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What Household Connectivity Gaps Mean for a Digital Future

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Malaysia has made great strides in digitalisation, particularly in improving internet access for the population. One key finding from KRI's State of Households 2024 report (SoH 2024) was that household internet access has grown from 92.1% to 98.1% over the pandemic. Nonetheless, access remained uneven across urban and rural households in 2022. The predominant type of access characterises Malaysia as a "mobile-first" nation, which has implications for the nation's path to a digitalised nation by 2050.

This article takes a deeper look at the data reported in the SoH 2024 report, with a focus on connectivity and internet access.

Device and connectivity access is "mobile-first"

Over the course of four years, Malaysian households have seen improvements in access to essential digital devices and amenities. Figure 1 shows that the share of households having access to internet, computer and smartphones increased by an average of 14% nationally.

This view was prepared by Khoo Wei Yang, a researcher from the Khazanah Research Institute (KRI). The authors are grateful for the valuable comments from Ilyana Mukriz, Rachel Gong and Salbiah Idris.

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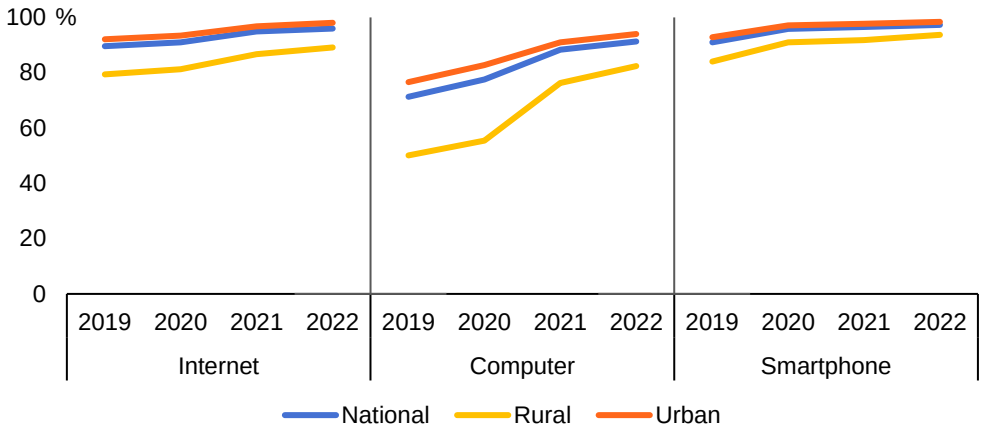
Despite improvements, an urban-rural divide persists. A higher share of urban households continued to have access to all three digital amenities compared to rural households. Among them, household access to computers has seen the highest jump—from 71.3% in 2019 to 94% in 2022 nationally.

Figure 1: Household internet, computer and smartphone access by strata, 2019 – 2022



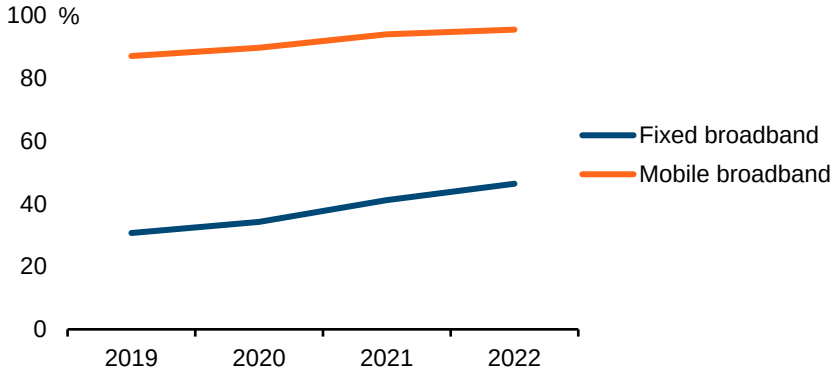
Source: DOS (2023a)

Digital access cannot be complete without internet access, as it enables access to the benefits of most modern digital services. Having access is only the first step—the quality of access is equally important, especially as more cloud-based information services now demand higher network bandwidth and connection speed.

Without more granular data on household connectivity, the type of broadband connection is one way of eyeballing the quality of internet access. Fixed broadband is generally faster, more stable, more reliable for heavy data usage and less likely to be affected by weather conditions and network congestion. Mobile broadband, on the other hand, offers more portability but can be susceptible to reliability issues. Speed and connectivity can vary by area signal strength, weather and congestion, as well as lower data caps.

Figure 2 shows households having access to broadband by type. Nationally, the share of households having access to fixed broadband remained half as much as households having access to mobile broadband, despite having grown by 10% from 2019 to 2022.

