



IFPMA

**Life-course
immunization:
Country
landscape
report**



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01

Executive summary

Executive summary

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Immunization is the greatest success story of the twentieth century. Vaccines eliminated most of the childhood diseases that used to cause millions of deaths, making possible a life without disabilities caused by certain communicable diseases like polio for the first time in human history. In the twenty-first century, though, the fruits of modern medicine are not reaching some of the most vulnerable, making global health insecure against vaccine preventable diseases (VPDs) once more.

Vaccines are critical to the prevention and control of many communicable diseases across all ages and therefore underpin global health security. Yet, only a few countries, such as the US, the UK, and Australia, have implemented a life-course approach to immunization (LCI) in line with recommendations in the Global Vaccine Action Plan 2011–2020 [1] (GVAP) and the Immunization Agenda 2030 [2] (IA2030). While there has been some progress, GVAP goals remain unachieved [3], and the pandemic has further exposed weaknesses in global immunization policies and most notably, on reaching out to the adult population. The focus on pediatric, maternal vaccination and seasonal influenza will not protect us from future pandemics [2].

Some progress has been made over the last years, though: the IA2030 explicitly adopts an LCI frame: “A world where everyone, everywhere, at every age, fully benefits from vaccines for good health and well-being.”, an important reorientation of immunization goals. In parallel, WHO has issued the Defeating Meningitis by 2030 [4] global roadmap, aiming to tackle the main causes of all-age acute bacterial meningitis (meningococcus, pneumococcus, Haemophilus influenzae, and groupB streptococcus).

Additionally, the United Nations has designated 2021-2030 the “Decade of Healthy Ageing [5],” to improve the lives of older people and their families and communities. Together, these initiatives offer an opportunity to highlight the importance and value of LCI, especially for adults and older adults.

But there is much to be done in nine years if we are to reach our goals. There are significant operational gaps, as clearly documented in the GVAP 2020 evaluation [3]. Few countries have inclusive national immunization programs (NIPs) and those that do focus more on pediatric immunization with little outreach for adult immunization. Expanding coverage of adult



A world where everyone, everywhere, at every age, fully benefits from vaccines for good health and well-being.

vaccination will require major shifts in immunization programs to remove barriers to access and uptake. With an aging population, the societal need to prolong healthy living in the face of waning immunity means that new methods will be necessary to deliver integrated, people-centered vaccination services, expand

protection with existing vaccines, and incorporate new vaccines as they become available for older age groups. Programs will also have to respond to significant global demographic shifts, which will have a major impact on the design and delivery of immunization services [2].

This project was commissioned to collect evidence focused on specific LCI policies and priority geographies, to compare available data sets and case studies before and during the COVID-19 pandemic, and to assess the quality of evidence for policy and practice change.



Policy

Across geographies, idiosyncratic and situational approaches to adult immunization have been adopted by nations. For example, poor uptake among pregnant women has a huge impact on illness and death, especially in low- to middle-income countries (LMICs). The lack of standardization in cost-benefit inputs and analyses makes comparisons across countries challenging. Given the paucity of data on VPDs, policies are not always informed by evidence.

This presents an immediate challenge in advancing LCI, but a longer-term opportunity to work with regions and countries to improve data and evidence, especially in the context of IA2030. Documenting best practices and supporting evidence-generation are urgent to advocate for the expansion of immunization policies.



Seasonal influenza is the most frequently recommended and monitored vaccine in adulthood (56% of 195 countries).

56%



Funding

Lack of data makes it difficult to estimate expenditures on adult vaccination services as a proportion of preventive services overall. By all counts, it is inadequate.

The next steps should include documenting high value and low cost of vaccination compared to restorative services to encourage greater investment.



Program

Ambitious global roadmaps come to a halt when faced with operational issues such as poor disease surveillance, lack of funding, and poor service delivery and program evaluation. One hundred and twenty-one countries (62%) recommend some vaccines in adulthood (>18 years of age). Seventy-four countries (38%) recommend only pediatric vaccination [6].

Seasonal influenza is the most frequently recommended and monitored vaccine in adulthood (56% of 195 countries), while other essential adult vaccines, such as the ones against pneumococcal disease and shingles, get left behind.

While more data is needed, the expansion of vaccination through community pharmacies and reimbursement through them is critical for ensuring higher vaccination coverage. This could be achieved by collaborating with WHO, the Strategic Advisory Group of Experts (SAGE), the global network of national immunization technical advisory groups (NITAGs) and regional institutions in Africa and Asia. The collaboration could lead us to data as well as developing best practices.



Performance

Coverage data for adult immunization is mostly limited to influenza and is often lacking outside of developed countries [7]. Influenza - which is the most used vaccine - falls well below the coverage rates for pediatric immunization.

Uptake among healthcare workers (HCWs) is often poor. However, there is reason to be optimistic. The SARS-CoV-2 pandemic has revealed the threats from vaccine hesitancy and stimulated several efforts to counter it. It also stimulated uptake of adult immunization to historic levels. We have a unique window of opportunity to build vaccine acceptance for other VPDs.

Digital tools for booking reminders, appointments and real-time record maintenance are critical to expanding services.

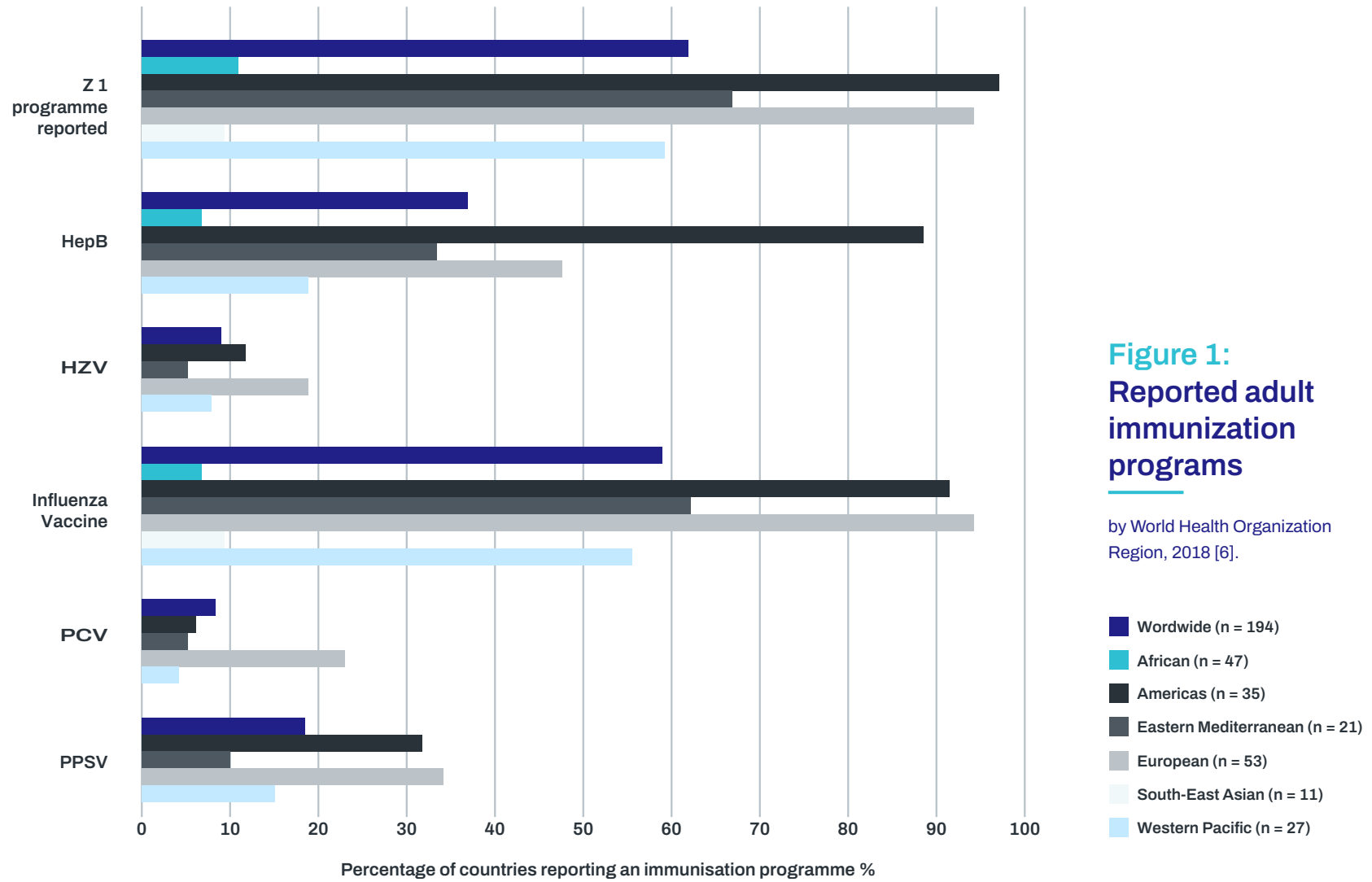


Figure 1:
Reported adult immunization programs

by World Health Organization Region, 2018 [6].

- Worldwide (n = 194)
- African (n = 47)
- Americas (n = 35)
- Eastern Mediterranean (n = 21)
- European (n = 53)
- South-East Asian (n = 11)
- Western Pacific (n = 27)



Towards a vaccinated world

In the third year of a global pandemic, the threat from deadly infectious diseases is no longer abstract. As the coronavirus swept the world, vaccines arrived at record speed and transformed both policy and lives.

Vaccines are global health's biggest success story. Over the next decade, as we deal with climate change, changes

in population demography and disease epidemiology, the importance of vaccines cannot be overstated.

The pandemic made it amply clear that the sick, the old and the vulnerable need a life-course approach to protection from infectious diseases. Viral disasters like the one we are witnessing also provide opportunities to strengthen infrastructures and recalibrate our approach to health insecurities. The transition from 'pediatric vaccination programs' to 'vaccination programs



Older people require non-discriminatory access to good-quality essential health services that include prevention... while ensuring that use of these services does not cause the user financial hardship.

for all ages and all groups' is critical for future pandemic preparedness and health security, by providing additional protection against waning immunity and stemming the rise in mortality from VPDs during adulthood.

Strengthening immunization programs is not simply about protecting individuals but about developing the capacity to protect health systems during future pandemics, which are sure to come. Meticulous education in illness among the vulnerable, especially the aging population, is the surest way to protect health systems as they face steadily increasing routine demands. These systems require awareness, advocacy, funding, infrastructure, measurement and continued support from healthcare professionals.

The Immunization Agenda 2030 (IA2030) [8] foresaw it well before the pandemic and called for: "A world where

everyone, everywhere, at every age, fully benefits from vaccines for good health and well-being."

This emphasis on immunization of older people is also reflected in the focus on prevention of United Nations Decade of Healthy Ageing [5], which will help achieve Sustainable Development Goals. The Decade's plan says, "Older people require non-discriminatory access to good-quality essential health services that include prevention...while ensuring that use of these services does not cause the user financial hardship." The phrasing may not make clear enough the foundational place of prevention in maintaining health, but the intention is clear.

There are nine more years to conform our reality to the vision set out in IA2030 and the UN plan, as confirmed by the experiences we lived through during the pandemic.

Need for life-course immunization

As society ages, life-course immunization will become even more important to personal and societal well-being. LCI strategies are a cost-effective means of improving health throughout the duration of adult life. Adult vaccination not only reduces the incidence and severity of infectious diseases but reduces the incidence and severity of comorbidities with noncommunicable conditions [9]. The incidence of VPDs is neither morally nor economically justifiable.

The Organization for Economic Cooperation and Development (OECD) predicts that: “Across the OECD, the median age of the population is projected to increase from 40 years today to 45 years in the mid-2050s, and the ratio of older people aged 65 and over to people of working age (15-64) is projected to rise from 1 in 4 in 2018 to 2 in 5 in 2050. Populations in emerging economies that are currently relatively young will age even more rapidly”. In 2014, workers aged 50 and older generated every third dollar earned. By 2035 this cohort is projected to generate nearly 40% of all earnings [10].

