

# PERSPECTIVES ON INFLUENZA IN OLDER ADULTS IN MALAYSIA



Insights into Action on Vaccination for High-risk Adults

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## FOREWARD

Many Malaysians perceive influenza to be a 'cold weather disease', often viewing it as a mere inconvenience. Hidden from public view is the true cost of influenza: its life-threatening complications and costly hospital bills, and the heavy burden of caring for those who are ill.

The COVID-19 pandemic has shown how devastating a respiratory virus can be when it spreads beyond our control, whilst it made us wait with bated breath for a safe and effective vaccine.

Today, as COVID-19 vaccines are being administered nationwide, we must not lose sight of the urgency of adopting preventive measures against influenza as well. This is especially vital to protect the older population who are most affected by both these viral diseases.

Available data points to a low vaccination coverage rate (VCR) for influenza in Malaysia, estimated at only ~3%. It also shows us that much more can be done.

To provide a starting point, this perspective paper gathers insights from medical leaders and allied health experts familiar with the struggles and challenges faced by the older Malaysian populations, from affordability and poor disease awareness to vaccine hesitancy.

With the certain knowledge that our vulnerable older populations face significantly higher mortality and morbidity from influenza, we bear the responsibility to ensure they are protected from severe illness. Strategic, integrated efforts between government and non-government entities, private and public institutions as well as members of the community are the priority.

"Our older populations value their independence and do not wish to trouble anyone, especially their children. However, they face a multitude of challenges in a world that does not readily cater to their needs, and even those who are able to live independently are likely to be frail or suffer from chronic conditions. At their age, any illness could tip the scales. We must be realistic about taking the necessary steps to protect their health, such as encouraging annual influenza vaccinations. As a society, we need to do more to care for the physical and mental health of our parents and grandparents."



**Prof Shahrul Bahyah Kamaruzzaman** is a Consultant and Professor in Geriatric Medicine. As a dedicated spokesperson on health inequalities and an active clinical academician, her efforts have focused on improving geriatric care and services through multidisciplinary clinical care and research. With a PhD in Epidemiology and Population Health, she has led the first ageing research group, Malaysian Elders Longitudinal Research (MELoR) which has produced many publications on the Malaysian older population in areas of frailty, falls and dementia. A former Head of the Geriatric Unit and Department of Medicine, she is now the Postgraduate Deputy Dean at the Faculty of Medicine at the University of Malaya.

"Diseases like influenza that attack our respiratory system have no boundaries. They attack without distinction and are easily spread between family members, schoolmates and colleagues. From my years as a chest physician, working with patients of all ages, I can attest to how severely respiratory diseases can affect not just the patient, but their entire family. With influenza, we have the means to protect ourselves as well as our most vulnerable individuals, and it is imperative that we do so."



**Associate Prof Pang Yong Kek** is a respiratory specialist and outspoken advocate for improving treatment goals for patients. An active researcher with many published papers on a wide range of lung health topics, Prof Pang is the president of the Malaysian Thoracic Society (MTS) and board member of Lung Foundation of Malaysia, and also a member of the Asian Pacific Respiratory Society and European Respiratory Society.





"Influenza vaccines are essential for safe and effective protection against a virus that has severe consequences for Malaysians of all ages, but especially for the older populations. The COVID-19 pandemic has shown us how important vaccines can be. The influenza vaccine has been in existence for over 60 years and has been proven safe and effective, but it is still perceived to be unnecessary. The average Malaysian does not see the cost of influenza: its economic impact from loss of productivity, the cost of treatment and hospitalization, and the ultimate cost of mortality. From a public health perspective, high vaccination coverage against influenza would contribute to the safety and wellbeing of the entire nation."



**Prof Zamberi Sekawi**, a Professor of Medical Microbiology and Consultant Clinical Microbiologist, is an active spokesperson on public health issues, with emphasis on prevention of influenza and other infectious diseases. He is a founding member and chairman of the Malaysian Influenza Working Group (MIWG) and active in the Malaysian Society of Infectious Diseases and Chemotherapy (MSIDC) and the International Society of Infectious Diseases (ISID) where he is an Executive Committee Member.

"Our elderly are exposed to many challenges outside of our control, however, there is a lot we can do to help them live healthy and productive lives. Getting vaccinated against influenza can protect them from more than the virus itself; it can help to prevent other health conditions like heart disease and diabetes from getting worse, it can save them from being hospitalised and exposed to other infectious diseases, and it can save their lives. From my perspective, there should be no debate on the matter."



**Prof Nathan Vytialingam** has over 48 years' experience in occupational therapy and is an honorary fellow of the World Federation of Occupational Therapists as well as former president of the Malaysian Occupational Therapy Association. A well-respected advocate for healthy aging, Prof Nathan serves as an honorary advisor to the Malaysian Healthy Ageing Society and is also Dean of the Perdana University School of Occupational Therapy (PUScOT). He is also an advisory council member on Global Coalition on Ageing.

"The past year has been a particularly challenging, with our older adults - being susceptible to COVID-19, they have been reluctant to visit clinics and hospitals, even for regular check-ups. As many of them also have existing chronic conditions, there is a concern that their overall health may have deteriorated. Moreover, they are also more vulnerable to respiratory distress from viral infections like influenza and COVID-19. There is no question that we need to adopt a more unified approach to protect our older citizens from infectious diseases, and the influenza vaccine is a good way to start."



**Prof Tan Maw Pin** is a Professor in Geriatric Medicine at University of Malaya and an established academician with many published works in local and international medical journals. In addition to being an active advocate for older adults, she is the Principal Investigator of the Transforming Cognitive Frailty into Later Life Self-Sufficiency (AGELESS) programme, an initiative funded by the Ministry of Higher Education Long Term Research Grant Scheme. Prof Tan is also the Honorary Secretary of the Malaysian Society of Geriatric Medicine and the College of Physicians of Malaysia, founder of ACT4Health Sdn Bhd, and Medical Director of the Genting Dementia Day Care Centre and Managed Care Sdn Bhd.





## EXECUTIVE SUMMARY

Consistent and reliable data from Southeast Asian countries show that influenza is a major threat to the population's health and wellbeing, with a significant cost impact on individuals, communities, and healthcare systems.<sup>1,2,3</sup>

At the centre of Southeast Asia, Malaysia sees a considerable number of influenza cases every year. It is estimated that influenza accounts for 23% of severe acute respiratory infection (SARI) cases and 13% of pneumonia hospitalizations in Malaysia.<sup>4,5</sup> Without a comprehensive and consolidated body of data, these numbers are likely to be conservative, with the true burden of disease being significantly higher.

Evidence shows that influenza has a disproportionately high impact on Malaysian older adults and those with co-morbid conditions.<sup>6</sup> It is also associated with higher healthcare utilization in older patients.<sup>6</sup> With Malaysia fast becoming an ageing society, this leaves a significant population segment vulnerable to the clinical and economic burden of influenza.

Prevention with annual influenza vaccination is now recognized as the most cost-effective way to fight influenza, compared to treating the active disease and its associated complications.

Data from various countries with strong influenza vaccination programs and high VCR have been shown to bring significant health and cost benefits to individuals, communities, and whole countries. For Malaysia, a handful of studies on Malaysian pilgrims and Malaysian old-age homes mirror these findings and offer proof of vaccine effectiveness against influenza-like illnesses.<sup>8,9,10,11</sup>

Leading global health authorities such as the World Health Organization (WHO) and the US Centers for Disease Control (CDC) identify vaccination as the most effective prevention measure against influenza. The latest WHO advisory recommends prioritizing seasonal influenza vaccination for older adults during the COVID-19 pandemic. This recommendation has been endorsed by Ministry of Health Malaysia (MoH) and several Malaysian medical associations.

In addition, Malaysian medical society stakeholders such as Malaysian Influenza Working Group (MIWG), Malaysian Society of Geriatric Medicine (MGSM), and others continue to actively advocate for influenza vaccines while recommending that all individuals aged 50 and above receive the influenza vaccine annually.

