



ILC Singapore
International Longevity Centre
A Tsao Foundation Initiative



Healthier for longer

Improving adult
immunisation uptake in
Singapore



Health and care

Immunisation

Community

Life expectancy

Prevention

Culture and society

Connections

Inequalities

International

About ILC Singapore

ILC Singapore (ILC-S) aims to promote the wellbeing of older people and contribute to national development through initiating research and forging collaborations which inform policy, facilitate policy-action translation and promote quality, effective practice in Singapore and the region.

About ILC-UK

The International Longevity Centre UK (ILC-UK) is the UK's specialist think tank on the impact of longevity on society. We work with central government, local government, the private sector, and professional and academic associations to provoke conversations and pioneer solutions for a society where everyone can thrive, regardless of age.

About the ILC Global Alliance

The International Longevity Centre Global Alliance (ILC Global Alliance) is a multinational consortium consisting of 16 member organisations. The mission of the ILC Global Alliance is to help societies to address longevity and population ageing in positive and productive ways, typically using a life course approach, highlighting older people's productivity and contributions to family and society as a whole.

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Summary

This report explores the relationship between Singapore's ageing population and adult vaccination.

We find that:

- Singapore's health system is coming under increasing pressure as its population grows older.
- Rates of chronic and age-related health conditions are rising which is leading to greater health service utilisation and costs.
- The potential impact of adult immunisation in Singapore is increased by the existence of several risk factors: year-round influenza, a large temporary population and high rates of pneumonia.
- Despite recent government-led efforts to promote adult vaccination, vaccine uptake rates are low.
- Singapore must overcome several challenges to better facilitate healthy ageing through adult vaccination, including:
 - The mandatory national medical savings scheme, MediSave disadvantaging patients with chronic or multiple health conditions;
 - Low public awareness of adult vaccination;
 - An overreliance on doctors, and an underuse of allied health professionals to drive adult immunisation;
 - Inadequate data to inform both policy and medical decisions on adult vaccination.

This report sets out a number of recommendations highlighting how Singapore can overcome these challenges by building upon its strengths:

1. Singapore has made great strides in addressing the financial barriers to vaccine uptake by allowing adults to use their MediSave pot to pay for vaccinations; however, we heard that this pot can easily be exhausted when patients have multiple or chronic health conditions.

The Singaporean government should provide a funded wellness package that includes vaccinations and screening for older people living in care homes. This would help to protect this high-risk population who have often exhausted their finances.

The Singaporean government should consider financial incentives for patients. These have been shown to increase vaccine uptake, with their cost potentially balanced by reduced health service utilisation.

The government should consider providing a wellness fund within the Medisave programme for all people over 65 with restricted uses and consider a separate fund/ higher amount for those with chronic diseases and in nursing care.

2. Adult vaccination has been put on the national agenda by the release of the National Adult Immunisation Schedule (NAIS). This policy drive represents an opportunity to tackle misconceptions around vaccine preventable diseases in adulthood.

The Health Promotion Board should run regular public education campaigns to increase knowledge and awareness around adult vaccination, focussing on how vaccinations can contribute to healthy ageing.

The Singaporean government should work with the voluntary sector to create older ambassadors. This could help to normalise vaccination amongst older people and improve their health literacy. The government could lead the way by encouraging high profile politicians (vaccinated themselves) to act as vaccination champions.

Senior healthcare management should lead efforts to increase their staff's knowledge and awareness of adult vaccination. By getting vaccinated themselves and encouraging staff vaccination, top-down awareness could be facilitated.

We heard that increasing health professionals' knowledge of adult vaccination would make them more secure in recommending this service to patients. **Medical schools should introduce adult vaccination into their curriculums** while **the College of Family Physicians Singapore should develop simplified guidelines on adult vaccination.**

3. Singapore's new National Collaborative Prescribing Programme empowers nurses and pharmacists to prescribe medications and presents a significant opportunity to reduce pressure on GPs and expand vaccination into new settings. **Policymakers should consider whether the National Collaborative Prescribing Programme should be expanded to include adult vaccinations.**

We heard that having patients belong to a multi-disciplinary team rather than an individual doctor can help to challenge the GP-centric view of healthcare that currently exists. **GP practices should introduce a team-based model of working to divorce patients from the idea that only the doctor's voice counts.**

4. The creation of the Ministry of Health online portal HealthHub has increased patients' access to their vaccination data; however, we heard that it currently lacks data from the private and charity sectors. Having a unified data source for adult vaccinations across the public, private and charitable sectors would help to increase the impact of policy and medical decisions and increase patients' health literacy.

