



Trends in Global Adult Vaccination: Impact of COVID-19

RESEARCH BRIEF



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THIS BRIEF IS BASED IN PART ON THE IQVIA SERVICES DETAILED BELOW

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This research covered the following countries:

Algeria	Finland	Malaysia	Serbia
Argentina	France	Mali	Slovakia
Australia	Gabon	Mexico	Slovenia
Austria	Germany	Morocco	South Africa
Belarus	Greece	Netherlands	Spain
Belgium	Guinea	New Zealand	Sweden
Benin	Hong Kong	Niger	Switzerland
Brazil	Hungary	Norway	Taiwan
Bulgaria	India	Pakistan	Thailand
Burkina Faso	Indonesia	Peru	Togo
Cameroon	Ireland	Philippines	Tunisia
Canada	Italy	Poland	Turkey
Chad	Ivory Coast	Portugal	UAE
Chile	Japan	Puerto Rico	UK
China	Jordan	Republic of Congo	Uruguay
Colombia	Korea	Romania	USA
Croatia	Kuwait	Russia	Vietnam
Czech	Latvia	Saudi Arabia	
Ecuador	Lebanon	Senegal	
Egypt	Luxembourg		

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Background

Vaccine-preventable diseases pose a significant public health burden

By 2030, the number of people aged 60 years and older is expected to increase by more than a third, to 1.4 billion.¹ Adult immunization is one of the most cost-effective public health preventative interventions available, accruing returns on investment at the individual, healthcare system, economic, societal and political levels. However, despite the clear benefits, vaccination coverage is almost always much lower in adults than in pediatric vaccination programs.² Maximizing the uptake of vaccines among the adult population is critical for reducing disease-associated outcomes and leads to improved health and reduced healthcare costs.^{3,4}

Vaccine-preventable diseases (VPDs) impose a significant burden on individuals, healthcare systems, and society at large, from both an economic and healthcare perspective. From an economic standpoint, VPDs result in a direct financial burden on healthcare systems through treatment costs and an indirect burden on the economy through loss of productivity, increased absenteeism, and the need for caregiving. VPDs can also have a substantial adverse impact from a healthcare perspective. Based on WHO estimates, seasonal influenza epidemics alone lead to 3–5 million hospitalizations and 290,000–650,000 deaths.⁵ In the European Union, VPDs cause an estimated 94,000 premature deaths annually^{6,7,8} with a substantial number of hospitalizations. In Australia, VPDs resulted in the loss of 15,781 years of healthy life (62 disability-adjusted life years per 100,000 population).^{9,10} VPDs also increase the risk of cardiovascular, cerebrovascular, neurological, and renal complications, adding to the burden from both an economic and healthcare perspective. Furthermore, the COVID-19 pandemic underscored the critical link between health and the economy, with more than \$11 trillion USD in costs on response and \$10 trillion in future lost earnings.¹¹ It crucially exposed vulnerabilities within the older adult population. Simultaneously, the rapid development, implementation, and uptake of COVID-19 vaccines, resulting in over 72% of the world's population receiving a dose, facilitated socioeconomic recovery and demonstrated prevention can be prioritized if all stakeholders work together.

Given this context, understanding the current status of adult vaccination in terms of uptake, as well as assessing the impact of COVID-19, is crucial for ensuring that appropriate policies, vaccine registries and protocol, and education campaigns are put in place to rebuild and improve coverage rates. This report aims to provide a baseline of adult vaccination trends and missed vaccination doses during the COVID-19 pandemic while assessing variations by countries and regions.

