



The Decade of Healthy Ageing in ASEAN: **Role of Life-course Immunisation**



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With the year that we have had, the focus on health has sharpened more than ever. But it goes beyond that. It has become abundantly clear that health issues have major knock-on effects on other aspects of society. The impact of the COVID-19 pandemic on the global economy has been significant, as it has been in each of our countries. We have all witnessed restrictions on personal liberties and loss of livelihoods. This has affected government programmes, major companies, and family units alike. It has resulted in airlines absorbing huge losses, and tourism-dependent economies taking major hits. But empty airports don't just affect airlines. Hotels, shopping outlets, even mom-and-pop stores have also had to absorb the effects of this so-called new normal.

Changes to our lifestyles and habits as a result of COVID-19 have been manifold. Many of us are familiar with Zoom calls now – too familiar, some might say. These new habits have given rise to other issues, not least feelings of isolation and even depression. The closure of schools has affected many families and children.

The road out of COVID-19 is still unclear. In some parts of the world, life is returning to some semblance of normalcy. As America and Europe head into their summer seasons, shops are open, cafes are crowded, and fans are being allowed back in sports stadiums. The quick rollout of vaccines, particularly in the US and UK, has played a big role. In Asia, at the turn of the year it appeared that the worst had come to pass. That proved to be a false dawn. South Asia and South-east Asia are seeing a frightening resurgence of

the virus, which could end up being worse than the earlier waves. Even in Australia, despite tightly sealed borders, a series of flare-ups and subsequent lockdowns tell us the fight is far from over. As vaccines trickle out, however, there is hope that things might change as 2021 runs its course. Many of us are quietly confident that the corner has been turned, at least to some degree.

But there is another ticking time bomb that we are inexorably approaching: Ageing societies. The impact that this will have is clear. Singapore has projected that its healthcare costs will rise startlingly as a result of its ageing population, and questions are already being asked about how it will fund this spending. China has announced an alarming set of population figures showing that a point of no return may have been crossed, and the adage that it is a country that will get old before it gets rich may come to pass. Social support systems everywhere will come under strain as the old outnumber the young.

It has often been said we are living longer, but not living better. For many, the so-called golden years are not lived in full health. Niggling problems, of course, are part of the ageing process. But there are many other diseases that ravage us as we age, leaving us with a quality of life that is less than ideal. This strains healthcare systems, but also imposes a terrible cost on society. Unwell individuals cannot contribute meaningfully, whether in social situations – helping raise grandchildren, for example – or to their economies. Countries lose the experience and productivity that could have helped them achieve growth, and for many, this effectively puts the brakes on development.

But it need not be this way. At the Western Pacific Pharmaceutical Forum, our goal is to enhance quality of life by improving the health of citizens in member countries. One important way of tackling the problems associated with ageing is life-course vaccination. Many diseases that afflict the elderly can be thwarted by immunisation. Sadly, while vaccines are a priority for the young and young-ish, the picture is much more mixed when it comes to older adults. Many countries simply have not seen the importance of vaccine programmes for their elderly population. For many, this is because they have been “young” for so long that it never became a priority.

This view has to change. ASEAN is a region where the demographic time bomb is ticking loudly. Several countries in the region, including Singapore, are already classified as “ageing societies”. They will soon cross over into the “aged” category. Hot on their heels are previously young countries that will soon grow old – within the decade or so. This is not the only problem. Lack of awareness, cost concerns, and disinformation all create barriers to effective vaccine administration, and heighten the danger.

The World Health Organization has recognised the dangers ahead and has designated 2021-2030 as the Decade of Healthy Ageing. Life-course immunisation is a critical pillar of healthy ageing policies, and ASEAN governments would do well to act sooner rather than later. Ironically, COVID-19 may stimulate this effort. After all, who now has not heard of vaccines? Interest has never been higher, the machinery to dole out doses has been ramped up, programmes to combat misinformation and address vaccine hesitancy have been developed, and the use analytics to secure supply has been established. It does not take much to switch these over to serve other vaccination efforts, such as that for influenza.

It is true that rolling out life-course immunisation programmes is a costly, logistically complex, and difficult endeavour. The alternative, however, will be far more expensive, and not just in monetary terms. Time is running out, and swift, decisive action to forestall threats is imperative.



John Jackson

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Introduction

The COVID-19 pandemic caused by the SARS-CoV-2 virus has exposed the fragility of global healthcare systems. This can be evidenced by the scramble faced by many countries to cope with the spread of the disease, and the seismic waves rolling across multiple dimensions ^[1] in societies and economies.

This pandemic also underscores the centrality – and, ironically the lack of recognition – of the public healthcare institution ^[2]. Necessity has resulted in new policy and regulation, investments in innovation, and healthcare delivery that has helped countries (to varying extents) meet the evolving challenges posed by COVID-19 ^[3]. This has given rise to a positive domino effect which has transcended other facets of society. The new-found emphasis on hygiene and holistic wellness has reminded people on the value of healthy lifestyles. Countries are seeing general dips in flu cases ^[4] with heightened hygiene practices and social-distancing measures in place, as well as a rise in physical activity accrued to the convenience and growing popularity of digital fitness channels ^[5].

Nevertheless, other challenges remain, including the global demographic transition ^[6] towards an ageing society. COVID-19 had initially disproportionately affected people aged 65 and older, and the newer mutant variants of the virus have taken its toll on young and middle-aged patients as well. That said, given the significant risk factors of developing severe illness if they were to contract COVID-19, older people are a vulnerable demographic that needs to be protected. This further warrants greater effort and action to reshape the way we view the issue, and the need to reconfigure our approach to foster healthy ageing ^[6].

To emphasise the importance on promoting health throughout life, especially among the elderly, the World Health Organization (WHO) has dedicated the years 2021–2030 as the Decade of Healthy Ageing. As part of this, WHO has taken the lead in driving international

action to improve the lives of older people, as well as that of their families and communities. To demonstrate its commitment, the WHO endorsed the Regional Action Plan on Healthy Ageing in the Western Pacific in 2020. This plan advocates the need to maintain the functional ability of older adults to support their well-being as they age, helping them maintain good health, get support from their community, and be able to contribute meaningfully to society throughout their lives.

Life-course Vaccinations: A Critical Pillar of Healthy Ageing Policies

One way of doing this is through a suite of preventive care mechanisms, including self-care, health screenings and vaccinations ^[7]. While vaccines are highly effective in disease prevention, the average global immunisation uptake is still far from WHO target rates, especially amongst the Association of Southeast Asian Nation (ASEAN) member countries. To reinforce the importance of immunisation and persuade more countries to ramp up their nationwide immunisation efforts, the WHO endorsed an immunisation agenda for 2030 (IA2030) with the view of a “world where everyone, everywhere, at every age, fully benefits from vaccines to improve health and well-being” ^[8] ^[9]. The agenda lays down an ambitious, overarching global vision and strategy for vaccines and immunisation ^[9].

While this is a strategy aimed at all age groups, policies targeting older adult vaccination are especially important, with this group disproportionately impacted by vaccine-preventable diseases and bearing the greatest health burden of all age groups. As an example, the risk of influenza related mortality rises sharply as adults age, where the mortality rate for persons aged above 85 is 16 times greater than that of persons aged 65 to 69 years. ^[10] ^[11] The risk of cardiovascular events and deaths have been consistently found to have risen following influenza infections, with the risk of heart attack and stroke increasing by 6-10 times and 8 times, respectively ^[12] ^[13] ^[14].

ASEAN is particularly vulnerable, for various reasons. Many ASEAN countries will soon cross the demographic Rubicon and be classified as ageing societies. By 2030, most ASEAN countries, including Vietnam, Malaysia and Indonesia, will

become ageing societies, while Singapore and Thailand will become aged ones ^[15]. This has serious implications for their economies, social spending programmes, and retirement schemes, among other things.

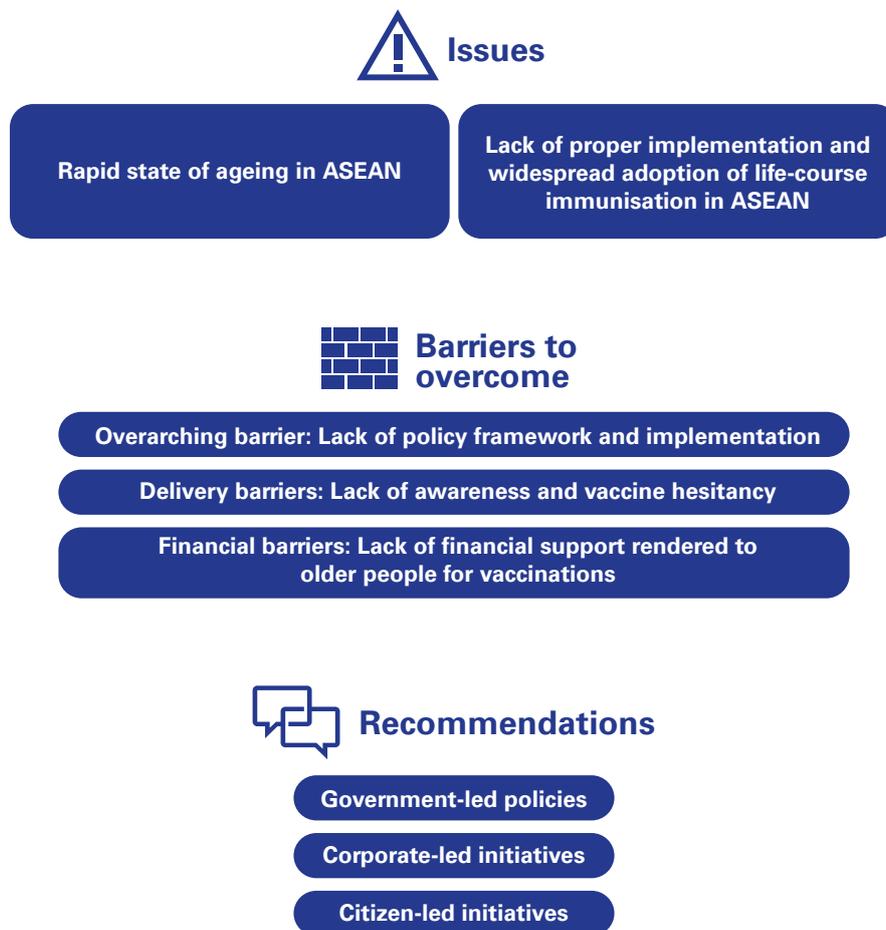


Figure 1: Summary of issues, barriers and recommendations

The rapid state of ageing in ASEAN

Since the beginning of recorded history, young children have outnumbered their elders. But in approximately five years, the number of people aged 65 or older will outnumber children under the age of 5 ^[16]. Driven by falling fertility rates and remarkable increases in life expectancy, population ageing will continue and possibly accelerate. The number of people aged 65 or older is projected to grow from an estimated 524 million in 2010 to nearly 1.5 billion in 2050, with most of the increase from developing countries, including those in ASEAN ^[16].

The rate of ageing varies across ASEAN countries, with Singapore, Thailand, Vietnam and Malaysia ageing faster.

They are officially classified as ageing countries, where the proportion of people aged over 65 is above 7%. An estimated 12.4% of both Singaporean and Thai population is above 65, while approximately 7.6% of Vietnam's population is above 65 ^[17]. While Indonesia and Philippines currently have less than 7% of the population above 65, these countries are also expecting to become ageing societies by 2030.

All ASEAN countries are projected to become aged societies (defined as countries with more than 20% of the population are above 65) by 2050. By then, the elderly population in ageing countries such as Singapore is projected to increase to 40.1% ^[18] while more than 20% of the population in younger countries such as Indonesia is expected to be above 65 ^[19].

Ageing status of ASEAN countries, 2020 and 2050

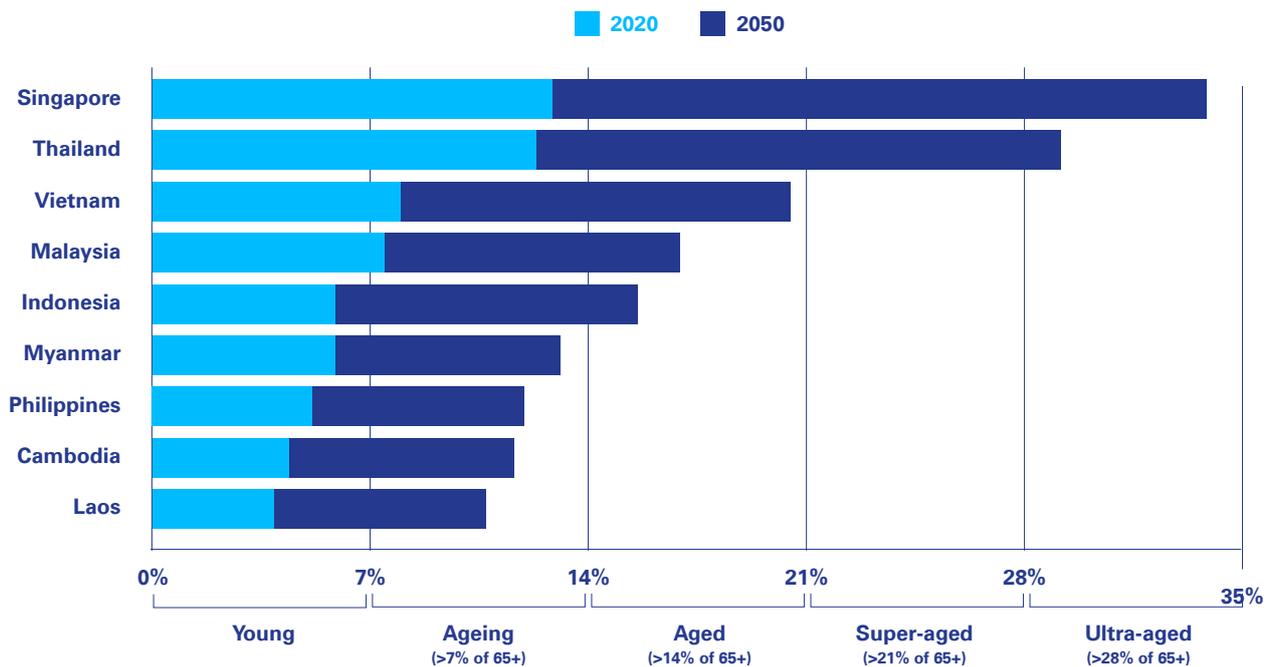


Figure 2: Probabilistic elderly (65+) population proportion projections by country, from 2020 to 2050

Source: United Nations, Department of Economic and Social Affairs, Population Division (2019). Probabilistic Population Projections Rev. 1 based on the World Population Prospects 2019 Rev. 1: <http://population.un.org/wpp/>

The dynamic shift in ASEAN's demographic towards an ageing population carries a cause of concern

This trend towards ageing has many implications, and not just on health. Middle-income ASEAN countries such as Malaysia ^[20] are transitioning towards attaining high-income status. The ageing trend could derail this process, for several reasons:

1. While people are living longer, they are not necessarily living healthier lives.

The average life expectancy in Southeast Asia has increased from 63 years in 2000 to approximately 71 years in 2019. But while they might be living longer, people are not living healthier lives. In 2019, on average, people only spent 61 years of their lives being healthy - Healthy Life Expectancy, or HALE ^[21], which is defined as the average number of years that a person can expect to live in "full health", as opposed to the years they spend living with disease and/or injury.

2. Frailty and weakened immune systems increase the incidence of infectious and chronic diseases, and hospitalisations among the older population.

This situation increases the burden on the healthcare system, straining government budgets, infrastructure capacity, and insurance schemes. In Singapore, annual public and private expenditure for older people in healthcare is estimated to rise tenfold, to SGD 49 billion in 2030 ^[15]. Across the wider Asia-Pacific, annual healthcare expenditure for older adults in 2030 will be five times the total expenditure in 2015.

3. With the rapid projected increase of healthcare related expenditure, pension schemes in countries like Malaysia and Indonesia could face sustainability issues as the number of beneficiaries and claimants increase greatly ^[22].

The speed and magnitude of the shift towards an ageing population in ASEAN potentially creates an increased economic burden of care for younger generations

The increase in healthcare expenditure will affect the personal savings of older adults and their families. By 2050, the potential support ratio (defined as the number of people aged between 15 – 65 per one older person aged 65 or older) across ASEAN will decline by more than half, to 1.7 in Singapore, 2.0 in Thailand, 2.9 in Vietnam, 4.1 in Malaysia, and 6.8 in the Philippines ^[23].

