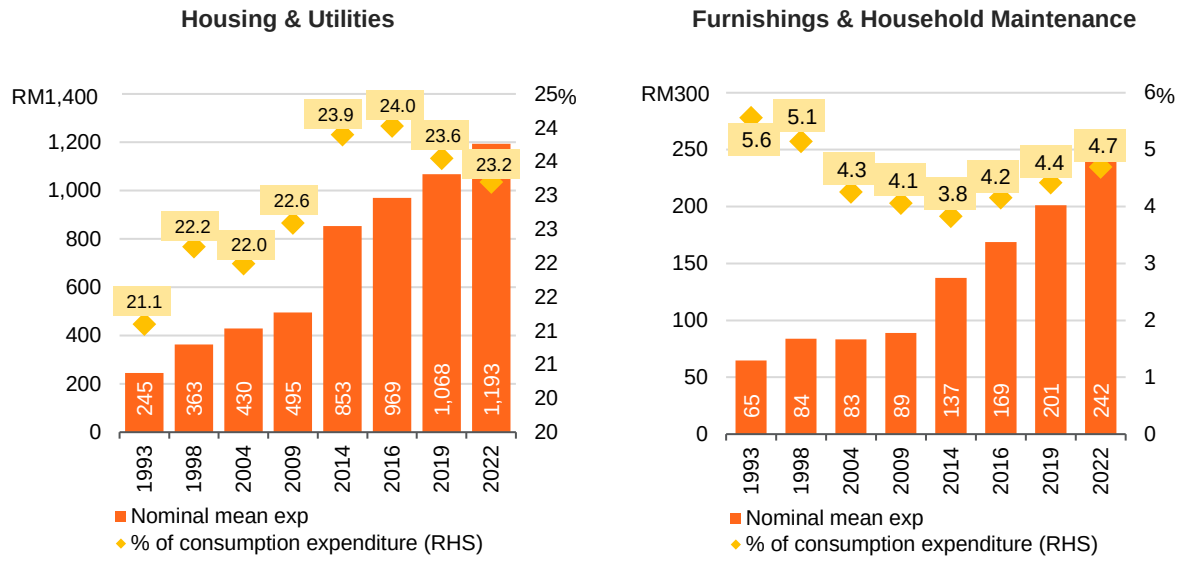
Expenditure on housing and utilities and furnishings and maintenance

Figure 2.19 demonstrates the time series of nominal expenditures for housing and utilities, and furnishings and household maintenance from 1993 to 2022. In the early 1990s, households spent only RM245 on nominal housing and utilities expenses. By 2022, this expense had increased nearly fivefold to RM1,193.20. The share of housing and utilities expenses in overall household expenditure has remained relatively stable throughout the period, peaking at 24% in 2016 before a marginal decrease to 23.2% in 2022.

Similarly, households have also increased their consumption of furnishings and household maintenance, from RM64.6 in 1993 to RM241.7 in 2022, representing an increase of about 3.7 times. While the share of this expense has decreased over the years, there has been a gradual improvement since 2016, reaching 4.7% of total household expenses in 2022.

[89] DOS as cited in Siti Aiysyah Tumin (2020). In 2020, DOS published findings from a survey analysing the effects of Covid-19 on the economy and individuals. As the survey results was based on convenient sampling, the results are non-representative and should be interpreted with caution to assess the impact of Covid-19 in Malaysia and not as official statistics.

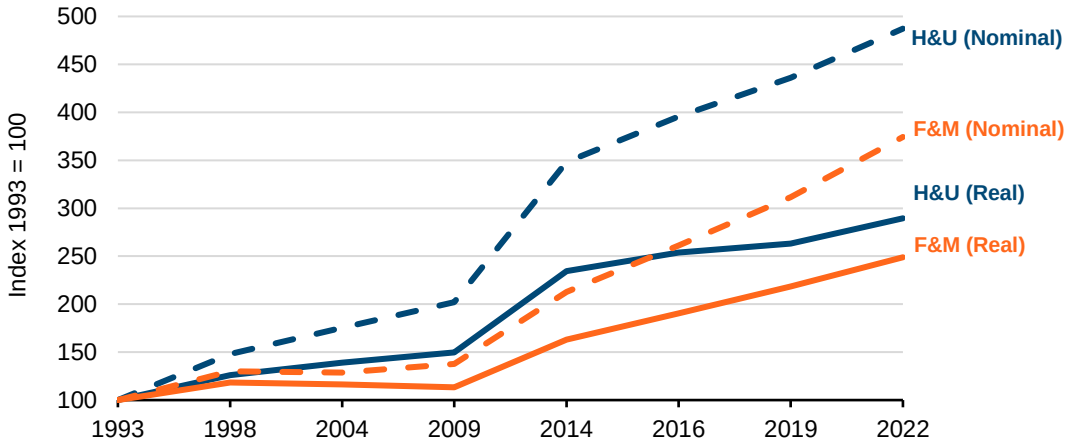
Figure 2.19: Time series of nominal expenditure and share of housing and utilities and furnishings and household maintenance expenditure, 1993 – 2022



Source: DOS (2011); DOS (2015); DOS (2017); DOS (2020); DOS (2023) and KRI calculations.

The real expenditures for both categories also show a clear upward trend over the years, as illustrated in Figure 2.20. While nominal expenditure for housing and utilities quintupled, real expenditure increased nearly threefold. Households experienced a steep rise in housing and utilities expenditures between 2009 and 2014 in both nominal and real terms. A possible contributing factor is the rapid house price escalations starting in 2010. A recent report by KRI, "The Financialization of our Lives: Values and Trade-offs" highlights that rapid price escalations during this period were driven by various innovative financing schemes, introduced to facilitate home purchasing[90]. This eventually accelerated the growth in house prices thus increasing the monthly mortgage expenses for households.

Figure 2.20: Changes in nominal and real housing and utilities (H&U) and furnishings and household maintenance (F&M) expenditures, 1993 – 2022



Source: DOS (2011); DOS (2015); DOS (2017); DOS (2020); DOS (2023) and KRI calculations.
Note: Real expenditure is in 2015 prices.

[90] KRI (2024)

Despite a steady increase in nominal expenses, the real growth for housing and utilities slowed down between 2014 and 2019. This can be attributed to the rising inflation, indicated by the growth in CPI for housing and utilities, which increased from 108.8 to 121.3 during this period (see also Figure 2.21). However, during the pandemic (2019 – 2022), the real growth for housing and utilities picked up, recording a 10% increase.

On the other hand, real expenditure for furnishings and household maintenance has steadily increased in recent years, by nearly 2.5 times, trailing behind the rise in nominal expenses by 3.7 times since 1993. Although there was a decrease in real expenditure in 2009, it has since followed an upward trajectory, recording a 14% growth during the pandemic period. This indicates that households have been purchasing more of these items to improve their living conditions.

Figure 2.21 provides a clearer picture of the actual cost increase in household consumption for these two expenditure categories. The increase in real expenditure, adjusted for price effects, shows that households have generally increased the quantity purchased for both housing and utilities as well as furnishings, particularly between 2019 and 2022—the pandemic period. Despite the rise in nominal expenditure influenced by price increases, households have increased consumption by quantity—either by purchasing more items or opting for higher-quality, usually more expensive.

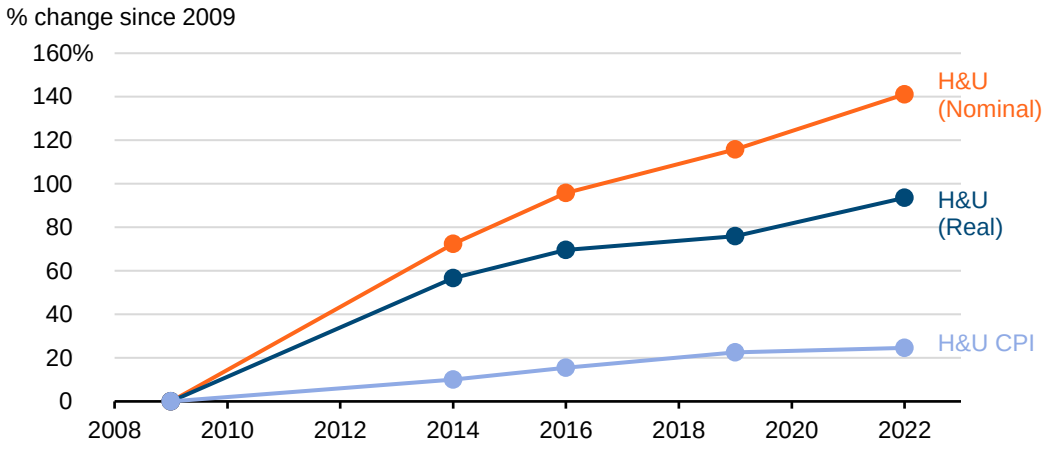
The surge in spending is more pronounced post-pandemic, suggesting that the pandemic has somewhat influenced household expenses in housing and furnishings. This includes higher utility bills due to working from home and spending more time at home during the lockdown measures. For example, data on electricity bill consumption shows that in 2019, households spent about RM127 in nominal terms, which increased to RM140 in 2022.

Moreover, a deeper look into the subcategories of furnishings and household maintenance reveals that households were buying more major household appliances as they had to cook more. They also purchased non-durable household goods and furniture items. Even DOS has noted that wall clocks and carpets were among the popular items purchased in this category[91]. This indicates that households have made an effort to improve the living conditions in their house, improving their house's interiors, and comfort levels during the pandemic.

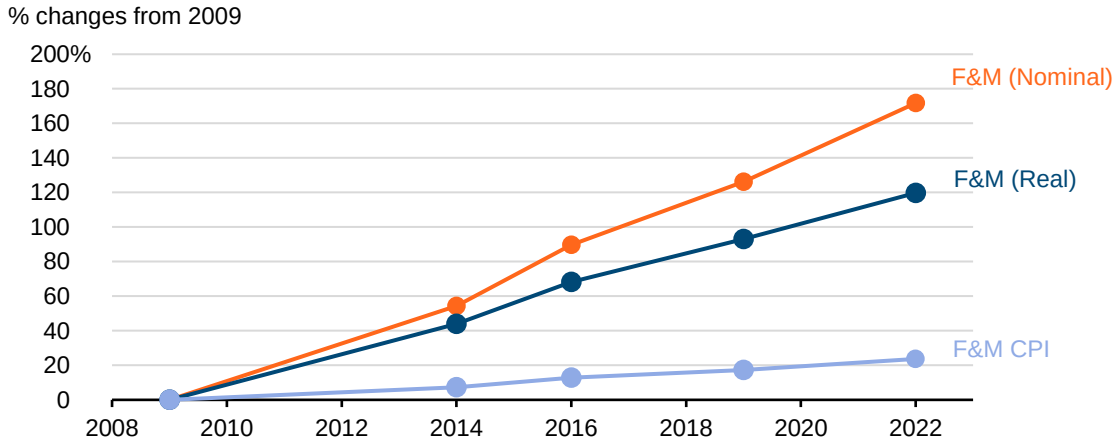
[91] DOS (2023)

Figure 2.21: Changes in nominal and real mean expenditure and CPI of housing and utilities and furnishings and household maintenance since 2009, 2009 – 2022

a) **Housing and utilities (H&U)**



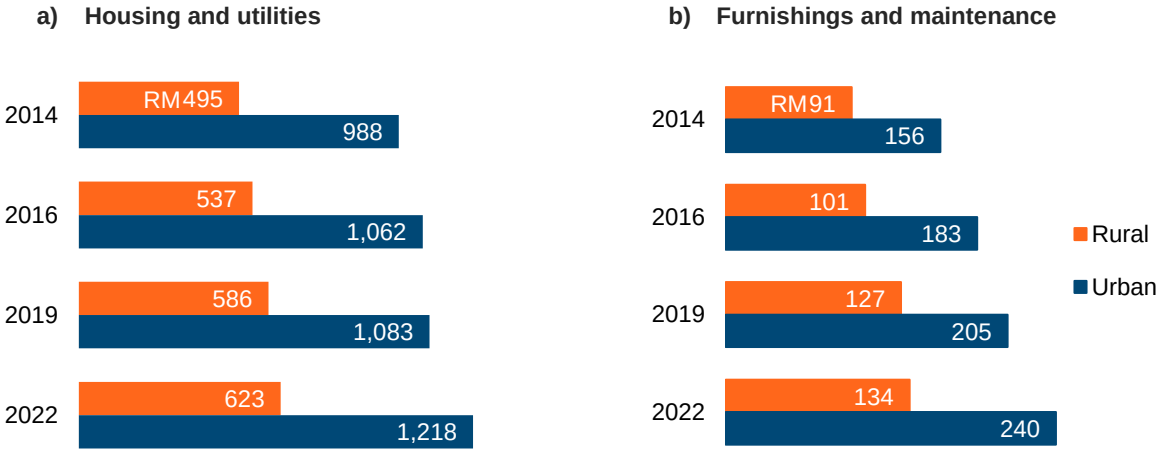
b) Furnishings and household maintenance (F&M)



Source: DOS (2011); DOS (2015); DOS (2017); DOS (2020); DOS (2023); DOS (n.d.b) and KRI calculations.
Note: Real expenditure is in 2015 prices.

A strata-level comparison of household consumption in these two expenditure categories, as shown in Figure 2.22 reveals that urban households have consistently incurred higher expenditures than rural households. The spending gap (in absolute terms) is more pronounced in housing and utilities with urban households spending twice as much as their rural counterparts. Urban households generally have greater access to better utilities and housing infrastructure in urban areas. While this generally improves the quality of life, it also results in a higher cost of living and, thus, higher expenses in this category.

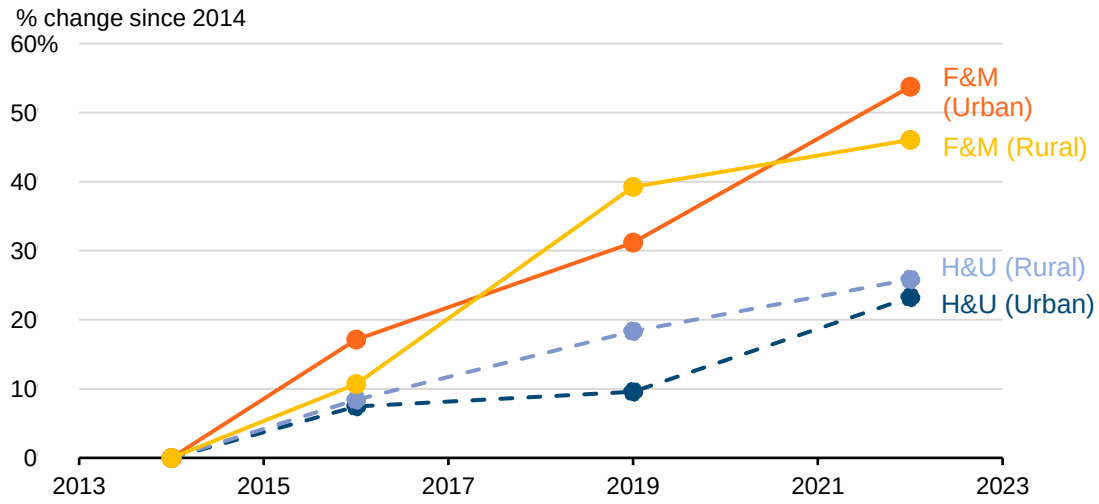
Figure 2.22: Real housing and utilities and furnishings and maintenance expenditures by strata, 2014 – 2022



Source: DOS (2015); DOS (2017); DOS (2020); DOS (2023) and KRI calculations.
Note: Real expenditure is in 2015 prices.

The analysis of real expenditure growth between 2014 and 2022 reveals some interesting findings. While urban households spend more on housing and utilities overall, rural households have experienced steady growth in this category, with a 26% increase since 2014. In comparison, urban households registered a slightly lower growth of 23% (see Figure 2.23). This trend suggests that rural households are gradually increasing their spending on housing and utilities, potentially reflecting improved living standards and infrastructure in rural areas. However, it is also observed that during the pandemic period (2019 – 2022), the growth in this spending among urban households began to catch up with that of rural households, with urban households recording a 12.5% real increase, slightly higher than the 6.3% growth seen in rural households.

Figure 2.23: Growth in the real housing & utilities and furnishings & maintenance expenditures by strata, 2014 and 2022

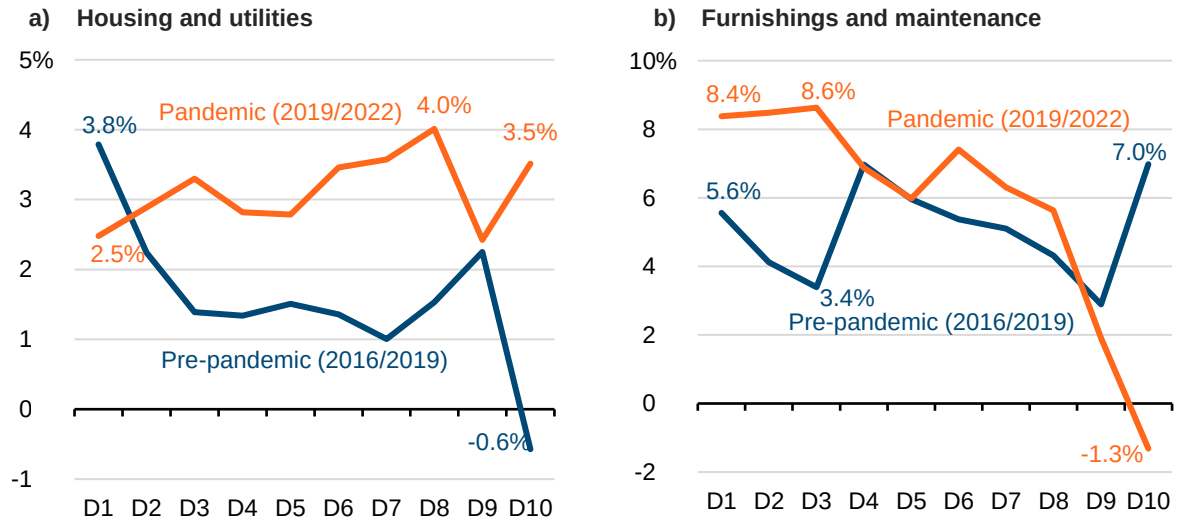


Source: DOS (2015); DOS (2017); DOS (2020); DOS (2023) and KRI calculations.
Note: Percentage change calculated based on real data expressed in 2015 prices.

Additionally, both urban and rural households experienced significant growth in spending on home furnishings and household maintenance. Between 2014 – 2019, rural households had a higher growth of approximately 39%, but their growth slowed, reaching about 46% by 2022. Meanwhile, urban households saw the highest growth in this category since 2014, registering nearly 54% by 2022. This rise can be attributed to multiple factors, including improved lifestyles or preferences, potentially driven by additional disposable income. The sharp rise seen during the pandemic period among urban households seeing a real growth rate of 17.2%, suggests an increased preference for home improvement and maintenance, as people spent more time at home. Chapter 1 also highlights that urban households incurred higher growth in household appliances with water filters growing at 17.7% and microwaves at 14.6% as more households turned to cooking at home during the pandemic.

On the other hand, an income-level comparison was also made to understand household consumption patterns across income deciles. Figure 2.24 shows the growth for both housing and utilities, and furnishings, and maintenance expenditures before (between 2016 and 2019) and during the pandemic (between 2019 and 2022). Households across all income deciles except for D1, experienced higher growth in housing and utilities expenditures during the pandemic compared to pre-pandemic years. The greatest change in growth rate was seen among households in D10, where the CAGR rose by 4.1 percentage points, from -0.6% before the pandemic to 3.5% during the pandemic years.

Figure 2.24: Growth in the real housing & utilities, and furnishings & maintenance expenditures by income decile, 2016 – 2022



Source: DOS (2017); DOS (2020); DOS (2023) and KRI calculations.
Note: Growth calculated based on real data expressed in 2015 prices.

Conversely, expenditures on furnishings and maintenance varied more. Between 2016 and 2019, all income deciles experienced positive growth, ranging from 2.8% to 7.0%. However, this trend shifted during the pandemic years. Between 2019 and 2022, real growth rates for furnishings and maintenance were significantly higher for lower-income deciles, with D1 to D3 recording a CAGR of above 8%. In contrast, higher-income deciles showed decreased growth with D10 households experiencing negative real growth, decreasing by 8.3 percentage points to -1.3% during the pandemic period.

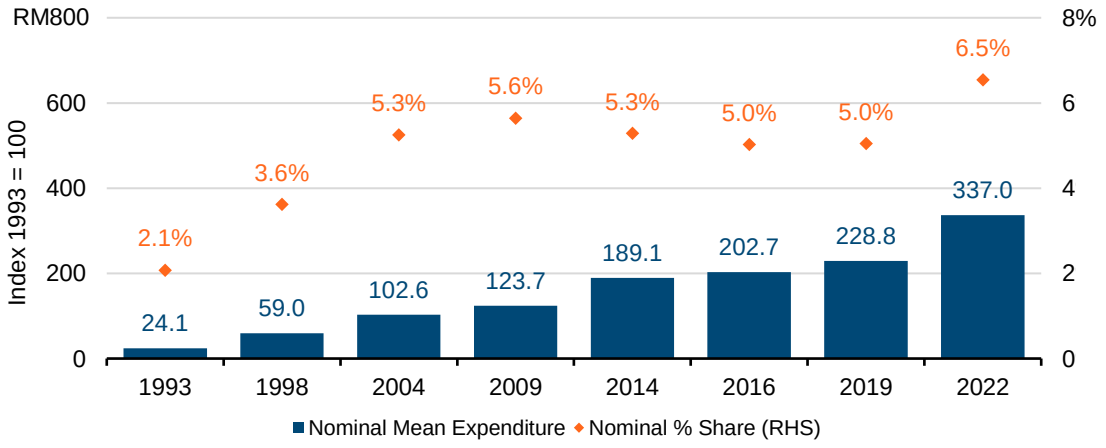
Figure 2.24 indicates several findings. During the pandemic years, lower-income households increased their consumption of furnishings and maintenance. This could be due to households in this cohort genuinely aiming to improve their living standards or needing to purchase additional household furniture and equipment during the MCO period. In contrast, the highest income decile exhibited negative growth in this category, suggesting that these households may have already possessed the necessary furniture or equipment for remote work and extended stays at home thus reducing the need for additional spending. They may have also prioritized their expenditure on more urgent needs during the crisis. Moreover, this cohort increased their housing consumption between 2019 and 2022, likely reflecting a shift in spending priorities among the higher income households, perhaps a preference towards savings and investments during the pandemic years.

Expenditure on information and communication technology (ICT)

During the pandemic, households also faced pressure to meet the requirements to have the equipment necessary to facilitate WFH or remote-learning. This is reflected in Figure 2.25 which highlights the rise in nominal expenditure and the overall share that ICT has in household expenditure.

Although the trend has steadily increased since 1993 from RM24.10 to RM228.80 in 2019, the post-pandemic period of 2022 has recorded a steep rise in expenditure to RM337. The overall share that ICT has in consumption has also reflected this, increasing from 2.1% in 1993 to 6.5% in 2022. This trend is understandable as Malaysian households are continually purchasing items such as mobile phones, internet subscriptions, computers, etc. This will be further explored in Chapter 4 as we examine the rise in accessibility and connectivity of households.

Figure 2.25: Time series of nominal expenditure and share of ICT expenditure, 1993 – 2022

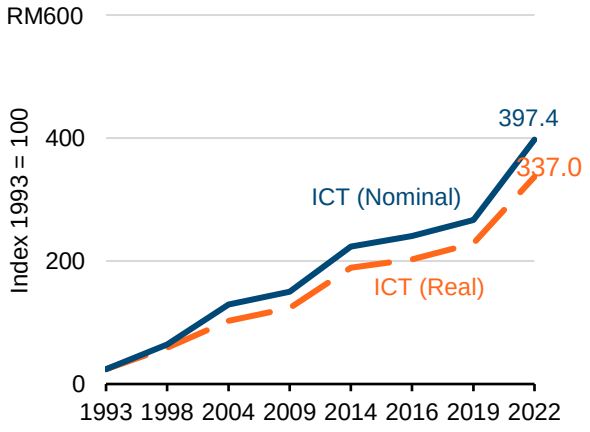


Source: DOS (2011); DOS (2015); DOS (2017); DOS (2020); DOS (2023) and KRI calculations.

According to Figure 2.26, there has been a steady increase in ICT-related expenditure in both nominal and real terms, with the sharpest increase being observed between 2019 and 2022. The nominal expenditure increased by 47.3%, from RM228.8 in 2019 to RM337 in 2022 while the real expenditure rose by 49.0%, from RM266.8 in 2019 to RM397.4 in 2022. This spike may be attributed to a number of different factors, which include an increase in the use of technology in our daily lives as well as the demand that is attributed to WFH and remote-learning policies during the pandemic.

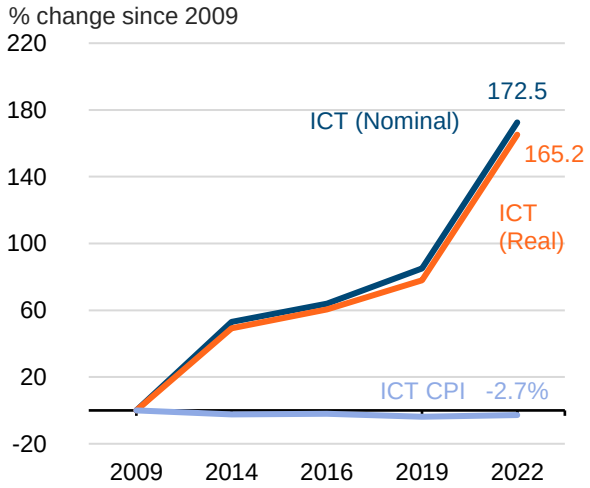
Figure 2.27 supports this as it shows a nominal increase of 172.5% and real increase of 165.2% between 2009 – 2022. However, it is important to note that even though the demand for ICT-related products has increased, the actual price of the products has shown a steady decline from 2009 as the CPI has continually decreased by around -2.1 – 3.8% between 2009 and 2022.

Figure 2.26: Changes in nominal and real ICT expenditures, 1993 – 2022



Source: DOS (2011); DOS (2015); DOS (2017); DOS (2020); DOS (2023) and KRI calculations.
Note: Real expenditure is in 2015 prices.