<sup>12,13</sup>

Despite such recommendations as well as the evidence, the burden of influenza and the value of vaccination remain underappreciated by the general public. Many Malaysians accept vaccinations if it is recommended by their doctors, but some may still reject it due to lack of awareness and issues of affordability. Even among healthcare professionals the value of vaccination could be better understood, to ensure that it is advocated for by all medical specialties.

Compounding the problem is the limited funding available to subsidize vaccination efforts, in part due to prioritization of other public health issues and to some degree because of budgetary constraints. Despite recent efforts, the clinical and economic burden of influenza and vaccination rates in Malaysia are not fully tracked and understood. This is mainly due to the limited number of surveillance sites, limited data collection mechanisms, and restricted funding for public health research.<sup>14,15</sup>

**More can be done to address the spread of influenza and translate recommendations into effective vaccination policies.**

A multi-stakeholder approach involving national and local governments, healthcare workers, clinical associations, vaccine manufacturers, patient advocates and consumers is required to protect high-risk groups and support effective influenza prevention across Malaysia, with the following objectives:

- 1. Normalize the mindset that regular influenza vaccinations are part of an overall healthy lifestyle**
- 2. Ensure availability of influenza vaccines through wider distribution channels and prioritized access pathways**
- 3. Ensure accessibility of influenza vaccines through government subsidy for the high-risk groups**
- 4. Prepare for pandemics by investing in long-term surveillance programs**

With a united view on the importance of influenza prevention among key medical stakeholders, Malaysia has started on the right track to influenza management. In time, planning and funding, and the growing healthcare consciousness that the COVID-19 pandemic has brought about, may be leveraged to help reduce the impact of influenza.



## INTRODUCTION

Influenza is a serious threat to public health that affects billions of people worldwide every year, sometimes with deadly consequences.

WHO estimates there are 1 billion cases of influenza annually worldwide<sup>17</sup>

3-5 Million are severe cases

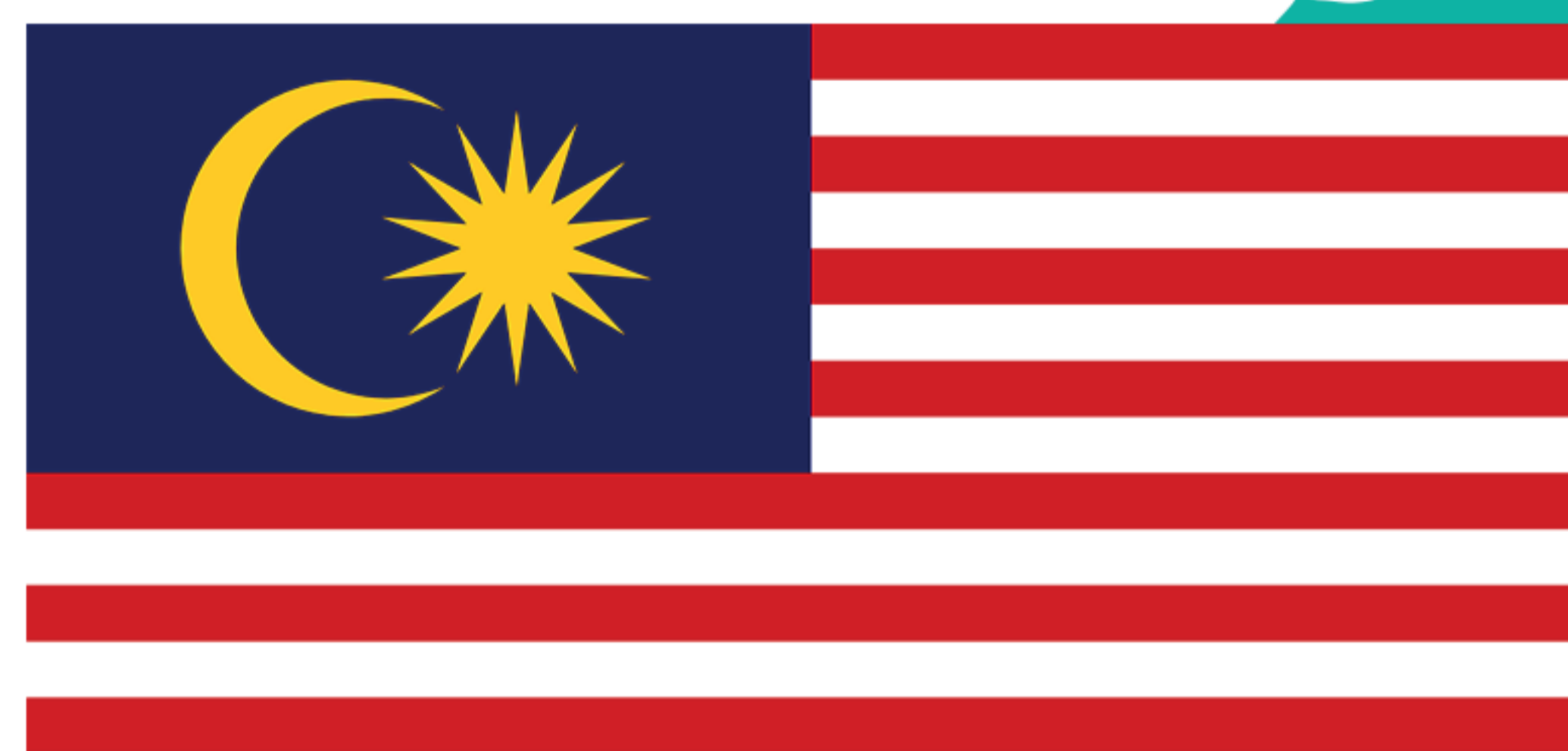
As many as 650,000 people die of influenza globally every year, 80% of whom are 65 years and older<sup>17</sup>

- Commonly thought to be a cold weather disease, influenza is a public health threat around the world, regardless of climate. Tropical countries report a substantial number of cases, accounting for approximately 6% of all global annual cases or up to 64 million people in South East Asia alone every year. Of these, between 3.8 and 8.9 million result in pneumonia and hospitalisation.<sup>1,14</sup>
- Influenza has a heavy impact on ageing populations as seen from global data:
  - Adults above 65 years of age account for 54-70% of influenza-related hospitalizations and 71-85% of influenza-related deaths.<sup>18</sup>
  - The average hospital stay due to influenza for patients above 65 years of age is over eight days.<sup>1,19,20</sup>
- In Malaysia, the true prevalence of influenza is unknown, due to low awareness, limited testing, and under-reporting as influenza is not a notifiable disease. There is a need for more research and better understanding on how to improve nationwide influenza prevention measures, including increasing the uptake of influenza vaccines.<sup>14</sup>

### Objectives of this paper

- With this perspective paper, we aim to start a dialogue on the burden of influenza on high-risk groups such as older adults and highlight potential methods on how this burden can be managed, both in the short and long term.
- We hope the findings from this paper can be used to drive policy recommendations that improve public awareness as well as the rate of influenza vaccination among the older generations in Malaysia.

## MALAYSIA





## KEY CONSIDERATIONS ON INFLUENZA MANAGEMENT

### Influenza and COVID-19: A complicated relationship

Both influenza and COVID-19 are respiratory diseases which affect older populations more severely, as older adults have weakened immune systems and a higher likelihood of experiencing comorbidities.<sup>21</sup> As such, the WHO categorizes older adults, together with healthcare workers, as high-risk groups.

At the time of writing, the COVID-19 pandemic has resulted in 145 million cases worldwide with roughly 2.2% of those infected dying due to complications.<sup>22</sup> The burden imposed by this pandemic will only worsen if an influenza pandemic were to cause further widespread disease and complications. In fact, COVID-19 pandemic aside, deaths due to seasonal influenza estimated to number 650,000 annually, exceeds the rough total of 413,000 deaths attributed to the four other pandemics (SARS, Swine Flu, MERS and Ebola) of the 21st century.<sup>16,23,24,25,26</sup> Therefore, the resulting strain caused by influenza outbreaks would be an additional burden on healthcare workers who are already battling COVID-19.<sup>27,28</sup>

Over the past year, with worldwide attention mostly focused on the COVID-19 pandemic, the importance of preventing influenza has been overshadowed.