Potential support ratio (ratio of population 15-64 per one person 65+), 2000 – 2050F

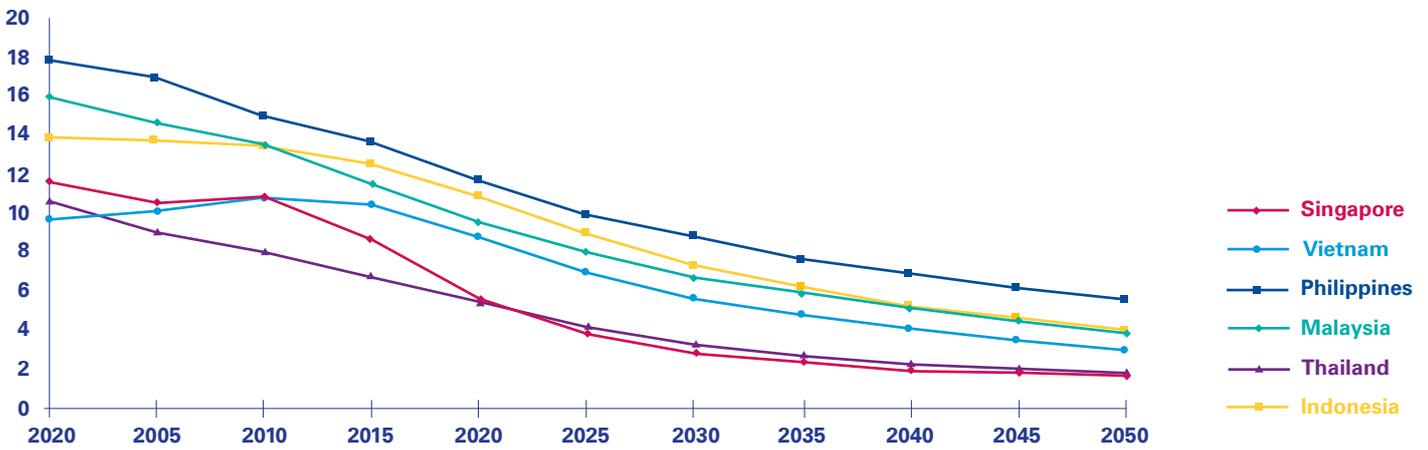


Figure 3: Projected potential support ratio in ASEAN countries, from 2000 to 2050

Source: United Nations, Department of Economic and Social Affairs, Population Division (2019). World Population Prospects 2019, Online Edition. Rev. 1.

While older people generally require more care, they receive the least amount of private coverage and typically lack the income required to fund their healthcare expenses. Consequently, the responsibility of care and sustenance falls onto individuals, families, and the public health system.

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“Older persons are the most vulnerable yet are paying the most in healthcare expenses. Even if they are covered by social insurance, out-of-pocket medical expenses are two times higher for older persons compared to the average individual.”

Usec. Juan Antonio A. Perez III,
Executive Director, Commission on Population and Development (POPCOM)

Leveraging preventive health measures to provide benefits to the community

As one of the most cost-effective and efficient methods of disease prevention, the importance of life-course immunisation should not be understated. Life-course immunisation is an important public health measure, with the ability to help improve our wellbeing and reduce our reliance on antibiotics that contributes to antimicrobial resistance.

It is also instructive to note that ageing exacerbates immunosenescence (the decline of immune function with age), increasing older persons' susceptibility to contracting vaccine-preventable diseases such as influenza, which ultimately manifests itself in a flood of other problems.

In Singapore, for instance, pneumonia was the second-leading cause of death in 2019, accounting for 20.7% of deaths that year ^[24]. Among older adults aged 65 and above, the annual number of influenza-associated all-cause deaths among adults aged 65 years and above was estimated to be 1678 per 100,000 persons (refer to table 1 beneath) ^[25]. Furthermore, research in the United States estimates that flu shots can reduce all-cause mortality among the elderly by approximately 47% ^[26].

Mortality outcome for persons aged > 65	All-cause deaths
Excess mortality rate / 100,000 person-years	1678

Table 1: Estimated influenza-associated excess deaths in Singapore, between 1996 to 2003

Source: Chow A, Ma S, Ling AE, Chew SK. Influenza-associated deaths in tropical Singapore. *Emerg Infect Dis.* 2006;12(1):114-121. doi:10.3201/eid1201.050826

These effects are not confined to health – they exact a heavy toll on the economy: Influenza was found to have a drastic effect on productivity. A research study calculated this impact to a total of 157,000 lost days of work in Singapore across the whole population ^[27].

Prioritising the health of older adults is therefore essential not just to prevent strain on health systems. If adults above the age of 65 remain healthy, they continue to be an important driver of a country's economy as well.

Vaccination remains one of the most cost-effective interventions ^[28] available to protect against several diseases. In a study involving low- and middle-income countries, immunisation programmes were found to return USD 51 for every USD 1 spent from 2011 to 2020, and are projected to generate even higher returns more from 2021 – 2030 ^[28].

Additionally, prioritising vaccinations for older adults yielded significant dividends. In countries with ageing populations, vaccinating older adults to establish a pre-existing immunity early in the flu season was found to be the most cost-effective strategy ^[29]. Influenza vaccinations among adults aged 65 and above were found to yield cost-savings of approximately USD 15,300 per quality-adjusted life years gained in countries such as the United States ^[30].

How life-course immunisation, a preventive health tool, can support healthy ageing

Vaccinations can help to reduce the risk of disease-related hospitalisations ^[31], and this arguably brings about substantial reductions in healthcare expenditure while enabling continued contributions to the economy and society by healthy older adults ^[32]. As stated, a fully-funded influenza immunisation programme could bring about cost savings of up to USD 15,300 per quality-adjusted life year in the United States ^[30]. In less developed countries, these cost savings could prove to be exponentially more significant, further emphasising the importance of introducing a holistic approach to life-course immunisation.

Life-course immunisation lacks proper implementation and widespread adoption in ASEAN

Despite the obvious benefits, ASEAN countries lag behind the rest of the world when it comes to life-course immunisation. Apart from some measures in Thailand, the Philippines, and Singapore, efforts by ASEAN countries to incorporate adult immunisation into routine programmes have been relatively lacking. For example, countries such as Malaysia, Vietnam, and Indonesia have yet to implement adult influenza vaccination programmes.

Even ASEAN countries with vaccination programmes in place have critical areas for improvement, particularly when it comes to accessibility of vaccines for the general population. Consequently, the coverage among older adults across ASEAN countries falls significantly short of the 75% target rate set by WHO. Comparing the take-up rate for influenza vaccines for adults 65 years and older, there is a stark contrast between ASEAN countries and other developed nations. Only 14% of Singapore’s elderly population is vaccinated, for example, compared to South Korea’s 83% rate. Other ASEAN countries such as Indonesia and Vietnam fared worse: The influenza vaccination rate in the 65 and over age group is only 1%.

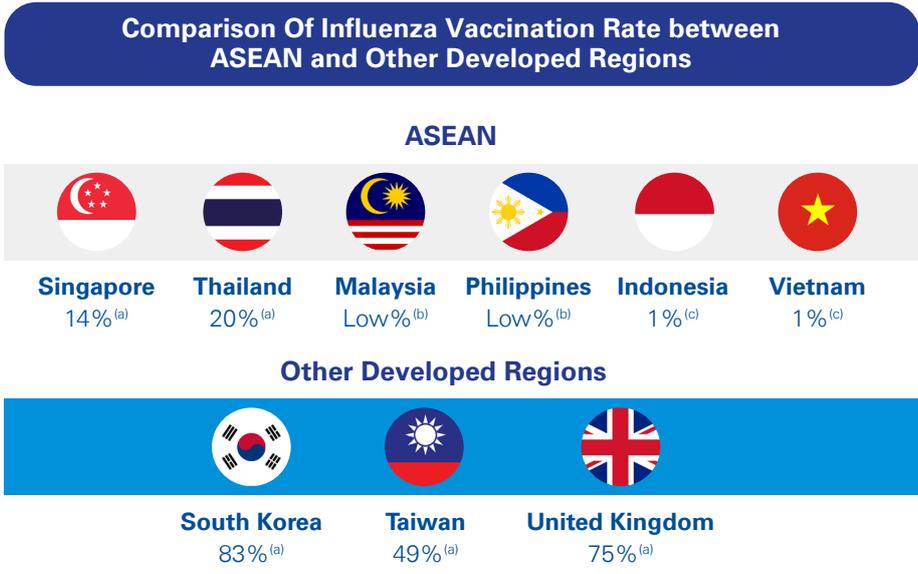


Figure 4: Comparison of influenza vaccination rates between ASEAN and other developed regions

(a) Influenza immunisation rates among adults aged 65 and older
 (b) No public information on population coverage rates but research suggests that immunisation rates are low
 (c) Influenza immunisation rates among the overall population

Current State of Life-Course Immunisation

The establishment of policies around life-course immunisation is highly fragmented across ASEAN, with only selected countries such as Thailand, the Philippines, and Singapore having baseline policies in place. That said, implementation of policies while ensuring effective uptake is a challenge, as vaccination uptake rates remain generally low from a regional perspective.

Best practices around life-course immunisation point to the implementation of a robust policy framework

In recognition of the importance of life-course immunisation as part of healthy ageing, global peers have developed comprehensive national vaccine programmes to increase the uptake rates of vaccines among older adults, in order to meet the 75% coverage target set by WHO ^[33]. In Europe, the WHO European Region Member States have devised the European Vaccine Action Plan (EVAP) as an adaptation of the Global Vaccine Action Plan. The EVAP aims to guide them in eliminating vaccine-preventable diseases through a multi-stakeholder approach, where member states pledge to ensure long-term domestic funding of and a commitment to immunisation.

In Asia – apart from South Korea – however, uptake rates remain low despite schemes such as free vaccinations. One of the reasons for this could be that across the different countries in ASEAN, there are varying levels of funding and campaign efforts around life-course immunisation. In Singapore, for example, despite the National Adult Immunisation Schedule (NAIS), a 2019 survey revealed that only 17.4% have received influenza vaccines ^[34]. Interviews conducted in 2020 with local doctors revealed the value of public education in dispelling misinformation or misconception around the severity of vaccine-preventable diseases, coupled by a lack of confidence in vaccines, which may account for such low take-up rates.

Barriers Faced to Achieving Higher Life-Course Immunisation Rates in ASEAN

Barriers to life-course immunisation

Overarching barrier:



- Life-course immunisation not recognised as an important pillar of a national Healthy Ageing policy
- Overall lack of public immunisation policy framework and implementation to promote and fund the immunisation costs

Delivery barrier:



Low awareness and increased vaccine hesitancy among public and HCPs

Financing barrier:



High out-of-pocket expenses

Enabler barrier:



Lack of data to quantify impact and to inform policy development

Figure 5: Key barriers to life-course immunisation rates in ASEAN

Barriers Faced to Achieving Higher Life-Course Immunisation Rates in ASEAN

There are a number of reasons for the low immunisation rates among older adults in ASEAN.

The first, and overarching barrier is an overall lack of policy framework and implementation to promote and fund the immunisation costs. A National Immunisation Programme (NIP) should be put in place to provide an official, government-funded framework that outlines the immunisations recommended for individuals throughout the life-course. Australia has a NIP in place that saw impactful outcomes in immunisation coverage in its population. As an example, since the programme was introduced, free shingles catch-up vaccines have been offered to elderly aged between 71 to 79 years old, resulting in an overall fall

in the incidence of shingles ^[35].

The lack of awareness and increasing vaccine hesitancy, which has resulted in misinformation about vaccine-preventable diseases and vaccines itself, are also key factors. For example, there are misconceptions that flu vaccinations are more necessary for those living in cold weather countries ^[36]. The overall problem around widespread misinformation is exacerbated by social media, which allows instantaneous and dissemination of this misinformation. For example in Malaysia, widespread anti-vax rumours spread through platforms such as WhatsApp have invoked fear and concerns from the general population ^[37].



“Older adults have low health literacy. They are afraid of the side effects of vaccines and are miseducated by the information circulating around social media such as WhatsApp.”

Dato' Dr Tengku Aizan Hamid, Director of Malaysian Research Institute on Ageing, President of the Gerontological Association of Malaysia



“Health literacy is the key barrier to life-course immunisation uptake among older people. In surveying health education on diseases and healthcare, the percentage of people that possesses adequate knowledge is abysmally low.”

Angelique Chan PhD, Executive Director at Centre for Ageing Research & Education, Duke-NUS Medical School, Singapore

Barriers Faced to Achieving Higher Life-Course Immunisation Rates in ASEAN



“In the past, I did not trust that vaccines are safe because of the technology involved. As I am allergic to a lot of drugs, I was also worried about the side effects. I think that good awareness from the government to inform the people about the privilege and benefits of getting free vaccination would help them feel more motivated about regular vaccination.”

Mrs. Thaninthorn Na Songkhla, based out of Thailand

Low awareness of the dangers of vaccine-preventable diseases is a third reason. In Indonesia, for example, few see flu as a threat to health, believing that they will recover

even without treatment. Therefore, they do not see the need for vaccination, regarding it as either needless or, worse, ineffective ^[38].



“Last year, I got two types of vaccines as a preventive measure due to the COVID situation. However, in general, it was not within my awareness that we needed to get regular vaccines.”

Ms. Phung Phuoc Hanh (Age: 73), retired military personnel in Vietnam

Even in countries where free vaccines are made available through national adult immunisation programmes, awareness is lacking. In the Philippines, where influenza vaccines are provided for free to older adults, only 30% of the population are aware of such programmes ^[39].

The inconsistency of vaccine advocacy has been a major hindrance to promoting life-course vaccination. For example, only a small proportion of healthcare providers (HCPs) push for adult influenza vaccines, and many are not immunised themselves ^[40]. Thus, they have neither the willingness nor authority to advocate such programmes ^[41].

A 2016 study found that much of the vaccine hesitancy amongst HCPs was related to influenza vaccines, followed by Hepatitis B and varicella ^[42]. This results in a lower level of confidence among patients, especially since HCPs remain among their most trusted advisers when it comes to health issues ^[42]. There are also some healthcare practitioners who believe that vaccines, such as those for influenza, are not effective because of the virus' mutable nature ^[43]. While others may believe myths that flu only affects colder countries. These factors all contribute to a prevailing view among the general public that vaccination is not important for healthy ageing.

Barriers Faced to Achieving Higher Life-Course Immunisation Rates in ASEAN

Financial challenges are another major barrier to overcome if vaccination is to be widespread. Many countries only give minimal financial support to older people, while prioritising other groups. Indonesia’s immunisation programme, for example, prioritises children, pregnant women, and pilgrims. Adult vaccines such as influenza and pneumococcal vaccines are not subsidised by the government, and

those wanting medication have to pay their own way, parting with between Rp 150,000 (USD 11) to Rp 500,000 (USD 35) per year out of their own pocket. This represents a heavy financial burden to families, considering the individual average monthly income is between Rp 2,620,000 (USD 185) and Rp 3,750,000 (USD 280) ^[38].

Comparison of Government Reimbursement for Adult Vaccines (e.g. influenza vaccine) between ASEAN and Other Developed Countries



Figure 6: Illustration to compare extent of government reimbursement for adult vaccines between ASEAN and developed countries

- (a) Subsidies received at public health facilities
- (b) Subsidies received at public health facilities but supply is limited
- (c) Subsidies received at public health facilities for indigent senior citizens

“Availability and cost are the main barriers of immunisation uptake among adults and older adults in Malaysia. Vaccines such as Influenza vaccines are only available in private clinics. In addition, the government does not provide subsidies or funding to older adult vaccination.”

Assoc. Prof. Ir. Dr. Siti Anom Ahmad, Director,
Malaysian Research Institute on Ageing,
Universiti Putra Malaysia

Barriers Faced to Achieving Higher Life-Course Immunisation Rates in ASEAN

Lastly, these delivery and financing barriers explored above are further compounded by the lack of enablers – such as integrated health records to track the uptake rates of adult vaccination. This leads to a gross underestimation of

the problems and consequences on individuals and wider society, and directly affects proper development of good public health delivery and financing policy ^[44].