Figure 2.27: Change in nominal and real mean expenditure and CPI of ICT since 2009, 2009 – 2022

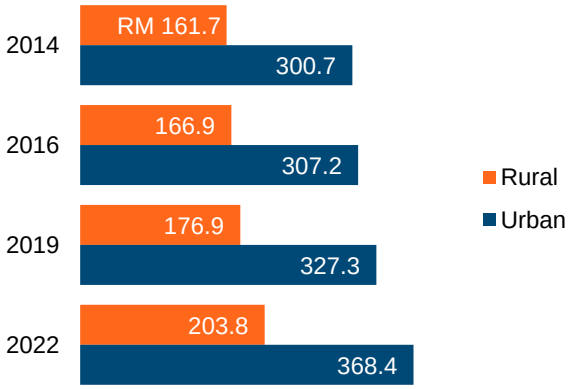


Source: DOS (2011); DOS (2015); DOS (2017); DOS (2020); DOS (2023); DOS (n.d.b) and KRI calculations.
Note: Real data expressed is in 2015 prices.

With regards to differences in ICT expenditure by strata, it can be seen that generally urban households do have comparatively higher demand for ICT products as they have continually recorded higher expenditure in ICT since 2014 (see Figure 2.28). It has increased from RM300.7 in 2014 to RM368.4 in 2022 as compared to rural expenditure from RM161.7 to RM203.8 in the same time period. This may be facilitated by increased demand for ICT-use in urban areas as the type of jobs or lifestyle that urban households have are different from those of a rural household.

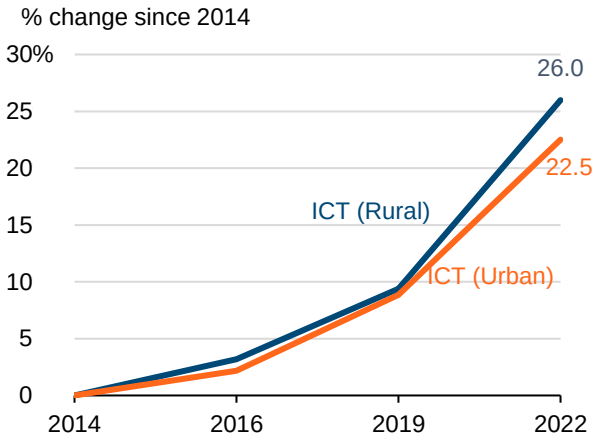
However, since 2014, rural households have actually experienced higher growth in ICT expenditure, rising to 26.0% by 2022 as compared to 22.5% recorded by urban households during the same time period (see Figure 2.29). This may be attributed to the shift to remote learning which has effectively forced rural households to increase their ICT expenditure. This has an impact as it effectively increases the burden that ICT expenditure has on total expenditure for rural households as Chapter 1 already outlines that rural households would generally report lower household income.

Figure 2.28: Real ICT expenditure by strata, 2014 – 2022



Source: DOS (2015); DOS (2017); DOS (2020); DOS (2023) and KRI calculations.
Note: Real expenditure is in 2015 prices.

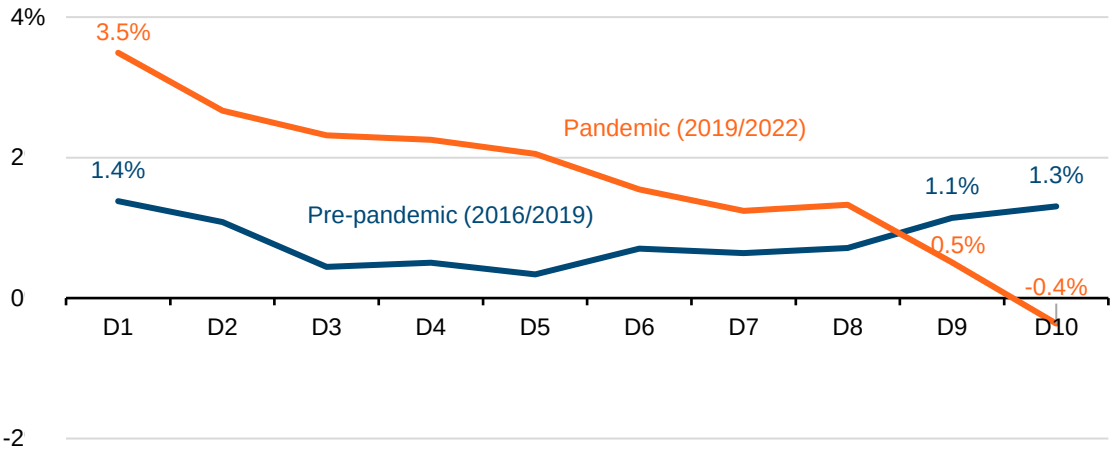
Figure 2.29: Change in real ICT expenditure by strata, 2014 – 2022



Source: DOS (2015); DOS (2017); DOS (2020); DOS (2023) and KRI calculations.
Note: Percentage change calculated based on real data expressed in 2015 prices.

Lastly, Figure 2.30 highlights this when comparing the growth in real ICT expenditure by income decile between 2016 and 2022. During the pre-pandemic phase, it has largely been similar between households of different deciles, with the lowest decile experiencing a 1.4% growth between 2016 and 2019 as compared to the highest decile at 1.3%. However, during the pandemic period of 2019 – 2022, there is a noticeable increase in real ICT expenditure of lower-income households, with the bottom 10% having the highest CAGR of 3.5%. On the other hand, the only income decile that experienced negative growth is the top 10% of households, with a CAGR of -0.4%.

Figure 2.30: Growth in real ICT expenditure by income decile, 2016 – 2022



Source: DOS (2017); DOS (2020); DOS (2023) and KRI calculations.
Note: Growth calculated based on real data expressed in 2015 prices.

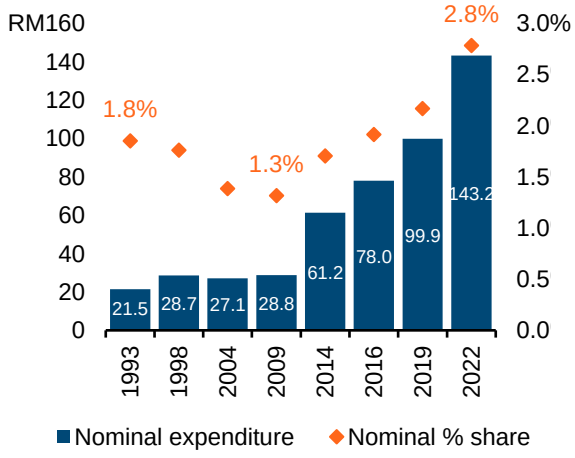
2.4.3. The shift in health expenditure

The Covid-19 pandemic, as the biggest public health threat since the 1918 influenza pandemic, has not only reshaped the world's public health landscape but has also altered households' health-related expenses. As families grapple with the threat of the virus, the burden of health-related expenses ranging from the cost of essential medicines and hospitalisation treatments to preventive measures, is expected to surge.

This section will focus on how households' health-related expenses have shifted from the pre-pandemic period to the post-pandemic period. However, it is important to note that not all changes in health-related expenses could be analysed from HES due to comprehensive revisions in definitions and classifications under division G06 for health-related items in the recent survey. This analysis, apart from the 2-digit aggregated division, is limited to the medicines and medical product categories, where changes are fewer, and also examines shifts in health-related insurance spending, which is under a separate consumption item division in the survey, division G12, specifically subclass 1212 under the latest MCOICOP. Despite data limitations, understanding the extent and nature of this financial burden is important for policymakers and healthcare providers as they navigate the post-pandemic recovery and strive to build more resilient systems in the future.

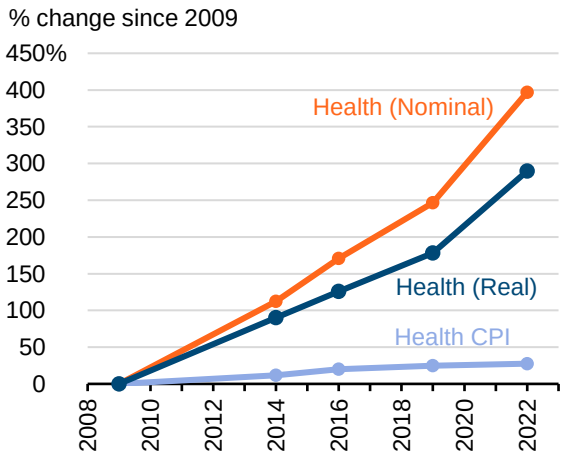
The average Malaysian household spends relatively little on health compared to other types of goods in the consumption basket. However, its importance has grown over the years. In 2009, spending on healthcare only comprised 1.3% of households' expenditure on goods and services (Figure 2.31). In 2022, the proportion has risen to 2.8%[92]. Keeping the 2009 prices constant, spending in real terms has grown 3.9 times from RM28.8 in 2009 to RM112.3 in 2022 (Figure 2.32). This growth notably accelerated during the pandemic, with a CAGR of 7.2% between 2016 and 2019, surging to 11.9% from 2019 to 2022.

Figure 2.31: Time series of nominal and share of health expenditure, 1993 – 2022



Source: DOS (2011); DOS (2015); DOS (2017); DOS (2020); DOS (2023) and KRI calculations.

Figure 2.32: Changes in nominal and real mean expenditure and CPI of health since 2009, 2009 – 2022

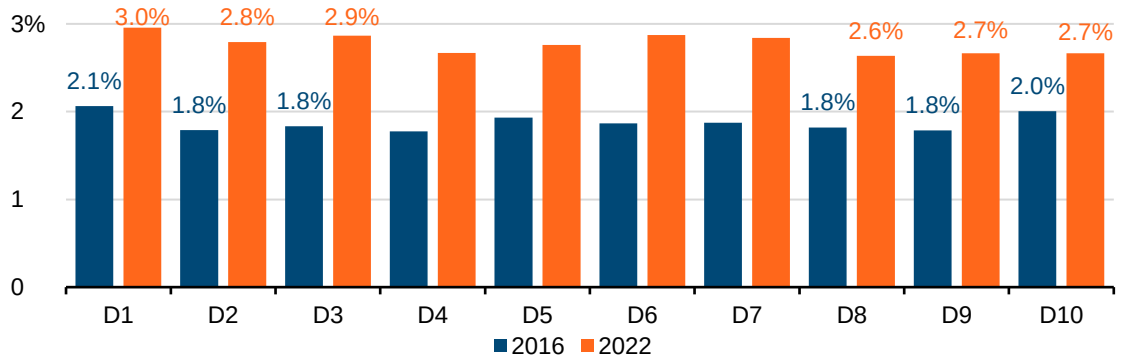


Source: DOS (2011); DOS (2015); DOS (2017); DOS (2020); DOS (2023) and KRI calculations.
Note: Real expenditure is in 2015 prices.

[92] Please note that these figures represent averages. While the average proportion of health-related expenses may seem small, this does not mean that these costs are insignificant for some households, nor are they evenly distributed. Health spending likely varies widely, influenced by factors such as the age of household members, lifestyle choices, and unexpected circumstances.

Across income deciles, the proportion of health spending in household expenditures was relatively similar in 2022, ranging from 2.6% to 3.0% (Figure 2.33). Before the pandemic, in 2016, both the bottom and top deciles spent slightly more on health-related expenses as a proportion of total expenditures, while the middle deciles spent a similar proportion. However, a distinct pattern emerged during the pandemic. By 2022, the bottom three deciles were spending marginally more on health than the top three deciles. This suggests that while the pandemic has driven up healthcare spending across all households, poorer households have experienced a slightly heavier burden.

Figure 2.33: Proportion of expenses allocated to health by income deciles, 2016 – 2022

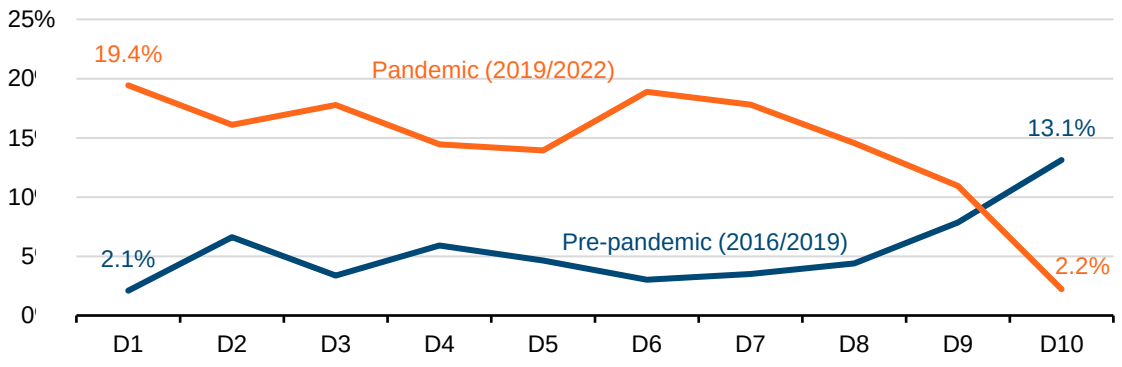


Source: DOS (2017); DOS (2020); DOS (2023) and KRI calculations.

These changes in health expenditure are largely driven by the differing growth rates across various income groups and regions. Between 2016 and 2019, before the pandemic, wealthier households bore the brunt of the increase in health spending. Health expenses across the first eight deciles averaged a CAGR of 4.2%, ranging from 2.1% to 6.6% (Figure 2.34). In contrast, a more pronounced increase was observed in the higher deciles, with D9 experiencing a growth rate of 7.9% and D10 growing significantly faster at 13.1%.

However, the pandemic period from 2019 to 2022 marked a major shift, as poorer households began to increase their health spending at a much faster pace than wealthier households. Specifically, households in D1 to D7 saw their health spending grow between 13.9% and 19.4%, with an average of 16.9%. In contrast, the growth rate among households in D8 to D10 tapered off, from 14.6% in D8 to just 2.2% in D10, averaging 9.2% in the top three deciles.

Figure 2.34: Growth in real healthcare expenses by income decile, 2016 – 2022

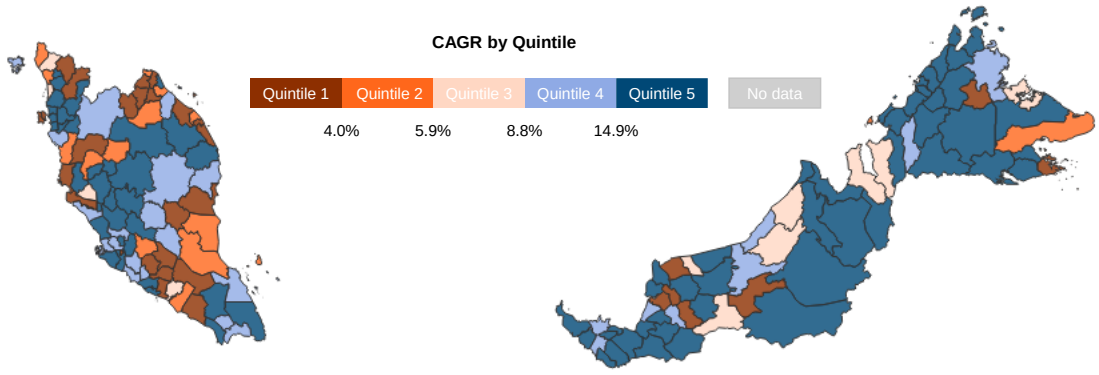


Source: DOS (2017); DOS (2020); DOS (2023) and KRI calculations.
Note: Growth calculated based on real data expressed in 2015 prices.

This disparity in growth rate is also evident when viewed from a regional perspective (Figure 2.35). Districts across Selangor, and many in Sabah, Sarawak, Johor, Malacca, Pahang, Penang, and Kedah, exhibited much faster growth rates, placing them in the fourth and fifth quintiles for CAGRs between 2014 – 2016 and 2016 – 2019. In contrast, Terengganu showed an equal number of districts growing above and below the third quintile, while Perak, Negeri Sembilan, Kelantan, and Perlis had more districts with growth rates falling below the third quintile.

The bottom ten districts in terms of growth rate were Machang (Kelantan), Telupid (Sabah), Kota Baharu (Kelantan), Sik (Kedah), Kuala Pilah (Negeri Sembilan), Marang (Terengganu), Pasir Mas (Kelantan), Manjung (Perak), Jeli (Kelantan), and Sarikei (Sarawak), in that order. The top five fastest-growing districts were Beluru (Sarawak), Pitas (Sabah), Kabong (Sarawak), Muaalim (Perak), and Pusa (Sarawak). Despite the fact that Sabah, Sarawak, and Kedah had most districts growing above the third quintile, the presence of districts within these states that ranked among the lowest in growth rates highlights the significant intra-state inequalities.

Figure 2.35: Growth in real health expenditure by district, 2019/2022

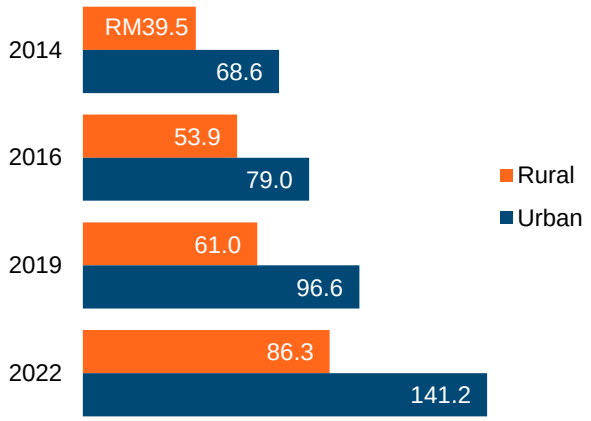


Source: DOS (2023) and KRI calculations.
Note:

1. Growth is calculated as CAGR and presented by quintiles to generate spatial analysis at the district level. Real data used to calculate growth is expressed in 2015 prices.
2. The benchmarked CAGRs are derived using state expenditure growth from 2014 – 2019 to generate the pre-pandemic distribution. Due to data unavailability at the district level prior to 2019, household expenditure at the state level from 2014 – 2019 used to have sufficient data points to generate the pre-pandemic distribution.
3. The CAGRs of health expenditure by district from 2019 to 2022 range from -5.8% to 71.6%.

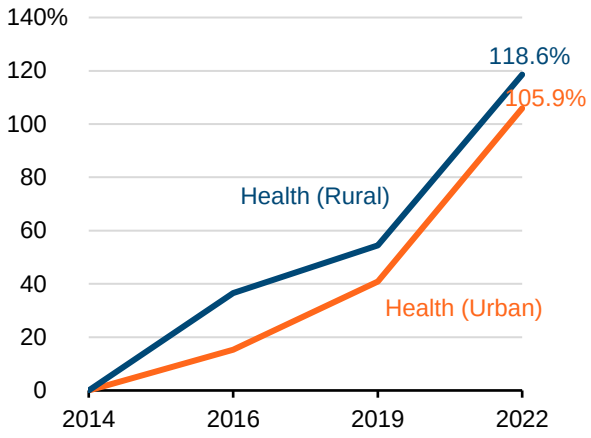
Throughout Malaysia, urban households consistently outspent rural households on healthcare from 2014 to 2022 (Figure 2.36). However, rural health expenditure grew at a faster rate compared to urban areas during this period (Figure 2.37). Between 2019 and 2022, health expenses in rural households in Kedah, Kelantan, Pahang, Perak, Perlis, Selangor, Sarawak, and Labuan grew faster than in the urban areas of these respective states. Despite this rapid growth, urban households in each of these states spent more on health in absolute terms in 2022 compared to their rural counterparts. However, this trend is not universal; in 2016 and 2019, rural households in Johor spent more on health than urban households, as did rural households in Labuan and Negeri Sembilan in 2014. These variations underscore the complex dynamics of health spending across different regions and time periods, influenced by factors such as the pandemic, access to healthcare facilities, and economic conditions.

Figure 2.36: Real health expenditure by strata, 2014 – 2022



Source: DOS (2015); DOS (2017); DOS (2020); DOS (2023) and KRI calculations.
Note: Real expenditure is in 2015 prices.

Figure 2.37: Change in real health expenditure by strata, 2014 – 2022

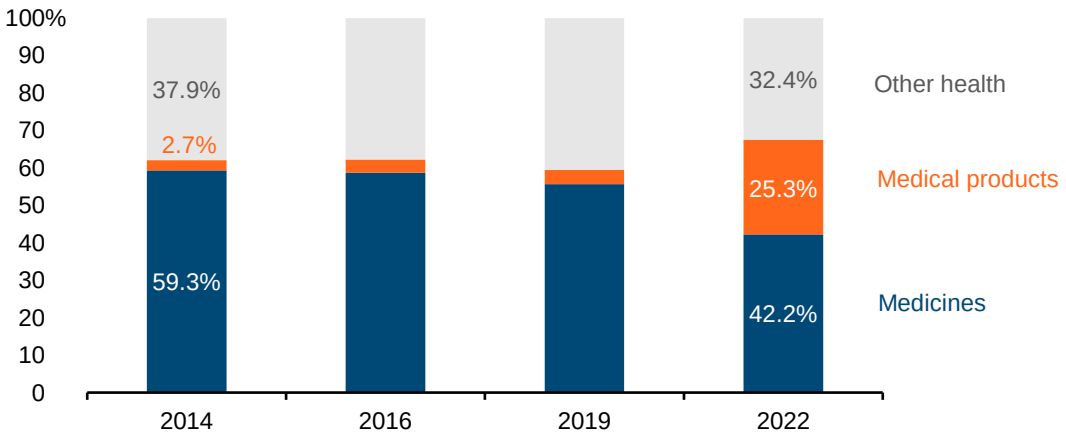


Source: DOS (2015); DOS (2017); DOS (2020); DOS (2023) and KRI calculations.
Note: Percentage change calculated based on real data expressed in 2015 prices.

It is crucial to approach the interpretation of these patterns with caution. Inferring causes for why some areas experienced slower growth—or even a decline—based solely on this data could be misleading. Slower or negative growth in health expenses could result from positive factors, such as reduced need for healthcare due to isolation from the pandemic. Conversely, it could also stem from negative factors, such as a drop in income reducing disposable income for health-related purchases or a shortage of health-related supplies in those areas. Given the ambiguity of the causes, further research is needed to better understand why certain regions saw slower or declining growth compared to others.

A closer examination of categories within health expenditure reveals that while medicines have continued to play a significant role, their prominence has diminished as other items, such as medical products, have grown in importance (Figure 2.38). In 2014, medicines comprised 59.3% of health expenditure, but by 2022, this share had shrunk to 42.2%. Conversely, medical products, which made up only 2.7% of health spending in 2014, surged to 25.3% by 2022.

Figure 2.38: Share of nominal mean household medicines and medical products expenditure, as a percentage of household healthcare expenditure, 2014 – 2022

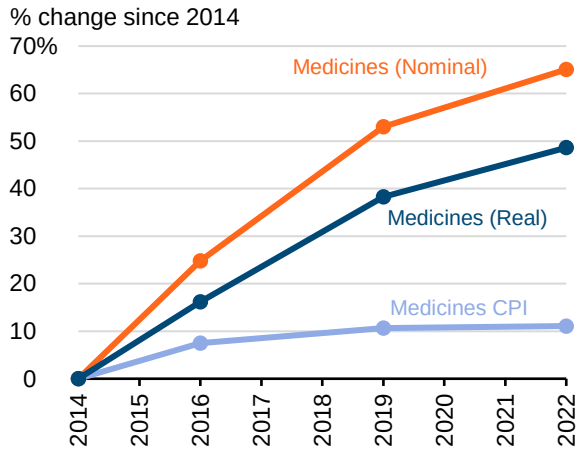


Source: DOS (2015); DOS (2017); DOS (2020); DOS (2023) and KRI calculations.

In real terms, using 2015 prices, spending on medicines in 2022 grew to 1.5 times the size of that in 2014, from RM38.8 to RM57.7 (Figure 2.39). Meanwhile, real spending on medical products saw a dramatic increase, from RM2.3 in 2014 to RM34.5 in 2022—14.8 times the size it was in 2014 (Figure 2.40). This significant rise reflects households' growing need for preventive items like face masks, sanitisers, and disinfectants to mitigate the risks of Covid-19, with face masks becoming the most popular health-related expenditure[93], as reported by DOS.

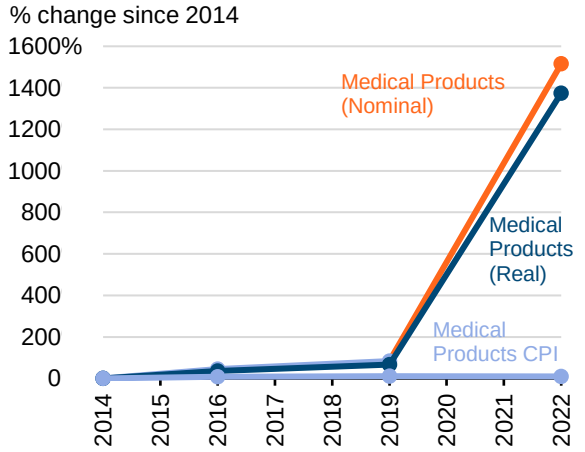
Other health expenses, though their share shrank from 37.9% in 2014 to 32.4% in 2022, grew to become 1.8 times the size in real terms[94]. This reflects increased spending on services such as outpatient care, inpatient care, and dental services. However, a detailed time series analysis of specific items is not possible due to changes in survey definitions, with some increased spending likely also attributable to the pandemic.

Figure 2.39: Changes in nominal and real mean expenditure and CPI of medicines since 2014, 2014 – 2022



Source: DOS (2015); DOS (2017); DOS (2020); DOS (2023); DOS (n.d.b) and KRI calculations.
Note: Real expenditure is in 2015 prices.

Figure 2.40: Changes in nominal and real mean expenditure and CPI of medical products since 2014, 2014 – 2022



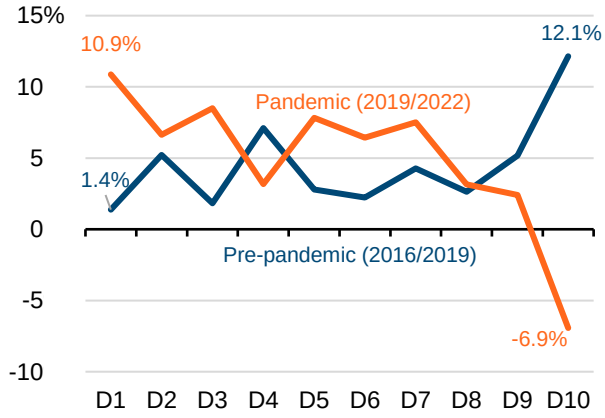
Source: DOS (2015); DOS (2017); DOS (2020); DOS (2023); DOS (n.d.b) and KRI calculations.
Note: Real expenditure is in 2015 prices.

