OHE

A COMPARATIVE ANALYSIS

Analysing Global Immunisation Expenditure

CONTRACT RESEARCH REPORT
APRIL 2025

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Executive Summary

Immunisation programmes are foundational to public health. Organised by health authorities, they systematically deliver vaccines to susceptible populations to prevent the spread of infectious diseases. They are a safe and cost-effective strategy to save lives and reduce long-term health care costs, while also providing broader societal economic impacts. The latter impact has been most clearly demonstrated by COVID-19 vaccination programmes, which facilitated the easing of stay-at-home measures, enabling economic recovery and the reintroduction of social and workplace activities.

Despite their proven societal and economic benefits, funding for immunisation programmes remains disproportionately low and vulnerable to economic shocks. As a form of prevention, immunisation helps stop diseases before they occur, complementing other preventative measures such as health education and early disease detection (e.g. screening). As such, funding immunisation requires making investment decisions today to secure potentially large long-term benefits.

To inform related decision-making processes, this summary outlines key findings, trends, and actionable recommendations based on an analysis of prevention and immunisation spending as well as vaccine-preventable health outcomes and coverage over the period of 2016 to 2022 across ten countries (Australia, Brazil, Canada, France, Germany, Italy, Japan, Mexico, South Korea and the United Kingdom).

Key Findings

Low spending on immunisation contrasts with the value of immunisation

Immunisation expenditure averages only 0.08% of GDP among analysed countries. This is low compared to healthcare spending, with mean immunisation expenditure being just 0.3% and 0.7% of overall health care expenditure during the period 2016-2019 and 2020-22, respectively. Funding for immunisation is often among the first to be cut during economic downturns, jeopardising public health resilience.

COVID-19 temporarily boosted immunisation budgets, with some countries quadrupling their spending between 2016-19 and 2020-22. However, this was in response to a global health emergency and is not indicative of future investment into immunisation.

The level of spending on immunisation is at odds with the evidence regarding the value of immunisation. This analysis shows that a $100 per capita increase in immunisation spending (prior to 2020) correlates with three fewer vaccine-preventable deaths per 100,000 people. The evidence in this report supports the growing evidence base that investment in vaccination programmes is a highly valuable healthcare policy intervention. Previous research showed that adult immunisation programmes can deliver up to 19 times their cost in societal value, underscoring their economic efficiency and welfare creating potential (El-Banhawi et al., 2023).

Nevertheless, gaps in coverage persist. This report monitored coverage rates for three key programmes with comprehensive data reporting (adult influenza, adolescent HPV and child measles). Many countries in the analysis do not achieve the WHO's 95% target for childhood measles, 90% for HPV, or 75% for adult influenza vaccines. Variation in vaccine coverage and programme availability exists, with adult immunisation in particular remaining underfunded and

underreported. Many other key programmes do not regularly report and publish data on coverage, both for adult programmes (such as COVID-19, pneumococcal and herpes zoster) and adolescent programmes (such as meningococcal).

Data gaps hinder effective policy-making and monitoring

Data on immunisation spending by age group and programme is limited, and coverage data for adult vaccines, such as COVID-19, pneumococcal, herpes zoster, and influenza, is also suboptimal. Among these, influenza has the most comprehensive reporting. These data gaps obscure areas of high-need and opportunities for improvement.

Policy Recommendations

Prioritise valuable immunisation programmes: We call on Governments to re-assess whether their national immunisation budgets are adequate to unlock the full value potential of a life-course immunisation approach. Increasing the overall share of immunisation spending as a proportion of healthcare spending and of GDP should actively be considered.

Increase and stabilise funding: We recommend that Governments review approaches to increase and protect budgets for prevention and immunisation.

- Strategic approaches should be explored to increase immunisation funding in absolute and relative terms. A novel prevention investment standard could address the comparative underfunding of vaccination.
- Prevention budgets must also be sustained to ensure consistent and adequate financing. Establishing dedicated prevention funds can safeguard immunisation programmes from economic fluctuations.

Enhance programme effectiveness: The effectiveness of programme delivery plays a crucial role in its success where public resources are constrained. Policymakers should review how vaccines are delivered to help improve coverage rates and deliver a more efficient programme, recognising that different approaches may be needed for adult, adolescent, and child programmes.

- Expanding vaccination options, including administration in pharmacies, could improve access, better meet population needs, and reduce pressure on other primary care services.
- Integrating vaccination into routine health care services, such as annual check-ups or chronic disease management, can improve accessibility and uptake.
- Adopting digital health tools, including electronic vaccination records and reminder systems, can streamline programme delivery and enhance data accuracy.

Improve data collection and reporting: Improved data collection is required to identify and enable focus on areas requiring additional support and resources, in particular for adult vaccination programmes, to maximise the health and broader economic impact.

- Health systems should report disaggregated data on immunisation expenditure by adult, adolescent, and paediatric, as well as by vaccine type, to enable targeted resource allocation.
- Enhanced morbidity and mortality tracking related to vaccine-preventable diseases can provide a more comprehensive picture of immunisation programme's impact.

Conclusion: By addressing funding gaps, implementing data-driven strategies, and promoting equitable access, healthcare and finance policymakers can build resilient healthcare systems that deliver long-term health and economic benefits. Immunisation is not only an effective health care intervention but a strategic investment in national prosperity and biosecurity. Further research is needed to evaluate the appropriate levels of funding required which reflect the value of immunisation.

Glossary

Acronym	Term
BCG	Bacillus Calmette-Guérin vaccine (for tuberculosis)
C19	COVID-19 vaccine
Den	Dengue vaccine
Dip	Diptheria vaccine
DTP3	3rd dose of diptheria, tetanus and pertussis vaccine
Flu	Influenza vaccine
GDP	Gross domestic product
Hep A	Hepatitis A vaccine
Hep B	Hepatitis B vaccine
HIB	Haemophilus influenza type B vaccine
HPV	Human papillomavirus vaccine
HZ	Herpes zoster vaccine
IHME	Institute for Health Metrics and Evaluation
JE	Japanese encephalitis vaccine
MCV2	Second dose of the Measles-Containing Vaccine (MCV)
Me	Measles vaccine
Men	Meningococcal (Men ACWY or B) vaccine
Mu	Mumps vaccine
OECD	Organisation for Economic Co-operation and Development
PCV	Pneumococcal vaccine
PCV3	3rd dose of pneumococcal containing vaccine
Pert	Pertussis vaccine
Pol	Polio vaccine
Rab	Rabies vaccine
RSV	Respiratory syncytial virus vaccine
Ru	Rubella vaccine
RV	Rotavirus vaccine
Tet	Tetanus vaccine
Typh	Typhoid vaccine
Var	Varicella vaccine
WHO	World Health Organisation
YF	Yellow fever vaccine

Definitions

Term	Definition
Immunisation programme	Public health initiatives designed to deliver vaccines to susceptible populations, protecting populations from vaccine-preventable diseases.
Prevention programme	Activities designed to avoid disease and identify risk factors, including health education, early disease detection and immunisation programmes.
Prevention Investment standard	A framework establishing spending plans on preventative health measures, which could require health systems to identify current prevention expenditure and commit to growing it faster than their overall budget to address historical underinvestment.
International Classification of Health Accounts (ICHA)	An internationally recognised system for healthcare expenditure categorisation designed by the OCED for standardised reporting.
ICHA Code HC.HTOT	The ICHA code representing total healthcare expenditure.
ICHA Code HC.6	The ICHA code representing preventative care expenditure.
ICHA Code HC.6.2	The ICHA code representing immunisation programmes.
EPI (Expanded Programme on Immunisation)	WHO's first major vaccination initiative launched in 1974 to provide universal access to all important vaccines for all children.
GVAP (Global Vaccine Action Plan)	A WHO vaccine framework adopted by the World Health Assembly in 2012. This ran until 2020 and was replaced by IA2030.
IA2030 (Immunisation Agenda 2030)	A WHO framework with a focus on a life course approach to immunisation, and specific vaccination coverage targets, including 90% coverage for DTP3 (child), MCV2 (child), HPV (adolescent) and PCV3 (adult) vaccines.
Vaccine-Preventable Mortality	Deaths from diseases that could have been prevented through vaccination. For data presented in the results of this report, these include influenza, respiratory tuberculosis, tetanus, diphtheria, measles, cervical cancer, and whooping cough.
Life-Course Approach to Immunisation	A vaccination strategy that addresses the health needs of individuals at all stages of life, from childhood through adolescence to adulthood and older age.
NIP (National Immunisation Programme)	Country-specific schedules of recommended or required vaccines provided through public health services.
Absenteeism	Missing work due to illness.
Presenteeism	Working while unwell, resulting in reduced productivity.
Vaccine hesitancy	Reluctance or refusal of vaccination despite availability.

1 Introduction

1.1 Background

Immunisation programmes are a cornerstone of public health initiatives. They offer an effective and efficient strategy to prevent the spread of infectious diseases and reduce morbidity and mortality. The most recent example is the implementation of cost-effective and often cost-saving COVID-19 vaccination programmes (Utami et al., 2023), which facilitated the easing of stay-at-home measures, enabling economic recovery and the reintroduction of social and workplace activities. Evidence shows that, in general, prevention is 3-4 times more cost effective than treatment, and immunisation programmes can return up to 19 times their cost in societal value (Hampson et al., 2023; El-Banhawi et al., 2023). However, despite their established public health value, immunisation funding is suboptimal and under disproportionate pressure.

Allocation of funds to prevention activities, including immunisation programmes, is a small fraction of overall health spending. Immunisation programmes are structured public health initiatives designed to systematically deliver vaccines to susceptible populations, protecting individuals and communities from vaccine-preventable diseases. While immunisation is a key component of disease prevention, spending in this area also includes measures such as health education and early disease detection (e.g. screening) (OECD, Eurostat and World Health Organization, 2017). In OECD countries, on average less than 3% of health spending is allocated to prevention, and in that only 9% of that goes to immunisation (Gmeinder, Morgan and Mueller, 2017). Historical data shows that prevention budgets, especially those dedicated to immunisation are more at risk of funding cuts following economic shocks than other parts of the health budget. They grow at relatively slower rates and face increasing competition both within and outside of the health care sector (Ethgen, Baron-Papillon and Cornier, 2016; Faivre et al., 2021).

Sustainable immunisation funding is essential for continuous immunisation-related activities to achieve and maintain high coverage rates, as only then will the public health impacts be realised. These impacts extend beyond preventing short-term disease outbreaks to reducing the burden of vaccine preventable cancers and chronic disease in adults (WHO, 2022; Sáfadi, 2022; NHS England, 2023).

Current funding levels may prevent important vaccination coverage targets from being met. The WHO has set vaccination targets since 1974 with the launch of the Expanded Programme on Immunisation (EPI). Over time new WHO frameworks have been implemented such as the Global Vaccine Action Plan (GVAP) and most recently the Immunisation Agenda 2030 (IA2030) (Shattock et al., 2024). Limited progress has been made towards the coverage targets set out in these initiatives.

Only 11 countries reached the GVAP targets of 90% coverage in routine childhood immunisations in 2019 (Galles et al., 2021). In 2020 GVAP was replaced by the IA2030 which focusses on a life-course approach to immunisation, including targets relevant for adult immunisation programmes. A 90% coverage target was set for DTP3 (3rd dose of diptheria, tetanus and pertussis vaccine), MCV2 (Second dose of the Measles-Containing Vaccine) , HPV (Human papillomavirus vaccine) and PCV3 (3rd dose of pneumococcal containing vaccine) (WHO, 2021) but in 2023, the global average coverage across these indicators was 73% (Momentum, IACG and USAID, 2024). Country specific data is available for the WHO European region and shows no country here met the region-specific coverage target set for MCV2 (95%), HPV (90%) and adult flu (75%) (WHO Regional Office for Europe, 2024). Despite the inclusion of adult vaccination programmes in IA2030, these are often deprioritized by the WHO and national health care systems compared to childhood immunisation efforts. Strategies for adult vaccination programmes suffer from disinterest, poor prioritisation and a lack of infrastructure (Doherty et al., 2024). One-third of WHO member states did not have a seasonal influenza vaccination policy as of December 2022 (Goldin et al., 2024).

Recognising these challenges, evidence-based policymaking depends on understanding changing immunisation spending patterns and their impact on health care delivery and health outcomes. This report presents a quantitative analysis of immunisation expenditure and outcomes across multiple countries. The findings offer policymakers actionable insights to enhance current vaccine delivery systems while ensuring capacity for future innovations. In addition, the report highlights key levers to strengthen immunisation delivery and support the development of resilient, sustainable programmes.

1.2 Outline

We conducted a comparative analysis of immunisation expenditure and related health indicators across ten countries: Australia, Brazil, Canada, France, Germany, Italy, Japan, Mexico, South Korea and the United Kingdom. These countries were selected to provide a diverse representation of high and upper-middle income economies with varying healthcare systems, geographical distribution, and population sizes, whilst ensuring sufficient data availability for meaningful comparative analysis. Data were collected and analysed for the period 2016-2023, subject to data availability. Data was also initially collected for Spain but was not reliably reported and therefore excluded from the report.

The main objectives were:

1. To describe the relationship between immunisation spending and national economic indicators over time.
2. To examine the associations between prevention and immunisation spending and health outcomes, specifically vaccine-preventable mortality rates.
3. To analyse how spending on immunisation compares with the number of programmes delivered and their coverage.

In **Section 1**, we describe trends in immunisation spending, national economic indicators, and health outcomes across the selected countries, identifying key correlations and patterns in the data.

Section 2 examines insights from specific country contexts, referencing detailed scorecards provided in Appendix A.

Finally, **Section 3** summarises the key findings; outlines the key features of effective immunisation programmes regardless of national context; and provides actionable opportunities for improvement to immunisation delivery and vaccine-preventable outcomes globally.

2 Data

This section outlines the data sources for the analyses, including definitions and notes on data collection.

Expenditure

Expenditure data was sourced primarily from OECD statistics, with national sources used when OECD data was unavailable (Table 1).