“Longitudinal data collection is challenging for developing countries, as it requires heavy resources and expertise to maintain a database regularly. Furthermore, large countries such as Indonesia and Philippines face additional difficulties with people migrating from rural to urban areas, or vice versa.”

Angelique Chan PhD, Executive Director at Centre for Ageing Research & Education, Duke-NUS Medical School, Singapore



“Due to the fragmented healthcare system, data gathering capabilities varies from one Local Government Unit to the next. Some LGUs lack a robust immunisation data gathering process, making them unable to report reliable and up-to-date data to the Department of Health.”

Maria Fatima “Girlie” Garcia-Lorenzo, President, Philippine Alliance of Patient Organizations

Recommendations to Increase Life-Course Immunisation Rates In ASEAN



Pillars for Establishing Life-Course Immunisation within Healthy Ageing in ASEAN

A



Government-led policies

A1. Leveraging the influence of healthcare providers

A2. Developing robust data collection systems

A3. Improving public access to vaccination points

A4. Investment in predictive analytics

Recommendations to Increase Life-Course Immunisation Rates In ASEAN



Pillars for Establishing Life-Course Immunisation within Healthy Ageing in ASEAN



Corporate-led policies

B1. Providing annual influenza vaccination to all employees at the workplace

B2. Creating insurance products to cover vaccine-related costs

Recommendations to Increase Life-Course Immunisation Rates In ASEAN



Pillars for Establishing Life-Course Immunisation within Healthy Ageing in ASEAN



Citizen-led policies

C1. Role of grassroots efforts to spread word on vaccine confidence through positive-word-of-mouth

C2. Bringing vaccination facilities closer to the community

C3. Bridging the digital gap for the elderly by providing them with easier access to vaccinations

Recommendations to Increase Life-Course Immunisation Rates In ASEAN

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“Governments need to show leadership by formulating national vaccination policies for older-adults covering aspects such as availability and subsidies. This needs to be further supported by other stakeholders such as healthcare practitioners, NGOs, and researchers who play important roles in education and advocacy. That said, all efforts would be futile if the older adults themselves do not take accountability of their own health.”

Dato' Dr Tengku Aizan Hamid, Director of Malaysian Research Institute on Ageing, President of the Gerontological Association of Malaysia

To overcome the stated barriers, life-course immunisation needs to be recognised as an important pillar of healthy ageing.

To provide the impetus for players in the older-adult care ecosystem to act and effect changes, it is imperative that governments recognise the importance of life-course immunisation and dedicate resources to implement this as part of their healthy ageing policies.

Besides top-down approaches, bottom-up efforts are also instrumental for overcoming the barriers of life-course immunisation for healthy ageing in ASEAN. As such, stakeholders in the corporate sector as well as members of the public have an important part to play to support policymakers' initiatives.

A: Government-led policies

A1. Leveraging the influence of healthcare providers

HCPs have been lauded as frontline heroes, and because of their newfound visibility and gravitas, governments should engage their expertise and knowledge by establishing a formal structure for vaccine advocacy in clinical and public settings.

Incentives can be provided to enable physicians to have the right resources that they need to support them in their role – for example, by hiring more nurses who can help to remind their elderly patients on their upcoming personal vaccination schedule. The United Kingdom, for example, has successfully encouraged general practitioners to advocate for vaccines through monetary incentives for reaching immunisation targets, detailed in their Quality Outcomes Framework which is a system for the performance management and payment of general practitioners in the National Health System (NHS) ^[45] ^[46]. The idea is for these incentives to be useful to the HCPs, encouraging them to actively advocate for vaccines towards their patients and community.

A2. Developing robust data collection infrastructure systems

Multi-stakeholder collaboration is necessary to reach a state where information is properly and accurately captured by HCPs and stored in a central location to create a national immunisation registry that can be easily accessed by relevant stakeholders.

This way, governments can regularly monitor, track, and convey information about current epidemics, allowing older adults as well as health care professionals to stay updated on current developments to make better-informed vaccination decisions. As immunisation is one of the most important public health prevention tools, such a surveillance mechanism is critical in order to evaluate and continuously improve the collective efforts.

Recommendations to Increase Life-Course Immunisation Rates In ASEAN

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A3. Improving public access to vaccination points

With diverse and far-ranging population centres within Southeast Asia, making sure that people who want to be vaccinated can do so at their convenience is critical. The importance of this was demonstrated in a study conducted in Thailand, where distance to the nearest vaccination centre was found to be the strongest predictor of uptake ^[47]. Policymakers could therefore expand the adult immunisation provider network, to allow people with more convenience in terms of access points where they can get vaccinated.

For example, in South Korea, the transition of influenza vaccine administration in the national immunisation programme from public health units to private clinics resulted in the coverage rate improving from 73% to 80.9% among adults aged 65 and above in 2015 ^[48]. By making it more convenient to get vaccinated, members of the public, who are pressed for time, can do so with less disruption to their daily routines.

A4. Investment in predictive analytics

To ensure the effectiveness of immunisation programmes, policymakers will need to ensure that the supply of vaccines is sufficient for the older adult population. Investment in predictive analytics capabilities and training of analytics personnel can help governments gain better clarity around expected vaccine demand. In fact, vaccine management analytics have been given a boost because of supply issues with COVID-19 vaccines ^[49]. Similar models can be used for other key vaccines, such as that for influenza.

By doing so, countries would be more confident about making longer-term commitments, allowing them to make better contracting arrangements for vaccines. The benefits of long-term supply planning are evident in several countries elsewhere: In Turkmenistan, for instance, a multi-year commitment for HPV vaccines was rewarded with an 11% reduction in prices ^[50].

B: Corporate-led initiatives

B1. Providing annual influenza vaccination to all employees at the workplace

Employers could sponsor annual influenza vaccination for all their employees as part of their employee benefits programme. This could either be in the form of an onsite vaccination drive at the workplace, or employees could opt to visit a clinic of their choice.

It is instructive to note that the extent to which an employer can implement policies mandating that employees be vaccinated are dependent on both the employer's industry and country of jurisdiction. At best, employers can encourage their employees to receive vaccinations by making it more convenient for them (in terms of reducing the cost-barrier and improving their ease of access to vaccines).

B2. Creating insurance products to cover vaccine-related costs

Health insurers can offer specific insurance products to cover the cost of vaccinations. This would provide a greater level of assurance to those who are considering to take up vaccinations but are concerned about the cost implications around it.

C: Citizen-led initiatives

C1. Role of grassroots efforts to encourage vaccine confidence through positive word-of-mouth

Assuring older adults of the safety and efficacy of vaccines is challenging, as many are rooted to their reasons for vaccine hesitancy. As experiences from one's own age group tend to be more relatable, positive stories from vaccinated older adults could prove to be more effective in reducing the psychological barriers of vaccine uptake ^[50].

Recommendations to Increase Life-Course Immunisation Rates In ASEAN

8

Social media is a useful tool that can be leveraged here. More adults are adopting the use of social media platforms such as Facebook and Instagram, and with generally high social media penetration rates across ASEAN, this may be a potentially useful medium to share positive narratives from peers.

Also, NGOs and grassroots organisations could share relevant narratives around the effectiveness and safety of vaccines, while simultaneously highlighting the burden of vaccine-preventable diseases to families. Such positive word-of-mouth is an important way that grassroots efforts can support policymakers in their marketing efforts.

Furthermore, grassroots organisations such as community centres and patient organisations are part of the communities where older adults live.

Representatives from these organisations would thus know and understand their respective constituents well. As such, they make an important touch point for conveying the importance of life-course immunisation by helping their constituents understand the benefits and risks of immunisation.

C2. Bringing vaccination facilities closer to the community

It will be helpful for citizens to play a more active role in supporting both seniors and marginalised communities, by making it easier for them to travel to vaccination facilities. In several cities in the United States (such as Oklahoma City), citizens have taken the lead in setting up mobile vaccine pods at their local community churches (with the government's support), so that neighbouring residents could easily visit the church as an information source and get their vaccines. This is because some of them might feel uncomfortable travelling too far out of their neighbourhood.

Further, elderly care homes could offer annual flu vaccination programmes. For one, it is more convenient for the elderly residents to receive the vaccines there because it reduces their need to travel elsewhere. Second, it is more assuring to receive vaccines in an environment that is familiar to an individual, and in the company of trusted peers and caregivers.

For example, in Singapore, a number of nursing homes have been equipped with the personnel and tools to administer COVID-19 vaccines to elderly residents. A similar model can be adopted to enable elderly residents to receive influenza vaccinations as well.

C3. Bridging the digital gap for the elderly by providing them with easier access to vaccinations

Gaps in internet access and digital literacy may create struggles for older adults to smoothly navigate vaccine appointment websites and platforms, as well as to seek information around the safety of vaccines. While this group of older adults are arguably most vulnerable to the viruses, they may be unfamiliar with using some digital platforms and tools, causing them to be left behind.

There is room for innovation here where nongovernmental organisations or grassroots organisations can partner with the government to create simple digital health solutions that streamline the vaccine access process for elderly adults. These solutions are intended to augment the government's initiatives and are targeted for use by the elderly.

This could be in the form of providing the elderly with assistance in booking their vaccine appointments, scheduling timely phone calls to remind the elderly that they are due for their annual vaccine appointments, and providing easy access to resources on vaccine-related information for the elderly.

It is also important to recognise that as our populations grow older, digital savviness will grow. In the future, more older adults will have higher levels of digital literacy than before, so it would be worthwhile to consider investing in more digital health solutions for the long-term.

The adoption of life-course immunisation for a healthy ageing policy will require purposeful and committed action. Only then can ASEAN convert the demographic burden into a longevity dividend. Policymakers need to view life-course immunisation as an economic investment, not a cost.

No policy measure can fully realise its potential if healthcare investment in older adults continues to be viewed as solely a cost item. Governments must see the value of older adults' contributions to the economy and society if they are empowered by good healthcare intervention, such as life-course immunisation. Similarly, policymakers must realise that while it takes resources to invest in preventive care such as life-course immunisation for older adults, the opportunity cost of not doing so will be even higher.

Preventive care brings significant value to economies and is instrumental in avoiding ballooning healthcare expenditures in the future, underscoring the need for both the implementation and active adoption of a National Adult Immunisation Programme across all countries in the region as critical.

To maximise health outcomes and avoid unnecessary costs, a number of these health intervention recommendations should be initiated at an earlier age. Conventionally, "older adults" or "elderly" have been defined as a chronological age of 65 years or older. However, many adult and older-age health problems have their roots in mid-adulthood, or even earlier. Therefore, a life-course approach is essential to allow adults to age healthily and gracefully while providing cost savings to society. This approach has been increasingly adopted in developed countries, with many starting their vaccine education programmes early. By targeting younger generations, health literacy can be instilled in the public, particularly as they age.

Policy Call-to-Action Checklist

General policy baselines:

- Incorporating life-course immunisation as part of the healthy aging policy. E.g. by establishing a National Adult Immunisation Schedule, providing national subsidies, and setting older adult vaccination KPIs as measurable indicators of a healthy aging policy
- Increasing affordability by providing free or subsidised vaccines to target populations to improve uptake (currently carried out in the UK and Hong Kong SAR)
- Financing the subsidies by using existing funds more efficiently through a tailored Health Technology Assessment (HTA) or pay-for-outcome models, and tapping on innovative financing mechanisms like sin taxes (as in Taiwan), individualised health savings accounts (as in Singapore), social impact debts like bonds, coverage by private insurers (as in US) and allowing tax deduction for vaccine insurance coverage
- Once fundamental building blocks for the elderly are resolved, go one step further by targeting delivery and financing interventions at younger adults, like those who are in their 50s (such as is done in the UK and Hong Kong SAR)

A

Government-led policies

- Leveraging the influence of healthcare providers to improve vaccine advocacy**
 - Learnings from best practices in the UK to set out guidelines for HCPs to advocate for vaccines
- Developing robust data collection infrastructure systems**
 - Improving surveillance infrastructure for immunisation to track coverage rates, and coordinate vaccination action by digitising health and vaccination records so as to establish a centralised immunisation register (such as in Australia)
- Improving public access to vaccination points**
 - Enhancing the vaccination administration process and providing increased convenience to the general public, through wider authorisation of physicians, pharmacists, and mobile administration (including home-based immunisation)
- Investing in predictive analytics to better forecast vaccine demand**
 - Keeping a stable supply of vaccines to support the growth in the older adult population across ASEAN

B

Corporate-led initiatives



Providing annual influenza vaccination to all employees at the workplace

- Employers can sponsor the cost of employee's flu vaccinations, if they are not already covered by the government. They could also host on-site vaccination drives (similar to that of blood-donation drives at the workplace)



Creating insurance products to provide coverage for vaccination related costs

- Alleviating people's concerns around the associated costs of by introducing relevant and targeted insurance products in this light

C

Citizen-led initiatives



Role of grassroots efforts to spread word on vaccine confidence through positive word-of-mouth

- Encouraging the sharing of peer narratives in community centres and patient organisations around the safety and effectiveness of vaccines, to promote vaccination advocacy among elderly adults



Bringing vaccination facilities closer to the community

- Equipping aged care homes with the facilities and personnel that they need to carry out on-site vaccination drives
- Endorsing citizen groups with the ability and resources to host mobile vaccination pods at convenient locations in the community for both elderly and marginalised groups



Bridging the digital gap for the elderly by providing them with easier access to vaccinations

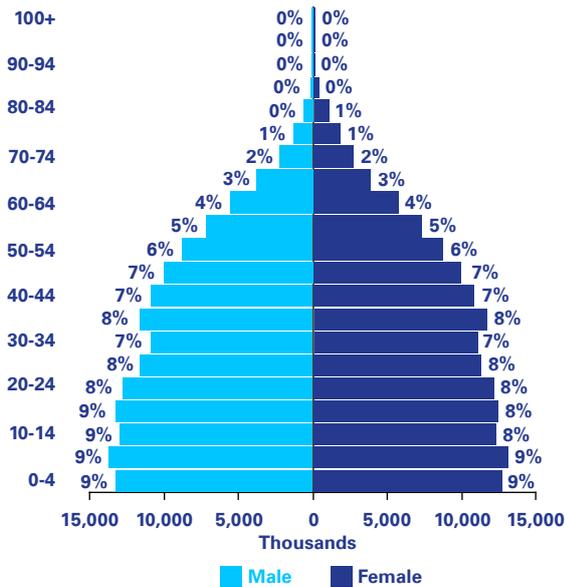
- Non-governmental organisations or grassroots organisations can partner with the government to create simple digital health solutions that streamline the vaccine access process for elderly adults



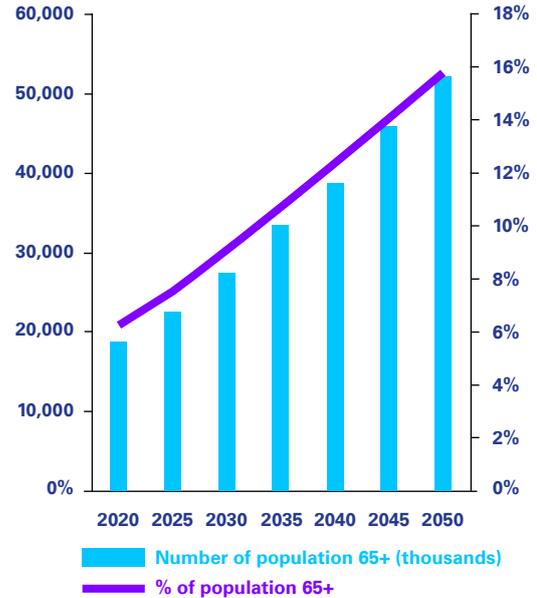
Indonesia

Overview of the ageing landscape in country

Indonesia Population Pyramid (2020)



Indonesia Older Adult Population Growth



Source: United Nations, Department of Economic and Social Affairs, Population Division (2019). World Population Prospects 2019, Online Edition. Rev. 1.

Indonesia is a relatively young country in the ASEAN region with a median age of 29.7 years old and 6.3% of its population comprising of individuals aged 65 and older. However, its population is rapidly ageing, with the number of people aged 65 and above growing at a CAGR of 4.8% over the next decade to reach 27.4 million people, equivalent to 9.2% of its projected population. By 2050, 16% of its population is projected to comprise of people aged 65 and above, resulting in the old-age dependency ratio increasing from 10.6 old-age persons per 100 working age persons to 27.3 old-age persons per working age persons.