It is crucial to remember that both types of influenza – pandemic and seasonal – are responsible for substantial mortality, disability, and economic disruption. Controlling seasonal influenza is critical to preventing the rapid spread of new influenza strains that emerge in pandemics.

At the centre of Southeast Asia, Malaysia sees many influenza cases per year, with considerable hospitalization and death rates. Influenza accounts for 23% of SARI cases and 13% of pneumonia hospitalizations in Malaysia, with on-ground influenza incidence suspected to be higher than these official reports.<sup>4,5</sup> Estimates show that in 2017, influenza-associated lower respiratory tract infections (LRTI) alone resulted in over 6,200 hospitalizations and 800 deaths.<sup>29</sup>

Consequences are even more severe for individuals who are categorized by the WHO as “high-risk”, which includes:<sup>30</sup>



1. Pregnant women at any stage of pregnancy



2. Children aged between 6 months to 5 years



3. Adults above 65 years of age



4. Individuals with chronic medical conditions such as diabetes or hypertension



5. Healthcare workers

### Burden of influenza among the older adult population in Malaysia

In Malaysia, influenza is commonly regarded as being no different from the common cold and it is not perceived as a serious threat. Most people do not realize the consequences of contracting influenza; even in the presence of symptoms, some individuals choose self-treatment. This may contribute to under-reporting or delay in treatment resulting in poorer outcomes, especially among high-risk populations such as older adults and those with co-morbid conditions.

**“Influenza is much more common than we know, partly because it is not a mandatory notifiable disease in Malaysia”**

**– Prof. Pang**



In the Malaysian setting, we are beginning to find clear evidence that older age is an established risk factor for poor outcomes in influenza-related illnesses: whilst 10% of those in the 25 to 60 age range face complications, 28% of patients above 65 years experience complications.<sup>6</sup> With more than a tenth of its population predicted to be above 60 within the coming decade, Malaysia is fast becoming an ageing society.<sup>31,32</sup> This is alarming because it leaves a sizeable segment of the Malaysian population exposed to the clinical and economic burden of influenza unless protected.



**7%** of Malaysia's population **>65 years**<sup>31</sup>



**15%** of Malaysia's population will be **≥60 years by 2030**<sup>32</sup>



2012 to 2014 Malaysian data indicates that **~28%** of those **≥65 years** experienced **hospitalization, ICU admissions, or death** within a year due to influenza, compared to 10% in the 25-65 age group<sup>6</sup>

This situation may be worsened by the public's poor understanding and awareness of influenza, which Malaysian stakeholders in our research attribute mainly to misconceptions. Our research shows that older Malaysians may be unclear on the clinical burden that influenza poses, but they acknowledge treatment for influenza to be costly, especially for those with comorbid diseases (of whom many are of older age).<sup>33</sup>

**"Many people do not realize that influenza can exacerbate heart problems or even trigger heart attacks. We need the public to know that influenza can trigger other medical problems."**

**– Prof. Zamberi**

Malaysian healthcare professionals (HCPs) and policy makers are aware that medical expenses and loss of productivity associated with influenza have a severe economic impact.

**"Managing influenza absorbs a lot of healthcare resources, especially when we have to handle their exacerbated chronic conditions like acute kidney injury, respiratory distress, heart failure, heart attack, and uncontrolled diabetes. These costs will escalate further if we take into consideration hospitalization and loss of work."**

**– Prof. Pang**

Whilst it is acknowledged that awareness has improved in recent years, there remains a great deal to be done to protect the nation's aged population.





## PLANNING FOR A BETTER FUTURE

### Global consensus on influenza vaccination benefits

According to international health authorities such as the WHO<sup>34</sup> and the CDC<sup>7</sup>, annual influenza vaccination is the most effective strategy to protect people from influenza and reduce its potentially severe consequences. Globally, the vaccine prevents millions of illnesses each year. From 2016 to 2017, influenza vaccination programs prevented an estimated 5.3 million cases of influenza, 2.6 million influenza-associated doctor visits, and 85,000 influenza-associated hospitalizations worldwide.<sup>7</sup>

Large studies involving older populations indicate that influenza vaccines reduced the risk of mortality by 25% and lowered the rates of admission for stroke and heart failure.<sup>35,36</sup> In fact, countries that have implemented large-scale vaccination programs for older adults have seen significant benefits.

Country	Recommendation & Funding Status	Outcomes & Benefits
<b>EU/ EEA</b> <b>(N=30)</b> <sup>37</sup>	<ul style="list-style-type: none"> <li>All member countries recommend influenza vaccines recommend influenza vaccines for adults ≥ 50 and adults with chronic conditions; 76% fund influenza vaccine</li> <li>97% recommend influenza vaccine for healthcare workers; 67% fund influenza vaccines</li> <li>≥ 50% recommend influenza vaccine for other WHO high-risk groups</li> </ul>	<ul style="list-style-type: none"> <li>47.1% median influenza vaccine coverage among older adults</li> <li>72.8% median vaccine coverage (among older adults) in countries with funding</li> <li>Prevention of influenza-associated illnesses/complications annually:<sup>38</sup> <ul style="list-style-type: none"> <li>- 1.6-2.1 million cases of influenza</li> <li>- 45.3-65.6 thousand hospitalizations</li> <li>- 25.2-37.2 thousand deaths</li> </ul> </li> </ul>
<b>KOREA</b> <sup>39</sup>	<ul style="list-style-type: none"> <li>Recommended for WHO high-risk groups</li> <li>Free for adults ≥ 65 and children aged 6 months - 5 years</li> </ul>	<ul style="list-style-type: none"> <li>84.4% influenza vaccine coverage among older adults, one of the highest worldwide</li> <li>High preparedness for 2009 H1N1 epidemic</li> </ul>
<b>THAILAND</b> <sup>40,41</sup>	<ul style="list-style-type: none"> <li>Recommended and free for WHO high-risk groups plus obese and patients with brain disorders</li> <li>≥65 years deemed as high-risk group and recommended influenza vaccine in 2008</li> </ul>	<ul style="list-style-type: none"> <li>Between 2010 and 2012, vaccine coverage increased among persons ≥65 years from 12% to 20%</li> </ul>
<b>AUSTRALIA</b> <sup>42,43</sup>	<ul style="list-style-type: none"> <li>Recommended and free for National Immunisation Program (NIP) target group that includes children aged 6 months - 5 years, adults with chronic conditions, pregnant women, and adults ≥ 65</li> </ul>	<ul style="list-style-type: none"> <li>Case-control study showed that vaccination was associated with a 32% reduction in influenza-related mortality in the NIP target group</li> </ul>
<b>MEXICO</b> <sup>44,45</sup>	<ul style="list-style-type: none"> <li>Recommended and free for adults ≥60, children from 6 months - 9 years, adults with chronic conditions, pregnant women, and healthcare workers</li> </ul>	<ul style="list-style-type: none"> <li>Decrease in influenza-related hospitalization by 27% and death by 48%, with increased quality of life since program implementation in 2002</li> </ul>