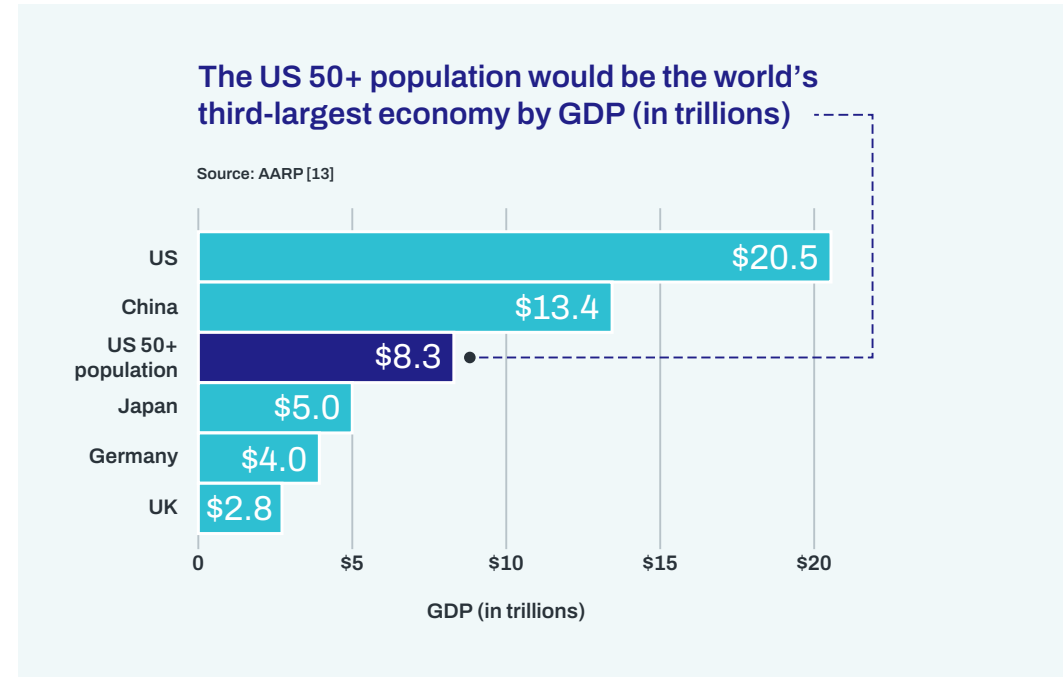
In virtually all OECD countries, the effective age at which people exit the labor market is still lower today than it was 30 years ago, despite higher remaining years of life. Participation

rates for 55–64-year-olds vary greatly between advanced economies [11]. In 2021, a Brookings Future Development blog reported: “In China, silver spending [spending in those aged over 50] will triple from \$750 billion to \$2.1 trillion, overtaking Japan where senior spending has already plateaued at \$900 billion. India will make a dramatic entrance into the group with an expected surge in silver spending from approximately \$100 billion to almost \$1 trillion [12]” but cautions that this requires the old gaining some attributes of the young, among them health

A study by the AARP, a US organization formerly known as the American Association of Retired Persons, found that US citizens aged 50 and over would constitute the world’s third-largest economy, if they were counted as their own country, illustrated in figure 2 [13].

Older individuals in the UK (aged 50 and over) contributed £175 billion in informal care, £7.7 billion in informal childcare and £43.4 billion through volunteer work [14]. Similarly, those aged 55 and above in Australia were found to contribute AU\$74.5 billion per annum in voluntary work and unpaid care [15]. The average unpaid contributions of older people across the EU and Turkey could be worth as much as 1.4% of GDP [11]. Healthy older people help their families to conserve household savings [16], “the main domestic source of funds to finance capital investment, which is a major driver of long-term economic

Figure 2: US over 50 population economic contribution.



“**VPDs such as influenza, meningitis, pneumonia and pertussis put a major strain on in and out-patient services and were estimated to cost the US health system \$27 billion annually.**

\$27b

growth,” according to the Organization for Economic Cooperation and Development [17]. Much of this health and productivity rests on preventing diseases; immunization can help prevent many of those diseases.

Immunization can also protect health systems. VPDs such as influenza, meningitis, pneumonia and pertussis put a major strain on in and outpatient services [18] and were estimated to cost the US health system \$27 billion annually [19]. Between 2009-2013, 31 infectious diseases accounted for 7,577 cases per 100,000 population per year across the EU/EEA population. Of these,



5%

“

Fewer than 5% of French patients with chronic conditions get the pneumococcal vaccine for which they are eligible.

influenza alone accounted for 29.8% of DALYs lost, representing a considerable toll on lives, economies, and healthcare resources [20].

Fewer than 5% of French patients with chronic conditions get the pneumococcal vaccine for which they are eligible [21]. A retrospective study from a center in Paris suggests that the vaccines would have prevented over 70% of cases of invasive pneumonia in some of the patients hospitalized there [21]. Vaccination against influenza could significantly reduce the prevalence of severe adverse effects of infection, such as myocardial infarction. One study has shown that rates of myocardial infarction increased nearly tenfold in the week following infection with influenza [22]. Similarly, rates of stroke were found to remain elevated for 28 days following infection.

Vaccination against influenza during pregnancy showed similarly low figures that fluctuate considerably by country, despite fifteen years of surveillance data on the safety of the vaccine. In Germany, for example, uptake of the flu vaccine amongst pregnant women was as low as 13% across the 2015-2018 period [23]. The consequence of contracting

the flu while pregnant can be severe, with the potential for premature birth or even death for the child [23].

The WHO target for flu immunization coverage targets for vulnerable populations, including pregnant women is 75%; at national level only the United States has come within range of this target. In the EU, 27 countries have established the 75% mark as a target for all groups eligible for the vaccine. One study has calculated that were this target to be achieved; average annual influenza-related events would be reduced by 1.6 to 1.7 million cases, 23,800 to 31,400 hospitalizations, and 9,800 to 14,300 deaths [24]. This is in addition to the current adverse events already prevented under current immunization rates.

We now have evidence that addressing VPDs comes with high costs. During 2017-2018, influenza alone resulted in £128 million in hospital costs in England [25]. Resource usage was similarly high in southern hemisphere countries, with Australia reporting that roughly 5% of all calls to the Healthdirect public health hotline were related to flu-like illness over the winter period [26].

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02

Overview

Key themes, findings and recommendations

The status quo is failing

The COVID-19 pandemic has exacerbated weaknesses in immunization programs around the world. In curtailing the spread of coronavirus, nations with weaker health systems suffered massive regressions in childhood vaccinations as routine immunization programs were halted in the spring of 2020 [27]. By July 2021, WHO and UNICEF reported that middle-income countries (MICs) accounted for an increasing share of unprotected children. India posted a particularly large drop, with diphtheria-tetanus-pertussis combined vaccine (DTP-3) coverage falling from 91% to 85%. Indonesia, the Philippines, Mexico, and Tanzania, among others, saw significant increases in children missing doses [28]. High-income countries (HICs) also suffered similar declines.

There is not yet a clear picture about the impact on adult immunization, but there are worrying signs. A study on vaccine acceptance in the US reported a correlation between areas with low COVID-19 vaccine acceptance rates and a reluctance to accept an influenza vaccination [29]. A study in the UK showed that reasons for objection were often based on misinformation [30]. Pneumococcal vaccination rates were

also observed to remain low during the pandemic, despite the potential lethality of coinfection. One study suggests that prioritization of COVID-19 vaccination by health bodies, and hesitancy related to fear of contracting COVID-19, may have led to lower pneumococcal vaccination rates [31]. The status quo ante was, in any case, poor.

Adult immunization rates (usually defined as >18 years of age) were stubbornly low in nearly all geographies before and during the pandemic. A review found that only 62% of WHO

member states have immunization programs for adults against one of five vaccine-preventable diseases in 2018 [6]. In contrast, many countries immunized adults against COVID during the pandemic [32].

Collecting evidence on VPD incidence and prevalence is difficult as many patients are seen in a primary care setting and those seen in hospitals may be treated without a lab-confirmed diagnosis. There is a particular paucity of data for diseases with disproportionate effects among adults, such as seasonal

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Only 62% of WHO member states have immunization programs for adults against one of five vaccine-preventable diseases in 2018.

62%

influenza and pneumococcal disease. Without data, policies will be unfocused at best and may often be absent.

Uptake of seasonal influenza vaccines by healthcare workers (HCWs) is often low, even in high-income countries. One large cross-sectional study in England compared high and low performing areas and found that low vaccine uptake among HCWs is often the result of a lack of easy access, or a lack of communication strategies to highlight the need and availability of vaccination [33]. This means that HCWs cannot set

the example they should for patients. The situation seems similar elsewhere: Even though most countries recommend that HCWs be vaccinated seasonally against influenza, coverage in many countries was low pre-COVID [34]. Influenza vaccination rates among

healthcare workers in 14 countries in one literature review ranged from 15.6 to 63.2% (with a median of 30.2%) before the COVID pandemic [35].

National decisions about adult vaccination seem to be idiosyncratic and

unaffected by either the median age of a country's population or its per capita GDP, according to a study of 34 middle and high-income countries purposively selected because they had a higher proportion of older people than many countries [36].

These failings became evident during the pandemic as many countries simply lacked the infrastructure to implement pandemic immunization programs while others had to cut back on other prevention measures and on care services in order to provide COVID vaccines [37].

Many countries have variable decision-making about adult immunization

Countries' approaches to adult immunization are idiosyncratic and situationally dependent. Standard approaches to policy influence like a cost-benefit analysis may work better in some countries than others. Global norming efforts – such as GVAP and IA2030 – are predicated on technocratic, data-driven approaches to decision-making, implementation and evaluation. These are not the primary drivers in some countries. Policy decision-making occurs in a cultural context and reflects countries' perspectives on governance, health, and citizenship [38].

In 2020, a study underlined decision-making processes behind adult immunization programs in 34 countries [36]. Their findings provide useful insights to guide future efforts to improve individual countries' adult immunization programs, as shown on the right):

A national aging strategy is immaterial: Policy around changing demographics – the so-called “Silver Tsunami” – did not affect decision-making in significant ways.

Value of vaccination data are inconsistently incorporated: Countries may or may not incorporate information about the value of vaccination in their decision-making.

Age doesn't matter:

The age of a country's population doesn't predict the number of vaccines recommended for adults or uptake rates of either influenza or pneumococcal vaccination.

A national immunization strategy has questionable effect:

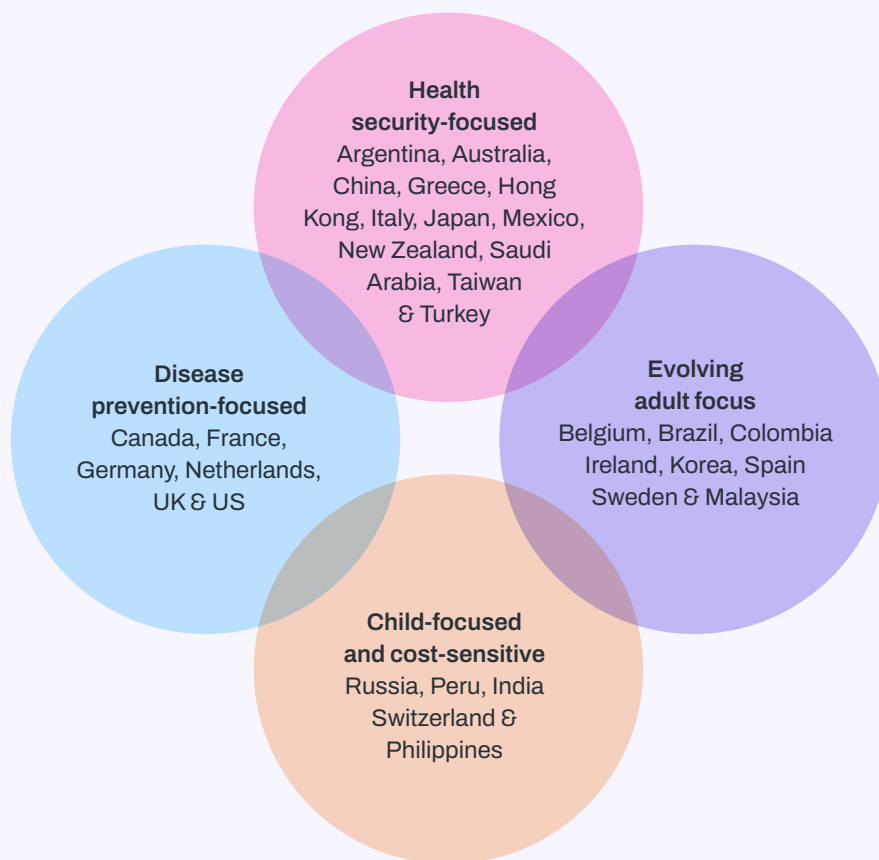
While countries that ranked higher in decision-making often had a national immunization strategy, it didn't guarantee good policy.