Global adult vaccines

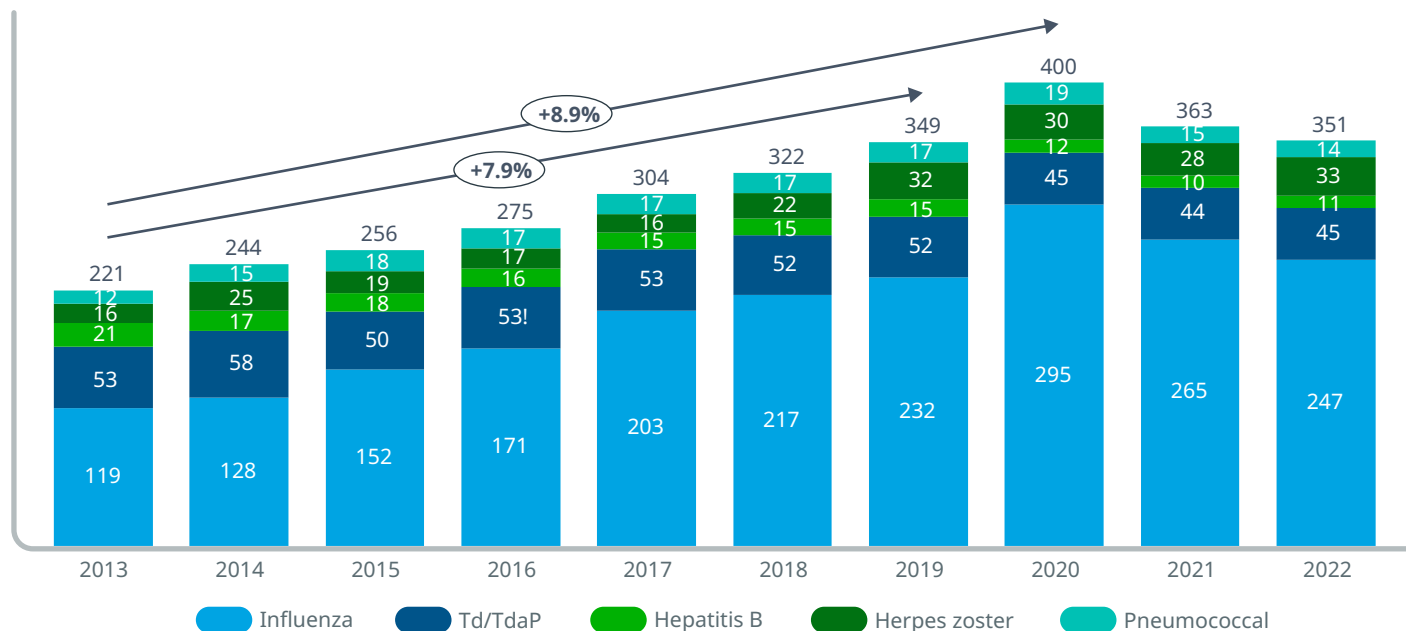
POSITIVE DEVELOPMENTS IN ADULT VACCINATION OVER THE PAST DECADE HAVE BEEN HINDERED BY THE COVID-19 PANDEMIC, COMPOUNDING ALREADY LOW UPTAKE

Over the last decade, adult vaccines (in terms of volume of use) for influenza, diphtheria and tetanus (Td), diphtheria, tetanus and pertussis (Tdap), hepatitis B, herpes zoster and pneumococcal have witnessed continual progress, reaching a peak of ~400Mn doses in 2020 with historical CAGR (compound annual growth rate) of 7.9% between 2013 and 2019 and a CAGR of 8.9%, including 2020. This measurement of adult vaccine doses is based on IQVIA MIDAS data, which serves as a proxy for adult vaccination coverage as real time adult vaccine coverage data is highly variable by country and oftentimes very limited. MIDAS provides a directional view on trends in vaccine coverage globally.

While the progress in adult vaccination between 2013 and 2019 is commendable, overall levels of vaccine coverage for adults have still remained low, which suggests that there is a need for further improvements.^{12,13,14,15}

Additionally, despite these developments in adult vaccination, the growth in vaccine doses associated with these diseases for the adult population has been adversely impacted by the COVID-19 pandemic. The overall doses for these vaccines reduced by 12% between 2020 and 2022, from 400Mn doses to 351Mn (Exhibit 1). The 363Mn doses in 2021 and 351Mn doses in 2022 represent 16.2 doses per 100 adults globally, which is in sharp contrast to the 132 COVID-19 vaccine doses received per 100 people by end of 2022 for the completion of the primary series, excluding boosters.¹⁶ Please note the COVID-19 vaccine doses per 100 people represents the entire population (including children), the doses per 100 adults is likely to be higher as the vaccination coverage rates in most countries was higher for adults.¹⁷

Exhibit 1: Global adult vaccination doses, 2013–2022



Source: IQVIA MIDAS®, June 2023; CDC (Influenza Vaccination Coverage, Children 6 months through 17 years, United States); UK Government (Vaccination coverage for children and mothers).

Notes: Adult vaccinations includes influenza; diphtheria and tetanus (Td); diphtheria, tetanus and pertussis (Tdap); hepatitis B; herpes zoster and pneumococcal. Diphtheria, tetanus and pertussis vaccinations in combination with polio or hepatitis B are not included. A 75:25% adult: pediatric split for influenza and 1/3:2/3 split for pneumococcal has been applied in accordance with available adult and pediatric coverage (UK and US). Only hepatitis B doses of 1mL or larger were assumed for adult use.