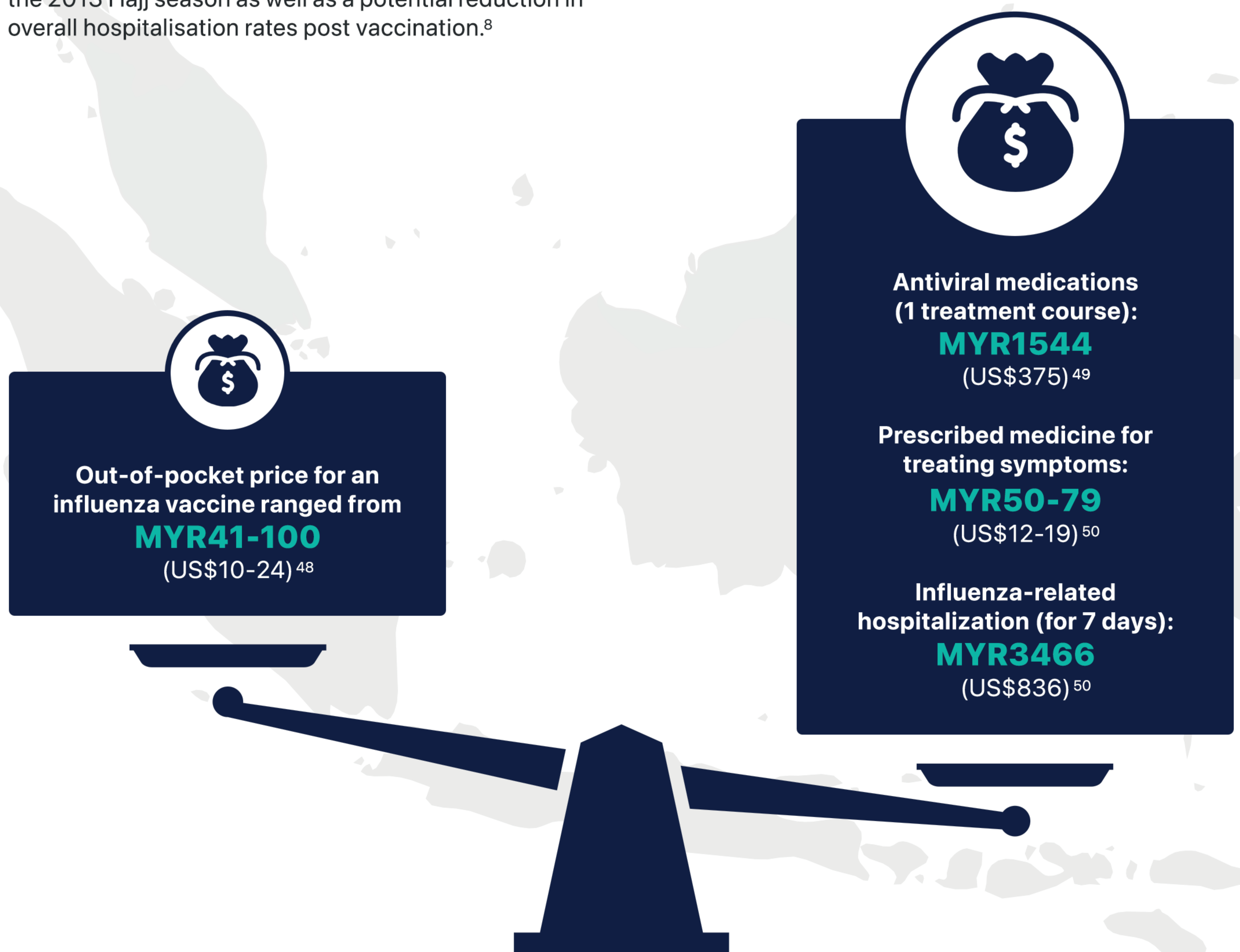
In addition to fighting influenza and its consequences, the WHO SAGE Seasonal Influenza Vaccination Recommendations published in September 2020 advises national authorities to prioritize seasonal influenza vaccination for older adults over 50 years as well as those in long-term care facilities, day-care hospitals or those receiving home-care during the COVID-19 pandemic.<sup>46</sup> This is aimed at reducing the potential for COVID-19 exposure for high-risk individuals, as they are more likely to require treatment or hospitalization and thus occupy valuable yet limited healthcare resources. This, in turn, will help to reduce the strain on healthcare systems currently burdened by COVID-19.<sup>47</sup>

### Benefits of influenza vaccination observed in the Malaysian setting

Whilst there are limited data in Malaysia, a few studies demonstrate the effectiveness of the influenza vaccine in reducing the burden of disease. Retrospective studies show a 22% reduction in influenza-like illnesses (ILI) among Malaysian pilgrims who were vaccinated, compared to unvaccinated pilgrims during the 2013 Hajj season as well as a potential reduction in overall hospitalisation rates post vaccination.<sup>8</sup>

There is further evidence that influenza vaccination provides significant protection among adults, especially those aged 65 and above.<sup>9,10,11</sup> A 2004 study on Malaysian adults (>50 years of age) in old-age homes, showed a 55-76% vaccine effectiveness in reducing the occurrence of influenza-like illness along with fewer episodes of fever, cough, muscle ache, and runny nose.<sup>11</sup>

The vaccine has also been shown to be cost-effective. Healthcare stakeholders report that the overall vaccination costs in Malaysia can be high due to various administration costs. However, local data from 2017 shows that the out-of-pocket price for an influenza vaccine ranged from MYR41-100 (US\$10-24),<sup>48</sup> which is considerably lower than the average cost for influenza treatment in the same year at MYR5,000 per case.<sup>49,50</sup>





## Current recommendations & vaccine funding pathways in Malaysia

Healthcare authorities and local influenza experts in Malaysia recognize influenza vaccination as an effective prevention measure. Malaysian healthcare stakeholders believe vaccination against influenza is important, especially for high-risk groups such as older adults, young children, those with co-morbid conditions, HCPs and travellers.



### CURRENT RECOMMENDATIONS BY MINISTRY OF HEALTH MALAYSIA<sup>51,52</sup>

- Annual vaccination against influenza is recommended for anyone above the age of 6 months
- Target groups as per the clinical practice guideline (CPG) on adult vaccination:
  - Residents of institutions for the aged or the disabled
  - Older non-institutionalized individuals with one or more of the following chronic conditions: chronic cardiovascular, pulmonary, metabolic, or renal disease, or who are immunocompromised
  - Other individuals in the community who have chronic cardiovascular, pulmonary, metabolic, or renal disease, or who are immunocompromised
  - *Those with regular, frequent contact with high-risk persons such as healthcare workers and household contacts*
  - *Large groups of Hajj and Umrah pilgrims gathering in the same area for several weeks*
- Older adults in nursing homes/ hospital wards as eligible patient groups to be prioritized for influenza vaccination
- Prospective Hajj pilgrims encouraged to take influenza vaccination a month before flying to the holy land

Stakeholders in our research estimate that approximately 70% of the MoH recommendations are being followed by HCPs. *Italicized recommendations include ones that are likely not being followed.*



In the last two decades, the Malaysian government has shown a clear commitment to supporting initiatives to increase vaccine uptake. As reported to the WHO by the Malaysian government, MoH expenditure towards vaccination and the National Immunisation Programme (NIP) have increased steadily from 2007 to 2017.<sup>53</sup> Moreover, the 2021 Malaysian Budget includes an expansion of tax relief of up to MYR1,000 per person for vaccination expenses against infectious diseases like pneumococcal infection, influenza, and Covid-19 for individuals, their spouses, and children.<sup>54,55,56</sup>

Recognizing that healthcare workers and older adults are two main high-risk groups, Malaysia has significantly expanded its healthcare workers vaccination coverage by means of annual immunization programs.<sup>57</sup>

Whilst advocacy campaigns remain the main push to vaccinate, there is a lack of official mandatory influenza vaccination policies for older adults. Current initiatives include:

- Immunise4Life initiative which drives general awareness about the safety and efficacy of vaccines, including targeted content for older adults. It is supported by MoH in collaboration with the WHO.<sup>58</sup>
- Campaigns by medical and professional organizations, such as the Malaysian Paediatric Association (MPA), Malaysian Medical Association (MMA), Malaysian Influenza Working Group (MIWG), which educate the Malaysian public via media engagements.

Some clinical experts feel existing recommendations are sufficient to outline the best prevention methods; the issue lies in the fact that the recommendations are not being effectively conveyed and implemented.

To help address this, stakeholders continue to actively advocate for influenza vaccination. This includes efforts by the Malaysian Influenza Working Group (MIWG) in collaboration with the Malaysian Society of Geriatric Medicine (MSGM) to recommend that all individuals aged 50 and above should receive the influenza vaccine annually, with no preference for specific month or season. The recommendations published in January 2021 are endorsed by over 30 organizations, from the Academy of Medicine Malaysia and Gerontological Association of Malaysia to the Malaysian Muslim Doctors Organisation and Medical Practitioners Coalition Association of Malaysia.<sup>12</sup>

Similarly, the Malaysian Society of Infectious Diseases and Chemotherapy (MSIDC) also recommends influenza vaccinations for those aged 50 years and older, as well as healthcare workers, those living in certain institutional settings and those with one or more medical conditions.<sup>13</sup>

It must also be noted that without a budget set aside to offer free vaccines, the MoH has limited power to make influenza vaccination mandatory.