The Ministry of Health should expand Healthhub to create a 'one stop shop' for patients' adult vaccination history.

Disclaimer

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- Dr Mark Chan, Tan Tock Seng Hospital
- Dr Christopher Chong, National Health Group Polyclinics
- Dr Ng Wai Chong, Tsao Foundation (moderator)
- Dr Elaine Chua, family physician
- Ms Susana Harding, Tsao Foundation
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This report from ILC-UK and ILC-Singapore does not necessarily represent the views of those attending the roundtable discussion and seminar. However, the expertise of the participants has shaped our thinking on this issue. The views expressed, and any errors of fact, within this document are the author's own.

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Singapore is ageing

Singapore's health system is being put under increased pressure as its population ages.

Singapore is getting older. By 2050, the proportion of the population aged 60+ is projected to increase to 40.1%, up from 19.5% in 2017.¹

Singapore's ageing society has resulted from a falling birth rate combined with increases in life expectancy. Resident total fertility rate has fallen from a peak of 1.96 births in 1988 to 1.14 births in 2018,² while resident life expectancy has increased by nearly 10 years over the same period to 83.2.³

Singaporeans are living longer but not necessarily healthier lives. Healthy life expectancy now sits at 74.2, almost ten years below resident life expectancy.⁴

Rates of chronic and age-related health conditions are rising. From 2009 to 2016/2017, the proportion of adults aged 60 and over with three or more self-reported chronic ailments increased by nearly 90%.⁵ Around 82,000 people had dementia in 2018, with this number predicted to soon exceed 100,000.⁶

Singapore's ageing society is putting increasing pressure on the country's health system. The cost of dementia to Singapore's economy, for example, was S\$2.8 billion in 2015, with this figure predicted to almost triple by 2030.⁶ From 2011 to 2016, the percentage of Singapore's GDP spent on health increased by over 40%.⁷ Singapore's Health Minister recently stated that these increases in national healthcare expenditure are unsustainable.⁸

Adult vaccination in Singapore

"Vaccination is one of the most cost-effective ways of improving population health".⁹

Adult vaccination is a key element of preventative healthcare which can help to address the challenges of Singapore's ageing society. It can contribute to healthier lives, thus reducing healthcare utilisation and has been shown to be cost-effective. A study in the Netherlands, for example, showed that for every €1 invested in vaccination from the age of 50, €4.02 of future economic revenue would be created for government.¹⁰

In Singapore, several situational factors potentially increase the beneficial impact of adult immunisation:

- The influenza virus circulates year-round, resulting in high-risk adult groups, such as older people and health care workers, constantly being in danger of contracting the virus.¹¹
- Singapore is a travel and work hub with around 29% of its population non-residents in 2019.¹² As a result, it is unclear whether herd immunity for different diseases has been achieved by the childhood immunisation programme.
- Singapore has extremely high rates of pneumonia, with pneumonia the second leading cause of death (20.6% of all deaths in 2018).¹³ The influenza virus and pneumococcal disease are both common causes of pneumonia and both are vaccine-preventable.

An encouraging policy drive

In Singapore, the government is promoting adult vaccination through the recent release of a National Adult Immunisation Schedule (NAIS), alongside health insurance legislation that helps address financial barriers to vaccine uptake.

Encouragingly, government subsidies may soon be provided for vaccines recommended under NAIS to further encourage vaccination amongst adults.