Adult decision making study

Public funding isn't enough:

Italy, for example, scored high on public funding for influenza, pneumococcal, and herpes zoster vaccines, but at the bottom for ease of patient access.

Figure 3: Archetype of older adult immunization policy drivers.



Source: Privor-Dumm et al. 2020 [36].

As shown in Figure 3, the authors grouped countries into four archetypes: disease prevention-focused, health security-focused, evolving adult focus, and child-focused and cost-sensitive.

- **Disease prevention-focused** countries value the use of data and processes. Yet, there is significant variation in performance, attributed to lack of national adult registries, equity focus, advocacy, and centralization of the immunization program.
- **Health security-focused** countries have a diverse program performance. The characteristic of this archetype is that outbreaks (H1N1 in Australia and Argentina; pneumonia in Japan), VPD threats, and natural disasters (tsunami in Japan) are viewed as an important country motivation for action.
- **Evolving adult-focus** countries – those countries expanding immunization from primarily pediatric into older age groups. These often lack a strong national immunization technical advisory group (NITAG) and have variable performance.
- **Child-focused and cost-sensitive** countries have not prioritized adult immunization programs. These countries may require patients to pay out of pocket for adult vaccines (Russia, India), although there are some exceptions for influenza vaccines, like the Philippines and Switzerland, where vaccines are covered through insurance. They lack a focus on program implementation: they have no registries or policies around adult health or adult immunization. For most countries in this archetype, there is a cost-based argument: given limited resources, child health is prioritized.

Adult immunization coverage rates are too low

For many adult VPDs, there is little or no data. There are few global consolidated sources of vaccine coverage rates for adult immunization. There is systematic annual reporting for pediatric vaccines through WHO's JRF system and the data are of good quality [39]; reported adult influenza immunization coverage rates are abysmal compared to pediatric immunization rates. There is some global documentation of influenza vaccination policies [40] but no reporting of vaccination coverage rates globally.

Given the variability in uptake of adult vaccines by antigen, influenza data are not reliable correlates for other vaccination coverage rates but are the most widely available numbers. To assess the performance of adult immunization programs, DTP3 coverage was selected as a benchmark against which to contrast adult influenza immunization coverage because of the programmatic similarities. We contrasted the coverage rates within a same country for all countries with data for both influenza vaccination coverage

in adults and DTP3 vaccination coverage in children, using either Eurostat [41] (or OECD influenza immunization coverage rates if a Eurostat rate was not available [42]) and WHO-reported rates for DTP3 coverage [43]. There were 44 countries – 38 HIC and 6 upper middle-income countries (UMIC) – for which both influenza vaccination coverage in adults and DTP3 coverage in children were available for comparison.

Vaccination coverage rates with DTP3 ranged from a low of 74% to a high of 99%. By contrast, adult influenza vaccination rates ranged from a low of 6% to a high of 86%, defined as the proportion of the population 65+ years who received influenza vaccination. Most

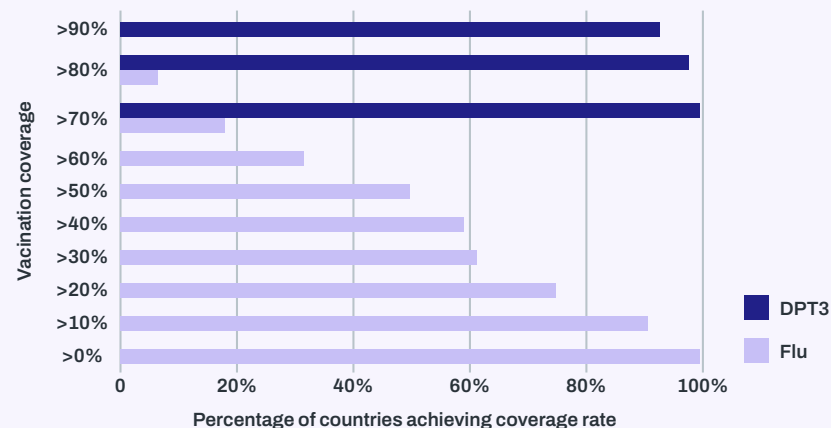
striking was that of the 44 countries compared, 100% achieved >70% vaccination coverage rates with DTP3 compared to only 18% of countries for adult influenza vaccination (Figure 4, below). Only 50% of countries achieved an adult influenza vaccination rate of >50%.

Better access boosts uptake

Expansion of access to vaccination through community pharmacies and other easily accessed sites is critical for ensuring high vaccination coverage. There may be political challenges in assuring evidence-

Figure 4:
Vaccination coverage rates for influenza and DTP3 in 44 countries.

Sources: Eurostat [41] & OECD [42].



based approaches to policymaking (e.g., regulatory approaches) and to program implementation (e.g., efficiently expanding immunization while simultaneously providing continuity of other operations). Reimbursement for pharmacy-based vaccination (PBV) is, however, essential for sustainability [44].

Over the last decade, PBV for influenza has gradually expanded to many nations. A 2020 survey of 99 countries by the International Pharmaceutical Federation (FIP) [45] found that PBV was then available in at least 36 countries, with an additional 16 countries considering PBV policies. Nearly 1.8 billion people could access vaccination services at a community pharmacy – almost twice as many as in 2016. Because of COVID-19, many nations are developing policies and implementing regulatory changes to introduce or expand PBV. PBV services are also expanding outside pharmacy premises. In October 2020, new legislation was passed in Ireland allowing pharmacists to provide a flu vaccination service offsite – for example, in the patient's home or their car, in a drive-through [46].

It is important to be alert to the impact of this expansion on pharmacy staff and operations. The expansion may



Vaccination requires a relatively low level of investment per individual... Increasing coverage rates would bring additional public health benefits for a relatively low incremental cost.

come with challenges such as filling staff positions; upward pressure on wages; working longer hours, and reimbursements [47]. While the role of pharmacists has steadily expanded in many high- and middle-income nations, the same trend has not happened in a formal way in many less-resourced settings, where arguably the need is even greater [48, 49] (although in some, pharmacists have long informally filled some roles theoretically reserved to medical practitioners).

Investing in prevention

Preventive spending is minuscule compared to restorative services, and spending for vaccination is a small proportion of spending for preventive services. Good data on spending on adult immunization is lacking. As a result, estimates of positive return on that investment – a bedrock for policymaking – are weak. However, providing funding does improve uptake and deliver benefits.

Prior to COVID-19, OECD countries spent on average 8.8% of GDP on healthcare [50]. It is difficult to estimate spending on prevention as a share of overall health expenditures, as these services, such as office-based

immunization, are often collapsed into overall tallies for care. Additionally, countries may (or may not) track “public health” spending as a separate category, and inconsistent definitions of what constitutes public health confuse the matter further. In a typical year, public health spending is estimated at just 3% of all health expenditures in the US [51]. Similar proportions – between 1% and 5% -- are reported for European Union (EU) and European Economic Area (EEA) countries [52].

In 2017, spending on immunization programs was estimated at about 9% of prevention budgets across Europe (0.5% of the health budget) [53]. It is safe to say that the expenditure on immunization is a small proportion of overall health expenditure and, as the pandemic has highlighted, prevention funding needs to be prioritized, both to support recovery from this pandemic and to build resilience for future outbreaks of disease.

Recommendations for adult immunization are not always linked to funding. The rationale for funding (or not) is not typically explicit in the available literature. As of 2020, 171 WHO member states had formed NITAGs, consistent with the recommendation in the Global Vaccine Action Plan 2011-

2020. However, a 2021 assessment of NITAG operations [54] found variable compliance with criteria for good governance: accountability, transparency, honesty, accessibility, and proportionality . It noted that governance practices may not be directly associated with quality of NITAG performance. A 2016 study [55] examined the cost of vaccination throughout life in England, France, Germany, Italy, Portugal,

Spain, and Sweden. In all countries, adults (18–64 years) and older people (>65 years) accounted for the lowest vaccination costs compared with infants (0–24 months) and children/ adolescents (2–17 years). The authors noted: “Vaccination requires a relatively low level of investment per individual... Increasing coverage rates would bring additional public health benefits for a relatively low incremental cost. A life-





course approach of vaccination should also be encouraged because some missed opportunities remain in senior vaccinations.” The study revealed that many of the 30 EU/EEA countries fund the antigens recommended in their adult immunization schedules. On average, influenza immunization coverage rates are much higher in countries that fund adult immunization than in countries that do not. Even so, funding does not necessarily correlate to high influenza coverage – the highest proportion among funded countries, in Greece at 74%, is still lower than coverage rates for pediatric vaccines. Coverage rates in other countries that fund influenza coverage – e.g., 12% in Latvia and

Slovakia, among others – point to a multifactorial set of barriers to influenza immunization.

Building vaccine confidence often requires combating complacency

Vaccine confidence is high overall, although attention needs to be paid to hesitancy, which is a complex and multifactorial problem. The COVID-19 pandemic has shown that very high levels of coverage are possible in countries where vaccines are funded

and easy to access but that some countries have persistent challenges. Although limited, hesitancy was high profile, so many organizations across sectors are now invested in countering it. Overall, the pandemic has resulted in uptake of immunization – particularly among adults – at historic levels. It may be possible to improve vaccine acceptance for other VPDs.

Vaccines, in general, are considered to be the victim of their own success, with hesitancy often highest in countries where prevalence of VPDs is the lowest [56]. Some countries also often seem vulnerable to populist politicization of vaccines [57].

Strong pharmacovigilance systems to detect and report adverse effects are essential to ensure policy recommendations are data-driven and evidence-informed and to boost public confidence in vaccine safety and efficacy. According to WHO, these are not in place in many (if not most) LMICs.

Challenges include under-reporting; lack of communication and coordination between regulatory authorities, public health programs and other key players; inability to use pharmacovigilance data for regulatory decisions; and the spread

of rumors and false information that fuel vaccine hesitancy.

SARS-CoV-2 has provided countries with several important lessons on how to address vaccine hesitancy [58]. Pharmacists and pharmacy associations have played an important role in developing and implementing policies to counter vaccine hesitancy for COVID-19, which can be applied to other vaccines [59].

A small Indian study in Kerala suggested that alternative medical practitioners negatively affect vaccine confidence [60], but this is not the global experience -- Chiropractic Australia, for example, endorsed all Commonwealth and state recommendations and regulations on vaccination against COVID-19 [61]. Organized and deliberate disinformation campaigns by unfriendly governments appear to: “increase the number of negative vaccine tweets by 15% for the median country” [62]. At its heart, confidence in vaccines is really about confidence in governments. No-fault vaccine injury compensation programs can boost people’s confidence in being vaccinated [63] and in their governments. In return, those vaccinated know they will be taken care of in the rare instance of a serious adverse event.

Health security may improve vaccine confidence

The life course immunization community needs to message carefully to avoid being perceived as scaremongering.

The SARS-CoV-2 pandemic has riveted policymakers' attention on health security, with high visibility reports issued by the G7 (100 Days Mission) and the G20 (A Global Deal for Our Pandemic Age), among others. International polling data indicate the public is also paying more attention to systemic health security as well as personal health security [64].

The expansion of vaccination during the pandemic has also increased concerns about potential risks of adverse events associated with it [65]. To ride the wave of increased vaccine acceptance created by the pandemic (at least in some countries and among some populations), the International Council on Adult Immunization (ICAI) has developed a high-level roadmap to catalyze action, provide policy guidance, and envision a global adult immunization platform that can be adapted by countries to fit their local contexts [66].