In **80-100%\*** of the cases, influenza vaccination costs are borne by patients



In **10-30%\*** of the cases, influenza vaccination costs are borne by charitable or non-governmental organisations



In **~10%\*** of the cases, influenza vaccination costs are covered by limited government distribution via government clinics

*\*based on stakeholder perspectives from this research*





## Vaccination Coverage Rate (VCR) & perception of influenza vaccination in Malaysia

Based on vaccine manufacturers' sales and import records, only an estimated ~3% of Malaysian adults are currently vaccinated against influenza.<sup>33</sup> Stakeholders we spoke to in this research suggested that this low VCR could be due to scepticism that Malaysians (including some HCPs) may feel on the value, benefits or safety of the influenza vaccine.

A cross-sectional survey carried out in three hospitals in Malaysia's Klang Valley reflected this scepticism, where despite 51% vaccine uptake among healthcare workers, 10% of those vaccinated were not sure of the vaccine's safety.<sup>59</sup> Another study at a Malaysian teaching hospital indicated that a common reason for low uptake among healthcare workers is time constraints (mentioned by 56.2% of those surveyed).<sup>60</sup>

**"Even people who can afford the vaccine are not getting vaccinated. Many do not feel that they need it. Sometimes healthcare providers themselves are not convinced that they should receive the influenza vaccine."**

**– Prof. Pang**

Our research shows that older Malaysians may face difficulties getting to healthcare facilities to receive their vaccination. This may be due to factors such as limited mobility, poor health, or dependency on their adult children for medical appointments as well as lack of age-friendly healthcare facilities. Such factors along with consultation waiting times and service costs involved potentially act as further deterrents to getting vaccinated.

Healthcare stakeholders consulted for this research are aligned that physician recommendation has the greatest potential to drive influenza vaccination uptake. Based on feedback from HCPs, low awareness of the burden of influenza and factors such as vaccine safety, cost-effectiveness and affordability need to be addressed in order to increase vaccine acceptance and uptake in Malaysia.

### DRIVERS OF VACCINATION\*

- Physician or HCP recommendation
- Protection from influenza-related complications
- Eligibility for free vaccine
- Positive promotional campaigns on the vaccine
- Data on efficacy & safety of vaccination
- Recommendations by authorities from different fields such as politicians, employers, teachers, travel agencies, celebrities and religious leaders

### BARRIERS TO VACCINATION\*

- Lack of publicized information on vaccine benefits
- Affordability
- Limited availability of vaccines
- Restricted access to vaccine
- Lack of patient counselling by HCPs (often due to time constraints)
- Fear of side effects
- Lack of policies promoting vaccination

*\*based on HCP and consumer perspectives from this research; reasons are organized from top to bottom by most mentioned to least mentioned*



## TURNING RECOMMENDATIONS INTO ACTIONS

Influenza vaccination is not a common practice in Malaysia, but this can change. We can do much more to improve access and acceptance of the influenza vaccine, thus helping to prevent millions of infections.

Our key action points are:

### 1. Drive awareness and communicate vaccine benefits through innovative health promotion campaigns

It is imperative to get the public to understand that a vaccine is a beneficial investment for a continued healthy lifestyle, despite the potential inconvenience and costs.

In communicating this message, memorable slogans that present influenza vaccinations as part of an overall healthy lifestyle should be employed. It is also important to channel indirect campaigning as more people get vaccinated - testimonials from vaccinators and their patients on experiencing fewer illnesses or having less severe symptoms will be crucial to advocating for vaccinations.

A coordinated effort involving all stakeholders – national and state governments, healthcare professionals, clinical associations, vaccine manufacturers and consumers – will help elevate awareness and improve understanding of the importance of vaccination, especially for high-risk groups, and increase willingness to vaccinate.

All communications should aim to:

- Correct existing misconceptions
- Fully demonstrate the benefits of vaccination
- Highlight its efficacy and cost-effectiveness in a way that is tailored and relevant to the local population
- Engage with younger relatives to become advocates for older adults to get vaccinated

### Key success factors for raising public awareness

The MoH and healthcare practitioners in general are regarded as reliable by consumers above 65 years of age, making these stakeholders effective influencers. This influence should be leveraged to raise public awareness of influenza and the benefits of influenza vaccination. To ensure better local reach, state health departments under the purview of MoH can also be mobilised to run decentralised vaccination programmes.

Moreover, COVID-19 vaccination programs being rolled out globally presents healthcare authorities with an opportunity to maximize their resources by administering influenza vaccinations in parallel, especially among older adults. In Malaysia, the widespread public health campaigns surrounding COVID-19 show that a concentrated effort with consistent messaging can be effective. It may be possible to leverage some of the COVID-19 preventive measures to help reduce the spread of influenza, such as:

- **Adoption of good hygiene practices**
- **Higher receptiveness to regulations**
- **Higher receptiveness on prevention vs. cure, with emphasis on vaccination**





## 2. Prioritize access to influenza vaccines for older adults by simplifying and streamlining the vaccination process, and providing detailed recommendations

Simple and streamlined vaccination processes may help to improve uptake, such as:

- Designated month for influenza vaccination to promote annual uptake. This targeted approach could potentially relieve the need for year-round promotion if influenza vaccinations are gradually incorporated as part of an annual routine.
- Leveraging on neighbourhood or community clinics to administer vaccinations, eliminating the need to travel far from home.

Further measures should also look into developing and circulating detailed advisories guiding the patients through the journey of the vaccination process. This could include practical tips and insights such as the nearest location where shots are available as well as what to expect before, during and after the vaccination.

## 3. Implement policy to provide free vaccinations for high-risk groups

Vaccination for older adults must be made more affordable as the cost is often borne privately and may be prohibitive for those in lower-income groups. To address this, a multi-stakeholder, cross-ministry approach needs to be adopted for developing and implementing a comprehensive policy implementation plan. Stakeholders to involve may include:

- Relevant NGOs and patient advocacy groups such as the National Stroke Association of Malaysia (NASAM), National Council of Senior Citizens Organisations Malaysia (NACSCOM), Malaysian Society for Geriatric Medicine (MSGM), Malaysian Healthy Ageing Society (MHAS), Alzheimer's Disease Foundation Malaysia (ADFM), Persatuan Kebajikan Usiamas Malaysia (USIAMAS) and Gerontological Association of Malaysia (GeM) that have established partnerships with charitable organizations and corporations.
- Non-MoH affiliated ministries such as the Ministry of Women, Family and Community Development, as well as academia, that can enable more effective and systematic planning.





Existing Malaysian tax reliefs which are granted to individuals to cover vaccination expenses against infectious diseases for their spouses and children are a step in the right direction in influenza management policy.<sup>54,55</sup> In the near future, the coverage for such tax reliefs could be further expanded to include aged parents as well, providing incentives for individuals to advocate for their parents' vaccination.

In the long-term, it is imperative to aim for the goal of providing free vaccinations for high-risk groups, rolled out in a systematic manner. Funding could first be allocated to allow for a broader influenza vaccination program with the primary purpose of increasing coverage for high-risk populations, with a secondary goal of subsidizing vaccines for those currently not designated as high-risk.

Over time, improving access for the entire population will help to reduce the rate of transmission even among unvaccinated individuals and diminish the risk of an epidemic.

Multi-sourced funding approaches to provide free vaccines for targeted high-risk groups is being used in neighbouring countries like Thailand to prevent outbreaks.<sup>61</sup> This is an effective long-term strategy that Malaysia can emulate in communicable disease management because an outbreak is ultimately associated with subsidies, bailouts, and other forms of financial assistance, that could have otherwise been directed at prevention.

**Our recommendations are aligned with the Malaysian Health Technology Assessment Section (MaHTAS) report which used a financial implication analysis to propose three strategies for consideration:<sup>57</sup>**

- **Strategy 1: Achieve 100% immunization coverage of older populations**  
Using a trivalent influenza vaccine (TIV) annually is estimated to have an economic impact of approximately RM5.447 million for a starting coverage rate of 10%.
- **Strategy 2: Achieve 75% immunization coverage of older populations in 3 years**  
The lowest cost estimated for a coverage rate of 25% was RM 13.619 million per year.
- **Strategy 3: Achieve 100% immunization of older adults with one co-morbidity**  
The estimated lowest cost of TIV for older adults with diabetes mellitus with a prevalence of 41.5% a year was RM 22.61 million per year.

