ECONOMIST IMPACT

Unmasking the risk and burden of seasonal influenza in the Middle East

Strengthening prevention and control strategies for a healthier tomorrow

Sponsored by sanofi

Contents

About this report

Unmasking the risk and burden of seasonal influenza in the Middle East: strengthening prevention and control strategies for a healthier tomorrow is an Economist Impact report, supported by Sanofi. The report explores the health and economic burden of seasonal influenza, considerations for at-risk populations, lessons learned from the covid-19 pandemic, and how stakeholders can work together to enhance awareness, prevention and control of influenza in the Middle East.

The findings presented in this report draw on insights gathered from a pragmatic literature review, expert interviews and an advisory panel. We would like to thank the following individuals (listed alphabetically by first name) who served as our advisory panellists for providing key insights and guidance on the direction of our research:

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- **Hiba Jawdat Barqawi**, lecturer, Department of Clinical Sciences, College of Medicine, University of Sharjah, UAE
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The report focuses on seven selected countries in the Middle East region: Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates (UAE) and Turkey. Depending on the source of the data used and for wider regional context, the report also refers in parts to the Middle East and North Africa (MENA) region and WHO Regional Office for the Eastern Mediterranean Region (WHO EMR), which covers 22 countries and territories in West Asia, North Africa, the Horn of Africa and Central Asia.

The Economist Impact research team consisted of **Melanie Noronha**, **Ashish Niraula** and **Clare Roche**, with guidance provided by **Rob Cook**.

The views of the interviewees are their own and do not necessarily reflect those of their affiliated institutions. Although every effort has been taken to verify the accuracy of this information, Economist Impact cannot accept any responsibility or liability for reliance by any person on this report or any of the information, opinions or conclusions set out within. The findings and views expressed in the report do not necessarily reflect the views of the sponsor.

Executive summary

Seasonal influenza is a major cause of morbidity and mortality worldwide. Annually, the respiratory virus infects approximately one billion people, resulting in severe illness in up to five million cases, and is responsible for up to 650,000 deaths.[1] Influenza affects all countries, communities and individuals with those at the extremes of the age spectrum, and those with underlying chronic health conditions, being the most vulnerable to influenza and its resulting complications.

Influenza viruses circulate and evolve continuously, with outbreaks potentially leading to epidemics or pandemics with far-reaching and long-lasting consequences. While the substantial morbidity and mortality due to influenza is well recognised during a pandemic, it is often underestimated in the context of year-round seasonal influenza. As infection and mortality rates due to influenza are difficult to determine precisely, reported data often underrepresent the burden of seasonal influenza and its impact on health systems, society and the economy.

Key findings:

The risk and burden of influenza in the Middle East may be underestimated – Adverse outcomes and mortality due to influenza disproportionately affect adults over the age of 65.[2] A younger population means the region does not currently experience the same pressure on health systems from seasonal influenza as the United States or Europe. However, a high prevalence of chronic diseases, notably diabetes (which affects 73m adults or 16% of the population in the Middle East and North Africa (MENA) region)[2], cardiovascular disease (which affects 10% of the MENA population and is responsible for one-third of deaths)[2], obesity (which affects over 20% of the adult population in many MENA countries)[3] and chronic obstructive pulmonary disease (COPD) (which affects 10.7m people in the MENA region)[4], means that a significant proportion of the population is at increased

risk from influenza and its complications. This data is typically not captured by the current surveillance systems.

The year-round risk of influenza in the region presents a challenge for regional policymakers and public health professionals – While the Middle East region experiences seasonal influenza activity in parallel with the Northern Hemisphere, secondary peaks in the summer are common, driven partly by the annual Hajj and Umrah pilgrimage season in recent years. Geographical proximity and population mobility further lead to the circulation of influenza year-round, thus increasing the risk of outbreaks with epidemic and pandemic potential. The annual Hajj pilgrimage in Saudi Arabia, which welcomes upwards of two million visitors, and the Umrah season, which was performed by over 24m pilgrims in 2022,[5] present a unique challenge, but also an opportunity to strengthen influenza prevention and control capacity.

Influenza imposes a large, and often overlooked, economic burden on healthcare systems, patients and the wider economy – Influenza results in significant direct costs in the form of doctors' visits, hospitalisation and drugs, as well as indirect costs in the form of lost productivity of patients and caregivers; productivity losses account for 88% of the total economic burden of seasonal influenza in adults aged 18 to 64.[6] Data on influenza's annual total economic burden vary according to geography, population demographics and healthcare systems. Available estimates range from US$11.2bn in the United States (with indirect costs estimated to account for US$8bn), US$6.5bn to 15bn in the European Union (EU) and US$270.5m in South Africa.[6]

The covid-19 pandemic had a positive as well as negative impact on societal attitudes towards seasonal influenza – While overall understanding of respiratory illnesses and infectious diseases has increased, complacency towards influenza prevention and control measures is also increasing. Global studies on the impact of the covid-19 pandemic on awareness and attitudes towards influenza report higher levels of uptake and intention to take the influenza vaccine during and following the pandemic. However, some countries have also reported a decline in influenza vaccine uptake. The severity with which covid-19 impacted an individual's health is noted as a driver for the risk perception of seasonal influenza.

The persistent risk of viruses to become endemic or cause a pandemic presents a continuous challenge for surveillance, testing and diagnostic capacities – Health systems faced a "tridemic" of covid-19, Respiratory Syncytial Virus (RSV) and seasonal influenza in the winter of 2022.[7] While the patient outcomes and clinical characteristics of these three viruses differ, the substantial overlap in baseline characteristics and symptoms put pressure on surveillance, testing and diagnostic capacities, making it more difficult to quickly identify circulating viruses, peaks in transmission and to treat patients appropriately.[8]

Scientific and technological breakthroughs throughout the covid-19 pandemic could inform and advance future pandemic and seasonal influenza preparedness and response efforts – Covid-19 is unlikely to be the last pandemic. It's imperative that policymakers, public health authorities and other key stakeholders use lessons learned from this pandemic to launch and sustain efforts to reinforce prevention and control measures for seasonal influenza, and address the weaknesses that inhibited covid-19 control measures. In many countries, core surveillance capacities expanded in response to covid-19 to include open-access electronic data streams, digital mobility data and sewage surveillance. Public health authorities can leverage these developments to boost the surveillance infrastructure for influenza and provide early warning signals of disease outbreaks.

The avian influenza A (H5N1) and Middle East Respiratory Syndrome (MERS-CoV) epidemics were catalysts for rapid improvement in surveillance and laboratory capacity in the region in the past decade – Although there have been remarkable developments in epidemic/pandemic preparedness in the region, there is opportunity for improvement and further advancement. National surveillance systems are primarily passive hospital-based systems. There is a need to expand surveillance to primary care and enhance screening and testing at community health centres and clinics, as well as integrate data from private healthcare facilities to provide a more accurate picture of the burden of influenza at the population level.

There is significant heterogeneity in surveillance capacity and data quality, and reporting frequency across the wider Middle East region – The World Health Organization (WHO) and regional networks, including Eastern Mediterranean Acute Respiratory Infection Surveillance (EMARIS) and the Middle East, Eurasia And Africa Influenza Stakeholders Network (MENA-ISN), have helped to support cross-border collaboration, which has been critical to improving surveillance capabilities and data-sharing. However, the completeness of the data captured locally and nationally varies, with limited capacity in low- and middle-income countries (LMICs) and countries experiencing conflict. There is a shared understanding that weaknesses within any country impact the region as a whole, and governments and public health professionals need to work together to reinforce regional influenza surveillance.

Translating surveillance data to policy and planning needs to be improved across many countries in the Middle East – Influenza policy involves strategy, policies and plans to prevent and control the burden of seasonal influenza, and to prepare for and mitigate the risk and impact of viruses of endemic or pandemic potential. Given the seasonality of influenza in the region, there is a need to quickly detect transmission strains and adjust policy and vaccination recommendations accordingly.

Healthcare systems in the Gulf Cooperation Council (GCC) member states and Turkey need to prepare for larger and older populations – While healthcare infrastructure is sufficient to manage cases and hospitalisations during peaks in seasonal influenza today, significant population growth is expected in all countries over the next few decades. The population aged over 65 years is anticipated to increase by almost 400% by 2050 across the seven study countries. Increased age also raises the risk for multiple chronic diseases, further increasing the risk for complications from influenza and placing additional pressure on health systems.

Social media is fuelling an epidemic of misinformation and disinformation – While social media helps public health organisations disseminate important health information quickly and widely, it also facilitates the spread of unreliable information. Although widespread misinformation is contributing to a global rise in vaccine hesitancy, public health professionals in the Middle East debate that low vaccination uptake in the region is more likely to stem from a lack of awareness of the risk and severity of influenza.

Call to action

A number of common priorities could improve seasonal influenza prevention and control in all countries, as well as prepare health systems, healthcare workers and other key stakeholders to manage and mitigate tomorrow's burden and, in turn, enhance pandemic preparedness.

1. Improve systematic surveillance of seasonal influenza by enhancing, integrating and expanding national and regional surveillance systems.

2. Using covid-19 as a catalyst, position influenza as a public health priority to build stronger multi-sector policies and plans for surveillance, prevention and control of seasonal influenza.

3. Understand the drivers of mis- and disinformation while simultaneously taking action to improve health literacy, and empower populations to find, understand and use evidence-based information.

4. Leverage the trust and knowledge of healthcare workers to advocate for seasonal influenza, and embed prevention and surveillance of seasonal influenza into broader chronic disease management strategies.

5. Engage other sectors to support influenza prevention and control and to facilitate policies and programmes for community engagement and social interventions that could reduce and mitigate the threat of seasonal and pandemic influenza.

1. Understanding the epidemiology of seasonal influenza in the Middle East

Seasonal influenza is an acute respiratory viral infection that is often characterised by a sudden onset of fever, headache, fatigue, cough, sore throat, runny nose, and muscle and joint pain. This form of influenza is prevalent across the world, and while most people recover from the virus within a couple of weeks, it can lead to hospitalisation, critical illness or even death.[9]

The World Health Organization (WHO) estimates that one billion people are infected by seasonal influenza every year, globally. Three to five million of these cases result in severe illness, and 290,000 to 650,000 deaths annually are due to respiratory complications from seasonal influenza.[9] The true burden of seasonal influenza, however, is difficult to capture because not all influenza-related deaths manifest as respiratory complications. Influenza can lead to death in a number of indirect ways, including by exacerbating underlying chronic conditions such as asthma or diabetes, through cardiovascular complications such as stroke and heart attack, and by increasing one's vulnerability to secondary bacterial infections.[10,11]

Infection rates of seasonal influenza are also difficult to determine. The symptoms of influenza vary and look similar to other infections, such as RSV and rhinovirus (the common cold). Many countries only test a fraction of patients with an

"influenza-like illness", meaning that surveillance systems do not provide a complete picture of infection among the general public.[12]

Measuring the burden of influenza is complex due to incomplete and diverse data systems and the unpredictability of the virus.[13] "I believe it's completely underestimated," says Dr Fayssal Farahat, a community and public health consultant at the Infection Prevention and Control Program of Saudi Arabia's Ministry of National Guard Health Affairs. "We [typically] estimate for the burden of flu based on the severely ill patients, hospitalised patients, but we don't have enough data for those with mild cases," he adds. The common case definition of "influenza-like illness" (ILI), which could be attributable to seasonal influenza and a number of other respiratory infections, makes accurately calculating the true burden of influenza a challenge.[14] "Although the burden of influenza is often discussed in the context of historical pandemics and the threat of future pandemics, every year a substantial burden of lower respiratory tract infections (LRTIs), such as pneumonia and other respiratory conditions like chronic obstructive pulmonary disease (COPD) are attributable to seasonal influenza," says Hiba Jawdat Barqawi, a lecturer in the Department of Clinical Sciences at the University of Sharjah's College of Medicine in the United Arab Emirates (UAE).

Reported data underestimate the burden of influenza and its impact on health systems, society and the economy. "It's so hard to make people believe that influenza is a deadly disease. Even when it doesn't cause mortality, it does cause severe functional decline, severe economic impact and severe exacerbations in chronic diseases," says Dr Mine Durusu Tanriover, a professor in the Department of Immunization Policies at Hacettepe University Vaccine Institute, Turkey.

"It's so hard to make people believe that influenza is a deadly disease. Even when it doesn't cause mortality, it does cause severe functional decline, severe economic impact and severe exacerbations in chronic diseases. "

Dr Mine Durusu Tanriover, professor in the Department of Immunization Policies at Hacettepe University Vaccine Institute, Turkey.

BOX1:

Definition and types of influenza viruses.

Influenza viruses belong to a family of RNA viruses called Orthomyxoviridae,[15] and are classified into four types according to their antigenic and biological properties: A, B, C and D – out of which influenza A and influenza B viruses are responsible for seasonal epidemics or flu in humans.[11]

Based on the presentation of hemagglutinin (HA) and the neuraminidase (NA) proteins on the surface of the virus, influenza A viruses are classified into 29 subtypes. While there are no subtypes for the influenza B virus, it is divided into two lineages: B/Yamagata or B/Victoria.[9] There may be a mix of influenza A and B viruses in circulation at any one time.