TABLE 1: EXPENDITURE DATA SOURCE LIST

Indicator	Country	Source
Health expenditure	All countries	(OECD, 2024)
Prevention expenditure	All countries	(OECD, 2024)
Immunisation expenditure	Brazil, Germany, France Korea, Mexico, UK	(OECD, 2024)
Immunisation expenditure	Japan	(Ministry of Health, Labour and Welfare, 2022)
Immunisation expenditure	Australia	(WHO, 2014)
COVID-19 vaccination expenditure	Italy	(OsMed, 2024)
COVID-19 vaccination expenditure	Canada	(IQVIA, 2023)

All sources reported expenditure using the International Classification of Health Accounts (ICHA) codes. The ICHA is an internationally recognised system for health care expenditure categorisation designed by the OECD. We used the following codes listed in Table 2 to represent different levels of expenditure. The full ICHA framework can be found in Appendix B.

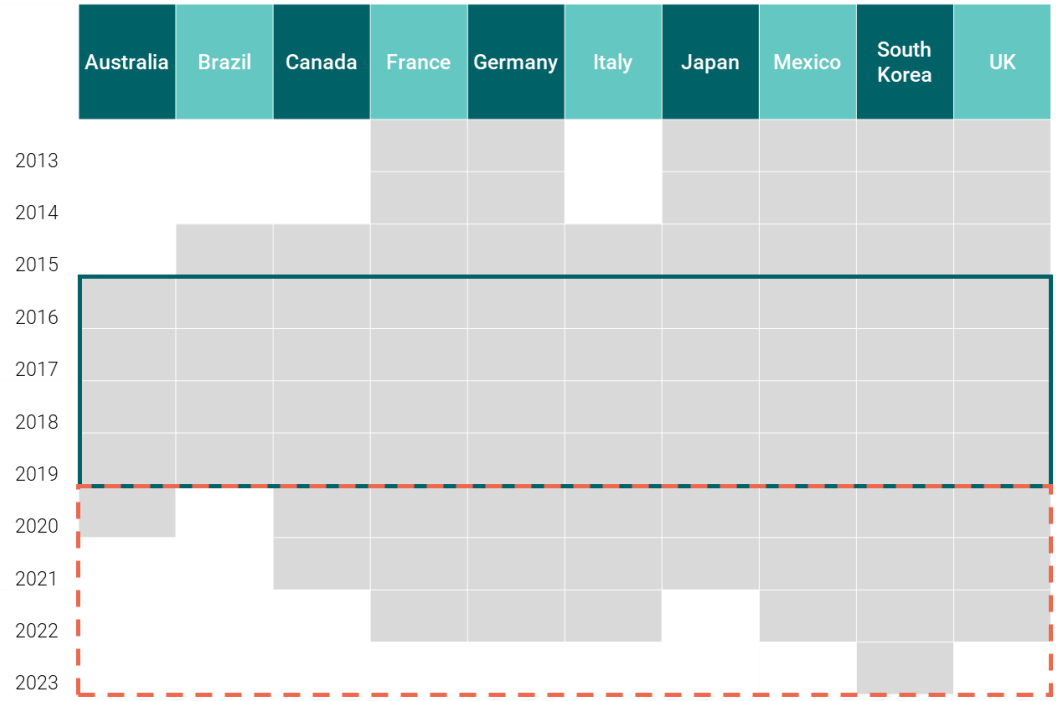
TABLE 2: INTERNATION CLASSIFICATION OF HEALTH ACCOUNTS

Indicator	ICHA Code
Total health care expenditure	HTOT: Total health care
Prevention expenditure	HC.6: Preventive care
Immunisation expenditure	HC6.2: Immunisation programmes

Notes: HC.6.2 immunisation programmes refers to the purchase of the vaccine itself and the cost of administration. It does not include emergency vaccine funding such as that for the COVID-19 vaccine (until it was integrated into the national immunisation programme). Where expenditure on COVID-19 vaccination was reported separately, it was added to the immunisation expenditure figures from HC6.2.

Figure 1 outlines the data availability for immunisation expenditure across all countries in our analysis. The time period 2016 – 2019 (highlighted in green) represents the largest period common to all countries in the dataset. Six countries had immunisation expenditure data up to 2022, and South Korea was the only country with data collected up to 2023 (highlighted in orange). Expenditure data beyond the emergency phase of COVID-19 are still emerging, so were not available for all countries. We included them in country specific analyses where available.

FIGURE 1: IMMUNISATION EXPENDITURE DATA AVAILABILITY



Notes: Grey cells = data available. Green highlighted box = time period 2016-2019. Orange dashed highlighted box = time period 2020-2023.

Mortality rates

All-cause mortality and vaccine-preventable mortality rates were sourced from WHO statistics (WHO, 2024b).

Vaccine-preventable deaths were estimated for a set of vaccine preventable illnesses based on the International Classification of Diseases (ICD-10) codes. The diseases included influenza, respiratory tuberculosis, tetanus, diphtheria, measles, cervical cancer and whooping cough.

Estimates of vaccine-preventable morbidity as published by the IHME were not available for use due to legal data restrictions over commercial use of the data.

Vaccination coverage

Vaccination coverage was obtained from WHO statistics (WHO, 2024a) and included measles vaccine second dose (MCV2) in children, adolescent HPV and adult influenza. These vaccines were used as indicators of a life-course approach by the WHO European region, based on the global IA2030, to evaluate the strength of immunisation programmes across different age groups (WHO Regional Office for Europe, 2024). Additionally, among adult and adolescent programmes, coverage data was the most comprehensively reported for HPV and influenza respectively, which was an important factor when choosing European indicators over the global indicators (see Appendix C).

Vaccination schedules

The most recent published vaccination schedule was found for each country from reputable sources such as their Ministry of Health or partnership entities delivering the national immunisation

programme including the Brazilian Immunisation Society and Japanese Paediatric Society. Country specific sources are listed in Table 3.

TABLE 3: IMMUNISATION SCHEDULE SOURCE LIST

Country	Source
Australia	(Department of Health and Aged Care, 2024)
Brazil	(SBIM, 2024)
Canada	(Public Health Agency of Canada, 2007)
France	(Ministère de la santé et de l'accès aux soins, 2024)
Germany	(STIKO, 2025)
Italy	(EpiCentro, 2023)
Japan	(NIID, 2023)
Mexico	(Ministry of Health, 2024)
South Korea	(Immunisation Control Division, 2024)
UK	(UKHSA, 2025)

Additional recommendations from national vaccine advisory bodies that have yet to be implemented via the national schedules were excluded from our analysis. Voluntary, catch-up and travel vaccines were also excluded. In Appendix B, we highlighted country rankings in terms of the number of programmes delivered.

Currency conversions

All expenditure data was adjusted for inflation in the local currency and converted to US$ (2023) using the official exchange rate. Expenditure data is presented as an interpretable measure of a country's expenditure.

As a robustness check, we repeated the analyses of the correlations in Section 3.3 using Purchasing Power Parity (PPP) adjusted expenditure, reported in international dollars (Int$, 2023). PPP accounts for different price levels across countries, so better represents the real health care resources of a government, but is less intuitive to interpret than US $.

3 Cross-country trends and relationships

3.1 Section aims and methods

This section provides an overview of the immunisation funding landscape in the selected countries, highlighting how spending has evolved over time and varies between nations.

We analysed trends primarily in immunisation expenditure, and additionally prevention expenditure, both per capita and as a percentage of GDP. We explored associations with economic and health outcomes such as GDP, overall mortality, and vaccine-preventable mortality. This report presents descriptive results graphically. Strength of relationships were evaluated by the Pearson correlation coefficient and regression analysis.

The section includes (1) a breakdown of expenditure trends over time, and (2) a comparison of key indicators between countries.

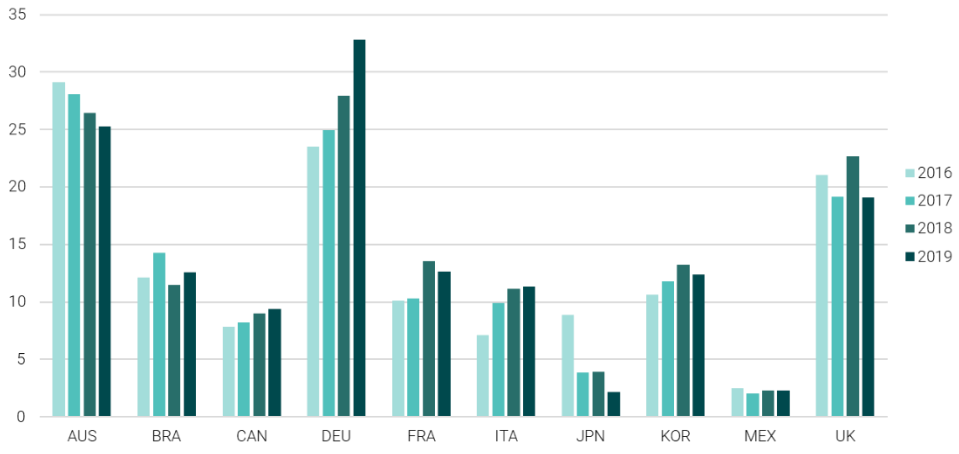
3.2 Breakdown of expenditure trends over time

3.2.1 What were the trends in immunisation expenditure in the years prior to the emergency phase of COVID-19 (2016-2019)?

Figure 2 shows observed trends in immunisation expenditure in the four years prior to the emergency phase of COVID-19. Average immunisation spending ranged from $2.3 to $27.3 per capita. Expenditure per capita was trending upwards in Canada, Germany, France, Italy and Korea. In Australia and Japan, immunisation expenditure was trending downwards.

Brazil, the UK and Mexico exhibited negligible changes in investment decisions in the years prior to COVID-19 (<1.5% annual change relative to average expenditure).

FIGURE 2: IMMUNISATION EXPENDITURE PER CAPITA (US$) 2016-2019



	AUS	BRA	CAN	DEU	FRA	ITA	JPN	KOR	MEX	UK
Annual average change in expenditure (US$)	-1.30	-0.16	0.53	3.09	1.07	1.38	-2.01	0.66	-0.02	-0.23
Annual % change relative to average	-4.77%	-1.26%	6.16%	11.31%	9.18%	13.93%	-42.82%	-5.54%	-0.93%	-1.15%

Notes: The value highlighted in green boxes on the figure indicates average expenditure 2016-2019. The annual average change in expenditure takes each year-on-year change and averages across all changes. The annual % change relative to average expresses this average change relative to the overall average spending amount.

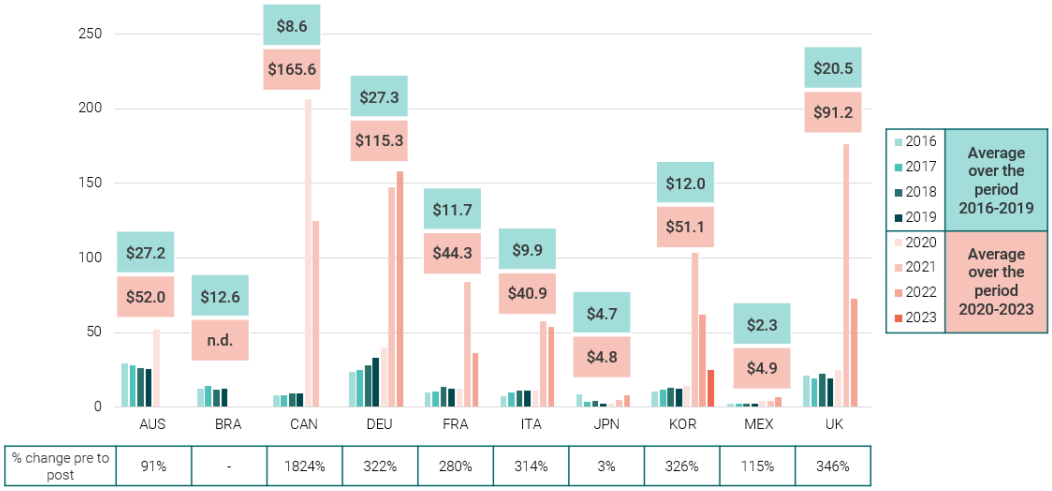
Source: Authors' analysis from references in Table 1

3.2.2 How did different countries respond in immunisation expenditure with the onset of COVID-19 (2020-2023)?

As expected, increases in immunisation spending were seen in many countries during the COVID-19 emergency phase, from 2020 onwards (Figure 3) - albeit with markedly different changes. By far the largest increase in 2020-2023 compared to the pre-COVID-19 period (2016-2019) was seen in Canada (1824% increase). The UK (346%), South Korea (326%), Germany (322%) and Italy (314%) showed similarly large increases in spending in response to the pandemic. A moderate increase in per capita spending on immunisation was seen in Mexico (115%), Australia (90.0%) and Japan (2.8%).

With the exception of Germany and Mexico, there was a year-on-year decline in expenditure per capita observed from 2021 onwards. The data are yet to show how this trend will develop.

FIGURE 3: IMMUNISATION EXPENDITURE PER CAPITA (US$) 2016-2023



Notes: n.d.= no data. All expenditure figures are adjusted to 2022 prices in the local currency and converted to US$ using the official exchange rate. The value highlighted in the green box for each country is average expenditure 2016-2019. The value in the pink box is average expenditure 2020-2023.

Source: Authors' analysis from references in Table 1

3.2.3 What does expressing expenditure as a % of GDP tell us about the relative priority of immunisation services?

Analysing immunisation expenditure as a % of the country's total wealth (Figure 4) revealed two main findings. First, the relative level of spending is very low for all countries. No country spent more than 0.4% of GDP on immunisation in any year across the period, and average spending for all countries was 0.08% of GDP. By comparison, the average spending on Defence in the EU in 2022 was 16 times higher (1.3% of GDP) (Eurostat, 2025). In 2019, the WHO encouraged that countries must spend at least 1% more of GDP on primary health care to address glaring coverage gaps (Lindmeier, 2019).

Second, the relative priorities are inflated for certain countries when expressed relative to their GDP, due to lower GDP levels. Though lower in absolute expenditure levels per capita, Brazil and South Korea spent among the highest between 2016-2019 as a percentage of GDP.