Figure 2: Mobile and fixed broadband access, 2019 – 2022



Source: DOS (2023a)

This shows that Malaysian households are accessing the internet primarily through mobile wireless connections. Fixed broadband is commonly based on direct subscriber line technologies, fibre-based technologies and satellite broadband. They generally require significant physical infrastructure and heavy capital costs[1]. Lower rates of fixed broadband penetration is common among low-income countries, resulting in mobile broadband being the main mode of internet access in most parts of the world[2].

Mobile device access, like mobile connectivity, continues to exceed computer access (Figure 1). This suggests that most Malaysian internet users are getting online with their mobile devices.

Internet access has improved overall, but inequality remains.

When we analyse the data by state, we find that while over 80% of households in all states had access to mobile broadband in 2022 (Figure 3), seven states exceeded the national average for the share of households having fixed broadband access (around 46%). During the pandemic period, two states—primarily those with more rural populations—more than doubled their growth in access rates (Figure 4). Kedah experienced the biggest improvement in fixed broadband access, 147% change from 2019 to 2022, while Kelantan followed at 138%. On the other hand, growth in access was low in states where household access to fixed broadband was already higher than 40% in 2019, the lowest being Selangor, with only a 23% change. Correspondingly, the pandemic period also saw a surge in household access to computers in Kedah and Kelantan.

Figure 3: Fixed broadband access by state, 2022

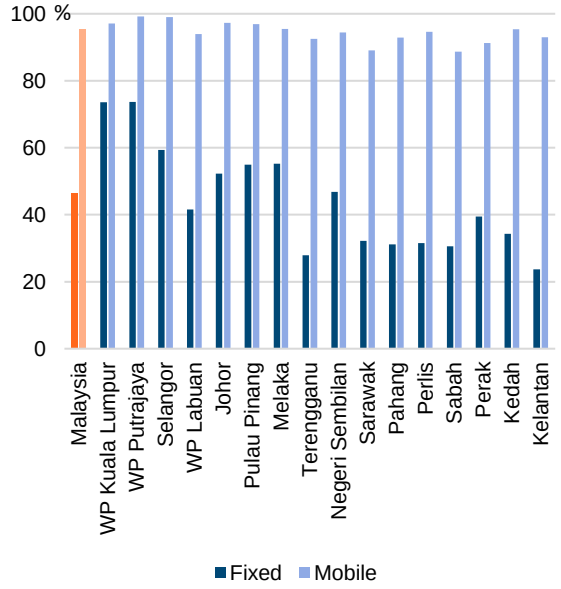
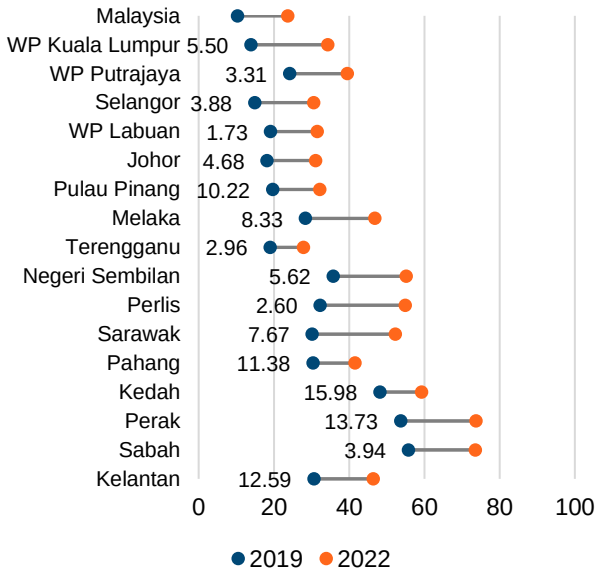


Figure 4: Fixed broadband access by state, 2019 and 2022



Source: DOS (2023a)

[1] International Telecommunication Union (ITU), UNESCO, and Broadband Commission for Sustainable Development (2022), 36

[2] Janevski (2024)

Despite notable improvements, states such as Kedah and Kelantan are still lagging behind when compared to other states. Figure 5 shows that household access to fixed broadband is consistently lower than access to mobile broadband in both urban and rural households. However, the gap between urban and rural access to fixed broadband is greater (about 30%) than the gap between urban and rural access to mobile broadband (about 7%). These figures may reflect the size of the urban population within a state. Figure 6 shows that states with a higher proportion of urban population are generally associated with a higher share of households with fixed broadband access.