The ICAI recognizes that programs to deliver existing influenza, pneumococcal, herpes zoster vaccines, and future COVID-19 vaccines to over a billion older adults are more urgent than ever. They have developed a framework for delivering routine and pandemic vaccines and call upon the global community and governments to prioritize action for integrating robust adult immunization programs into the public health agenda.

Population of special interest and concern: Pregnant women

Although WHO and many national health authorities currently recommend maternal immunization for more than 10 VPDs, global vaccination coverage rates remain low in pregnant women, even for the most common VPDs (e.g., influenza, pertussis and tetanus). Poor uptake of vaccination during pregnancy poses risks for women and for their children, in utero and after birth. Impacts are greatest in LMICs.

The value of maternal immunization seems not to be appreciated. Global policies have been in place for nearly a decade, but influenza vaccination



coverage in high-income countries remains suboptimal and in LMICs, negligible.

Issues relating to delivery of vaccinations, chiefly arising from lack of coordination between immunization programs and antenatal care are among the common barriers reported by pregnant women [67]. Successfully increasing uptake of existing vaccines and introducing new vaccines for pregnant women in LMICs requires collaboration between two fields: immunization and maternal, newborn and child health.

Concerns about vaccine efficacy, belief that vaccination is not necessary, poor awareness, contradictory precautionary language in the labeling information, lack of recommendations from healthcare providers [68] do, however, exist and must be addressed.

Awareness among health professionals

There is a well-documented positive effect of HCW recommendations on patients' vaccine acceptance and uptake, but not enough HCWs lead by

example. Improving HCWs' awareness is critical to expanding coverage, and more education appears essential.

Even though most countries recommend that HCWs be vaccinated seasonally against influenza, coverage in many countries remains low [34]. A meta-study of 25 studies [34] revealed that HCWs believed that influenza vaccine to be effective. Authors of several studies suggested that the balance of the data showed self-protection to be a more important motivator than the protection of patients.

Several HCWs argued that vaccination is a basic part of professional ethos. Barriers to vaccine uptake include concerns about vaccine side effects, skepticism about vaccine effectiveness, and the belief that influenza is not a serious illness [69].

Digital support for adult immunization

Technology has an increasing role to play in planning and delivering immunization services. Several tools have been developed for paperless management of immunization, from booking reminders to scheduling

appointments to real-time recording of immunization, although additional evidence is needed to determine the effectiveness of these tools.

A study of SMS reminders for HPV vaccine series completion led to timely HPV vaccine series completion in a low-income, urban, minority study population and also led to population-wide effects. Educational information did not provide an added benefit to this population [70]. Recent research showed that text message nudges drive higher rates of patient flu vaccinations and that digital reminders increase influenza vaccination rates for people with diabetes [71].

We should expect advanced technologies to do much more in predicting risk and estimating benefits. For example, the Community Health Plan of Washington (USA) uses data aggregated from multiple sources like claims, EHRs, labs and social determinants of health to stratify risks for their members and use the information to plan their vaccination outreach and distribution priorities [72].

What must now be done

Expanding coverage of adult vaccination will require major shifts in immunization programs to remove barriers to access and uptake. We need new designs to deliver integrated, people-centered vaccination services [2]. In order to realize the ambitions outlined in Immunization Agenda 2030 [2], there is an urgent need to course-correct in this decade, and COVID-19 has created a policy window for necessary change.

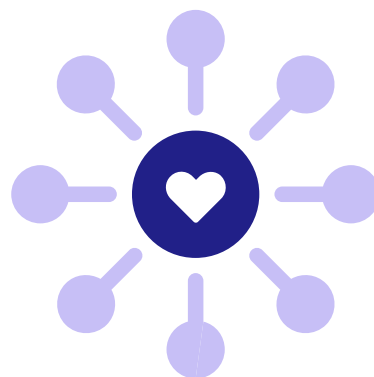
There are three overarching priorities:

- 01 ▶ **Acknowledge and demonstrate** the full societal value of vaccination and put in place value assessment mechanisms for inclusion of vaccines in national adult immunization programs.
- 02 ▶ **Build or reinforce** resilient and self-sustaining inclusive immunization systems as well as investment streams that protect people at every stage of life against VPDs, and find sustainable funding to cover routine vaccination of children and adults, in the knowledge that long-term savings and gains are certain to follow.
- 03 ▶ **Make sure** that life course vaccines are accessible to all who want them.

These translate into a series of specific actions which are clustered below and may serve as a guide for the life course immunization community. Different collaborations will be appropriate to different tasks, but some tasks mention essential participants. The ICAI is likely to be pivotal to many of these joint undertakings.

Exchange of best practices

- Look for opportunities to foster learning across countries, particularly those that are archetype-aligned. Document best practices in decision-making, program implementation, and program evaluation.
- For countries that may share a regional affinity – e.g., via the African Union, through the Pan American Health Organization (PAHO), or the Association of Southeast Asian Nations (ASEAN) – seek to foster equitable approaches through regional solidarity and exchanges. This may be especially important as African regulatory systems are being developed.
- Build a body of knowledge on the links between vaccine confidence and easy, affordable access to life course immunization.
- Document and communicate on the expansion and successful implementation of community-based immunization, and partner with professional associations to encourage improvements in adult vaccination coverage rates.
- Consider collaboration, for example, between FIP, national pharmacy associations, and adult immunization advocates to develop best practices guides, support evidence-based policy, and encourage fair reimbursement.
- Develop an evidence-base for digital tools that facilitate the management of efficient and effective adult immunization delivery.
- Build on the historic establishment of the COVAX's no-fault compensation (NFC) program and country-developed NFC systems to cement them in place post-pandemic and to extend their protection to routine immunization across the life course.





Include experts in policy-making

- Advocate for NITAGs to be representative of the IA2030 and Decade of Healthy Ageing ambitions by including adult-serving practitioners in their membership.
- Continue efforts to bolster pharmacovigilance systems and to communicate to policymakers and the public their value in the context of data-driven management of patient health.
- Work with professional organizations and stakeholders such as the African Union, Africa CDC, ASEAN and others to focus particularly on expanding the role of nurses and pharmacists [73].
- Research collaboratively to develop a better understanding of country specific HCW knowledge, attitudes, beliefs, and behaviors.
- Professional associations can work with others to promote education on immunization among HCWs.

Documentation

- Document and communicate the differences in coverage rates for pediatric and adult vaccination within countries to highlight disparities and improvements needed in support of adult immunization programs.
- Document and communicate on the link between public funding for immunization and vaccination coverage rates.
- Advocate for leveraging real-time COVID-19 vaccine coverage tracking to be pivoted/expanded to other adult vaccinations.

Value

- Document and communicate the high value and low cost of vaccination compared to restorative services.
- Push for value assessment frameworks to include FSV, rather than merely averted health spending.
- Continue to message on the importance and socio-economic benefits of LCI as a fundamental of health security for everyone, everywhere.

[MENU](#)



03

Regional summaries

The Americas

Summary

The emergence of new pathogens and the re-emergence of old ones has made life course immunization an urgent priority, especially in view of rapidly aging populations. After the coronavirus pandemic, a life cycle approach to vaccinations for all ages and against all vaccine-preventable diseases has emerged as the main strategy to reduce unnecessary hospitalizations, control infectious disease outbreaks and build herd immunity against common infections.

The Region of the Americas adopted the Expanded Program on Immunization (EPI) in 1974 [74]. The long-term commitment to pediatric immunization has made this region a global leader in the elimination and control of vaccine-preventable diseases such as smallpox, polio, rubella, congenital rubella syndrome, measles, and neonatal tetanus. In the 40 years since the creation of the EPI, countries have moved from using six vaccines in their national vaccination schemes to an

“This region was one of the worst affected by COVID-19. The pandemic has highlighted the challenges faced by the region’s health systems in ensuring universal access to healthcare.”

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average of more than 16 vaccines [75], priming the region to take a life cycle approach to immunization.

However, this region was one of the worst affected by COVID-19. The pandemic has highlighted the challenges faced by the region's health systems in ensuring universal access to healthcare and two of the most devastating consequences were that, for the first time, life expectancy in 2021 fell to levels comparable to those of 2004; and the number of vaccines administered to children has fallen dramatically. As of September 2022, even as COVID-19 continues to infect thousands of people in the Americas and monkeypox cases rise, the polio virus has now been detected in New York and in Pará in Brazil. In light of this, the Pan American Health Organization

Director (PAHO) has called on countries to urgently strengthen surveillance and routine vaccination campaigns.

On 21 September 2021, PAHO announced the selection of two centers in Argentina and Brazil as regional hubs for the development and production of mRNA-based vaccines in Latin America in a bid to tackle COVID-19 and future infectious-disease challenges [76].

This introduction to life course immunization in the Americas focuses on four nations - Brazil, Mexico, Argentina and the United States- to get a comprehensive view from nations with disparities in access to healthcare. The information presented here has been drawn from a detailed life course immunization report prepared for the IFPMA in February 2022.

Brazil

Health system overview

The Brazilian health system, known as SUS (Sistema Único de Saúde), cares for approximately 75% of Brazilian citizens. Private health insurance is voluntary, supplementary and covers the rest of the population [77]. As per the World Bank, in 2018, government health expenditure per capita was \$610.22 or 3.91 % of GDP [78], with \$1.25 billion spent on immunization in 2017. Brazil's industrial policy has strongly encouraged local vaccine manufacturing [79].

Adult immunization

Influenza: Brazil reports one of the highest influenza vaccination rates of older adults (98.2%) and those with chronic conditions (86.3%) in the world [80]. However, a recent study of influenza vaccine coverage among adults found a lower rate: 73.0% (95% confidence interval: 70.6–75.2), falling short of the goal of 80% set by the national health authority [81]. The most frequent reasons given for skipping vaccination were beliefs about the lack of efficacy and possible side effects of the vaccine. The coverage of vaccination did not differ by socioeconomic characteristics. Older individuals, never smokers, having two

or more chronic diseases, and being registered in the Family Health Program were positively associated with influenza vaccine uptake.

A cross-sectional survey of physicians conducted June-August 2018 focused on the vaccines recommended by the Brazilian Society of Immunization (SBIm) for adults and older adults (years 2017-2018) found that the vaccines prescribed by the highest proportions of physicians were Influenza (>90% of physicians for adults and older adults), hepatitis B (adults: 87%; older adults: 59%) and Yellow Fever (adults: 77.7%; older adults: 58.5%) [82].

COVID-19: Seven vaccines are approved for use in Brazil: Pfizer-BioNTech, Gamaleya/Sputnik, Johnson & Johnson, Oxford/AstraZeneca (produced in country by Fiocruz, an institute of the federal government), Serum Institute of India Covishield, Sinopharm, and Sinovac (produced in country by Butantan, run by the state of São Paulo). As of January 6, 2022, the government reports that 74.1% are fully vaccinated [83]. The government spent roughly \$121.85 billion on pandemic response in 2020; that figure was slashed by 80% to \$24.37 billion in 2021 [84].

At nearly 620,000 deaths, Brazil ranks second in the world after the US (which had slightly over 832,000) in total deaths from COVID-19 as of January 6, 2022 [85]. In the current national COVID-19 vaccination plan – the eleventh – adults are prioritized for immunization across multiple target groups in a highly articulated scheme [83].

Mexico

Health system overview

The Mexican health system is a mix of three components - employment-based insurance schemes, public assistance services for the uninsured, and private insurers. Approximately 8% of the population has private health insurance. Health care is provided free of charge to approximately 85% of the population [86]. According to the World Bank, in 2018, OOP was 42.12% of overall spending [87]. Government expenditures on health were \$521.01 per capita [88], last among all OECD countries in 2018, and total health spending accounted for 5.371% of GDP [89], last among OECD countries save for Turkey.

Adult vaccination in Mexico

Mexico has a Universal Vaccination Program that enjoys international



In Mexico approximately 8% of the population has private health insurance. Health care is provided free of charge to approximately 85% of the population.

85%

recognition, being public and free and among the broadest scope worldwide, with coverage against 14 preventable diseases [90]. For adults 60 and older, hepatitis B, influenza, PPV, and Tdap – and now COVID-19 – are covered by the NIP; two additional vaccines, varicella and hepatitis A, are covered only at a subnational level due to budgetary constraints.