FIGURE 4: IMMUNISATION EXPENDITURE PER CAPITA AS A % OF GDP 2016-2023

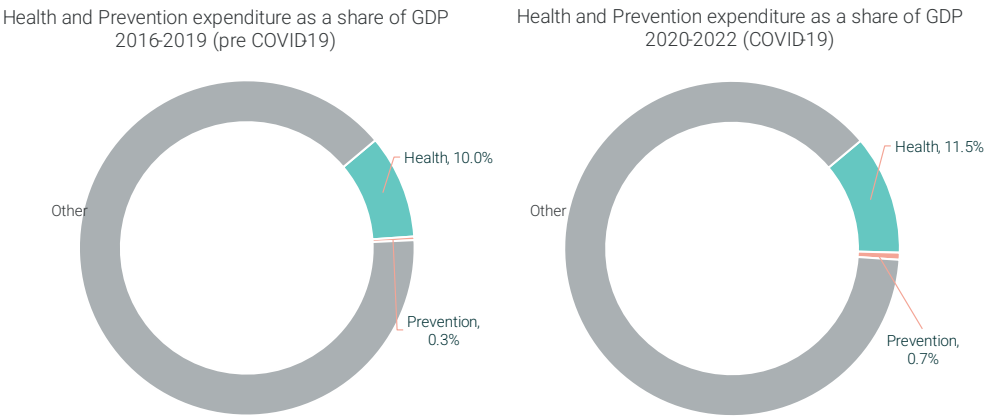
Notes: n.d.= no data. All expenditure figures are adjusted to 2022 prices in the local currency and converted to US$ using the official exchange rate. The value highlighted in the green box for each country is average expenditure 2016-2019. The value in the pink box is average expenditure 2020-2023

Source: Authors' analysis from references in Table 1

3.2.4 How has the breakdown in prevention spending changed?

Figure 5 illustrates that, during the pandemic, both the size of the overall share of GDP on health and the allocation of prevention within that increased. The share of GDP on expenditure on health and prevention increased from 10% to 11.5% and 0.3% to 0.7%, respectively.

FIGURE 5: HEALTH AND PREVENTION EXPENDITURE AS A SHARE OF GDP

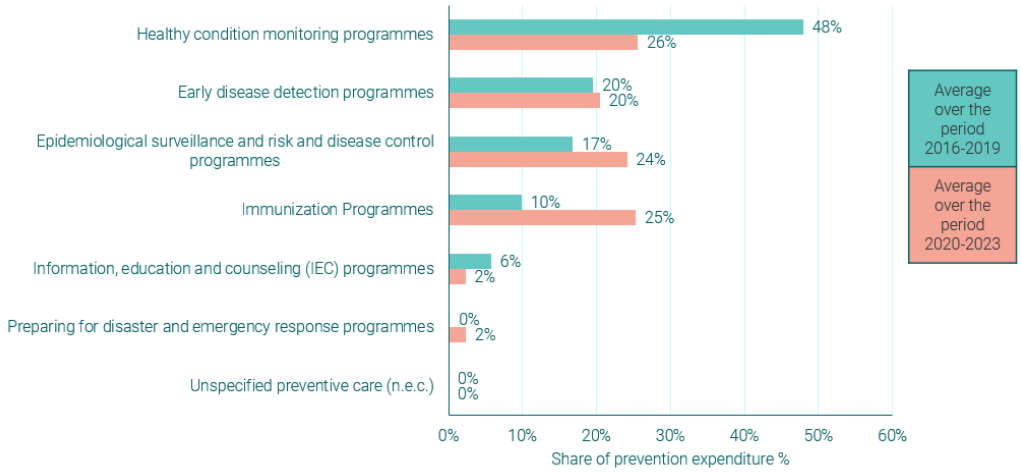


Notes: The chart depicts the percentage of GDP expenditure on health and prevention on average across all countries, the blue represents health (including prevention) and the orange prevention. The grey represents all other spending.

Source: Authors' analysis from references in Table 1

During the pandemic, the programmes for immunisation and epidemiological surveillance received a greater share of budget allocations to prevention programmes (Figure 6). The increased combined share of budgets (22%) was offset by a decrease in healthy condition monitoring programmes. Disease detection programmes maintained a 20% share of prevention budgets.

FIGURE 6: SHARE OF PREVENTION EXPENDITURE BY PROGRAMME TYPE



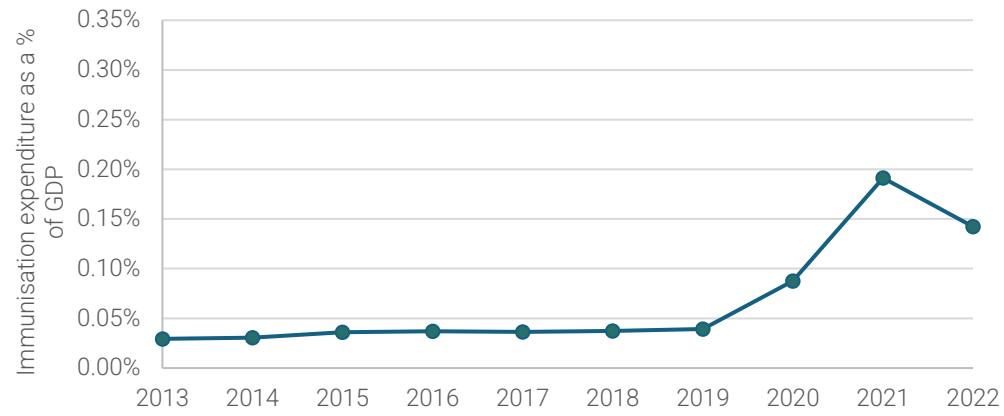
Notes: n.e.c=Not Elsewhere Classified.

Source: Authors' analysis from references in Table 1

3.2.5 As countries adjust their immunisation budgets post-COVID-19, what will be the "new normal?"

Average expenditure on immunisation relative to GDP increased during the emergency phase of COVID-19 (2020 and 2021), followed by a subsequent decrease in 2022 (Figure 7). It is as yet unknown what level it will reach. Most countries have an age and risk-based programme for COVID-19 vaccinations which should entail additional expenditure, however, coverage may be linked to affordability or may impact on other programmes.

FIGURE 7: AVERAGE IMMUNISATION EXPENDITURE AS A % OF GDP ACROSS ALL COUNTRIES



Source: Authors' analysis from references in Table 1

3.3 Comparison of key indicators between countries

In this section we compare immunisation and prevention expenditure to key indicators across countries. Data sources are outlined in Section 2.

3.3.1 Do wealthier countries spend more on prevention and immunisation?

Figure 8 shows that before the COVID-19 pandemic, wealthier countries (measured by GDP) tended to spend more on prevention per person. This is quantified by a Pearson correlation coefficient of 0.73, which suggests a fairly strong positive relationship between a country's wealth and its spending on prevention. For context, Pearson correlations can range from -1 to 1, where 1 means a perfect positive relationship, -1 means a perfect negative relationship, and 0 means no relationship at all.

FIGURE 8: PREVENTION EXPENDITURE COMPARED TO GDP (2019)

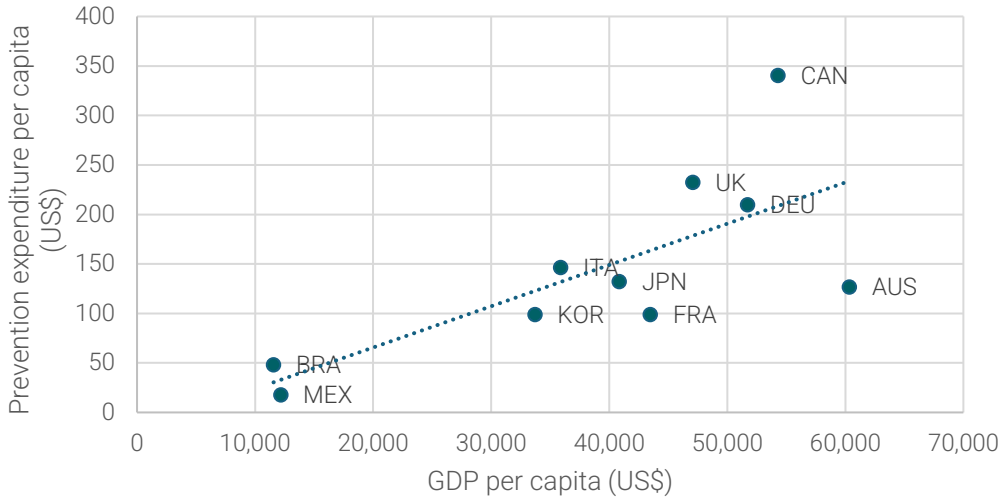
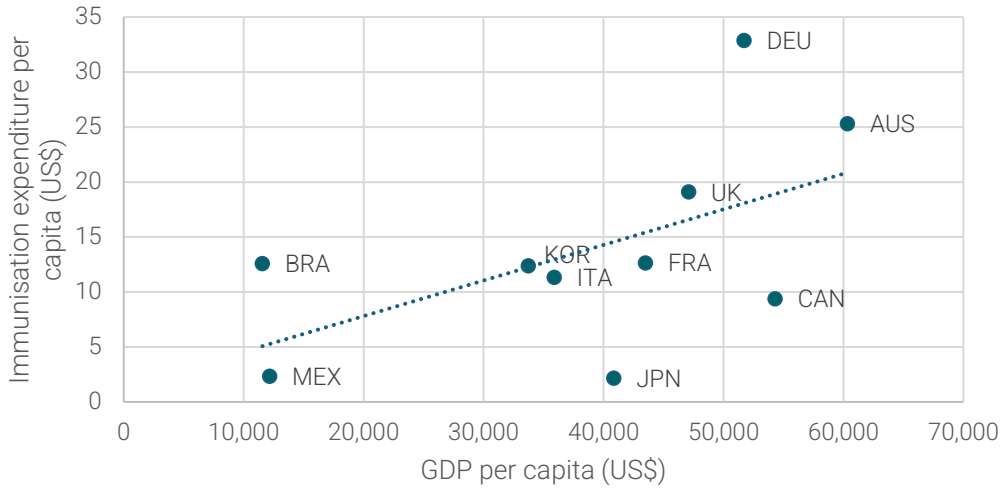


Figure 9 shows that wealthier countries also spent more on immunisation per capita, though this relationship is weaker than for prevention expenditure (Pearson correlation coefficient 0.56).

Canada and Japan tended to spend relatively more on prevention than immunisation. Conversely, Germany, Australia and Brazil spent relatively more on immunisation.

This positive association suggests a correlation between national wealth, health care investment, and prioritisation of preventative measures.

FIGURE 9: IMMUNISATION EXPENDITURE COMPARED TO GDP (2019)



A robustness check using expenditure adjusted for PPP shows a positive, but slightly weaker correlation between immunisation and prevention expenditure and GDP in 2019, compared to Figures 8 and 9 (Appendix D).

3.3.2 Do countries that spend more on prevention and immunisation have lower mortality?

Figure 10 shows that countries which spent more on prevention services typically reported lower mortality rates from diseases such as influenza, respiratory tuberculosis, tetanus, diphtheria, measles, cervical cancer and whooping cough (Pearson correlation coefficient -0.43).

FIGURE 10: PREVENTION EXPENDITURE COMPARED TO VACCINE-PREVENTABLE DEATHS (2019)

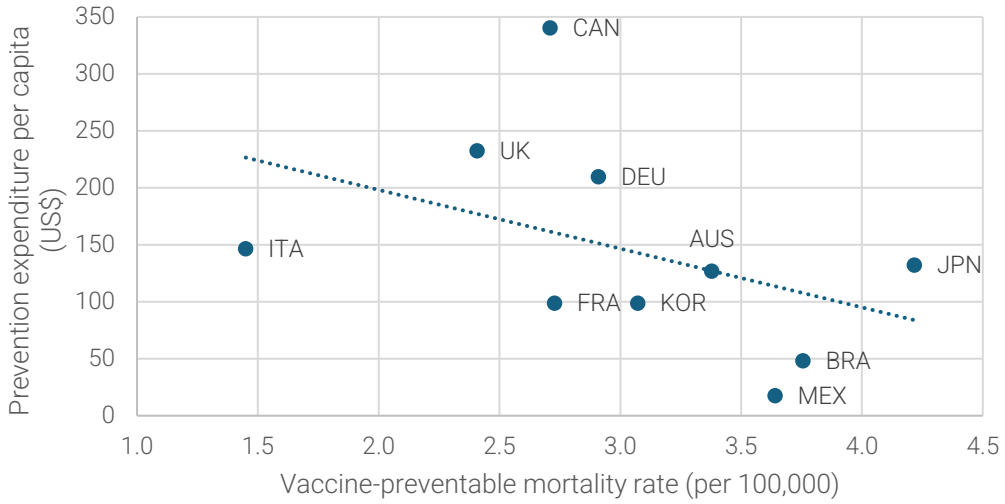
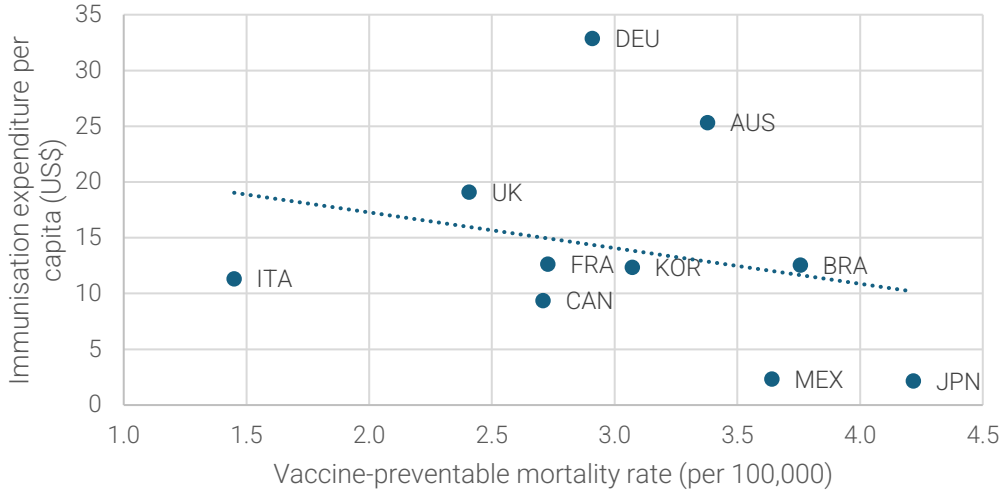


Figure 11 shows that countries which spent more on immunisation services reported a lower vaccine-preventable mortality rate. This relationship is weaker (Pearson correlation coefficient -0.26) and the robustness check shows similar strength of correlations between prevention or immunisation expenditure adjusted for PPP and vaccine-preventable deaths in 2019 (Appendix D). We tested this relationship further using a regression analysis.