Figure 1: Types of influenza viruses

Virus	Host	Structure	Disease severity	Epidemic potential	
Influenza A	Humans and a wide range of animals	8 gene segments 10 viral proteins M2 unique	Often severe - can cause significant disease and mortality in all population groups	Pandemic and epidemic potential - antigenic drift and shift	**Subtypes** A(H1NA) A(H3N2)
Influenza B	Humans only	8 gene segments 11 viral proteins M2 unique	Occasionally severe - causes milder disease and mortality in older adults and high risk groups	Outbreaks and occasional epidemics - antigenic drift only	**Lineages** B(Victoria) B(Yamagata)
Influenza C	Humans and pigs (more rare than type A or B)	7 gene segments 9 viral proteins HF unique	Usually mild - can cause mild disease in children	Limited outbreaks - antigenic drift only	
Influenza D	Cattle only				

A
B
A and B cause most seasonal influenza illnesses in humans

Antigenic drift: accumulation of a series of genetic mutations in a virus that can limit the duration of immunity as a virus circulates in a population

Antigenic shift: mixing of genes from influenza viruses from different species that can result in a new influenza subtype

Source: Adapted from the US Centers for Disease Control and Prevention. Types of influenza viruses[11]

1.1 A year-round risk: seasonality of influenza in the Middle East region

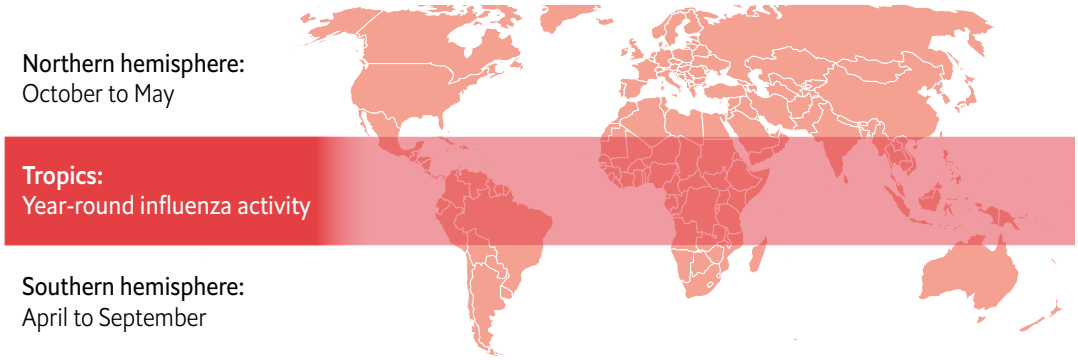
While influenza viruses are in circulation year-round, observable differences exist in seasonal influenza activity and the number of peaks by geography. Influenza activity peaks in the temperate populations of the northern and southern hemispheres during their respective winters. While it is assumed that cooler temperatures, low indoor humidity and reduced solar radiation increase influenza activity, many tropical regions, where humidity and temperatures are consistently high, experience year-round influenza activity (see Figure 2).[16]

A variety of factors, including contact rates, travel, temperature, rainfall and humidity, are presumed to influence influenza activity and account for the seasonal nature of influenza. Stimuli that increase the rate and proximity of human contact, such as schools, travel and crowding, are important drivers of influenza transmission.[16]

Based on the cases reported to the WHO FluNet database, seasonal influenza peaks in the Middle East are parallel to the northern hemisphere (December-March), with influenza activity typically starting in October in the Gulf and late November in the Levant countries.[17] Within the region, there are country-level variations in the primary peak weeks for seasonal influenza – Oman, Qatar, Saudi Arabia and the UAE saw peaks starting in November, December-January in Turkey, while Bahrain reported peaks in July and August.[18]

While the pattern of influenza in the Middle East is generally similar to that of temperate countries, smaller secondary peaks are observable in the summer months.[19] The year-round risk of influenza in the region presents a challenge for surveillance, prevention and vaccination strategies.

Figure 2: Global influenza seasonality



Source: Adapted from: Tamerius J, Nelson MI, Zhou SZ, Viboud C, Miller MA, Alonso WJ. Global influenza seasonality: reconciling patterns across temperate and tropical regions. Environ Health Perspect. 2011;119(4):439-45.

"In our setting, we are seeing influenza throughout the year, with two peaks, a peak that comes in November, and another that comes in around April and May and extends to June," says Dr Faryal Khamis, a senior consultant and head of the Infectious Diseases Department at the Royal Hospital in Oman. Dr Khalid Hamid Elawad, health protection manager at the Primary Health Care Corporation (PHCC) in Qatar, reports a similar situation in his country. "Although there is a particular season during which influenza is more prominent, (in Qatar our peak is from October to March), influenza is actually with us all year around," he explains. While in Bahrain, Dr Adel Salman Al Sayyad, chief of the Disease Control Section at the Ministry of Health, observes that "More cases are diagnosed earlier, in August and even July. So the flu season starts before we have the vaccine. This is one of the main challenges."

The year-round activity of influenza in the Middle East may be attributed to a number of factors, including geographical proximity and population mobility – for instance, a high proportion of expatriates and tourists transit through high-income Gulf countries, refugees are displaced by conflict in a number of low- and middle-income countries, and mass gatherings and events bring together scores of people in close proximity, most notably Hajj and Umrah in Saudi Arabia. "In Saudi Arabia, we are closer to the northern hemisphere. However, we have an influx of pilgrims for Umrah and Hajj from all over the world throughout the season. So we get exposed to the northern hemisphere and the southern hemisphere influenza types," says Dr Hani Abdulaziz Jokhdar, Saudi Arabia's deputy minister for Public Health. "Hajj and Umrah bring many people from all over the world, from different backgrounds, countries and environments. We want to ensure their trip is as safe as possible and prevent the spread of communicable diseases," adds Dr Anas Khan, director general of the Global Center for Mass Gatherings Medicine at the Ministry of Health in Saudi Arabia.

Climate change may also impact the activity and transmission of influenza in the region and beyond over the coming decades. "I think we will also see some kind of impact of the changing seasonality in terms of climate change and the changing seasonality of respiratory diseases," says Dr Durusu Tanriover. While the evidence on the link between climate change and seasonal influenza is mixed and underdeveloped, changing weather variability is expected to extend influenza outbreaks, with a reduction in the size of seasonal peaks.[26] In the long term, ongoing climate and demographic changes may alter the frequency, magnitude and timing of influenza epidemics.[27]

"More cases are diagnosed earlier, in August and even July. So the flu season starts before we have the vaccine. This is one of the main challenges"

Dr Adel Salman Al Sayyad, chief of the Disease Control Section at the Ministry of Health.

BOX 2:

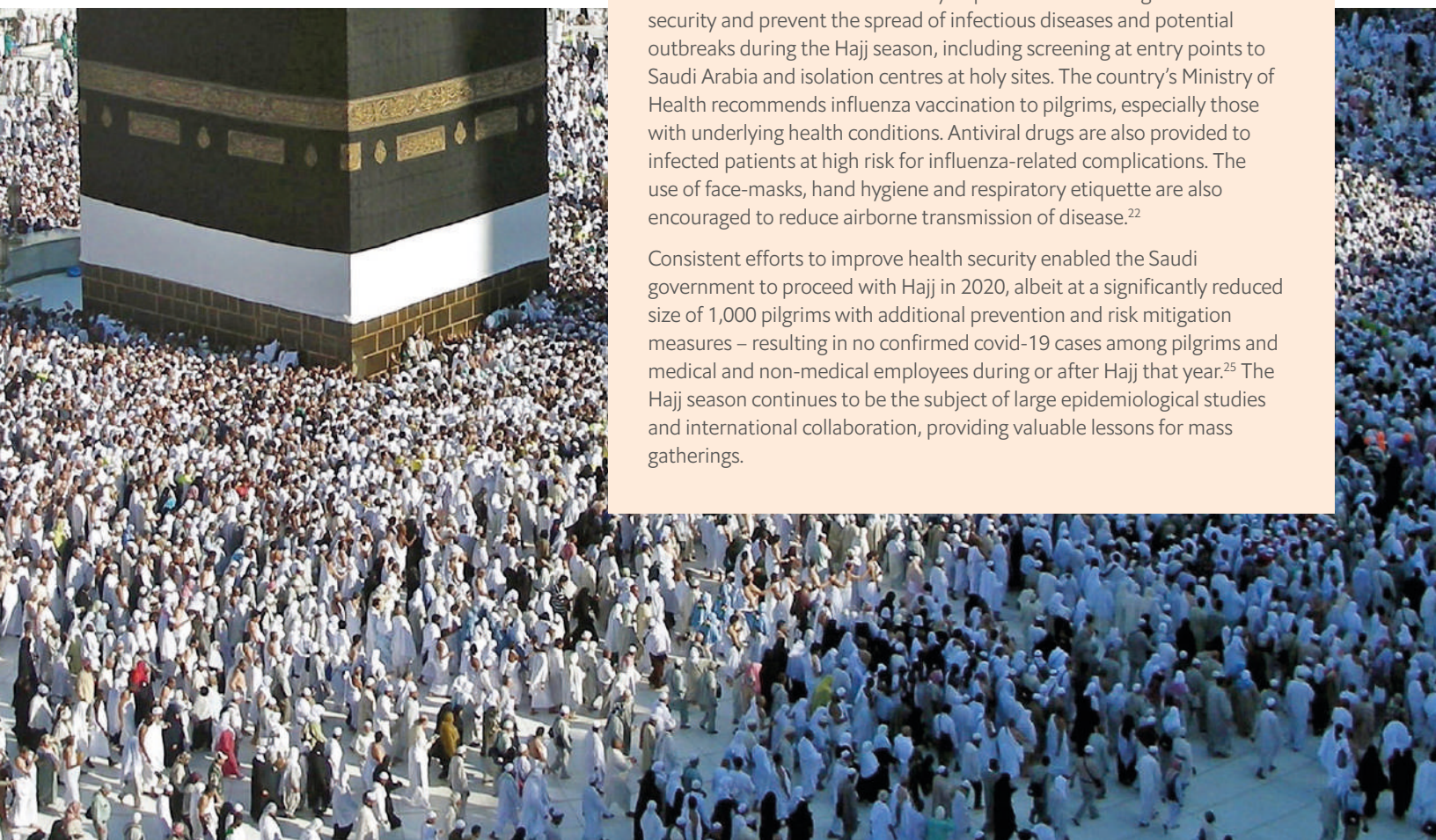
Hajj in Saudi Arabia – annual lessons for infectious disease control

In Saudi Arabia, the 'Hajj', or religious pilgrimage to Mecca, which hosts upwards of two million visitors from 180 countries each year, poses a distinct risk for infectious disease transmission.[20] Extreme heat, crowded accommodations and extended stays at Hajj sites in close proximity stimulate disease transmission and viral respiratory tract infections, including influenza.[21]

Data on annual infection rates of seasonal influenza among Hajj pilgrims range from 6% to 39%, depending on the testing methods and study design.[22] Over one-third of Hajj pilgrims are estimated to suffer respiratory infection symptoms, mainly due to the influenza virus.[23] In fact, respiratory infections are the leading cause of hospitalisation during Hajj, with pneumonia reported as the main reason for admission.[24]

Preparing for and providing health services during Hajj is a significant operation and public health priority for Saudi Arabia's Ministry of Health. The dates of Hajj are dictated by the lunar calendar and shift by ten days every year, presenting a moving target for public health policymakers. Several interventions are routinely implemented to strengthen health security and prevent the spread of infectious diseases and potential outbreaks during the Hajj season, including screening at entry points to Saudi Arabia and isolation centres at holy sites. The country's Ministry of Health recommends influenza vaccination to pilgrims, especially those with underlying health conditions. Antiviral drugs are also provided to infected patients at high risk for influenza-related complications. The use of face-masks, hand hygiene and respiratory etiquette are also encouraged to reduce airborne transmission of disease.[22]

Consistent efforts to improve health security enabled the Saudi government to proceed with Hajj in 2020, albeit at a significantly reduced size of 1,000 pilgrims with additional prevention and risk mitigation measures – resulting in no confirmed covid-19 cases among pilgrims and medical and non-medical employees during or after Hajj that year.[25] The Hajj season continues to be the subject of large epidemiological studies and international collaboration, providing valuable lessons for mass gatherings.