COVID-19: Mexico's COVID-19 vaccination program began 24 December 2020. As of 14 January 2022, Mexico had reported 4.26 million cumulative cases. As of 1 January, nearly 150 million doses had been administered; 63% of the population had received at least one; 56% were fully vaccinated [91]. The country is among the worst affected based on four metrics: high infection and mortality rates among health workers, inequities in disease burdens across social groups and regions, high excess mortality from all causes, which reflects both the direct and indirect impact of COVID-19, and comparatively high numbers of reported

cases and deaths, after accounting for differences in population size and testing levels [92].

Influenza: Mexico uses trivalent influenza vaccine [93]. The OECD reports that coverage for those 65 and older was 82.3% in 2014, the most recent data available [43]. The Mexican influenza vaccination program does not include a recommendation for adults 50–59 years, unless they have risk factors for complications (diabetes, hypertension, obesity, chronic kidney disease and asthma, among others) [94].

Pneumococcal: For adults >65 years, PPSV23 is recommended. For children, Mexico has benefited from the inclusion of the 7-valent (PCV7) and 13-valent pneumococcal conjugate vaccines (PCV13) since their inclusion in the NIP in 2006 and 2010, respectively [95]. PCV10 is available in the private market.

Hepatitis B: As of 2020, Mexico lacked a national plan to address viral hepatitis, presenting “a major obstacle for the development and implementation of actions and procuring funding [96].” Further, the lack of a plan “has not only failed to establish national policies and strategies in the fight against viral hepatitis, but also interfered with resource

allocation for studies of HBV and HCV epidemiology, clinical investigation as well as basic and applied scientific research” and likely explains the absence of data on HBV vaccination coverage.

Argentina

Health system overview

The Argentinian health system consists of three sectors: public, social security, and private. The public health system is financed by taxation and provides the majority of health services free of charge to users. The social security sector (Obras Sociales) is a form of health insurance for those working in the formal sector that is financed by employer or employee contributions.

Health expenditure

Argentina expends 9.12% of annual GDP on health services, an increase over expenditure in 2016 of 7.54% of GDP, and higher than the average in Latin America [97]. Argentina implemented a Universal Health Plan in 2016, since which time expenditure has risen. Because of decentralization, there are inequities in distribution of funds for the healthcare system. Privor-Dumm et al. describe Argentina as a health security-focused country [36].



COVID-19 vaccination

The pandemic and the containment measures had a significant economic impact, with a GDP contraction of around 10% of GDP in 2020 [98].

On 21 September 2021, the PAHO announced the selection of two centers in Argentina and Brazil as regional hubs for the development and production of mRNA-based vaccines in Latin America in a bid to tackle COVID-19 and future infectious-disease challenges [76]. According to Our World in Data, as of 5 October 2022, Argentina had recorded 9.71 million cumulative cases of COVID-19, and nearly 129,937 deaths [99]. More than 84.6 million vaccine doses have been administered.

United States

Health system overview

The US health system is a mix of public and private, for-profit and nonprofit insurers and health care providers [100]. Private insurance, the dominant form of coverage, is provided primarily by employers. The uninsured constituted 8.6% of the population in 2020 [101].

The World Bank reports that government health expenditures were 16.69% of GDP in 2018 [102], or \$10,515.32 per capita [103]. The Centers for Medicare and Medicaid Services (CMS) estimates 2021 health expenditure at \$4.217 trillion, 18.2% of GDP, with government public health representing 2% of the total [104].

People enrolled in the Medicare program receive some immunization coverage [105]. Medicaid provides health coverage to more than 76 million people, including eligible low-income adults, children, pregnant women, elderly adults, and people with disabilities [106]. Medicaid is administered by states, according to federal requirements. The program is funded jointly by states and the federal government [107]. Immunization coverage in Medicaid is variable by state [108]. Most state Medicaid agencies cover at least some adult immunizations but may not offer coverage of all ACIP-recommended vaccines [109].

Adult immunization in the US

Experts consider the US a disease prevention-focused nation [36]. A total of 14 antigens are targeted for adults ages 19 and older, in a combination of risk- and age-based recommendations. But with such a confusing patchwork of coverage, adult vaccination rates remain far below national targets. Additionally, with the aging of the U.S. population, the public health impact of vaccine-preventable diseases and their complications in adults is likely to grow [110].

The Vaccines National Strategic Plan: 2021-2025 notes that adult vaccination

rates remain low overall and continue to lag well behind those for children [111]. For instance, during the 2019–2020 season, influenza vaccination coverage among adults was only 48% [112].

The most recent available data from the 2018 National Health Interview Survey show that at least three out of every four adults are missing one or more of four routinely recommended vaccines: influenza, pneumococcal, zoster, and tetanus toxoid-diphtheria (Td) or tetanus toxoid-diphtheria-pertussis (Tdap) [113].

COVID-19: As of 5 October 2022, the US has had 96.55 million cumulative cases and 1.06 million deaths [114]. Nearly 527 million doses of COVID vaccine have been administered, amounting to 75% of the population with at least one, and 207.37 million fully vaccinated [115]. All adults are eligible for boosters, as well as those 12 years and older (Pfizer) and those 18 and older (Moderna and Johnson & Johnson) [116].

Influenza: Vaccination for influenza is recommended for all adults over age 19. During the 2019–2020 flu season, vaccination coverage with ≥ 1 dose of flu vaccine among adults ≥ 18 years was 48.4%, an increase of 3.1% from the prior season [117].

The Western Pacific

Summary

While countries across the globe are reporting an ever-increasing proportion of the population aged 65 or over, the Western Pacific Region in particular, has one of the largest and fastest growing older populations and hosts over a third of the world's population aged over 65 [118]. With an ever-aging population, life-course immunization is a priority on the region's health agenda. The COVID-19 pandemic has highlighted that prevention schemes against vaccine-preventable diseases must

focus on all age groups if outbreaks are to be effectively controlled and hospitalizations and severe effects significantly reduced.

In October 2014, the Western Pacific adopted WHO's Regional Framework for Implementation of the Global Vaccine Action Plan [1]. The region has made significant progress in the battle against vaccine-preventable diseases (VPDs). The Region has maintained polio-free status, maternal and neonatal tetanus

The COVID-19 pandemic has further exacerbated these inequities with routine immunizations being disrupted.



Maintained polio-free status, maternal and neonatal tetanus (MNT) elimination has been achieved with the exception of one country, rubella elimination is on track, the control of hepatitis B has accelerated, and the introduction of new vaccines, overall, has been on track.

Demand is increasing for new and underutilized vaccines that prevent major causes of diarrhea, pneumonia, meningitis, and encephalitis, as well as cervical cancer.

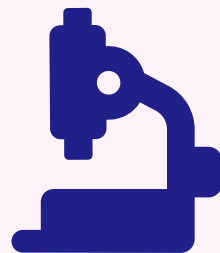
The Western Pacific Region in particular has one of the largest and fastest growing older populations, and hosts over a third of the world's population aged over 65... life-course immunization is a priority on the region's health agenda.

(MNT) elimination has been achieved with the exception of one country, rubella elimination is on track, the control of hepatitis B has accelerated, and the introduction of new vaccines, overall, has been on track. However, there are inequities in routine immunization coverage between and within countries, threatening achievement of the regional goals.

As of September 2019, nine areas have been verified as having achieved measles elimination, and five countries and areas have been verified as having achieved rubella elimination [2]. Despite measles outbreaks in a number of countries (Vietnam and Philippines), the overall number of reported measles cases dramatically decreased by 2011. The COVID-19 pandemic has further exacerbated these inequities with routine immunizations being disrupted. In some countries, routine immunizations were temporarily suspended or delayed, and school closures saw a drop in school-based immunization activities. The decline in routine immunizations and an impaired surveillance system may lead to the resurgence of VPDs in this region.

Demand is increasing for new and underutilized vaccines that prevent major causes of diarrhea, pneumonia, meningitis, and encephalitis, as well as cervical cancer, and with it an increased need to assure vaccine safety, quality and adequate supply chain management.

Adaptable solutions were identified which could be implemented (like non-traditional vaccination venues, virtual engagement, and social media campaigns). Governments and private providers realize the need to act urgently to improve coverage rates and plan for future waves of the pandemic, to avoid a resurgence of vaccine-preventable diseases. This summary focuses on the following countries – Australia, China, Japan, and the Philippines. The information presented here has been drawn from a detailed life-course immunization report prepared for the IFPMA in February 2022.



Australia

Australia has a regionally administered, universal public health insurance program (Medicare) financed through general tax revenue and a government levy.

The National Partnership on Essential Vaccines (NPEV), an agreement between the Commonwealth of Australia and the states and territories, guides the immunization program. The objective of the agreement is “to protect the Australian public from the spread of vaccine preventable diseases through the cost-effective and efficient delivery of immunization programs” under the NIP, which aims to minimize the incidence of vaccine preventable diseases and HPV in the country.

In 2019, Australia spent 9.91% of GDP on healthcare, a little over \$5,000 per capita [119]. Total federal spending on health in 2021-2022 is projected to be \$98.3 billion, representing 16.7% of the national government’s total expenditure [120].

Only a few countries, such as the US, the UK, and Australia, have implemented an LCI in line with GVAP and the Immunization Agenda 2030 (IA2030) [2]. A “whole-of-life” Australian Immunization

Register (AIR) was introduced to replace the Australian Childhood Immunization Register (ACIR) in September 2016. The AIR aims to capture all NIP-funded and most privately purchased vaccines given to people of all ages. For adults, only seasonal influenza, pneumococcal, and zoster vaccines are funded through the NIP.

COVID-19 vaccination is free for everyone, including booster doses for those 18 and older. As of early January 2022, 94.5% of people 16 and older had a first shot; 91.6% had their second dose [121].

Adult vaccination in Australia

In a 2021 paper titled “Enhancing Adult Vaccination Coverage Rates in Australia,” the National Immunization Coalition flagged the lack of complete data on adult vaccination as a critical issue [122].

The Immunization Coalition estimates that only 51% of older Australian adults receive all government-funded vaccinations annually, compared to 93% of children and 73% of adolescents.

China

Health system overview

China achieves near-universal health coverage through the provision of publicly funded basic medical insurance. In 2018, China spent approximately 6.6% of GDP on health care, which amounts to CNY 5,912 billion (USD 1,665 billion), \$501 per capita. 28% was financed by the central and local governments, 44% was financed by publicly funded health insurance, private health insurance, or social health donations, and 28% was paid out-of-pocket [123].

Adult vaccination in China

China has the fastest growing older adult population of any nation: By 2050, more than one in four people in China (26.3%) will be 65 years or older. In this context, adult immunization is a critical imperative for individual and population health. However, China lacks a national adult immunization program on par with its extensive and free pediatric immunization program.

Pediatric vaccines are made available through the government's Expanded Program on Immunization (EPI) at no charge for all children up to 14 years of age.

COVID-19 vaccination is at high levels among urban adults. As of 21 July 2021, Beijing reported 91% of residents fully vaccinated (17.7 million people); The National Health Commission had a target of 70% vaccination for several groups, including adults, by the end of 2021 [124].

Influenza vaccination is not funded by the central government or included in the NIP. The influenza vaccination rate is low and varies across the country. Coverage was only 1.9% in 2008-2009; the rate in urban adults >60 years was 4.3% in the 2011-2012 season [125].

Japan

Health system overview

Japan's statutory health insurance system provides universal coverage. It is funded primarily by taxes and individual contributions. The World Bank reports that health expenditures were 10.74% of GDP in 2019, or \$4,360.47 per capita [126, 127]. OOP accounted for 12.91% of spending [128].

Adult immunization in Japan

Despite a rapidly aging population, Japan remains an outlier in terms of attitudes to adult vaccination, with surveys showing

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Beijing reported 91% of residents fully vaccinated. The National Health Commission had a target of 70% vaccination for several groups, including adults, by the end of 2021.

91%





that just 4.7% of adults in Japan agreed that vaccines were important, 25.1% agreed they were safe, and 9.9% agreed they were effective – despite grappling with a flu epidemic in 2019 [129].