Burden of vaccine-preventable diseases and state of immunisation

With the increased risk of complications, influenza presents a significant burden to Indonesia's health and economic systems. For persons aged 65 and above, 50% of pneumonia cases are triggered by influenza^[38]. Across all ages, 3.4 million clinical episodes of lower respiratory tract infections (defined as clinically diagnosed pneumonia and bronchitis) were attributable to influenza, with case-fatality ratios ranging from 25.7% to 96.8% across the 65+ age groups (in 5 year bands up to 90+ years old)^[52]. In addition to years of life lost due to influenza, the years lived with disability results in average Disability Adjusted Life Years (DALY) ranging from 19.8 – 46.7 years for adults aged 65 and above^[52]. As a result, the annual costs to the economy amounted to USD 866.7 million, comprising USD 847.5 million in indirect costs due to productivity losses and USD 19.2 million in direct costs due to medical expenses.

Despite the significant burden posed by influenza, less than 1% of the overall population receives the seasonal influenza vaccine^[53].

Policies for adult immunisation

Indonesia does not have any national adult immunisation policy and vaccines such as the influenza vaccine is recommended to older adults, adults with underlying chronic diseases, Hajj pilgrims, and health care workers ^[38].

Current landscape for life-course immunisation

Delivery:

With its geographically diverse population and fragmented healthcare system, older adults with multiple complex conditions require multiple specialists at different locations and may face inconvenience when receiving vaccines.

Furthermore, the level of awareness and understanding of vaccines and vaccine-preventable diseases remain low in Indonesia. In a focus group discussion designed to help individuals identify the differences between influenza and the common cold, only 2 out of 6 respondents were able to identify symptoms for influenza ^[38]. This lack of awareness is also prevalent among physicians, with only 64% of physicians surveyed in Western Java recognising that older adults and immunosuppressed adults are at high-risk of contracting influenza and only 11% of them having had the influenza vaccine in 2016. In addition, around 90% of physicians seeing outpatients have never made a clinical diagnosis of influenza ^[38].

Financing:

Due to the lack of a national adult immunisation policy, vaccines are financed entirely out-of-pocket for older adults. The cost of an influenza vaccine ranges from Rp 150 thousand to Rp 500 thousand (USD 10 – 35). This poses a significant financing barrier for many families as it accounts for around 5 – 10% of the monthly average individual income of Rp 2.4 million (USD 170) ^[54].

Current policies addressing healthy ageing

National Plan of Action for Older Person Welfare Guidelines:

Sets out development initiatives for community-based home care and older person empowerment at the grassroots level ^[55].

- Through such initiatives, programmes have been established to increase the access to primary health care facilities through the development of age-friendly primary health care. Furthermore, older adults are empowered through the greater social protection and preventive health care. For example, the government promotes the adoption of healthy lifestyles, provides regular health check-ups for early detection of risk factors, incentivizes community participation through social and recreational activities conducted by elderly support groups, and provides a minimum income for older persons with no other means of support ^[56].

Government Regulation No. 43/2004 on Older Person Welfare Improvement Efforts

Presidential Decree No. 52/2004 on the Formation of National/Regional Commission:

Establishes the National Commission for Older Persons (NCOP) comprising representatives from 17 Ministries.

- The NCOP assists the President in coordinating the improvement of older person social welfare initiatives and provides recommendations to the President in developing policy on improvement of older person social welfare.

Top three policy recommendations

1. Establish adult vaccine schedule and guidelines for vaccine administration:

Currently, Indonesia does not have an adult immunisation schedule or a set of national guidelines governing the administration of vaccines. Developing such initiatives will be helpful in facilitating the safe and routine administration of vaccines to older adults among health care workers.

2. Provide vaccine financing for older adults:

As vaccine expenses amount to a significant portion of the monthly average income, policymakers need to provide adult vaccines for free or at highly subsidised rates to individuals in high-risk groups such as older adults. This would help to reduce the financing barrier faced by older adults and increase the vaccination uptake rate, as seen in countries such as Thailand.

3. Improve immunisation data infrastructure:

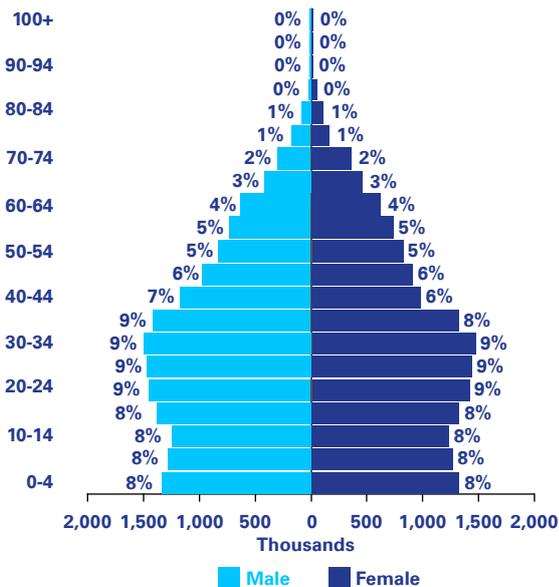
To support policies for adult immunisation, policymakers should invest in the tracking of immunisations through the development of a centralised, computerised immunisation register. Through such a development, policymakers would be better able to assess the cost and benefit of its national immunisation programme. At the same time, it would facilitate vaccine awareness and outreach by other stakeholders as the vaccination history of patients are accessed easily.



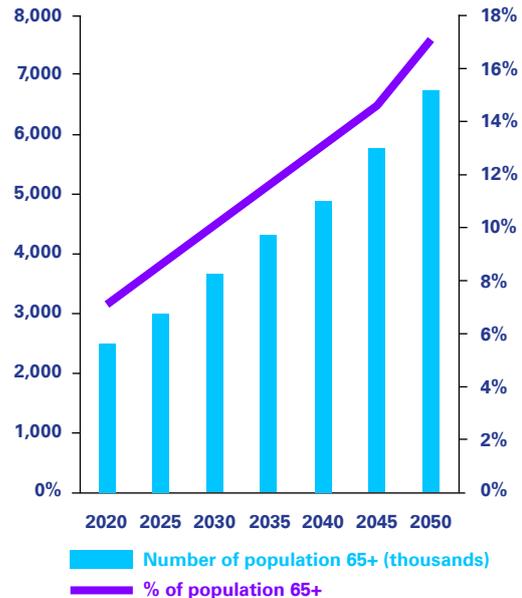
Malaysia

Overview of the ageing landscape in country

Malaysia Population Pyramid (2020)



Malaysia Older Adult Population Growth



Source: United Nations, Department of Economic and Social Affairs, Population Division (2019). World Population Prospects 2019, Online Edition. Rev. 1.

Malaysia has entered the ageing status with 7.2% of its population aged 65 years and above in 2020. Over the next decade, the population of individuals aged 65 and above is projected to grow at a CAGR of 4.53% to reach 3.6 million people, equivalent to 19.6% of its population. By 2050, close to one out of five people in Malaysia will be aged 65 and older. Consequently, the old-age dependency ratio is expected to increase from 11.8 in 2020 to 28.2 in 2050.

Burden of vaccine-preventable diseases and state of immunisation

In Malaysia, influenza occurs throughout the year with no clear seasonal trends. While the clinical and economic burden of influenza are yet to be fully established, influenza is estimated to account for 23% of severe acute respiratory infections (SARI) cases and 13% of pneumonia hospitalisations in Malaysia^{[57] [58]}. Furthermore, the seroprevalence rates of 22.3% for seasonal H1N1 and 14.7% for seasonal H3N2 in Kuala Lumpur suggests that infection with influenza A is common within the overall population and influenza is likely to cause a significant and under recognised burden in the country^{[59] [60]}.

However, adult immunisation rates remain low in Malaysia. Based on vaccine import and sales data, less than 2% of the population receives the seasonal influenza vaccine ^[61] ^[62]. Even among Umrah and Haj pilgrims where vaccinations are highly recommended ^[63], the uptake of influenza and pneumococcal vaccines only stood at only 28.6% and 25.4% respectively ^[64].

Policies for adult immunisation

Health care workers are enrolled into an annual immunisation programme, and influenza and Hepatitis B vaccines are provided at no cost to them ^[65] ^[66]. However, the current focus of the National Immunisation Programme lies in childhood vaccination; Malaysia does not have a population-wide adult immunisation programme. Nevertheless, the Ministry of Health recommends adult vaccines as outlined in the adult immunisation schedule, but immunisation expenses are financed entirely out-of-pocket.

Malaysia National Adult Immunisation Schedule

Vaccine	19 – 26 years	27 – 59 years	≥65 years
Influenza (INF)	1 dose annually ^(b)		
Pneumococcal polysaccharide (PPSV23)	1 or 2 doses ^(a)		1 dose ^(b)
Tetanus, reduced diphtheria and acellular pertussis (Tdap)	3 doses of Tdap ^(b) and Boost with 1 dose of Td every 10 years		
Hepatitis A (Hep A)	2 doses ^(a)		
Hepatitis B (Hep B)	3 doses ^(a)		
Zoster			1 dose ^(c)
Meningococcal	1 or more doses ^(a)		

(a) Recommended for adults with specific medical condition or indication
 (b) Recommended for adults who have not been previously vaccinated, or lack evidence of past infection or immunity
 (c) Recommended for adults who have not been previously vaccinated

Current landscape for life-course immunisation

Delivery:

In Malaysia, influenza vaccines are primarily accessed through private healthcare facilities, with only 10% of adult vaccinations administered via public health care facilities.

Supported by the World Health Organisation, the Ministry of Health drives awareness of the safety and efficacy of vaccines through the Immunise4Life initiative. However, vaccine hesitancy and anti-vaccine sentiments have been growing in Malaysia due to the growth of misinformation disseminated on social media channels. In particular, some people believe that vaccines are harmful or prohibited by religion while others believe in the sufficiency of traditional complementary and alternative medicines in tackling infectious diseases. Furthermore, this negative sentiment regarding vaccines extend to some physicians and other healthcare workers such that they discourage their patients from being vaccinated ^[67]. As a result, increasing numbers of people are refusing to be vaccinated, evidenced by the growing childhood vaccine refusal by parents and a 12.5% prevalence of vaccine hesitancy among urban parents ^{[65][68]}. Immunisation records are stored in individual vaccination books. The lack of a computerised, central immunisation register hinders the nationwide efforts to measure the burden of vaccine-preventable diseases, and the cost-benefit of introducing an adult immunisation programme. Furthermore, it facilitates the falsification of vaccination records by anti-vax physicians ^[67].

Financing:

Adult vaccines are financed entirely out-of-pocket, via public or private healthcare facilities and influenza vaccines cost between MYR 41 – 100 (USD 10 – 24) ^[69]. As part of the country's efforts to stave off infectious diseases during the COVID-19 pandemic, the 2021 Malaysian Budget provides tax exemptions of up to MYR 1,000 per person to cover vaccination expenses for the pneumococcal, influenza, and COVID-19 vaccines ^[70].

Current policies addressing healthy ageing

Ageing policies in Malaysia are guided by the National Policy for Older Persons and the National Health Policy for Older Persons. Through these policies, older adults, especially lower-income individuals, receive financial and healthcare assistance through schemes such as the PeKa B40 and Bantuan Orang Tua schemes. In addition, under the 2021 Budget, senior citizens as well as caregivers of senior citizens are able to receive financial assistance of between MYR 350 – 500 (USD 85 – 120) every month ^[71]. Furthermore, employers are incentivised to hire older adults through tax deductions that is slated to run through 2025 ^[71].

Top three policy recommendations

1. Advocate for vaccines through a multi-stakeholder approach:

In order to tackle the increasing vaccine hesitancy and dispel common misconceptions, policymakers should work alongside local authorities, health care professionals, non-governmental organisations and vaccine manufacturers to improve the level of understanding of vaccines among older adults and increase the adult vaccine uptake rate. For example, training and re-training programmes can be instituted for health care professionals to help them understand the importance of vaccines and their responsibility for advocating for them. At the same time, all stakeholders in the healthcare ecosystem should play their part in correcting vaccine misinformation and helping older adults understand the benefits of vaccination.

2. Provide vaccine financing for older adults:

To remove prohibitive financial barriers faced by lower-income individuals, vaccines need to be made more affordable through government subsidies and incentives. For example, tax exemptions for vaccination expenses can be extended to include aged parents, incentivising younger adults to take greater responsibility in helping their parents get the appropriate vaccines. Furthermore, vaccines for high-risk individuals such as older adults and adults with comorbidities should be provided at no cost to boost coverage rates. Over the long-term, such a preventive strategy would harness economic benefits with by negating the need for expensive treatments following outbreaks.

3. Improve data collection and infrastructure:

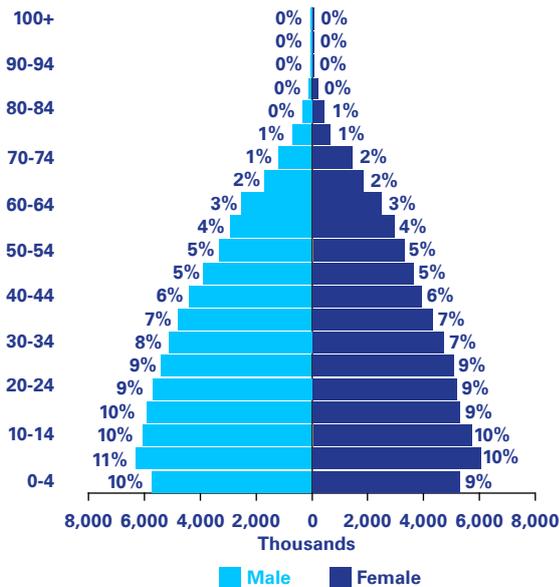
To support policies for adult immunisation, policymakers should invest in infectious disease surveillance and tracking of immunisations. For example, the Influenza Surveillance System can be stratified by age groups, allowing for more granular analyses and targeted action towards reducing the disease burden ^[72]. In addition, policymakers should expand existing sentinel networks to improve their data collection capabilities and share epidemiological influenza reports on a frequent basis to facilitate collaboration between stakeholders ^[73]. Such efforts should be supported by a centralised, computerised immunisation register for real-time tracking of vaccine coverage rates, facilitating vaccine outreach efforts by all stakeholders in the ecosystem.



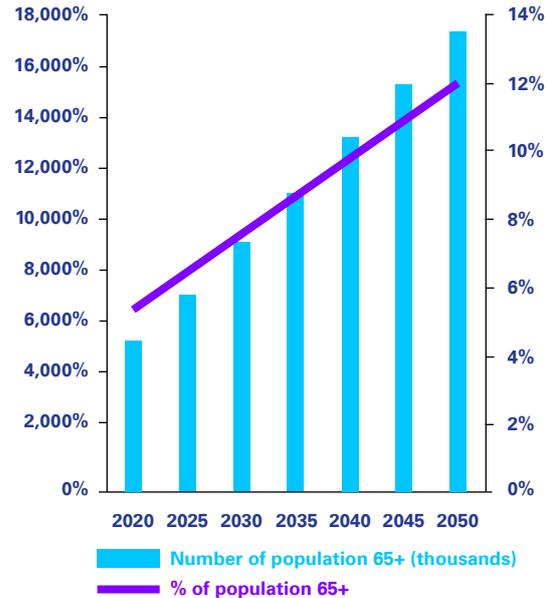
Philippines

Overview of the ageing landscape in country

Philippines Population Pyramid (2020)



Philippines Older Adult Population Growth



Source: United Nations, Department of Economic and Social Affairs, Population Division (2019). World Population Prospects 2019, Online Edition. Rev. 1.

While the population in Philippines currently stands at a relatively young median age of 25.7 years, we recognise that its population will start to age over the next decade. From 2020 to 2030, the population of persons aged 65 and above is projected to grow at a CAGR of 4.5%. This means that by 2050, the number of people aged 65 years and above will triple to 17 million people, equivalent to 11.8% of its overall projected population. As a result, the old-age dependency ratio is expected to increase from 20.2 older persons per 100 working age persons to 55.3 old-age persons per 100 working age persons.

Burden of vaccine-preventable diseases and state of immunisation

In 2020, pneumonia was the 5th leading cause of death, explaining 5.6% of all-cause deaths ^[74]. Furthermore, 67.1% of influenza-associated mortality each year occur in adults aged 60 years and older ^[75]. Moreover, influenza is the fifth leading cause of morbidity, with the influenza morbidity growing 21% year-on-year in 2018 ^[76].