When comparing spending growth across different income groups, spending on medicines during the pandemic period (2019 – 2022) grew significantly for most groups within D1 to D8, with the exception of D4, compared to the pre-pandemic period (2016 – 2019) (Figure 2.41). The CAGR for these lower-income deciles averaged 6.8%, ranging from 3.2% to 10.9% during the pandemic, compared to an average of 3.4% with a range of 1.4% to 7.1% pre-pandemic. During the pandemic, a tapering pattern emerged, with higher growth rates in the lower deciles, while the top three deciles saw a significant decline, with the highest decile (D10) even experiencing negative growth. In contrast, the pre-pandemic period exhibited a more random pattern among the first eight deciles, followed by a sharp increase starting from D9 onwards. This indicates that while the pre-pandemic burden of growth fell more heavily on high-income households, the pandemic period reversed this pattern, shifting a greater burden onto lower-income households.

[93] DOS (2023)
[94] The price levels of the aggregate health division were assumed to represent the price levels of other health expenses for the comparison in real terms.

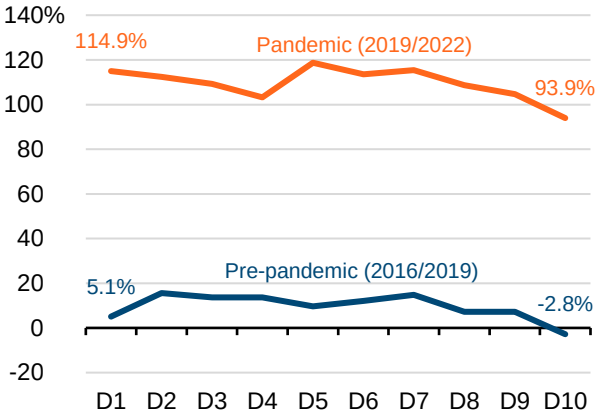
The difference in growth performance between the pre-pandemic and pandemic periods is even more pronounced for medical products (Figure 2.42). Before the pandemic, growth rates across most deciles ranged from 5.1% to 14.8%, with the exception of D10 which experienced a decline of -2.8%. However, during the pandemic, the CAGR for medical products skyrocketed across all the deciles, ranging from 93.9% to 118.7%. Both periods generally exhibited a tapering pattern, where lower-income households generally bore a greater burden as they increased their spending on medical products.

Figure 2.41: Growth in real medicines expenses by income decile, 2016 – 2022



Source: DOS (2017); DOS (2020); DOS (2023) and KRI calculations.
Note: Growth calculated based on real expenditure expressed in 2015 prices.

Figure 2.42: Growth in real medical products expenses by income decile, 2016 – 2022



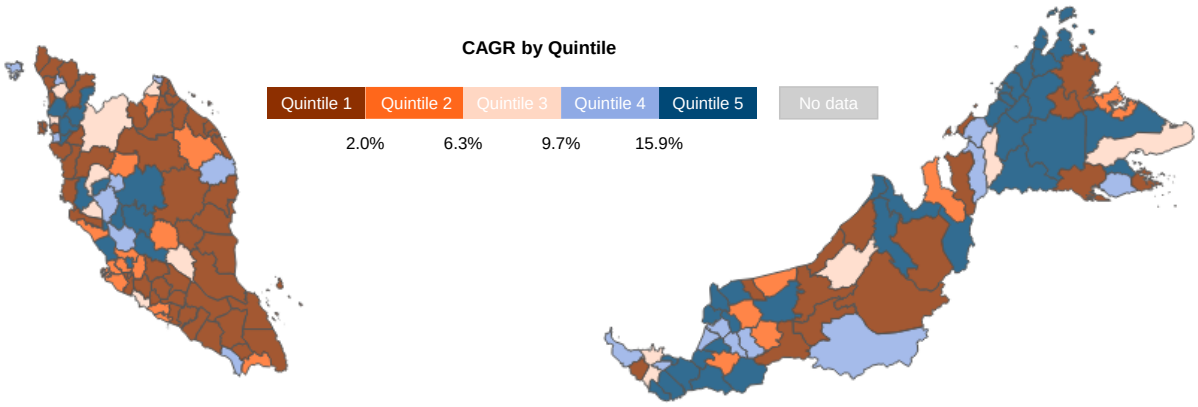
Source: DOS (2017); DOS (2020); DOS (2023) and KRI calculations.
Note: Growth calculated based on real expenditure expressed in 2015 prices.

Regionally, medicine expenditure growth varied significantly (Figure 2.43). Only Sabah and Sarawak had most of their districts growing above the third quintile based on CAGR rates during the benchmark periods of 2014 – 2016 and 2016 – 2019. Other states had more districts growing at rates within the bottom two quintiles. The bottom 10 districts in terms of medicine expenditure growth were Tatau (Sarawak), Marang (Terengganu), Tangkak (Johor), Larut & Matang (Perak), Jasin (Melaka), Kerian (Perak), Setiu (Terengganu), Sik (Kedah), Labuan, and Kuantan (Pahang). In contrast, the top five districts, all located in East Malaysia, were Pitas (Sabah), Beluru (Sarawak), Saratok (Sarawak), Kinabatangan (Sabah), and Miri (Sarawak).

As with healthcare expenditure in general, caution is required when interpreting these results, as slow growth could be influenced by both positive factors, such as reduced need for healthcare, and negative factors, such as limited access to medical resources.

On the other hand, expenditure growth for medical products was largely concentrated in the fifth quintile of CAGR during the benchmark years, with only five exceptions: Meradong (Sarawak) and Muar (Johor), in quintile four, Bagan Datuk (Perak) and Machang (Kelantan) in quintile three, and Pasir Mas (Kelantan) in quintile one, which actually experienced a contraction. Across Malaysia, households generally increased spending on medical products as part of their efforts to prevent contracting Covid-19. However, further research is needed to understand why spending on medical products shrank in Pasir Mas.

Figure 2.43: Growth in real medicines expenditure by district, 2019/2022

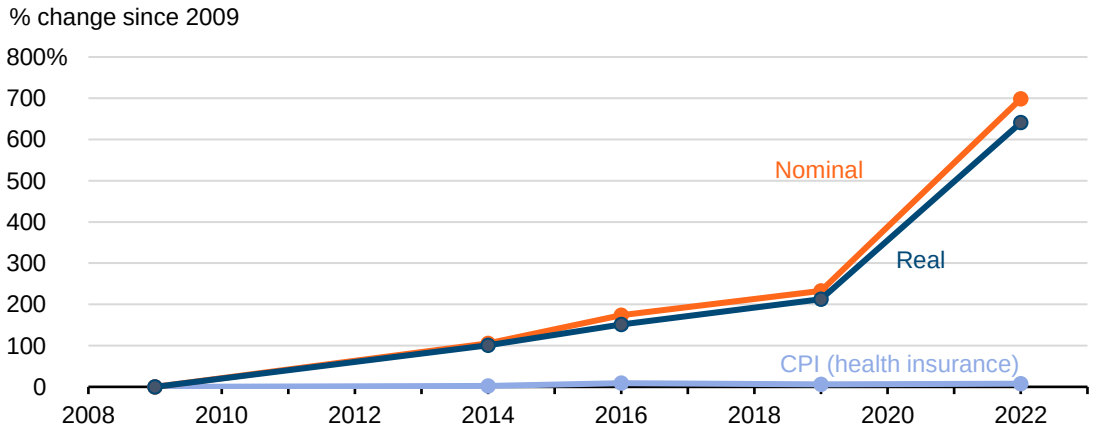


Source: DOS (2023) and KRI calculations.
Note:

1. Growth is calculated as CAGR and presented by quintiles to generate spatial analysis at the district level. Real data used to calculate growth is expressed in 2015 prices.
2. The benchmarked CAGRs are derived using state expenditure growth from 2014 – 2019 to generate the pre-pandemic distribution. Due to data unavailability at the district level prior to 2019, household expenditure at the state level from 2014 – 2019 used to have sufficient data points to generate the pre-pandemic distribution.
3. The CAGRs of real medicines expenditure by district from 2019 to 2022 range from -36.6% to 58.3%.

In addition to out-of-pocket health expenses, health insurance expenditures have surged dramatically, growing sevenfold since 2009, with the most significant increase occurring between 2019 and 2022 (Figure 2.44). Keeping prices constant, in 2009, the average household spent RM3.1 monthly on health and accident insurance, which grew to RM9.8 by 2019. In 2022, DOS began separating accident insurance from health insurance, with health insurance spending recorded at RM23.3. Assuming accident insurance was negligible from 2009 to 2019, the increase in health insurance spending represents a 2.4-fold increase over three years during the pandemic, compared to a 1.6-fold increase over the prior five years.

Figure 2.44: Changes in nominal and real mean expenditure and CPI of health insurance since 2009, 2009 – 2022



Source: DOS (2011); DOS (2015); DOS (2017); DOS (2020); DOS (2023); DOS (n.d.b) and KRI calculations.
Note: Growth calculated based on real expenditure expressed in 2015 prices. The health insurance expenditure category included accident insurance from 2009 to 2019. In 2022, accident insurance was separated from health insurance.

Despite growing insurance expenses, households have also increased their out-of-pocket health expenditures, which suggests that rising insurance expenses have not reduced overall health spending. This is further supported by other research[95] that found supplementary personal health insurance in Malaysia significantly increased out-of-pocket inpatient expenses, questioning its effectiveness in financial protection. Possible contributing factors include a higher likelihood of private hospital admissions, unexpected insurance-excluded expenses, cost-sharing policies, reimbursement limits, and increased healthcare utilization due to aging.

The rise in insurance spending may also be due to a higher appreciation of healthcare protection due to the pandemic and higher healthcare costs. Higher healthcare costs typically lead to higher premiums, as insurers adjust rates annually to cover costs[96]. In 2020, many insurers deferred premium price increases to maintain affordability but resumed re-pricing in 2021, which also accounted for the growth in medical costs and medical service utilisation, likely contributing to the health insurance expense spike[97].

While it might be expected that higher premiums would be reflected in the health insurance CPI, which rose only 7.8% from 2009 to 2022, real expenditure increased by 612% over the same period. This indicates that increased premiums are captured more as higher real spending rather than higher price levels in HES. Unfortunately, further analysis by income deciles and geographical distribution, as done in previous sections, cannot be conducted here due to limited data.

2.5 Concluding Remarks

The chapter examines the evolution of Malaysian household expenditure, focusing on the pandemic's impact between 2019 and 2022. On average, Malaysian households spent 77.6% of their income on expenses in 2022, which may reflect the rising cost of living or increased spending to improve their living conditions. However, given the slower growth in household income, the rising trend in household expenditure is concerning. It indicates reduced savings, particularly among lower-income households, which could lead to increased debt and reliance on borrowing to meet basic needs.

Interestingly, rural as well as lower-income households recorded higher growth in spending, challenging the general perception that the cost of living in urban areas is the primary driver of increased expenses among urban households. Post-pandemic, lower-income households experienced the highest expenditure growth in categories like communication and healthcare, signalling both improved living conditions and the need to adapt to pandemic-induced new norms such as remote work and learning. In contrast, except for housing and utilities, high-income households saw lower growth in expenditure categories like furnishings and household maintenance, communication and healthcare as they were already better positioned before the pandemic, thus reducing the need to make additional purchases when these needs arose.

[95] Ng et al. (2024)
[96] BNM (2021b)
[97] Ibid.

Emerging trends in household spending reveal significant growth in key categories affected by the pandemic. The shift from home cooking to dining out reflects the evolving preferences of Malaysian households fuelled by two main factors: the growing accessibility of FAFH and time scarcity, which makes food preparation less desirable. This shift in food consumption expenditure, however, can have health implications, considering that FAFH is commonly associated with higher energy intake and poorer diet quality compared to home-prepared meals. The increased significance of FAFH in the Malaysian diet suggests the opportunity to tackle poor dietary choices through the out-of-home food sector.

Housing expenses have continued to grow over time. The increase in spending on housing and utilities aligned with the rapid house price escalations since 2010. This trend highlights the need for government measures to ensure affordable housing for all income groups and strata. Additionally, communication expenses, once considered non-essential, have now become a critical need in the digital era. The rise in ICT-related expenditure, particularly among lower-income households and those in rural areas, underscores the need for greater digital inclusion and accessibility through affordable internet packages to reduce the burden among lower-income households and improve internet connectivity in both rural and urban areas.

Health expenses also surged during the pandemic, particularly among lower-income households, who experienced a faster increase in healthcare spending during the pandemic compared to wealthier households, reversing pre-pandemic trends. The rising healthcare places a heavier burden on lower-income households. This emphasizes the need for strengthened public healthcare, especially in vulnerable districts where reliance on public services is high due to falling incomes and rising inequality.

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CHAPTER

03

FROM BLACKBOARDS TO BROADBAND: EDUCATION OUTCOMES AND DIGITAL LEARNING DURING COVID-19

CHAPTER 3

FROM BLACKBOARDS TO BROADBAND: EDUCATION OUTCOMES AND DIGITAL LEARNING DURING COVID-19

By Shereen Hazirah Hishamudin, Dr Teoh Ai Ni and Wan Amirah Wan Usamah

"The Covid-19 pandemic has exacerbated a lot of problems facing public schools — but it didn't create most of them. Most of the inequities existed long before the pandemic. The only difference is who was affected and who was paying attention."

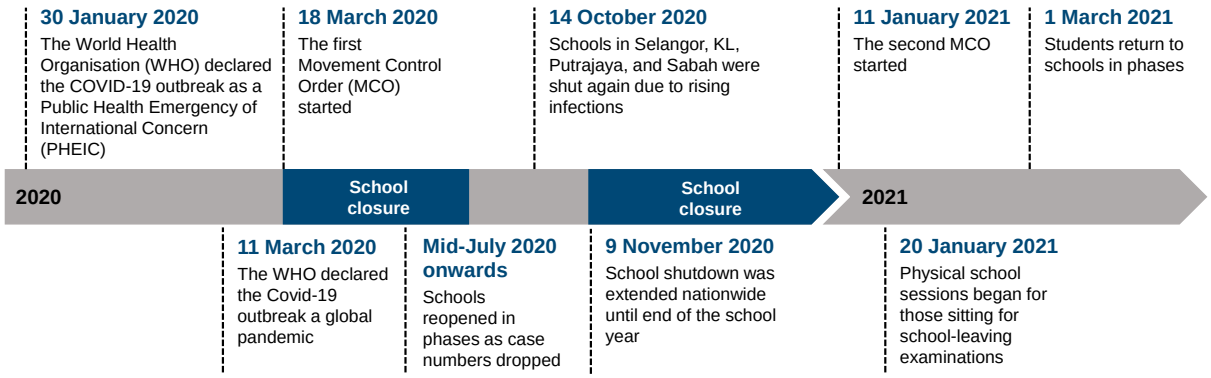
Meghan Mangrum (2020)

3.1 Introduction

The Covid-19 pandemic, which emerged in late 2019, led to unprecedented disruptions across the globe, significantly impacting public health, economies and social structures[98]. By early 2020, the virus had spread rapidly, prompting governments worldwide to implement stringent measures to contain its transmission. Among these measures were the widespread closures of educational institutions, an action that had significant implications for education systems across the globe, including Malaysia.

In Malaysia, the first Covid-19 case was reported on 25 January 2020[99]. As infection rates surged, the government imposed the first MCO on 18 March 2020 (Figure 3.1), which led to the closure of schools nationwide[100]. This marked the beginning of a protracted period of interrupted face-to-face education that triggered an immediate and complex challenge faced by the education sector in ensuring continuous delivery of education while prioritising the safety and well-being of students and teachers. In total, schoolchildren in Malaysia attended in-person classes for only six months in 2020.

Figure 3.1: Timeline of school closures and re-openings in Malaysia during Covid-19, January 2020 – March 2021



Source: Adapted from Loganathan et al. (2021)

[98] The idea of "social structure" was first introduced by Herbert Spencer in 1896, who argued that society had "social structures" that carried out social functions. In sociology, it is defined as the distinctive, stable arrangement of institutions whereby human beings in society interact and live together.
[99] MOH (2020)
[100] Loganathan et al. (2021)

The closure of schools in Malaysia mirrored a global trend, with the United Nations Educational, Scientific and Cultural Organisation (UNESCO) reporting that by mid-April 2020, over 1.5 billion learners were affected by school closures across 195 countries[101]. These closures, while necessary to curb the virus's spread, brought about significant disruptions to traditional learning environments and exacerbated existing educational inequities. As the shift to remote learning became the primary strategy to ensure continuity of education during school shutdown, it also deepened the digital divide, highlighting disparities in access to technology and the internet. It should also be noted that the transition to online learning was a response to prolonged pandemic-induced school closures and is considered to be an emergency remote teaching rather than true virtual learning.

In an effort to remediate the repercussions on the pupils and teachers, the Malaysian Ministry of Education (MOE) swiftly responded by implementing remote learning initiatives such as the *Program Pengajaran dan Pembelajaran di Rumah (PdPR)*. Programs such as TV Pendidikan and the use of digital platforms like Google Classroom and Microsoft Teams were also introduced to facilitate online learning. However, the efficacy of these measures varied widely and was influenced by various factors such as socio-economic status, geographical location and availability of technological resources. Rural areas, in particular, faced significant challenges due to limited internet connectivity and a lack of digital devices.

The transition to digital education globally also faced similar hurdles. While countries with robust digital infrastructures and pre-existing e-learning platforms adapted seamlessly, nations with limited resources struggled. The pandemic highlighted the critical need for resilient education systems capable of adapting to emergencies, prompting calls for increased investment in digital infrastructure and teacher training.

This chapter aims to explore the effects of school closures on education outcomes during the Covid-19 pandemic in Malaysia. It will delve into educational impact, particularly in terms of academic performance. Furthermore, it will situate local outcomes within the context of global trends, providing a broader perspective on the pandemic's educational ramifications. Additionally, this chapter will examine the role of ICT and virtual learning during this period, assessing its contribution and limitations.

Overall, this chapter seeks to provide an understanding of how the Covid-19 pandemic reshaped the education landscape in Malaysia. It will also suggest several key areas to enhance the resilience and inclusivity of the current education system while ensuring it is better prepared for future crises.

[101] UNESCO (2020)

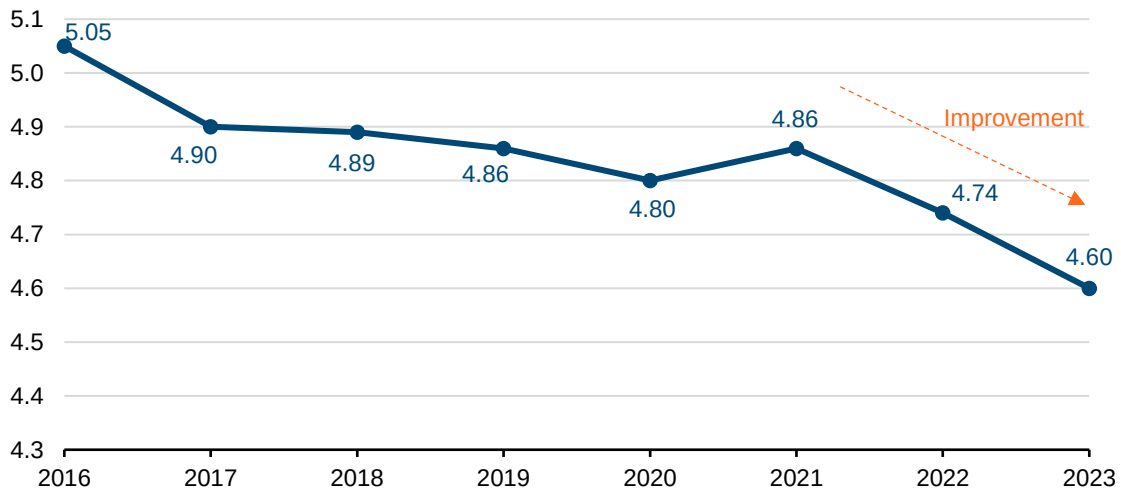
3.2 Students' Education Outcomes: A Covid-19 Perspective

The Covid-19 pandemic has profoundly impacted students' education outcomes worldwide, and Malaysia is no exception. As the pandemic forced the closure of schools and a rapid shift to online learning, students' academic performances have been notably affected, particularly those preparing for critical examinations like SPM. This section explores trends in SPM student performance with a particular focus on the pandemic period, highlighting disparities between urban and rural areas, as well as absenteeism rates. This section will also examine Malaysia's performance in the PISA.

3.2.1. SPM student performance

SPM is a crucial examination for Malaysian secondary school students, playing a role as a stepping stone into higher education and future career opportunities. Overall, the *Gred Purata Nasional (GPN),* an indicator measuring SPM student performance, improved at the national level, recording 5.05 in 2016 and 4.60 in 2023[102] (Figure 3.2), where a declining figure indicates an improvement in performance. Between 2020 and 2021, however, a decline in performance was observed, with GPN recording a rise from 4.80 in 2020 to 4.86 in 2021, possibly reflecting the challenges in the transition to remote learning and the limited access to resources for many students.

Figure 3.2: Gred Purata Nasional (GPN), Malaysia, 2016 – 2023



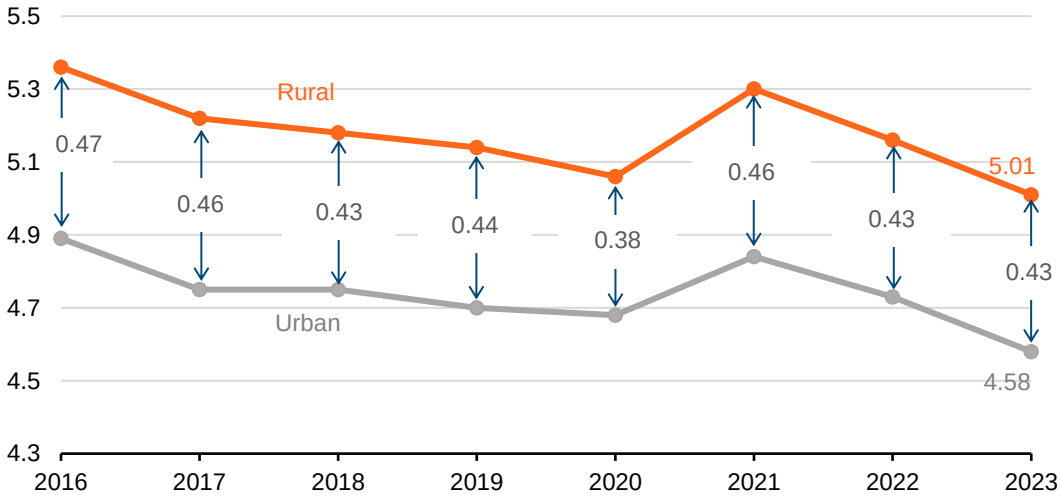
Source: LPM (2020); LPM (2022); LPM (2023) and KRI calculations.
Note: The GPN measures SPM candidates' achievement across the country. A decrease in the GPN's value indicates an improvement in candidates' achievement for the year.

[102] LPM (2020); LPM (2022); LPM (2023)

Despite the improvement in SPM candidates' achievement at the national level, there remains a gap in student performance between rural and urban areas (Figure 3.3). The disparity between urban and rural areas has been a longstanding issue in Malaysia, though the gap was declining between 2016 and 2020[103]. However, the 2021 SPM results showed that urban students outperformed their rural counterparts by a larger margin, reversing progress made in closing the urban-rural gap. As school closures resulted in students having to rely on virtual learning, lower digital access in rural areas may have exacerbated the gap between urban and rural students. This is further discussed in Section 3.4.

In addition, studies have shown that teachers in rural areas are often faced with challenges related to limited training, given the scarcity of resources[104] and self-efficacy in adopting new pedagogies, amongst others. During the pandemic, these disparities have widened. While urban students were able to continue their education with minimal disruption due to better access to online learning tools, many rural students struggled to adapt to remote learning, contributing to a significant drop in their academic performance. As such, this trend underscores the urgent need for targeted interventions to bridge the educational divide and ensure equitable learning opportunities for all students.

Figure 3.3: GPN, by location, 2016 – 2023



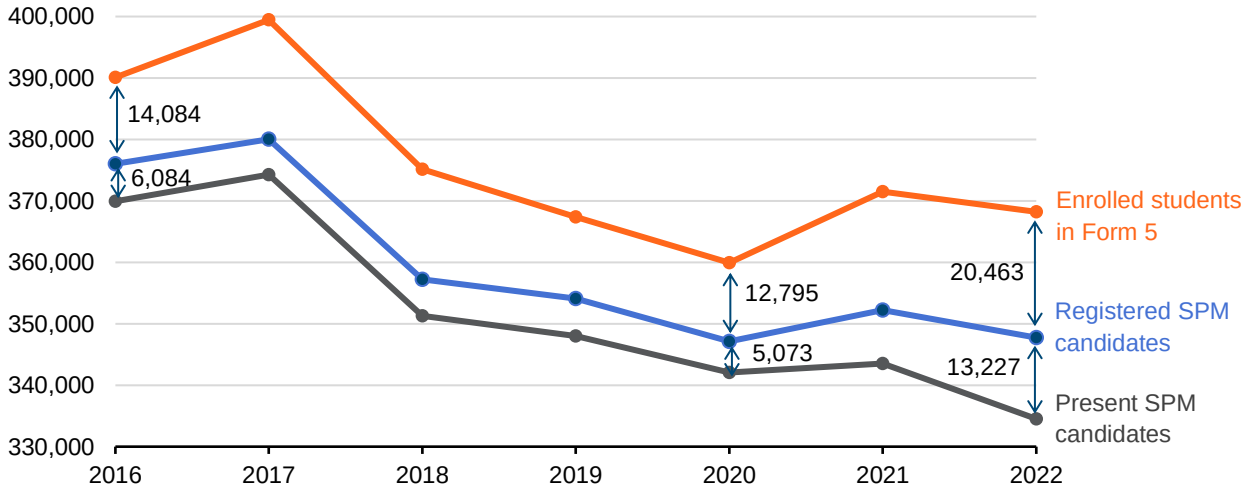
Source: LPM (2020); LPM (2022); LPM (2023) and KRI calculations.

[103] LPM (2020); LPM (2022); LPM (2023)
[104] Holloway (2002)

3.2.2. SPM absenteeism

Another notable issue during the pandemic was the rise in SPM absenteeism. In 2021 and 2022, the gap between enrolled students in Form 5 and the number of registered and present SPM candidates increased[105], indicating a higher number of SPM absentees (Figure 3.4). This trend persisted in 2023 when over 10,000 students were reported absent[106]. According to the MOE, family issues, accidents, illnesses and candidates' employment were among the key reasons attributing to SPM absenteeism[107]. Indeed, this trend is concerning, as absenteeism can have long-term implications for students' educational trajectories and future prospects[108]. Addressing the root causes of absenteeism is crucial to ensuring that all students have the opportunity to complete their education and succeed academically.