FIGURE 11: IMMUNISATION EXPENDITURE COMPARED TO VACCINE-PREVENTABLE DEATHS (2019)



We estimated how many fewer vaccine-preventable deaths were associated with an additional dollar of immunisation expenditure. We did so by taking into account other important factors such as GDP and the size of the population, as well as the trend in immunisation spending over time.

Using data between 2017 and 2019, we found that an increase in annual expenditure of $100 per capita across countries is associated with three fewer vaccine-preventable deaths per 100,000 of the

population (Table 4). This is a meaningful effect size, given that the average number of deaths in the period across all countries was 2.8 vaccine-preventable deaths per 100,000 of the population annually.

TABLE 4: REGRESSION ANALYSIS OF THE ASSOCIATION BETWEEN IMMUNISATION EXPENDITURE AND VACCINE-PREVENTABLE DEATHS (2017-2019)

	Vaccine-preventable deaths per 100,000 of the population
Immunisation expenditure per capita (USD)	-0.0369* (0.0141)
GDP per capita (USD)	0.0000296 (0.0000223)
Total population	0.0000000116 (0.00000000628)
Time trend	-0.0176 (0.0657)
Constant	36.93 (132.7)
N (number of countries x number of years)	30

Notes: Pooled Ordinary Least Squares (OLS) regression analysis. Robust standard errors included in parentheses below coefficients.
** p<0.05, ** p<0.01, *** p<0.001*

The robustness check using expenditure adjusted for PPP supports the results in Table 4 in terms of the strength, direction, and statistical significance of the effect size (Appendix D).

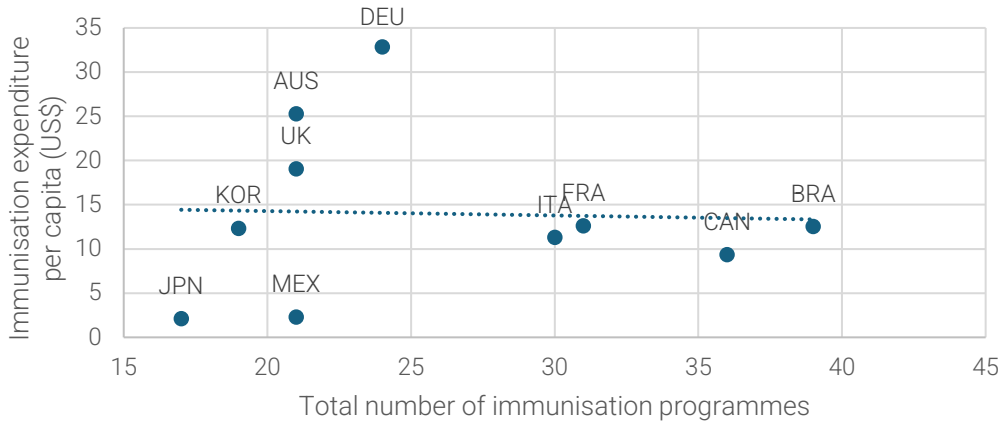
3.3.3 Do countries that spend more on immunisation provide more vaccination programmes on the national schedule?

Figure 12 shows no clear relationship between the number of vaccine programmes delivered and the amount spent on immunisation (Pearson correlation coefficient of -0.04).

Australia delivers the same number of immunisation programmes as Mexico but spends 10 times more per capita on immunisation. Brazil and Korea have very similar expenditure levels. Brazil delivers the highest number of programmes (39) while Korea delivers among the fewest (19).

This indicates that countries that spend more on immunisation do not necessarily just provide more vaccination programmes on the national schedule, instead they may invest in implementation and quality of programmes. These expenditure figures may also reflect higher cost of vaccinations in some countries.

FIGURE 12: NUMBER OF IMMUNISATION PROGRAMMES PROVIDED IN THE NIP COMPARED TO IMMUNISATION EXPENDITURE (2019)

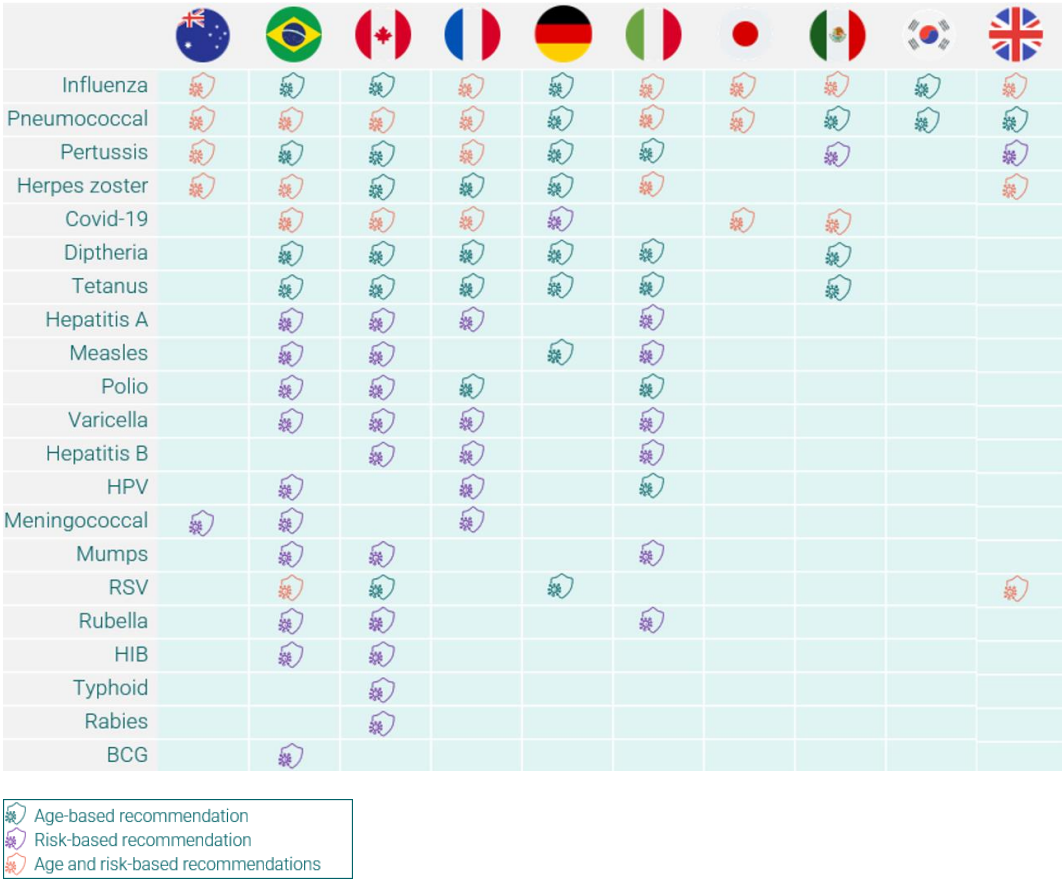


Notes: The sum of child and adult vaccination programmes reported on each country's national immunisation schedule 2024 (2023 for Mexico), excluding voluntary, catch-up and travel vaccines is compared to immunisation expenditure in 2019.

3.3.4 Which immunisation programmes are delivered on the national schedule?

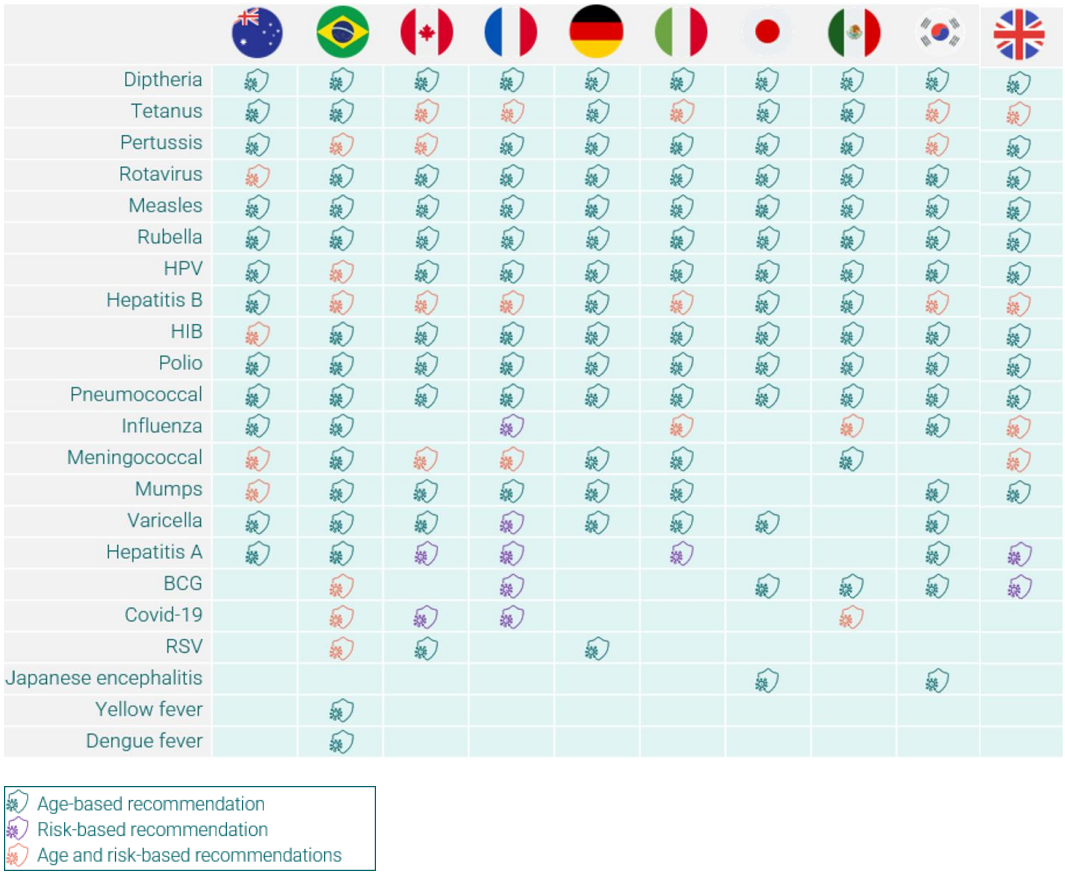
Adult immunisation delivery varies significantly between countries (Figure 13). Most programmes are risk-based and programmes against respiratory viruses are often age- and risk-based. Detailed schedules are available in the country score cards in Appendix A.

FIGURE 13: ADULT PROGRAMMES DELIVERED



The types of child immunisations that are delivered on the national schedule are largely comparable across countries (Figure 14). Most child programmes are, unsurprisingly, age-based, while only some are risk-based. Detailed schedules are available in the country scorecards appendix.

FIGURE 14: CHILD PROGRAMMES DELIVERED



4 Learnings from individual countries

4.1 Country score cards

Country scorecards were developed, describing the following five data elements:

1. **Immunisation spending as a % of GDP over time:** this indicates a country's prioritisation of immunisation spending compared to all other uses of public budgets and allows comparison with other countries.
2. **Immunisation and prevention spending compared to the overall health budget**: detailed spending trends over time, compared to overall health care expenditure, which allows us to compare the role of treatment vs prevention across countries.
3. **Vaccine-preventable mortality rates over time**: analysis of immunisation-related health outcomes combined with coverage data where possible, with influenza is highlighted as an example.
4. **Programmes delivered as part of the national schedule:** examining what programmes are being delivered with immunisation budgets.
5. **Coverage rates for key programmes:** indicating the success of immunisation delivery across three key programmes (child measles, adolescent female HPV, and adult influenza). These three programmes were chosen as data were well reported, especially female HPV and influenza, in comparison with other adolescent and adult vaccination programmes (See Appendix C). Additionally, these three programmes have been used by the WHO to monitor progress of the life-course approach to vaccination (WHO Regional Office for Europe, 2024).

The below section summarises the main successes, opportunities and challenges across countries based on those scorecards. The complete country scorecards are included in Appendix A.

4.2 Key successes, opportunities and challenges for adult immunisation programmes

Table 5 describes the main successes and challenges identified across the five indicators described in the country score cards.

The success of immunisation programmes across countries in this report is primarily examined through three example programmes, for which coverage rates are presented in the country score cards. However, other vaccination programmes require attention. Appendix C highlights the published data available on coverage rates by adult, adolescent and child vaccination programmes in the countries included in this study.

For adult and adolescent programmes, Influenza and HPV are revealed as the most comprehensively reported vaccination programmes. Data is much more sparse for other key programmes such as COVID-19, shingles (herpes zoster) and pneumococcal for adults, and meningococcal for adolescents. It is important for Governments to track and report coverage rates for a broader range of immunisation programmes to effectively monitor progress.

The UK has high coverage rates for influenza and HPV vaccinations, providing strong examples of successful programme implementation and effective outreach efforts. The UK is recognised as a high-performing country in influenza vaccination, employing multiple strategies across five key pillars to achieve success: Health authority accountability; facilitated access to vaccination; HCP accountability and engagement; awareness of influenza burden and severity of disease; and belief in influenza vaccination benefits (Kassianos et al., 2021).

Canada and Brazil are notable for having some of the most comprehensive immunisation programmes globally, although they do not consistently achieve the highest coverage rates for key vaccine programmes. These two countries highlight challenges faced by both high- and middle-income countries.