Immunisation rates for vaccines among older adults depend on the extent of financing coverage. The Expanded Pneumococcal Immunisation Programme was launched in 2016 ^[77]. Under this programme, all Filipino senior citizens can receive free pneumococcal vaccines in their respective health centres. While this has facilitated a pneumococcal vaccine coverage rate of 52.9% for persons above 60 years old, the vaccine coverage rate for influenza remains low due to the lack of a comprehensive immunisation policy. As a result, only 36.3% of adults above 60 years have ever received an influenza vaccine as of 2019 ^[39].

Policies for adult immunisation

While the Philippines has not developed an adult immunisation schedule, vaccine subsidies are available for influenza and pneumococcal vaccines. The Expanded Pneumococcal Immunisation Programme for Senior Citizens launched in 2016 provides free pneumococcal vaccines to all citizens, administered at ages 60 and 65 ^[78]. Outside of the national immunisation programme, individuals aged 60 and above receive discounts between 20 - 60% for influenza and pneumococcal vaccines through the Expanded Senior Citizens Act and the nationwide PhilHealth public insurance scheme ^{[79] [80]}. Furthermore, the Health and Wellness Programme for Senior Citizens provides free influenza and pneumococcal vaccines to the 1.3 million indigent citizens aged 60 and above in the country ^[81].

Current landscape for life-course immunisation

Delivery:

Since influenza vaccines are provided at no cost only to indigent older citizens, more than 75% of individuals aged 60 and above do not qualify for the programme; vaccines procured by the government have not been sufficient to cover the overall older adult population and barangays (the smallest administrative level of a Local Government Unit) have also experienced insufficient supply to cover the current Health and Wellness Programme for Senior Citizens ^[82].

To increase access to vaccines, the Department of Health has made efforts to make seasonal vaccinations available at all health centres. Currently, 90% of vaccination administration is conducted through public healthcare facilities, and a total of 77.5% through local barangay health stations ^[39].

However, awareness of vaccines is considerably low, with only 30% and 41% of adults aged 60 and above being aware of the influenza and pneumococcal vaccines respectively ^[39]. Furthermore, immunisation records are handled by Local Government Units and stored locally in physical patient vaccination cards and paper-based registries, restricting the ability for population level tracking and analysis.

Financing:



Recommended vaccines and available subsidies

Vaccine	19 – 26 years	27 – 64 years	≥65 years
Influenza (INF)			1 dose annually ^{[a] [c]}
Pneumococcal conjugate (PCV13)			1 dose during each pregnancy ^{[a] [b] [c]}
Tetanus, reduced diphtheria and acellular pertussis (Td)		1 dose during each pregnancy ^[d]	

- (a) Full subsidies available to indigent citizens through the Health and Wellness Programme for Senior Citizens
- (b) Full subsidies available to all citizens through the Expanded Pneumococcal Immunization Programme
- (c) Partial subsidies and tax exemptions as outlined in the Expanded Senior Citizens Act
- (d) Full subsidies available to all citizens through the Expanded Programme on Immunization

While the Philippines provides subsidies for adult vaccines for certain target individuals, self-paying individuals may face financing barriers. For individuals who have to self-pay, influenza vaccines cost between PHP 600 – 1,500 (USD 12.5 – 31.25) ^[83]; a prohibitive cost for some where the monthly average family income in the country is PHP 22,000 (USD 460) ^[84].

Current policies addressing healthy ageing

In ensuring older persons are able to access essential items for healthy ageing, older persons are entitled to 20% discounts and value-added tax exemptions on medical, transport, food and entertainment expenses, as well as 5% discounts on utilities and certain groceries through the Expanded Senior Citizens Act of 2010 ^[86]. Furthermore, Filipino citizens automatically qualify for the PhilHealth National Health Insurance Programme upon reaching 60 years of age, helping to ensure that medical expenses remain affordable to all in their older years ^[86]. In addition, indigent senior citizens receive a monthly pension of PHP 500 (USD 10). To support the Senior Citizens Act, the Health and Wellness programme for Senior Citizens was established which resulted in the creation of the Expanded Pneumococcal Immunization Programme and the provision of influenza and pneumococcal vaccines to indigent senior citizens.

In 2019, the Universal Health Care Law was passed, intended to guarantee equitable access to quality and affordable health care goods and services and expected to improve the access to healthcare by older persons, especially in rural and underserved areas. In the same year, the National Commission of Senior Citizens was established to oversee the formulation, implementation and management of all programmes, research initiatives and policies for older adults.

Top three policy recommendations

1. Expand adult immunisation programmes:

To reduce the burden of vaccine-preventable diseases and increase vaccine coverage rates, policymakers should expand the immunisation programme to subsidise vaccines to all older persons aged 60 and above, taking into consideration the Recommendations for Routine Immunisation by the World Health Organisation for recommended vaccines ^[87]. To support such efforts, policymakers can expand on its ongoing plans for local Covid-19 vaccine manufacturing, to produce other vaccines such as the routine influenza vaccine to provide a reliable source of supply ^[88].

2. Improve data infrastructure for vaccines:

To support policies for adult immunisation, policymakers should explore investments into implementing an immunisation information system, allowing governments to better assess the costs, benefits, and procurement requirements for an adult immunisation programme while providing health care professionals and patients greater access to immunisation records. For example, best practices from the Danish Vaccination Register can be applied to rollout a compulsory, standardized immunisation information system nationwide, allowing local governments to monitor vaccine coverage rates in smaller geographical areas while allowing for the consolidation of data at the national level ^[89].

3. Increase support for non-governmental and grassroots organisations:

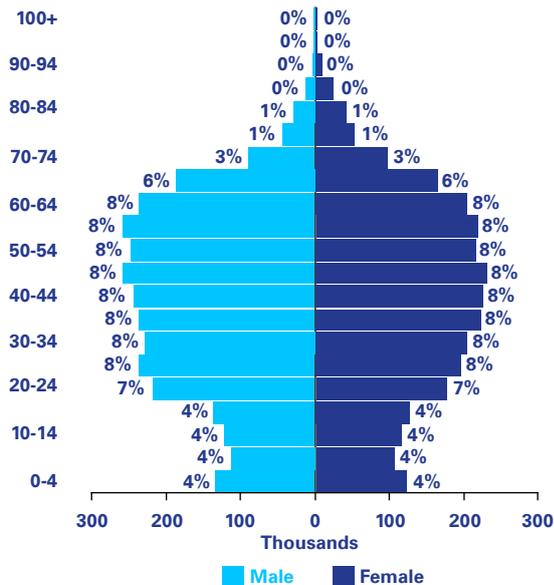
To better connect to patients on-the-ground, policymakers should empower non-governmental and grassroots organisations with greater financial and educational support for vaccine awareness programmes. Such organisations understand the unique and localised needs of their constituents better and can help older adults understand and go for vaccinations.



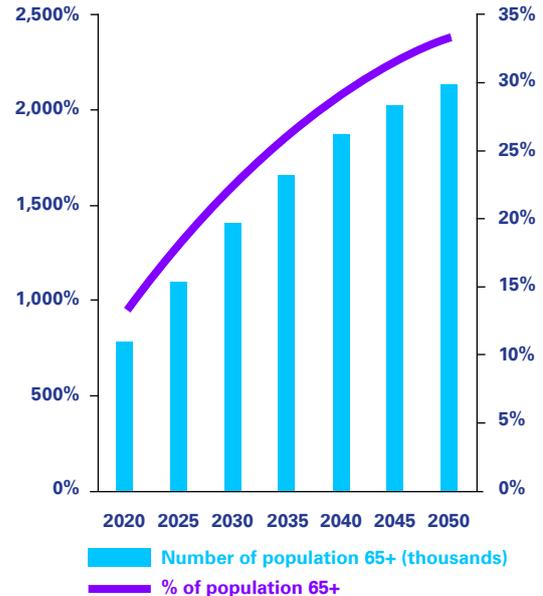
Singapore

Overview of the ageing landscape in country

Singapore Population Pyramid (2020)



Singapore Older Adult Population Growth



Source: United Nations, Department of Economic and Social Affairs, Population Division (2019). World Population Prospects 2019, Online Edition. Rev. 1.

Singapore is transitioning into an officially aged society with 13.4% of its population comprising adults aged 65 and older, a composition that is projected to increase to almost 25% in 2030. From 2020 to 2050, the population of adults aged 65 and above is projected to grow at a CAGR of 3.4%, reaching 2.1 million people or 1 in 3 of the overall population.

Burden of vaccine-preventable diseases and state of immunisation

Vaccine-preventable diseases impose a considerable burden in Singapore. For example, pneumonia was the second leading cause of death among adults aged 65 and above, explaining 20.7% of all deaths in 2019 ^[24]. In addition, 16.3% of all pneumonia and influenza (P&I) hospitalisations were attributable to influenza among adults aged 65 and older ^[74]. Consequently, influenza causes a loss of 157,000 workdays across the population per year ^[75].

Despite being the most developed country in the region, the seasonal influenza immunisation rate in Singapore remains low at just 17.4% ^[34]. Among adults aged 65 to 74, the immunisation rate stood at only 14% ^[76]. Specifically for pneumonia, around 10.3% of adults aged between 65 and 74 have reported to have ever received the vaccine ^[34].

Policies for adult immunisation

Singapore's National Adult Immunisation Schedule (NAIS) was established in 2017, incorporating best practices and recommendations of the Expert Committee on Immunisation (ECI). The NAIS currently outlines vaccine recommendations for 11 diseases, with vaccines in the NAIS eligible for government subsidies since Nov 2020^[77]. In addition, individuals may withdraw up to SGD 700 annually from their MediSave accounts for remaining vaccination expenses^[78].

Singapore adult immunisation schedule

Vaccine	18 – 26 years	27 – 64 years	≥65 years
Influenza (INF)	1 dose annually or per season ^(a)		1 dose annually or per season
Pneumococcal conjugate (PCV13)	1 dose ^(a)		1 dose
Pneumococcal polysaccharide (PPSV23)	1 or 2 doses (depending on indication) ^(a)		1 dose
Tetanus, reduced diphtheria and acellular pertussis (Tdap)	1 dose during each pregnancy ^(a)		
Human papillomavirus (HPV2 or HPV4)	3 doses ^(b) (Females)		
Hepatitis B (Hep B)		3 dose ^(b)	
Measles, mumps and rubella (MMR)		2 dose ^(b)	
Varicella (VAR)		2 dose ^(b)	

(a) Recommended for adults with specific medical condition or indication
 (b) Recommended for adults who have not been previously vaccinated, or lack evidence of past infection or immunity

Current landscape for life-course immunisation

Delivery:

With its island wide network of 20 outpatient polyclinics and 1,700 private GP clinics, Singaporeans enjoy wide access to vaccinations. In addition, immunisation data is stored centrally and easily accessible for providers and patients via the National Immunisation Register.

To boost awareness, road shows and talks are held during the annual World Immunisation Week by public healthcare institutions. Furthermore, information on the vaccination programme can be found on the Health Promotion Board's Health Portal ^[79]. However, awareness and understanding of the importance of vaccines included in the National Adult Immunisation Schedule (NAIS) is arguably low in Singapore. According to the Saw Swee Hock School of Public Health, National University of Singapore, the most likely reasons for this include: a lack of recommendation by healthcare providers, a lack of knowledge (including misconceptions) about influenza and influenza vaccines, public concerns about vaccine efficacy and side effects, as well as a lack of opportunities for vaccination ^[80].

Currently, there is no framework for health care providers to recommend vaccines to their patients, leading to inconsistent recommendations amongst health care providers at different touchpoints. As such, patients may not be well informed of the vaccination options that are most suitable for them.

Furthermore, a lack of knowledge and understanding around the types of vaccines available and their respective purposes can allow for misconceptions to arise, resulting in sentiments that may echo a sense of vaccine hesitancy amongst members of the public. In Singapore, there is a generally low level of health education across the population (with nearly 3 in 4 Singaporeans possessing limited English Health Literacy) ^[81], which can potentially make it more challenging to educate the public on the benefits of adult vaccination.

Financing:

Through government subsidies and mandatory savings, adult vaccinations are largely affordable in Singapore. The government provides subsidies ranging from SGD 35 to SGD 125 for recommended vaccines administered at Community Health Assistance Scheme (CHAS) GP clinics, lowering maximum out-of-pocket immunisation fees against diseases such as influenza to between SGD 9 and SGD 19 among older adults ^[82] ^[83]. Patients may also receive recommended vaccines at polyclinics, provided with a subsidy that covers up to 75% of costs. In addition, adults in the Pioneer Generation (individuals born on or before 31 December 1949) and Merdeka Generation (individuals born between 1950 and 1959) receive an additional 50% and 25% subsidy respectively ^[82]. After subsidies, vaccination costs at polyclinics are comparable to those at CHAS GP clinics. Furthermore, remaining out-of-pocket fees can be paid using the individual's MediSave compulsory savings account.



Patient fee caps for vaccines in the NAIS

Vaccine	Pioneer Generation ^(a)	Merdeka Generation ^(b) / CHAS Blue / CHAS Orange	CHAS Green / Non-CHAS
Influenza (INF)	\$9	\$19	\$38
Pneumococcal conjugate (PCV13)		\$23	\$45
Pneumococcal polysaccharide (PPSV23)	\$9	\$18	\$35
Tetanus, reduced diphtheria and acellular pertussis (Tdap)	\$9	\$18	\$35
Human papillomavirus (HPV2 or HPV4)	\$16	\$31	\$63
Hepatitis B (Hep B)	\$10	\$20	\$40
Measles, mumps and rubella (MMR)	\$10	\$20	\$40
Varicella (VAR)	\$11	\$23	\$45

(a) Singaporeans born on or before 31 December 1949

(b) Singaporeans born between 1950 and 1959 or individuals born in or before 1949 who obtained Singaporean citizenship by 1996

Current policies addressing healthy ageing

The Ageing Planning Office (APO) oversees the SGD 3 billion nationwide Action Plan for Successful Ageing which provides a national blueprint for ageing. Singapore has set healthy ageing as an important priority, with a plan set out for Singapore's vision to becoming a Senior Friendly City, through "City for All Ages" at the national level, "Kampong for all Ages" at the community level, and "Opportunities for All Ages" at the individual level^[64]. While this demonstrates the commitment at national level it is equally instrumental that a holistic policy around adult immunisation and the necessary communications and health literacy education work in tandem to ensure success around the action plan.

City for All Ages

“City for All Ages” is vision that is focused on transforming the country into a place where people can age gracefully and confidently. Developments include the provision of research grants on ageing, the development of Active Ageing Hubs, the expansion of aged care facilities, the construction of age-friendly amenities and the improvement in age-friendly transport infrastructure. These are established to create a comfortable environment that seeks to better accommodate the needs and interests of elderly residents.

Kampong for All Ages

“Kampong for All Ages” is vision that is anchored on fostering a greater sense of inter-generational harmony and cohesiveness, reducing the extent of ageism. Developments include the creation of Dementia Friendly Communities and the co-location of eldercare and childcare facilities in Housing & Development Board (HDB) developments.

Opportunities for All Ages

“Opportunities for All Ages” aims to enable older adults to continue working, learning and growing. Developments include the creation of seniors’ health programmes, the delivery of post-secondary education programmes for older adults through the National Silver Academy and the provision of grants for employers to redesign jobs and age management practices for older adults

Top three policy recommendations

1. Incentivise practitioner-led advocacy:

Polymakers could explore the design and establishment of an incentive framework for doctors to advocate for and administer adult vaccines. For example, monetary incentives can be given to doctors at GP clinics for achieving vaccination target rates within their region. In addition, patients could be offered the option to learn more about suitable vaccinations for them whenever they visit GP clinics or polyclinics. With a patient’s medical profile on hand, doctors would be able to recommend suitable vaccinations for the patient. An automatic notification could be sent to the doctor during the in-patient consultation, and the doctor can assess whether it would be appropriate start a conversation with their patient around their vaccination options.

To ensure that community-dwelling and hospice-based adults that do not visit healthcare facilities regularly are not neglected, incentives should be given to home care, nursing home, and old age home providers for incorporating a vaccination programme within their services.

2. Increase support for non-governmental organisations and grassroots organisations:

The government could support and empower NGOs and grassroots organisations to advocate on vaccination topics. For example, grants can be provided for organisations to fund marketing and outreach efforts. Guidebooks and toolkits can also be prepared for organisations to better understand and convey the importance and benefits of vaccinations.