Includes retail and non-retail from 76 countries covered by IQVIA MIDAS panels. These may not cover all vaccination delivery channels in each country.

Estimated missed doses

~100MN (RANGE: 80-119MN) DOSES ARE ESTIMATED TO HAVE BEEN MISSED IN 2021 AND 2022

The trends in vaccine doses for adults prior to the COVID-19 vaccination have been utilized to model the expected doses if the positive developments in vaccine uptake had continued. This modelling exercise provides two scenarios (Exhibit 2):

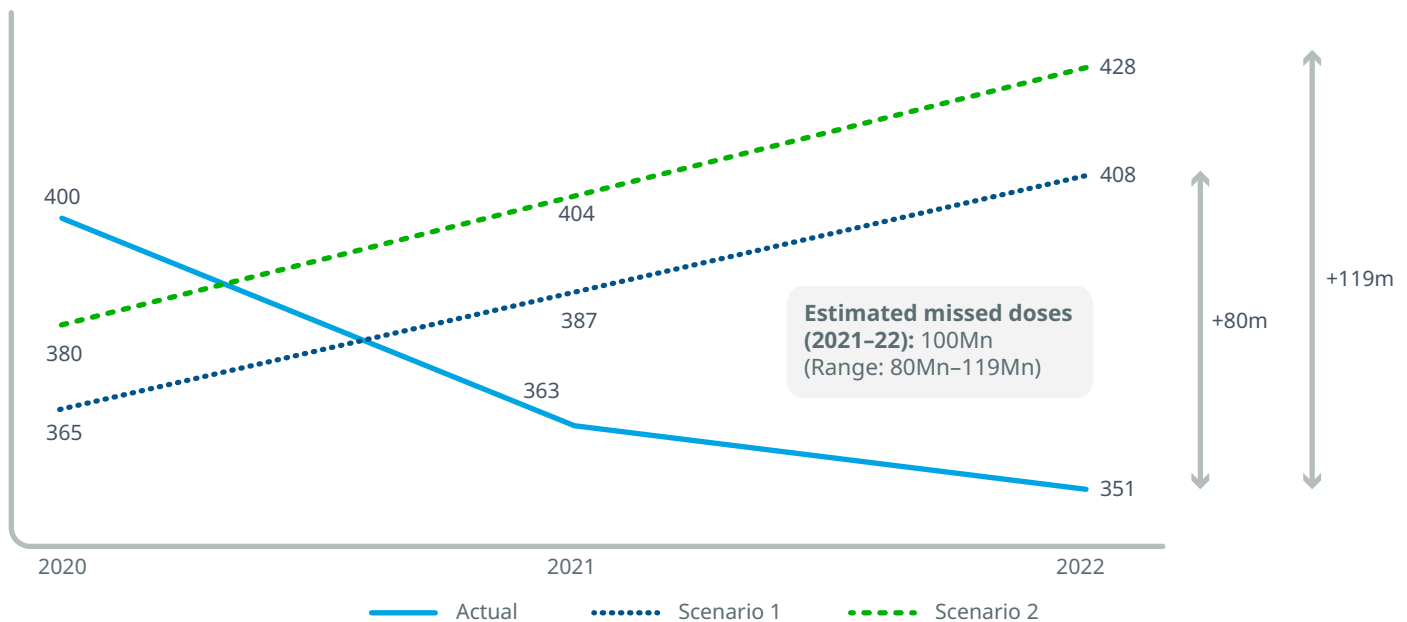
Scenario 1: This scenario uses the historical data trendline for the pre-pandemic period (2013-19). This period had a CAGR of 7.9% and extends the trendline up to 2022. The trendline smooths variations in the overall historical trend for the selected period (2013-19). The difference between the projected trendline for 2021 and 2022 and actual doses is 24Mn doses in 2021 and

57Mn doses in 2022, giving a total of 81Mn estimated missed doses of adult vaccines (Tdap, herpes zoster, hepatitis B, influenza and pneumococcal).

Scenario 2: This scenario uses the historical data trend line for 2013 to 2020. This period had a CAGR of 8.9% and extends the trendline to 2022. The trendline smooths variations in the overall historical trend for the selected period (2013-20). The difference between the projected trendline and actual doses is 41Mn doses in 2021 and 77Mn doses in 2022, giving a total of 119Mn estimated missed doses of adult vaccines.

The mid-point of these two scenarios gives an estimated 100Mn missed doses for the two years.