"There was a huge vacuum for the adult side of vaccination".⁹

Singapore has had a very successful childhood immunisation programme based around a National Childhood Immunisation Schedule (NCAIS); however, until recently immunisation policy related to adults was lacking. This changed in 2017 when the Singaporean Ministry of Health (MoH) established an NAIS to provide vaccination guidance to specific high-risk adult groups.¹⁴

Singapore's National Adult Immunisation Schedule (NAIS)

The NAIS was developed based on the recommendations of the national Expert Committee on Immunisation (ECI), and comprises seven types of vaccines that protect against 11 diseases (influenza; pneumococcal (PCV13/PPSV23); human papillomavirus (HPV2/HPV4); tetanus, diphtheria and pertussis (Tdap); measles, mumps and rubella (MMR); hepatitis B; and varicella).¹⁴ Recommendations for who receives each vaccination are based on whether adults belong to specific high-risk groups, such as older people or pregnant women, or have previously been vaccinated.¹⁴

The government has further promoted adult vaccination through reducing the financial barriers to uptake. Since November 2017, the population groups recommended by the NAIS to receive vaccination can use up to \$500 of their Medisave savings, a mandatory medical savings programme, to pay for the vaccinations.¹⁴

Medisave

Medisave is a mandatory medical savings programme, into which workers contribute a percentage of their wages, which is then matched by their employers. Strict guidelines designate what Medisave funds can be used for, with services covered including hospitalisation, day surgery and a number of outpatient expenses.¹⁵

*"The MoH has said it will subsidise adult vaccinations, but it is unclear yet how much."*¹⁶

Encouragingly, in mid-2019, the government continued its efforts to address the financial barriers to adult vaccination by announcing that it would subsidise the NAIS vaccinations in the near future, with the aim of tripling the current vaccination coverage for these vaccines within five years.¹⁷

Challenges and ways forward

Low uptake

Uptake of adult vaccinations on the NAIS is low, tempering their ability to promote healthy ageing.

*"In each clinic we cater to 60-70,000 patients; however, we only vaccinate around 2-5% of these patients against influenza and pneumococcal disease".*¹⁸

In 2016/17, it was estimated that only 12% and 14% of people aged 65 to 74 had been vaccinated against pneumococcal disease and influenza respectively.¹⁷ The introduction of the NAIS does not appear to have had a significant impact on uptake rates, with a small proportion of eligible adults reported to be using Medisave to pay for the pneumococcal vaccine.¹⁹

The NAIS's implementation lacks many of the mechanisms that are used to ensure high vaccination uptake rates for the childhood vaccination schedule. In contrast to the NAIS, most of the vaccines in the childhood immunisation schedule are available free of charge from polyclinics²⁰ and two of the vaccines are mandatory (diphtheria and measles).²¹

Vaccine cost is a significant factor affecting uptake despite the introduction of the Medisave500. A great concern among participants was the lack of free or subsidised vaccinations for older adults, particularly for high risk groups such as nursing home residents. While the government has announced that it will be introducing subsidises in the future, their level is yet to be confirmed, with patients reported to currently pay around \$74 for the Pneumococcal Polysaccharide Vaccine and \$153 for the Pneumococcal Conjugate Vaccine.¹⁹ Participants highlighted that the lack of free or subsidised vaccines is sometimes stopping GPs from recommending vaccination, with clinicians not wanting to be seen as "selling" additional services to their patients.²²

"We need to move away from this pool of money (Medisave) and have something separate for vaccination".¹⁸

People do not always have money in their Medisave pot to pay for vaccinations. Medisave funds are used to pay for a range of health services and can easily get used up when patients have multiple or chronic health conditions. This is worrying, as it is often these patients who are at greater risk of vaccine-preventable diseases. Participants gave examples of how this was directly impacting vaccination rates among older people - in one nursing home participants reported that only 1% of residents were vaccinated for pneumococcal disease as most had used up their Medisave pot; however, uptake increased to 99% when the care home funded the vaccine as part of a broader intervention.⁹

Ways forward

"What is the right amount to pay?"¹⁶

Participants called for a funded wellness package that includes both vaccinations and screenings for older people living in care homes. This would help to protect this high-risk population who are reported to have often exhausted their finances.²³ This could be aided by the introduction of an 'opt-out' system for vaccination, as annual 'opt-in' systems were seen as creating an additional barrier to vaccine uptake.^{24 16}

Participants suggested that the Singaporean government should consider financial incentives for patients to help increase vaccine uptake, alongside performance-based incentives for clinicians to conduct vaccinations. A recent study suggested that a monetary incentive of SGD 20 for patients was the optimum amount for increasing uptake of the influenza vaccine amongst people aged 65+ in Singapore.²⁵

Low public awareness

Reducing the financial barriers to vaccination is only part of the puzzle to increasing vaccination rates, with low awareness of adult immunisation a major issue.