Figure 3.4: Number of enrolled students in Form 5, registered, and present SPM candidates, 2016 – 2022



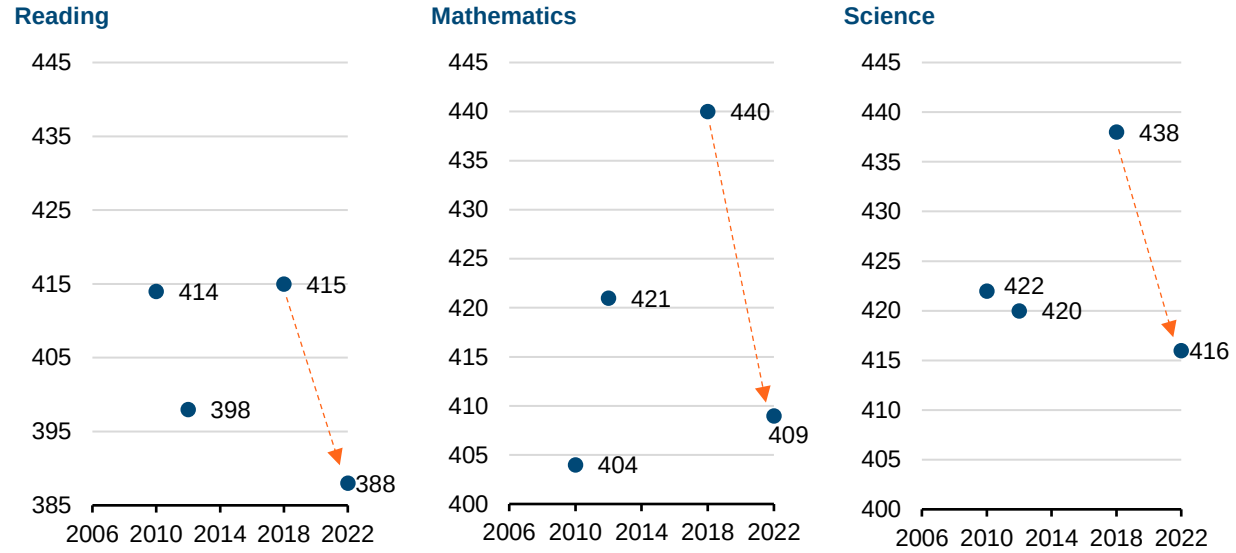
Note: Only includes candidates from government schools, government-aided schools, and government-aided religious schools.
Source: MOE (2019); MOE (2021); MOE (2022) and KRI calculations.

3.2.3. Malaysia's Programme for International Student Assessment (PISA) performance

PISA, conducted by the Organisation for Economic Co-operation and Development (OECD), assesses the reading, mathematics and science proficiency of 15 year old students globally. Malaysia's performance in PISA has been a topic of concern[109], with the country consistently ranking below the OECD and ASEAN-6 averages[110]. The most recent PISA results, released in 2022, showed a declining trend from 2018 in all three categories: reading, mathematics and science (Figure 3.5)[111], with disparities more apparent between private and public schools, particularly in Mathematics (Figure 3.6).

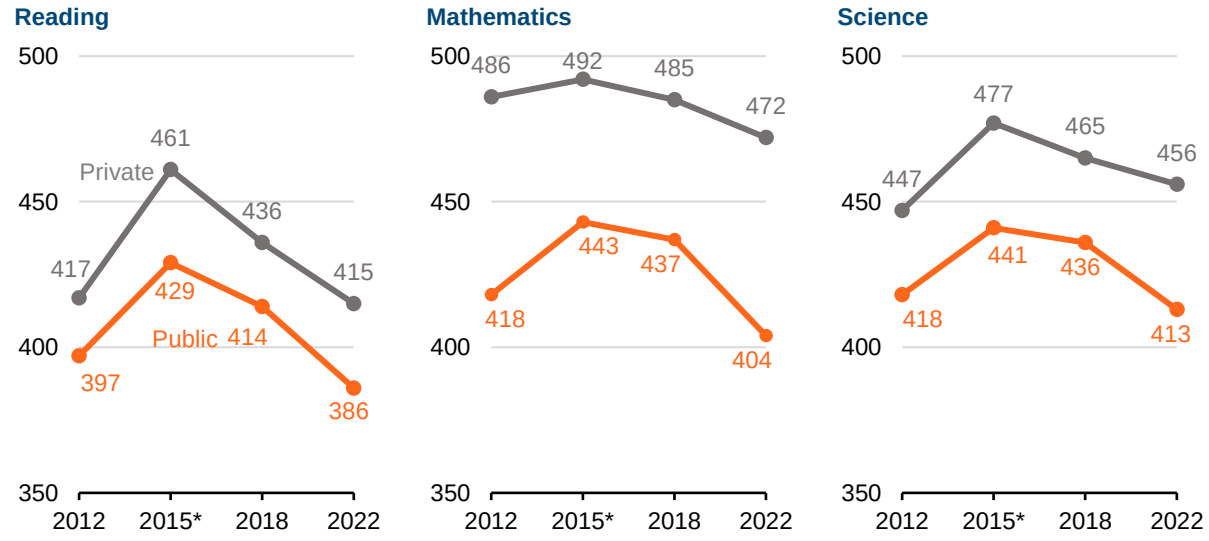
[105] MOE (2019); MOE (2021); MOE (2022)
[106] The Star (2024)
[107] Ibid.
[108] Heckman, Stixrud, and Urzua (2006)
[109] Perera and Asadullah (2019); World Bank (2024a); Sofea Azahar and Cheng (2024)
[110] Sofea Azahar and Cheng (2024). The ASEAN-6 consists of Singapore, Vietnam, Malaysia, Thailand, Indonesia and the Philippines.
[111] OECD (2022)

Figure 3.5: PISA Scores, Malaysia, selected years



Source: OECD (2022)

Figure 3.6: PISA Scores, Malaysia, by type of school (public and private), selected years



Source: OECD (2022)
Note: *Malaysia did not meet the PISA Technical Standards in PISA 2015 as the weighted response rate among the initially sampled Malaysian schools (51%) was short of the standard PISA response rate of 85%. Hence, Malaysia's PISA 2015 results may not be comparable to those of earlier or later years.

3.3 Impact of School Closures on Education Outcomes: Global Insights

School disruptions are among the unintended consequences of the Covid-19 pandemic. In line with social distancing measures, many countries closed schools and suspended face-to-face learning as a response to escalating Covid-19 cases at the time. At the peak of the pandemic in April 2020, it is estimated that around 1.5 billion children and youth were affected by school closures[112]. Thus, this section seeks to explore other countries' experiences with school closures and their impact on students' education outcomes. This section begins with a literature review of past occurrences of school disruptions and their consequences towards education attainment before delving deeper into insights specific to Covid-19.

3.3.1. School disruptions and its impact on education attainment

The association between schooling disruptions and their negative impact on learning is not new. Variations in instructional time, whether due to planned changes in the school day or unexpected closures, have been shown to affect student performance. Past literature on this topic has documented the effects of various disruptions, such as teacher strikes and crises including pandemics[113], famines[114], floods[115], hurricanes[116], earthquakes[117] and the Asian Financial Crisis[118], on both learning outcomes and labour market returns in the short and long term. These disruptions can lead to significant declines in school enrolment and student achievement, and recovery from them may take years.

Increased dropout rates are a significant outcome of emergency school closures and other educational disruptions. Generally, as children grow older, the opportunity cost of staying in school rises. This, in turn, makes it more challenging for households, especially those under financial strain, to justify sending older children back to school after an interruption. Such patterns were observed not only during the 1916 polio pandemic[119] (which saw children of working age leave school permanently during pandemic-related shutdowns), but also in large economic disruptions such as those experienced in Indonesia during the 1980 economic adjustments[120].

Additionally, past studies have found that any interruption in schooling, including scheduled school holiday periods, can lead to a loss of learning for many children. This is observed mainly in countries with long summer breaks, which, on average, are over the period of three months. For instance, a long-term study conducted in the US found that between 25% to 30% of learning gained during the school year was lost during the summer break[121]. These losses tend to be greater among students from low-income households[122] or when the disruptions are happening during critical schooling stages[123].

[112] UNESCO (2023)
[113] Meyers and Thomasson (2017)
[114] Dercon and Porter (2014)
[115] Sacerdote (2012)
[116] Ibid.
[117] Andrabi, Daniels, and Das (2023)
[118] Cameron (2009)
[119] Meyers and Thomasson (2017)
[120] Cameron (2009)
[121] Alexander, Pitcock, and Boulay (2016)
[122] Kim and Quinn (2013)
[123] Lloyd (1978)

Education loss is not only limited to the immediate observed effects of school closures. Rather, past disruptions have shown that they may have a large and lasting impact. An example of this is the education losses observed following the 2005 earthquake in Pakistan, where even four years after the event, school-aged children who lived near the fault line performed worse in school[124]. However, the losses observed among the children could not be fully attributed to the school closures. Rather, it was argued that the children were learning less in subsequent years after schools reopened[125].

This suggests that students may face compounding learning losses even years after a school-disrupting event. The much lower education attainment faced by students affected by the 2005 Pakistan earthquake may be driven by the education policy at the time[126]. Students had to be promoted into the next grade in each new school year and were taught at a higher grade level compared to their current grade performance—hence, were more likely to have fallen farther behind. This is aligned with the literature that highlights that students being taught at a higher level than they are reduces how much they are able to learn[127].

While the impact of the Covid-19 pandemic on global school disruptions stands at an unprecedented scale, previous studies on other crises provide a baseline understanding of the relationship between school closures and their impact on children's academic attainment in both the short and long term.

3.3.2. Examining learning loss during the Covid-19 pandemic

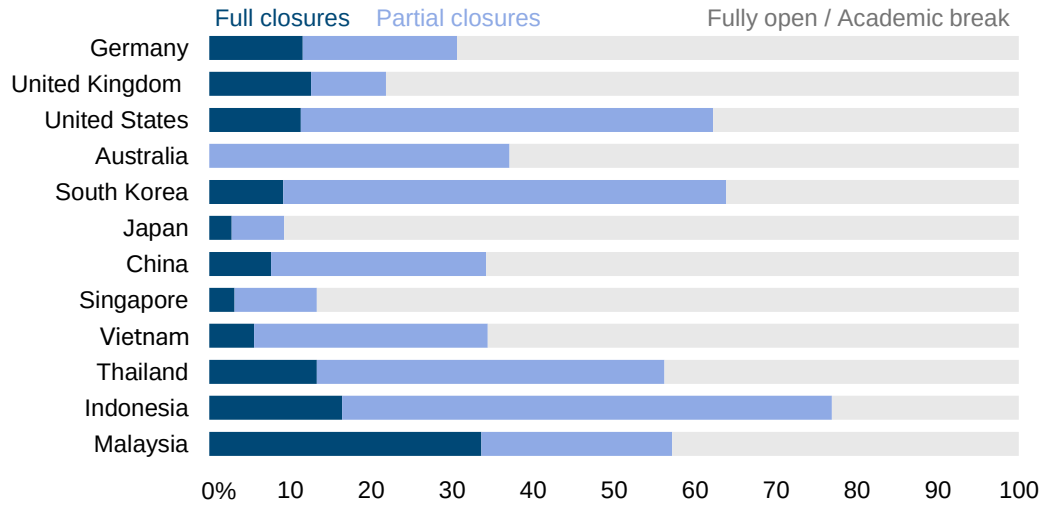
School closures during the Covid-19 pandemic

Globally, full school closures due to the pandemic stood at an average duration of 14 weeks (3.5 months) since the onset of the pandemic[128]. A country is defined as having experienced full school closures when all schools nationwide were closed down due to Covid-19. However, when considering localised school closures (partial closures), the duration rises to 22 weeks (5.5 months)[129].

Partial school closures are when schools were closed in selected regions or that only certain grades were open for face-to-face teaching. Partial school closures imply that some students may experience differences in the length of school closures within the country—with some having longer closures than others. The length of these closures also greatly varies by region and country for both full and partial school closures. Figure 3.7 shows the percentage of days schools were either fully or partially closed during the period from February 2020 to July 2022.

[124] Ceyhan and Ceyhan (2007)
[125] Andrabi, Daniels, and Das (2023)
[126] Ibid.
[127] Banerjee et al. (2016)
[128] Ibid.
[129] Ibid.

Figure 3.7: Percentage of days schools were fully or partially closed over the February 2020 to July 2022 period



Source: UNESCO (2023) and KRI's calculations.

In comparison to the countries above, Malaysia had the longest duration of full school closures (Figure 3.7). In total, Malaysia experienced around 41 and a half weeks (33.6%) of full school closures out of the 124 weeks from mid-February 2020 to 1st July 2022. Meanwhile, other countries in the region experienced much shorter full school closures. Indonesia had around 20 weeks of full school closures, while the lowest in the region, Singapore, saw a little under four weeks of closures.

When considering partial closures, some students in Malaysia could have experienced up to 71 weeks (57.2%) of school closures depending on their school's region or grade. Particularly, due to rising Covid-19 infections, schools in Selangor, Kuala Lumpur, Putrajaya and Sabah were closed for an additional three weeks compared to other states. Meanwhile, priority for physical school sessions was given to those sitting for school-leaving examinations whilst others continued with virtual learning.

However, it should also be noted that a significant majority of countries underestimated the initial duration of school closures needed during the Covid-19 pandemic. In a World Bank survey, 63 out of the 169 countries analysed estimated one to two weeks of school closures, while another 47 estimated around three to four weeks[130]. In actuality, the majority of countries experienced school closures that were seven weeks longer than expected[131]. The unexpected, prolonged school closures may indicate that most countries were not adequately prepared to support alternative forms of learning for longer durations—especially during the early stages of the pandemic.

[130] Prihartono et al. (2024)
[131] Ibid.

Capturing learning loss: experiences of other countries

School closures and being unable to attend school can impact students in several ways. Students may not have an opportunity to learn (forgone), they may have forgotten what they have previously learned (forgetting) or they may experience both (forgone and forget).

Recognising the importance of capturing potential learning loss, the World Bank developed an estimate on how school closures during the Covid-19 pandemic can impact the loss in learning quality adjusted years of schooling. Learning adjusted years of schooling (LAYS) is a metric developed and updated by the World Bank in 2020 as a means of standardising the learning quality and quantity of individual countries in a singular, comparable measurement[132]. LAYS reflects both learning and barriers to learning within a country, serving as a metric of progress on its performance in educating its people[133].

The impact of post-Covid-19 scenarios onto LAYS is dependent on the duration of school closures. Prior to the pandemic, globally children were receiving an average of 7.8 years of schooling when adjusting for the quality of learning they experienced between the ages of 4 to 17[134]. In the intermediate scenario (where schools are closed for 5 months), school disruptions due to Covid-19 could result in the loss of 0.6 years of schooling (Table 3.1). This brings down the global average learning experienced by students to 7.2 LAYS post-pandemic.

In a more optimistic scenario (3 months of school closure), students are likely to experience a loss of 0.3 years of schooling. However, in the pessimistic (7 months closure) and very pessimistic (9 months closure) the schooling loss is higher at 0.9 years and 1.1 years, respectively. In cases of both pessimistic and very pessimistic scenarios, the estimated years of schooling lost is higher than the duration of school closures for all regions.

The extent of learning loss will also vary by region. In the case of East Asia and Pacific, children who are expected to have 8.3 years of learning adjusted schooling before the Covid-19 pandemic may instead only experience 8.1 years in an optimistic scenario or 7.2 years in a very pessimistic scenario. This equates to a loss of between 0.2 to 1.0 years of learning adjusted schooling due to school closures and disruptions caused by the pandemic.

[132] Filmer et al. (2020)
[133] Ibid.
[134] Azevedo et al. (2021)

Table 3.1: Simulated effects of Covid-19 on Learning-Adjusted Years of Schooling (LAYS), by region

	Baseline	Post-Covid			
		Optimistic	Intermediate	Pessimistic	Very Pessimistic
Global	7.8 LAYS	7.5	7.2	6.9	6.7
	Loss (years)	*0.3*	*0.6*	*0.9*	*1.1*
By region					
East Asia and Pacific	8.3	8.1	7.8	7.4	7.2
		0.2	*0.5*	*0.9*	*1.1*
Europe and Central Asia	10.0	9.8	9.4	9.0	8.7
		0.2	*0.6*	*1.0*	*1.3*
Latin America and Caribbean	7.8	7.5	7.2	6.9	6.7
		0.3	*0.6*	*0.9*	*1.1*
Middle East and North Africa	7.6	7.4	7.0	6.7	6.5
		0.2	*0.6*	*0.9*	*1.1*
North America	11.1	10.9	10.5	10.0	9.7
		0.2	*0.6*	*1.1*	*1.4*
South Asia	6.5	6.2	6.0	5.7	5.5
		0.3	*0.5*	*0.8*	*1.0*
Sub-Saharan Africa	5.0	4.8	4.6	4.4	4.2
		0.2	*0.4*	*0.6*	*0.8*

Source: Azevedo et al. (2021)

Note: The post-Covid-19 scenarios are categorised as follows-

1. Optimistic: schools are closed only for 3 months of a 10-month school year, and the effectiveness of mitigation measures (such as remote learning) put in place by governments is high.
2. Intermediate: schools are closed for 5 months, and the mitigation measures have a middle level of effectiveness.
3. Pessimistic: schools are closed for 7 months, and the mitigation measures have low levels of effectiveness.
4. Very pessimistic: schools are closed for 9 months, and the mitigation measures have low levels of effectiveness.

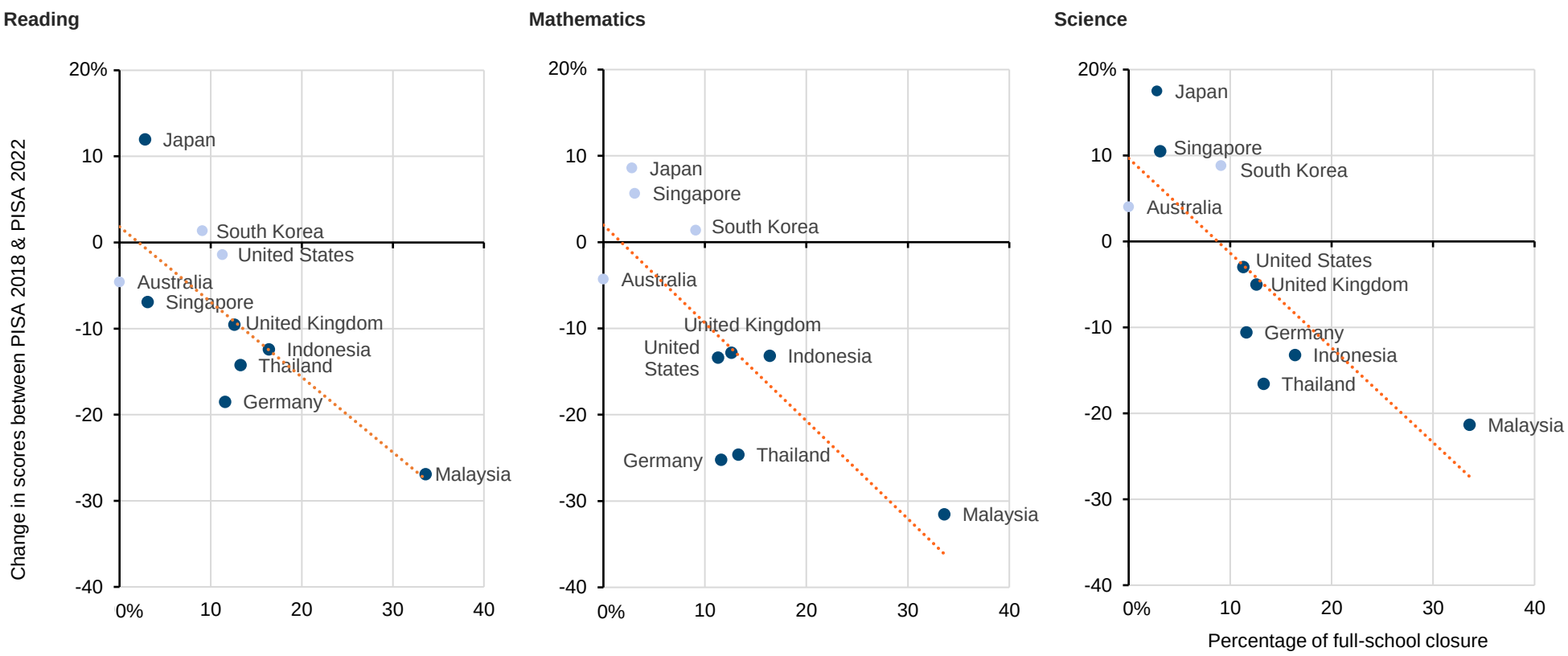
Findings from the above study on simulated learning loss indicate that longer school closures result in higher losses in years of schooling. This is further echoed by the results of the 2022 PISA. Figure 3.8 shows that the duration of full school closures is correlated with the change in PISA scores from 2018 to 2022. Countries with longer full school closures during the February 2020 to July 2022 period also showed greater reductions in average student scores in the 2022 PISA compared to the previous 2018 PISA. This trend is observed in all three subjects tested under the PISA examinations.

Concerningly, Malaysia, which had 41 and a half weeks of full school closures, showed a significant reduction in the 2022 PISA compared to its performance in the 2018 PISA. Malaysia's average PISA scores dropped by -26.9% in *Reading,* -31.5% in *Mathematics* and -21.3% in *Sciences*. While there may be other factors that could have influenced the decrease in performance, it is highly likely that the long school closures contributed significantly to the decline in scores between the 2022 and 2018 PISA.

In addition to the reduced learning brought on by the school closures, global economic recession may worsen issues surrounding dropouts. It is estimated that Covid-19 may result in an additional 10.7 million children to drop out of school, with two-thirds in the aged between 12 and 17[135]. The cause of students dropping out of school is likely to be driven by income shocks and economic recession brought on by the pandemic[136].

[135] Azevedo et al. (2021)
[136] Ibid.

Figure 3.8: Change in Programme for International Student Assessment (PISA) Scores from 2018 to 2022, by percentage of full school closures, by country and subject



Source: OECD (2022); UNESCO (2023) and KRI's calculations.
Note: Non-significant change in the PISA results is highlighted in a lighter colour.

Learning losses extend beyond academic losses

The losses experienced during the Covid-19 school closures have long-term implications for educational equity and societal outcomes. These losses are not only limited to losses in academic outcomes. Rather, global experience showed that school closures have led to several types of losses (Table 3.2). The absence of in-person instruction also meant that students missed out on critical social interactions and support services provided by schools, such as special education, meal programs and mental health counselling.

Table 3.2: Summary of various learning losses

Academic losses	Losses in socio-emotional learning
• Schooling disruptions and loss of regular study cycles • Loss in peer learning and active participation • Unable to learn through practice or experiential learning • Teachers' unfamiliarity with distance teaching	• Students lose or cannot develop their creative, critical, analytical thinking and assertiveness skills • Weakening of communication and self-control skills • Deprivation of social environment
Losses in equal education	**Psychological losses**
• Unequal access to education support • Irregular participation, access to education, and disruptions driven by digital inequality • Differences in inclusive and appropriate education environment	• Behavioural control • Issues with a lack of attention and focus • Loss of interest and low motivation • Implications on mental health

Source: KRI's compilation

It is important to note that the transition to online learning during the pandemic was an emergency response towards the need for education continuity during the prolonged school closures. As such, most countries were unprepared for the full implementation of online learning and their ability to implement alternative teaching channels was dependent on their existing capacity and infrastructure[137]. Many teachers were also unfamiliar and had insufficient time to adapt to distanced learning[138]. Furthermore, their previous teaching methods used during in-person teaching were unsuitable for virtual learning[139]. The limited interactions and forms of teaching available during distanced learning, especially at the start of the pandemic, resulted in many students being passive learners[140] and contributed to the academic loss experienced.

[137] Prihartono et al. (2024)
[138] Seetal, Gunness, and Teeroovengadum (2021)
[139] DemiR, Özdaş, and Çakmak (2022)
[140] Ibid.

Additionally, distanced learning may have negatively impacted children's socio-economic learning (SEL)[141]. SEL is defined as the process of obtaining a range of holistic skills and qualities such as the capacity to regulate emotions and actions, resolve issues, make ethical decisions and other forms of non-cognitive skills[142]. There are two broad categories of SEL, namely the ability of students to achieve a set of goals (student effort) and the ability to develop inter-personal skills (social skills)[143]. Students with high SEL competencies are less likely to experience mental health difficulties and thus tend to have higher academic attainment[144].

School closures and social distancing measures during the Covid-19 pandemic resulted in limited means for children to engage with their peers. Typical school interactions such as playing with other children, socialisation over recess or lunch or competing in extra-curricular activities became absent during distanced learning[145]. Hence, skills such as sharing, coping with competitions and communication skills were weakened due to them being away from a school and classroom environment[146]. The lower development of these SEL attributes, particularly among younger students, may have long-term consequences on their academic outcomes and mental resilience[147].

In relation to mental resilience, the Covid-19 pandemic has been found to negatively impact children's mental health. Various studies have found that pandemics can result in high levels of stress in both children and parents. At its peak, the Covid-19 pandemic was marked by rising infection rates, high death tolls, social isolation and economic distress. This could result in severe anxiety, depression and post-traumatic stress among children[148]. Prolonged elevated stress can lead to long-term health implications[149] whilst in the short-term impact children's motivation and focus towards learning[150].

There is a large concern about how school closures may have worsened equal education access. Various studies have shown that the pandemic had worsened educational inequalities[151]. Children from lower socio-economic backgrounds and low-income countries showed the highest learning deficits[152], in part due to disparities in technology access that allows for virtual learning. The relationship between digital accessibility and learning loss in the case of Malaysia is further explored in Section 3.4. On top of digital accessibility, learning continuity through distanced learning is affected by the student's environmental conditions (such as having a conducive space for learning) and parental or learning support received at home.

[141] Bayley et al. (2023)
[142] Ibid.
[143] Yorke, Wole, and Rose (2021)
[144] Panayiotou, Humphrey, and Wigelsworth (2019)
[145] DemiR, Özdaş, and Çakmak (2022)
[146] Ibid.
[147] Bayley et al. (2023)
[148] Araújo et al. (2021)
[149] Ibid.
[150] DemiR, Özdaş, and Çakmak (2022)
[151] UNESCO, World Bank and UNICEF (2021)
[152] Ibid.