Exhibit 2: Estimated adult vaccine missed doses in 2021 and 2022



Source: IQVIA MIDAS®, June 2023; CDC (Influenza Vaccination Coverage, Children 6 months through 17 years, United States); UK Government (Vaccination coverage for children and mothers).

Notes: Adult vaccinations includes influenza; diphtheria and tetanus (Td); diphtheria, tetanus and pertussis (Tdap); hepatitis B; herpes zoster and pneumococcal. Diphtheria, tetanus and pertussis vaccinations in combination with polio or hepatitis B are not included. A 75:25% adult:pediatric split for influenza and 1/3:2/3 split for pneumococcal has been applied in accordance with available adult and pediatric coverage (UK and US). Only hepatitis B doses of 1mL or larger were assumed for adult use.

Scenario 1 and 2 are developed from trendlines from 2013 to 2019 or 2020, respectively. Includes retail and non-retail from 76 countries covered by IQVIA MIDAS panels. These may not cover all vaccination delivery channels in each country.

WHILE IMMUNIZATION RATES FOR ADULT VACCINES ARE LOW ACROSS COUNTRIES GLOBALLY, THE PANDEMIC HAD A DISPROPORTIONATELY NEGATIVE IMPACT ON ADULT VACCINE DOSES IN COUNTRIES THAT ARE IN THE MEDIUM OR LOW CATEGORY ON THE HUMAN DEVELOPMENT INDEX

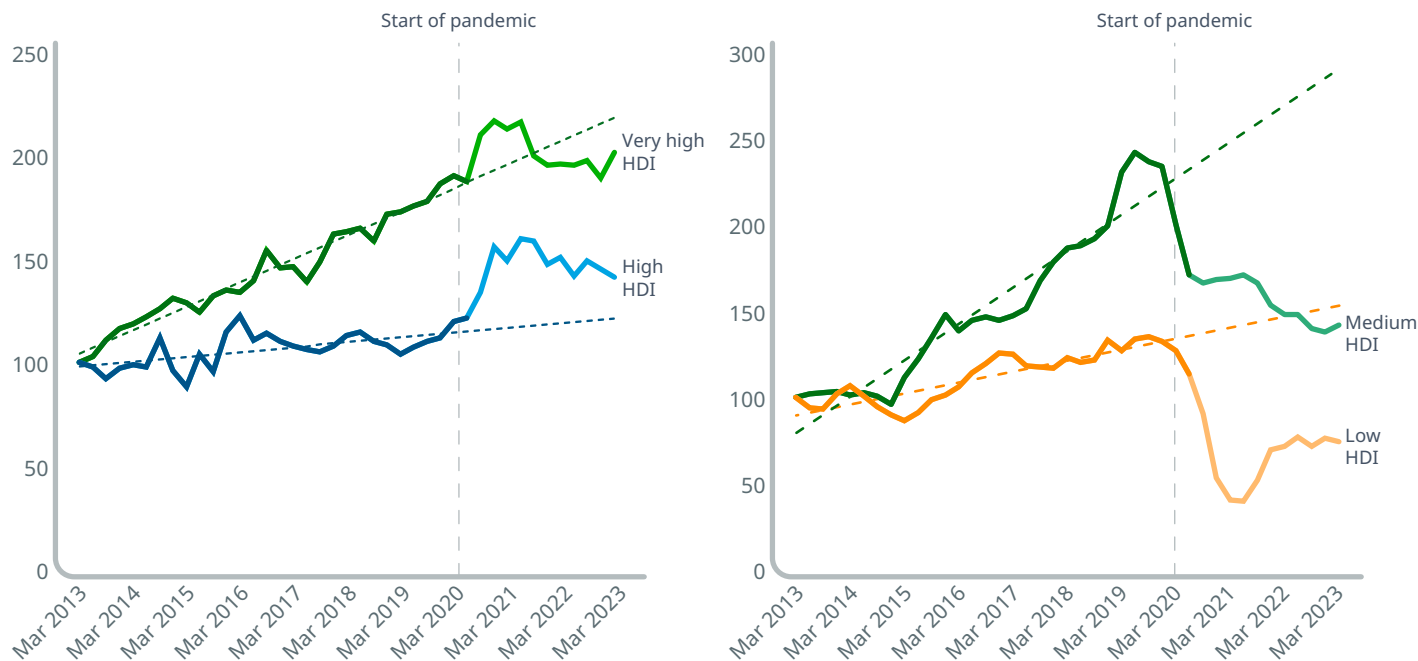
Clear differences emerge when adult vaccination trends in countries at different levels of human development are considered. The Human Development Index (HDI) is a composite measure that considers life expectancy, education and per capita income.¹⁸ Countries at the top end of the HDI scale, “Very High” HDI, (e.g. USA, most of Europe, Japan and others), had been trending the most positively in vaccine volumes prior to the pandemic, with the volume peaking in 2020–2021, after which they saw a decline and are in the process of recovering. Despite this positive trend prior to the pandemic, it is important to note that all countries continue to have sub-optimal vaccine coverage rates for adults and that