1.2 The influence of demographics on the burden of seasonal influenza

Although influenza could infect anyone, it doesn't affect everyone equally. Adults over the age of 65, children between six months and five years old, individuals with chronic diseases and immunosuppressive conditions, and pregnant women are classified as at-risk groups, meaning they are at greater risk for severe complications when infected with influenza. Healthcare workers are also classified as an at-risk group because they are at higher risk of acquiring the infection and transmitting the virus to vulnerable populations.[9]

Adults aged over 65

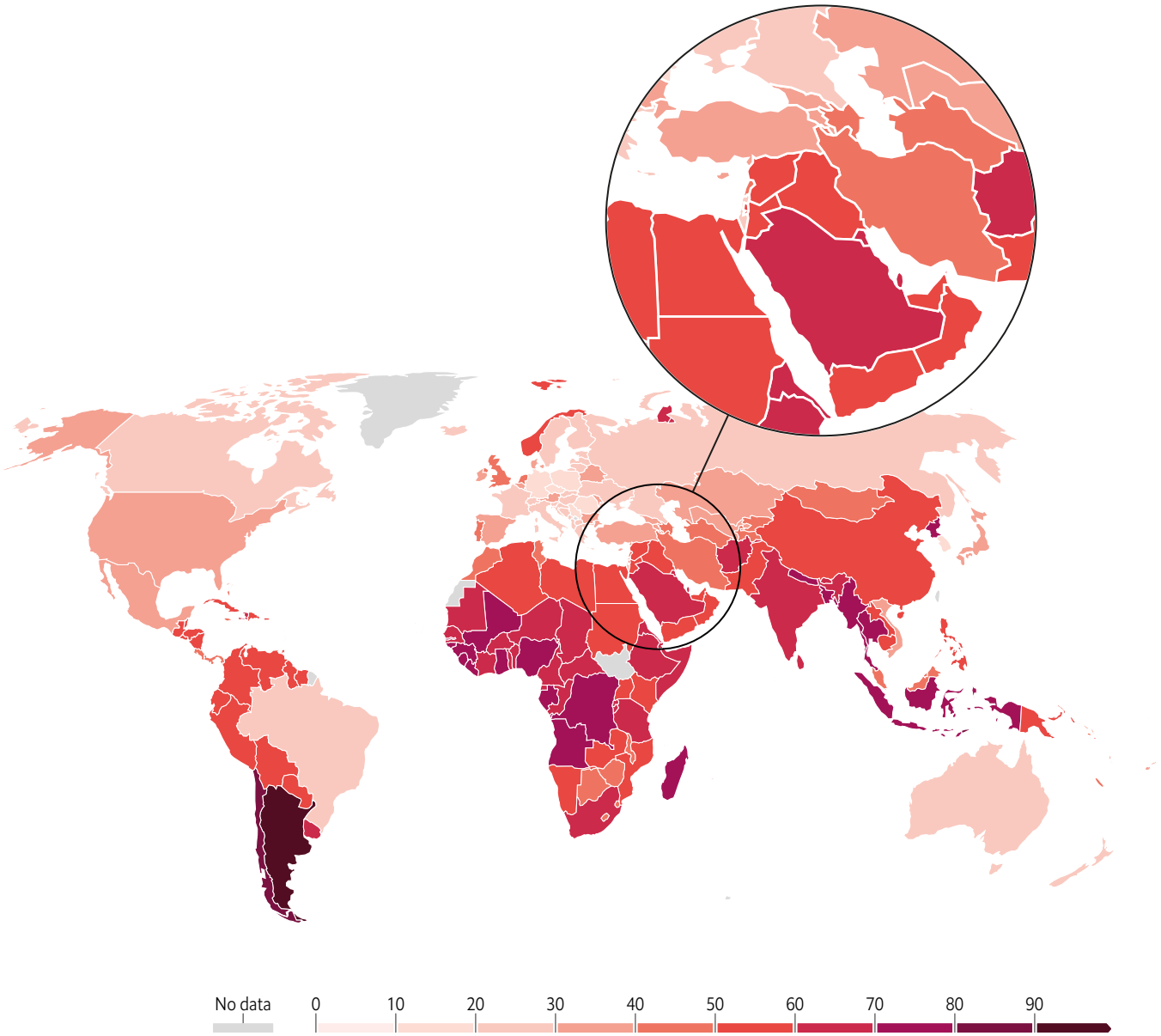
The risk of influenza-related complications and hospitalisation increases with age. Older adults generally have a weaker immune system that is less effective in fighting infections and are more likely to have underlying health conditions such as diabetes and/or respiratory illness. The over-65 population accounts for approximately 90% of influenza-related deaths and 50-70% of hospitalisations.[28] Mortality from influenza among adults aged 60 years is 10 times greater than that among adults aged 20 years.[29] "Although flu is not as much of a concern for us [in Saudi Arabia] as in Europe and North America, because the winter here is not so hard, we are still worried about the elderly population and people with comorbidities, cardiac diseases, respiratory disease and chronic diseases," explains Dr Khan.

With the proportion of the population aged over 65 ranging from 2% in the UAE, 3% in Oman and Saudi Arabia to 8% in Turkey, the region does not experience the same burden and pressure on health systems from seasonal influenza as the United States or Europe, where 17% and 21% of the population, respectively, is over 65 years old. However, the region is on the cusp of a demographic transition that will force health systems to deal with a growing demand for care, which will, in turn, require them to adapt. The population in the Middle East and Turkey is projected to increase from 1.4bn in 2023 to 1.8bn by 2050. Many countries will also experience a shift from a younger to an older population age structure. The older adult population (aged 65 years and older) will increase by over 500% between 2023 and 2050, from over 59m in 2023 to over 305m by 2050.[30] Over the next 10-20 years, the burden of seasonal influenza in the Kingdom of Saudi Arabia could undergo changes due to multiple factors. These include the level of awareness among the general public and healthcare professionals, vaccination rates, age demographics, prevalence of chronic diseases, and healthcare infrastructure," explains Dr Omar Khojah, director of the Vaccine-Preventable Disease Department at the Saudi Public Health Authority and executive secretary of the National Immunization Technical Advisory Group (NITAG), Saudi Arabia.

The region's disproportionally young population may also mask higher-than-average influenza mortality rates. The Global Pandemic Mortality Project, which analysed average seasonal influenza data between 2002 and 2011, estimates that the average annual respiratory mortality from seasonal influenza ranges from 33 per 100,000 people over 65 in Turkey to 58 per 100,000 in the UAE, and 60 per 100,000 in Saudi Arabia. This compares to 31 per 100,000 in the United States and 45 per 100,000 in the United Kingdom.[31]

Figure 3: Respiratory mortality rate from seasonal influenza (annual rate per 100,000 population aged over 65)

Average between 2002 and 2011, excluding the 2009 Swine flu pandemic season

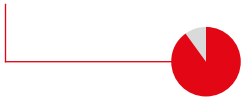


Note: Data include deaths from respiratory complications due to seasonal influenza. Deaths from other complications of influenza, such as cardiovascular disease, are not included.

Source: Global Pandemic Mortality Project II, 2019

Close family dynamics and intergenerational living, which are characteristic of Middle Eastern cultures, may increase exposure to influenza among the older adult population.[32] "We live in families, all different generations in the same household. So the risk here remains the same. Influenza might not affect you, but you have parents and grandparents living with you in the house," says Dr Khamis.

People aged over 65 years account for approximately 50-70% hospitalisations & 90% of influenza-related deaths[28]



Annual seasonal influenza infection rates:

children 20-30% **adults 5-10%**

Young children

While older adults are at greater risk of adverse outcomes and mortality from seasonal influenza, infection rates are highest among children – 20-30% among children as compared with 5-10% among adults annually. Children under the age of five are also at increased risk of complications due to influenza.[33]

In the WHO Eastern Mediterranean Region (EMR), of the over 40,000 cases of severe acute respiratory infections (SARI) reported between 2016 and 2018, more than 50% were observed in children aged five years or below.* A 2022 study in Qatar also observed a decline in the number of cases of influenza A from mid-July, reflecting disruption of the transmission chain coinciding with the summer school break.[34] "It's very clear from the surveillance data. The seasonal influenza epidemic starts in schools. The first cases you see are mainly between the ages of five and 14," says Dr Durusu Tanriover.

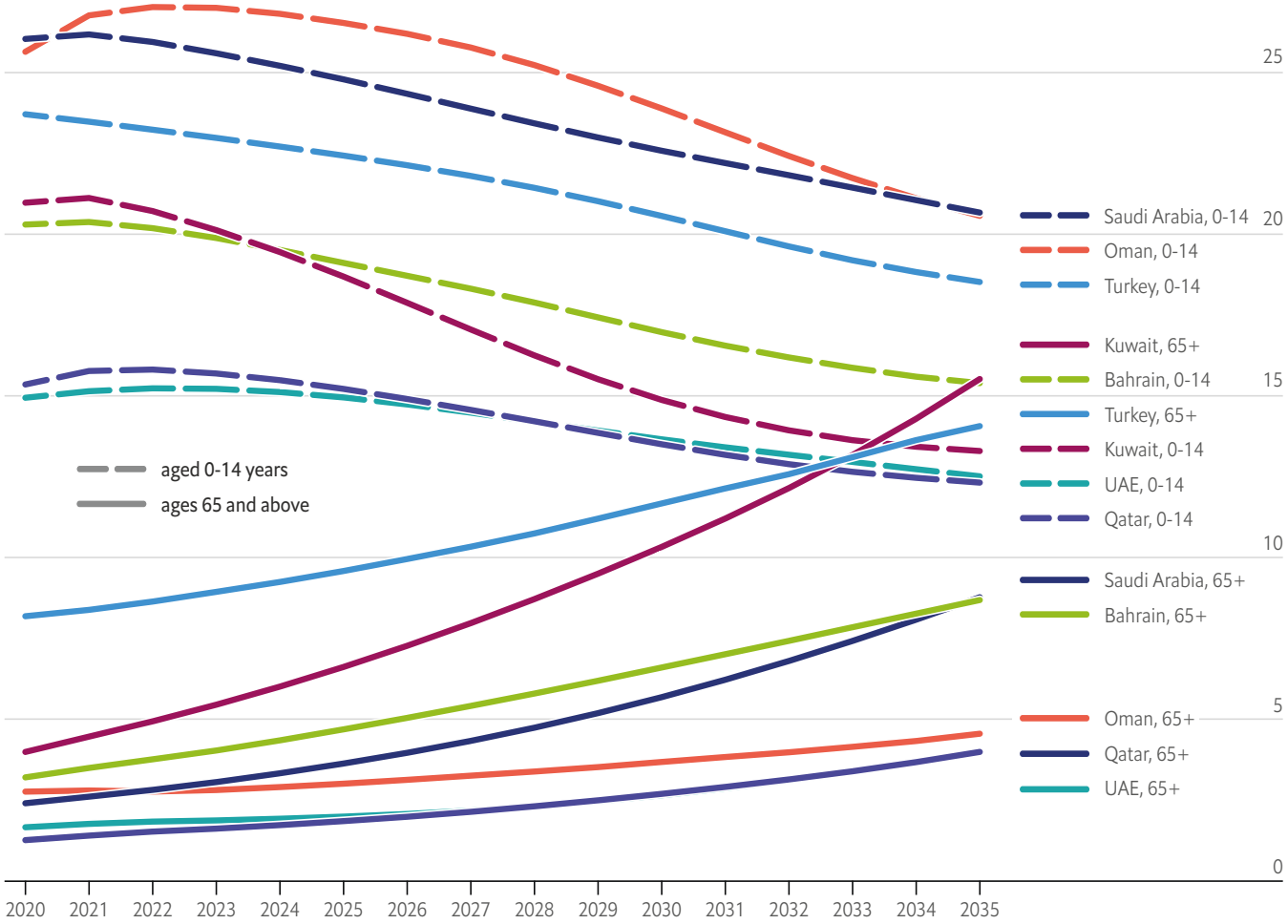
"It's very clear from the surveillance data. The seasonal influenza epidemic starts in schools."

Dr Mine Durusu Tanriover, professor of internal medicine, Faculty of Medicine, Hacettepe University, Turkey.

* The WHO case definition of severe acute respiratory infections (SARI) is anyone with an acute respiratory infection with symptoms within 10 days of presentation, cough, fever and hospitalisation.

Figure 4: Regional demographic shift

Percentage population share of children aged 0-14 years and adults ages 65 and above (out of total population), 2020-2035



Source: World Bank population estimates and projections, 2023

Chronic conditions

People with chronic medical conditions, particularly cardiovascular disease, diabetes, obesity, asthma and other respiratory disorders, represent a significant at-risk population for influenza and its complications. According to the United States' Centers for Disease Control and Prevention (CDC), about nine out of 10 people hospitalised due to influenza have at least one underlying medical condition, with diabetes reported in approximately 30% of adults who are hospitalised.[35,36]

"There are many factors that influence possible complications from influenza. Even though there are fewer elderly people in our population compared to other countries, which usually contributes towards the prevalence of complications of influenza, we do have the chronic disease factor in our region, which could play a role," explains Hiba Barqawi speaking about

the high prevalence of chronic disease in the Middle East. Diabetes and obesity, in particular, are significant risk factors for the region. "This region is riddled with non-communicable diseases (NCDs), specifically diabetes and its attendant consequences of cardiovascular and other morbidities. So there is a huge burden of these comorbidities," reiterates Dr Parvaiz Koul, vice chancellor of Sher-i-Kashmir Institute of Medical Sciences University in India and Vice chairman of the Middle East, Eurasia And North Africa Influenza Stakeholders Network (MENA-ISN).