3. Target earlier ages for intervention:

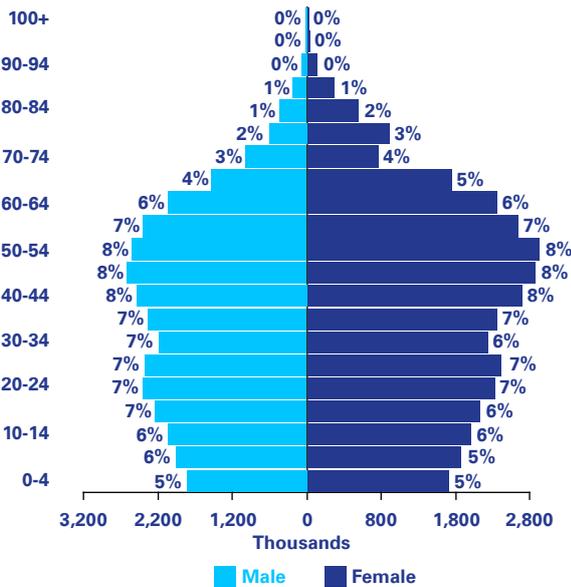
Polymakers should explore delivery and financing interventions for younger adults, starting with persons aged 50 and above. Awareness campaigns should also be targeted at younger adults (in addition to campaigns targeting older adults) to ensure that individuals are keenly aware of the burden of vaccine-preventable diseases and the avenues for vaccinations. To do so, the government can expand on its VaccinNationSG COVID-19 awareness campaign to include vaccines such as influenza and pneumococcal conjugate in the future.



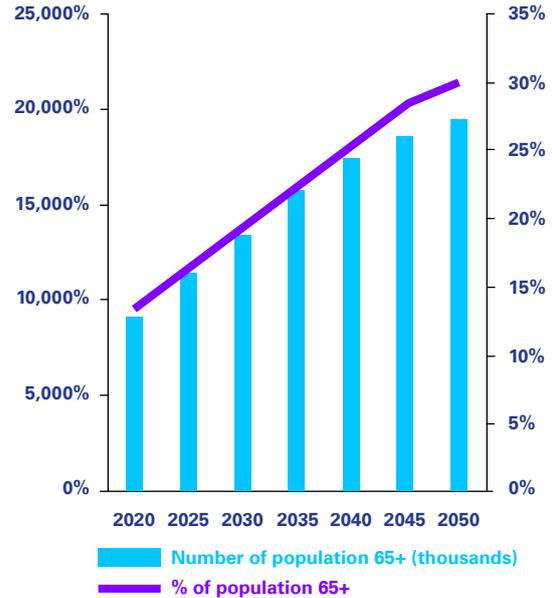
Thailand

Overview of the ageing landscape in country

Thailand Population Pyramid (2020)



Thailand Older Adult Population Growth



Source: United Nations, Department of Economic and Social Affairs, Population Division (2019). World Population Prospects 2019, Online Edition. Rev. 1.

Currently, 13% of Thailand's population comprises adults aged 65 and older. Between 2020 to 2050, Thailand will shift its demographic towards becoming an aged society, with the share of older persons aged 65 and above projected to reach 30%, representing the 5th largest percentage point increase worldwide. Consequently, the number of persons aged 65 and above is expected to reach 19.5 million, with old-age dependency ratio increasing from 20 old-age persons per 100 working age persons to 55 old-age persons per 100 working age persons.

Burden of vaccine-preventable diseases and state of immunisation

In Thailand, influenza leads to 3,600 deaths per year with adults aged 65 and above representing 83% of deaths across all age groups ^[85] ^[86]. Furthermore, influenza was identified in one out of every ten pneumonia patient at hospitals over a 4 year period, with the highest incidence observed in adults aged 75 and above ^[87]. Overall, seasonal influenza was found to result in an economic burden ranging from USD 31.1 million to USD 83.6 million due to direct medical and non-medical costs and indirect costs from productivity loss ^[87].

Despite the costs to health and society, the country's immunisation rates remain low. For example, the immunisation rate for individuals aged 65 and above stood at 20% in 2012 ^[88]. As the pneumococcal vaccines have not been included in the national immunisation programme, the coverage rate among older adults remained at less than 5%.

Policies for adult immunisation

While Thailand has not established a formal adult immunisation schedule, adult influenza vaccine subsidies are available through the Expanded Programme on Immunisation (EPI). Vaccines are recommended by the Advisory Committee on Immunisation Practices (ACIP) and is covered by the budget of the Universal Health Coverage (UHC) scheme. The UHC scheme is managed by the National Health Security Office (NHSO), an autonomous public health authority supervised by the Ministry of Public Health (MoPH). This provides an avenue for individuals in target groups to receive influenza vaccines at no cost. Since 2008, individuals aged 65 years and above as well as younger adults with comorbidities have been identified as target groups in the programme. While pneumococcal conjugate vaccines have been recommended for inclusion by the ACIP, it has yet to be adopted by the NHSO into the EPI.

Current landscape for life-course immunisation

Delivery:

In Thailand's EPI, vaccines are accessible via public health facilities under the MoPH as well as private health facilities participating in the nationwide UHC scheme ^[89]. While Thailand's in-country vaccine production facilities has helped boost influenza vaccine supply, the number of vaccines in the programme has not been sufficient to cover the entire high-risk population, with 6.4 million doses in the programme (as of March 2021) and 7.5 million older adults, excluding other high-risk groups such as health care workers, pregnant women, infants, and adults with comorbidities ^[90]. Furthermore, free influenza vaccines are only available from June to September of each year, even though influenza occurs throughout the year in Thailand with no clear seasonal pattern.

Awareness of the influenza disease and vaccine remains low. Despite 77% of older adults aged 60 and above reporting to have received information on influenza infection, only 30% had a high level of knowledge about the diseases, with 38.7% and 31.1% of older adults having moderate and low levels of knowledge respectively. With regards to the influenza vaccination, only 66.1% of older adults were aware of the influenza vaccination prevention even though 96.7% of them knew that people should get a flu shot every year ^[91].

Financing:



Recommended vaccines and available subsidies

Vaccine	19 – 26 years	27 – 64 years	≥65 years
Influenza (INF)		1 dose annually ^(a)	1 dose annually
Tetanus, reduced diphtheria and acellular pertussis (Td or Tdap)		1 dose during each pregnancy	

(a) Full subsidies available for adults with specific medical condition or indication

While adults aged 65 and above qualify for free vaccines through the EPI, some individuals have to self-pay due to the limited supply in the programme, discouraging them from receiving the vaccine. Immunisation fees at public and private healthcare facilities range from THB 350 to THB 700 (USD 10.80 – 21.50), a price at which only 7% of respondents to a study indicated that they could afford ^[91].

Current policies addressing healthy ageing

Thailand's National Committee of Senior Citizens manages its agenda for an aged society, with developmental goals outlined in the 2nd National Plan on the Elderly (2002 – 2021) and supported by the 20-Year National Strategy (2018 – 2037) as well as the 12th National Economic and Social Development Plan (2017 – 2021).

To maximise the potential of older adults, labour policies including severance packages for retirement as well as tax benefits for the employment of adults aged 60 and above were established ^[92]. In ensuring equity in healthcare access and affordability, the Universal Health Coverage was extended to cover all older persons in 1992. Furthermore, the Old-Age Allowance, a non-contributory scheme that provides a monthly-rate allowance of up to THB 1,000, covers all adults aged 60 and above ^[93].

Top three policy recommendations

1. Increase supply of vaccines in the national immunisation programme:

To ensure that health care facilities do not experience stockouts in their vaccine supply, policymakers should continue to invest and scale its vaccine production capacity. While making up for the shortfall, policymakers should negotiate long-term contracts with vaccine manufacturers to ensure an adequate and sustainable supply of vaccines.

2. Incentivise practitioner-led advocacy:

Culturally, doctors and other healthcare workers are held in high regard in Thailand. Backed by their credibility, policymakers can introduce frameworks and guidelines to encourage greater ownership of vaccine recommendations by health care workers across all healthcare settings. For example, policymakers can set target vaccine coverage rates for hospitals and practitioners, and provide incentives to encourage these healthcare institutions to achieve their targets.

3. Target earlier ages for intervention:

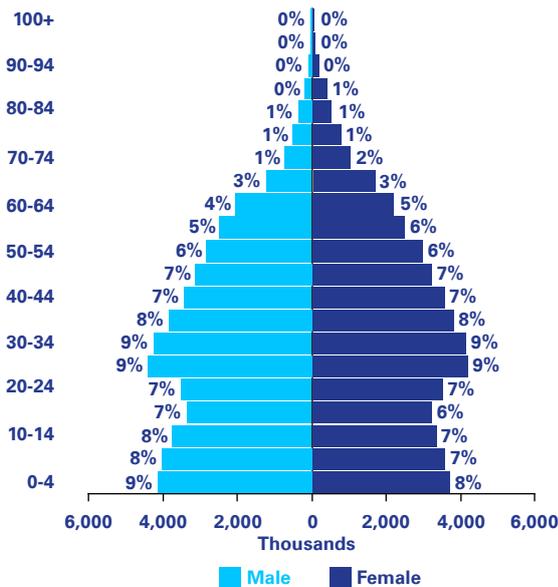
In maximising the benefits of a national immunisation programme, policymakers should emulate global leaders such as the United Kingdom and explore delivery and financing interventions for younger adults, starting with persons aged 50 and above. Awareness campaigns should also be targeted at younger adults (in addition to campaigns targeting older adults) to ensure that individuals are keenly aware of the burden of vaccine-preventable diseases and the avenues for vaccinations. For example, subsidies can be provided to adults that do not qualify for free vaccines, helping to ensure that vaccines remain affordable. Consequently, greater health and economic outcomes are attained with reduced rates of transmission even among unvaccinated individuals.



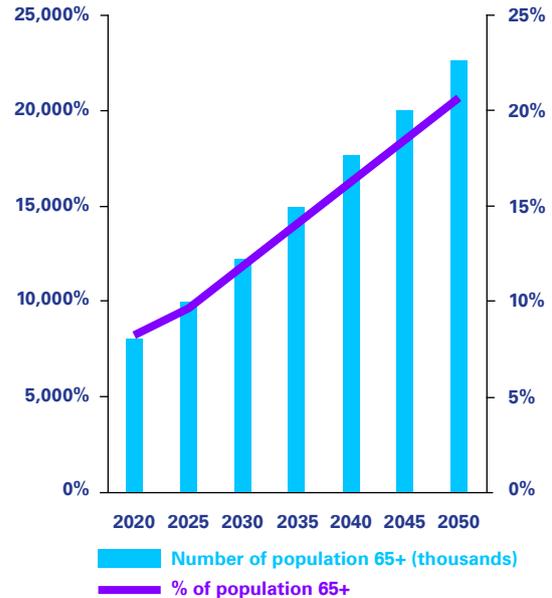
Vietnam

Overview of the ageing landscape in country

Vietnam Population Pyramid (2020)



Vietnam Older Adult Population Growth



Source: United Nations, Department of Economic and Social Affairs, Population Division (2019). World Population Prospects 2019, Online Edition. Rev. 1.

Vietnam is one of the fastest ageing populations in Asia with the share of adults aged 65 and above projected to nearly double from 7.9% to 14.1% over the next 15 years. From 2020 to 2050, the population of adults aged 65 and above is projected to grow at a CAGR of 3.6%, where 20.5% or one out of every five people is expected to be aged 65 and above. As a result, the old-age dependency ratio is expected to increase from 12.6 old-age persons per 100 working age persons to 36.1 old-age persons per 100 working age persons.

Burden of vaccine-preventable diseases and state of immunisation

In Vietnam, research into vaccine-preventable diseases on older adults is notably lacking, with limited information on the burden of vaccine-preventable diseases on the overall health and economic systems. However, out of 7,833 severe acute respiratory infection (SARI) cases in 2013, 18% of a sample tested positive for influenza and the average cost for 8 days of treatment for influenza-related SARI amounted to approximately 3 times the average monthly household income, with additional economic burden of USD 176 per patient, contributed by direct and indirect costs due to work days lost for the patient and caregiver days lost ^[94].

While Vietnam has made great strides in boosting immunisation rates for childhood vaccines, immunisation rates for influenza remain significantly low at just 1% of the overall population and 7% among physicians ^{[95] [96]}.

Policies for adult immunisation

Vietnam's Expanded Programme on Immunisation (EPI) currently focuses on infants, and population-wide adult immunisation policies have yet to be established. However, the country recommends influenza vaccines to health care workers and has piloted a programme providing free influenza vaccines to health care workers accompanied by educational materials ^[97].

Current landscape for life-course immunisation

Delivery:

In improving the feasibility of a potential influenza immunisation programme, Vietnam has established production capabilities for the vaccine. Since 2019, locally produced influenza vaccines have been licensed for use in Vietnam following a 10-year effort in collaboration between Vietnamese manufacturers, PATH, the United States and Vietnam governments, and the World Health Organisation ^[98]. However, the country's low physician to population ratio of 0.8 per 1,000 persons hinder the accessibility to vaccines, as vaccines are primarily administered by physicians ^[99].

However, the level of awareness and willingness to receive adult vaccinations is generally low in Vietnam. In a study comparing college students in the United States and Vietnam, people in Vietnam were found to have significantly lower levels of awareness about flu risk, higher levels of negative attitudes toward flu vaccination, lower levels of knowledge about the flu and vaccination, and lower levels of self-efficacy than those in the United States ^[100]. The increased vaccine hesitancy could be attributed to the media's reporting of Adverse Events Following Immunisations (AEFIs),

where the media was found to be the most trusted source of vaccine information, ranking above staff in hospitals with vaccination clinics. Between 2012 and 2013, the highly critical reporting of AEFIs in the pentavalent Quinvaxem led to childhood immunisation coverage rates falling from 99% to 83% for diphtheria-tetanus-whooping cough, and from 76% to 56% for hepatitis B birth dose ^[101]. Consequently, the decline in immunisation coverage led was projected to lead to more than 90,000 infections of hepatitis B where approximately 17,500 deaths might occur.

With the assistance of the World Health Organization and PATH, Vietnam has developed its National Immunisation Information System (NIIS), a digitised immunisation database to track immunisation records as well as vaccine stocks and distribution in support of its EPI ^[102]. With the NIIS, relevant stakeholders can send automated SMS reminders for vaccinations, access patient vaccination records, and perform population-wide tracking and analysis. As of 2020, the NIIS covers less than a quarter of the country's population, and additional work is required to onboard older adults onto the database ^[103].

Financing:

As adult immunisations are not covered under the EPI, immunisations for older adults are accessible at approximately 2,000 fee-based facilities (including both public and private facilities) countrywide and are financed entirely out-of-pocket, costing between VND 120 thousand to 180 thousand (USD 5.2 – 7.8) per dose ^[103].

Current policies addressing healthy ageing

Healthy ageing initiatives are guided by the National Action Programme on Older People 2012 – 2020, the Ordinance on Elderly People 2000 and the Law on the Elderly 2009 ^[104]. Through such policies, older adults are entitled to social protection and healthcare benefits such as the automatic enrolment into a public health insurance scheme, priority queues for health check-ups, pensions, and transport fare discounts. These policies are aimed at enabling active ageing, but shortfalls arise in their implementation due to the lack of funding, human resources, and coordination between governmental organisations ^[105]. Furthermore, pension schemes and public insurance are mainly targeted to individuals aged 80 and above, with adults between the ages of 60 and 79 years old qualifying only if they are indigent or severely disabled ^[106].

Top three policy recommendations

1. Establish adult immunisation schedule and provide financing:

As Vietnam grows into an ageing population, an adult immunisation schedule is crucial in adopting a preventive healthcare strategy. This schedule should be developed in view of the World Health Organisation's Recommendations for Routine Immunisation and best practices by health authorities worldwide ^[107]. Equally crucial is the financial support given by the government for vaccines in the schedule, helping to drive the uptake of vaccines among older adults.

2. Increase public education around adult vaccines:

As vaccines have been traditionally addressed towards infants, a shift in consumer mindset is required to promote vaccine uptake by older adults. For example, policymakers can collaborate with health care professionals, clinical associations and non-governmental organisations to produce and disseminate vaccine educational materials across offline and online channels to reach older adults. A public consultation hotline or a messaging chatbot can also be set up to address vaccine related queries.