"We don't have a culture of vaccination. It's a good to do rather than a must do".²⁶

Few adults are aware of the risk of vaccine-preventable diseases. A survey of adults aged 21 to 70 found that overall, the intention to get vaccinated against influenza and dengue was low, with only around one fifth reporting that they would consider vaccination against these diseases the following year.²⁷ Participants highlighted that many older patients do not see vaccination as a critical health intervention, but instead view it as an unnecessary increased cost for their family.²² Among participants of the public seminar and roundtable held

to inform this report we found limited awareness of adult vaccines beyond influenza and pneumococcal disease.

"We've found the care home residents we've given the vaccine to get pneumonia. Why?" (Participant, adult vaccination public seminar)

Many people have misconceptions about the vaccines themselves. A small study of adults aged 60+ found that many older adults held mistaken beliefs about the effectiveness of the influenza and pneumococcal vaccinations and their potential side effects.²⁸ During the public seminar, questions on the effectiveness of the influenza and pneumococcal vaccines were the most common topic put to the speakers.

*"If healthcare workers have these concerns, what hope do the general public have?"*²³

Worryingly, these misconceptions around vaccination have also been found among health care workers (HCWs). A Singaporean study on HCWs' perceptions of the influenza vaccine found that many wrongly believed the vaccine can cause influenza, that influenza cannot lead to serious medical complications, and showed poor awareness that vaccinating HCWs can protect the health of patients.²⁹ These misconceptions appear to be affecting vaccine uptake, with influenza vaccination rates amongst HCWs found to be suboptimal.¹¹ Participants highlighted how their medical colleagues were often sceptical about vaccination,³⁰²⁴ which was leading to few staff choosing to be vaccinated, even when free vaccination was available, or recommending vaccination to their patients.²³

*"If you can't convince people to be vaccinated once a year, how can you get them to do it twice".*¹⁶

The lack of a clear flu season is making efforts to increase public awareness around vaccination more difficult. Singapore experiences both strains of influenza all year round, with a

bimodal increase in incidence seen from May to July and November to January.³¹ As a result, the flu vaccine is offered all year round, with the vaccine strain switched depending upon the month. Participants highlighted how the absence of a clear flu season makes it much more difficult to facilitate a concerted drive to action, as occurs during the winter in the UK.¹⁶

Ways forward

"We can't overestimate the role of education".²³

"Older people who are offered vaccination say 'no, give it to my grandchildren'".³⁰

Participants called for regular and consistent public education campaigns to increase knowledge and awareness around adult vaccination, with the Health Promotion Board potentially taking a leading role. Participants highlighted that many older people are concerned about becoming a burden on their families and suggested that targeted educational efforts should focus on how vaccinations can help to keep older people active and mobile.^{9 30}

Participants called for the use of older ambassadors to normalise vaccination amongst older people and to help tackle their misconceptions around vaccines. Clinicians could then build on the vaccine awareness that had been built. Using older ambassadors was thought to be beneficial because of their position within the peer network that they were trying to influence, with older people thought to be more likely to trust their advice.^{26 32 22}

"We underestimate the power society puts in us (HCWs) in how we can influence healthcare behaviours".²³

Participants suggested that senior healthcare management should take a leading role in increasing their staff's knowledge and awareness around adult vaccination. Currently, too little

endorsement of vaccination was seen to be occurring by senior staff.²³ Participants called for senior doctors to set the example by getting vaccinated themselves, encouraging their staff to get vaccinated and highlighting the patient benefits of staff vaccination.^{23 24} With senior management leading the way, awareness was then believed to trickle down through the healthcare organisation.³³

Participants called for medical schools to introduce adult vaccination into their curriculums as currently only childhood vaccination is taught. This knowledge gap was thought to be contributing to HCWs being insecure in recommending adult vaccination to patients.⁹ Understanding could be further facilitated by simplified guidelines on adult vaccinations. Participants suggested that a summary of the current medical guidelines for vaccination would aid time-pressured GPs, with the College of Family Physicians Singapore potentially taking a leading role.^{22 32}

A Pneu Choice^{33 34}

The 'A Pneu Choice' campaign aimed to increase older people's uptake of the pneumococcal vaccine by improving their health literacy and by offering free vaccination. Piloted in two areas of Singapore by the Tzu Chi Foundation, in collaboration with final-year undergraduates, the campaign conducted a range of promotional activities in community clubs and senior activity centres. These activities included group health talks and free brochures designed with the help of older people, that targeted common misconceptions around pneumococcal disease and its vaccines. Free vaccination was then provided at a designated Tzu Chi medical clinic. As a result of the campaign, 84 older adults were vaccinated.