According to the 2021 Diabetes Atlas by the International Diabetes Federation (IDF), the MENA region has the highest prevalence of diabetes among adults (aged 20-79) in the world, with 73m adults, or 16% of the population, living with diabetes in 2021, projected to reach 135m, that is 19% of the population, by 2045. Turkey, with over 14% of the adult population living with diabetes in 2021, is projected to move into the top 10 countries in the world for the total number of people living with diabetes by 2045.[2] Kuwait, Qatar and Saudi Arabia are all in the top 20 countries for the prevalence of obesity, with over 30% of males and 40% of females with the condition.[3] Cardiovascular disease affects over 10% of the population in the MENA region.[37] According to the World Heart Federation, cardiovascular disease is the leading cause of death in the MENA region, responsible for more than one-third of all deaths, or 1.4m people every year.[38]

COPD, a common lung disease characterised by persistent respiratory symptoms and airflow limitation, is one of the most common causes of mortality and morbidity worldwide and a leading risk factor for influenza-related complications. For people with COPD, a viral respiratory infection like seasonal influenza can exacerbate breathing difficulties and lead to life-threatening complications, including an increased risk of stroke, pneumonia and respiratory failure.[4] Patients with COPD need to be closely monitored following an influenza infection, thereby increasing hospital utilisation and healthcare costs.[39] There is an estimated 10.7m sufferers of COPD in the MENA region, according to 2019 Global Burden of Disease (GBD) data, with an age-standardised prevalence rate of 233 per 10,000 population, with the highest prevalence in Turkey and the UAE at 328 and 292 per 10,000 population, respectively.[39]

The exacerbation of the symptoms of comorbid conditions by an influenza infection is a challenge for health systems, as well as for estimating the true burden of seasonal influenza. As Dr Durusu Tanriover explains, "When a diabetes patient contracts the flu, they can develop severe pneumonia, but at the same time, they can come up with very high levels of blood glucose, which may require intravenous treatments. So that patient may require hospitalisation, if not from the flu, from the acute exacerbations or complications of the underlying chronic diseases. Surveillance systems are far from measuring these kinds of flu impacts."

Table 1: Prevalence of chronic diseases in the GCC member states and Turkey, %

Country	Diabetes	Obesity	Cardiovascular disease (CVD)	COPD*	Asthma
	Adult population, latest available year [2]	Adult population, latest available year [3]	Total population, age-standardised, 2019 [40]	Total population, age-standardised, 2019 [40]	Total population, age-standardised, 2019 [40]
Bahrain	11.3	36.9	7.7	2.1	3.8
Kuwait	24.9	43.8	8.4	1.1	4.4
Oman	13.8	30.7	8.5	1.3	4.2
Qatar	19.5	41.4	7.6	1.8	3.7
Saudi Arabia	18.7	20.2	8.3	2.1	2.8
Turkey	14.5	20.2	6.6	3.4	5.3
UAE	16.4	27.8	8.9	3.1	7.5
Global	9.8	14.0	7.0	2.8	3.5

Sources: source reference numbers listed within table.

*Chronic obstructive pulmonary disease

1.3 The economic burden of seasonal influenza

Influenza imposes a large, and often overlooked, economic burden on healthcare systems, patients and the wider economy. "When talking of the burden of influenza, we are not just talking about the health burden, we're talking of the economic burden, we're talking of the socioeconomic burden," says Dr Koul.

The economic burden of seasonal influenza stems from both direct and indirect costs. Direct costs include doctors' visits, hospitalisation and drugs, as well as non-medical expenses such as transportation and food.[41] Hospitalisation is estimated to account for 75% of the direct costs related to seasonal influenza. Indirect costs refer to the value of lost productivity due to absenteeism, presenteeism, reduced working time or the inability to perform at full capacity due to an influenza infection or caregiving for someone with it. The indirect costs or productivity losses account for 88% of the total economic burden of seasonal influenza in adults aged 18 to 64.[6] Influenza-related costs also increase with age and underlying medical conditions. The estimated cost of influenza-associated hospitalisations is 2.5 times higher among at-risk populations.[6]

"There is a significant economic burden of influenza in countries in the Middle East given the fact that they have a backdrop of a very high prevalence of comorbid conditions like diabetes."

Dr Parvaiz Koul, vice chancellor, Sher-i-Kashmir Institute of Medical Sciences University, India; vice chairman, MENA-ISN.

Data on the annual total economic burden of influenza on the healthcare system and society vary according to geography, population demographics, healthcare models and methodological differences. Available estimates range from US$11.2bn in the United States, with indirect costs estimated to account for US$8bn, US$6.5bn-15bn in the European Union (EU), and US$270.5m in South Africa, 44% of which was attributed to indirect costs and 15% to out-of-pocket payments.[42,43,44] Estimated hospitalisation costs per influenza patient also vary significantly, from over US$500 in Thailand and Hong Kong to approximately US$3,000 in Turkey, and over US$4,000 in Spain and France.[44]

Similar to data on the health and mortality burden of seasonal influenza, available estimates of the economic impact often omit complications in patients with comorbid conditions. There is limited data on the economic impact of seasonal influenza in the Middle East. More accurate data on population-level infection rates and the complications due to comorbid conditions are needed to understand the real impact of seasonal influenza on the economy and society. "There is a significant economic burden of influenza in countries in the Middle East given the fact that they have a backdrop of a very high prevalence of comorbid conditions like diabetes," says Dr Koul. Accurate data on the economic burden of influenza would also help support evidence-based policy decisions when allocating resources and evaluating influenza prevention/control interventions.

2. Impact of covid-19 on seasonal influenza

2.1 Impact of covid-19 on the transmission of seasonal influenza

Globally, there was a steep decline in seasonal influenza virus transmission during the covid-19 pandemic, with as much as a 99% reduction in detected cases compared with previous years in some places.[45] "During covid-19, influenza was basically suppressed in Turkey and elsewhere," says Dr Murat Akova, professor of medicine in the Infectious Diseases Department of Hacettepe University's School of Medicine in Turkey. Dr Farida Ismail Al Hosany, executive director of the Communicable Diseases Sector of the Abu Dhabi Public Health Center (ADPHC) and official spokesperson for the healthcare sector in the UAE, adds that in the UAE, "hospitalisations went down between 2020 and 2022".

The rapid decline of influenza was associated with the non-medical preventative interventions and behavioural changes introduced during the covid-19 pandemic. Social distancing, mask-wearing, hygiene measures, and restrictions in travel and movement were major drivers of the reduction in influenza infections between 2020 and 2021.[45,46] However, testing and surveillance may have also been disrupted during the pandemic. "Covid-19 may also have interrupted sentinel surveillance," says Dr Akova. "The number of samples sent for testing was also less, meaning the number of cases reported may have been less," adds Dr Al Hosany.

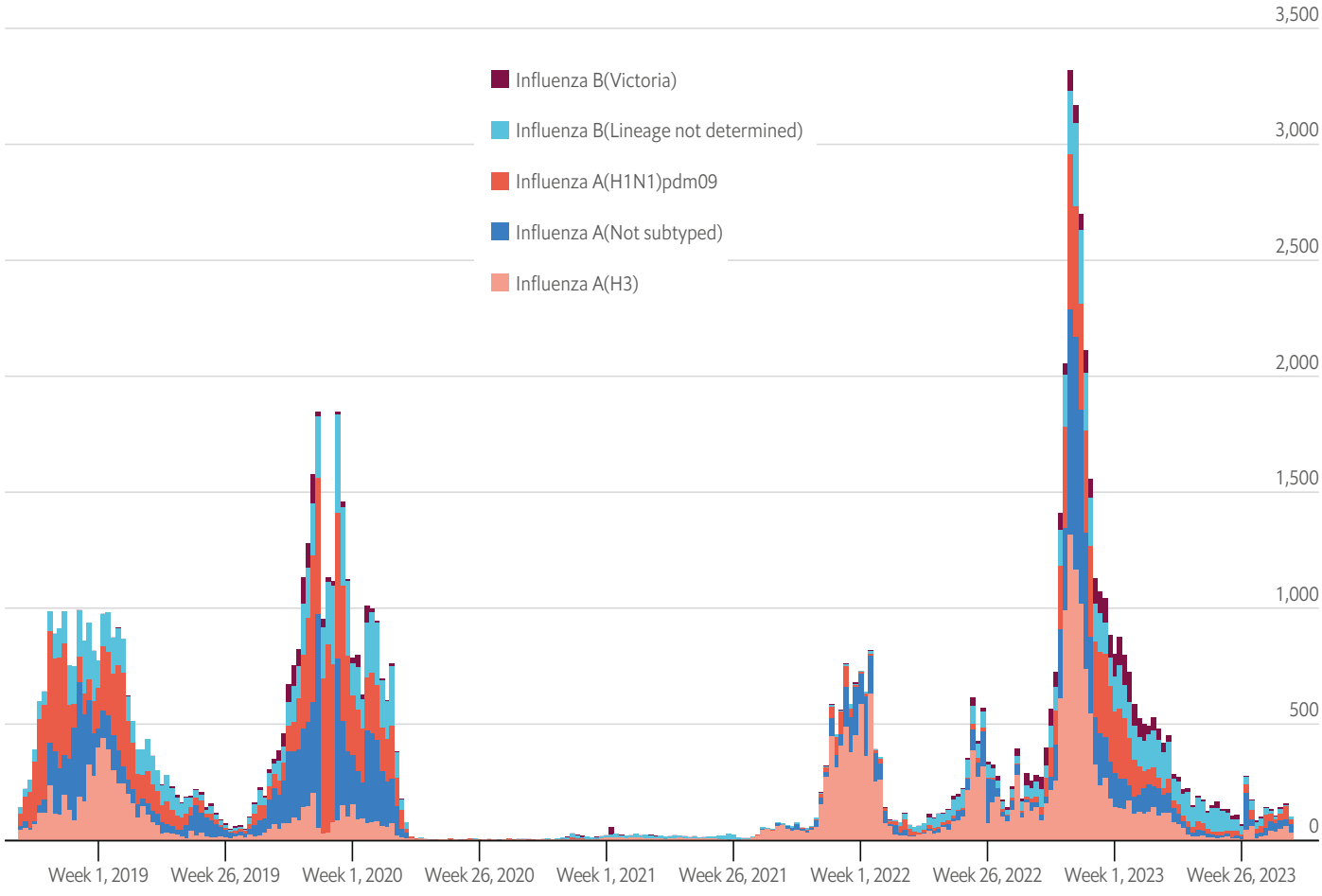
The lack of exposure to seasonal influenza throughout the pandemic may have also left people's immune systems more vulnerable to infections than usual.[47] "After the pandemic, we started to see a surge in upper respiratory tract infections, including very high rates of influenza. And this is not unique to Oman, but worldwide," says Dr Khamis. The pandemic also disrupted the seasonality of the influenza virus. In the Gulf Cooperation Council (GCC) countries, where the influenza season typically starts in October, countries saw a surge in cases during the summer in the 2021, which dropped in autumn. "The timing was different due to the pandemic," explains Dr Nawal Al Kaabi, chair of the SEHA Infectious diseases and Infection Control Council and the National Covid-19 Clinical Management Committee in the UAE, adding that the severity of influenza also varied. "We also had an increase in different respiratory illnesses around the same time – RSV, rhinoviruses and all other respiratory illnesses."

"After the pandemic, we started to see a surge in upper respiratory tract infections, including very high rates of influenza. And this is not unique to Oman, but worldwide," says Dr Faryal Khamis, senior consultant and head, Infectious Diseases Department, The Royal Hospital, Oman.

Health systems faced a "tridemic" of covid-19, RSV and seasonal influenza in the winter of 2022, leading to an influenza epidemic being declared in Europe.[7] RSV cases surged in young children who hadn't been previously exposed to the virus due to covid-19 restrictions; at the same time, seasonal influenza cases dramatically increased and cases of covid-19 picked up again following reduced transmission during the summer months.[48] While the patient outcomes and clinical characteristics of these three viruses differ, with covid-19 associated with more severe complications as compared with other respiratory viruses, the substantial overlap in baseline characteristics and symptoms put pressure on surveillance, testing and diagnostic capacities, making it difficult to quickly identify circulating viruses, peaks in transmission and to treat patients appropriately.[8]

Figure 5: Number of positive specimens in WHO Eastern Mediterranean Region by influenza virus subtypes/lineages

Data from week 37, 2018 to week 36, 2023



Note: The following influenza strains have not been included as the number of positive specimens is too small to be legible within the graph: Influenza A(H1); Influenza A(H5); Influenza B(Yamagata)

Source: World Bank population estimates and projections, 2023

2.2 Impact of covid-19 on attitudes and awareness towards influenza

The covid-19 pandemic had a positive as well as negative impact on societal attitudes towards seasonal influenza. While overall understanding of respiratory illness and infectious diseases has increased, complacency and outright resistance towards influenza prevention and control measures are also rising.