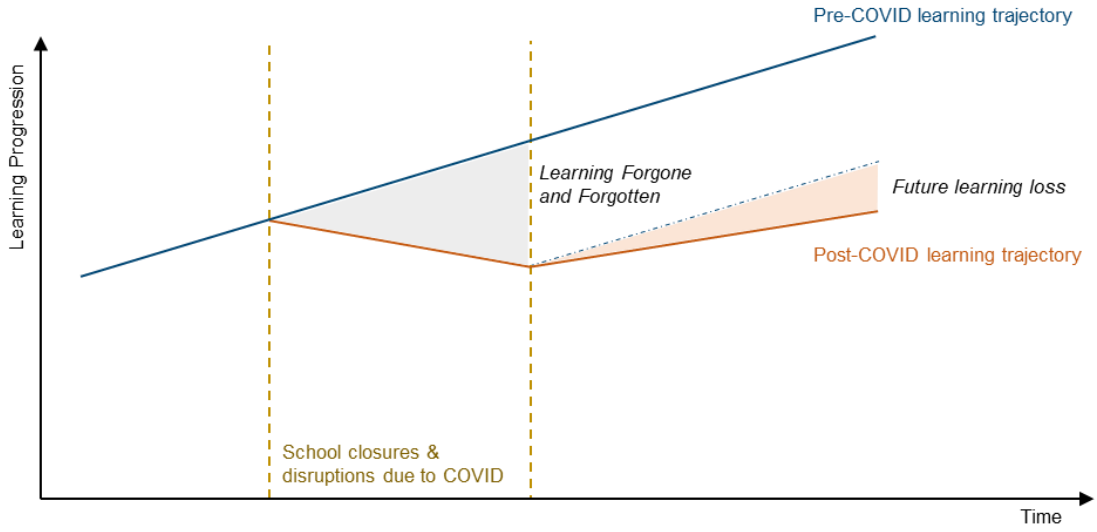
3.3.3. After Covid-19: The risk of compounding learning loss

Past crises and experiences from previous emergency-driven school closures have shown that their impact on education loss can be long-lasting (Section 3.3.1). Children who were affected by school disruptions often face lower educational attainment, higher unemployment in adulthood as well as lower expected lifetime earnings. Among the long-term education losses associated with school closures are slower learning progressions even when students resume normal school hours[153]. In the case of Malaysia, despite the reopening of schools, a third of students (both primary and secondary) reported that they were not learning more, while one-fifth of students shared that they struggle to catch up on their studies[154].

Learning is a cumulative process as new knowledge and skills are built upon the student's previous understanding and ability to grasp taught concepts[155]. Hence, on top of the learning forgotten and forgone during the pandemic, learning loss could further accumulate despite schools reopening. Students who are struggling with their studies at the current grade level may struggle even more when they move up to a higher grade if their learning gaps are not sufficiently addressed[156]. This, in turn, may lower their learning trajectory compared to their pre-Covid learning trajectory.

Figure 3.9 provides a visualisation of how future learning loss can occur after schools reopen. The *Pre-Covid learning trajectory* shows the learning progression rate of the student prior to the pandemic school closures. However, during the school disruption period (marked in yellow dotted lines), the student experiences learning loss (marked by the area shaded in grey, *learning forgone and forgotten*) which reduces their learning progression. If the student is unable to recover and struggles to catch up with their studies, they may be pushed towards a new lower learning trajectory (*Post-Covid learning trajectory*). The gap between the pre-Covid rate of learning (represented by the dashed blue line) and the *Post-Covid learning trajectory* represents the accumulation of future learning loss.

Figure 3.9: Visualisation of learning trajectories, pre- and post-Covid, without learning recovery efforts



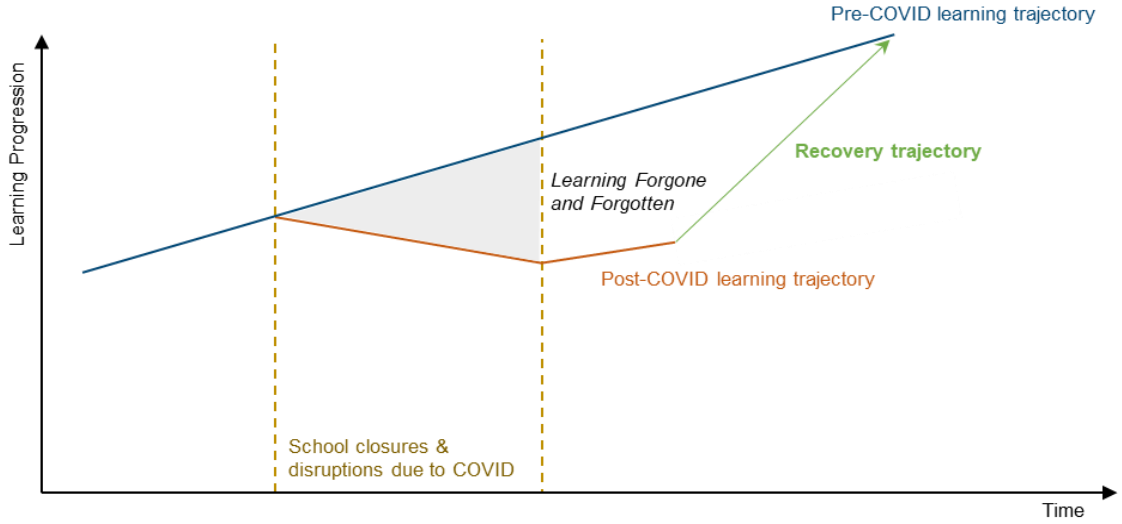
Source: Visualisation adapted from UNESCO, World Bank, and UNICEF (2021)

[153] Andrabi, Daniels, and Das (2023)
[154] Asadullah (2023)
[155] UNESCO, World Bank, and UNICEF (2021)
[156] Banerjee et al. (2016)

Figure 3.9 illustrates how the absence of learning recovery initiatives can result in a greater learning loss compared to what is estimated at the end of the pandemic. In the scenario where the student retains their pre-COVID learning rate, they are still unable to reach their expected learning progression due to the forgone and forgotten learning experienced during the school closures. Thus, for a student to truly recover from the learning loss, they need to be learning at an accelerated trajectory (*recovery trajectory)*[157] (Figure 3.10).

Figure 3.10 shows that concentrated efforts are needed to improve student's learning trajectories to make up for the learning loss experienced during the pandemic. It can also indicate that the earlier the student is placed on the *recovery trajectory*, the more achievable their ability to recuperate their learning progression during their education period.

Figure 3.10: Visualisation of learning trajectories, pre- and post-Covid, with learning recovery efforts



Source: Visualisation adapted from UNESCO, World Bank, and UNICEF (2021)

However, it should be noted that this trajectory only visualises a singular student. Variations in the length of school closures experienced, the time/grade in which the disruption occurred as well as the support received during this period can all result in different learning trajectories and loss. Given that the pandemic had likely led to losses in equal education access, it is important to highlight that education recovery should be tailored to the needs of individual students. Thus, assessing students' learning levels periodically is important to ensure that the proper support and resources can be mobilised.

3.4 The Role of ICT and Virtual Learning

Following the implementation of the first MCO, home-based learning was introduced to mitigate learning disruptions from school closures. Despite efforts to ensure uninterrupted access to education, digital inequalities remained an issue among many students, hindering equitable learning when school lessons were primarily delivered online. This section first elaborates on the home-based learning scheme introduced by the government and other initiatives to address the digital gap. It then identifies the prevalence of digital inequality among students and its impacts on learning during school closures.

[157] UNESCO, World Bank, and UNICEF (2021)

3.4.1. Introduction of home-based learning

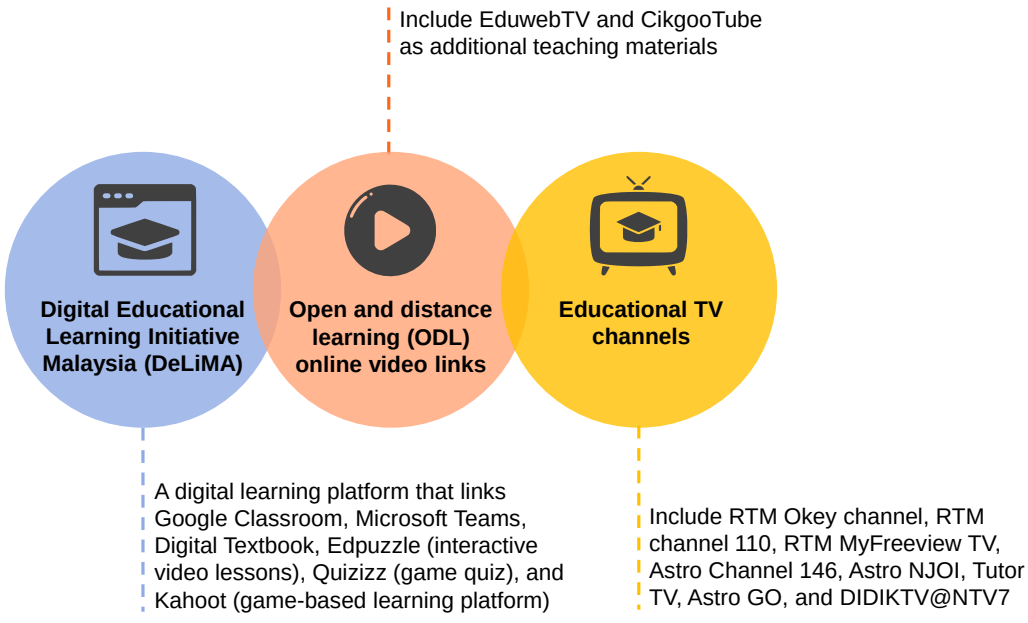
The PdPR scheme, also known as the Teaching and Learning at Home scheme, was launched on 18 March 2020, alongside the initiation of the first MCO. The PdPR is a comprehensive home-based learning programme introduced by MOE to ensure learning continuity during school closures. It was implemented at all MOE educational institutions at primary and secondary levels. The implementation of PdPR was guided by three main principles: leaving no students behind, fulfilling basic learning and prioritising the socioemotional well-being of students.

PdPR learning modalities and delivery means

The PdPR comprises three primary learning modalities: Digital Educational Learning Initiative Malaysia (DELIMa), Open and Distance Learning (ODL) online video links and educational TV channels (Figure 3.11). The DELIMa modality is a digital learning platform that allows students real-time access to online classes delivered by their schoolteachers, while ODL online video links serve as additional learning and teaching materials accessible to teachers, students and parents.

Several educational TV channels were also introduced as an additional medium for distance learning delivery through the broadcast of daily educational lessons. In particular, DIDIKTV, an educational programme that previously aired on specific slots on certain channels, was expanded into a TV channel dedicated to airing programmes based on the ministry's curriculum and co-curriculum from 7 a.m. to midnight daily during school closures[158]. In 2022, the DIDIKTV programme recorded a monthly viewership of four million, demonstrating its extensive reach and widespread usage among audiences[159].

Figure 3.11: PdPR learning modalities



Source: Asadullah (2023) and KRI's illustration.

[158] BERNAMA (2021b)
[159] New Straits Times (2022)

The PdPR can be implemented online, offline or off-site. The PdPR manual, which serves as a guideline for parents, teachers and MOE administrators, encourages teachers to use any or a combination of the delivery methods to conduct lessons that suit the needs and circumstances of the students. The online delivery of PdPR is mainly aimed at students who have access to both the internet and digital devices in order to follow real-time learning. It utilises online learning platforms, including DELIMa, ODL online video links and social media applications such as Telegram and WhatsApp. Game-based activities, video, audio clips, eBooks and recordings of online assignments were also administered to strengthen the online delivery of PdPR.

Offline administration of PdPR is typically employed for students who do not have an internet connection but can access digital devices such as computers, laptops, tablets or smartphones. This approach also involves the use of textbooks and other learning materials such as video, audio, slides, notes and exercises that can be downloaded from online platforms when students have access to the internet.

For students who have access to neither the internet nor digital devices, the PdPR is delivered off-site. The off-site PdPR generally takes place at community centres or other suitable premises designated as temporary transfer centres for natural disasters or disease outbreaks. This delivery method requires self-learning or guidance by academic support teams consisting of district education office (*Pejabat Pendidikan Daerah*) officers or appointed schoolteachers.

The versatility in implementing the PdPR is crucial in accommodating students with varying needs, resources and home environments, ensuring learning is as accessible and equitable as possible during school closures. Despite the availability of offline and off-site options, online PdPR remained the primary means of learning during school closures as it allowed real-time learning and interactions between students and teachers.

Additional government initiatives aimed at addressing the digital gap

The government also introduced several complementary initiatives and aids to facilitate the implementation of the PdPR. These include providing digital devices and distributing internet data packages to students and households that were in need through initiatives such as *PerantiSiswa Keluarga Malaysia*, *Jaringan Prihatin* and the distribution of special internet subscription packages. In addition, the government launched the National Digital Network or *Jalinan Digital Negara* (JENDELA), a comprehensive digital infrastructure initiative, which forms part of the 12th Malaysia Plan, amidst the pandemic, in an effort to improve nationwide internet coverage and service quality.

Community Internet Centres or *Pusat Internet Komuniti* (PIK), facilities that provide free internet connection and computer usage, served as another alternative for the unconnected to follow PdPR sessions or borrow a laptop for home-based learning. The government also provided training to teachers to equip them with the skills and knowledge essential for delivering remote classes. The list of initiatives is summarised in Table 3.3.

Table 3.3: Government initiatives aimed at addressing the digital gap (non-exhaustive)

Initiatives and assistances	Description
Provision of digital devices	
PerantiSiswa Keluarga Malaysia	Distribution of tablets to Malaysian students from the B40 income group pursuing diploma, advanced diploma, and first-degree studies at higher learning institutions.
Tabung CERDIK	A project supervised by Yayasan Hasanah with the involvement of 13 government-linked investment companies (GLIC) and government-linked companies (GLC) under the MOF that distributed laptops to 150,000 students from 500 schools.
MyBAIKHATI campaign	Crowdsourcing and refurbishment of usable digital devices for distribution to B40 households and the community.
Tax reliefs	Extension of the special individual income tax relief of up to RM2,500 for the purchase of mobile phones, computers and tablets until 31 December 2022.
State initiatives	Several state governments distributed digital devices and internet data to students in need, especially those sitting for the SPM, STPM and STAM examinations.
Distribution of internet data	
Jaringan Prihatin	Subsidised mobile device package (rebate of up to RM300) or monthly internet data plan (rebate of up to RM180) for *Bantuan Prihatin Rakyat* (BPR) households over 12 months.
Special subscription packages	Special internet subscription package for SPM and STPM students as well as students of higher learning institutions until the end of April 2021.
Free internet data	Free internet data from all telecommunication companies (telcos) from 1 April 2020 until the end of MCO in 2020. Participating telcos also offered 1GB of free data for daily use on education, work, and news between 8 a.m. and 6 p.m. from 1 January 2021 until the end of April 2021.
Improvement of internet connectivity	
National Digital Network or *Jalinan Digital Negara* (JENDELA)	The government allocated RM500 million under Budget 2021 to implement JENDELA and ensure connectivity of 430 schools nationwide.
Learning facilities	
Community learning centres or *Pusat Internet Komuniti* (PIK)	Served as an alternative for students without electronic gadgets, digital devices or stable internet access, particularly those living in rural and remote areas, to follow PdPR lessons. Students were also able to borrow laptops from the PIK to use at home.
Teacher training	
Teacher Digital Learning Community or *Komuniti Guru Digital Learning*	Launched by MOE with support from UNICEF to provide online training to equip teachers with the skills and knowledge essential to conduct remote classes effectively and efficiently.

Source: BERNAMA (2021a); BERNAMA (2022); MOF (2020); MOF (2021a); UNICEF (2021); Yin and Wan Amirah (2022)

3.4.2. Digital inequalities and unequal learning

Digital inequality has been a pressing issue prior to the Covid-19 pandemic. However, its impact was felt more substantially during school closures as the reliance on digital technology became greater than ever. While efforts were undertaken to ensure access to online learning through the implementation of PdPR and other initiatives aimed at closing the digital gap, digital inequalities among students remained a barrier to effective home-based learning. Observations based on available data reveal that digital inequalities among students were evident at two levels: internet and device access. Consequently, students who faced digital inequalities were disadvantaged in their home-learning experience and subsequently, education outcomes.

Inequalities in internet and device access

Malaysia has seen significant progress in the overall level of internet access over the years (refer to Chapter 4 of the report). However, the country's digital transformation is not equally distributed, with the Covid-19 pandemic further illuminating unequal digital access among socially and economically disadvantaged groups during the crisis.

In the educational context, digital gaps remained evident among students during school closures, particularly in relation to access to fixed broadband and connected devices. Based on the PISA 2022 student questionnaire, students' access to mobile broadband was nearly universal—95.8% of students had access to mobile broadband through their own smartphone. However, about one-third, or 34.9%, lacked internet access via fixed broadband. This suggests that the majority of the students were relying on mobile broadband to follow PdPR lessons.

The type of broadband access matters for online learning. Fixed broadband generally offers higher data transfer speeds, better network stability and unlimited data in comparison to mobile broadband, making it more suitable for data-extensive online activities such as attending video conferences for work or online classes[160]. For households with multiple household members, fixed broadband serves as a better choice as it allows multiple simultaneous access without compromising connection quality.

On the other hand, mobile broadband, albeit more affordable[161], is a poor substitute for fixed broadband as it tends to be less reliable and slower[162], which can restrict the downloading of school materials and resources. The lack of internet access via fixed broadband can, therefore, hinder students from fully engaging in online classes and accessing online educational resources.

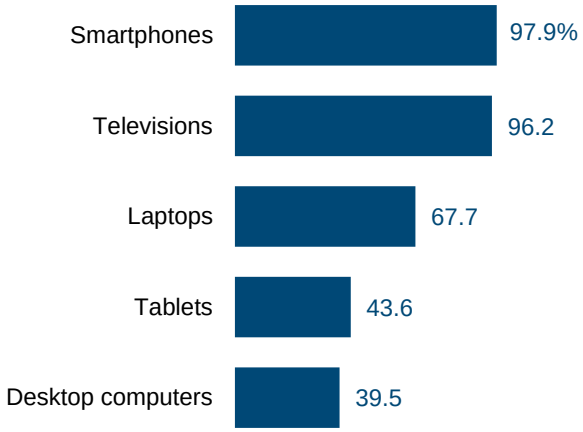
[160] Gong (2020)
[161] Ibid.
[162] Cullinan et al. (2021)

The inequality in device access was more widespread among students than internet access; there were significant disparities in the types of devices students could access and use to follow online lessons. According to a survey conducted by MOE during the first MCO, over one-third, or 36.9% of students did not own any digital devices, while less than 10% of the surveyed students owned a laptop, desktop computer or tablet[163]. Smartphone ownership was the highest compared to other digital devices but still considerably low, whereby less than half of them, or approximately 46%, had access to a smartphone.

Overall, the observation from MOE's survey was consistent with the results from the PISA 2022 student questionnaire. Access to smartphones was nearly universal among the surveyed students, followed by televisions (Figure 3.12), while the proportion of students with access to laptops, tablets and desktop computers was significantly smaller[164]. As the PISA student questionnaire was carried out later in 2022, access to laptops, tablets and desktop computers was higher than reported by the previous MOE survey conducted during the first MCO. Nonetheless, it is noteworthy that, at the time of the survey, there was still a considerable proportion of students who did not have access to these devices.

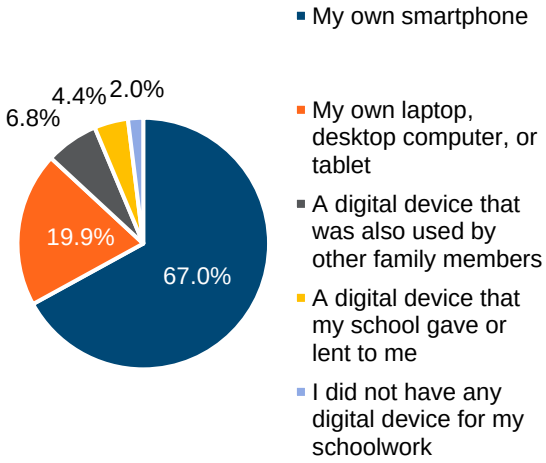
As a result, only one-fifth of students were able to engage in online learning using their own laptop, desktop computer or tablet, with the majority relying on their smartphones (Figure 3.13). Some students also reported a lack of digital devices, as they had to either share a digital device with other family members or use one that was provided or lent by the school. In addition, some (2%) did not have any digital devices to go online altogether.

Figure 3.12: Proportion of students who had access to selected digital devices, 2022



Source: OECD (2022)

Figure 3.13: The most often used digital devices for online learning, 2022



Source: OECD (2022)

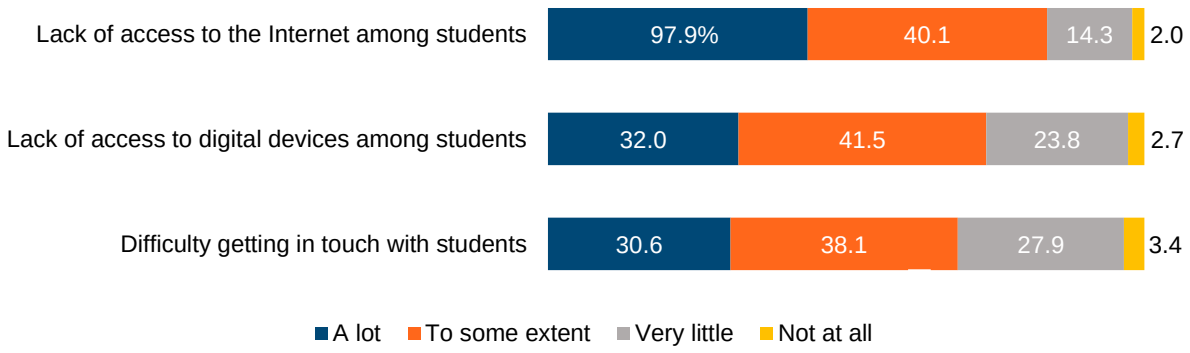
[163] Malay Mail (2020). The findings were based on an unpublished survey conducted by MOE involving 670,118 parents of 893,331 students between March and April 2020.
[164] OECD (2022)

Smartphones help those who do not have access to more robust and adequate devices like laptops and desktop computers to access online classes, but they do not necessarily close the digital gap. For instance, tablets, laptops and desktop computers provide larger screens than smartphones, making them more suitable for reading, watching video content and completing schoolwork online. Hence, students who rely on smartphones for online learning may face more constraints in online participation as well as completing homework and reading assignments outside of online classes.

In addition, fixed broadband access is generally associated with non-mobile device access[165], meaning those who attend online classes using laptop or desktop computers are more likely to enjoy the additional benefit of a reliable internet connection. When online learning became the default during school closures, not owning a suitable device such as a laptop or desktop computer could, therefore, leave the student at a disadvantage.

Issues with internet and device access were not only reported among the students; schools also faced similar issues, reflecting the scale of the issues in affecting students' engagement in online learning and schools' capacity in conducting virtual classes. According to the PISA 2022 school survey, over one-third of schools reported that students' lack of internet and device access significantly hindered their capacity to provide remote instructions during school closures (Figure 3.14). The issue with internet connection was more prevalent than the access to digital devices, indicating a cause for concern given that internet connection is the basic requirement for online learning. Some schools also encountered difficulty getting in touch with their students, presumably due to the lack of access to the internet or devices.

Figure 3.14: Proportion of PISA surveyed schools reporting the extent to which the school's capacity to provide remote instructions was hindered by issues related to internet and device access, 2022



Source: OECD (2022)

[165] Gong (2020)

Digital inequalities during school closures can further widen the existing gaps between socio-economic inequalities and urban-rural groups, hitting disadvantaged groups the hardest. In PISA 2022, Malaysia demonstrated one of the largest gaps between socio-economically advantaged and disadvantaged students[166], particularly in regard to their confidence in their capacity to drive self-directed learning. Socio-economically disadvantaged students were less confident in their capacity to drive self-directed learning than their more advantaged peers. This highlights the effect of the disparities in social and economic resources in magnifying the digital inequalities among students—both access to digital technology and the ability to use digital technologies for self-directed learning—which can have an unequal implication on their education.

Furthermore, digital inequalities may further increase the educational gap between urban and rural students. According to MOE's Home-Based Learning Effectiveness Implementation Study that examined multiple aspects of PdPR implementation during the first MCO period (March to July 2020), rural student involvement in online PdPR classes was 52.4%, lower than urban students (59.3%). Given that rural adoption and usage of digital technology is typically lower than urban (refer to Chapter 4 of the report), it is expected that rural students are less equipped to adapt to the online transition of schooling. This means that rural students might have experienced greater disruption in their education during school closure, making them more likely to fall behind their urban counterparts.

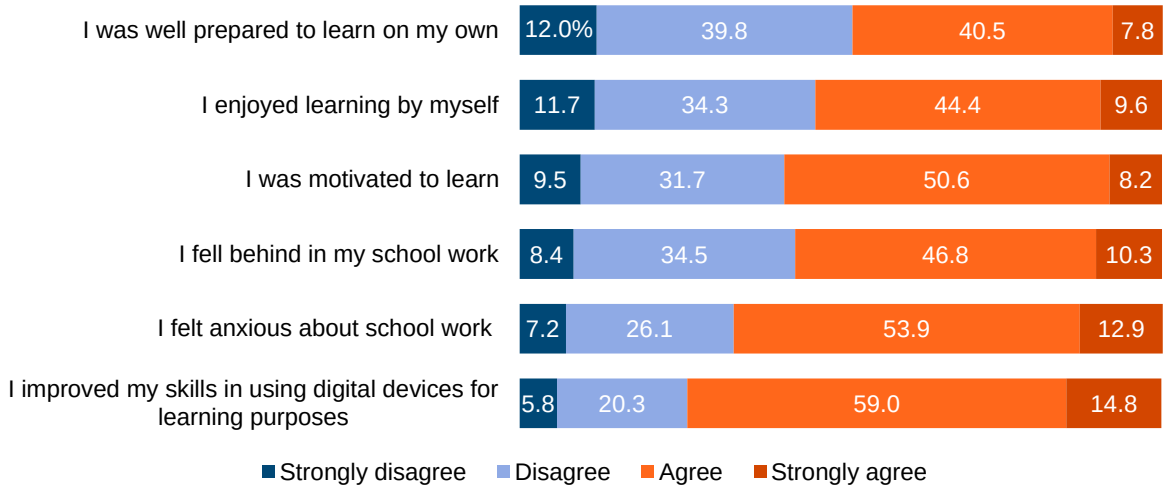
Students' perspectives on online learning

The overnight transition into online learning following the implementation of MCO and school closures was unprecedented. Although efforts to incorporate digital technology in school education started long before the pandemic, digital usage was mainly supplementary due to the lack of digital infrastructure and shortage of skilled teachers[167]. The sudden shift from communal, in-person learning to online distance learning undoubtedly presented significant challenges to students and teachers, who had to adjust quickly to the new form of schooling.