Brazil's National Immunisation Programme was groundbreaking in its successful implementation in 1973. But since then, it has faced budget constraints alongside rising vaccine import costs which have contributed to decreasing coverage rates since 2015 (Minakawa and Frazão, 2023). Canada is a high-income country with a more stable funding environment, however, provincial variation poses significant challenges in maintaining consistent coverage rates (Harmon et al., 2020). Legislation varies across all provinces, with different mandates, exemption clauses and policies regarding school enrolment requirements (Public Health Agency of Canada, 2024).

Germany and Brazil stand out for consistently allocating the highest percentage of GDP to immunisation spending relative to other countries; however, their overall spending levels remain low. This reflects a commitment to public health and prevention efforts but highlights the constraints to absolute spending faced by countries at different income levels.

Italy's healthcare system is unique as it exhibits relatively low levels of spending on immunisation while also achieving low vaccine preventable mortality rates, suggesting efficient spending to maximise implementation. This trend is found within Italy's healthcare system more broadly, as studies show that despite lower healthcare spending compared to countries like Canada, Italy achieves better health outcomes, suggesting better value for money (Matteo and Barbiero, 2020). However, the system faces challenges due to fragmentation following constitutional reforms, leading to regional inequalities and complexities in immunisation implementation (Bechini et al., 2024; D'Ancona et al., 2018).

TABLE 5: SUMMARY OF KEY SUCCESSES, CHALLENGES AND OPPORTUNITIES IDENTIFIED IN THE COUNTRY SCORE CARDS

	Successes	Challenges	Opportunities
Australia 	Australia is one of the highest ranking countries for immunisation expenditure in terms of per capita spending and percentage of GDP. Childhood vaccination rates for measles consistently exceeds the WHO target of 90%.	Adult vaccinations programmes are limited, and vaccination rates are low for adolescent HPV and adult influenza. Vaccine preventable mortality rates are relatively high given the level of spending, of these, deaths related to influenza contribute significantly.	Expand adult vaccination programmes and increase coverage. Focus on influenza which currently contributes significantly to vaccine preventable mortality rates. Invest in existing programmes to ensure reaching the WHO coverage targets e.g. HPV.

Brazil 	Brazil has the lowest GDP per capita of all countries in the sample and spends the greatest portion of GDP on immunisation. Brazil also has the most comprehensive national immunisation programme measured by the number of programmes provided.	Despite high number of programmes, vaccination rates for childhood measles and HPV remain below WHO targets, and there is no data available for adult influenza vaccination rates. Vaccine preventable mortality rates in Brazil are the second highest of all countries studied.	Invest in improvements to the delivery and effectiveness of immunisation programmes to increase vaccination rates and reduce vaccine preventable mortality. Improve data collection and reporting systems for key vaccine-preventable illnesses (e.g. influenza).
Canada 	Compared to its GDP, Canada has one of the lowest spending on immunisation programmes, while delivering one of the most comprehensive national immunisation programmes. High coverage for adolescent HPV (84%) and child measles (84%)	No reported vaccination rates for adult influenza. Low percentage of GDP invested in immunisation.	Maintain efficient implementation of vaccine programmes. Prioritise immunisation in national health spending and increase the percentage of GDP spent on it to increase outcomes. Improve influenza coverage data reporting.
France 	France reports average spending on immunisation and low vaccine preventable mortality rates. Very strong childhood immunisation programme provision, ranked 2nd out of all the countries analysed in terms of the number of programmes delivered.	Below-average vaccination rates for childhood measles, adolescent HPV and adult influenza. Deaths related to influenza make up a large proportion of France's vaccine preventable mortality rate	Increase coverage in existing programmes for both adolescent and adult programmes. Increase adult influenza uptake rates, as this could lower vaccine-preventable mortality significantly.
Germany 	Germany has one of the highest proportions of GDP expenditure on immunisation. Child vaccination rates are high.	Adult immunisation programmes are relatively limited compared to other countries because there are fewer vaccine mandates in Germany to encourage personal choice towards immunisation (Robert Koch Institute, 2024). Vaccination rates are low for adult influenza which may contribute significantly to Germany's vaccine preventable mortality rate.	Increase education and awareness to encourage vaccine uptake while maintaining personal choice regarding vaccination. This is especially of relevance where German uptake rates lack behind international best practice (e.g. influenza). Explore learnings on programme delivery from top-performing countries for HPV (e.g. UK).

Italy 	Despite relatively low levels of expenditure on immunisation, Italy has a more extensive adult vaccination schedule compared with other European countries. It also has the lowest rate of vaccine preventable mortality.	Coverage for adolescent HPV (43%), adult influenza (55%) and child measles (86%) are relatively low compared to other countries. Vaccine preventable mortality rates are relatively low, but influenza is a significant contributor.	Increase coverage across child and adult programmes. Invest in adult programmes (e.g. influenza), as increasing coverage could have a significant impact on vaccine-preventable mortality rates. Learn from the successes of UK HPV implementation.
Japan 	Childhood measles vaccination rates consistently exceed the WHO target of 90%.	Japan has the lowest proportion of GDP invested in immunisation, the least comprehensive vaccination programmes and the highest vaccine preventable mortality rate among the countries studied. Low HPV coverage (13%) and moderate adult influenza coverage (53%).	Increase investment to expand child immunisations first. Review voluntary and privately provided vaccines and move to a larger proportion of mandatory vaccines.
Mexico 	Mexico has the highest vaccination rates for adult influenza in this analysis, though these trends are highly variable.	Lowest per capita spending on immunisation and below average number of immunisation programmes for both children and adults. Above average vaccine preventable mortality rates despite below average spending.	Concentrate initial focus of immunisation investment in child immunisation programmes. Stabilise implementation and consistency in coverage rate reporting.
South Korea 	South Koreas immunisation programme delivery is balanced and spending on vaccination and related preventable mortality is moderate. It has strong provision of childhood vaccines and the highest vaccination rate for childhood measles.	Adult vaccination programmes are very limited with recommendations for PCV and influenza only. Coverage data is not reported for adult influenza immunisations.	Prepare to transition to greater provision of adult vaccination programmes to support an increasing ageing population. Implement a greater number of the recommendations by the Korean Society of Infectious Diseases into the NIP.

UK 	Efficient implementation of adult vaccination programmes with strong coverage rates for adolescent HPV (73%) and adult influenza (75%), despite moderate level of immunisation expenditure.	Less comprehensive vaccination programmes compared to other countries, more evident in the adult programmes compared to children, even though the aging population in the UK puts an increasing burden on the health service. Declining vaccination rates for child measles observed (85% in 2016, 56% in 2023).	Build up the evidence base for the value and cost effectiveness of adult immunisation programmes to increase number of provided adult programmes. Make existing programmes more robust to regain high coverage rates.

5 Discussion

5.1 Summary of findings

Low levels of immunisation expenditure

This report shows that immunisation spending is low in all countries when compared to both overall GDP and total health care spending. This suggests that immunisation is given relatively low priority, not only within wider government budgets, but also within health budgets specifically.

Mean spending for all countries between 2016 and 2023 was 0.08% of GDP. By comparison, the average spending on defence in the EU in 2022 was 16 times higher, at 1.3% of GDP (Eurostat, 2025).

When compared to the overall health care budget, immunisation expenditure is also consistently low, despite the additional investment as a response to the COVID-19 pandemic. Mean immunisation expenditure was 0.3% and 0.7% of overall health care expenditure during the period 2016-2019 and 2020-22, respectively. This is in line with evidence from European countries showing a median allocation of 0.3% between 2015 and 2019 (Faivre et al., 2021).

High value of immunisation

In contrast to the low expenditure levels, immunisation programmes can deliver high value. Higher immunisation and prevention expenditure correlate with lower vaccine-preventable mortality, supporting the case for investment in immunisation. An increase in expenditure of $100 per capita across countries is associated with three fewer vaccine-preventable deaths per 100,000 of the population. We note that mortality is a severe and narrow measure of immunisation outcomes and morbidity estimates would provide a broader picture of vaccine-preventable health impacts. However, these data were unavailable for this report.

The gap between the potential value generation and the value recognition by individual country policy makers is clear from the various analyses undertaken in this study. Influenza, for example, is an important contributor to vaccine-preventable deaths in many countries, yet the WHO target for adult influenza coverage is largely not met.

Similarly, HPV immunisation has proven to be highly effective in driving down cervical cancer rates on a population level in the UK (Public Health Scotland, 2024; Palmer et al., 2024) but many countries in our sample do not achieve adequate coverage rates.

The tragedy of the COVID-19 pandemic highlighted the value of immunisation to decision makers and the wider society. However, while immunisation spending increased significantly during this period, it remains unclear how future levels of immunisation spending will develop due to factors such as vaccination fatigue, shifting priorities, and post-pandemic fiscal challenges. Further analysis is required to determine long-term trends and to establish if the lessons learned from the pandemic translated into real policy change.

Data gaps

This report also highlights critical data gaps related to immunisation spending.

First, there is a lack of disaggregated expenditure data between adult and child programmes; immunisation spending is often reported as a total figure, without separating adult and child programmes. This overlooks the distinct challenges and strategies required for each. Better disaggregation would support more effective resource allocation. Additionally, total spending data

may hide changes in spending that are due to underlying developments such as the number of doses administered per vaccine (e.g. the introduction of a two-dose shingles vaccine).

Second, there is disparity in coverage reporting. Coverage data is more consistently reported for child and adolescent vaccinations compared to adult influenza immunisation. Reliable reporting is required for effective performance monitoring, especially for adult vaccination programmes where targets are frequently missed.

Third, spending on immunisation does not strongly correlate with the number of vaccination programmes included in a country's schedule. This result is expected, as expenditure includes a variety of costs such as vaccine procurement, administration services, cold chain logistics, public awareness campaigns, infrastructure support, monitoring and evaluation, programme management, and contributions to global immunisation efforts.

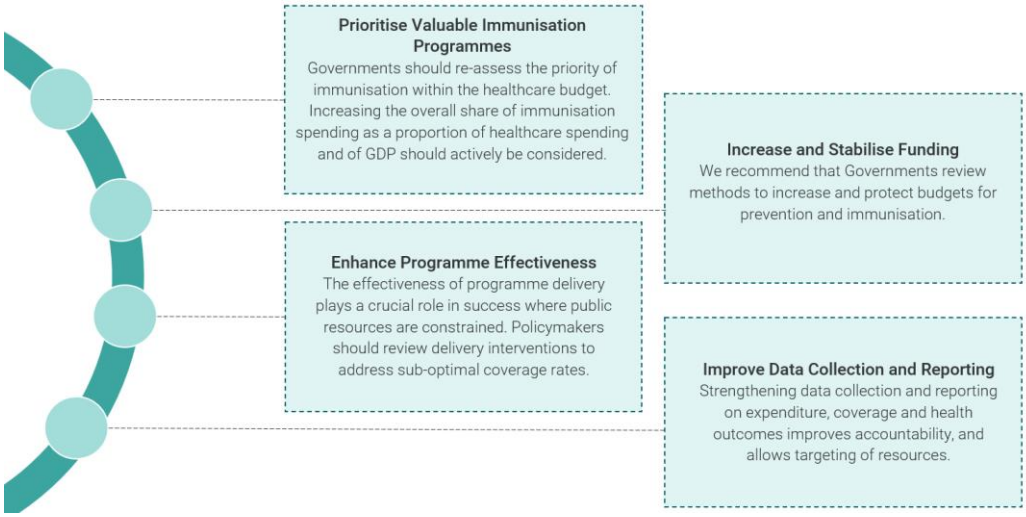
Finally, in some countries, discrepancies exist between the officially reported vaccine schedules and other mandates targeting specific age or risk groups, and there is variation in the breadth of recommendation.

5.2 Opportunities for improvement

THIS REPORT HIGHLIGHTS THE LOW SHARE OF SPENDING ON IMMUNISATION ACROSS HEALTH CARE BUDGETS, IN CONTRAST WITH THE HIGH VALUE OF VACCINATION PROGRAMMES. THE KEY CALL TO ACTION IS TO INCREASE THE SHARE OF IMMUNISATION EXPENDITURE WITHIN HEALTH CARE BUDGETS.

Figure 15 summarises four key levers that policymakers should consider to address underfunding and improve the success of vaccination programmes.

FIGURE 15: KEY LEVERS FOR IMPROVEMENTS TO THE SUCCESS OF VACCINATION PROGRAMMES



Prioritise Valuable Immunisation programmes

Strengthening immunisation is an important policy priority, and dedicating a higher share of the health care budget towards prevention, is essential to closing coverage gaps, reducing the economic burden of vaccine-preventable diseases, and maximising the cost-effectiveness of health care spending.

The findings support a call for considering increasing immunisation budgets, and greater government attention to immunisation programmes. The benefits would be achieved without significant burden on the healthcare system; investment in the delivery of immunisation programmes would remain a small fraction of the total healthcare budget.

Increase and Stabilise Funding

Reallocating funds from other healthcare areas towards prevention may not be a sustainable long-term solution for prioritising immunisation and is likely to face political challenges. Therefore, strategic approaches should be explored to increase and maintain immunisation funding.

We highlight two examples of how to i) increase and ii) sustain funding for prevention.

- *Prevention investment standard:* Strategic approaches should be explored to increase immunisation funding in absolute and relative terms. A prevention investment standard could monitor current prevention spending and commit to increasing it a faster rate than the overall healthcare budget. This has been utilised in other historically underfunded areas of the healthcare system, such as mental health services (Anandaciva, 2025).

- *Dedicated prevention funds:* Prevention budgets must also be sustained to ensure consistent and adequate financing. Establishing dedicated prevention funds can safeguard immunisation programmes from economic fluctuations and ensure consistent and adequate financing (Hampson et al., 2023).

Enhance Programme Effectiveness

Third, policymakers should review implementation and delivery strategies to ensure resources are used efficiently. The effectiveness of programme delivery plays a crucial role in success, where public resources are constrained and increasing budgets may not be feasible.

There are valuable lessons to be learned from countries with high vaccination uptake. Examples of interventions implemented in the countries included in this report include: integrating vaccination into routine health care services; adopting digital health tools, including electronic vaccination records and reminder systems; vaccine-delivery outside of standard healthcare settings; and addressing vaccine hesitancy.