Global studies on the impact of the covid-19 pandemic on the public's awareness of, and attitudes to, influenza report higher levels of influenza vaccine uptake during and following the pandemic. In Australia, demand for the influenza vaccine increased in 2020, with 18m doses administered that year as compared with 11m in 2018. Another study in the United Kingdom found that over 50% of the eligible population who had not taken the influenza vaccination in previous years reported that they intended to receive the vaccination in 2021.[49] A study in Turkey reported positive changes in vaccination behaviour and general awareness of seasonal influenza during the covid-19 pandemic with 84% reporting that the pandemic had increased their intention to vaccinate.[50] Another global study looking at the spillover effects of covid-19 on influenza and other vaccine-preventable diseases reported an increase in the perception of the risk and danger of influenza during the pandemic.[51]

Individual experiences of the covid-19 pandemic have also shaped perceptions towards influenza. While the public health prevention measures, such as social distancing and mask-wearing during covid-19, contributed to a sharp reduction in influenza infection rates, it may also have led to people's underestimation of the severity of influenza. Dr Jokhdar explains that, in Saudi Arabia, they are seeing increasing complacency towards vaccination from people who used to get the vaccine year-on-year, but did not experience adverse health impacts from covid-19. Conversely, those who were sick or lost someone due to covid-19 are keen to take the vaccine. "We have seen the two sides of the coin. We've seen people refusing the vaccination, and we've seen people running to take the vaccination, and they take it more seriously now," he explains. "Awareness of influenza among the general public and healthcare workers was very high because of their experience with the pandemic," adds Dr Salah Al Awaidy, communicable disease surveillance and control advisor at Oman's Ministry of Health.

Other countries, including Canada, Japan and Singapore, reported a fall in influenza vaccination rates in 2020-2021, suggesting a lower perceived risk of influenza infection, which may be due to the perceived protection of public health measures.[52] Dr Ismail Balik, professor and Head of Infectious Diseases Department at Ankara University, explains that in Turkey "after the covid-19 pandemic, we saw [more] evidence of infectious diseases. However, we saw a rise in vaccine hesitancy as well, especially due to misinformation circulated on social media." There are also concerns that complacency towards influenza prevention and control is setting in, among both policymakers and the public. "Despite the fact that covid-19 did influence our awareness towards influenza and the vaccine that prevents influenza, the effects seem to have worn off, not only with the general public and the healthcare providers, but also among policy planners," says Dr Koul.

"After the covid-19 pandemic, we saw [more] evidence of infectious diseases. However, we saw a rise in vaccine hesitancy as well, especially due to misinformation circulated on social media. "

Dr Ismail Balik, professor and Head of Infectious Diseases Department at Ankara University, Turkey.

The covid-19 pandemic has also impacted attitudes among healthcare workers towards seasonal influenza, with the uptake of vaccination linked to concerns and a sense of responsibility to protect themselves, their families, patients and colleagues, and fear of co-infections with covid-19.[53] "Covid-19 has helped a lot in healthcare worker education. During the pandemic, healthcare workers were repurposed to work with respiratory illnesses. Getting them exposed to that practice greatly helped enhance their knowledge," says Dr Jokhdar.

2.3 Applying lessons from covid-19 to seasonal influenza

Covid-19 will not be our last pandemic. It is imperative that policymakers, public health authorities and other key stakeholders use the lessons learned from this pandemic to launch and sustain efforts to reinforce prevention and control measures for seasonal influenza, as well as address the weaknesses that inhibited the covid-19 response. "Covid-19 exposed our health systems. It told us that our surveillance is not good enough, our prevention and control measures are not good enough, and it also told us that we are not prepared for this kind of an outbreak," says Dr Koul. "Awareness flattens as time passes. So, now that covid-19 is over, everybody forgets what happened. And then until the next health problem, the concern is somewhat less as compared to the covid era," adds Dr Akova.

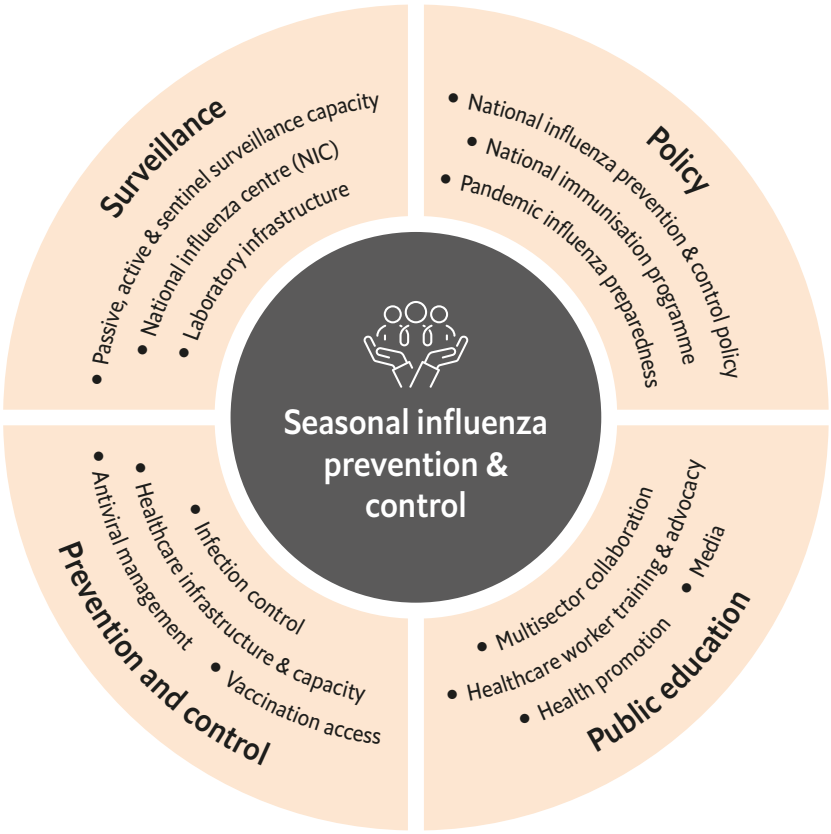
The scientific and technological breakthroughs brought about by the covid-19 pandemic could inform and advance future pandemic and seasonal influenza preparedness and response efforts. In many countries, core surveillance capacities have expanded to include open-access electronic data streams, digital mobility data that track the movement of populations, and sewage surveillance. "During the covid-19 pandemic, Qatar published statistics on intensive care unit (ICU) admissions, mortality rates, number of positive infections, etc., which helped to keep the public as informed as possible regarding the dangers of the disease. For influenza, however, we do not release the same amount of information to the community and therefore the public is not as aware of the impact of the disease, or its severity," says Dr Elawad. Public health authorities could leverage these developments to enhance the surveillance infrastructure for influenza and provide early warning signals of disease outbreaks.[54]

In terms of lessons learned from non-pharmaceutical prevention and control measures, such as face-masks, social distancing and lockdowns, while these interventions may be useful to explore in the context of seasonal influenza, especially given the drastic decline in infection during covid-19, evidence of efficacy is limited as many of these measures cannot be appropriately studied through randomised controlled trials (RCTs).[54]

Advances in vaccine research and development, supply chain infrastructure, and globally coordinated data-sharing should also be preserved.

3. A framework for action on seasonal influenza in the Middle East

Figure 6: Pillars of seasonal influenza prevention and control



Source: Economist Impact

Following our analysis, which deployed a mixed-methods approach by engaging regional influenza experts and in-depth systematic analysis, our team developed an evidence-based conceptual framework that illustrates different influential factors for the prevention and control of seasonal influenza (see Figure 6).

Given the complexity and challenging nature of controlling seasonal influenza and the enduring risk of endemic and pandemic influenza outbreaks epidemics, collaboration between policymakers, health professionals, and non-health sectors is crucial to optimise the effectiveness of prevention and control strategies.

In the rest of this report, we will investigate each pillar of seasonal influenza prevention and control in greater detail and offer insights on what countries need to prioritise and enhance to prepare for and mitigate the risk of influenza transmission and reduce influenza-related morbidity and mortality.

3.1 Surveillance

BOX 3:

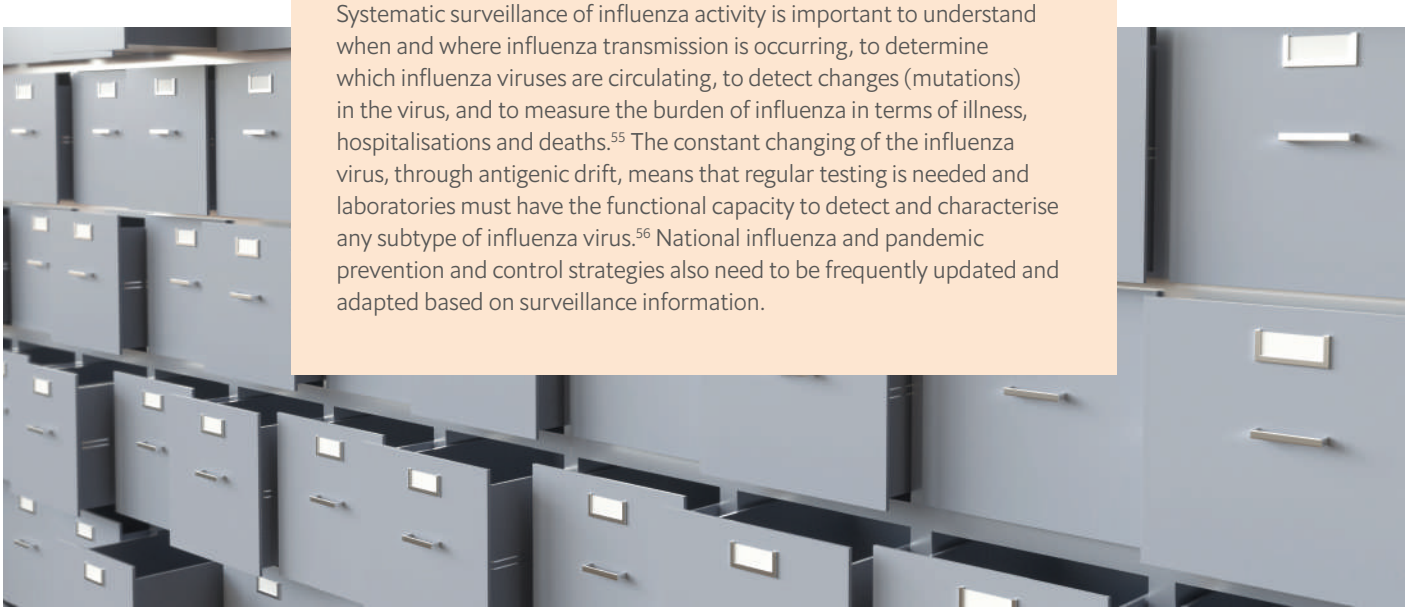
Role, function and types of influenza surveillance

Influenza surveillance is the collection, compilation and analysis of information on influenza activity in a country, region or specific population group over a defined period of time.[55] Surveillance is a key function of monitoring seasonal influenza, pandemic preparedness planning and International Health Regulation (IHR) compliance.

Influenza surveillance is conducted through passive, active and sentinel surveillance methods.[55]

- ***Passive surveillance*** is the routine collection of data from fixed sites, such as outpatient wards and hospitals.
- ***Active surveillance*** is the monitoring of cases reported to health authorities, usually through hospitals or the community.
- ***Sentinel surveillance*** is the collection of more detailed information and samples through a network of purpose-built reporting sites. Sentinel surveillance can supplement existing passive systems with more detailed information.

Systematic surveillance of influenza activity is important to understand when and where influenza transmission is occurring, to determine which influenza viruses are circulating, to detect changes (mutations) in the virus, and to measure the burden of influenza in terms of illness, hospitalisations and deaths.[55] The constant changing of the influenza virus, through antigenic drift, means that regular testing is needed and laboratories must have the functional capacity to detect and characterise any subtype of influenza virus.[56] National influenza and pandemic prevention and control strategies also need to be frequently updated and adapted based on surveillance information.



Surveillance capacity and infrastructure varies across the Middle East

The importance of having the capacity and infrastructure for surveillance of, and response to, influenza and other respiratory diseases in the region cannot be overemphasised. "Unless you have the surveillance systems, you are simply grasping in the dark. You don't know what you are actually looking at," says Dr Koul.