It should be noted that while the MaHTAS report is based on the use of TIV, the quadrivalent influenza vaccine (QIV) is preferred by health authorities in countries like Hong Kong, Taiwan, and the United Kingdom.<sup>62,63,64</sup> Furthermore, the WHO notes that recommendations for influenza vaccinations should not be limited to TIV and it is important to account for this in future strategy implementation.<sup>64,65</sup>



#### 4. Prepare for pandemics

A successful program for influenza vaccination lays the foundation for pandemic preparedness.<sup>66</sup>

Malaysian health authorities and medical communities acknowledge influenza burden. However, with gaps in adhering to WHO's guidance for influenza surveillance and maintaining stratified influenza epidemiological data, Malaysia lags behind countries like Australia and China in crucial aspects of influenza management.<sup>63</sup>

Malaysia lacks surveillance in key areas such as community spread, outbreak, and mortality. The recent MaHTAS report also highlights the limited availability of data on local epidemiology and costs.<sup>57</sup>

The Malaysia Influenza Surveillance System only collects data from disease-based and laboratory-based surveillance to gain an understanding of the locally circulating Influenza A and B virus strains. These include data from the National Public Health Laboratory (NPHL) Sungai Buloh and the Institute of Medical Research (IMR).<sup>14,57</sup> However, the data from these sources is not stratified by age. Moreover, while VCR data for other diseases among Malaysian children is well-documented, it does not include data on influenza vaccinations.

At present, the low Malaysian influenza VCR of ~3% is based on vaccine sales and import records from manufacturers. As data from the private sector falls under the Personal Data Protection Act 2010, data is only available from public hospitals for aggregate number calculations.

In light of these gaps, more up-to-date, comprehensive information is needed regarding case monitoring and vaccination.

**“It would definitely be beneficial to have a tracking system as it would allow us to understand which groups were given the vaccines.”**

**– Prof. Zamberi**

Firstly, to facilitate analysis and reporting, the Malaysia Influenza Surveillance System data should be stratified as per the WHO recommendation of aggregation of surveillance data by age groups.<sup>67</sup> Analysing aggregated datasets, especially when organised by age groups, may provide insights and help reinforce the need to cater for high-risk adults such as older populations.

As a next step, authorities should strengthen data collection mechanisms to capture cases and vaccination coverage rates robustly, frequently, and systematically. Recommendations for this include expanding existing sentinel networks as well as regularly publishing influenza reports communicated via official channels.<sup>63</sup>

Such initiatives would enable policymakers to identify strengths and weaknesses in immunisation policies, evaluate vaccination efforts, reinforce pandemic preparedness programs, and continue to protect the population against influenza.







## Conclusion: Influenza Prevention is Key

Malaysia is making important progress in managing the public health concern of influenza. In doing so, the nation is starting to focus on reducing the burden of influenza on its vulnerable populations, with a view to investing more resources to continue these efforts.

A key aspect lies in educating the population at large - with a specific focus on older adults - about incorporating influenza preventative habits as part of a healthy lifestyle. To maximize the available healthcare resources, these efforts can be carried out in tandem with the ongoing COVID-19 awareness and vaccination campaigns.

With the benefits of vaccination realized at the individual, family, and societal levels, efforts to increase vaccination rates in high-risk groups can first focus on ensuring tax incentives, prioritizing older adult vaccination pathways, and mobilizing non-MoH ministries and advocacy groups to support the cause. This focus can then be broadened to include budget allocation to fund or subsidize broader vaccination programs. These would act as incentives for high-risk Malaysians to receive the influenza vaccine.

As recommendations from official bodies slowly gain momentum increasing vaccine uptake, it is important to strengthen data collection mechanisms to help monitor both influenza spread and vaccination rates. This data will be crucial in validating the resources that are invested into awareness and vaccination efforts. It will also help identify potential knowledge gaps, and guide policymakers and medical stakeholders on implementing further measures.

A multi-stakeholder, evidence-based, coordinated effort to increase awareness and provide access to preventive measures will form a strong foundation to address the public health challenge that influenza represents for Malaysia.



# METHODOLOGY

## Secondary Research

To consolidate baseline knowledge and gain insights to guide each discussion and interview, secondary research was conducted on the following topics:

- Burden of Influenza (clinical, economic, and societal)
- Value of influenza vaccine
- High-risk groups for influenza vaccination in Malaysia
- Attitude and habits, drivers, and barriers to influenza vaccination
- Current influenza vaccination rates
- Current influenza vaccination policies
- Implications of not taking influenza vaccine on health & economy
- Strategies to increase influenza vaccination rates among older adults

Sources included global and local academic literature as well as commercial data and news articles.

## Primary Research

In-depth-interviews (IDIs) of approximately 45 minutes were conducted with 4 healthcare professionals and 4 older adult consumers. IDIs were used to evaluate appreciation of the burden of influenza and understand attitudes, perceptions, and habits regarding influenza vaccination based on personal, financial, and cultural factors. These were moderated by an experienced interviewer and insights from the IDIs informed the direction and focus of the FGDs.

### In-depth-interviews

#### Malaysian healthcare professionals

1. Equal split between chest physicians & infectious disease specialties  
 High prescribing clinicians with experience vaccinating older adults for influenza
3. Mixture of HCPs from public and private centres

#### Older adult consumers

1. Older adults above 65 years of age (recruited via NACSCOM / AGECOPE / MHAS, etc.)
2. Mixture of patients who have received influenza vaccination and who have not received influenza vaccination

Each FGD lasted for 120 minutes and was conducted virtually. The main objectives of the FGDs were to identify gaps and solutions that might improve the uptake of influenza vaccination. The focus of stakeholder FGDs was to gain insights on their attitude to influenza vaccination and understand the drivers and barriers facilitated by systemic as well as cultural norms.

### Multi-stakeholder Focus Group Discussion

#### Policy Makers

1. Representatives from: Ministry of Health (MoH), Ministry of Women, Family & Community Development, and other government sectors
2. Strong knowledge of policy recommendations regarding influenza vaccines or strong experience with healthcare policy making

#### Clinical Key Opinion Leaders (KOLs)

1. Medical doctors involved in national medical associations such as Malaysian Influenza Working Group (MIWG), Malaysian Society of Geriatric Medicine (MSGM), and others
2. Impactful position in national or local immunization bodies and/or guideline development

#### Non-Governmental Organisations (NGOs)

1. Representatives from National Council of Senior Citizens Organisations Malaysia (NACSCOM), Association for Residential Aged Care Operators of Malaysia (AGECOPE), Malaysian Healthy Ageing Society (MHAS) and others
2. Moderate to strong experience assessing the health concerns related to influenza for the older population of Malaysia

## Interpretation of Research Results

As screener criteria were strictly applied to the participants, any respondent data and findings from this paper should be interpreted as limited to the populations tested. Moreover, due to the limitations of qualitative research, any figures presented should be considered directional insights and may not be conclusive in nature.