there is a need for attention toward increasing adult immunization globally. As examples, Tdap and Herpes Zoster vaccination coverage is between 21% and 40% in USA and Canada while influenza vaccination coverage in these countries is between 41% and 60%.^{12,13,14,15}

“High” HDI countries (e.g. China, Mexico, Brazil) had experienced only a modest increase in adult vaccine volume in the 2000s, and after the pandemic, adult vaccination doses saw an increase, largely driven by additional influenza vaccination doses in China due to updates to their influenza vaccination guidelines and out of season influenza epidemics,^{19,20} and have continued to remain above the pre-pandemic trend.

“Medium” level (e.g. India, Morocco, Philippines) and “Low” HDI countries (e.g. Pakistan, Senegal, Togo) witnessed substantial declines in adult vaccine volume and have not recovered with vaccination doses remaining well below the historic trendlines.

Exhibit 3: Adult vaccination trends for very high/high/medium/low human development index countries



Source: IQVIA MIDAS®, June 2023; CDC (Influenza Vaccination Coverage, Children 6 months through 17 years, United States); UK Government (Vaccination coverage for children and mothers); UNDP (Human Development Index).
 Notes: Adult vaccinations includes influenza; diphtheria and tetanus (Td); diphtheria, tetanus and pertussis (Tdap); hepatitis B; herpes zoster and pneumococcal. Diphtheria, tetanus and pertussis vaccinations in combination with polio or hepatitis B are not included. A 75:25% adult:pediatric split for influenza and 1/3:2/3 split for pneumococcal has been applied in accordance with available adult and pediatric coverage (UK and US). Only hepatitis B doses of 1mL or larger were assumed for adult use.
 Includes retail and non-retail from 76 countries covered by IQVIA MIDAS panels. These may not cover all vaccination delivery channels in each country. Periods shown are rolling 12 months to reduce volatility. Countries are assigned to Human Development Index categories and values are indexed to rolling 12 months to March 2013 to allow comparison.