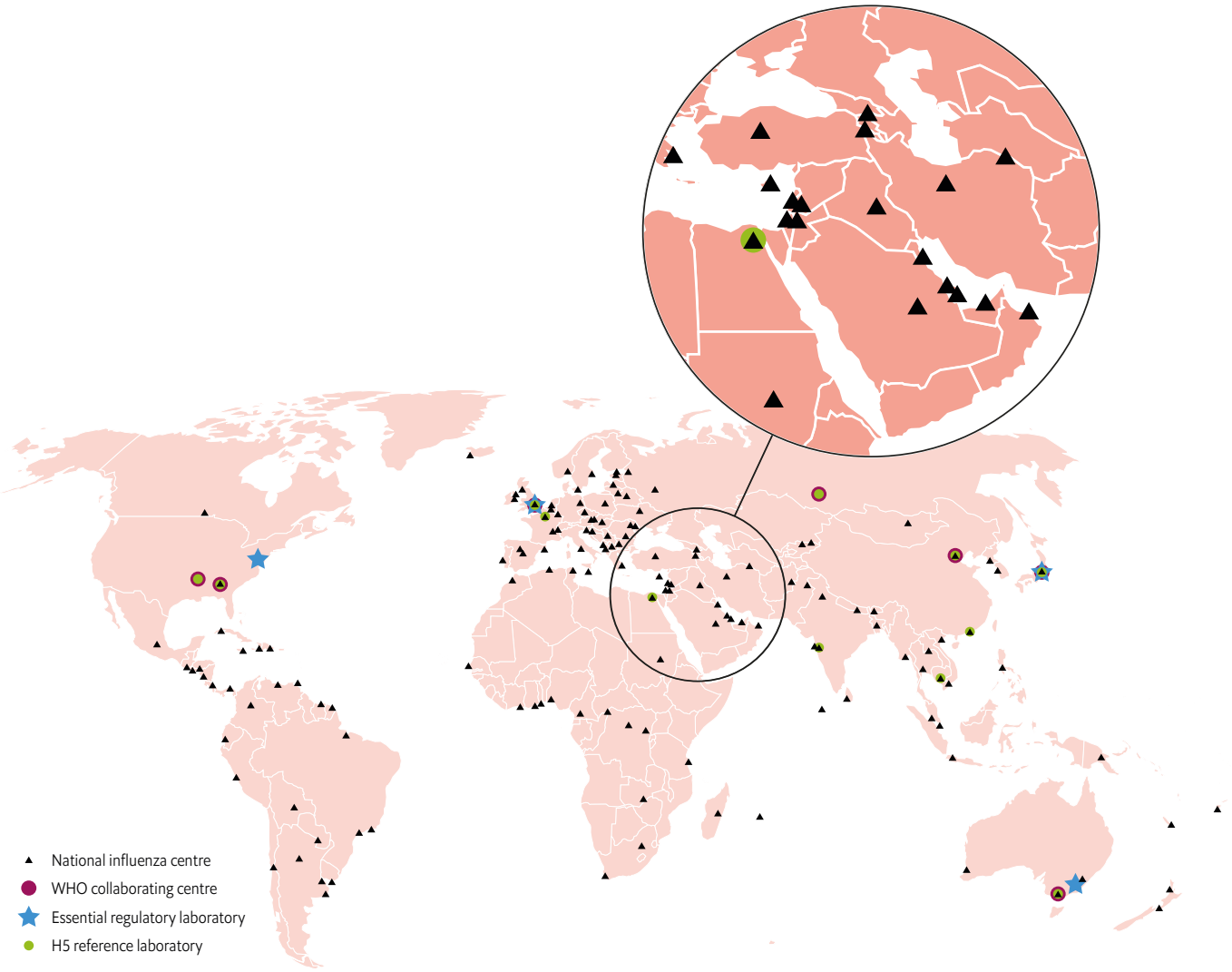
"Unless you have the surveillance systems, you simply are grasping in the dark. You don't know what you are actually looking at."

Dr Parvaiz Koul, Vice Chairman, MENA-ISN.

Prior to the covid-19 pandemic, the WHO EMR reported the highest number of human infections with avian influenza A (H5N1). The region also experienced Middle East Respiratory Syndrome (MERS-CoV), a respiratory pathogen capable of causing a global health emergency that was first identified in Saudi Arabia in 2012. Both H5N1 and MERS-CoV have been catalysts for rapid improvement in surveillance and laboratory capacity in the region over the past decade.[56] The number of sentinel sites for influenza surveillance increased substantially, from 36 in 10 countries in 2011 to 132 sites in 19 countries by 2019.[48] These developments also contributed to managing the covid-19 pandemic more effectively. "When covid-19 emerged, there was already an established system for surveillance and for risk assessment and risk communications for respiratory disease in Saudi Arabia. In terms of infection prevention and control in hospitals, the teams were already trained," explains Dr Mutaz Mohammed, a consultant in preventive medicine and public health in Saudi Arabia's Ministry of Health. "We have an efficient surveillance system in Turkey. There are around 80 sentinel and non-sentinel systems in place. Rapid progress was made especially after the 2009 influenza pandemic," adds Dr Balik about the surveillance capacity in Turkey.

As of January 2023, 17 out of 21 countries in the WHO EMR, including all the GCC countries, have a functional influenza sentinel surveillance system and report influenza data to FluNet, a web-based influenza repository, and/or EMFLU, a regional platform for sharing epidemiological and virological data on influenza. 16 of the countries in the EMR , including each of the GCC countries, have a National Influenza Centre (NIC).[57]

Figure 7: WHO Global Influenza Surveillance and Response System (GISRS)
July 12th 2023



Source: WHO, Global Influenza Surveillance and Response System (GISRS), 2023, www.who.int/initiatives/global-influenza-surveillance-and-response-system

Regional collaboration

There is a shared understanding that weaknesses within any country impact the region as a whole, and governments and public health professionals need to work together on infectious disease management. Collaboration across the region has been largely led by the WHO Regional Office for the Eastern Mediterranean (WHO EMRO), and has improved in recent years and been enhanced by the establishment of local and regional networks, including Gulf Center for Disease Prevention and Control (Gulf-CDC), MENA-ISN, a regional partnership for sharing evidence-based information, experience and best practices, and EMARIS, which collects and reports data on severe respiratory infections. "There is already an ongoing collaboration between Gulf countries. We have established the Gulf-CDC, which has been working on developing a common platform to share information. The regional WHO office is also doing a lot in terms of encouraging countries to share experiences" explains Dr Al Awaidy. According to Dr Farahat, the availability of the Health Electronic Surveillance Network (HESN) and the National Vaccination Registry (NVR) in Saudi Arabia would improve the understanding of both the disease burden and vaccine coverage. The establishment of the Public Health Authority of Saudi Arabia and the Gulf-CDC brings "huge opportunity for expanding surveillance programs and sharing experiences," he explains.

"The most crucial component of surveillance would be analysis. We need data from the whole region to be shared regularly and consistently in real-time. But we don't have that system in place yet. "

Dr Nawal Al Kaabi, chair, SEHA Infectious diseases and Infection Control Council/ National Covid-19 Clinical Management Committee, UAE.

Although most of the countries in the region now have some form of influenza surveillance in place, they still face multiple challenges in introducing or expanding surveillance, prevention and control programmes. "The most crucial component of surveillance would be analysis. We need data from the whole region to be shared regularly and consistently in real-time. But we don't have that system in place yet," says Dr Al Kaabi. "Not many countries in the region are sharing data regularly and publicly," adds Dr Al Awaidy. "This is something we need to acknowledge and push countries in the region to share their data as much as possible, particularly during the influenza season," he reiterates. Many countries lack accurate data on the disease burden of seasonal influenza, and hospitalisation rates and length of hospital stay due to influenza, especially among high-risk groups.[56] Despite systems and infrastructure in place, there is a considerable variability in data quality and case reporting standards. Kuwait has not reported data to WHO FluNet since February 2021, and Bahrain has reported only until week 52 of the year 2022.[58]

National surveillance systems are largely passive, hospital-based systems, with some countries having primary care-based surveillance as well. There is a need to further expand primary care-based surveillance and enhance screening and testing at the community level. This sentiment is echoed by many experts in the region. "We do have good surveillance when it comes to the hospital setting but not so much at the community level," says Hiba Barqawi. "Even though we have hospital- and lab-based surveillance systems, and influenza is a notifiable disease, the completeness of the data is not that great even amongst the sentinel sites," adds Dr Hamad Bastaki, head of the Communicable Disease Control Division in Kuwait's Ministry of Health. "Overall, what is the epidemiology of influenza? What is the vaccination rate? These kinds of data remain unavailable. So this is one of the challenges that we are really facing. The other thing is the surveillance system is quite variable within the region and across countries," adds Dr Khamis. "One of the issues with surveillance data is its dependency on the notification of cases," explains Dr Al Sayyad, adding that "the major gap is that we are not reporting all of the cases identified or diagnosed. Another issue is with testing not being a common practice. So we have a gap in diagnosis at first, reporting, doing the test, and of course later on, there is a gap in collating all the data in the central centre. All of these gaps need to be addressed."

The heterogeneity in assessment criteria and data collection across the region also makes surveillance comparisons difficult. Implementation of regional standardisation would allow for direct data comparisons and help in understanding the impact of influenza in the region.[51] According to Dr Al Awaidy, "The Middle East has a huge variation in terms of surveillance capacities between countries. And even within countries, we need to distinguish between the private and public sectors. Some countries have a highly involved private sector, while others do not."

Opportunity for integrating Electronic Health Records (EHRs) and genome sequencing

Improving data collection and the integration of systems used during covid-19, such as Electronic Health Records (EHRs), could provide valuable information on transmission and help mitigate the impact of seasonal influenza. GCC member states and Turkey are also building on the learnings from covid-19 and expanding measures adopted during the period, including integration of EHRs and genome sequencing. Speaking on the experience in Kuwait, Dr Bastaki says, "In terms of surveillance, we expanded the usage of every data source available, including EHRs and hospital records. These sources have traditionally been under-utilised prior to covid." Dr Bastaki adds that "EHRs have been pivotal to accurately monitoring trends, and I'd say more so than the traditional surveillance methods we have used." "[In Saudi Arabia] We are making sure that our EHRs and health information systems (HIS) are well integrated so that we are able to see early patterns of diseases at the national level," says Dr Khan.

In the UAE, Dr Al Hosany points towards the extension and expansion of genetic testing as a part of surveillance. "Incorporation of genetic testing as part of our surveillance is one of the unique areas that we invested in, and it is currently operational. We are trying to work with various academic institutions to encourage research in influenza, using all the different information available," she explains.

The advancement of genome sequencing capabilities in the UAE during covid-19 enabled the country to contribute to the global understanding of mutations in the virus.[59] "During covid-19, we did a lot of gene sequencing. And I think we should use these capabilities to learn more about influenza. I think the gene sequence will give us more information that we can share with the world," says Dr Al Kaabi.

"Incorporation of genetic testing as part of our surveillance is one of the unique areas that we invested in, and it is currently operational. We are trying to work with various academic institutions to encourage research in influenza, using all the different information available. "

Dr Farida Ismail Al Hosany, executive director, Communicable Diseases Sector, Abu Dhabi Public Health Center (ADPHC), UAE.

3.2 Policy

Influenza policy involves strategy, guidelines and plans to prevent, reduce and control the burden of seasonal influenza, and to prepare for, mitigate and minimise the risk of zoonotic influenza and the impact of pandemic influenza. The WHO Global Influenza Strategy 2019-2030 provides a framework for countries to tailor national programmes for influenza surveillance, prevention and control to approach the disease holistically so that they can strengthen capacity for seasonal prevention and control while simultaneously preparing for future pandemics.[60] Similar to surveillance capacity, the policy environment for influenza has also improved following the 2009 H5N1 and 2012 MERS-CoV outbreaks. According to Dr Jokhdar, "[In Saudi Arabia] infection control has improved a lot since 2009 and it improved further in 2013 or '14 when we had the MERS [outbreak] in Saudi Arabia and again during the covid-19 pandemic."

The availability and scope of the strategies, policies, plans and guidelines for influenza prevention and control vary across the region. In many countries, influenza prevention and control is included in the broader infectious diseases policy, while some countries have

"[In Saudi Arabia] infection control has improved a lot since 2009 and it improved further in 2013 or '14 when we had the MERS [outbreak] in Saudi Arabia and again during the covid-19 pandemic. "

Dr Hani Abdulaziz Jokhdar, deputy minister for Public Health, Ministry of Health, Saudi Arabia.

influenza plans for specific situations, such as guidelines for diagnosis, treatment, infection control and isolation in healthcare settings. The Ministry of Health in Saudi Arabia published the "Infection Prevention and Control Guidelines for Seasonal Influenza in Healthcare Setting" in 2018, which outlines procedures for surveillance, testing, diagnosis and management of patients with influenza in a healthcare setting, including the treatment of patients in high-risk groups.[61] Although Bahrain does not have any specific plan or strategy for influenza, its "Guideline for Communicable Diseases Surveillance & Control", published in 2022, lays out protocols and processes for identifying and reporting SARI, including influenza cases.[62] Turkey has a pandemic influenza preparation plan developed in 2019, which outlines approaches to risk management, and the duties and responsibilities of different institutions across the spectrum of care.[76]

Table 2: An assessment of policies and programmes for prevention and control of seasonal influenza in the GCC member states and Turkey