Drawing from the PISA 2022 student survey results, students' views of online learning during school closures were more negative than positive (Figure 3.15). More than half of the students (51.8%) were not well-prepared to learn on their own. Around 46% of them did not find self-learning enjoyable. At least half the students reported falling behind in their schoolwork and being anxious about it. Despite an overall discouraging experience with online learning during school closures, the silver lining was that most students improved their digital skills for learning purposes, which will serve as the foundation for greater use of digital technology in education moving forward.

[166] Socio-economically advantaged students refer to those in the top 25% in terms of socio-economic status, whereas socio-economically disadvantaged students include those from the bottom 25%.
[167] Sofea Azahar (2023)

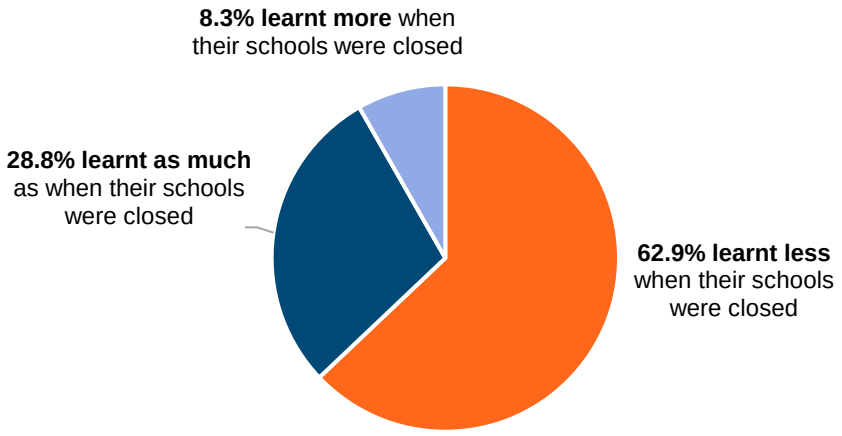
Figure 3.15: Proportion of Malaysian students reporting perspectives on online learning during school closures



Source: OECD (2022)

Additionally, most students felt that they learnt less at home than they would have at school, and only a quarter of them learnt as much from online classes as in-person learning (Figure 3.16). Although the findings were perception-based and cannot be directly translated into actual learning loss, the somewhat negative perception of students implies that many students struggled with several aspects of the online mode of learning brought on by the pandemic. These results suggest that digital inequalities are not the only barriers to online learning during school closures; there are additional issues concerning students' lack of confidence and ability to conduct remote learning that may hamper the effectiveness of online learning as an adequate replacement for in-person learning during school closures.

Figure 3.16: Students' perception towards online learning relative to in-person learning, 2022

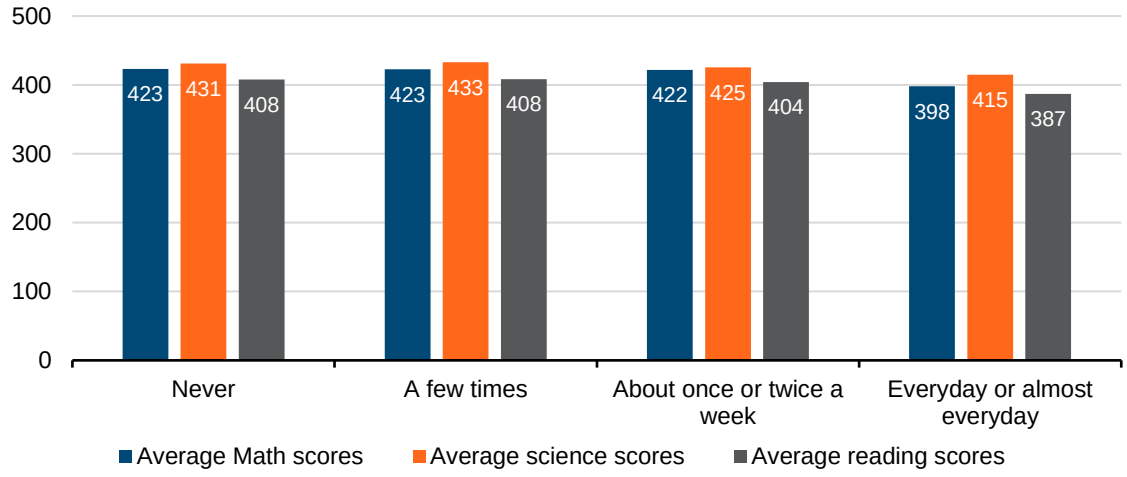


Source: OECD (2022)

Unequal digital access, unequal learning outcomes

Inequalities in access to the internet and digital devices can have an impact on students' learning outcomes. Stability, not just availability, of internet connectivity is essential for effective online learning. Regular disruptions to internet connection during online classes can lead to missed lessons or constrain students from fully engaging in learning[168], as online learning generally requires students and teachers to be online simultaneously to enable real-time interactions. As shown in Figure 3.17, students who encountered disruptions in their internet connection on a daily basis exhibited lower PISA scores in 2022 in mathematics, science and reading compared to those who had never experienced internet disruptions or had only minimal disruptions while following online lessons.

Figure 3.17: Average student PISA scores, by frequency of internet disruptions, 2022

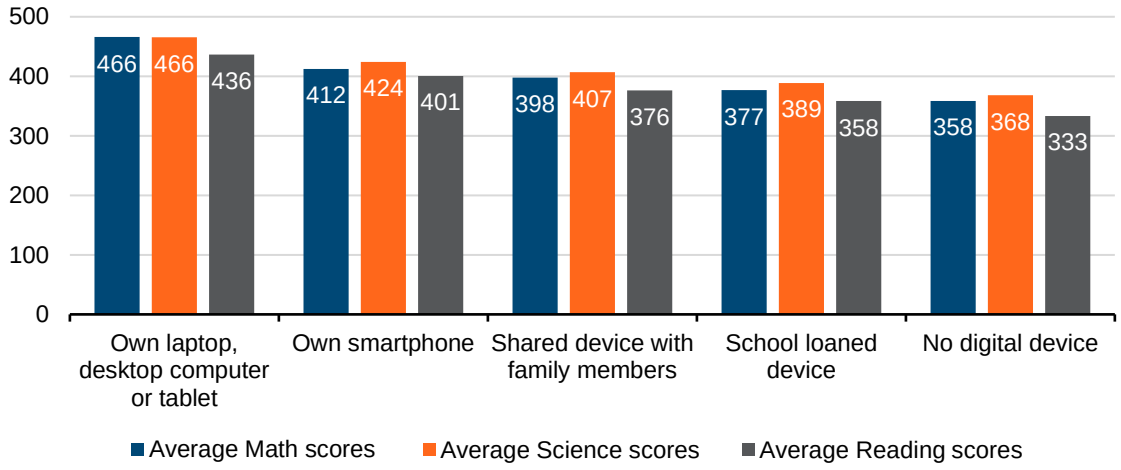


Source: OECD (2022)

The impact of disparities in digital devices was more pronounced; students with no digital device scored lower in mathematics, sciences and reading, followed by those who used school-loaned devices and shared devices with family members (Figure 3.18). Notably, students who relied on their own smartphones also had poorer performance in all three assessments of PISA 2022 than their peers who used laptops, desktop computers or tablets for online learning. This highlights that access to digital devices is simply not sufficient to ensure effective online learning where having access to a suitable device has similar importance.

[168] Cullinan et al. (2021)

Figure 3.18: Average student PISA scores, by type of device used, 2022



Source: OECD (2022)

3.5 Concluding Remarks

While the effects of school closures on education outcomes are evident as laid out in this chapter, a more thorough assessment is required to investigate the full impact of the Covid-19 pandemic on education outcomes and learning losses at each level of education, i.e., preschool, primary school and secondary school utilising more granular data. At this juncture, however, our observations suggest several key areas in addressing the effects of school closures during the Covid-19 pandemic on education outcomes, which include addressing the increase in SPM absenteeism, improving inequalities in digital learning and enhancing education recovery to address learning losses.

Address increased SPM absenteeism

Based on the MOE's analysis of the causes of SPM absenteeism as laid out in Section 3.2.2, it is important to address underlying issues, particularly related to health, social and financial aspects, faced by students from various household income backgrounds that led to increased SPM absenteeism. In addition, the prevalence of early employment amongst students in secondary school must be addressed.

Reduce inequalities in digital learning

Reducing inequalities in digital learning requires addressing issues related to access, particularly faced by those within lower socio-economic backgrounds. In the longer run, initiatives to improve inequalities in digital learning play a key role in future-proofing the nation against shocks, in alignment with the Malaysia Education Blueprint 2013 – 2025 (i.e., Shift 7: Leverage ICT to Scale Up Quality Learning Across Malaysia).

Enhance education recovery to address learning losses from Covid-19

Learning losses from Covid-19, as discussed in Section 3.3.3, suggest the need for recovery measures to ensure students do not continue to suffer from long-term education losses such as lower education attainment, higher unemployment in adulthood and lower expected lifetime earnings. As Malaysia moves forward in its education agenda, recovery measures need to be well formulated and targeted, within the context of students at each level of education and socio-economic background to ensure that measures or programs introduced are effective.

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CHAPTER

04

HEALTH AND DIGITALISATION: SOLUTIONS FOR THE PANDEMIC AND BEYOND

CHAPTER 4

HEALTH AND DIGITALISATION: SOLUTIONS FOR THE PANDEMIC AND BEYOND

By Ilyana Mukhriz, Dr Rachel Gong and Khoo Wei Yang

Digital health will be valued and adopted if it: is accessible and supports equitable and universal access to quality health services; enhances the efficiency and sustainability of health systems in delivering quality, affordable and equitable care; and strengthens and scales up health promotion, disease prevention, diagnosis management, rehabilitation and palliative care including before, during and after an epidemic or pandemic, in a system that respects the privacy and security of patient health information.

WHO (2021)

4.1 Introduction

It would be remiss to discuss the impact of the Covid-19 pandemic on the state of households without considering the increased role of digital technology in everyday life. Other chapters have already discussed the role of technology in enabling economic productivity to continue via work from home and the role of technology in enabling schooling to continue via online classes. This chapter focuses on the role of digital technology in obtaining health services, i.e. digital health.

Much has been said about how digital transformation was accelerated during the early stages of the pandemic and the healthcare sector has not been an exception. In Malaysia, health-related internet use increased due to the introduction of MySejahtera, a mobile contact tracing application which was also used to register for and record vaccinations. The widespread take-up of this app suggests that, health crisis notwithstanding, Malaysians are ready and willing to use digital health tools, with government support, described in later sections of this chapter.

The chapter begins by setting the context of digital access among households in Malaysia, examining trends of internet use during the period of 2019 – 2022. We draw on data from DOS's Information and Communication Technology Use and Access by Individuals and Households Survey (ICTHS) to show that household internet access has been consistently increasing over the years. Nonetheless, an urban-rural divide remains in terms of access to devices and type of internet access, with Malaysia generally being a "mobile-first" nation[169].

[169] "Mobile-first" refers to the Malaysian landscape where mobile broadband penetration and/or subscription rates are higher than fixed broadband.

Digital use rose during the pandemic, but this use was not sustained evenly[170]. MCOs during the pandemic forced more people to do more things online, such as paying bills. However, while younger demographics persisted with new online practices, seniors were more likely to return to offline habits. This trend is especially pronounced when examining health appointments made online.

The chapter then examines Malaysia's journey in hospital digitalisation since the 1980s. The pioneering vision of the 1997 Telemedicine Blueprint is a crucial milestone in this journey, but it has not been fully realised, due to challenges faced along the way. These challenges include procurement, internet connectivity and supporting infrastructure, system and process design, interoperability and standardisation, and data governance.

After unpacking these challenges, the chapter concludes with a way forward in line with the national digital transformation agenda, such that the healthcare sector is prepared for future crises and can contribute to a productive and thriving society. On top of adapting to be more lightweight and mobile-friendly, digital health systems should meet three design criteria. These criteria are patient inclusion and empowerment, data governance in the public interest and system integration across the healthcare landscape and over the life course.

4.2 Trends in Household Internet Use

4.2.1. Overall increase in internet access although mobile broadband outpaced fixed broadband

From 2019 to 2022, overall internet access by households saw a steady increase from 89.6% to 96.0%. Mobile broadband access was consistently higher than fixed broadband access. Figure 4.1 shows mobile broadband access as being 95.5% in 2022, while fixed broadband access was only at 46.4%.

Figure 4.1: Mobile and fixed broadband access, 2019 – 2022

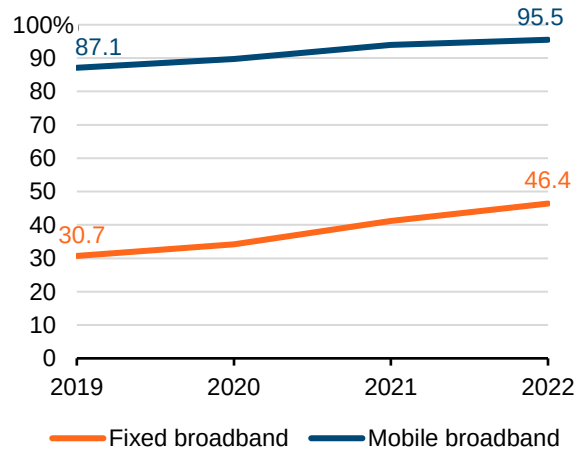
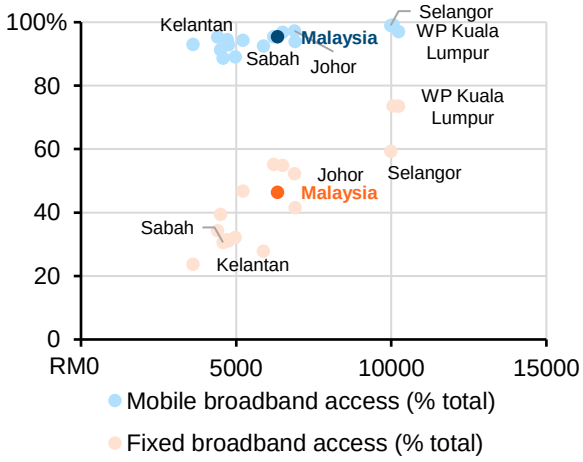


Figure 4.2: Median monthly household income - mobile and fixed broadband access, 2022



Source: DOS (2020); DOS (2021); DOS (2022); DOS (2023)

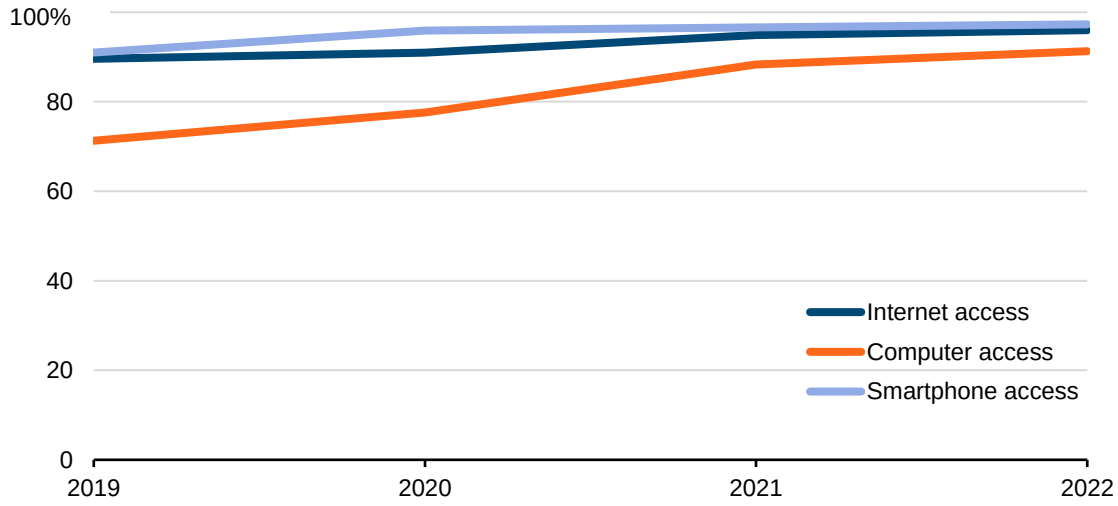
[170] Gong, Ashraf Shaharudin, and Siti Aiysyah Tumin (2022)

Moreover, differences in state median monthly income appear to have a bearing on the level of fixed broadband access. States with higher median household income are found to have higher levels of fixed broadband access (Figure 4.2). This relationship is not as pronounced for mobile broadband access, which was consistently around 90% regardless of median household income level.

The near saturation of mobile broadband access and low fixed broadband access have implications for meaningful connectivity. According to the Alliance for Affordable Internet (A4AI), meaningful connectivity is fulfilled by the following criteria: (1) sufficient download speed, (2) an adequate device (or at least one device with a full physical keyboard such as a laptop), (3) sufficient data, and (4) frequent connection[171].

The reliance on mobile broadband for internet access has its own limitations. Studies have found mobile broadband to be a weak substitute for fixed broadband[172], implying that there are benefits of fixed broadband access that are hard to be replaced by mobile alternatives. Fixed broadband is known to provide "higher data transfer speeds, better network stability, and unlimited data"[173].

Figure 4.3: Internet, computer, and smartphone access in Malaysia, 2019 – 2022



Source: DOS (2020); DOS (2021); DOS (2022); DOS (2023)

Figure 4.3 shows access to digital services and equipment at the national level. Household access to internet, smartphones, and computers has improved from 2019 to 2022. Smartphone and internet access both stood at around 96.0% in 2022 and showed only minor improvements from 2019. On the other hand, computer access significantly increased to 91.3% in 2022 from 71.3% in 2019. This improvement, however, is not uniform across states.

[171] A4AI and World Wide Web Foundation (2019)
[172] Bae, Choi, and Hahn (2014)
[173] Gong (2020)

Figure 4.4a – c on the following page shows changes in household access to internet, computers, and smartphone by states between 2019 and 2022. In 2022, Putrajaya recorded the highest level across all three types of access whereas Sabah ranked the lowest in both internet (89.6%) and computer (83.4%) access. Smartphone access is consistently high, ranking above 90.0% across all states.

In all states, internet and smartphone access were already above 80% in 2019, which explains the small growth up to 2022. The highest growth in internet access was seen in Perak at almost 14.0% while smartphone access increased the most in Kedah by almost 17%. States including Kelantan, Kedah and Pahang, which previously ranked below national average in 2019, saw some of the highest growth in computer access (percentage change of approximately 50%, 44% and 46% respectively).

Figure 4.4a: Internet access by state, 2019 and 2022

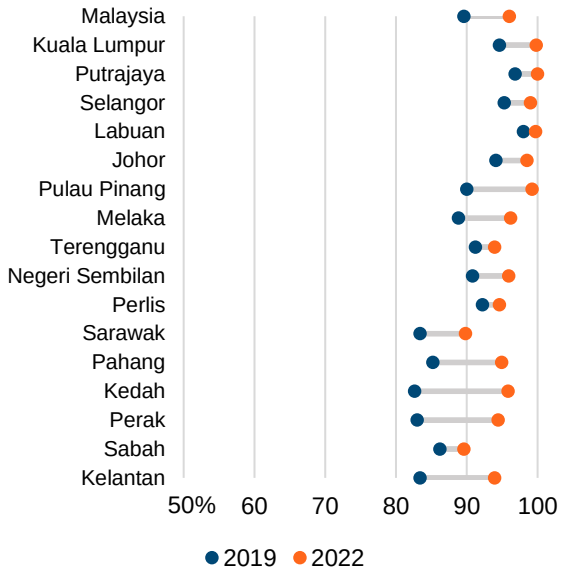


Figure 4.4b: Computer access by state, 2019 and 2022

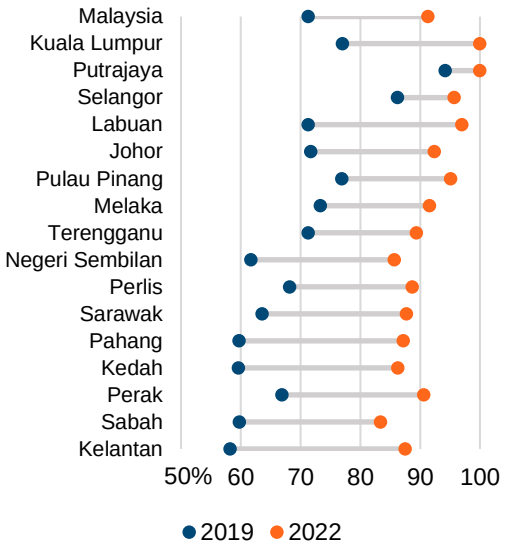
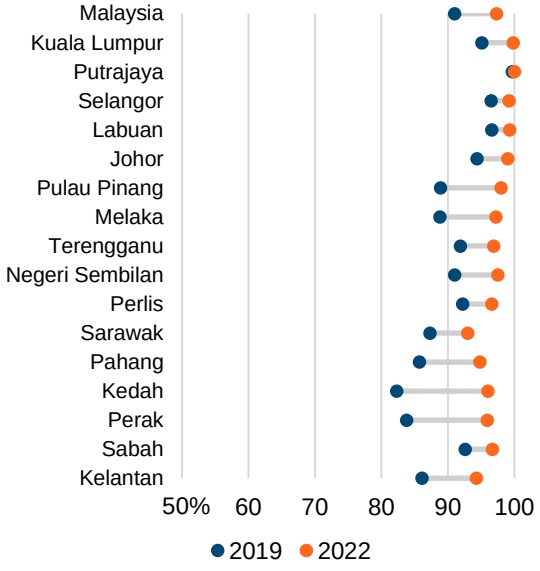


Figure 4.4c: Smartphone access by state, 2019 and 2022



Sources: DOS (2020); DOS (2023)

4.2.2. Despite significant growth, the urban-rural gap in all types of digital access persists

Figure 4.5 shows that both urban and rural households have more access to mobile broadband than fixed broadband. Urban households consistently recorded higher levels of access than rural households for both fixed and mobile broadband. Fixed broadband access remained significantly lower in rural households than urban households, reaching only 23.7% in 2022.

This trend is consistent for states with a higher proportion of urban population. Figure 4.6 shows the relationship between the proportion of the urban population in a state and fixed broadband access in 2019 and 2022. States with a higher urban population tend to access fixed broadband more than states with a lower urban population.

Figure 4.5: Mobile and fixed broadband access by strata, 2019 – 2022

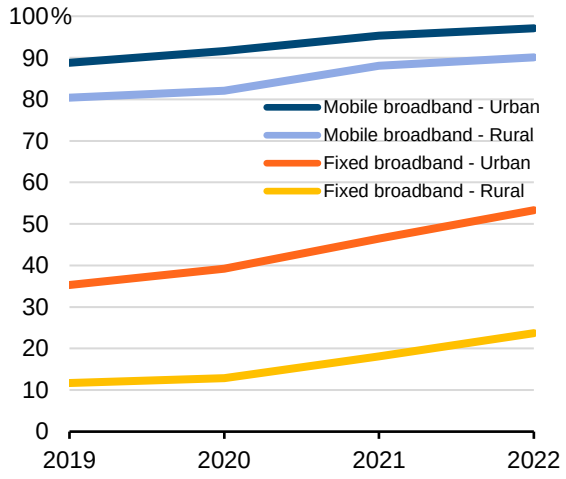
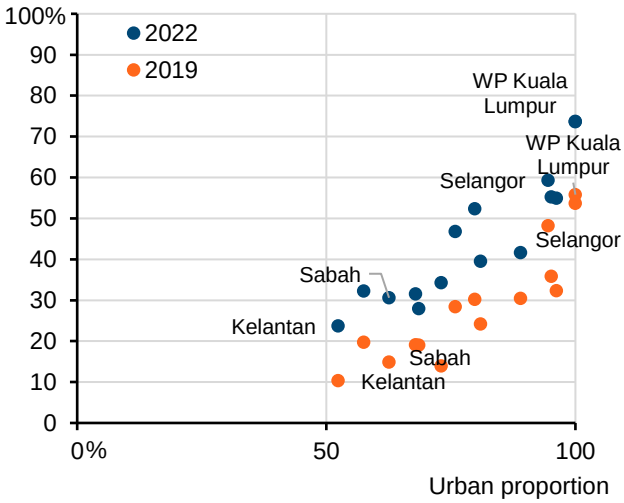


Figure 4.6: Urban proportion - fixed broadband access, 2019 and 2022

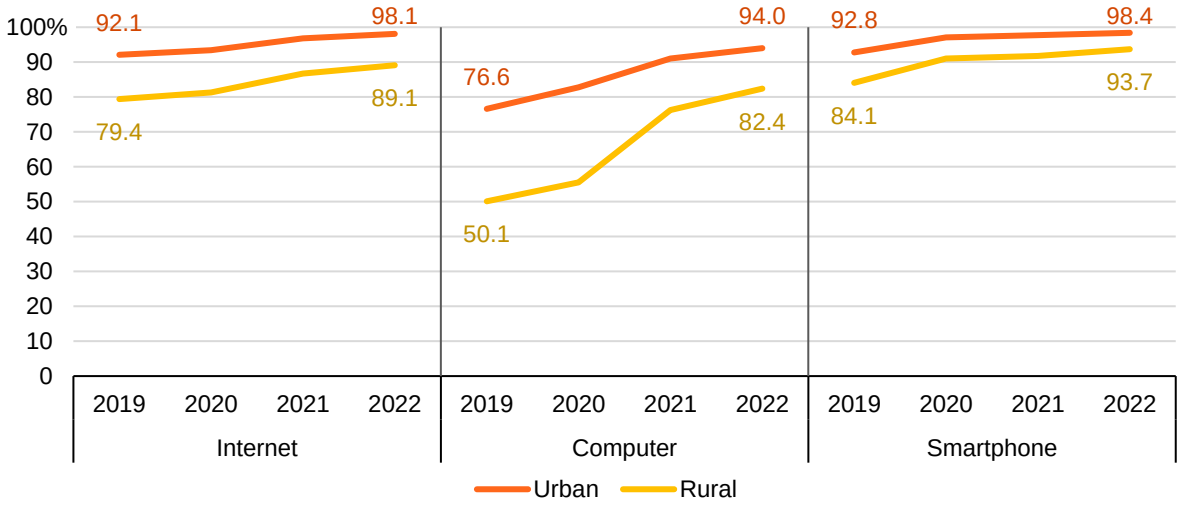


Source: DOS (2020); DOS (2021); DOS (2022); DOS (2023)

This digital divide is also seen globally where internet access in rural areas is lower than in urban areas[174]. Rural communities would benefit from having improved digital access which in turn enhances accessibility to services such as education, financial and public services. Digital infrastructure for these services is less readily available in rural areas. For Malaysia, although basic access (in terms of digital penetration and availability) has improved, more focus should be given to quality of access and use.