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# APPENDIX

## Appendix 1: Focus Group Discussions and In-Depth Interviews

Table 1 Multi-stakeholder Focus Group Discussion

### Areas of Focus

1. Burden of influenza disease
2. Influenza vaccine perceptions and value
3. Influenza vaccination drivers & barriers
4. Strategies to improve influenza vaccination uptake

Table 2 In-Depth Interviews with HCPs

### Areas of Focus

1. Burden of influenza disease
2. Influenza vaccine perceptions and value
3. Influenza vaccination practice
4. Influenza vaccination drivers & barriers
5. Strategies to improve influenza vaccination uptake

Table 3 In-Depth Interviews with Consumers

### Areas of Focus

1. Burden of influenza disease
2. Influenza vaccine perceptions and value
3. Process for getting influenza vaccination
4. Maximise influenza vaccination acceptance

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## REFERENCES

- 1 Simmerman JM, and Uyeki TM. "The burden of influenza in East and South-East Asia: a review of the English language literature." *Influenza and other respiratory viruses* vol. 2,3 (2008): 81-92. doi:10.1111/j.1750-2659.2008.00045.x
- 2 Ng, S, and Gordon A. "Influenza Burden and Transmission in the Tropics." *Current epidemiology reports* vol. 2,2 (2015): 89-100. doi:10.1007/s40471-015-0038-4
- 3 Young BE & Chen M. "Influenza in temperate and tropical Asia: a review of epidemiology and vaccinology." *Human Vaccines & Immunotherapeutics*, 16:7, 1659-1667, 2020, doi: 10.1080/21645515.2019.1703455
- 4 Toh TH et al. "High Prevalence of Viral Infections Among Hospitalized Pneumonia Patients in Equatorial Sarawak, Malaysia." *Open forum infectious diseases* Vol. 6,3 ofz074. 13 Feb 2019, doi:10.1093/ofid/ofz074.
- 5 Oong XY et al. "Epidemiological and Evolutionary Dynamics of Influenza B Viruses in Malaysia, 2012-2014." *PloS one* vol. 10,8 e0136254. 27 Aug 2015, doi:10.1371/journal.pone.0136254
- 6 Pui LW, Hoe LS, et al. "The effects of age on clinical characteristics, hospitalization and mortality of patients with influenza-related illness at a tertiary care centre in Malaysia." *Influenza and Other Respiratory Viruses*, Vol 14, 3:286-293. 05 February 2020, doi: 10.1111/irv.12691
- 7 CDC. "Vaccine Effectiveness - How Well Does the Flu Vaccine Work?" 16 December 2020 , <https://www.cdc.gov/flu/about/qa/vaccineeffect.htm>
- 8 Hashim, Suhana et al. "The prevalence and preventive measures of the respiratory illness among Malaysian pilgrims in 2013 Hajj season." *Journal of travel medicine* Vol. 23,2 tav019. 8 Feb 2016, doi:10.1093/jtm/tav019
- 9 Immunise4life. "Adult vaccination sharply reduces hospitalisation for influenza cases." <https://www.immunise4life.my/beat-the-flu/influenza/adult-vaccination-sharply-reduces-hospitalisation-for-influenza-cases/>.
- 10 Ministry of Health Malaysia. CPG Management of Chronic Obstructive Pulmonary Disease 2nd Edition, p21. <https://www.moh.gov.my/moh/attachments/4750.pdf>.
- 11 Isahak I et al. "Effectiveness of influenza vaccination in prevention of influenza-like illness among inhabitants of old folk homes." *The Southeast Asian journal of tropical medicine and public health* vol. 38,5 (2007): 841-8.
- 12 Malaysian Influenza Working Group. Position Paper on Influenza Vaccination In the Elderly, <https://msgm.com.my/pdf/SFAI-Position-Paper.pdf>.
- 13 Malaysian Society of Infectious Diseases. Guidelines for Adult Immunisation (3rd Edition), <https://adultimmunisation.msidsc.my/wp-content/uploads/2020/12/AIG-3rd-edition-Final-version-09122020-c.pdf>.
- 14 Sam JIC. "The burden of human influenza in Malaysia." *The Medical journal of Malaysia* vol. 70,3 (2015): 127-30.
- 15 Guerche-Séblain C et al. Comparison of influenza surveillance systems in Australia, China, Malaysia and expert recommendations for influenza control. Doi:10.21203/rs.3.rs-360363/v1
- 16 Iuliano AD et al. "Estimates of global seasonal influenza-associated respiratory mortality: a modelling study." *Lancet (London, England)* Vol. 391,10127 (2018): 1285-1300. doi:10.1016/S0140-6736(17)33293-2
- 17 CDC. People at High Risk For Flu Complications, <https://www.cdc.gov/flu/highrisk/index.htm>
- 18 CDC. Flu & People 65 Years and Older, <https://www.cdc.gov/flu/highrisk/65over.htm>
- 19 Ang, Li Wei et al. "Influenza-associated hospitalizations, Singapore, 2004-2008 and 2010-2012." *Emerging infectious diseases* vol. 20,10 (2014): 1652-60. doi:10.3201/eid2010.131768
- 20 Milenkovic M et al. "Hospital Stays for Influenza, 2004: Statistical Brief #16." *Healthcare Cost and Utilization Project (HCUP) Statistical Briefs*. Agency for Healthcare Research and Quality (US); 2006 Oct, <https://www.ncbi.nlm.nih.gov/books/NBK63484/>
- 21 Mueller AL et al. "Why does COVID-19 disproportionately affect older people?." *Aging* vol. 12,10 (2020): 9959-9981. doi:10.18632/aging.103344.
- 22 Worldometers.info. Coronavirus (COVID-19) Mortality Rate, 17 February, 2021. <https://www.worldometers.info/coronavirus/coronavirus-death-rate/>
- 23 CDC. SARS Basics Fact Sheet. <https://www.cdc.gov/sars/about/fs-sars.html>
- 24 WHO. Middle East respiratory syndrome coronavirus (MERS-CoV). [https://www.who.int/health-topics/middle-east-respiratory-syndrome-coronavirus-mers#tab=tab\\_1](https://www.who.int/health-topics/middle-east-respiratory-syndrome-coronavirus-mers#tab=tab_1)
- 25 CDC. 2014-2016 Ebola Outbreak in West Africa. <https://www.cdc.gov/vhf/ebola/history/2014-2016-outbreak/index.html>