Country	National influenza prevention and control policy	National immunisation programme	Pandemic influenza prevention and preparedness
Bahrain	The Guideline for Communicable Diseases Surveillance & Control, published in 2022, includes requirements for reporting and notification of seasonal influenza[62]	The "Expanded Programme on Immunization", recommends seasonal influenza vaccine in every season to at-risk population groups.[63]	According to a 2017 Joint External Evaluation (JEE) mission report, Bahrain has a national public health emergency response plan and contingency plans for Ebola, MERS-CoV, epidemic influenza, polio and measles that have been developed and tested.[64] The Guideline for Communicable Diseases Surveillance & Control, 2022, also includes procedures for the prevention and control of diseases of endemic and pandemic potential.[62] A case study published by the WHO on Bahrain's response to the covid-19 pandemic recognises developments in pandemic preparedness and capacity building prior to the pandemic.[65]
Kuwait	The Infection Control Directorate at the Ministry of Health has published guidelines for infection control within healthcare settings and guidelines for isolation and prevention of transmission of infectious agents in healthcare settings, both of which include influenza.[66,67]	Kuwait's national immunisation schedule recommends seasonal influenza vaccination for healthcare workers, and adults and children from high-risk groups.[68]	According to a 2018 JEE mission report, Kuwait has a national Pandemic Influenza Preparedness Plan (PIP), and the facilities and conditions to manage pandemics and epidemics are in place as part of requirements under the IHR.[69]
Oman	The Manual on Communicable Diseases, 2017, published by the Ministry of Health, outlines surveillance, laboratory investigation protocols, and prevention and control strategies for influenza A, seasonal influenza and influenza-like illness.[70] The Ministry of Health has also published the Infection Prevention and Control Guidelines for Triage of Infectious Diseases, 2020, which outlines protocols for health institutions in screening and early containment and management of influenza and other infectious diseases.[71]	Seasonal influenza vaccination is included in the national "Expanded Programme on Immunization" schedule, targeting four of the Strategic Advisory Group of Experts (SAGE) recommended groups – pregnant women, older adults, health workers, and people with chronic conditions – in addition to Hajj travellers.[72]	According to a 2017 JEE mission report, Oman has a plan for pandemic influenza preparedness, as well as strong public health capacities for detection, preparedness and response to communicable disease and diseases of epidemic and pandemic potential. Health emergencies are also included under the Manual on Communicable Diseases.[70]
Qatar	The Public Health Strategy of Qatar, 2017-2022, includes influenza.[73]	Annual seasonal influenza vaccination campaign led by The Ministry of Public Health, Hamad Medical Corporation (HMC) and PHCC (Primary Health Care Corporation).[74] The vaccination is free for all residents of Qatar. [75]	The Qatar National Preparedness and Response Plan for Communicable Diseases, 2019, includes capacity-building and readiness to manage potential outbreaks and pandemics (plan not publicly available).[76] The Public Health Strategy of Qatar, 2017-2022, outlines strategies for emergency preparedness communication protocols, training and drills.[73]

Country	National influenza prevention and control policy	National immunisation programme	Pandemic influenza prevention and preparedness
Saudi Arabia	The Infection Prevention and Control Guidelines for Seasonal Influenza in Healthcare Setting, published by the Ministry of Health in 2017, outlines procedures for surveillance, testing, diagnosis and management of patients with influenza in a healthcare setting, including the treatment of patients in high-risk groups.[61]	The National Immunization Schedule recommends annual influenza vaccination for all individuals, over six months old.[77] Vaccination is provided free-of-charge at Ministry of Health clinics, and private health insurance plans are required to cover vaccination.[78]	The Ministry of Health in Saudi Arabia published The National Plan for Preventing Flu Pandemics in 2009, which outlines strategies pertaining to surveillance, diagnosis, treatment and control of flu pandemics.[79]
UAE	The Ministry of Health and Prevention's National Plan for prevention and Control of Acute Severe Respiratory Infections, 2015, outlines procedures for testing, vaccination and antiviral treatment. [80] ADPHC issues an annual circular to all health facilities in the Emirate, namely, the Prevention and Control of Influenza Infection in the Community, which covers annual vaccination procedures, surveillance and reporting and adherence to infection control guidelines.[81] Dubai Health Authority issued a Seasonal Influenza Factsheet and Technical Guide, 2022, to all public and private health facilities in the Emirate of Dubai, which covers guidelines for prevention and treatment.[82]	In Abu Dhabi, seasonal influenza vaccination is provided free to UAE nationals and individuals at high risk through healthcare facilities under the Abu Dhabi Health Services Company (SEHA) and Mubadala Health, as well as some approved private healthcare facilities and pharmacies.[83,84] The Dubai Health Authority offers free flu vaccination to UAE nationals, Dubai residents who are aged 65 and above, children below the age of five, pregnant women and people of determination.[85]	The UAE has a national public health emergency response plan that addresses planning for multiple communicable diseases with pandemic potential. The National Response Framework (NRF), issued in 2013 by the National Emergency Crisis and Disasters Management Authority (NCEMA), includes planning for emergencies and crisis.[86]
Turkey	The Pandemic Influenza Preparedness Plan, 2019, which is a public health legislation and infection control measures related to seasonal influenza, outlines surveillance, reporting and precautionary measures for seasonal influenza and influenza of endemic/ pandemic potential.[87]	Seasonal influenza vaccinations are funded by the state for individuals 65 years and above and for those in certain at-risk groups (people with diabetes, chronic lung disease and heart diseases).[88]	The Pandemic Influenza Preparedness Plan, 2019, includes strategies for the surveillance, diagnosis, treatment and control of pandemic influenza.[88] The plan also outlines the roles and responsibilities of health and non-health stakeholders including media, finance, education, defence, transport and workplaces during a pandemic or health emergency.

Source: Economist Impact analysis

National immunization programmes

All GCC states and Turkey prioritise high-risk groups in their national immunisation programmes. For instance, Qatar's Public Health Strategy[73] refers to vaccination, treatment and care focusing on high-risk groups. Similarly, the Manual on Communicable Diseases published by the Ministry of Health in Oman[70] mentions high-risk groups and provisions for influenza vaccines for healthcare workers, Hajj/Umrah pilgrims, and other high-risk groups, such as the elderly (aged 65 years and above) and anyone with a serious long-term health condition since 2005, with pregnant women added in 2015. While Saudi Arabia's national immunisation schedule[77] recommends influenza vaccination for all individuals over 6 months of age, there is growing recognition of the higher risk of severe outcomes among adults over 65 years old and the inevitable growth of this population group in the country. According to Dr Khojah, executive secretary of the National Immunization Technical Advisory Group (NITAG), "for individuals over 65 years of age, considering their higher risk for severe influenza outcomes compared with young, healthy adults, we recently recommend high-dose influenza vaccines, if available, to provide better immunity in this age group."

"Although we have surveillance and we have preparedness at the Ministry of Health level, I think we are not so ready to translate all this information into policymaking. We cannot translate the surveillance data to vaccination policies. I think this is the weakest link in our system."

Dr Mine Durusu Tanriover, professor of internal medicine, Faculty of Medicine, Hacettepe University, Turkey.

Although vaccination policies do not guarantee equitable access or ensure vaccination coverage, they are critical to establishing a coordinated influenza vaccination programme, which can reduce morbidity and mortality associated with seasonal influenza, especially in high-risk groups. Established programmes can also provide a good foundation for pandemic preparedness and response.[89] While all countries in the study recommend and cover vaccination for high-risk groups, data on vaccination uptake among these groups and implementation in clinical settings is lacking.

Surveillance data also contributes to the understanding of the ongoing risk of new influenza viruses that could potentially cause a pandemic. Therefore, surveillance data must also feed into maintaining national programmes, policies and plans for pandemic preparedness. Translating surveillance data to policy recommendations needs to be improved across many countries. "Although we have surveillance and we have preparedness at the Ministry of Health level, I think we are not so ready to translate all this information into policymaking. We cannot translate the surveillance data to vaccination policies. I think this is the weakest link in our system," explains Dr Durusu Tanriover.

Pandemic preparedness

Influenza pandemics, whether mild, moderate or severe, affect a large proportion of the population and require a multi-sectoral response over several months or even years.[60] For this reason, countries develop plans describing their strategies for responding to a pandemic, supported by operational plans at the national and sub-national levels.[88] While each of the countries in this study had a pandemic response plan or strategy before the covid-19 pandemic, the pandemic served as a stark reminder of the persistent threat and devastating health and economic impact of infectious diseases. "We know within the field of public health or the field of communicable disease that influenza is one of the potential diseases that can be pandemic again," says Dr Al Sayyad.

"We know within the field of public health that influenza is one of the potential diseases that can be pandemic again."

Dr Adel Salman Al Sayyad, chief, Disease Control Section, Ministry of Health, Bahrain.

As Dr Durusu Tanriover explains, robust preparation for pandemic scenarios could potentially reinforce preparation for, and response to, seasonal influenza. "If you are ready for a pandemic, you are ready for the impacts of seasonal influenza. If you just tackle the issue from the worst scenario, then you may be readily prepared for the seasonal waves of influenza because you will have a prioritisation policy, you will have an infection control policy, you will have an antiviral treatment policy."

At the World Health Assembly in May 2023, the WHO called on countries to expedite reforms to prepare for the next pandemic, highlighting community engagement, health equity, and the protection of vulnerable and marginalised populations as key focus areas, as well as enhanced processes for the sharing of data and genome sequences of emerging viruses.[90,91] "There is continuous work and effort to [better] understand the burden of influenza and do regular risk assessments about the possibility of having a new emerging pandemic for influenza at a global level and at a local level," says Dr Al Hosany.

3.3 Prevention and treatment

Prevention and treatment measures broadly fall under pharmacological and non-pharmacological measures. Non-pharmacological measures such as hand hygiene, respiratory etiquette, and the wearing of face-masks are recommended for respiratory illnesses and pandemic influenza cases.[92] Pharmacological methods for prevention and control of influenza include immunisation and treatment with antiviral drugs for high-risk patients.[1]

Non-pharmacological prevention and control measures

While there was limited information on infection control interventions in the literature from the Middle East region, there are some examples from the experts interviewed on measures that have been expanded following the covid-19 pandemic.

In the UAE and Oman, mask mandates have been maintained in healthcare settings. "In the UAE, we have kept mask wearing in the healthcare setting, and we are trying to maintain the culture of mask wearing in these settings," says Dr Al Hosany. "In Oman, until now, no one is allowed into our hospitals or primary health care facilities without wearing a mask," adds Dr Al Awaidy.

Pharmacological measures

The WHO recommends annual influenza vaccination for the following at-risk groups: pregnant women, children aged between six months and five years, elderly individuals (aged 65 years and above), individuals with chronic medical conditions and healthcare workers. Influenza vaccination provides protection among healthy adults, even when the vaccines do not exactly match the circulating viruses. However, among the at-risk groups, influenza vaccination may be less effective in preventing illness, but can considerably reduce the severity of disease and the incidence of complications and deaths.[9]

Countries in the Middle East are at different stages of implementation of influenza vaccination programmes. Priorities vary across countries ranging from vaccine availability, reduction of vaccine hesitancy to enhancing coverage for high-risk groups. A review of the use of seasonal influenza vaccines in the EMR showed that 17 of the 22 countries were using some form of seasonal influenza vaccine in 2020, as compared with only 12 countries in 2011.[56] While all GCC countries and Turkey have an immunisation programme covering free seasonal influenza vaccination for high-risk groups, and for the whole population over six months old in Saudi Arabia

(see Table 2), information on vaccination coverage in these countries is limited, making it difficult to assess the efficacy of these programmes.[93] "We can say that there is limited data on the implementation of existing vaccination programmes. It indicates that these countries have vaccination programmes, but the practicality and implementation is an issue," says Dr Khamis. "Another challenge is in monitoring and evaluation of these programmes, specifically in monitoring vaccination coverage among high-risk groups," says Dr Al Awaidy.

"Another challenge is in monitoring and evaluation of these programmes, specifically in monitoring vaccination coverage among high-risk groups."

Dr Salah Al Awaidy, communicable disease surveillance and control advisor, Ministry of Health, Oman.

Among healthcare workers in the UAE, it is estimated that under 25% are vaccinated, despite recommendations from national health authorities.[94] In Turkey, the influenza vaccination rate is estimated at around 7% among the over-65 population, as compared with an average coverage rate of 75% among that age group in Europe .[95]

Ongoing influenza surveillance and updates to the vaccine are required every year and throughout the annual influenza season. Due to the high frequency of influenza virus mutations, the protective effect of the vaccine is estimated to range from 37% in the northern hemisphere to 54% in the southern hemisphere.[96] A number of countries in the region, including Saudi Arabia, Oman and the UAE, administer both northern and southern influenza vaccines to protect against year-round transmission and account for variables such as the Hajj season.[89]

Expanding vaccination sites beyond hospitals and health clinics and utilising community pharmacists have helped to increase vaccination coverage rates in the United Kingdom and Portugal. "It would reduce the pressure on primary healthcare centres if we could encourage community pharmacists to educate the public about vaccines and also to actually administer these vaccines," explains Hiba Barqawi. There may also be an opportunity for countries to leverage lessons learned from the covid-19 adult vaccination programmes to improve seasonal influenza vaccine uptake.[97]

According to recommendations from a MENA-ISN situation report published in 2018, countries should primarily focus on increasing vaccination coverage among high-risk groups, with prioritisation among high-risk group categories driven by the demographics and prevailing disease burden in the individual country, as well as health system capacity and financial resources. The recommendations also advocated for working with relevant medical associations to increase awareness of seasonal influenza and vaccination among these high-risk groups.[98]

In terms of treatment protocols for individuals with influenza, for those who are not from a high-risk group, the virus can be managed with symptomatic treatment, and symptomatic individuals are further advised to stay at home to reduce the risk of infecting others. High-risk population groups and patients with severe or progressive illness associated with an influenza infection, such as clinical syndromes of pneumonia, sepsis or exacerbation of chronic underlying conditions, should be treated with antiviral drugs.[9]

Health system capacity and preparedness

Influenza results in significant pressure on healthcare systems with higher volumes of hospitalised patients during the influenza season, increasing the use of inpatient critical

care beds and causing Emergency Department (ED) backlogs. Between 29,000 and 46,000 influenza-related hospitalisations are reported annually in the United Kingdom.[99] While healthcare infrastructure in the GCC is sufficiently prepared for peaks in seasonal influenza today, demographic changes over the next two decades as populations grow and age will result in greater pressures on healthcare capacity, particularly in the context of an already high burden of NCDs.[30] "We don't face the surge of cases, and we don't have a shortage of ICU beds like many countries," says Dr Khan on the impact of the influenza season on the healthcare system in Saudi Arabia, while also acknowledging that with changing population demographics and increased mobility during the Hajj season, having a strong health system is not necessarily a safeguard against an infectious disease outbreak. Dr Khan adds that since covid-19, the country has improved reporting on bed capacity at the national level. "While it depends on the situation, most regions are at least reporting two or three times a day on the bed census, the capacity and the occupancy. This allows for early interventions and early response for each threshold."