Underuse of allied health professionals

A reliance on doctors to recommend and prescribe adult vaccinations is impeding patients' access to these services.

"Doctors are the worst at asking patients to do extra things as they are so busy".¹⁸

Participants argued that a GP-centric culture exists in Singapore where only the "doctor's voice counts." This was seen as impacting on vaccination uptake as these health professionals are under a lot of pressure to deliver their core services and may not take the time to recommend additional services such as vaccination.¹⁸

"When patients first come in to our clinic, they are a captive audience, so we need to try and get them vaccinated".³⁵

Allied health professionals could play a greater role; however, most are unable to prescribe vaccinations. While participants highlighted that it is pharmacists and nurses who most often recommend vaccination to adult patients,³⁰ legislation is currently stopping them from being able to prescribe these drugs.³⁶ As a result, patients have to make an appointment to see their GP, creating an extra step that increases the risk of patients not being vaccinated.³⁰

Ways forward

Participants called for team-based models of working to be introduced into GP practices to divorce patients from the idea that only the doctor's voice counts. The introduction of this model into participants' own practices, where patients belong to a multi-disciplinary team rather than an individual GP, was reported to have increased patient interactions with allied health professionals and was helping to challenge patients' GP-centric view.¹⁸

"I'm getting rice at 14:00 so why not get a vaccination as well".²³

Participants called for allied health professionals to be empowered to prescribe adult vaccinations. The recently introduced National Collaborative Prescribing Programme has created a significant opportunity to facilitate this. This programme trains pharmacists and nurses to prescribe specific medicines, which they are then free to prescribe on completion of the programme and once their place of work has attained the appropriate licence.³⁶ Expanding prescribing to allied health professionals would also allow vaccination to be expanded to new settings, further improving people's access. Supermarkets and drug stores could be potential new avenues, with these settings delivering 20.1% of adult influenza vaccinations in the U.S. in 2011–2012.³⁷

A lack of data

Too little data is being collected to inform both policy and medical decisions on adult vaccination.

Singapore lacks a robust national electronic registry to record adult vaccination uptake resulting in a dearth of data to inform policy decisions,³⁸ and to assess if implemented actions are working.²⁶ With vaccinations currently delivered in the public, private and charitable sectors, adult vaccination data currently sits in multiple different electronic and paper silos.

"Is it better to over or under vaccinate?"³⁰

Participants highlighted how the lack of a single data source to unify data on adult patients' vaccinations is often stopping doctors from actively recommending vaccination due to worries about overvaccination.⁹

Ways forward

Participants called for a 'one stop shop' for people's adult vaccination history. Having a unified data source for adult vaccinations was seen as vital to aid policy and medical decisions on vaccination.^{9 16} Healthhub, a centralised system where patients can see all of the vaccinations they have received in the public sector, could offer a potential solution by being expanded to incorporate the private and charity sectors.⁹ Participants suggested that this could then be linked with GP clinics to further aid uptake, such as pop-up reminders to vaccinate on the self-check-in system,⁹ and text reminders sent to patients' mobile phones.³⁰

Conclusion

Singapore's health system is coming under increasing pressure as its population grows older. Rates of chronic and age-related health conditions are increasing, which is leading to greater health service utilisation and costs. Adult vaccination is a key element of preventative healthcare which can help to address these challenges. Adult vaccination can keep people healthier for longer and has been shown to be cost-effective. The recommendations of the participants provide some specific examples of how our general recommendations might be implemented. We recommend:

- Investing in financial incentives and care packages to overcome the financial barriers to vaccination for those most at-risk.
- Investing in top-down and bottom-up educational efforts to normalise adult vaccination and improve health literacy, including regular public education campaigns and older ambassadors, together with increased training and simplified guidelines for HCWs.
- Expanding the use of team-based models of working to divorce patients from a GP-centric view of healthcare, while investing in allied health professionals to play a greater role.
- Expanding the scope of national data collection on adult vaccination to better inform policy and medical decisions on adult vaccination.

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