Figure 5: Mobile and fixed broadband access by strata, 2019 – 2022

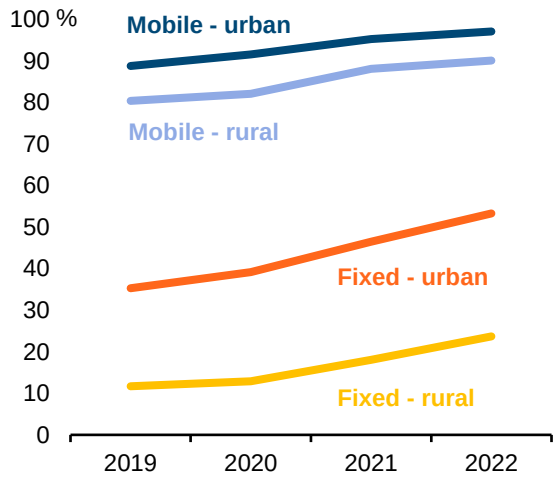
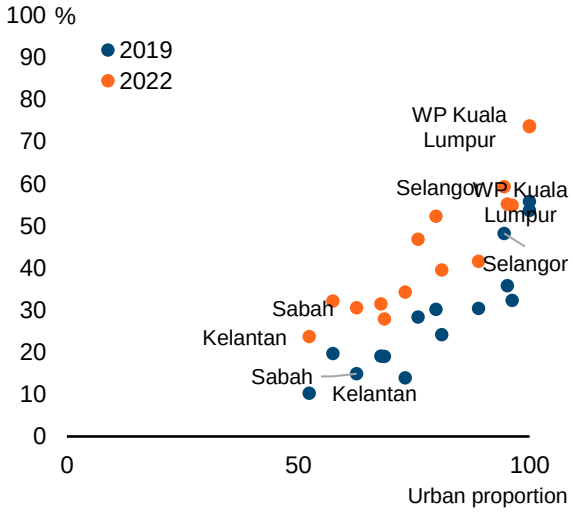


Figure 6: Proportion of urban population – fixed broadband access, 2019 and 2022



Source: DOS (2023a)

This coincides with the global trend where urban areas enjoy more developed network infrastructure while rural households remain marginalised. Globally, telecommunication operators face high costs and low returns on investments in rural areas, where geographical isolation and low demand constrain economies of scale. Rural households also face affordability challenges as a higher proportion of households do not have the means to afford internet access[3].

Fixed broadband prices in Malaysia are regulated by the Mandatory Standard on Access Pricing[4]. The regulation was introduced in 2018 to improve access of alternative Internet Service Providers (ISPs) to Telekom's bandwidth capacity and lower prices for high-speed broadband for households[5]. The reform has boosted access to high-speed fixed broadband, where total subscriptions saw a 30% increase from 2017 to 2020 (2.58 million to 3.35 million)[6]. This measure

[3] International Telecommunication Union (ITU) (2023)
[4] Siddharta Raja and Record (2019)
[5] *Malaysiakini* (2019)
[6] DOS (2022a); MCMC data as reported in ICTHS. Subscription rate is often lower for fixed broadband than mobile broadband as households share one subscription between multiple users.

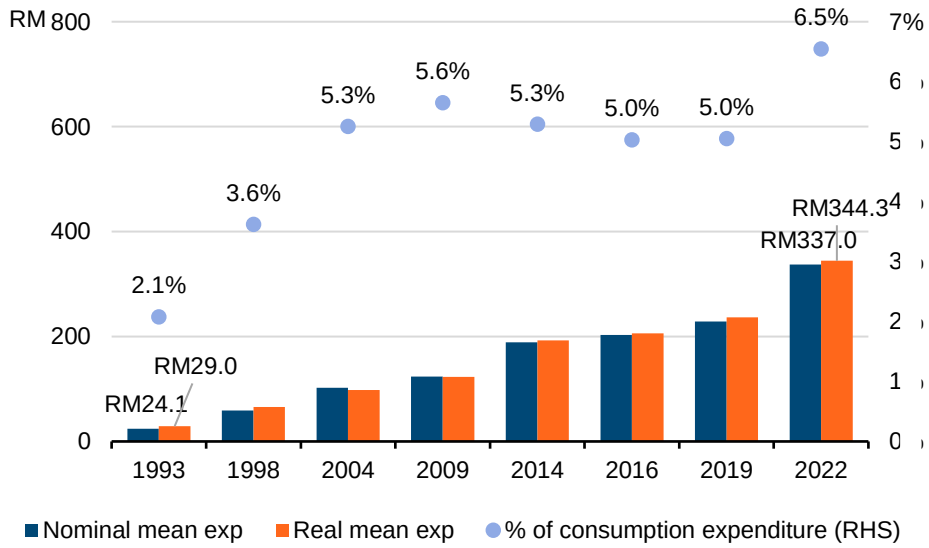
has solved a part of the affordability issue, benefitting mostly households in areas with good coverage.

How much did households spend on ICT goods during the pandemic?

The surge in household digital access can result from necessary changes made by households during the pandemic. The Movement Control Order (MCO) was implemented during the height of the pandemic. The Order restricted physical interactions in work settings and services to limit the spread of diseases. Under physical restrictions, households turned to digital means under government decree (e.g., body temperature scanning before entering premises and sign-ups for vaccination programmes) or employer requirements (e.g., some jobs became primarily remote-based).