In the wider Middle East, limited resources, political instability and regional conflicts have left populations and health systems more vulnerable to influenza outbreaks. As Dr Al Kaabi explains, "The GCC is very well prepared for any pandemic. We handled the most difficult one, we can handle seasonal influenza. But there are countries in the Middle East that will need support to be able to manage, especially if they are facing a large number of challenges." Dr Al Awaidy agrees, adding that "When you talk about impact, it mainly relates to hospitalisations. The GCC countries are in good shape in terms of coping with the burden of seasonal flu. But in the Middle East, there's a huge variation. Some of the low-income countries are far from what we are talking about now. They have tons of other priorities."

"It would reduce the pressure on primary healthcare centres if we could encourage community pharmacists to educate the public about vaccines and also to actually administer these vaccines."

Hiba Jawdat Barqawi, lecturer, Department of Clinical Sciences, College of Medicine, University of Sharjah, UAE.

"The GCC is very well prepared for any pandemic. We handled the most difficult one, we can handle seasonal influenza. But there are countries in the Middle East that will need support to be able to manage, especially if they are facing a large number of challenges."

Dr Nawal Al Kaabi, chair, SEHA Infectious Diseases and Infection Control Council, National Covid-19 Clinical Management Committee , United Arab Emirates (UAE).

3.4 Public education

"National seasonal campaigns should underscore the significance of influenza vaccination and highlight other preventive measures to educate and raise awareness among the general population."

Dr Omar Khojah, director, Vaccine-Preventable Disease Department, Public Health Authority, executive secretary, National Immunization Technical Advisory Group (NITAG), Saudi Arabia.

Effective communication strategies are important to engage policymakers and communities in influenza prevention and control efforts. Risk communication and public education, including community engagement and social mobilisation, are core capacities and essential components of an effective response to health threats such as pandemics and seasonal influenza.[100] Educational interventions can have a positive association with the efficiency of influenza prevention programmes and improve awareness of preventive behaviours. Public education interventions range from rolling out short educational campaigns to patients in hospitals to incorporating information strategies pertaining to seasonal influenza prevention in schools, hospitals and other public settings.[101] "National seasonal campaigns should underscore the significance of influenza vaccination and highlight other preventive measures to educate and raise awareness among the general population. Effective dissemination of information can be achieved through collaboration with pertinent stakeholders, healthcare providers, community leaders, and the media," explains Dr Khojah.

According to a 2019 report by MENA-ISN, social mobilisation and advocacy campaigns are in place in almost all member countries. In the majority of countries, social mobilisation consists of health education campaigns promoted through national media or press conferences. The Ministry of Health in Bahrain has a web portal with updated information about seasonal influenza, vaccines and their role, and other non-vaccine prevention and control measures.[102] Similarly, the government of Qatar has a dedicated web portal for seasonal influenza, which has information on signs and symptoms, vaccination and other preventative measures.[103] Hamad Medical Corporation (HMC) and Primary Health Care Corporation (PHCC) are the principal public healthcare providers in Qatar. Both organisations use social media to share information about seasonal influenza and other diseases.[104] "In Qatar, we have numerous strategies to help deliver reliable and accurate information to the public via multimedia campaigns and national annual awareness campaigns. This year is the 9th Annual influenza vaccination Campaign, whereby PHCC is working

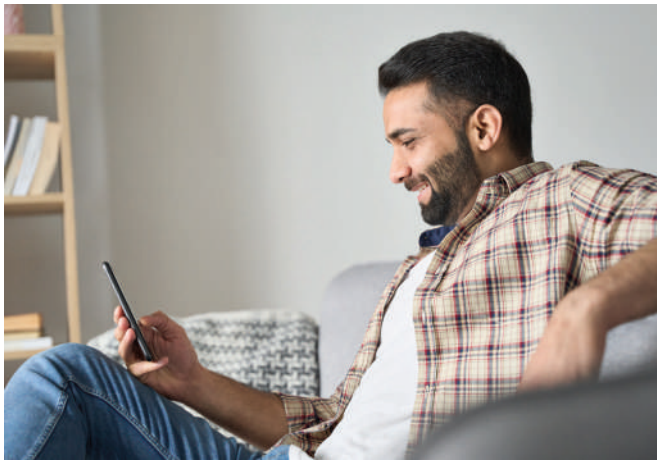
alongside HMC under the Ministry of Public Health. The world is far more connected now and so we utilise many different platforms such as the TV, radio and social media to help engage as many members of the community as possible," says Dr Elawad. Saudi Arabia, Turkey and Kuwait have similar communication and awareness campaigns. In Saudi Arabia, "a lot of good work has been done in terms of surveillance, access to the flu vaccine and awareness activities among the community during the influenza season. Campaigns and educational messages are delivered through social media platforms, and there is also the Ministry of Health hotline center, 937, so people can call at any time and get information from the specialists who are available," says Dr Farahat.

Social media is fuelling an epidemic of mis- and disinformation

Social media is quickly becoming an unstoppable communication tool and the primary source of health information for many people. Social media also facilitates the rapid spread of mis- and disinformation. "One of the most difficult challenges we faced during the pandemic was the misinformation and disinformation. Pushing the right information with scientific evidence is a very important requirement to protect the world from further hassle or danger from new viruses," says Dr Jokhdar.

"One of the most difficult challenges we faced during the pandemic was the misinformation and disinformation. Pushing the right information with scientific evidence is a very important requirement to protect the world from further hassle or danger from new viruses. "

Dr Hani Abdulaziz Jokhdar, deputy minister for Public Health, Ministry of Health, Saudi Arabia.



Misinformation, the sharing of false or inaccurate information, usually unintentionally, and disinformation, the sharing of false or misrepresented information with the intention to mislead or deceive, are growing challenges for the public health community.[105] Amongst the top YouTube videos related to covid-19, 27.5% contained non-factual or inaccurate information and had millions of views.[106] Another study from the United States analysing Twitter mentions of flu and influenza found that while healthcare professionals were active in sharing positive messages about preventive measures and vaccination early in the influenza season, during the peak season, there was a surge in tweets and engagement around distrust of medical professionals, science and governments.[107]

While vaccine hesitancy is growing globally,[108] public health professionals in the Middle East suspect that low vaccination uptake in the region is more likely to stem from a lack of awareness of the risk and severity of influenza rather than a mistrust of the healthcare system. "With regards to awareness compared to hesitancy, I think both play a huge part. Low awareness adds to vaccine hesitancy. Specifically, the low perception of severity, and this is something that needs to be addressed. Another factor is the low perception of the effectiveness of vaccines," cautions Dr Bastaki.

Elevating the role of healthcare professionals

The role of healthcare professionals is critical not only to disrupt the chain of misinformation, but also to shape the perception of the severity of seasonal influenza among the public. Healthcare workers are at the forefront of tackling misinformation on seasonal influenza. "I think the critical issue is to inform, educate and update physicians, particularly primary care physicians, family physicians and general practitioners (GPs) who are actually seeing the public regularly," says Dr Akova. Dr Al Kaabi stresses the responsibility of the healthcare sector and authorities in making other sectors aware of issues related to seasonal influenza, similar to the integral strategic role played by the healthcare sector during the covid-19 pandemic.

"A reminder or follow-up system for healthcare providers may be beneficial, especially for high-risk patients, including the elderly, diabetes patients, those who are immunocompromised, cancer patients and other key groups."

Eman Abu-Gharbieh, professor, Department of Clinical Sciences at the University of Sharjah's College of Medicine, UAE.

Self-reported seasonal influenza vaccination rates are low among healthcare workers in the region; they range from 24.7% in the UAE, 46.4% in Oman, 55.9% in Saudi Arabia to 67.2% in Kuwait. This is indicative of the low perceived risk of the severity of influenza among healthcare workers in the region.[109] Team-based training or education and providing guidelines and information to physicians and nurses may be effective in increasing their capacity to educate their patient population on the risks and preventative measures for seasonal influenza. Reminder systems also serve as important tools, especially for high-risk patients. Such systems alert healthcare providers to the necessary preventive care that a patient may need and the protection measures that they should adopt.[110] "A reminder or follow-up system for healthcare providers may be beneficial, especially for high-risk patients, including the elderly, diabetes patients, those who are immunocompromised, cancer patients and other key groups," says Eman Abu-Gharbieh, a professor in the Department of Clinical Sciences at the University of Sharjah's College of Medicine, UAE.

Multi-sector collaboration

Mitigating the adverse health and economic consequences of seasonal influenza requires the coordination and participation of sectors beyond healthcare. While healthcare professionals and healthcare authorities are at the forefront, stakeholders such as policymakers, media personnel, public advocacy organisations, civil society and relevant associations should also be involved in planning and delivering awareness campaigns. "We need to build trust again between doctors and patients after this pandemic. We need to ensure that when we are dealing with influenza, all stakeholders are at the table, and all stakeholders therefore have a responsibility to cascade the information to the public," says Dr Elawad. "We have multi-sectoral coordination in Turkey when it comes to influenza. And when we find evidence of any new respiratory disease circulating, we immediately inform the relevant authorities and stakeholders. For example, a couple of weeks back, we had respiratory virus cases. Schools and the general public were immediately made aware through information campaigns," explains Dr Balik.

"We need to build trust again between doctors and patients after this pandemic. We need to ensure that when we are dealing with influenza, all stakeholders are at the table, and all stakeholders therefore have a responsibility to cascade the information to the public."

Dr Khalid Hamid Elawad, health protection manager, Primary Health Care Corporation (PHCC), Qatar.

Call to action

Substantial efforts to strengthen influenza surveillance, policy, prevention and control in the region over the past decade is visible through the response measures and impact of covid-19. However, as populations grow and age, the health and economic burden of seasonal influenza will become more visible in the region. A number of common priorities could improve seasonal influenza prevention and control in the region, as well as prepare health systems, healthcare workers and other key stakeholders to manage and mitigate tomorrow's burden and, in turn, enhance pandemic preparedness.

1. Improve systematic surveillance of seasonal influenza

Enhancing, integrating and expanding national and regional surveillance of influenza is desperately needed to understand the epidemiology and true burden of seasonal influenza, and to guide policy and allocation of resources to prevent and control influenza. Influenza must be included in the digital transformation of many of the region's health systems. Advancements in EHRs and genetic testing provide an opportunity to monitor the impact of the virus on patients, particularly those at high risk, and to generate real-time data to better understand the transmission of the virus and quickly mitigate the potential for an outbreak.

2. Position influenza as a public health priority

As the world moves beyond covid-19, influenza should remain at the top of the public health agenda, and the pandemic should be used as a catalyst to build stronger capacities and robust multi-sectoral policies and plans for surveillance, prevention and control of seasonal influenza. Better data on the health and economic burden will also help facilitate evidence-based policy decisions and stakeholder buy-in.

3. Understand the drivers of mis- and disinformation while taking action to improve health literacy

Mis- and disinformation can adversely impact health-seeking behaviour. Policymakers and public health professionals should seek to understand the dynamics and drivers of the mis- and disinformation environment in the Middle East. Efforts and initiatives to improve health literacy should also be enhanced to counteract false information, and to empower populations to discern the credibility of information online and find, understand and utilise evidence-based information.

4. Leverage the trust and knowledge of healthcare workers to advocate for seasonal influenza

Healthcare workers are at the forefront of tackling false information on seasonal influenza. They should therefore be equipped to educate and inform their patient population and the wider community on the risk of seasonal influenza, as well as the pharmaceutical and non-pharmaceutical interventions to prevent influenza. Policymakers should also embed prevention and surveillance of seasonal influenza into broader infectious disease management strategies.

5. Engage other sectors to support influenza prevention and control

While influenza prevention and control is primarily led by the healthcare sector, other sectors can support policies and programmes for community engagement and social interventions in order to reduce and mitigate the threat of seasonal and pandemic influenza. Public health authorities should communicate information on the risk and burden of influenza, and related complications, to civil society organisations, education authorities, employers, community groups, and other key decision-makers to enhance understanding of the disease's impact and increase political commitment. The engagement of multiple sectors is critical to an effective epidemic/pandemic response, as seen during covid-19, a strategy which should also be activated during seasonal influenza.

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