3. Expand authorisation of vaccine administration:

To reduce any potential friction faced by older adults in accessing vaccination services, policymakers can consider expanding the authorisation of vaccine administration to pharmacists or nurses. Such an initiative would require the additional training for such professions and reduce the load placed on physicians and bring vaccination centres closer to the individual. In addition, policymakers can establish guidelines for remote administration to reach bed-bound adults.

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The information contained herein is of a general nature and is not intended to address the circumstances of any particular individual or entity. Although we endeavour to provide accurate and timely information, there can be no guarantee that such information is accurate as of the date it is received or that it will continue to be accurate in the future. No one should act on such information without appropriate professional advice after a thorough examination of the particular situation.

- [1] OECD, "COVID-19, crises and fragility," 29 April 2020. [Online]. Available: <https://www.oecd.org/coronavirus/policy-responses/covid-19-crises-and-fragility-2f17a262>
- [2] S. Miceli, "COVID-19 Pandemic Underscores Importance of Investment in Public Health: 2012 National Academies Report Has Lasting Impact," 24 November 2020. [Online]. Available: <https://www.nationalacademies.org/news/2020/11/covid-19-pandemic-underscores-importance-of-investment-in-public-health-2012-national-academies-report-has-lasting-impact>
- [3] A. Tan and J. Teo, "Medical, tech investments pay off in Covid-19 war," 3 May 2020. [Online]. Available: <https://www.straitstimes.com/singapore/thescience-medical-tech-investmentspay-off-in-covid-19-war>
- [4] R. J. J. Soo, C. J. Chiew, S. Ma, R. Pung and V. Lee, "Decreased Influenza Incidence under COVID-19 Control Measures, Singapore," *Emerging Infectious Diseases*, vol. 26, no. 8, p. 1933–1935, 2020.
- [5] D. Ding, B. d. P. Cruz, M. A. Green and A. E. Bauman, "Is the COVID-19 lockdown nudging people to be more active: a big data analysis," *British Journal of Sports Medicine*, vol. 54, pp. 1183–1184, 2020.
- [6] A. Jowell, L. L. Carstensen and M. Barry, "A life-course model for healthier ageing: lessons learned during the COVID-19 pandemic," *Healthy Longevity*, vol. 1, no. 1, pp. E9–E10, 2020.
- [7] A. Stenquist, "Types of Preventive Care: 8 Proactive Ways to Ward Off Health Problems," 1 January 2020. [Online]. Available: <https://www.rasmussen.edu/degrees/health-sciences/blog/types-of-preventive-care>
- [8] World Health Organization, "Global vaccine action plan," 11 January 2013. [Online]. Available: https://apps.who.int/gb/ebwha/pdf_files/EB132/B132_18-en.pdf
- [9] World Health Organization, "Immunisation Agenda 2030: A global strategy to leave no one behind," 1 April 2020. [Online]. Available: <https://www.who.int/publications/m/item/immunization-agenda-2030-a-global-strategy-to-leave-no-one-behind>
- [10] M. B. Rothberg, S. D. Haessler and R. B. Brown, "Complications of Viral Influenza," *The American Journal of Medicine*, vol. 121, no. 4, pp. 258–264, 2008.
- [11] W. W. Thompson, L. Comanor and D. K. Shay, "Epidemiology of Seasonal Influenza: Use of Surveillance Data and Statistical Models to Estimate the Burden of Disease," *The Journal of Infectious Diseases*, vol. 194, no. Supplement_2, pp. S82–S91, 2006.
- [12] J. C. Kwong, K. L. Schwartz, M. A. Campitelli, H. Chung, N. S. Crowcroft, T. Karnauchow, K. Katz, D. T. Ko, A. J. McGeer, D. McNally and D. C, "Acute Myocardial Infarction after Laboratory-Confirmed Influenza Infection," *The New England Journal of Medicine*, vol. 378, no. 4, pp. 345–353, 2018.
- [13] C. Warren-Gash, L. Smeeth and A. C. Hayward, "Influenza as a trigger for acute myocardial infarction or death from cardiovascular disease: a systematic review," *The Lancet Infectious Diseases*, vol. 9, no. 10, pp. 601–610, 2009.
- [14] C. Warren-Gash, R. Blackburn, H. Whitaker, J. McMenemy and A. C. Hayward, "Laboratory-confirmed respiratory infections as triggers for acute myocardial infarction and stroke: a self-controlled case series analysis of national linked datasets from Scotland," *European Respiratory Journal*, vol. 51, 2018.

- [15] Oliver Wyman, "Asia's \$20 Trillion Elderly Medical Bill: Will rising elderly healthcare costs slowly fuel a regional healthcare crisis?," December 2016. [Online].
Available: https://www.oliverwyman.com/content/dam/oliver-wyman/v2/publications/2016/dec/RJ6_1_4-Asias-Elderly_Medical_Bill.pdf.
- [16] World Health Organization, "Global Health and Aging," October 2011. [Online].
Available: https://www.who.int/ageing/publications/global_health.pdf.
- [17] The World Bank, "Population ages 65 and above (% of total population) - Malaysia, Singapore, Thailand, Vietnam, Philippines, Indonesia," 2019. [Online].
Available: <https://data.worldbank.org/indicator/SP.POP.65UP.TO.ZS?contextual=default&end=2019&locations=MY-SG-TH-VN-PH-ID&start=2019&view=bar>.
- [18] United Nations, "World Population Ageing," 2017. [Online].
Available: https://www.un.org/en/development/desa/population/publications/pdf/ageing/WPA2017_Highlights.pdf.
- [19] Ageing Asia, "Ageing population in Indonesia," [Online].
Available: <https://ageingasia.org/ageing-population-indonesia/>.
- [20] The World Bank, "Aiming High: Navigating the next stage of Malaysia's development," Kuala Lumpur, 2021.
- [21] World Health Organization, "Life expectancy and Healthy life expectancy," 2020. [Online].
Available: <https://apps.who.int/gho/data/view.main-searo.SDG2016LEXREGv?lang=en>.
- [22] S. A. Ahmad, Interviewee, Director, Malaysian Research Institute on Ageing, Universiti Putra Malaysia. [Interview]. 17 February 2021.
- [23] Department of Older Persons and College of Population Studies, "Care for Older Persons in ASEAN+3: The Role of Families and Local and National Support Systems," 2018. [Online].
Available: https://www.duke-nus.edu.sg/docs/librariesprovider3/research-policy-brief-docs/care-for-older-persons-in-asean-3--the-role-of-families-and-local-and-national-support-systems.pdf?sfvrsn=5830f2be_4.
- [24] Ministry of Health, Singapore, "Principal Causes of Death," [Online].
Available: <https://www.moh.gov.sg/resources-statistics/singapore-health-facts/principal-causes-of-death>.
- [25] A. Chow, S. Ma, A. E. Ling and S. K. Chew, "Influenza-associated Deaths in Tropical Singapore," *Emerging Infectious Diseases*, vol. 12, no. 1, pp. 114-121, 2006.
- [26] B. Fireman, J. Lee, N. Lewis, O. Bombom, M. v. d. Laan and R. Baxter, "Influenza Vaccination and Mortality: Differentiating Vaccine Effects From Bias," *American Journal of Epidemiology*, vol. 170, no. 5, pp. 650-656, 2009.
- [27] T. P. Ng, K. H. Pwee, M. Niti and L. G. Goh, "Influenza in Singapore: assessing the burden of illness in the community," *Annals of the Academy of Medicine, Singapore*, vol. 31, no. 2, 2002.
- [28] S. Y. Sim, E. Watts, D. Constenla, L. Brenzel and B. N. Patenaude, "Return On Investment From Immunization Against 10 Pathogens In 94 Low- And Middle-Income Countries, 2011–30," *Health Affairs*, vol. 39, no. 8, pp. 1343-1353, 2020.
- [29] A. K. Lugnér, M. v. Boven, R. d. Vries, M. J. Postma and J. Wallinga, "Cost effectiveness of vaccination against pandemic influenza in European countries: mathematical modelling analysis," *BMJ*, vol. 345, no. e4445, 2012.

- [30] N. M. Dabestani, A. J. Leidner, E. E. Seiber, H. Kim, S. B. Graitcer, I. M. Foppa and C. B. Bridges, "A review of the cost-effectiveness of adult influenza vaccination and other pre-ventive services," *Preventive Medicine*, vol. 126, no. 105734, 2019.
- [31] Centers for Disease Control and Prevention, "Fully Vaccinated Adults 65 and Older Are 94% Less Likely to Be Hospitalized with COVID-19;" 28 April 2021. [Online]. Available: <https://www.cdc.gov/media/releases/2021/p0428-vaccinated-adults-less-hospitalized.html>.
- [32] N. Langeron, P. Lévy, J. Wasem and X. Bresse, "Role of vaccination in the sustainability of healthcare systems," *Journal of Market Access & Health Policy*, vol. 3, no. 10.3402/jmahp.v3.27043, 2015.
- [33] World Health Organization, "Influenza vaccination coverage and effectiveness," [Online]. Available: <https://www.euro.who.int/en/health-topics/communicable-diseases/influenza/vaccination/influenza-vaccination-coverage-and-effectiveness>.
- [34] Ministry of Health, Singapore; Health Promotion Board, Singapore, "National Population Health Survey 2019 (Household Interview)," 2019. [Online]. Available: <https://www.hpb.gov.sg/docs/default-source/default-document-library/national-population-health-survey-2019.pdf>.
- [35] Flinders University, "Shingles declining with vaccination uptake," 11 June 2020. [Online]. Available: <https://news.flinders.edu.au/blog/2020/06/11/shingles-declining-with-vaccination-uptake/>.
- [36] T. Ojong, "Flu shot myths, such as that you should wait for cold weather to get the vaccine: Another myth is that people with egg allergies can't get the flu vaccine.," 6 October 2018. [Online]. Available: <https://abcnews.go.com/Health/flu-shot-myths-wait-cold-weather-vaccine/story?id=58315168>.
- [37] A. Hamid, Interviewee, Director of Malaysian Research Institute on Ageing, President of the Gerontological Association of Malaysia. [Interview]. 10 February 2021.
- [38] Ipsos, "Flu in Indonesia: Insights into Perception and Action on Vaccination," 12 February 2020. [Online]. Available: <https://www.ipsos.com/en-sg/flu-indonesia-insights-perception-and-action-vaccination>.
- [39] G. T. Cruz, C. J. P. Cruz and Y. Saito, *Ageing and Health in the Philippines*, Jakarta: Economic Research Institute for ASEAN and East Asia (ERIA), 2019.
- [40] G. Vallée-Tourangeau, M. Promberger, K. Moon, A. Wheelock, M. Sirotac, C. Nortond and N. Sevdalis, "Motors of influenza vaccination uptake and vaccination advocacy in healthcare workers: Development and validation of two short scales," *Vaccine*, vol. 36, no. 44, pp. 6540-6545, 2018.
- [41] L. C. Karlsson, S. Lewandowsky, J. Antfolk, P. Salo, M. Lindfelt, T. Oksanen, M. Kivimäki and A. Soveri, "The association between vaccination confidence, vaccination behavior, and willingness to recommend vaccines among Finnish healthcare workers," *PLoS ONE*, vol. 14, no. 10, 2019.
- [42] P. Paterson, F. Meurice, L. R. Stanberry, S. Glismann, S. L. Rosenthal and H. J. Larson, "Vaccine hesitancy and healthcare providers," *Vaccine*, vol. 34, no. 52, pp. 6700-6706, 2016.
- [43] J. B. Balfour, Interviewee, Founder & Programmes Director, Bailey Balfour Asia Pacific. [Interview]. 17 March 2021

- [44] C. R. Macintyre, "Elderly vaccination—The glass is half full," *Health*, Vols. -5, no. 12, pp. 80-85, 2013.
- [45] NHS England; NHS Improvement, "Directed Enhanced Service (DES) Specification: Seasonal flu and pneumococcal vaccination programme," November 2020. [Online]. Available: https://www.england.nhs.uk/wp-content/uploads/2020/03/B0130_SFLand-pneumococcal-final-version.pdf.
- [46] "Quality and Outcomes Framework," [Online]. Available: https://en.wikipedia.org/wiki/Quality_and_Outcomes_Framework.
- [47] P. Praphasiri, D. Ditsungnoen, S. Sirilak, J. Rattanayot, P. Areerat, F. S. Dawood and K. A. Lindblade, "Predictors of seasonal influenza vaccination among older adults in Thailand," *PLoS ONE*, vol. 12, no. 11, 2017.
- [48] J.-W. Yun, J. Y. Noh, J. Y. Song, C. Chun, Y. Kim and H. J. Cheong, "The Korean Influenza National Immunization Program: History and Present Status," *Infection & Chemotherapy*, vol. 49, no. 4, pp. 247-254, 2017.
- [49] S. Kosaraju, "Vaccine Management Analytics: Will It Be The Next 2021 Data Story?," 6 April 2021. [Online]. Available: <https://www.forbes.com/sites/tableau/2021/04/06/vaccine-management-analytics-will-it-be-the-next-2021-data-story/?sh=5a4acb8080d0>.
- [50] UNICEF, "Scaling vaccine procurement," 25 June 2020. [Online]. Available: <https://www.unicef.org/supply/stories/scaling-vaccine-procurement>.
- [51] F. Wee, Interviewee, Deputy Executive Director, Metta Welfare Association. [Interview]. 12 March 2021.
- [52] S. Kosen, E. Indriasih, T. Rosita, V. Setiawaty, M. Karyana, H. Kosasih, I. Rengganis, A.-F. Taurel, J. Nealon, S. Nawawi and C. Kartasmita, "Influenza disease burden and cost estimates in Indonesia," in *Options X for the Control of Influenza*, Singapore, 2019.
- [53] UNAIR News, "Influenza vaccination for elderly especially with disabilities," 20 June 2020. [Online]. Available: <http://news.unair.ac.id/en/2020/06/20/influenza-vaccination-for-elderly-especially-with-disabilities/>.
- [54] CEIC, "Indonesia Monthly Earnings," [Online]. Available: <https://www.ceicdata.com/en/indicator/indonesia/monthly-earnings#:~:text=Indonesia%20Monthly%20>.
- [55] N. Abikusno, "The Elderly of Indonesia: Current policy and programmes," *BOLD*, vol. 15, no. 2, p. 18, 2005.
- [56] M. Sunusi, "Inter-generational Family and Community Support: Implication to Social Participation and Contribution of Older Person," The Ministry of Social Affairs, Republic of Indonesia, Tokyo, 2014.
- [57] X. Y. Oong, K. T. Ng, T. T.-Y. Lam, Y. K. Pang, K. G. Chan, N. S. Hanafi, A. Kamarulzaman and K. K. Tee, "Epidemiological and Evolutionary Dynamics of Influenza B Viruses in Malaysia, 2012-2014," *PLoS ONE*, vol. 10, no. 8, 2015.
- [58] T.-H. Toh, K.-C. Hii, J. K. Fieldhouse, J. Ting, A. Berita, T. T. Nguyen, S.-C. Wong, T.-M. Wong, W.-H. Lim, S.-J. Ha, C.-Z. Lau, S.-L. Kong, E. S. Bailey and T. E, "High Prevalence of Viral Infections Among Hospitalized Pneumonia Patients in Equatorial Sarawak, Malaysia," *Open Forum Infectious Diseases*, vol. 6, no. 3, 2019.
- [59] I.-C. Sam, R. Shaw, Y.-F. Chan, P.-S. Hooi, A. C. Hurt and I. G. Barr, "Seroprevalence of seasonal and pandemic influenza a in Kuala Lumpur, Malaysia in 2008-2010," *Journal of Medical Virology*, vol. 85, no. 8, 2013.
- [60] I.-C. Sam, "The burden of human influenza in Malaysia," *Med J Malaysia*, vol. 70, no. 3, 2015.
- [61] L. F. Fong, "Flu vaccine only given to patients in high-risk groups at govt health facilities, says Health D-G," 15 January 2020. [Online]. Available: <https://www.thestar.com.my/news/nation/2020/01/15/flu-vaccine-only-given-to-patients-in-high-risk-groups-at-govt-health-facilities-says-health-d-g>.