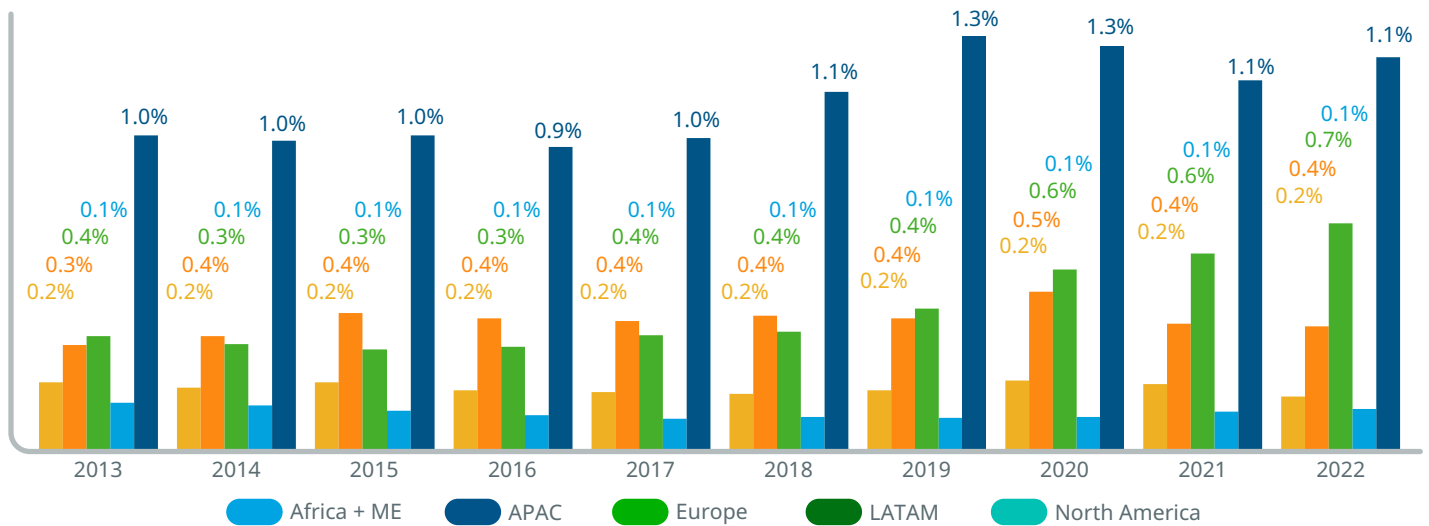
Adult vaccine spending

ADULT VACCINATION EXPENDITURE IS A LOW PROPORTION OF OVERALL PHARMACEUTICAL EXPENDITURE AND VARIES SUBSTANTIALLY ACROSS COUNTRIES AND REGIONS

Spend on adult vaccines represents a minor share of the wider pharmaceutical expenditure on drugs and vaccines. Even in the most developed regions (Exhibit 5), adult vaccine spend only amounts to less than 2% of total pharmaceutical expenditure. Over time, there has been

a moderate increase of 0.2–0.5 percentage points in this proportion in Europe and North America; however, in other countries and regions, the proportion is much lower, ranging between 0.1% to 0.5% (Exhibits 4 and 5). This suggests that there may be a greater need for focus and potential investment in adult vaccination, particularly in developing countries that are witnessing the fastest increase in adult populations.

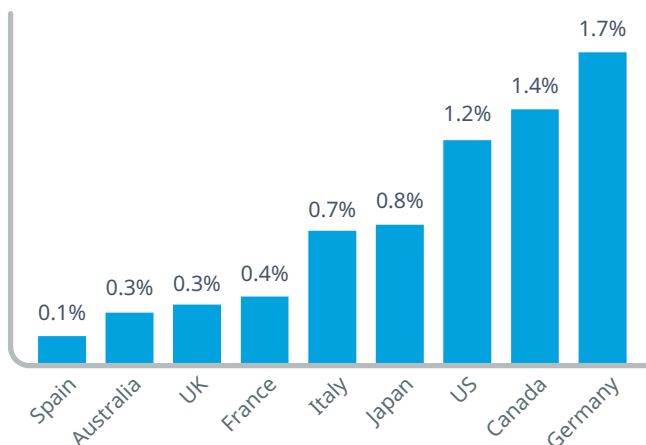
Exhibit 4: Adult vaccination spend as a share of total pharmaceutical expenditure by region



Source: IQVIA MIDAS®, June 2023; CDC (Influenza Vaccination Coverage, Children 6 months through 17 years, United States); UK Government (Vaccination coverage for children and mothers)

Notes: Adult vaccinations includes influenza; diphtheria and tetanus (Td); diphtheria, tetanus and pertussis (TDaP); hepatitis B; herpes zoster and pneumococcal. Diphtheria, tetanus and pertussis vaccinations in combination with polio or hepatitis B are not included. A 75:25% adult:pediatric split for influenza and 1/3:2/3 split for pneumococcal has been applied in accordance with available adult and pediatric coverage (UK and US). Only hepatitis B doses of 1mL or larger were assumed for adult use. Includes retail and non-retail from 76 countries covered by IQVIA MIDAS panels. These may not cover all vaccination delivery channels in each country.

Exhibit 5: Adult vaccination spend as a share of total pharmaceutical expenditure by selected countries



Source: IQVIA MIDAS®, June 2023; CDC (Influenza Vaccination Coverage, Children 6 months through 17 years, United States); UK Government (Vaccination coverage for children and mothers)

Notes: Adult vaccinations includes influenza; diphtheria and tetanus (Td); diphtheria, tetanus and pertussis (TDaP); hepatitis B; herpes zoster and pneumococcal. Diphtheria, tetanus and pertussis vaccinations in combination with polio or hepatitis B are not included. A 75:25% adult:pediatric split for influenza and 1/3:2/3 split for pneumococcal has been applied in accordance with available adult and pediatric coverage (UK and US). Only hepatitis B doses of 1mL or larger were assumed for adult use. Data period is 12 months to March 2023. Comparison is made with all registered pharmaceutical sales, including retail and non-retail channels. These may not cover all vaccination delivery channels in each country. The total pharmaceutical spend is captured through sales from the IQVIA MIDAS data panels (and extrapolated) of registered pharmaceutical products. These could be purchased out of pocket, reimbursed at different levels or covered by any other means of payment.