[174] UN (2021)

Figure 4.7: Household internet, computer and smartphone access by strata, 2019 – 2022



Source: DOS (2020); DOS (2021); DOS (2022); DOS (2023)

Figure 4.7 shows household access to digital services and equipment, including internet, computer, and smartphones from 2019 to 2022 by strata. As expected, urban access to all services and equipment was consistently higher than rural access although the gap between urban and rural access has been steadily closing.

The bridging of this gap is most pronounced in computer access with a 56.2% change from 2019 to 2022. Nonetheless, in rural areas, access to computers remained lower than access to internet and smartphones, implying that a large share of internet use in rural areas is through mobile devices.

Previous KRI studies have underlined the importance of closing the digital divide beyond addressing issues of access, instead moving towards ensuring inclusive meaningful connectivity and use[175]. This shift means a more holistic view of digitalisation that promotes the quality of connectivity, providing users with "a safe, satisfying, enriching and productive online experience at an affordable cost"[176]. Digital policies ought to "ensure that internet access contributes to development and equal opportunity, rather than becoming yet another means to increase social and economic inequality"[177].

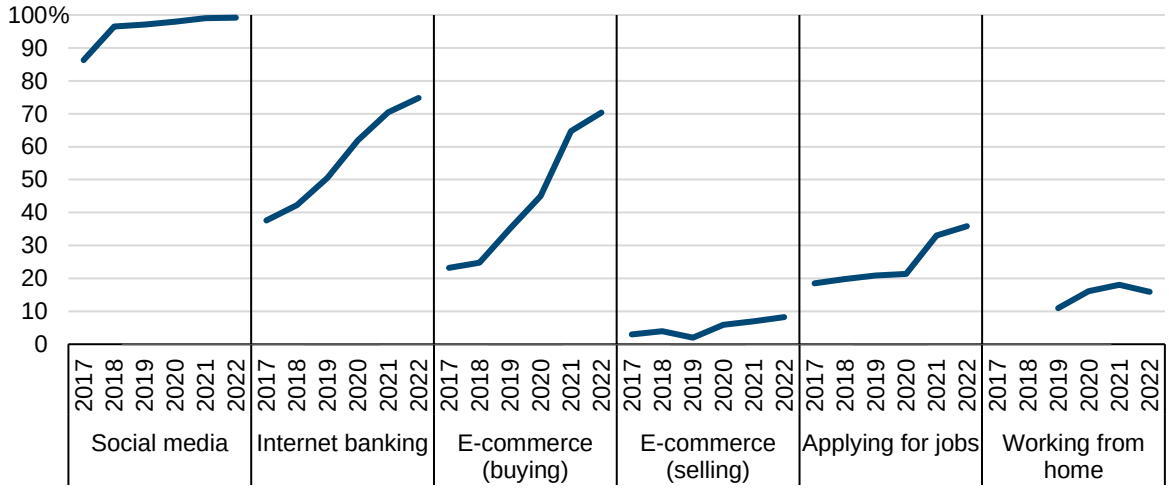
4.2.3. Digital use rose during the pandemic, but this use was not sustained evenly

ICTHS publishes data for twelve major categories of internet use[178]. We focus on six of these use types for our analysis, namely the use of internet for social media, internet banking, buying and selling through e-commerce, applying for jobs and working from home. These six use types represent reasonably broad categories of activities that most households perform. The Covid-19 pandemic accelerated digitalisation as national lockdowns were expected to influence the patterns of these use types[179]. We also break down use trends by gender and age group to look at pre- and post- pandemic differences.

[175] Gong (2020)
[176] ITU and United Nations Office of the Secretary-General's Envoy on Technology (2022)
[177] Jorge (2019)
[178] DOS (2024)
[179] Feldmann et al. (2020)

The use of digital services is a useful measure of meaningful connectivity. ICTHS found that, generally, internet use among Malaysians remained high at 97.7%. Figure 4.8 shows the percentage of internet use by activity types from 2017 to 2022. Across the six-year period, all types of activity experienced growth except for working from home, which decreased to around 15.9% after a peak at 18.1% in 2021.

Figure 4.8: Digital use by type in Malaysia, 2017 – 2022

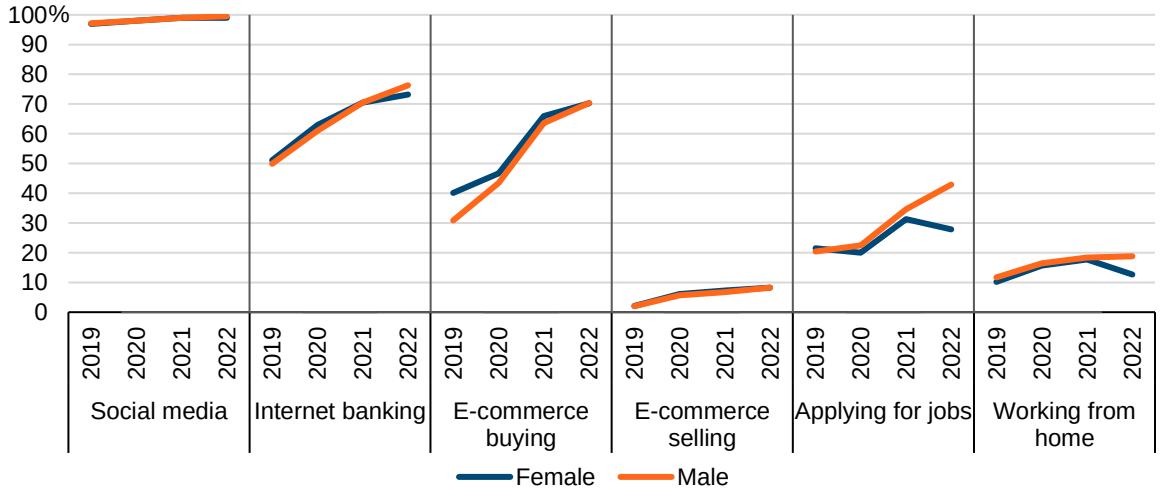


Source: DOS (2020); DOS (2021); DOS (2022); DOS (2023)

Social media remains the most popular type of use compared to other uses, having already reached saturation before the pandemic. The highest growth in internet use was observed for internet banking and e-commerce services. Using the internet for e-commerce services, both buying and selling, saw the highest percentage change from 2017 to 2022 (203.4% and 173.3% percentage change respectively), followed by internet banking (98.9% percentage change).

These trends are further broken down by gender and age groups in Figure 4.9 and Figure 4.10. When analysed by gender, most internet use types generally follow the aggregated trend, apart from job applications and working from home.

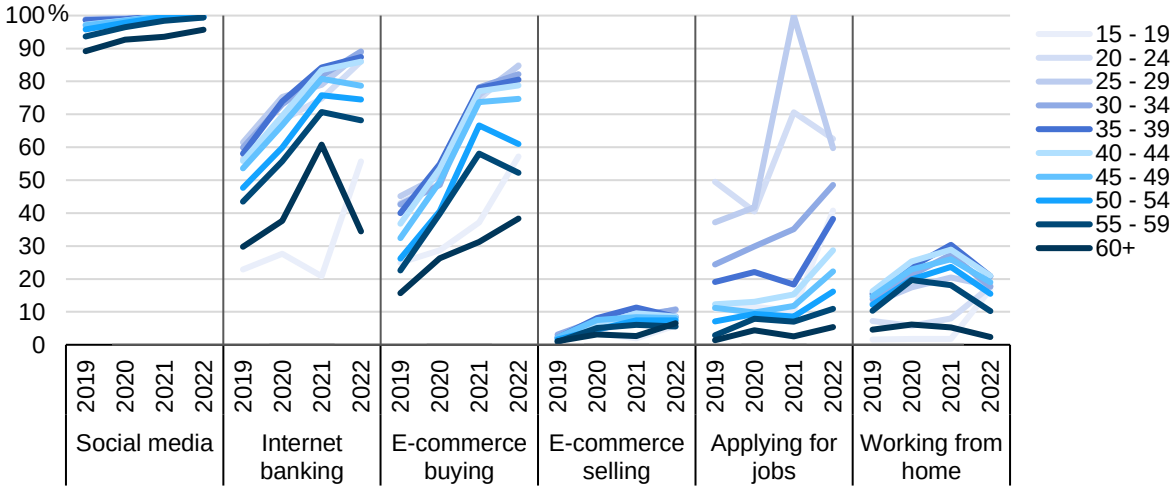
Figure 4.9: Digital use by type and sex, 2019 – 2022



Source: DOS (2020); DOS (2021); DOS (2022); DOS (2023)

Noticeably, a gap emerged between male and female usage of internet for job applications as well as remote work after 2021 (Figure 4.9). Among males, both types of activities have continued to increase from 20.4% and 11.7% in 2019 to 42.9% and 18.8% in 2022 while among females, these activities decreased to 27.8% and 12.7% respectively after a peak in 2021 (31.3% and 17.7% respectively). This could be due to the nature of jobs that are taken up by respective genders, but further analyses would be required to understand this phenomenon.

Figure 4.10: Digital use by age group, 2019 – 2022



Source: DOS (2020); DOS (2021); DOS (2022); DOS (2023)

When analysed by age groups (Figure 4.10), we see differences between younger cohorts and older cohorts in internet banking, e-commerce buying and job application. Online job applications among younger people grew during the pandemic. For instance, 100% of 25 – 29 year olds used the internet to apply for jobs in 2021. Although this percentage dropped in 2022, younger groups continued to make up the biggest proportion of users applying for jobs online.

Internet banking also increased across all age groups prior to 2021, except for the 15 – 19 year old age group, which increased from 2021 to 2022. However, in 2022, internet banking decreased for everyone above 35 years old. This drop is starkest in those over 60.

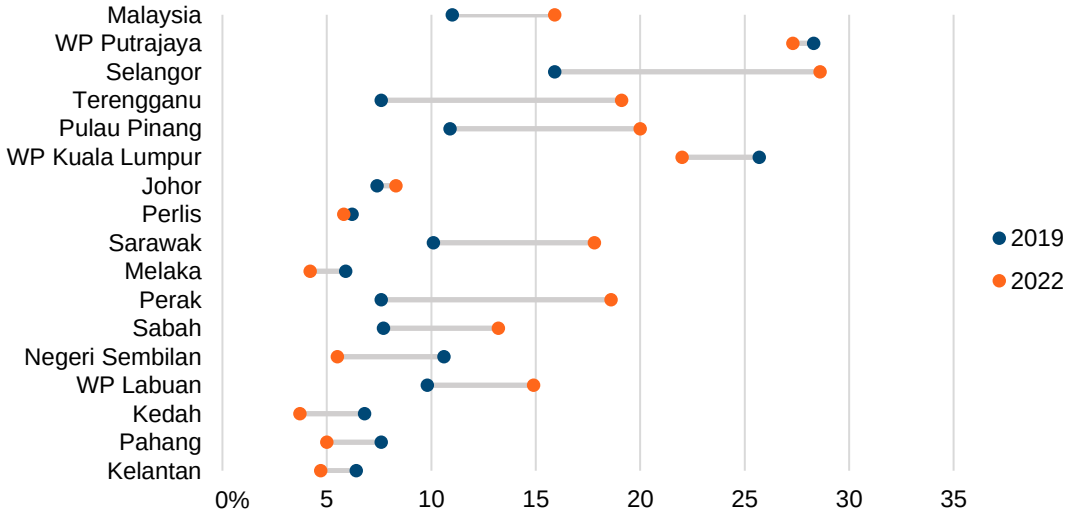
This growth in internet banking mirrors the growth in e-commerce. Both use types experienced an average percentage growth of 57% and 116% respectively across all age groups from 2019 to 2022. Internet use for social media was consistently high for all age groups, although the oldest cohort (those over 60) trailed behind other age groups.

A reduction in internet use for remote work in 2022 was observed particularly among females and those above the age of 25. This drop came one year after the Covid-19 MCO ceased, which had made remote work more prevalent if flexible working arrangements were not commonplace before. However, remote work is dependent on job context. The option of working from an alternative worksite other than the default place work is contingent upon type of job and the preference of the employee or employer.

Most remote work arrangements are biased towards skilled employment such as knowledge work and managerial and professional occupations[180]. While the Malaysian Employment Act does require employers to consider flexible work arrangements for employees upon request[181], this was a very recent amendment that occurred in 2024.

There was inconsistent growth of internet use for remote work among states from 2019 to 2022 (Figure 4.11). Selangor, Terengganu and Pulau Pinang experienced the most growth in their population's use of the internet for remote work. Negeri Sembilan, Kuala Lumpur and Kedah experienced a decline in this type of use.

Figure 4.11: Working from home internet use, 2019 and 2022



Source: DOS (2020); DOS (2023)

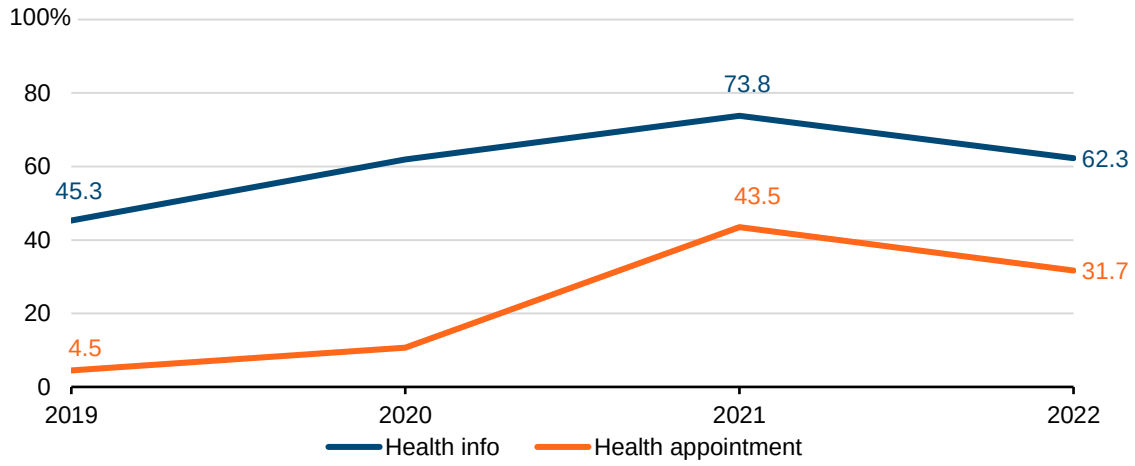
4.2.4. Health-related internet activities spiked during the pandemic but fell as endemicity was announced

In the wake of the Covid-19 pandemic, the Malaysian public became more acquainted with health-related uses of digital technology. The ICTHS collects two indicators on health-related internet activities. These are (1) using the internet to seek health information and (2) using the internet to set up health appointments.

Figure 4.12 shows that health-related digital use up until 2021 was on the rise, especially for making health appointments. The steep increase in health appointment-making online could be due to the launch of the vaccination registration module under the MySejahtera application in February 2021[182]. MySejahtera became the main mode of applying for a Covid-19 vaccine, as discussed later in this chapter.

[180] Siti Aiysyah Tumin (2020)
[181] Tan (2024)
[182] Malay Mail (2021)

Figure 4.12: Health-related internet use in Malaysia, 2019 – 2022

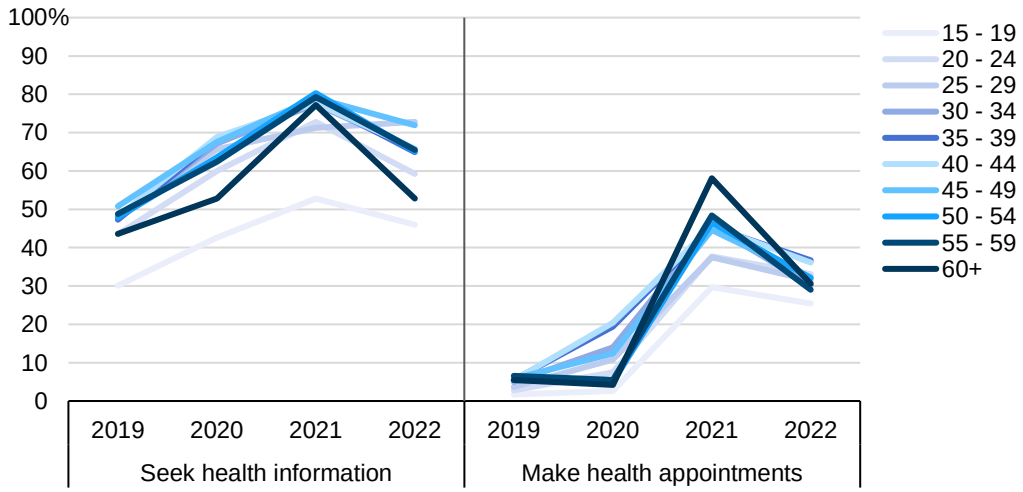


Source: DOS (2023)

Post-2021, health-related internet activities began to fall, although levels remained higher than pre-pandemic times. This decline could be attributed to the announcement of endemicity in Malaysia in March 2022[183].

A breakdown by age group shows a similar upward trend across all age groups for both use types up until 2021 (Figure 4.13). However, those in the 15 – 19 year old age group used the internet for health information seeking and health appointment-making the least. For the latter, this could be due to some of this population being registered for their vaccination appointments as dependents under their caregivers. Those above 60 showed the highest increase in internet use for making health appointments but this also sharply dropped once the pandemic ended, suggesting that they only used the internet for this purpose out of necessity.

Figure 4.13: Health-related internet use by age group, 2019 – 2022



Source: DOS (2020); DOS (2021); DOS(2022); DOS(2023)

[183] The Star (2022a)

A previous KRI publication highlighted differences in health-related internet use by state[184]. Health information seeking online ranged from 91.5% in Terengganu to 57.9% in Sarawak. For making health appointments online, there was an even starker difference in the most active state (Terengganu, at 75.5%) and the least active state (Perlis, at 11.9%)[185].

Some populations may also use the internet for certain purposes but not others. For example, even though those in Kedah were actively using the internet to seek health information (87.6%), only 22.8% of the Kedah population used the internet to make health appointments[186].

4.3 Barriers to Digital Adoption in the Public Healthcare Sector

4.3.1. Definitions of digitalisation and an introduction to electronic health records

Previous KRI research has distinguished between digitisation, digitalisation and digital transformation (see Box 4.1) to understand the ways in which digital adoption affects society[187]. Efforts to incorporate digital systems into Malaysia's healthcare delivery have shown that digitising data is not enough. User perspectives, work processes and routine practice must adapt for digital transformation of the healthcare sector to be effective.

Box 4.1: Definitions of digitisation, digitalisation and digital transformation

Digitisation: the process of making a digital (i.e. electronic) version of something analog, e.g. scanning a document or converting a paper ledger into an electronic spreadsheet.
Digitalisation: the process "in which many domains of social life are restructured around digital communication and media infrastructures"[188]. This process changes the world of work, making "the acquisition of digital skills…a prerequisite for individual, industry, and regional success"[189] e.g. automated filtering of resumes and first-round interviews taking place via video-conferencing.
Digital transformation: the process of technological adoption and cultural change that have broader socio-technological implications, e.g. influencers on social media becoming primary news sources as paid print journalism declines.

Source: Gong (2020)

[184] Tan and Ilyana Mukhriz (2023)
[185] Ibid.
[186] Ibid.
[187] Gong (2020)
[188] Brennen and Kreiss (2016)
[189] Muro et al. (2017)

Malaysia's government has long aspired to improve healthcare delivery through digitalisation[190]. Its 1997 Telemedicine Blueprint introduced the concept of a Lifetime Health Record (LHR), which were longitudinal medical records containing detailed patient information from every healthcare visit. These LHRs would be used to customise lifetime health plans, empowering individuals to manage their health, whether well or ill[191] and ensuring "access to an integrated set of medical records independent of time and location"[192].

It was a worthwhile ambition. An integrated digital health records system is essential for future healthcare and well-being management. These records are referred to in various forms including electronic medical records, electronic health records and personal health records, sometimes even interchangeably despite there being significant differences between them[193]. In this chapter we will use the term electronic health records (EHR) which refers to "a digital record of patient health that can follow an individual throughout their entire journey across the healthcare landscape through the enablement of seamless information sharing between healthcare providers and facilities"[194].

4.3.2. An overview of efforts to introduce digitalisation into the public healthcare sector

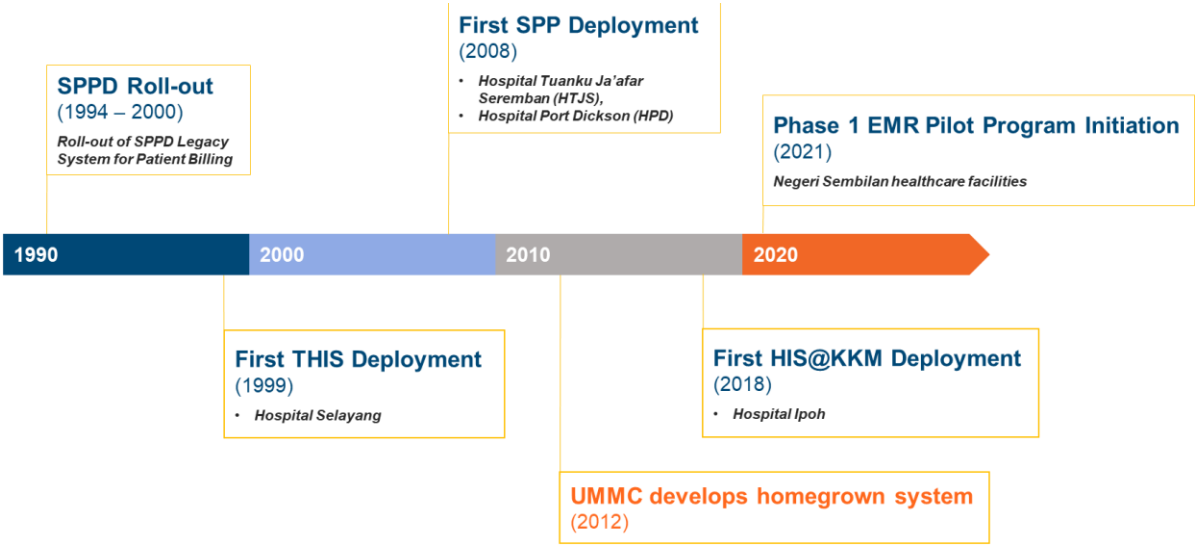
Health records are only one component of healthcare information management. Healthcare facilities manage not only patient data, but also medical supplies, staff schedules, clinical orders, and administrative and financial data. Healthcare information systems often require complex software suites.

Efforts to introduce digitalised healthcare facilities in Malaysia began with the Fifth Malaysia Plan (5MP) (1985 – 1990). They focused on administrative management, such as billing[195]. Later, with the Sixth Malaysia Plan (6MP) (1991 – 1995), non-medical programmes such as quality assurance budget performance monitoring were also computerised[196]. Patient records and laboratory orders were still done manually on paper forms[197].

The Multimedia Super Corridor (MSC) project was inaugurated in 1996, paving the way for the 1997 Telemedicine Blueprint. The Blueprint envisioned a comprehensive transformation of Malaysia's healthcare services via the planning and implementation of IT initiatives[198]. Figure 4.14 shows several digital systems deployed in public hospitals in Malaysia as part of these initiatives.

[190] EPU (2021a)
[191] MOH (1997b)
[192] Ibid.
[193] Ilyana Mukhriz and Gong (2023); Ilyana Mukhriz, Gong, and Lim (2023)
[194] Ilyana Mukhriz and Gong (2023)
[195] EPU (1991)
[196] EPU (1996)
[197] Bulgiba (2004)
[198] Zainatul Shima Abdullah (2013)

Figure 4.14: Malaysia's Key Public Hospital Digital System Deployments, 1994 – 2021



Source: Previously published in Ilyana Mukhriz, Gong, and Lim (2023)

There were three key systems used in Malaysia's public hospitals prior to the National EMR Initiative (NEI) in Negeri Sembilan[199].

The first system was a Total Hospital Information System (THIS)[200] provided by vendors. The second was Sistem Pengurusan Pesakit (SPP) or Patient Management System built by external developers according to Ministry of Health's (MOH) specifications. The third was a self-developed i-Pesakit (or i-Patient) system used in a teaching hospital under Ministry of Higher Education (MOHE).

These systems were intended to be facility-wide information management systems and typically contained a digital health records element. At the same time, several other digitalisation initiatives were developed within the public sector. These are described in more detail in Ilyana and Gong (2023).

Despite these initiatives, as of 2020, only 25% of 146 public hospitals and 9% of 1,090 public clinics had been digitalised[201]. Private healthcare facilities have begun deploying their own digital systems, but most public healthcare facilities still rely on paper-based forms and there is no patient data sharing between the two sectors.

4.3.3. Challenges and lessons learned

Efforts to digitalise public healthcare facilities have faced different challenges over the years. This section summarises these challenges and, where relevant, describes current efforts to overcome them[202].

[199] For further details about these systems, see Ilyana Mukhriz, Gong, and Lim (2023)
[200] A THIS is a comprehensive system that integrates clinical (including imaging and critical care), finance, administrative, laboratory, imaging and support services systems in a facility.
[201] The Star (2023); Parliament of Malaysia (2020)
[202] More details on these and other challenges to hospital digitalisation can be found in Ilyana Mukhriz, Gong and Lim (2023).

Procurement

Digital health information systems are complex and have many moving parts. For example, a THIS would be expected to have functions or applications that manage patient records, pharmacy systems, clinical orders, critical care and operating theatre schedules and financials and billing. These may be provided by a single vendor or by multiple vendors.

Malaysia's first comprehensive THIS in Hospital Selayang attempted to have all of this housed under one vendor, but complications arose when attempting to customise a pre-built system for the specific needs of the hospital. Further financial challenges arose when the system needed to be expanded and upgraded. This exemplifies the procurement challenge of scaling digital healthcare systems at a national level. Relying on a single external vendor to adjust or add features to the digital system can be painstaking for users.

On the other hand, it is also a challenge for the public sector to design, develop and scale its own digital information system. Funding remains an issue and there is also a lack of relevant software development skills. While individual hospitals such as University Malaya Medical Centre (UMMC) have been able to do so, these single-facility solutions have not been tested at a national scale.