Minimum access to connectivity and appropriate devices became necessary overnight, and obtaining access added to household burdens. From 2019 to 2022, the average nominal household ICT expenditure has grown from RM228.80 to RM337.00. As a share of household income, this figure has grown from 5% to 6.5% (Figure 7). The demand for ICT goods during the pandemic was uneven across urban and rural households. Figure 8 shows that urban households have consistently spent more on ICT than rural households, but in terms of growth, rural households experienced a higher increase (RM182.80 to RM208.20 14%) in outlay onto ICT goods as compared to urban households (RM338.20 to RM376.30, 11%).

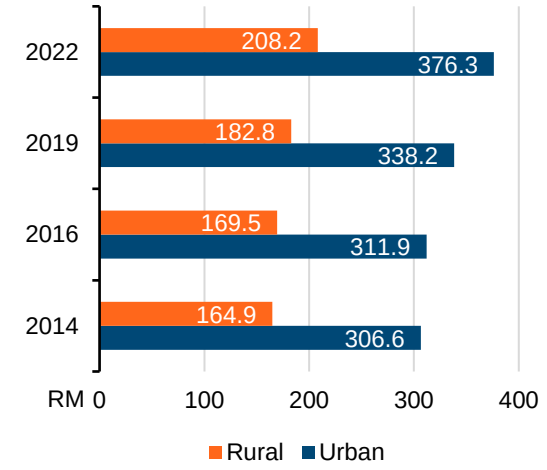
Figure 7: Time series of nominal, real expenditure and share of ICT expenditure, 1993 – 2022



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

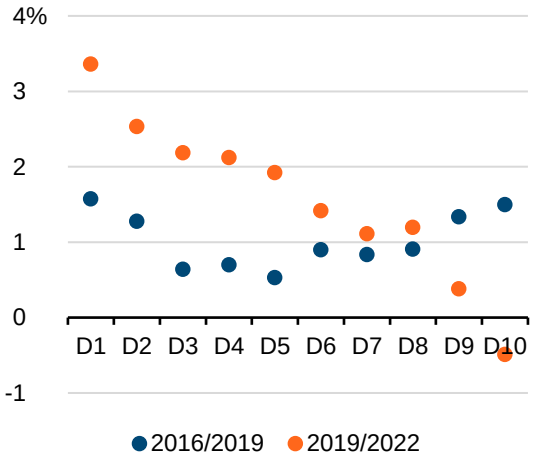
A look at household ICT expenditure by income deciles gives us a clearer picture of how this additional expenditure impacts various households (Figure 9). Before the pandemic, growth in ICT expenditure had been largely the same across different income households. However, over the pandemic, the growth in real ICT expenditure was the starkest among lower-income households, with the bottom 10% (D1) having the highest CAGR of 3.4%. On the other hand, the top 10% of households experienced a drop in ICT spending.

Figure 8: Real ICT expenditure by strata, 2014 – 2022



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

Figure 9: Change in real ICT expenditure by income deciles, pre- v. post-pandemic



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

This might suggest that lower-income households may have allocated more to cover ICT expenses during the pandemic relative to their normal expenses. The trends over the pandemic could mean deeper burdens on poorer households to obtain access compared to richer counterparts.

Bridging the needs of a digitalised future

Internet access is a key indicator of digital connectivity. However, having the ability to get online is not enough. The quality of internet access, in terms of speed and bandwidth, matters.

Many solutions have been floated to bridge the urban-rural gap in access to the internet and cloud-enabled services[7]. Satellite internet, the most commonly proposed solution for bringing high-speed internet to households in under-connected areas, may be too expensive for households that need it[8].

Sometimes, in resource-constrained areas, online solutions become the front line of public service delivery. For instance, MEASAT and Mudah Healthtech have piloted telehealth kiosks service in Sabah that provide online medical consultations to underserved communities[9].

Telemedicine is but a subset of online services that can improve the living standards of rural households; online services such as online learning and e-commerce can offer greater opportunities and level the playing field for rural communities. Mobile broadband has been shown to offer better coverage and reach, but it is not a substitute for fixed broadband[10]. Fixed broadband remains the gold standard in terms of reliability and support for heavy traffic.

[7] Gong (2023)
[8] Starlink starts at RM220 for 100Mbps, MEASAT ConnectMe 60Mbps RM10/GB.
[9] Ang (2024)
[10] Alderete (2017)

In its drive towards becoming an advanced digital economy, Malaysia must ensure equitable access to high-quality connectivity for all. Equalised quality of access would uplift communities on the fringe, allowing them to realise their potential through the full gamut of benefits provided by digital services. This would reduce the asymmetry between urban and rural populations as well as the uneven economic development across different areas.

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