- *Integrating vaccination into routine appointments:* Incorporating vaccines into routine health care appointments, such as those for chronic conditions or annual check-ups, ensures adults are more likely to receive their vaccines. In Germany, a targeted programme for chronic patients more than doubled vaccine uptake, especially among those with oncological-haematological diseases and HIV (Adamo et al., 2024).

- *Reminder systems*: Implementing or improving reminder systems through phone calls, texts, or emails can significantly improve vaccination rates, especially for adults with busy schedules. In Italy, a recall system using letters and phone calls improved childhood vaccination coverage from 70% to 82% (Marsico et al., 2017).

- *Digital vaccination records*: Digital vaccination records offer significant benefits for improving healthcare efficiency and tracking in Germany and other European countries. Studies have shown that digital platforms can enhance data accessibility, accuracy, and interoperability in vaccination processes (Klausen et al., 2024).

- *Improving equity and access*: Diversify and expand vaccination pathways to support expanded access to services, address unmet need and increase primary care capacity.
    - Ensuring vaccines are available in convenient locations, such as community pharmacies, and encouraging occupational health programmes may improve accessibility, particularly for adults with limited mobility or time.
    - The UK's school-based HPV vaccination programme for adolescent boys and girls has been successful in achieving high coverage rates. School delivery is associated with higher uptake, particularly when targeting younger age groups (Tiley et al., 2020).
    - Effective planning, data management, and collaboration between stakeholders are crucial for successful implementation (Paterson et al., 2021).

- *Addressing vaccine hesitancy:* Vaccine hesitancy poses a significant threat to disease prevention efforts. Evidence on interventions to improve hesitancy is mixed, and suggests that interventions must be tailored to the specific population (Dubé et al., 2015; MacDonald, Butler and Dubé, 2018). Strategies include community-based interventions, technology-based health literacy and healthcare worker education (Singh et al., 2022; Lo Moro et al., 2023).

Improve Data Collection and Reporting

Finally, there is a need for improved data collection on expenditure, coverage, and health outcomes. Data collection and reporting, target-setting and performance-monitoring can be used as tools to increase visibility and accountability (Kassianos et al., 2021).

Reported data should be disaggregated, at a minimum, by age group (adult, adolescent and child) to better identify challenges and assess the effectiveness of spending. Improved reporting of coverage data and morbidity related to vaccine-preventable illnesses will enable better performance monitoring and inform decision-making.

Policymakers should identify and prioritise key areas where coverage rates, vaccine uptake, and health outcomes are notably poor. Allocating financial resources to these high-need areas will ensure the most impactful improvements and maximise the return on investment in immunisation programmes. To do this requires accurate and regular reporting on these indicators.

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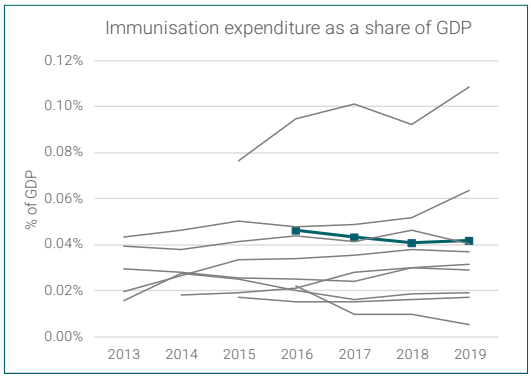
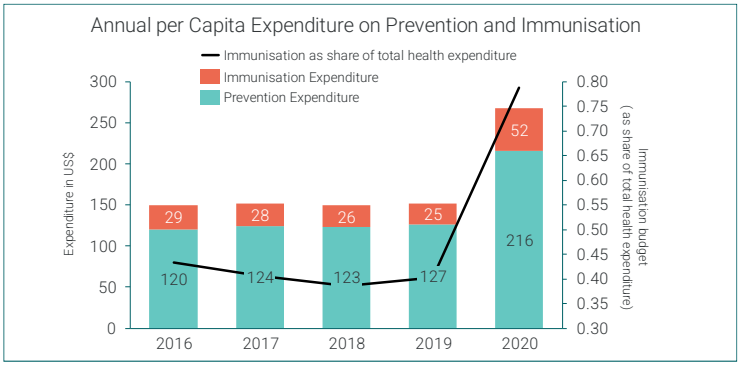
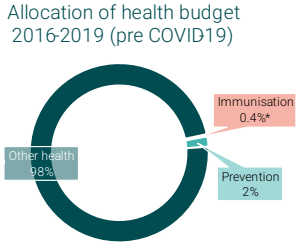
Appendix A: Country Score Cards

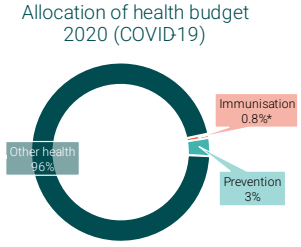
Australia



- Immunisation expenditure as a % of GDP illustrates the **low priority for spending on immunisation** in Australia over time.
- However, this figure is higher than in other countries. Australia had the 3rd highest average immunisation expenditure between 2013 and 2019 (0.043%).
- Australia was the **highest country in our analysis in terms of GDP per capita** in 2019 ($60,332).

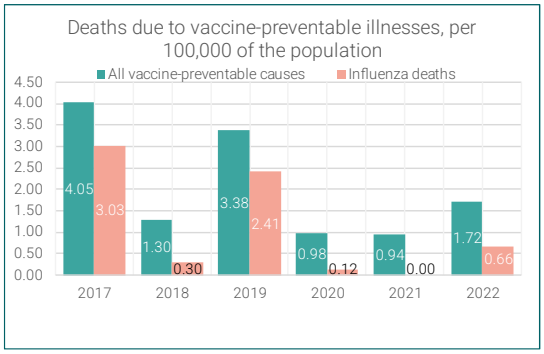


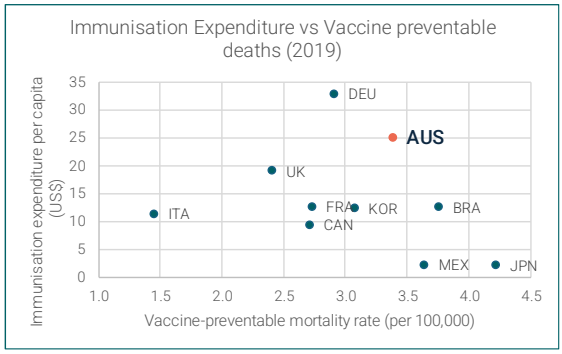




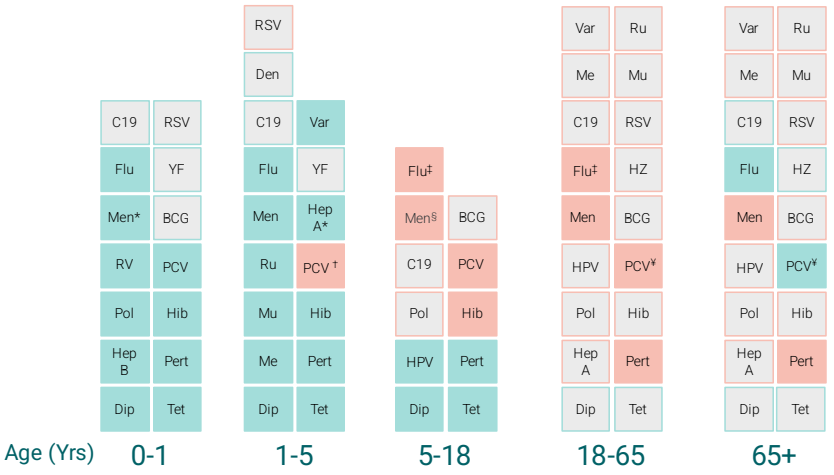
*Immunisation is shown with one decimal place due to its small proportion.
Other values are rounded to whole numbers, so totals may not sum to 100%.

- Before COVID-19, average spending on prevention and immunisation was a little under 2.5% of the total health expenditure (HE). At $25 per person the share of total health spend per person on immunisation in 2019 was **just under half a percent** (0.4%).
- During the first year of COVID-19, **spending on prevention and immunisation grew to 3.8% of total HE**.
- Immunisation spending doubled to $52 per capita, but still **only 0.8% of total health expenditure**.





- Deaths from vaccine-preventable causes in Australia has been variable, even prior to the onset of COVID-19, **ranging between 1 and 4 vaccine-preventable deaths per 100,000 of the population**. Influenza-related deaths comprised 38% of these deaths in 2022.
- In 2019, Australia was in the **mid to high range of investment in immunisation and prevention**, while also demonstrating relatively **high vaccine-preventable deaths compared to other countries.**



*Aboriginal and Torres Strait Islander peoples. † Routine for 1-2 years, risk groups and Aboriginal and Torres Strait Islander peoples aged >4 years. ‡ Risk groups and Aboriginal and Torres Strait Islander peoples. ¥ Risk groups and Aboriginal and Torres Strait Islander peoples aged 50+ years, and routine for 70+ years. § Routine for 14-16 years and risk groups 5-18 years.

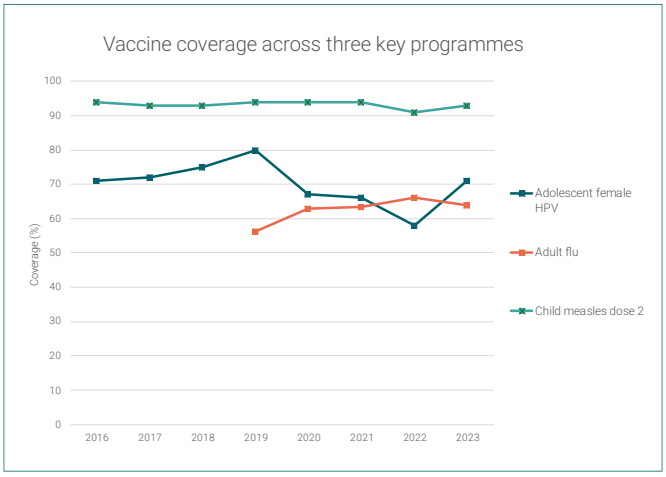
- Programmes available to all
- Programmes available to risk groups
- Additional programmes available to all in rank 1 country
- Additional programmes available to risk groups in rank 1 country

- Total Immunisation programmes
- Childhood Immunisation programmes
- Adult Immunisation programmes

	# Programmes	Country rank
Total Immunisation programmes	21	6th
Childhood Immunisation programmes	16	5th
Adult Immunisation programmes	5	7th

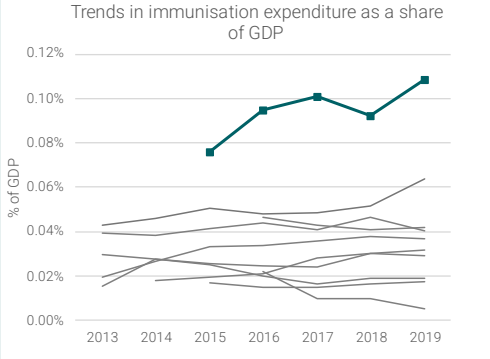
Note: Countries ranked in terms of the number of programmes.

- Australia has a **comprehensive paediatric immunisation** schedule but a **very limited adult schedule** (Australian Government Department of Health and Aged Care, 2024).
- Both the paediatric and adult schedules include targeted provision for Aboriginal and Torres Strait Islander peoples, addressing **population-specific needs**.

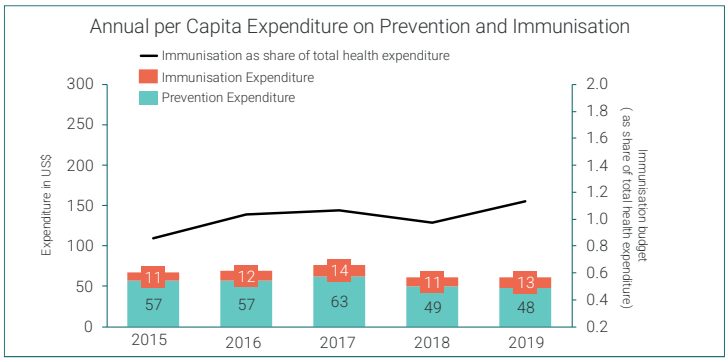


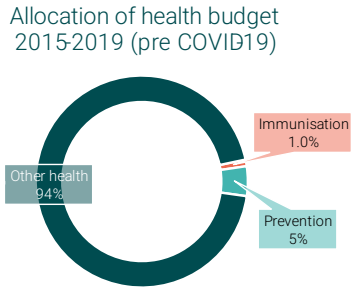
- **Influenza coverage:** Adult influenza vaccination rates ranged from 56% to 64% between 2019 and 2023.
- **HPV coverage:** HPV vaccination for adolescent females has varied between 58% to 80%, with an increase from 2016 to 2019, followed by a decline and recovery since 2020. This remains below the WHO 2030 target of 90% (WHO, 2025a).
- **Measles coverage:** MCV2 coverage for children consistently exceeds 90% across the period.

Brazil

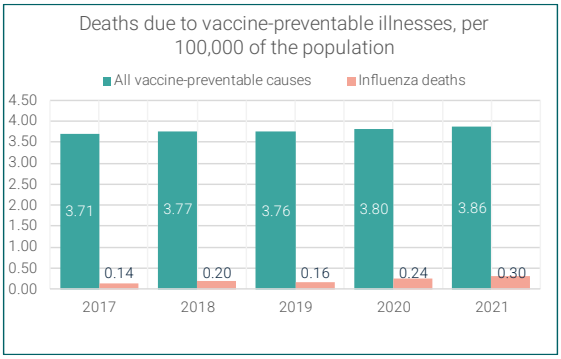


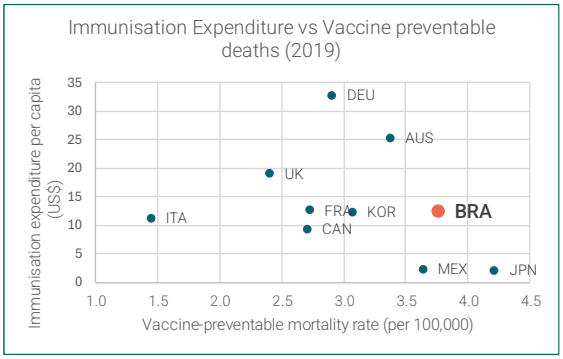
- The absolute size of spending as a % of GDP illustrates the **low priority for spending on immunisation** in Brazil over time.
- However, compared with other countries, Brazil **invested the highest amount in immunisation** across the period (0.095%).
- Brazil had the **lowest GDP per capita** in 2019 among countries in our analysis ($11,559).