Conclusion and policy considerations

Older adults constitute a growing proportion of the global population. People aged 50 and above are increasingly susceptible to infectious diseases due to age-related declines in immunity and live with a higher risk of comorbidities. Vaccination against common vaccine-preventable diseases has been shown to dramatically improve health and quality of life for adults around the world and, in some cases, reduce the risk of hospitalization by half and death by a third.²¹

The benefits of vaccination go beyond the prevention of acute disease to avoiding long-term consequences such as resulting co-morbidities, ill health and reducing the incidence of chronic disease complications such as diabetes, respiratory illness, and heart failure, which can be costly. As such, adult immunization not only prevents diseases, hospitalizations and premature deaths, but also provides a wider individual and societal, economic benefit. Consequently, more than 80% of the vaccines in development target adults.²²

Vaccination can also support the fight against antimicrobial resistance (AMR). Approximately 700,000 people die globally each year from AMR-related causes. Without action, by 2050, this could increase to 10 million.²³ Prevention of bacterial and viral infectious diseases through the use of vaccines can reduce the consumption of antibiotics and slow the level of AMR.²⁴ This is a particularly crucial aspect of vaccines, as AMR can have large impacts on the health and economic well-being of a region.

Adult vaccines can also have broader knock-on effects as they can relieve pressure on hospitals, physicians, and long-term care systems by preventing diseases, thereby leading to more efficient use of constrained resources.

However, as demonstrated earlier, adult vaccination constitutes a minor share of overall pharmaceutical spending, especially in less developed areas which have been witnessing the highest growth in adult populations.

Additionally, any disruption to immunization services poses a threat to progress made to reduce the burden of VPDs, as was the case during the COVID-19 pandemic where ~80-120 million vaccination doses for adults in 2021 and 2022 are estimated to have been missed.

Furthermore, disparities in vaccine uptake or access persist among different ethnic groups and socio-economic classes across and within countries, but information on the extent of these disparities is limited. In fact, basic reporting on vaccination coverage for adults is not commonplace. Future efforts regarding adult vaccination should aim to improve this reporting as this will allow for more evidence-based policy. The results shown in this research brief further highlight the need for continuous monitoring of adult vaccination rates.

Additionally, while this research analyzes the missed doses in 2021 and 2022, further research on reasons behind this adverse impact is needed. Missed adult vaccinations during COVID-19 also need greater visibility and more in-depth analysis in terms of the impact to the system for direct health conditions such as shingles, flu or pneumonia, as well as related issues such as cardiovascular disease that increase with the prevalence of such conditions as flu.

Although there is some evidence of recovery in certain regions, adult immunization coverage was sub-optimal prior to COVID-19 and has seen further decline during the pandemic. There is an urgent need for action to ensure that the adult vaccination trajectory is further enhanced through continued prioritization and investments to chart a new course for healthier, more resilient societies across the globe. COVID-19 reinforced the power of immunization and demonstrated that high uptake can be achieved in adults. This momentum should be maintained to strengthen the public health value of vaccination.

With new adult vaccines becoming available which aim to address unmet medical needs and avoid unnecessary healthcare spending, increasing adult immunization coverage and enhancing policies that optimize ease of access will be crucial.