- [62] I.-C. Sam, W. Noraini, S. S. Sandhu, I. Norizah, S. Sengol, R. Thayan, M. A. Yusof, A. Hassan, F. L. Jafar and Y.-F. Chan, "Seasonal influenza activity based on laboratory surveillance in Malaysia, 2011-2016: SAM et al.," *Journal of Medical Virology*, vol. 91, no. 3, 2018.
- [63] Tabung Haji, "Immunization Information," [Online]. Available: <https://www.tabunghaji.gov.my/en/immunization-information>.
- [64] M. D. Goni, N. N. Naing, H. Hasan, N. Wan-Arfah, Z. Z. Deris, W. N. Arifin and A. A. Baaba, "Uptake of Recommended Vaccines and Its Associated Factors Among Malaysian Pilgrims During Hajj and Umrah 2018," *Frontiers in Public Health*, vol. 7, p. 268, 2019.
- [65] F. Kusnin, "Immunisation Programme in Malaysia," in *Vaccinology 2017 - III International Symposium for Asia Pacific Experts*, Hanoi, 2017.
- [66] A. Shaharudin, "Influenza Vaccination for the Elderly and Economic Evaluation: Executive Summary," Malaysian Health Technology Assessment Section (MaHTAS), Ministry of Health Malaysia, 2019.
- [67] L. P. Wong, P. F. Wong and S. AbuBakar, "Vaccine hesitancy and the resurgence of vaccine preventable diseases: the way forward for Malaysia, a Southeast Asian country," *Human Vaccines & Immunotherapeutics*, vol. 16, no. 7, p. 1511–1520, 2020.
- [68] F. Shaheera, M. Azizi, Y. Kew and F. M. Moy, "Vaccine hesitancy among parents in a multi-ethnic country, Malaysia," *Vaccine*, vol. 35, no. 22, pp. 2955-2961, 2017.
- [69] FMT News, "Yearly influenza vaccine for high-risk groups recommended," 25 April 2017. [Online]. Available: <https://www.freemalaysiatoday.com/category/nation/2017/04/25/yearly-influenza-vaccine-for-high-risk-groups-recommended/>.
- [70] A. Tang, "Budget 2021: Tax relief on medical treatment raised, including for parents," 6 November 2020. [Online]. Available: <https://www.thestar.com.my/news/nation/2020/11/06/budget-2021-tax-relief-on-medical-treatment-raised-including-for-parents>.
- [71] Ministry of Finance, Malaysia, "Belanjawan 2021 Touchpoints," [Online]. Available: <http://belanjawan2021.treasury.gov.my/pdf/speech/2021/rub-2021-en.pdf>.
- [72] Ipsos, "Perspectives on Influenza in Older Adults in Malaysia," 18 May 2021. [Online]. Available: <https://www.ipsos.com/en-sg/perspectives-influenza-older-adults-malaysia>.
- [73] C. E. Guerche-Séblain, T. R. D. Fougérolles, K. Sampson, L. J. P. Buynder, Y. Shu, Z. Sekawi, L. Yee-Sin, T. Walls, O. Vitoux, J. K. Yin, A. Wong, F. Schellevis and P. Vanhems, "Comparison of influenza surveillance systems in Australia, China, Malaysia and expert recommendations for influenza control," 2021.
- [74] Philippine Statistics Authority, "Cause of Deaths in the Philippines," 16 March 2021. [Online]. Available: https://psa.gov.ph/sites/default/files/attachments/crd/pressrelease/Press%20Release_Cause%20of%20Death%20Statistics%20January%202019%20to%20Dec%202020_signed.pdf.
- [75] K. J. G. Cheng, A. Rivera and H. Y. Lam, "Influenza-associated excess mortality in the Philippines, 2006-2015," 2020.
- [76] C. M. Carino, "Seniors urged to take flu shots," *The Manila Times*, 2018. [Online]. Available: <https://www.manilatimes.net/2018/09/22/business/health-industry/seniors-urged-to-take-flu-shots/443808/>.
- [77] T. Padilla, "Fighting pneumonia," *BusinessWorld*, 2019. [Online]. Available: <https://www.bworldonline.com/fighting-pneumonia/>.

- [78] The Manila Times, "DOH wellness program protects elderly Filipinos from third killer," The Manila Times, 2020. [Online]. Available: <https://www.manilatimes.net/2020/02/19/lifestyle-entertainment/life-times/health-wellness/doh-wellness-program-protects-elderly-filipinos-from-third-killer/689376/>.
- [79] Congress of the Philippines, "Fourteenth Congress," The LawPhil Project, 2021. [Online]. Available: https://lawphil.net/statutes/repacts/ra2010/ra_9994_2010.html.
- [80] PhilHealth, "Improving PhilHealth Benefits for our Elders," PhilHealth, 2012. [Online]. Available: https://www.philhealth.gov.ph/news/2012/elders_benefits.html.
- [81] Department of Health, "HEALTH AND WELFARE OF SENIOR CITIZEN PROGRAM," Republic of The Philippines, 2021. [Online]. Available: <https://ro9.doh.gov.ph/index.php/health-programs/maternal-child-health/health-and-welfare-of-senior-citizen-program>.
- [82] Ipsos, "Flu in the Philippines: Insights into Perception and Action on Vaccination," 2020. [Online]. Available: [Flu in the Philippines: Insights into Perception and Action on Vaccination](#).
- [83] Moneymax, "The Importance of Vaccination and Prices of Vaccines in the Philippines," 2021. [Online]. Available: <https://sg.news.yahoo.com/importance-vaccination-prices-vaccine-philippines-060055974.html>.
- [84] Philippine Statistics Authority, "Income and Expenditure," 2021. [Online]. Available: <https://psa.gov.ph/survey/annual-poverty-indicator>.
- [85] J. Zambrano, "Benefits and privileges senior citizens should know," 2021. [Online]. Available: <https://pia.gov.ph/features/articles/1026127#:~:text=7432%2C%20as%20amended%20by%20RA,at%20least%2060%20years%20old..>
- [86] PhilHealth, "Senior Citizens," 2021. [Online]. Available: <https://www.philhealth.gov.ph/members/senior/>.
- [87] World Health Organization, "Recommended Routine Immunization," 2019. [Online]. Available: https://cdn.who.int/media/docs/default-source/immunization/immunization_schedules/immunization-routine-table1.pdf?sfvrsn=c7de0e97_4&download=true.
- [88] Department of Health, "The Philippine National Deployment and Vaccination Plan for COVID-19 Vaccines," 2021. [Online]. Available: <https://doh.gov.ph/sites/default/files/basic-page/The%20Philippine%20National%20COVID-19%20Vaccination%20Deployment%20Plan.pdf>.
- [89] European Centre for Disease Prevention and Control, "Designing and implementing an immunisation information system," 2018. [Online]. Available: https://www.ecdc.europa.eu/sites/default/files/documents/designing-implementing-immunisation-information-system_0.pdf.
- [90] Y. Ng, L. A. V. Chua, S. Ma and V. J. M. Lee, "Estimates of influenza-associated hospitalisations in tropical Singapore, 2010-2017: Higher burden estimated in more recent years," *Influenza and other respiratory viruses*, vol. 13, no. 6, pp. 574-581, 2019.
- [91] T. P. Ng, K. H. Pwee and L. G. Goh, "Influenza in Singapore: assessing the burden of illness in the community," *Annals of the Academy of Medicine, Singapore*, vol. 31, no. 2, 2002.
- [92] A. H. Min, "Subsidies helpful, but public education also needed to improve adult vaccination rates: Experts," 1 August 2019. [Online]. Available: <https://www.channelnewsasia.com/news/singapore/vaccination-flu-public-health-subsidies-education-11769428>.
- [93] Ministry of Health, Singapore, "Nationally Recommended Vaccines," [Online]. Available: <https://www.moh.gov.sg/resources-statistics/nationally-recommended-vaccines>.

- [94] Integrated Health Information Systems (IHIS), Singapore, "12 HealthTech Systems Upgraded for NAIS, NCIS Vaccination Subsidies and Flexible Medisave Withdrawals," [Online]. Available: https://www.ihis.com.sg/Project_Showcase/covid-19/Pages/twelve-healthtech-systems-upgraded-nais-ncis-vaccination-subsidies-and-flexible-medisave-withdrawals.aspx.
- [95] Ministry of Health, Singapore, "Adult Immunisation Vaccinations Take-up Rate," 3 February 2020. [Online]. Available: <https://www.moh.gov.sg/news-highlights/details/adult-immunisation-vaccinations-take-up-rate>.
- [96] H. L. Yang and A. R. Cook, "Why is Singapore's adult vaccination rate so low?," 18 August 2019. [Online]. Available: <https://www.todayonline.com/commentary/why-singapores-adult-vaccination-rate-so-low>.
- [97] A. Chan, R. Malhotra, N. B. Manap, Y. Y. Ting, A. Visaria, G. H.-L. Cheng, V. S. M. Goh, P. K. C. Tay, J. M. L. Lee and A. Maulod, "Transitions in Health, Employment, Social Engagement And Intergenerational Transfers In Singapore Study (THE SIGNS Study) – I: Descriptive Statistics and Analysis of Key Aspects of Successful Ageing," Centre for Ageing Research and Education, Duke-NUS Medical School, Singapore, 2018.
- [98] Ministry of Health, Singapore, "Vaccination and Childhood Developmental Screening Subsidies," [Online]. Available: <https://www.moh.gov.sg/cost-financing/healthcare-schemes-subsidies/vaccination-and-childhood-developmental-screening-subsidies>.
- [99] Primary Care Pages, "National Adult Immunisation Schedule (NAIS)," [Online]. Available: [https://www.primarycarepages.sg/practice-management/moh-national-schemes/vaccination-cds-subsidies/national-adult-immunisation-schedule-\(nais\)](https://www.primarycarepages.sg/practice-management/moh-national-schemes/vaccination-cds-subsidies/national-adult-immunisation-schedule-(nais)).
- [100] Ministry of Health, Singapore, "Action Plan for Successful Ageing," Singapore, 2016.
- [101] S. Kiertiburanakul, W. Phongsamart, T. Tantawichien, W. Manosuthi and P. Kulchaitanaroaj, "Economic Burden of Influenza in Thailand: A Systematic Review," *Inquiry*, vol. 57, 2020.
- [102] S. Aungkulanon, P.-Y. Cheng, K. Kusreesakul, K. Bundhamcharoen, M. Chittaganpitch, M. Margaret and S. Olsenb, "Influenza-associated mortality in Thailand, 2006–2011," *Influenza and other respiratory viruses*, vol. 9, no. 6, p. 298–304, 2015.
- [103] J. M. Simmerman, M. Chittaganpitch, J. Levy, S. Chantra, S. Maloney, T. Uyeki, P. Areerat, S. Thamthitawat, S. J. Olsen, A. Fry, K. Ungchusak, H. C. Baggett and S. Chunsuttiwat, "Incidence, Seasonality and Mortality Associated with Influenza Pneumonia in Thailand: 2005–2008," *PLoS ONE*, vol. 4, no. 11, 2009.
- [104] J. T. Owusu, P. Praphasiri, D. Ditsungnoen, G. Leetongin, P. Yoocharoen, J. Rattanayot, S. J. Olsen and C. Muangchana, "Seasonal influenza vaccine coverage among high-risk populations in Thailand, 2010–2012," *Vaccine*, vol. 33, no. 5, 2014.
- [105] W. Rattanavipapong, R. Kapoor, Y. Teerawattananon, J. Luttjeboer, S. Botwright, R. A. Archer, B. Giersing and R. C. W. Hutubessy, "Comparing 3 Approaches for Making Vaccine Adoption Decisions in Thailand," *International Journal of Health Policy and Management*, vol. 9, no. 10, pp. 439-447, 2020.
- [106] A. Pisuthipan, "Same but different: Although Covid-19 is a more serious illness compared to seasonal flu, the two diseases share similar preventive measures," 9 June 2020. [Online]. Available: <https://www.bangkokpost.com/life/social-and-lifestyle/1931732/same-but-different>.
- [107] R. Worasathit, W. Wattana, K. Okanurak, A. Songthap, J. Dhitavat and P. Pitisuttithum, "Health education and factors influencing acceptance of and willingness to pay for influenza vaccination among older adults," *BMC Geriatrics*, vol. 15, no. 136, 2015.
- [108] S. Gudeerat and R. Bhula-or, "Country presentation: Thailand," in Regional Conference on "Promoting Decent Work for Older Persons in ASEAN+3", Bangkok, 2019.
- [109] Ageing Asia, "Ageing population in Thailand," [Online]. Available: <https://ageingasia.org/ageing-population-thailand/#govpolicies>.

- [110] Y. Nguyen, T. Nguyen, T. Nguyen, T. Nguyen, H. Vu, M. Le, D. Tran, T. Do, J. Partridge, J. Kile, T. Nguyen and H. Nguyen, "Influenza-related severe acute respiratory infection in the north of Vietnam: healthcare burden and economic impact," *Antimicrobial Resistance and Infection Control*, vol. 4, 2015.
- [111] "Made in Viet Nam Vaccines : efforts to develop sustainable in-country manufacturing for seasonal and pandemic influenza vaccines," World Health Organization, Geneva, 2017.
- [112] Centers for Disease Control and Prevention, "Success Story: Vaccination of Health Care Workers in Vietnam with Seasonal Influenza Vaccine," 10 July 2018. [Online].
Available: <https://www.cdc.gov/flu/international/highlight-vietnam-vaccination.htm>.
- [113] N. T. Ha, T. T. M. Nguyen, T. X. Nguyen, P. D. Tran, H. M. Nguyen, V. T. Ha, K. E. Lafond, Jane F. Seward, J. W. McFarland and S. Y. Chu, "A case study of an influenza vaccination program for health care workers in Vietnam," *BMC Health Services Research*, vol. 20, no. 1, 2020.
- [114] PATH, "Vietnam-produced seasonal influenza vaccine licensed for production and use," 15 January 2019. [Online].
Available: <https://www.path.org/media-center/vietnam-produced-seasonal-influenza-vaccine-licensed-production-and-use/>.
- [115] World Health Organization, "Physicians (per 1,000 people)," [Online].
Available: <https://data.worldbank.org/indicator/SH.MED.PHYS.ZS>.
- [116] A. Kamimura, H. N. Trinh, S. Weaver, A. Chernenko, M. M. Nourian, N. Assasnik and H. Nguyen, "Knowledge and Perceptions of Influenza Vaccinations Among College Students in Vietnam and the United States," *Journal of Preventive Medicine & Public Health*, vol. 50, no. 4, p. 268–273, 2017.
- [117] B. X. Tran, V. L. Boggiano, L. H. Nguyen, C. A. Latkin, H. L. T. Nguyen, T. T. Tran, H. T. Le, T. T. M. Vu, C. S. Ho and R. C. Ho, "Media representation of vaccine side effects and its impact on utilization of vaccination services in Vietnam," *Patient Preference and Adherence*, vol. 12, pp. 1717-1728, 2018.
- [118] PATH, "From paper to e-records: Vietnam's electronic immunization registry: How a pilot idea grew into the National Immunization Information System," Hanoi, 2019.
- [119] PATH, "National Expanded Program on Immunization. Engaging private-sector providers in immunization data management and use: Perspectives from Vietnam," Hanoi, 2020.
- [120] P. V. Hoang, "Vietnam's experience in promoting healthy ageing," 2017.
- [121] Vietnam National Committee on Ageing; UNFPA, "Towards a Comprehensive National Policy for an Ageing Viet Nam," Ha Noi, 2019.
- [122] Ageing Asia, "Ageing population in Vietnam," [Online].
Available: <https://ageingasia.org/ageing-population-vietnam/>.
- [123] World Health Organization, "Recommendations for Routine Immunisation," 2020.
- [124] N. Wetsman, "Older adults struggle to access COVID-19 vaccine appointment websites," 2021. [Online].
Available: <https://www.theverge.com/22227531/covid-vaccine-website-appointments-accessible-seniors>.
- [125] D. Koenig, "Grassroots Efforts Help People Get COVID Vaccines," 2021. [Online].
Available: <https://www.webmd.com/vaccines/covid-19-vaccine/news/20210204/grassroots-efforts-to-help-people-get-covid-vaccines>.
- [126] G. Cruz, C. Cruz and Y. Saito, "Ageing and Health in The Philippines," 2019. [Online].
Available: <https://www.eria.org/uploads/media/Books/2019-Dec-ERIA-Ageing-And-Health-In-The-Philippines.pdf>.