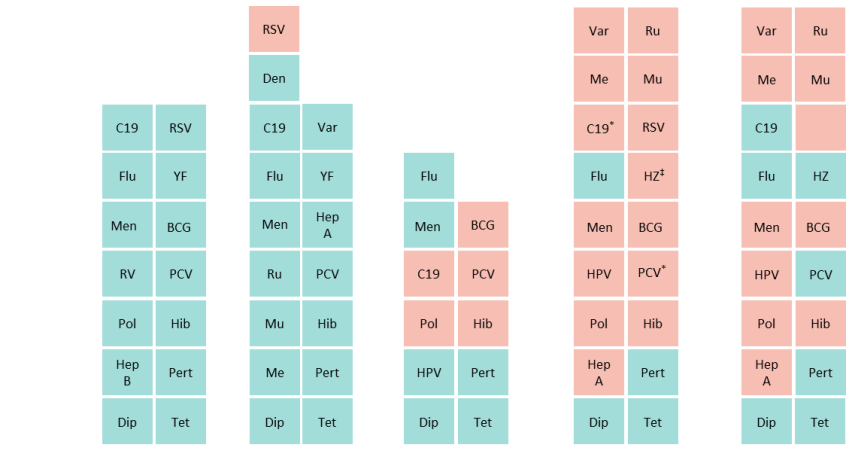


- Before COVID-19 average spending on prevention and immunisation **was around 1.5%** of the total health expenditure (HE). At $13 per person the share of total health spend per person on immunisation in 2019 was around **one percent.**
- There was no data available for the years following 2019.





- Brazil experiences roughly **4 vaccine-preventable deaths per 100,000 annually**. Influenza-related deaths comprises a low proportion of vaccine-preventable deaths for the causes considered.
- In 2019, Brazil was in the low to mid range of investment in immunisation, while also demonstrating relatively **high vaccine-preventable deaths compared to other countries**.



* Risk groups 18-60 years and routine for 60+ years. † Risk groups 60-69 years and routine for 70+ years. ‡ Risk groups 18-50 years and routine for 50+ years.

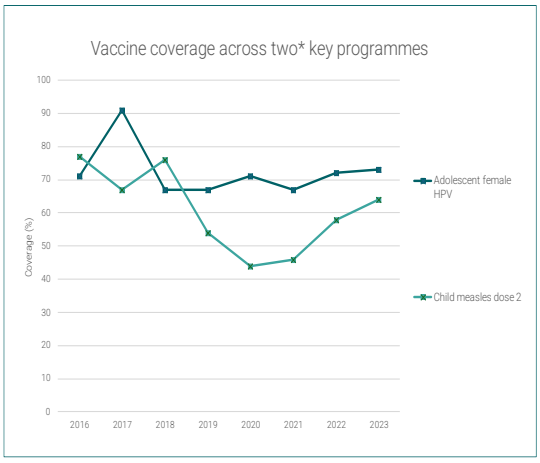
- Brazil's **comprehensive programme** uses multiple combined age and risk group-based recommendations to provide targeted and effective care to many vulnerable groups (Sociedade Brasileira de imunizacoes, 2024).
- Region specific vaccines are also included which are not necessary in other countries.

Programmes available to all
Programmes available to risk groups
Additional programmes available to all in rank 1 country
Additional programmes available to risk groups in rank 1 country

Total Immunisation programmes
Childhood Immunisation programmes
Adult Immunisation programmes

	# Programmes	Country rank
Total Immunisation programmes	39	1st
Childhood Immunisation programmes	21	1st
Adult Immunisation programmes	18	1st

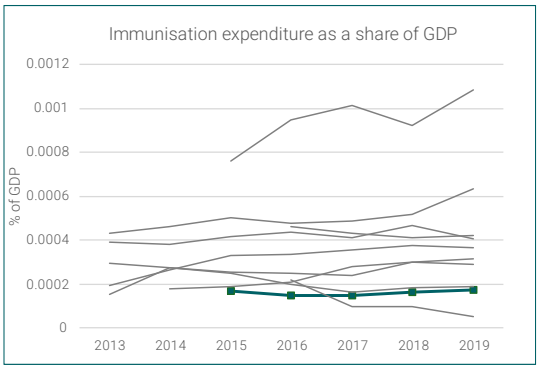
Note: Countries ranked in terms of the number of programmes.



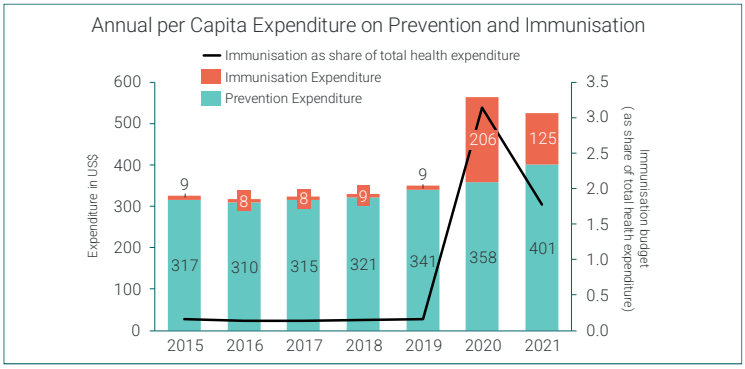
*Influenza coverage unavailable for Brazil

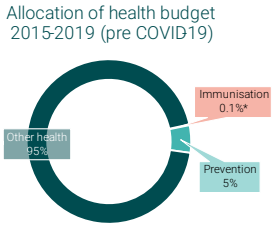
- **Influenza coverage:** Data on adult influenza vaccination is unavailable.
- **HPV coverage**: Coverage for adolescent females reached the WHO 2030 target of 90% in 2017 but has since declined and remained between 67% and 73%.
- **Measles coverage**: MCV2 coverage has been increasing since 2021.
- **Since the emergency phase of COVID-19,** HPV coverage has remained largely unaffected at roughly 70%, Measles coverage was already declining prior to 2020 and has since been on the rise.

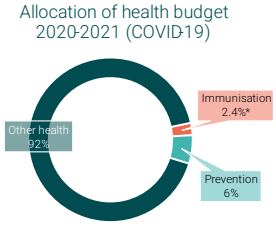
Canada



- Immunisation expenditure as a % of GDP illustrates the **low priority for spending on immunisation** in Canada over time.
- This figure is lower than in other countries. Canada had the **2nd lowest average immunisation expenditure** between 2013 and 2019 (0.016%)
- Canada was the **2nd highest country in our analysis in terms of GDP per capita** in 2019 ($54,301).

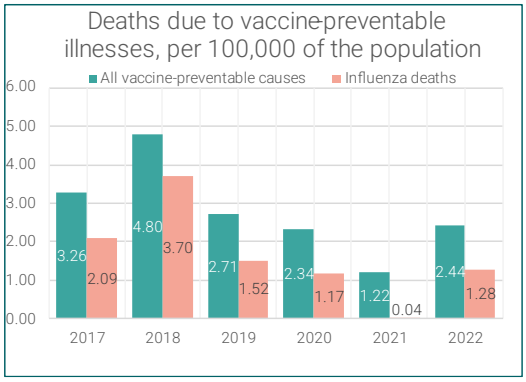


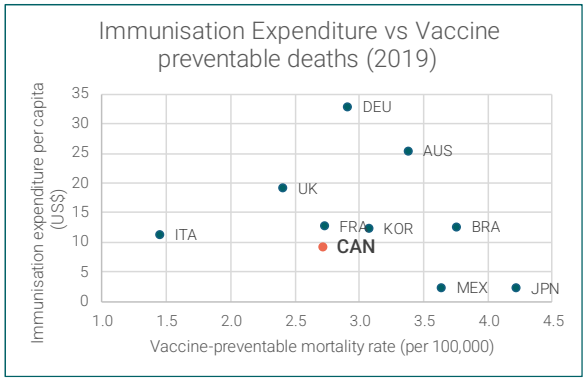




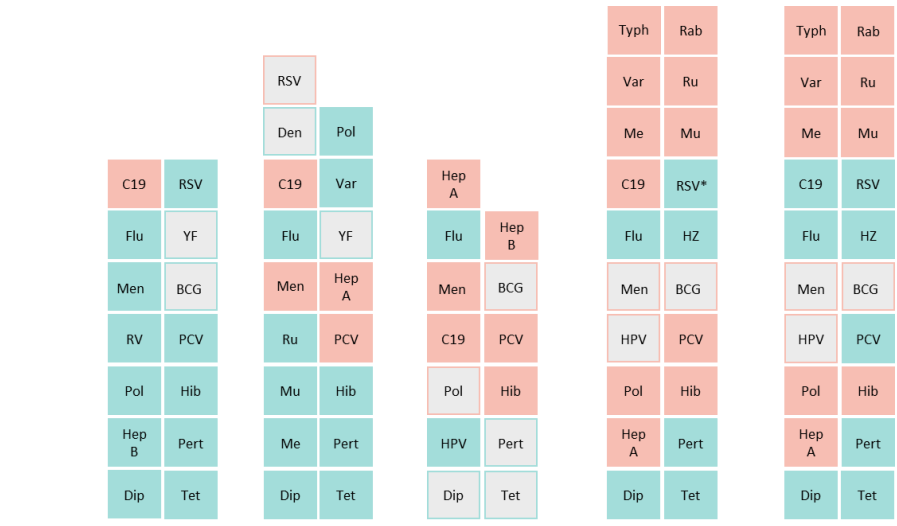
*Immunisation is shown with one decimal place due to its small proportion.
Other values are rounded to whole numbers, so totals may not sum to 100%.

- Before COVID-19, average spending on prevention and immunisation was **a little over 5%** of the total health expenditure (HE). At $9 per person the share of total health spend per person on immunisation in 2019 was around **one tenth of a percent.**
- During COVID-19 spending on **prevention and immunisation grew to 7.4%** of total healthcare expenditure.
- Average immunisation spending over this time (2020 – 2021) grew rapidly to $166 per capita, but still **less than 2.5% of total health expenditure.**





- Deaths from vaccine-preventable causes in Canada has been variable, even prior to the onset of COVID-19, ranging **between one and five vaccine-preventable deaths per 100,000** of the population. Influenza-related deaths comprised 52% of these deaths in 2022.
- In 2019, Canada was in the **mid to low range of investment in immunisation**, while also demonstrating **relatively low vaccine-preventable deaths compared to other countries**.



*Routine for ages 60+ years.

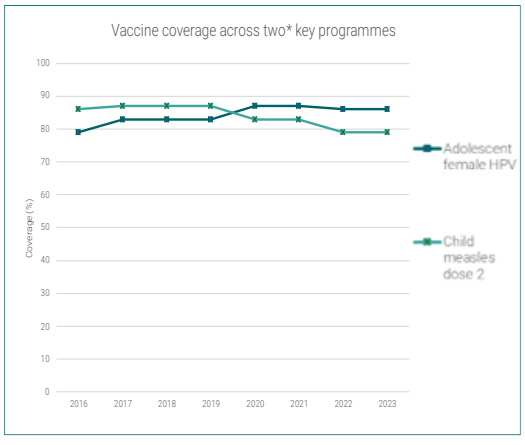
- Canada has a **comprehensive child and adult vaccination schedule**, ranking 2nd overall.
- The **adult immunisation programmes rank joint 1st**, including less common programmes such as rabies and typhoid (Public Health Agency of Canada, 2024).

Programmes available to all
Programmes available to risk groups
Additional programmes available to all in rank 1 country
Additional programmes available to risk groups in rank 1 country

Total Immunisation programmes
Childhood Immunisation programmes
Adult Immunisation programmes

	# Programmes	Country rank
Total Immunisation programmes	36	2nd
Childhood Immunisation programmes	18	2nd
Adult Immunisation programmes	18	1st

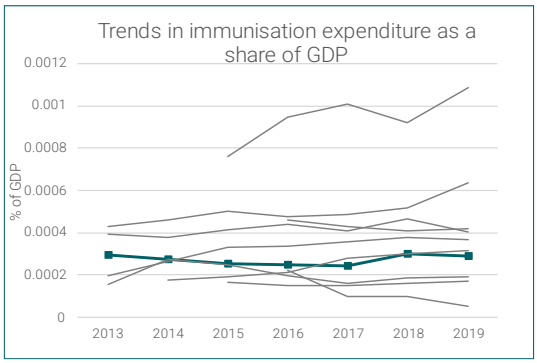
Note: Countries ranked in terms of the number of programmes.



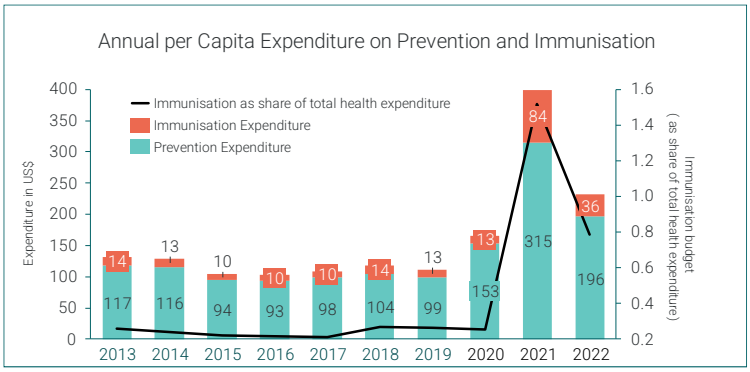
*Influenza coverage unavailable for Canada

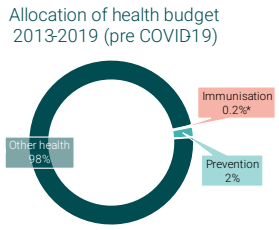
- **Influenza coverage:** Data for adult influenza coverage is not available.
- **HPV coverage:** Adolescent HPV vaccination rates have remained relatively stable, with a slight increase observed in 2020.
- **Measles coverage:** MCV2 vaccination rates have also stayed consistent, though they have experienced a slight decline since 2020, coinciding with the uptick in HPV coverage.
- HPV and measles vaccination rates were **relatively unaffected during the emergency phase of COVID-19**.