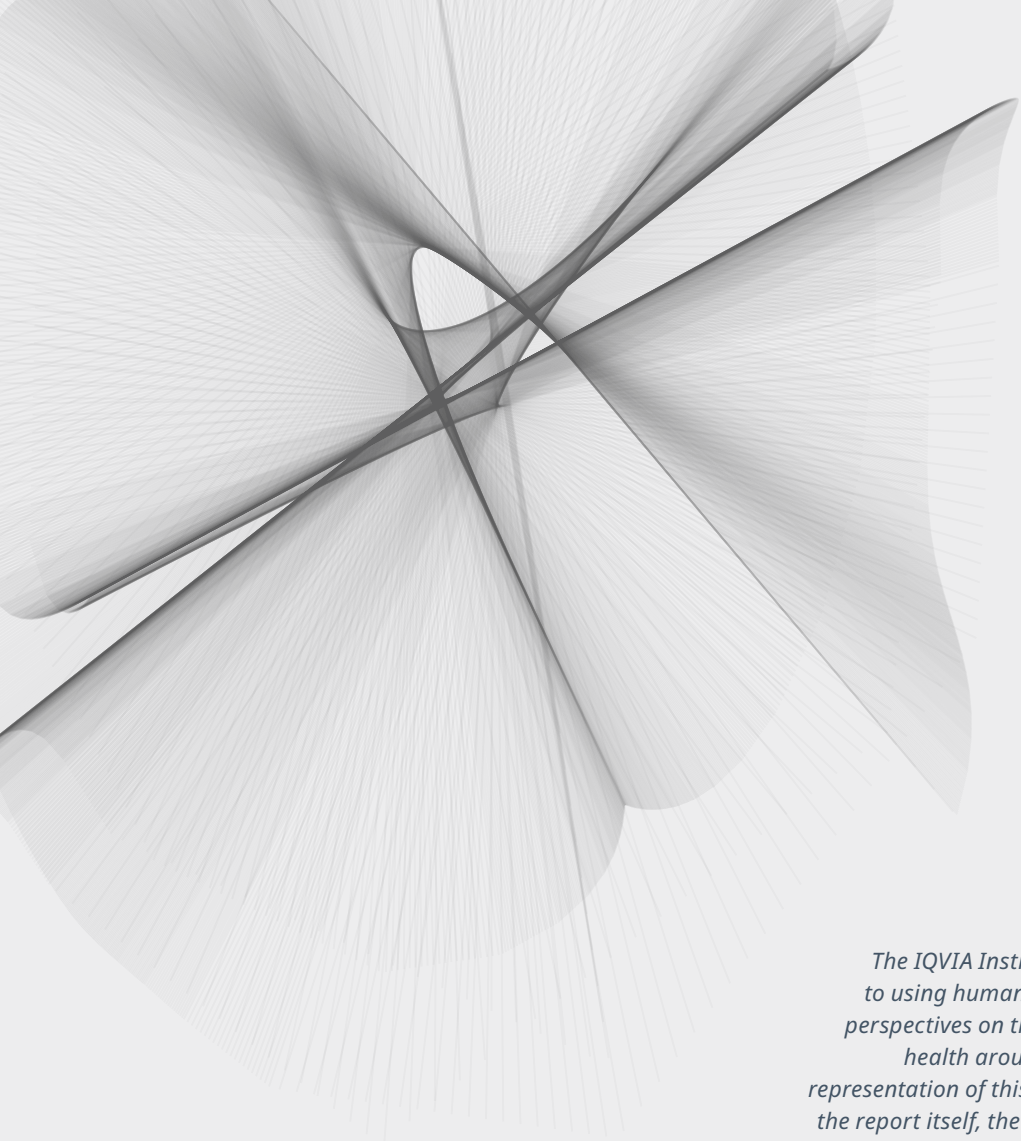
The following approaches may support optimization of adult vaccination globally and capitalize on the substantial progress made during COVID-19 to raise awareness of adult vaccination and deploy policies to realize high vaccine uptake:

- **Make adult immunization a standard of care**, including prioritization of timely national immunization technical advisory groups' (NITAGs) recommendations as science and new technologies address unmet medical need (e.g., RSV). Ensure adequate funding to implement equitable and accessible vaccination programs with a greater emphasis on prevention. Operationalize the adult vaccination calendar by improving clarity and simplifying timing of receiving vaccines over the year to limit missed opportunities.
- **Increase the number of vaccinators**, expanding beyond doctors and medical clinics (e.g, pharmacists), creating additional access points to improve health equity. As demonstrated by the COVID-19 pandemic, ease of access and convenience plays an important role to reach the adult population equitably, and pharmacists are instrumental providers.²⁵ Laws and regulations that ease the ability of pharmacists to immunize patients are important for ensuring that they continue to provide access to a broad set of vaccines.
- **Capture and report vaccination data** to track progress and enable follow-up. Capture and analyze data for prioritization and allocation of funding and improve digital data availability infrastructure nationally and regionally. Track the completion of vaccine series to meet the efficacy potential of vaccines.
- **Encourage, support and incentivize HCPs** to routinely and proactively initiate vaccination conversations with patients, increase vaccine acceptance, and turn vaccines into vaccination.
- **Raise media and public awareness** on the consequences of infectious diseases and the value of adult immunization, including partnering with professional bodies. Highlight that adult vaccination is valuable for not only older adults but also society as a whole. Prevention should be communicated as a tool of positive impact for health systems and societies overall.

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The IQVIA Institute for Human Data Science is committed to using human data science to provide timely, fact-based perspectives on the dynamics of health systems and human health around the world. The cover artwork is a visual representation of this mission. Using algorithms and data from the report itself, the final image presents a new perspective on the complexity, beauty and mathematics of human data science and the insights within the pages. The artwork on this research brief cover is based on the total doses of vaccines for adult populations dispensed globally between 2013 and 2022.



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