While vaccine uptake for pediatric routine vaccines is close to 100%, the uptake for non-pediatric vaccines remains low. NIP category B vaccination (flu and pneumococcal vaccines for elderly people) is not 100% funded, though for some populations (those over 65 and those 60-64 with chronic illness), these vaccines are free or have copayment support, depending on the local immunization schedule [130].

COVID-19: As of November 2021, Japan led the G7 nations in COVID-19 coverage, with 75.5% of the population of 126 million vaccinated [131]. Given long-standing vaccine skepticism in Japan, experts are uncertain about why COVID-19 vaccination has proved so successful. Experts believe that vaccine shortages in the early stages of the pandemic could have resulted in a sense of urgency to get the doses.

Pertussis: Japan has yet to approve the adult tetanus, diphtheria, and acellular pertussis (Tdap) vaccine, nor has it included the vaccine in its national immunization program (NIP).

Influenza: Coverage is approximately 50%. Experts believe increasing the frequency of physician recommendations might lead to increased vaccination coverage [132].

Philippines

Health system overview

Health services are delivered by government facilities under the national and local governments. The budget of the DOH, which had the lion's share of the national budget for public health services, has increased from PHP 10 billion in 2005 to PHP 123 billion in 2016. PhilHealth premiums comprised the largest line item at PHP 44 billion (36%). Various disease prevention and control programs comprise 6.5% (at PHP 8 billion) and immunization and vaccines 3.2% (PHP 4 billion) [133].

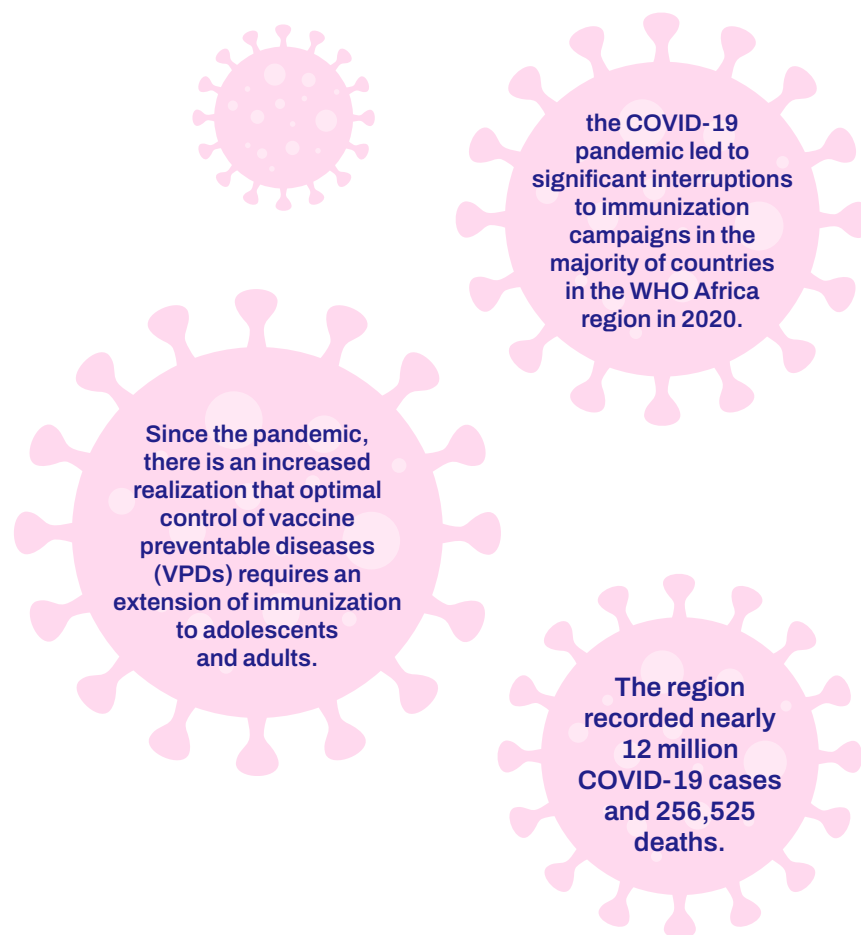
Adult immunization in the Philippines

Many Filipinos suffer from vaccine preventable diseases such as measles and diphtheria. Despite this, immunization rates in the country have fallen. The national immunization program is largely limited to basic immunization for children: BCG, HepB, Penta, HPV, MMR, IPV, Td [134].

Only three vaccines are recommended for adults: PPSV and influenza to those ≥60 years and Td to all pregnant women. No immunization coverage data are available.

COVID-19: The Philippine response to COVID-19 has been described as one of the longest and strictest lockdowns in the world. In June 2021, President Duterte threatened to jail anyone refusing to be vaccinated; in August, he said vaccine refusers should be shot; and in September that they should be detained in their homes, a policy of questionable constitutionality [135].

As of 27 October 2022, around 71.5 million people were already fully vaccinated from the COVID-19 virus in the Philippines, roughly 64.4% of the population [136]. Vaccine hesitancy is deep-rooted [137]. Many Filipinos are refusing to be jabbed with Chinese-made shots [138] and a recent poll found that fear of vaccination's side effects was a major concern [139].



Mostly focused on pregnant women [140] and data on other adult immunizations hardly exist but given that the priority area – pediatric immunization- is struggling.

This pause, coupled with related disruptions to routine immunization, led to tens of millions of children not receiving polio vaccines.

The underperformance of national immunization systems in the region is largely because of the shift in focus and resources to rolling out COVID-19 vaccination.

Most adults in Africa remain unvaccinated despite the vaccines being available.

Africa

Summary

Adult vaccination in Africa has mostly focused on pregnant women [140] and data on other adult immunizations hardly exist but given that the priority area – pediatric immunization- is struggling, it is safe to assume that the prognosis is grim unless a life course approach to immunization is adopted as a national and regional policy.

While predictions of Africa being hardest hit did not come to pass, the region recorded nearly 12 million COVID-19 cases and 256,525 deaths [141]. Member States in the African Region (Burundi, Cameroon, Central African Republic, Chad, Congo, DRC, São Tomé and Príncipe) have learned invaluable

lessons that are helping build resilient systems to secure health in the future.

Special strategies were implemented in the area of routine immunization, with seven countries implementing the “Identify, Reach, Monitor, Measure and Advocate” (IRMMA) framework for reducing the number of “zero-dose” children and missing communities [142]. Significant efforts have also been made by some African countries to introduce new vaccines such as rotavirus, Pneumococcal Conjugate Vaccines (PCVs) and, recently Human Papilloma Virus (HPV) vaccine into National Immunization Programmes (NIPs). Nine countries (Burundi, Cameroon,

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32.1 million children received the first dose of the measles vaccine, a coverage of 84%, which is below the target of 90% for all antigens. The result is a 2.5% increase in the number of under-immunized children in the Region.

32.1m



Chad, Equatorial Guinea, Gabon, São Tomé and Príncipe, Kenya, Uganda, and Zimbabwe) have recently implemented strategies for reducing the number of under-immunized children.

Despite these efforts, the COVID-19 pandemic led to significant interruptions to immunization campaigns in the majority of countries in the WHO Africa region in 2020 [37]. This pause, coupled

with related disruptions to routine immunization, led to tens of millions of children not receiving polio vaccines [143]. The region was declared polio-free in 2020 but has been threatened by the detection of wild poliovirus type 1 (WPV1) in Malawi and Mozambique in February and May 2022 respectively.

According to WHO's latest annual report [144] routine immunization

focused targets were not fully achieved. In 2021, out of a total target population of 38.4 million in the Region, 33.6 million children received the three doses of DTPCV (diphtheria, tetanus, pertussis containing vaccine), achieving coverage of 87%. Also, 32.1 million children received the first dose of the measles vaccine, a coverage of 84%, which is below the target of 90% for all antigens. The result is a 2.5% increase in the

number of under-immunized children in the Region.

The underperformance of national immunization systems in the region is largely because of the shift in focus and resources to rolling out COVID-19 vaccination. Since the pandemic, there is an increased realization that optimal control of vaccine preventable diseases (VPDs) requires an extension of immunization to adolescents and adults.

Largely, most adults in Africa remain unvaccinated despite the vaccines being available. Although there are fewer recommended routine vaccines for adults in general compared to children and adolescents, the WHO has a set of recommended vaccines for healthcare workers, who, due to the nature of their jobs, are frequently exposed to VPDs.

Nevertheless, immunization policies for adults are lacking in many African countries and more research is needed to understand how to best improve vaccine uptake in older populations.

Strategic investments to strengthen health systems are critical to support robust immunization programs that can deliver vaccines to everyone in Africa, including the elderly, a fast-growing demography.

Europe

Summary

The increase of life expectancy in Europe renders older people an important proportion of the general population and healthy aging is being increasingly incorporated into modern healthcare systems.

In 2019 persons ≥ 65 years old accounted for approximately 20% of the European population, and this is expected to increase to approximately 30% by 2050 [145]. The region has had a comprehensive adult immunization schedule, which is likely related to lesser vaccine hesitancy as well as larger acceptance for adult immunization.

A 2019 analysis of vaccination policies for adults in 42 European countries revealed that adult immunization programs for adults were in place in all countries [145].

However, there were considerable differences between countries in terms of number of vaccinations, target populations, etc. Despite the long-standing vaccination programs, large epidemics of measles, mumps, rubella, pertussis and hepatitis A occurred in Europe in the past decade, disproportionately affecting vulnerable communities like the elderly, asylum seekers, refugees and immigrants.

The coronavirus pandemic, however, exposed the weaknesses in the system.



Older people an important proportion of the general population and healthy aging is being increasingly incorporated in modern healthcare systems. In 2019 persons ≥ 65 years old accounted for approximately 20% of the European population.

A 2019 analysis of vaccination policies for adults in 42 European countries revealed that adult immunization programs for adults were in place in all countries.

Considerable differences between countries in terms of number of vaccinations, target populations etc.

All European countries have influenza vaccination policies for high-risk groups, including older adults, and most of them for residents of long-term care facilities.

144 cases of diphtheria have been reported by seven countries (Austria, France, Germany, Italy, Norway, Switzerland and the United Kingdom), many of which among asylum seekers.

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In 2019 persons ≥65 years old accounted for approximately 20% of the European population, and this is expected to increase to approximately 30% by 2050.

30%

Despite overall success in achieving high vaccination coverage rates, research studies across the Region have found examples of inequity related to immunization. For that reason, equity has been the guiding principle in all of the priority areas identified in WHO's 13th General Programme of Work, 2019–2023.

All European countries have influenza vaccination policies for high-risk groups, including older adults, and most of them for residents of long-term care facilities. This is attributed to the decade-long European Council recommendation to improve influenza vaccine uptake among older age and high-risk groups. New and underused vaccines recommended for introduction in national immunization programs include those for Haemophilus influenzae type b (Hib), human papillomavirus (HPV), pneumococcal and rotavirus.

The coronavirus pandemic, however, exposed the weaknesses in the system. While coverage rates among children have been robust, there are gaps in vaccination policies aimed at adults in several countries in the region, which provide a compatible environment for pathogens to thrive.

In 2022 an unusually large number of reported diphtheria cases - considered uncommon in the region - were submitted through the International Health Regulations (IHR) reporting mechanism. 144 cases of diphtheria have been reported by seven countries (Austria, France, Germany, Italy, Norway, Switzerland and the United Kingdom), many of which are asylum seekers [146].

We picked six nations - Denmark, Romania, United Kingdom, France, Belgium, Germany and Spain - for this analysis.



Denmark

Health system overview

In Denmark's universal, decentralized health system, Danes are entitled to publicly financed care [147]. The World Bank reports that health expenditures were 9.96% of GDP in 2019 [148], or \$6,003.33 per capita [149]. OOP accounted for 14.17% of spending [150].

Adult immunization in Denmark

Pneumococcal (PPSV23) and seasonal influenza vaccines are free and recommended for adults over age 65. No other adult vaccines are currently recommended for other adults, with the exception of COVID-19 and catch-up measles vaccine for those born outside Denmark and previously unvaccinated. COVID-19 vaccination is recommended, voluntary, and free of charge for adults over age 18. The two vaccines approved for use are Pfizer-BioNTech and Moderna. Boosters are recommended in addition to the primary series. The Danish Health Authority reports that 82.1% of eligible people have received a first dose; 78.7% have received two; and 51.2% have received three as of January 6, 2022 [151].