MOH found a solution by adopting a mix of "buy off-the-shelf" and "build-from-scratch"[203]. The ministry commissioned developers to build SPP and Hospital Information System @ Kementerian Kesihatan Malaysia (HIS@KKM) systems according to its guidelines and policies[204]. This approach allowed some flexibility in terms of customisation without requiring extensive in-house technical expertise. Whatever the procurement method, the costs of maintenance and upgrades need to be factored into the overall implementation budget of any digital health system.

Internet and supporting infrastructure

A second challenge lies in legacy facilities. Many public healthcare facilities were not designed to support always-connected digital solutions. Older hospitals that did support early digital systems used client/server setups within the facility that took up more space and were not interoperable.

Besides improving internet connectivity, there is room for improvement of IT-supporting infrastructure as well. For example, healthcare facilities would benefit from more charging points and flat surfaces in suitable locations for staff to set up devices[205]. New hospital projects under the Twelfth Malaysia Plan (12MP) will include modern IT infrastructure and hardware[206], but existing hospitals are not as well-equipped.

Extra attention and funding may be needed at healthcare facilities in rural and remote areas, and where internet connectivity may be unreliable. Upgrading healthcare facilities requires a heavy investment. Given the competing funding demands within the public healthcare system, digital systems implementation may continue facing financial constraints, despite the ministry's commitment to digitalisation.

[203] In this context, "build-from-scratch" refers to developing a system independently from beginning to end, whereas "buy-off-the-shelf" refers to acquiring a complete and finished system in the market.
[204] MOH (2017b)
[205] Ilyana Mukhriz, Gong, and Lim (2023)
[206] EPU (2021b)

System and process design

As described earlier, digitalisation entails more than the digitisation of paper form to electronic form. Previous digital systems simply created digital forms without taking into account healthcare delivery workflows[207]. For example, clinicians had to fill out all fields before submitting a digital form which they might have left blank on a paper form. This resulted in healthcare providers being frustrated when trying to use these systems, which lowered user trust and satisfaction, resulting in low take-up. Healthcare practitioners who were less familiar with technology faced additional challenges transitioning to digital systems. Newer digital systems have improved their user interface and user experience, so some frustrations faced by users of earlier systems should improve with increased technology use.

In their latest initiative to introduce a digital health records system[208], MOH recognised that digital adoption requires long term support. It implemented a "train the trainer" programme whereby on-site facility training on how to use digital systems is complemented with specially trained staff who can support their colleagues adjusting to using the system. This programme is supplemented by situational assessments where the vendor returns to the facility to obtain feedback on the system and make any necessary adjustments, allowing some agility in implementation.

Interoperability and standardisation

Given Malaysia's two-track healthcare delivery of public and private facilities, no single digital system is going to suit every need or budget. The different digital systems used in the public healthcare system that were described earlier were built by different vendors using different architectures, codes and database formats. This resulted in difficulties integrating data across healthcare facilities within the public sector, much less across both public and private sectors.

Data sharing between public and private healthcare facilities has been and remains an unresolved challenge. MOH rules[209] prohibit health data collected and stored in its healthcare facilities from being shared with private providers or third parties. While there are legitimate data privacy, security and governance issues that must be addressed, these rules limit data sharing that is needed for an integrated nationwide digital healthcare system. To facilitate interoperability, shared standards are a good place to start. Two types of standards are needed. First, technical standards. Standardisation of database architecture and data format ensures that any software system can read source data, such as the Clinical Document Architecture (CDA) used by MOH.

Second, medical standards. These are internationally recognised codes used for health data such that any digital healthcare system can accurately record a patient's condition and treatment. Health informatic standards used in Malaysia include the International Classification of Disease (ICD), Malaysia Health Reference Data Model (MyHRDM), Malaysian Health Data Dictionary (MyHDD), Logical Observation Identifiers Names and Codes (LOINC) and SNOMED CT[210]. However, these standards are recommendations, not requirements[211].

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[207] Ilyana Mukhriz, Gong, and Lim (2023)
[208] This initiative refers to a pilot programme launched in 2019 with a goal of equipping all healthcare facilities in Negeri Sembilan with a system that would allow sharing of patient records across the healthcare landscape by 2023. As at 2024, this has yet to be achieved for the whole state.
[209] MOH (2010)
[210] KRI (2021b)
[211] MOH (2017a)

Data governance

Any digital system that wants to earn the trust of its users needs to have good data governance. When it comes to a digital healthcare system, clinicians and patients want to have confidence that the system can protect data privacy and guard against misuse. Patients well-informed on health and digital tools may want to have access and control over their own health data.

Health data is sensitive personal data that needs extra protection. Medical records are classified as confidential documents that must comply with the government's Security Orders[212]. Poorly managed or unsecured health records systems and their networks pose serious risks of data breaches or misuse[213]. For example, Singapore's integrated health information system was compromised in 2018, leading to a data breach of the personal data of 1.5 million patients[214].

MOH takes measures to protect patient privacy. It complies with government agency data guidelines and requires hospitals to maintain an Information Security Policy and to comply with existing data governance laws and regulations[215]. However, there is no law or regulation that explicitly governs health data (further details discussed in Section 4.4.4).

Data governance has become even more pressing given the importance of a nationally integrated digital health records system that can follow a patient over the course of their lifetime across the healthcare landscape. Currently, patients' access and control over their health data are limited despite existing government and medical professional guidelines suggesting that "ownership of medical records lies with the hospital or healthcare facility, with the caveat that actual patient health and treatment information contained in the record belongs to the patient"[216].

As consumer health literacy and digital health tracking tools become more widespread, more people may want access to their health data. Although the patient is the undisputed owner of their health data[217], healthcare providers have tended to gatekeep health data even while championing patient empowerment[218]. This approach seems to run counter to the objective of the Telemedicine Blueprint, which was to empower patients to have greater agency over their health[219].

[212] MOH (2016)
[213] Tan and Ilyana Mukhriz (2023)
[214] HealthITSecurity (2019)
[215] Ilyana Mukhriz, Gong, and Lim (2023)
[216] Ibid.
[217] MMC (2006)
[218] Ilyana Mukhriz, Gong, and Lim (2023)
[219] MOH (1997a)

4.4 Moving Forward with the National Digital Transformation Agenda

Despite the challenges that have been faced in previous attempts to introduce digital systems within public healthcare facilities in Malaysia, the potential for rapid scalability and adoption could be seen during the Covid-19 pandemic in the case of MySejahtera.

Although adopted under mandatory circumstances and eventually stagnating under public scrutiny, MySejahtera illustrates the local mobile-first digital landscape. This marks a shift from approaches requiring large local storage and high processing power towards cloud storage and app- or browser-based access. Further discussion on the merits and pitfalls of MySejahtera will follow. First, this section will unpack elements of digital health transformation that contribute towards pandemic preparedness.

4.4.1. Digital health transformation and its contribution towards tackling the pandemic

According to a publication in the British Medical Journal (BMJ) assessing the national responses to Covid-19 in 28 countries, countries that were considered 'high performing'[220] were characterised by actions following four main themes of partnership, coordination, development and strengthening. The final theme included the strengthening of health systems and services through enhancing primary and community care as well as access to and use of digital technologies[221].

During the pandemic, digital technologies played a pivotal role in supporting healthcare systems worldwide, with functions ranging from contact tracing to care delivery. At the peak of the pandemic, 23 countries scaled up their capacity for telemedicine through legislations, insurance coverage, service provision and setting up relevant governance[222]. In France, Germany and Norway, the use of telemedicine rose exponentially, with Norway recording an increase in share of primary health teleconsultations rising from 5.0% to 60.0% during the pandemic[223].

Beyond telemedicine, there was also a rise in e-health applications such as online symptom assessments, home monitoring and contact tracing. In South Korea and Iceland, specific mobile phone applications were rolled out to monitor Covid-19 patients at home and ensure that they remained in self-isolation[224]. Another example is Canada's launch of the Wellness Together application during the pandemic aimed at providing a national mental health portal for support, resources and counselling[225].

Governments have also introduced new payments and reimbursement packages to meet the need for healthcare to move online. European countries such as Germany, Italy, Spain and Switzerland moved to ensure that teleconsultations with providers in public service would be compensated by public insurance[226]. Australia also moved to introduce new items into their Medicare benefits register to allow provision of telehealth services. This underscores the importance of digital technology as a solution to the challenges of a pandemic.

[220] High performing countries were defined as countries that had the least number of deaths directly related to Covid-19 per capita in November 2020 (Haldane et al., 2021)
[221] Haldane et al. (2021)
[222] OECD (2021)
[223] Ibid.
[224] Whitelaw et al. (2020)
[225] OECD (2021); Canadian Healthcare Technology (n.d.)
[226] OECD (2021)

4.4.2. Malaysia is mobile-first: The introduction of MySejahtera during Covid-19[227]

As discussed in the preceding section, digital technology offered a tangible solution towards many of the healthcare issues faced during the pandemic and Malaysia was no exception in embracing it. In April 2020, MySejahtera was a mobile application launched by the Malaysian government to address the need for scientific data to tackle the country's Covid-19 outbreaks[228].

MySejahtera gradually evolved from a monitoring tool for contact tracing to more wide-ranging functions such as home-monitoring and vaccine registration. At first, the Malaysian government utilised the application to detect spikes in Covid-19 cases by mandating that the public scan QR codes upon entry to any premise. The mandate lasted from August 2020 to April 2022. Other state-level initiatives were also launched during the pandemic but only MySejahtera was mandated nationwide[229].

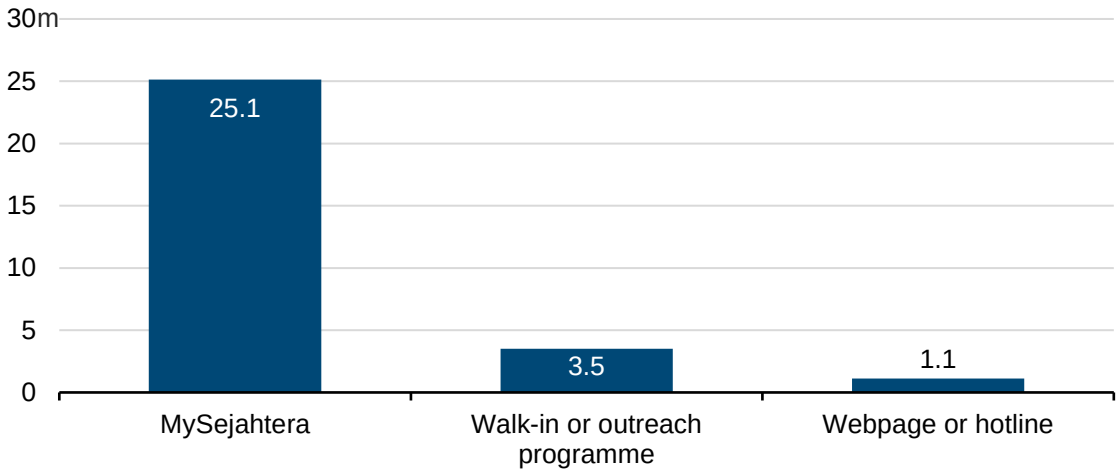
In a bid to relieve the burden on the healthcare system, the MySejahtera home monitoring module was launched mid-2020. Those with less severe symptoms were allowed to isolate in their own residences or selected facilities, while being required to check-in through daily health assessments on the application[230].

Compared to other Covid-19 applications launched globally, MySejahtera ranked first in 2021 in terms of install penetration (85%) and open rates (92%)[231]. This was higher than applications launched in Germany, France and the UK[232]. In combination with the data discussed earlier which showed a significant increase in health-related internet use during the pandemic, the high take up of MySejahtera illustrates the agility of the Malaysian population in adapting to mobile technology. It should be noted that the government mandate during the early stages of the pandemic until endemicity was announced was pivotal in pushing for widespread adoption of MySejahtera.

The MySejahtera application performed well to meet Malaysia's needs during the pandemic in the case of both contact tracing and vaccinations. Between 15.1% to 37.8% of positive Covid-19 cases were detected through the application three months after the government mandating its use for check-ins[233]. Within two days of the vaccination registration module being added, 1.067 million Malaysians had registered via the application and most of the population (83.5%) chose to register on MySejahtera versus other modes of registration (Figure 4.15)[234].

[227] Ilyana Mukhriz and Gong (2023)
[228] Nur Khairlida Muhamad Khair, Lee, and Mazlin Mokhtar (2021); Chin and Chan (2023); internal MOH documents (2022)
[229] Nur Khairlida Muhamad Khair, Lee, and Mazlin Mokhtar (2021); The Star (2020); internal MOH documents (2022)
[230] Internal MOH documents (2022)
[231] Install penetration rate refers to the percentage of actively used smartphone or tablet devices within a chosen market that had installed a specific application during a selected period of time. Open rate is the percentage of devices with said application installed that opened the application at least once during a selected time period (data.ai, 2017)
[232] data.ai (2022)
[233] Director General of Health (2020)
[234] Auditor General of Malaysia (2022)

Figure 4.15: Mode of registration for Malaysia's Covid-19 vaccination programme, 2022



Source: Auditor General of Malaysia (2022) based on data up to August 2022.

Eventually, the government lifted the requirement of checking-in at all premises with MySejahtera as the transition towards endemicity began[235]. Although plans were announced to expand the function of MySejahtera into that of a public health super-app[236], issues of public trust have stagnated these plans. One of the modules originally included under this expansion was health records. Under this module, information from healthcare providers such as laboratory results as well as information sourced from users such as height and weight could be saved and accessed via mobile[237].

The 2021 Auditor General's report raised data security issues found in the MySejahtera system. These include "sharing of administrative accounts to third party and general users, shared user accounts for on-duty officers at vaccination centres as well as the downloading of information of 3 million vaccine recipients by a 'Super Admin' account"[238]. These issues have resulted in public resistance against utilising MySejahtera in post-pandemic times.

Issues of public trust related to MySejahtera have been specific to its governance and security. During the pandemic, the app fell under the Prevention and Control of Infectious Diseases Act 1988 (PCIDA) which allowed enforcers to "request any information related to the prevention and control of disease and every person in the country is required to comply"[239]. However, post-Covid-19 the PCIDA becomes irrelevant, leaving questions as to what legislation replaces it in governing MySejahtera.

4.4.3. Setting a strong digital foundation post-Covid

The post-pandemic era brings with it newfound worries as to our health system's resilience towards sudden shocks. Malaysia's Health White Paper (HWP) released in 2023 stressed the need to introduce major changes to Malaysia's health system to better prepare for the oncoming burden of communicable and non-communicable diseases, an ageing population and rising healthcare costs[240].

[235] The Star (2022b)
[236] The Malaysian Reserve (2022)
[237] The Sun Daily (2023); The Star (2022c)
[238] Auditor General of Malaysia (2022)
[239] MOH (1988)
[240] MOH (2023)

Publications discussing the establishment of a resilient health system by WHO, OECD and Malaysia's HWP all include increasing digital technology adoption to enhance coverage and improve healthcare quality[241].

In fact, suggestions for the use of technology such as e-health, telemedicine and real-time surveillance through EHR systems for pandemic preparedness had already been put forth since the 2009 influenza A pandemic[242]. According to WHO's Recommendations on Digital Interventions for Health System Strengthening, technological innovations could solve critical health system challenges such as insufficient supply of commodities, lack of access to information and loss of continuity of care[243].

One of the digital solutions highlighted by WHO was digitalised health records. Having an EHR system of good quality has been cited as crucial in determining the success of further digital health technology adoption, particularly since it serves as an infrastructural foundation for remote healthcare delivery and ensuring continuity of care[244]. A study looking at hospitals in the US found that a larger proportion of hospitals with EHR systems in place (82%) offered telemedicine services during the Covid-19 pandemic compared to only 28% of hospitals without EHR systems[245].

In this way, putting in place an EHR system will be able to act as a foundation for further technological innovations that are able to shift the care burden away from hospitals and reserve physical capacity of the healthcare system for those with more serious health conditions. With health records being accessible from anywhere, a patient with a chronic condition or minor ailment would be able to receive continuous care online and be appraised of their medication or treatment plan without needing to repeat their consultation. According to OECD, expanding primary healthcare services with the help of digital technology is crucial in maintaining the frontline of all health systems[246].

Additionally, the granularity, timeliness and rich characteristics of data generated via EHR systems hold potential for ongoing performance measurement to ensure healthcare is being delivered at an optimal level as well as for real-time disease surveillance[247]. The importance of having population-wide data in real-time was showcased during the Covid-19 pandemic where rapid dissemination of research was required to inform policy-making decisions. For example, in the UK a study published in 2020 found a significantly higher Covid-19 mortality rate for Black and South Asian people based on the analysis of 17 million EHRs[248].

4.4.4. Ways to move forward: Cross-country comparisons of healthcare record digitalisation

Zooming in on the EHR aspect of healthcare digitalisation, countries such as Australia, China, Singapore and the US have moved towards establishing EHRs as a foundational tool for digital transformation within the healthcare sector[249, 250].

[241] OECD (2021); European Observatory on Health Systems and Policies (2023); MOH (2023)
[242] Li et al. (2012); Ohannessian (2015); Santillana et al. (2016)
[243] WHO (2019)
[244] Zhang and Saltman (2022); Al-Shorbaji (2021)
[245] Jiang et al. (2023)
[246] OECD (2021)
[247] Barbazza et al. (2021); Dron et al. (2022)
[248] Williamson et al. (2020)
[249] Stephanie (2017); Atherton (2011); Xu et al. (2013); Gao et al. (2013); Mohd Idzwan Mohd Salleh, Rosni Abdullah, and Nasriah Zakaria (2021)
[250] We note that the case study countries may not have achieved full EHR status.

However, the implementation of each EHR system and the legislations that accompany it differ between countries such that each country's system has its definition of its role, purpose, standards, and operating guidelines. The differences are summarised in Table 4.1 below and further discussion can be found in a previous KRI publication, "Putting Patients First: Principles for Electronic Health Records in Malaysia".

This brief summary in Table 4.1[251] illustrates how various approaches can be taken in digitalising health records. However, across countries, there appear to be three critical design aspects that were taken into consideration in the design and implementation of their respective EHR systems.

Table 4.1: Brief comparison between EHR systems

Measure	Australia	China	Singapore	US
System Name	My Health Record (MHR)	Electronic Health Record (EHR)	National Electronic Health Records (NEHR)	Electronic Health Record (EHR)
Estimated cost of Implementation	USD1.4 billion (over 10 years)	USD19 billion (for overall development)	USD265 million (over 10 years)	N/A
Governance	Centralised	Decentralised	Centralised	Decentralised
Module Examples	e.g., Shared Health Summaries, discharge summaries, event summaries, pathology result reports and specialist letters	e.g., Personal information, disease and health summary, Covid-19 control and management	e.g., Admission and visit history, laboratory test results, radiology reports, medication history, history of surgeries, immunisation and allergies record	e.g., Medical history, diagnoses, medications, treatment plans, immunisation records, allergies, radiology images, laboratory and test results
Authority	Australia Digital Health Agency	National Health Commission	Integrated Health Information Systems	Office of the National Coordinator for Health Information Technology
How patient accesses their data	myGov	Hospital app, WeChat and relevant third-party app	Health Hub	API-enabled app

Note: Estimated cost[252] for China was obtained from Gao et al. (2013), cost for Singapore and Australia was obtained from proposed budget estimations for an implementation period between 2010 and 2020.
Source: Previously published in Ilyana Mukhriz and Gong (2023)

[251] More detailed comparative analysis between Malaysia and the four case study countries can be found in KRI's 2023 publication "Putting Patients First: Principles for Future-Facing Electronic Health Records in Malaysia"
[252] Please note that throughout this section all figures in AUD were converted to USD rate of about AUD 1.00 to USD 0.71; figures in SGD were converted to USD at a rate of about SGD 1.00 to USD 0.73; figures in CNY were converted to USD at a rate of about CNY 1.00 to USD 0.15, based on Google's Currency Converter on August 12, 2022 at the time of analysis.

Patient Inclusion and Empowerment

A common trend seen in the implementation of EHRs in other countries has been ensuring that the systems benefit the many instead of the few in addition to empowering patients to use them.

Malaysia has taken an inclusive approach in implementing digital systems within public healthcare facilities since the government has focused on public healthcare facilities which serves a greater proportion of the population[253]. However, no specific acts or guidelines have been put in place to promote inclusivity[254].

An example of promoting inclusivity can be seen in China where the Basic Medical Healthcare and Promotion of Health Law provides "guidelines for promoting equitable access to healthcare information technology". This contributed to the expansion of health information infrastructure in more rural areas of the country[255]. Also, the US Congress mandates "all executive agencies to ensure accessibility and ease of use in designing systems and websites" through the 21st Century Integrated Digital Experience Act 2018[256].

EHRs also hold the potential to promote self-management of disease, particularly for those with chronic, non-communicable diseases that pose the biggest health risk to Malaysia[257]. This potential can only be realised if individuals understand the importance of accessing their health records and are granted the right to know and decide how their health information is being used.

With the MySejahtera application and more recent systems introduced in Malaysia, patient-centricity has been given importance through the incorporation of a patient-facing platform which allows access to health records[258]. Australia has taken patient empowerment a step further by setting in place legislations specific to patient access of EHRs. Under the My Health Records Act, Australians are given the power to "permanently delete their record at any time, prevent any commercial use of EHR data and automatically remove authorised representative access of EHRs on behalf of teenagers once they exceed the age of 14"[259].

In Malaysia as at 2024, implied consent is used to enrol patients into digital health records at public healthcare facilities. Patients who register for treatment are assumed to have agreed to have their health data digitally collected and stored by the healthcare facility. Subsequently, they may choose to opt out of further data collection, but they are not able to delete data already collected by the system[260].

[253] Nazihah Muhamad Noor and Ilyana Mukhriz (2021)
[254] Ilyana Mukhriz and Gong (2023)
[255] Constitution of the People's Republic of China (2019); Ilyana Mukhriz and Gong (2023)
[256] US Congress (2018); Ilyana Mukhriz and Gong (2023)
[257] Toni et al. (2021); WHO Europe (2006)
[258] Ilyana Mukhriz and Gong (2023)
[259] Commonwealth of Australia (n.d.); Ilyana Mukhriz and Gong (2023)
[260] MOH (2017a)

Data Legislation, Privacy, Security and Governance

According to Ilyana and Gong (2023)[261],

> *"The implementation of EHRs [has] typically been accompanied by many digital health legislations that outline their structure, security and interoperability".*

Although Malaysia has previously cited PCIDA 1988 and the Medical Act 1971 as the governing legislations with regard to MySejahtera, these acts do not have specific provisions regarding the security of health data. For example, the Medical Act only ensures that registered medical practitioners refrain from improper disclosure of confidential patient information. However, it is insufficient when it comes to data breaches. Additionally, the PCIDA lacks a focus on data protection, is not specific to health data and is not relevant under non-outbreak conditions[262].

Another frequently cited act when it comes to the governance of data under MySejahtera has been the Personal Data Protection Act 2010 (PDPA). It is important to note that PDPA only applies to commercial transactions and does not apply to federal or state government data or to health data specifically. In the case of MySejahtera, under the PDPA the government would not be held responsible for any data misuse[263].

Australia and China have set out specific laws governing health data. The My Health Records Act 2012 in Australia provides guidelines on how entities should "collect, use and disclose information" whereas multiple legislations in China lay out security and technical frameworks related to EHRs[264].

Beyond setting legislations in place, integrated security technologies should also be an intrinsic part of any EHR system. Examples of these could include multi-factor authentication and data retention limits. While countries such as Australia, China, Singapore and the US have publicly available cybersecurity requirements for EHR systems, Malaysia does not. It is also unclear what crisis management plans are in place should there be a data leak in the health record database in Malaysia unlike plans seen in Australia, China and the US[265].

Integration and Adoption Across the Healthcare Landscape

In Malaysia, there has been a mixed of centralised and decentralised health records systems that have been introduced over the years due to the dual nature of our healthcare system. Whilst public healthcare facilities have been reliant on systems rolled out by the government, private facilities have been allowed to implement any system of their choosing[266]. System standards are also currently provided only as recommendations instead of being made mandatory[267].

[261] Ilyana Mukhriz and Gong (2023)
[262] Ibid.
[263] MySejahtera (2022); KRI (2021a)
[264] Commonwealth of Australia (2012); Constitution of the People's Republic of China (2020); (2021a); (2021b); (2015); (2016a)
[265] Ilyana Mukhriz and Gong (2023)
[266] Ibid.
[267] MOH (2017a)

This has resulted in issues of standardisation and interoperability across the healthcare landscape. In the case study countries that have a decentralised database (e.g. China and the US), mandatory standards have been put in place by the government to ensure that individual vendors provide interoperable EHR systems. In China, a specific government committee was established to ensure standardisation of health information technology and to carry out mandatory testing and evaluations of EHR systems provided by vendors[268].

Information flow across private and public healthcare providers in Malaysia is also currently prohibited under the Private Healthcare Facilities and Services Regulations 2005[269]. This is contrary to what is seen in case study countries such as Singapore that have made specific efforts to provide bidirectional information flows between sectors in the healthcare industry[270].

An important lesson from the pandemic on interoperability can be learned from MySejahtera's vaccination record module. In this case, patient data was stored in a cloud-based database and was able to be accessed using a mobile application or web browser. As Malaysia rolled out its National Immunisation Programme, the population's vaccination record was accessible regardless of the phone model they were using and by healthcare practitioners, regardless of whether they were in a public or private facility[271].

4.5 Concluding Remarks

Digital transformation of the healthcare sector is an important part of the national digital transformation agenda. It is vital that such transformation be done in the public interest, putting patients first and ensuring that digital systems can benefit the many and not the few. Effective digital transformation can facilitate person-centric care, ensure continuity of care over the patient's lifetime and improve individual and public health outcomes.

The lessons learned in digitalising the healthcare system could also potentially be applied towards the digitalisation of public services overall. Key areas of consideration in the implementation of digital systems could be consistently applied across industries such as:

1. Ensuring relevant legislations are established for effective data governance;
2. Allocating sufficient funding for the lifecycle of such systems beyond implementation costs;
3. Setting in place standards for the integration of public and private sectors;
4. Educating the public on their digital rights and importance of embracing digital technology in their daily lives

Post-pandemic we have recognised gaps in service provision to the population as well as how the digital divide further exacerbates differences in strata, income and accessibility to services during times of crises. Moving forward, it is important that we ensure that the digital transformation of the Malaysian society ensures inclusivity and can bring benefit to all.

[268] Constitution of the People's Republic of China (2016a); (2016b); US Congress (2015)
[269] MOH (2017a)
[270] Stephanie (2017)
[271] Ilyana Mukhriz and Gong (2023)

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