## REFERENCES

- <sup>26</sup> WHO. Past pandemics. <https://www.euro.who.int/en/health-topics/communicable-diseases/influenza/pandemic-influenza/past-pandemics>
- <sup>27</sup> Zi TM. "Geriatrician: Elders need flu vaccine to avoid 'twindemic' that could break Malaysian healthcare system." MalayMail, 19 January 2021, <https://www.malaymail.com/news/life/2021/01/19/geriatrician-elders-need-flu-vaccine-to-avoid-twindemic-that-could-break-ma/1941910>.
- <sup>28</sup> Yuan A. "A Twindemic Like No Other: The Malaysian Workforce Must Brace For the Recurring Flu Season Amid An Ongoing COVID-19 Battle." HR Asia, 3 February 2021, <https://hrasiamedia.com/top-news/a-twindemic-like-no-other/>.
- <sup>29</sup> GBD 2017 Influenza Collaborators. "Mortality, morbidity, and hospitalisations due to influenza lower respiratory tract infections, 2017: an analysis for the Global Burden of Disease Study 2017." *The Lancet. Respiratory medicine* vol. 7,1 (2019): 69-89. doi:10.1016/S2213-2600(18)30496-X
- <sup>30</sup> WHO. Influenza (Seasonal). [https://www.who.int/news-room/fact-sheets/detail/influenza-\(seasonal\)](https://www.who.int/news-room/fact-sheets/detail/influenza-(seasonal))
- <sup>31</sup> Department of Statistics Malaysia. Current Population Estimates, Malaysia, 2020, [https://www.dosm.gov.my/v1/index.php?r=column/cthemebByCat&cat=155&bul\\_id=OVByWjg5YkQ3MWFZRTN5bDJiaEVhZz09&menu\\_id=L0pheU43NWJwRWVSZklWdzQ4TlhUUT09](https://www.dosm.gov.my/v1/index.php?r=column/cthemebByCat&cat=155&bul_id=OVByWjg5YkQ3MWFZRTN5bDJiaEVhZz09&menu_id=L0pheU43NWJwRWVSZklWdzQ4TlhUUT09)
- <sup>32</sup> Are we ready for an ageing Malaysia? <https://healthyageing.org/index.php/are-we-ready-for-an-ageing-malaysia/>
- <sup>33</sup> Ipsos internal insights
- <sup>34</sup> WHO. Global Influenza Strategy 2019-2030, [https://www.who.int/influenza/global\\_influenza\\_strategy\\_2019\\_2030/en/](https://www.who.int/influenza/global_influenza_strategy_2019_2030/en/)
- <sup>35</sup> Vamos EP et al. "Effectiveness of the influenza vaccine in preventing admission to hospital and death in people with type 2 diabetes." *CMAJ : Canadian Medical Association journal = journal de l'Association medicale canadienne* vol. 188,14 (2016): E342-E351. doi:10.1503/cmaj.151059
- <sup>36</sup> Jefferson T et al. "Efficacy and effectiveness of influenza vaccines in elderly people: a systematic review." *Lancet (London, England)* vol. 366,9492 (2005): 1165-74. doi:10.1016/S0140-6736(05)67339-4
- <sup>37</sup> European Centre for Disease Prevention and Control. Technical Report. Seasonal influenza vaccination and antiviral use in EU/EEA member states, <https://www.ecdc.europa.eu/en/publications-data/seasonal-influenza-vaccination-antiviral-use-eu-eea-member-states>.
- <sup>38</sup> Preaud E et al. "Annual public health and economic benefits of seasonal influenza vaccination: a European estimate." *BMC public health* vol. 14 813. 7 Aug. 2014, doi:10.1186/1471-2458-14-813
- <sup>39</sup> Yun JW et al. "The Korean Influenza National Immunization Program: History and Present Status." *Infection & chemotherapy* vol. 49,4 (2017): 247-254. doi:10.3947/ic.2017.49.4.247
- <sup>40</sup> CDC. International activities report FY 2014-2015 153 WHO South-East Asia region (SEAR).
- <sup>41</sup> Owusu, Jocelynn T et al. "Seasonal influenza vaccine coverage among high-risk populations in Thailand, 2010-2012." *Vaccine* vol. 33,5 (2015): 742-7. doi:10.1016/j.vaccine.2014.10.029
- <sup>42</sup> Australian Government Department of health. Immunisation throughout life, <https://www.health.gov.au/health-topics/immunisation/immunisation-throughout-life>
- <sup>43</sup> Nation, Monica L et al. "Influenza Vaccine Effectiveness Against Influenza-Related Mortality in Australian Hospitalized Patients: A Propensity Score Analysis." *Clinical infectious diseases : an official publication of the Infectious Diseases Society of America* vol. 72,1 (2021): 99-107. doi:10.1093/cid/ciz1238
- <sup>44</sup> Gutiérrez-Robledo LM et al. "Resultados del Primer Consenso Mexicano de Vacunación en el Adulto" [Results of the First Mexican Consensus of Vaccination in the Adult]. *Gaceta medica de Mexico* vol. 153,2 (2017): 190-204.
- <sup>45</sup> Programa de Vacunación en el Adulto y el Anciano, [http://salud.edomex.gob.mx/salud/at\\_vacunacion\\_adultoanciano](http://salud.edomex.gob.mx/salud/at_vacunacion_adultoanciano)
- <sup>46</sup> WHO. WHO SAGE Seasonal Influenza Vaccination Recommendations during the COVID-19 Pandemic, [https://www.who.int/immunization/policy/position\\_papers/Interim\\_SAGE\\_influenza\\_vaccination\\_recommendations.pdf?ua=1](https://www.who.int/immunization/policy/position_papers/Interim_SAGE_influenza_vaccination_recommendations.pdf?ua=1)
- <sup>47</sup> WHO. Influenza, [www.who.int/influenza/vaccines/use/en/](http://www.who.int/influenza/vaccines/use/en/).
- <sup>48</sup> Bernama. Yearly influenza vaccine for high-risk groups recommended. FMT news, 2017. Accessed: <https://www.freemalaysiatoday.com/category/nation/2017/04/25/yearly-influenza-vaccine-for-high-risk-groups-recommended/>.
- <sup>49</sup> DoctorOnCall. Tamiflu 75mg Capsule, <https://www.doctoroncall.com.my/medicine/en/drugs/tamiflu-75mg-capsule>.



## REFERENCES

- <sup>50</sup> Lee KF. Cold or influenza? The Star Malaysia. Accessed: <https://www.pressreader.com/malaysia/the-star-malaysia/20170709/282857960950355>.
- <sup>51</sup> Lim V et al. Clinical Practice Guidelines on Adult Vaccination. Putrajaya: Ministry of Health Malaysia; 2003.
- <sup>52</sup> Ministry of Health Malaysia. Immunization Schedule for the Elderly, <http://www.myhealth.gov.my/en/immunization-schedule-for-the-elderly>
- <sup>53</sup> Moi F and Gergen J. August 2017. "Malaysia Country Brief". Sustainable Immunization Financing in Asia Pacific. Washington, DC: ThinkWell. <https://thinkwell.global/wp-content/uploads/2018/09/Malaysia-Country-Brief-081618.pdf>
- <sup>54</sup> Tang A. "Budget 2021: Tax relief on medical treatment raised, including for parents." The Star, 6 November 2020, <https://www.thestar.com.my/news/nation/2020/11/06/budget-2021-tax-relief-on-medical-treatment-raised-including-for-parents>
- <sup>55</sup> "Tax exemptions for Covid-19 treatment, vaccine — MoF" [Internet]. [cited 2021 Feb 2]. Available from: <https://www.theedgemarkets.com/article/tax-exemptions-covid19-treatment-vaccine-%E2%80%94-mof>
- <sup>56</sup> "RM3Bil On Covid-19 Vaccines, Higher Tax Reliefs For Medical Expenses: Budget 2021." Code Blue, 6 November 2020, <https://codeblue.galencentre.org/2020/11/06/rm3bil-on-covid-19-vaccines-higher-tax-reliefs-for-medical-expenses-budget-2021/>
- <sup>57</sup> Atikah S et al. Influenza vaccination for the elderly and economic evaluation. Ministry of Health Malaysia: Malaysian Health Technology Assessment Section (MaHTAS); 2019.
- <sup>58</sup> Immunise4life website [www.immunise4life.my](http://www.immunise4life.my)
- <sup>59</sup> Hudu SA et al. Influenza vaccination among Malaysian healthcare workers: a survey of coverage and attitudes. The Medical Journal of Malaysia. 2016 Oct;71(5):231-237.
- <sup>60</sup> Rashid, Zetti Zainol et al. "influenza vaccination uptake among healthcare workers at a Malaysian teaching hospital." The Southeast Asian journal of tropical medicine and public health vol. 46,2 (2015): 215-25.
- <sup>61</sup> Coe, M. and Gergen J. "Thailand Country Brief". Sustainable Immunization Financing in Asia Pacific. Washington, DC: ThinkWell. (2017).
- <sup>62</sup> Taiwan Centers for Disease Control. The government-funded influenza vaccination campaign to provide quadrivalent vaccines starting next flu season, <https://www.cdc.gov.tw/En/Bulletin/Detail/Ju0-yxpySVoRIU0g-6abrw?typeid=158>.
- <sup>63</sup> Guerche-Séblain C et al. Comparison of influenza surveillance systems in Australia, China, Malaysia and expert recommendations for influenza control. doi:10.21203/rs.3.rs-360363/v1.
- <sup>64</sup> NHS England. Vaccines for 2019/2020 seasonal flu vaccination programme. 20 November 2018. [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/757784/Vaccines\\_for\\_2019\\_20\\_seasonal\\_flu\\_vaccination\\_programme.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/757784/Vaccines_for_2019_20_seasonal_flu_vaccination_programme.pdf)
- <sup>65</sup> WHO. Recommended composition of influenza virus vaccines for use in the 2021 - 2022 northern hemisphere influenza season. 26 February 2021. [https://www.who.int/influenza/vaccines/virus/recommendations/2021-22\\_north/en/](https://www.who.int/influenza/vaccines/virus/recommendations/2021-22_north/en/)
- <sup>66</sup> The Taskforce for Global Health. "Pandemic Preparedness: Developing and Deploying Vaccines", <https://taskforce.org/pandemic-preparedness-developing-and-deploying-vaccines%E2%80%8B/>
- <sup>67</sup> World Health Organization 2013. "Global epidemiological surveillance standards for influenza", [https://www.who.int/influenza/resources/documents/WHO\\_Epidemiological\\_Influenza\\_Surveillance\\_Standards\\_2014.pdf](https://www.who.int/influenza/resources/documents/WHO_Epidemiological_Influenza_Surveillance_Standards_2014.pdf)