Pneumococcal: On 31 March 2020, the Danish government offered free PPSV23

vaccination to all persons aged 65 and above, aiming for a vaccine coverage rate of 75%. By November 2020, less than eight months after the introduction of the universal age-based vaccination program, they had achieved coverage of 59% [152]. This is a case study in scaling up adult immunization programs.

Influenza: Since 2002, seasonal influenza vaccination has been free to all adults aged 65 and older. In the 2019/2020 season, influenza vaccine coverage among those ≥65 years was only 52%. The coverage still lags far behind the 75% coverage target recommended by the WHO, which is also the vaccination target in Denmark [153].

France

Health system overview

Like other European Welfare States, France has a system of universal health care. This is largely financed by the government through a system of national health insurance [154]. According to the World Bank, France spends around 11% of the GDP on public health [155]. The proportion of GDP allocated to prevention and public health in 2015 was estimated at 0.26%, and spending for vaccines was estimated at €8 per capita and 0.21% of health expenditures [156].

MENU

Adult immunization in France

In France, about 13.4 million individuals over the age of 65 years are considered at risk for adult VPDs – a figure predicted to rise to 20 million by 2050. Despite recommended schedules and evidence on protective effects of vaccination, uptake rates are decreasing in France. Influenza vaccination rates decreased from 60% in 2010 to 46% in 2017, and pneumonia vaccination was at 20% coverage for adults [157]. Eurostat reports a five-year average influenza vaccination coverage rate for adults 65 and older of 50.7% for the period 2015-2019 [41]. Coverage rates for other vaccines are not available.

COVID-19: As of 16 October 2022, France had reported 36.22 million cumulative confirmed cases and 155,885 cumulative deaths [158].

More than 133 million doses had been administered, and 80.4% of the populace had received at least one, with 79.1% fully vaccinated [159]. The pandemic highlighted structural weaknesses of the health system as well as the need to factor in the country's policy-making apparatus, power structure, and policy dynamics while aiming to implement LCI beyond COVID-19.

Germany

Health system overview

Health insurance is mandatory in Germany [160]. Approximately 86% of the population is enrolled in statutory health insurance, which provides inpatient, outpatient, mental health, and prescription drug coverage.

The World Bank reports that health expenditures were 11.7% of GDP in 2019 [161], or \$5440.25 per capita [162]. OOP accounted for 12.82% of spending [163]. Spending on prevention and public health in 2016 was estimated at 0.07% of GDP and €16 per capita; immunization was estimated at 0.62% of overall health spending [156].

Adult immunization in Germany

In Germany, the Standing Vaccination Committee at the Robert Koch Institute (Ständige Impfkommision, STIKO) issues recommendations on vaccination to prevent the occurrence and spread of infectious diseases in the nation's population. The annually updated vaccination calendar currently includes recommendations for vaccination against diphtheria, tetanus, pertussis, type b Haemophilus influenzae, hepatitis B, poliomyelitis, and pneumococci.



The pandemic highlighted structural weaknesses of the health system as well as the need to factor in the country's policy-making apparatus, power structure, and policy dynamics while aiming to implement LCI beyond COVID-19.

Adults should have their tetanus and diphtheria vaccinations refreshed regularly and their pertussis vaccination refreshed once; from age 60 onward, they should be vaccinated against pneumococcal and influenza [164].

COVID-19: According to Our World in Data, as of 16 January 2022, there have been 8.02 million confirmed cases and 115,654 deaths in Germany. Nearly 75% of the population has received at least

1 dose of vaccine, and 72.1% are fully vaccinated [165]. Germany is reportedly planning to make vaccination mandatory for adults [166].

Influenza: Germany has adopted a risk-based influenza vaccination policy to recommend influenza vaccination in most at-risk groups, including citizens over the age of 60 years, pregnant women, healthcare workers and people with chronic medical conditions such



On 5 January 2022, Italy made vaccination mandatory for all adults over 50. As of 10 January, 75% of the population was fully vaccinated and 40% boosted [171].

75%

as diabetes, asthma, or cardiovascular disease [167]. For the five-year period 2015-2019, Eurostat reports average vaccination coverage rate for adults 60 and older of just 36.68% [41]. Data for other antigens are not readily available.

Italy

Health system overview

Italy's National Health Service (Servizio Sanitario Nazionale, or SSN) automatically covers all citizens and legal foreign residents. Public financing accounted for 74.2% of total health spending in 2018, with total government expenditures standing at 6.404% of GDP and amounting to \$2988.996 per capita [168]. The public system is financed primarily by corporate tax (18.6% in 2018) and a fixed proportion of the national value-added tax revenue (60% in 2018).

Spending on prevention and public health in 2015 was estimated at 0.37% of GDP and €5 per capita; immunization was estimated at 0.20% of overall health spending [156].

Adult immunization in Italy

In 2017, 10 vaccinations were made compulsory and free of charge for all infants and children up to age 16, though immunization remains voluntary for adults. The Italian National Immunization Plan is considered among the most advanced adult vaccination plans in Europe. However, available data indicate low adherence to vaccination recommendations [169].

Vaccination coverage data are available only for influenza; Eurostat reports small annual increases in influenza vaccination coverage rates for adults >65 over the 2015-2020 period: from 48.65% to 54.60% [41].

The Italian National Immunization Plan target for influenza vaccination is 75% at minimum and optimally 95%.

Italy was the first European country to be heavily swept by the COVID-19 pandemic and was the first to introduce stringent lockdowns. The estimated excess deaths in Lombardy, the hardest hit region in the country, reached a peak of more than 23,000 deaths, equivalent to an excess mortality of +118% compared to the average mortality rate of the period 1 January–30 April 2015–2019 [170].

Despite having one of Europe's highest vaccination rates, as of 15 October 2021, a new universal, mandatory use of the COVID-19 Green Pass was required in all remaining industries. On 5 January 2022, Italy made vaccination mandatory for all adults over 50. As of 10 January, 75% of the population was fully vaccinated and 40% boosted [171].



Romania

Health system overview

Romania has a highly centralized health care system, covering nearly 89% of the population in 2017. Reform in the Romanian health system has been both constant and yet frequently ineffective, due in part to the high degree of political instability. The Romanian population has seen increasing life expectancy and declining mortality rates, but both remain among the worst in the European Union. Public sources account for over 80% of total health financing [172, 173]. The World Bank reports that domestic government health expenditures were 5.74% of GDP in 2019 [174], or \$738.56 per capita [175]. OOP accounted for 18.88% [176].

Adult immunization in Romania

Only two vaccines are currently recommended for adults 65 and older: influenza and COVID-19.

COVID-19: As of 15 January, Our World in Data reports 1.9 million cumulative confirmed cases and a little over 59,000 deaths. As of 9 January, 42% of the population had received at least one dose, and 41.4% were fully vaccinated [32].

Influenza: Eurostat reports influenza vaccination coverage has doubled from 2014, when it was 10%, falling to 7.80% in 2016; rising to 16.10% in 2017; and hitting 20% in 2018 [41]. More recent data are not available.

Spain

Health system overview

Spain has a strong primary care, which acts as the gatekeeper of the health system. The universal national health system (Sistema Nacional de Salud, SNS) operates in 17 regions and is responsible for care provision.

The World Bank reports that health expenditures were 9.13% of GDP in 2019 [177], or \$2740.27 per capita [179]. OOP accounted for 21.81% of expenditures [178]. Spending on prevention and public health in 2014 was estimated at 0.18% of GDP and €3 per capita; immunization was estimated at 0.15% of overall health spending [156].

Adult immunization in Spain

In 2018, an expert group on adult immunization noted that there is low health care workers and public understanding of the subject, resulting in low coverage [180]. Diphtheria, Tetanus

and Pertussis are recommended for citizens over 65 years of age.

COVID-19: As of 15 January 2022, according to Our World in Data, cumulative confirmed cases amounted to 8.09 million, with nearly 2.5 million added in the December-January period.

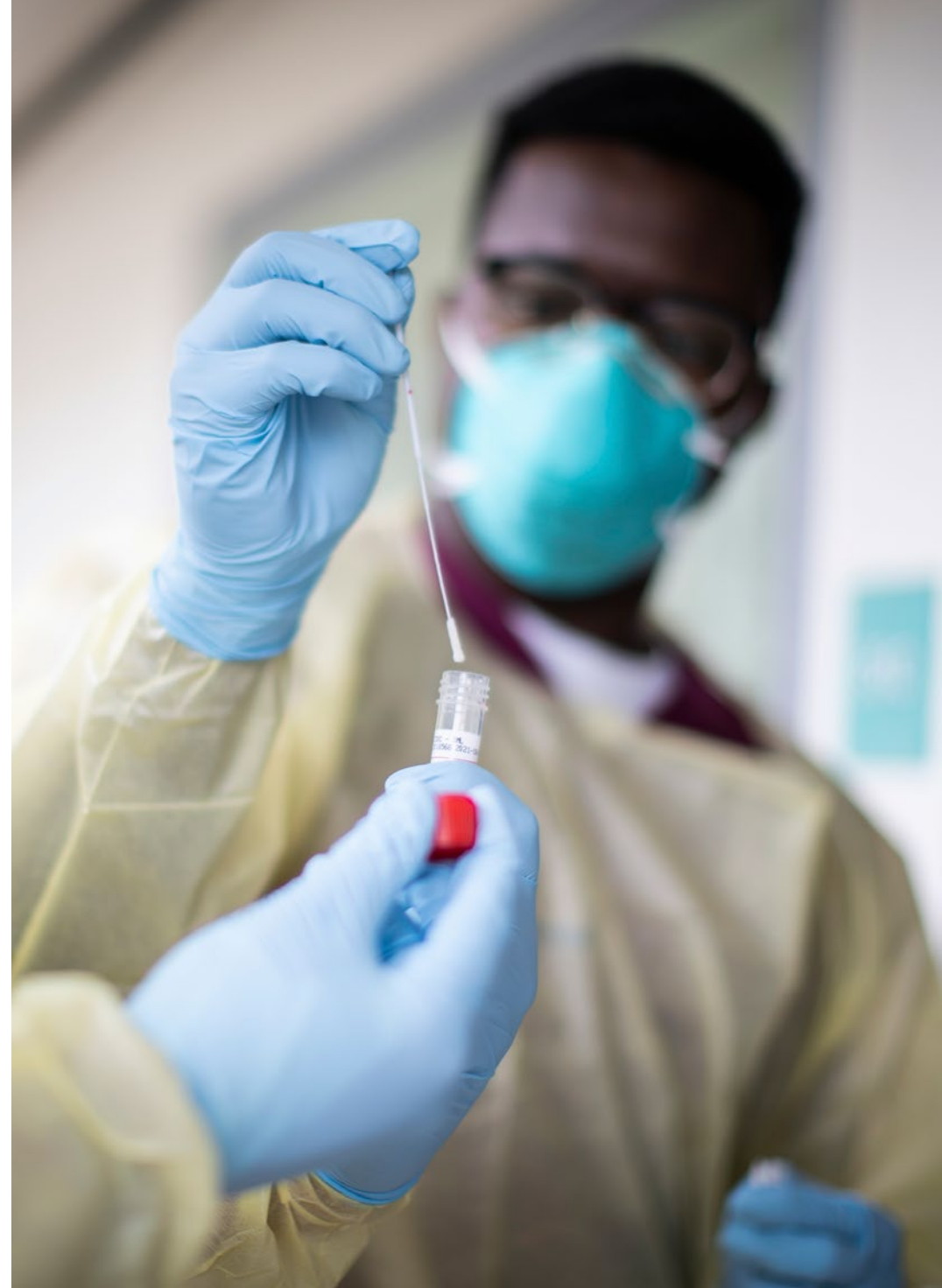
There have been nearly 91,000 confirmed deaths. As of 13 January, nearly 87 million doses had been administered; more than 86% of the population had received at least one dose, and 82% were fully vaccinated [181].

Influenza: Eurostat reports that influenza vaccination coverage for adults >65 years was 65.50% in 2020, up from 54.30% the prior year [41]. Coverage among healthcare workers is estimated at less than 40% [182].

United Kingdom

Health system overview

This health system overview includes only England, omitting the three other countries that, together with England, form the United Kingdom of Great Britain and Northern Ireland: Scotland, Wales, and Northern Ireland. However, the World Bank data are for the UK.



All English residents are entitled to free public health care through the National Health Service. The NHS is funded primarily through general taxation [183]. In 2019, the World Bank reported that health spending was 10.15% of GDP [184] or \$4312.89 per capita [185]. OOP was 17.07% of overall health expenditures [186]. Spending on prevention and public health in 2014 was estimated at 0.41% of GDP [156].

Adult immunization

The UK Green Book [187] – the national immunization guide – includes just three routine adult vaccines: pneumococcal polysaccharide vaccine (PPV) at 65 years of age; inactivated influenza vaccine at 65 and older (and for pregnant women and others based on risk); and shingles vaccine at 70.

COVID-19: All adults in the UK are now eligible for first, second and booster doses. Fourth doses as a booster have been recommended for severely immunosuppressed individuals.

According to Our World in Data, 15.18 million confirmed cases had been recorded as of 15 January 2022, and 152,021 deaths. As of the same date, 136.39 million doses had been administered, accounting for 76.4% of the population; 47.91 million are fully vaccinated [188].

Influenza: Influenza immunization has been recommended in the UK since the late 1960s. In 2010, pregnancy was added as a clinical risk category, and in October 2014 the JCVI advised that morbid obesity (defined as BMI 40+) should be considered a risk factor for seasonal influenza vaccination.

Pneumococcal [189]: PPV vaccination is recommended for adults aged 65 and over. Pneumococcal vaccines (PPV and PCV) are also recommended for people of all ages with some health conditions who are at greater risk of complications from pneumococcal disease.

Zoster vaccination [190] is recommended and offered free of charge for all people in their 70s. Adults aged 80 or over are not offered the shingles vaccine. Zoster vaccine coverage in 2021 varied across age groups: from a low of 47.9% in 71-year-olds to a high of 76.8% in 76-year-olds [191].

Belgium

Health system overview

The Belgian health system covers almost the entire population with a large range of services. The provision of care is from independent medical practice, with free choice of physician and care facility, and predominantly fee-for-service payment. Health insurance is compulsory [192].

In 2019, health expenditure was 10.66% of GDP [193] and health expenditure was US\$ 4960.39 per capita [194]. 77% is funded by the public sector. Voluntary health insurance represents 5.12% of health expenditure [192].

Patients' OOP payments were 17.63% in 2019 [195]. Official co-payments represented about 22% of patients' out-of-pocket payments in 2017.

Adult immunization in Belgium

Belgium's approach to vaccination is among the few to evolve a focus on adults. Influenza vaccination coverage in eligible persons is 59.1% [43]. Pertussis vaccine is also recommended for specific high-risk groups in Belgium. Vaccines for Diphtheria, Tetanus, Pertussis, influenza and pneumococcal diseases are recommended for adults [196].

COVID-19: Those eligible for vaccination received an invitation by post, text message, and/or email. Non-residents are eligible for vaccination if they stay in the country for more than nine months. Although vaccination uptake rose steadily through 2021, reaching more than 70% of the population fully vaccinated as of 2021, surging cases prompted the federal government to impose a vaccination mandate for HCWs starting 1 January 2022.

According to estimates, some 60,000 health workers across the country of 11.5 million people are not vaccinated against COVID-19 [197].

“

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76.4%



Eastern Mediterranean

Summary

The Eastern Mediterranean Region has seen a remarkable increase in the number of people receiving vaccines in recent years, with more vaccines introduced and more countries eliminating diseases through immunization. More than 470 million children have been vaccinated against measles through supplementary immunization activities, and several countries are making progress toward eliminating measles. The region includes a number of countries wracked by war and conflict, including Afghanistan, Sudan, Somalia, the Occupied Palestine Territory and Yemen.

Vaccine deployment in the Region has reflected regional differences in capacities and resources. High-income countries are quick to vaccinate and have better immunization infrastructures, while low-income countries are slow on the uptake. Having said that, national immunization programs in the Region

have achieved some success over the last decade. By the end of 2019, three EMR countries (Bahrain, Iran, and Oman) had achieved measles elimination. As many as 3.1 million children remain unvaccinated or under-vaccinated in the Region, and outbreaks of measles and diphtheria have been reported in some countries.

There is limited knowledge about adult vaccinations and the limited data reveals high vaccine hesitancy among adults [198]. Researchers in UAE found that for all the vaccines except pneumococcal and zoster, the recommendation rate (from physicians) decreased as the age increased.

One of the learnings from COVID-19 pandemic has been the urgency to scale up existing adult immunization infrastructures, given how many pathogens, like SARS-CoV-2 disproportionately affect older adults.

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By April 2022 [199], 42% of the Eastern Mediterranean region was fully vaccinated, despite adequate stocks.

42%

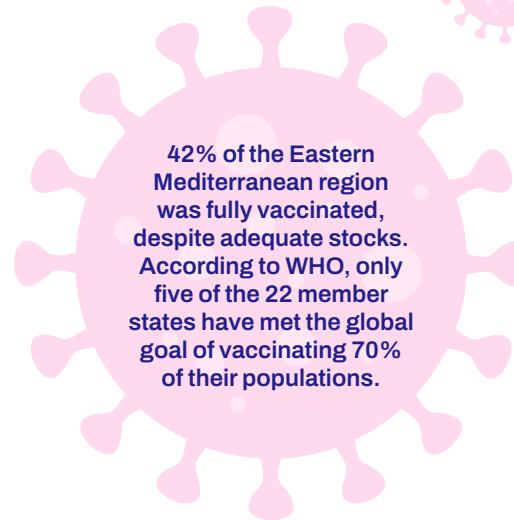




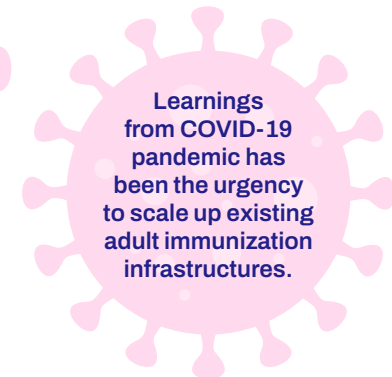
Remarkable increase in the number of people receiving vaccines in recent years, with more vaccines introduced and more countries eliminating diseases through immunization.

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Learnings from COVID-19 pandemic has been the urgency to scale up existing adult immunization infrastructures.

By April 2022 [199], 42% of the Eastern Mediterranean region was fully vaccinated, despite adequate stocks. According to WHO, only five of the 22 member states have met the global goal of vaccinating 70% of their populations. The vaccination rates vary hugely from 99% in the United Arab Emirates all the way down to 2.1% in Yemen.

To establish life-course immunization, policy frameworks need to be adapted, systems to monitor immunization in older age groups expanded, and collaborations to integrate age-appropriate vaccination into public and private health services strengthened.



By 2050, the number of people over 65 years in SEA is expected to double to over 110 million seniors.

The region was declared 'polio-free' in 2014 and achieved MNT elimination in 2016.

National routine immunization coverage data show that six countries (Bangladesh, Bhutan, Democratic People's Republic of Korea, Maldives, Sri Lanka, Thailand) have achieved and sustained $\geq 90\%$ DTP3 coverage since 2012.

South-East Asia

Summary

The South-East Asia WHO region is a region of enormous social, economic, and political diversity, both across and within nations. The throughline between these nations is that it is witnessing dramatic demographic transition, affecting the population growth rate, deaths and births. By 2050, the number of people over 65 years in SEA is expected to double to over 110 million seniors [200].

Keeping this in mind, in 2020, India launched the National Programme for the Health Care for the Elderly (NPHCE) aimed at delivering affordable and quality geriatric care at primary and secondary levels. The policy aims to develop a "Silver Economy", helping older citizens contribute meaningfully both in economic and societal terms. India has comprehensive data collection on social, economic and health conditions of the elderly as part of the Longitudinal Aging

Study of India, the first nationwide study and the world's largest study on older adults.

From a public health perspective, it is a challenge to improve elder care- the fastest growing demographic segment- and promote an LCI but the region is well-poised to build on its significant achievements in controlling and eliminating pediatric vaccine-preventable diseases. The region was declared 'polio-free' in 2014 and achieved MNT elimination in 2016. Immunization has been a priority for all nations in the region, and political commitment at the highest level has led to great progress over the past decade.

The South-East Asia Regional Vaccine Action Plan (SEARVAP) was developed in line with GVAP to expand region wide access to vaccines. National routine

immunization coverage data show that six countries (Bangladesh, Bhutan, Democratic People's Republic of Korea, Maldives, Sri Lanka, Thailand) have achieved and sustained $\geq 90\%$ DTP3 coverage since 2012 [201].

Thailand

All Thai citizens have access to comprehensive health services under public health insurance schemes [202]. Thailand's health expenditure as a share of GDP fluctuated in recent years. It has tended to increase, ending at 3.7% (or \$275.917 per capita) in 2019, as per the latest World Bank data. Out of pocket expenditures account for 8.67% of spending [203].

The NIP was introduced in 1977, and since 2005 it has consistently achieved

around 96–99% immunization coverage among Thai children. Schools provide routine immunization for HPV for girls in Grade 5 (11 years of age) and Tetanus and diphtheria or Td for both boys and girls in Grade 6 (12 years of age).

Besides pediatric and maternal immunizations, seasonal influenza for pregnant women and older citizens, the Royal College of Physicians of Thailand [204] recommend Pneumococcal vaccine, Hepatitis B and HPV vaccines.

Influenza: Free influenza vaccination is provided annually to high-risk

populations, including persons ≥ 65 years, persons with chronic illness, pregnant women, persons with obesity and children 6 months to 2 years old. The total number of people eligible for free influenza vaccination is estimated at >20 million, approximately 30% of the population.

Thailand has 76 provinces, with 9,770 primary health centers and 771 community hospitals providing secondary health services and the Bangkok Metropolitan Area, which has 68 public health centers responsible for primary care similar: 39 public hospitals and 92 private hospitals in Bangkok.

Immunization is integrated in the primary care units of all public health facilities in Thailand.

COVID-19: Thailand reported its first case of COVID-19 on 13 January 2020. According to Our World in Data [205], as of 16 January, Thailand had recorded a total of 2.31 million cases: 21,898 deaths. As of 27 December 2021, 102.68 million doses had been administered, covering 73% of the population.

Indonesia

Indonesia, a middle-income country, is also witnessing demographic and epidemiological transitions. While maternal and child health and communicable diseases persist, noncommunicable and chronic diseases are emerging as new priorities.

Health indicators in Indonesia have improved significantly over the last 30 years, but spending as a proportion of GDP remains at 3.3%. The country faces a dual burden of its incidence of NCDs and communicable diseases and the health system is made up of a mixture of public, private and not-for-profit providers.

As of 2016, despite total health spending steadily increasing by 222% over 8 years, it has remained stable at 3.3% as a proportion of GDP. Public expenditure on health, 1.4% of GDP, and

7.8% of total government expenditure in 2016 is only about half of spending in countries of similar income level (about 2.7% of GDP). The NIP is limited to basic immunization for children: hepatitis B, BCG, polio, diphtheria, pertussis, tetanus, measles, Hib, PCV and uses the pentavalent vaccine distributed by Bio Farma, the national vaccine supplier. Recommendations for adult immunization are limited to Td in women of childbearing age [206].

The Indonesian Government has allocated US\$14.9 billion to its health sector response as of September 2021. Indonesia was one of the first countries in the world to announce free COVID-19 vaccinations for its adult population. As of September 2021, the COVID-19 vaccination program expanded to include 12-17-year-olds and was administering over 1.2 million doses a day.

The World Bank cites two reasons for Indonesia's success: while the global vaccine shortage has become a major issue for other countries, Indonesia has been able to secure steady supplies and significantly increase its vaccination program through timely and decisive action. This became possible due to adequate financing as the government has committed over US\$50 billion to the health sector.

As of 10 January 2022, with nearly 43% fully vaccinated, the government started its booster campaign, with shots free to elders and those unable to pay (criteria not defined).



[MENU](#)



04

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