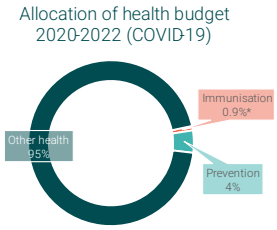
France



- Immunisation expenditure as a % of GDP illustrates the **low priority for spending on immunisation** in France over time.
- This figure is low compared to other countries. France had the **6th highest average immunisation expenditure** between 2013 and 2019 (0.027%)
- France was the **5th highest country in our analysis in terms of GDP per capita** in 2019 ($43,483).

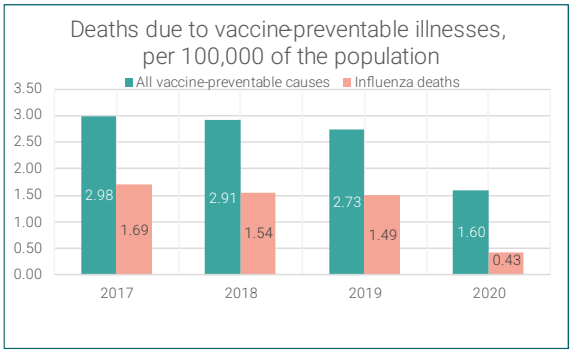


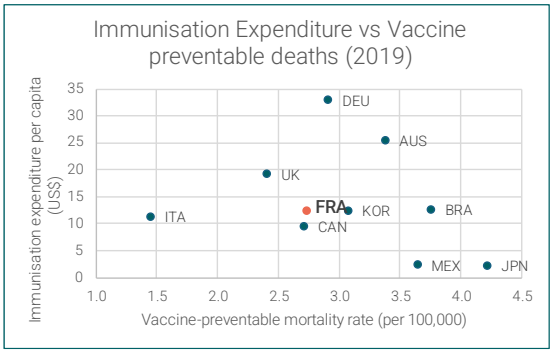




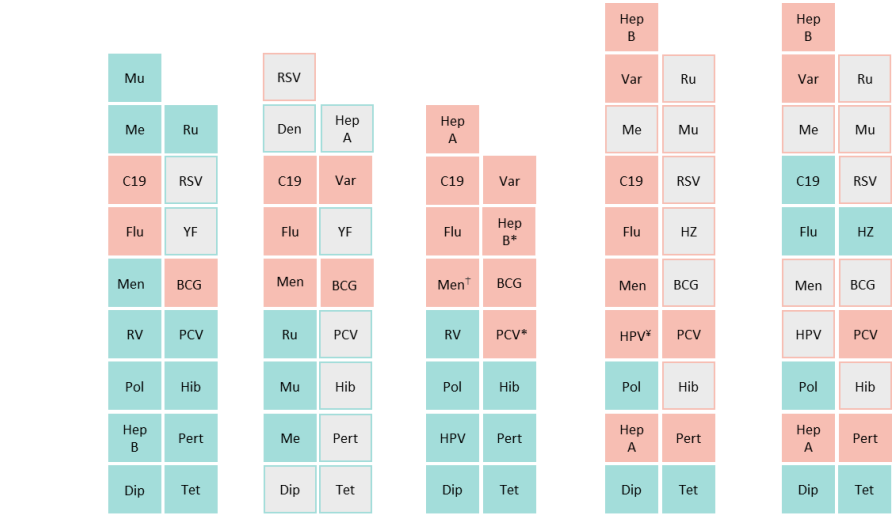
*Immunisation is shown with one decimal place due to its small proportion.
Other values are rounded to whole numbers, so totals may not sum to 100%.

- Before COVID-19, average spending on prevention and immunisation was **less than 2.5% of the total health expenditure** (HE). At $13 per person the share of total health spend per person on immunisation in 2019 was around 0.2%.
- During COVID-19, average spending on prevention and immunisation more than **doubled to 4.9%** of total healthcare expenditure.
- Over this time period, average **immunisation spending more than quadrupled** to over $44 per capita, but still **less than 1%** of total health expenditure.





- France experiences roughly **2-3 vaccine-preventable deaths per 100,000 annually**. Influenza-related deaths comprised a significant proportion (55%) of vaccine-preventable deaths for the causes considered in 2019.
- In 2019, France was in the mid-range of immunisation investment, while also demonstrating relatively **few vaccine-preventable deaths compared to other countries.**



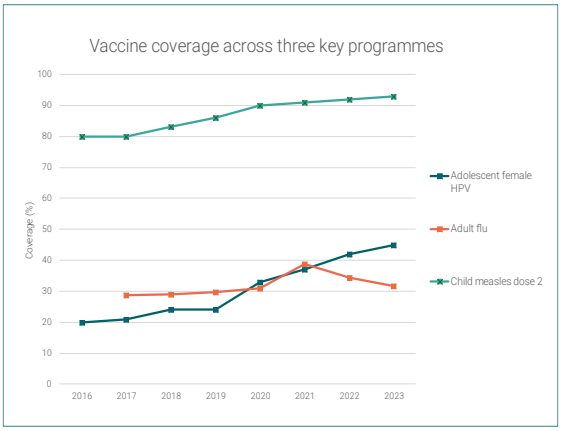
* Routine at 6 years, and for risk groups 7-17 years. † Routine for 11-14 years, and for risk groups 2-18 years. ¥ Risk groups 18-26 years.

Programmes available to all
Programmes available to risk groups
Additional programmes available to all in rank 1 country
Additional programmes available to risk groups in rank 1 country

- France **ranks very highly for its child immunisation programmes**, 11 of which being mandatory, and non-compliance leads to denied school admission (Ministère de la Santé et de l'Accès aux soins, 2024).
- Italy is the only other European country to have a similar policy (Partouche et al., 2019).

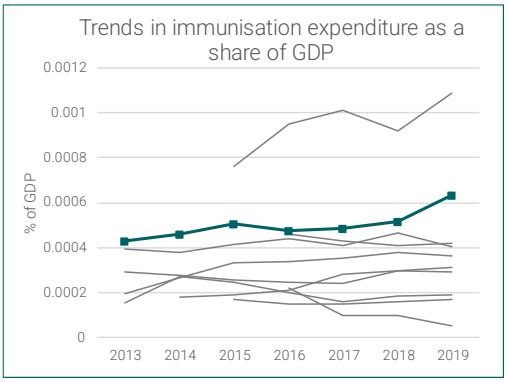
	# Programmes	Country rank
Total Immunisation programmes	31	3rd
Childhood Immunisation programmes	18	2nd
Adult Immunisation programmes	13	4th

Note: Countries ranked in terms of the number of programmes.

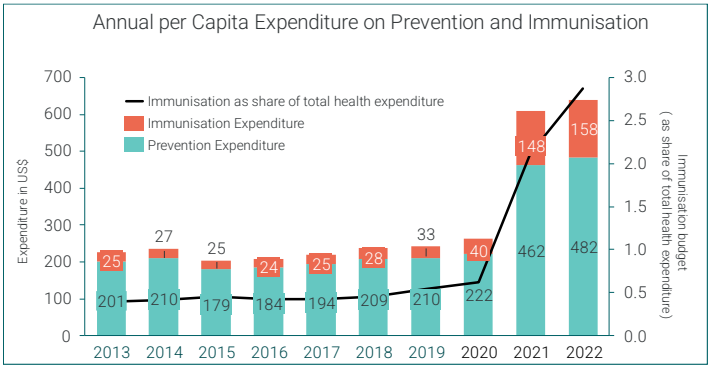


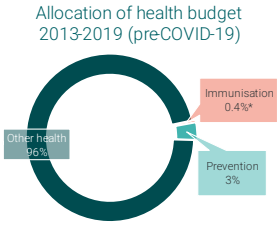
- **Influenza coverage:** France achieves relatively low coverage levels for influenza. There was an uptick in vaccination rates in 2021 which has been subsequently declining.
- **HPV coverage**: Adolescent HPV vaccination rates are low but have been steadily increasing over the period.
- **Measles coverage:** MCV2 vaccination rates have also been steadily increasing over the period, achieving over 90% since 2020.

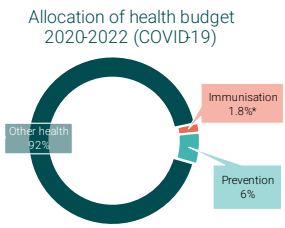
Germany



- Immunisation expenditure as a % of GDP illustrates the **low priority for spending on immunisation** in Germany over time.
- However, this figure is higher than in other countries. Germany had the **2nd highest average immunisation expenditure** between 2013 and 2019 (0.05%)
- Germany was the **3rd highest country in our analysis in terms of GDP per capita** in 2019 ($51,709).

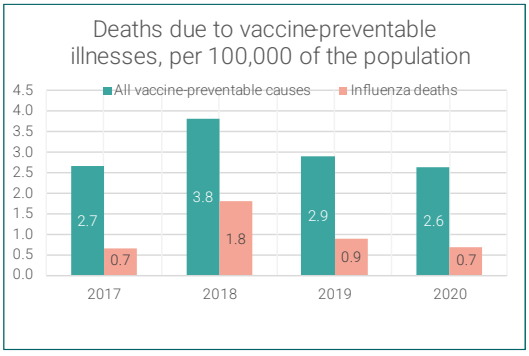


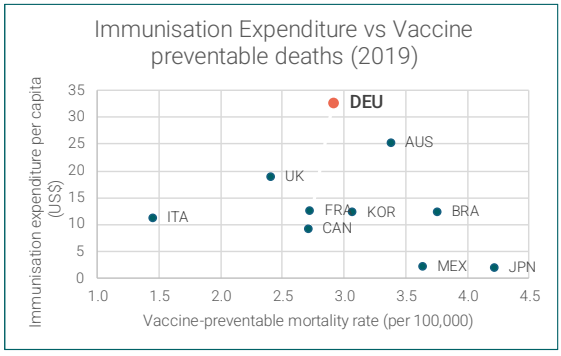




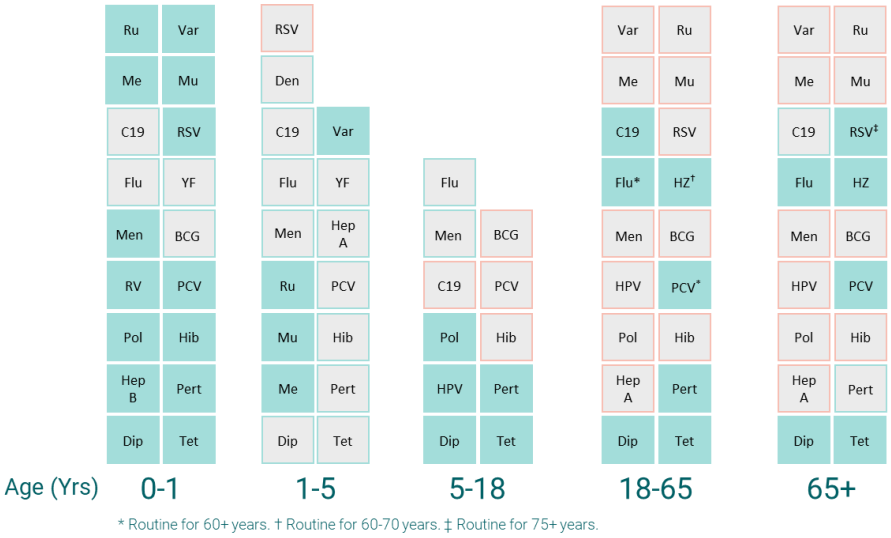
*Immunisation is shown with one decimal place due to its small proportion. Other values are rounded to whole numbers, so totals may not sum to 100%.

- Before COVID-19 average spending on prevention and immunisation was **less than 3.5%** of the total health expenditure (HE). At slightly over $30 per person, the share of total health spend per person on immunisation in 2019 was 0.4%.
- During COVID-19, average spending on **prevention and immunisation more than doubled to 7.8%** of total health expenditure.
- Average immunisation spending over this period quadrupled to $115 per capita, but **still less than 1.8% of total health expenditure.**



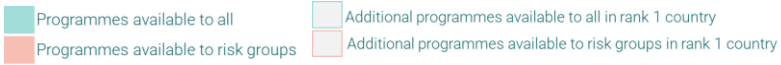


- Germany experiences roughly **3 vaccine-preventable deaths per 100,000** of the population annually. Influenza-related deaths comprise a significant proportion **(between 25% and 47%)** of vaccine-preventable deaths for the causes considered.
- In 2019, Germany was the biggest investor in immunisation per capita, while exhibiting **average vaccine-preventable deaths compared to other countries.**



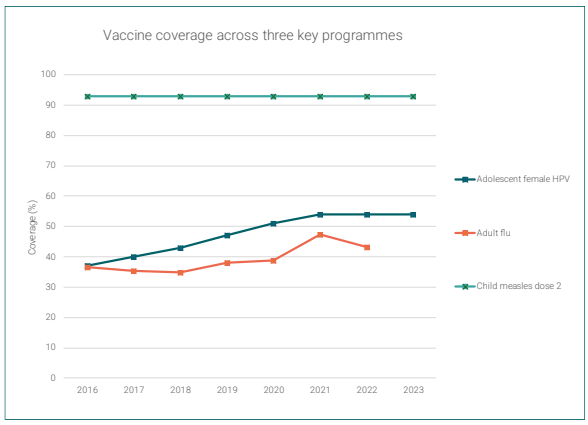
* Routine for 60+ years. † Routine for 60-70 years. ‡ Routine for 75+ years.

- Germany has a less comprehensive national schedule than other countries because there are **fewer vaccine mandates** (Robert Koch Institute, 2024).
- Additional recommendations which fall outside the routine schedule **encourage personal choice** towards immunisation.



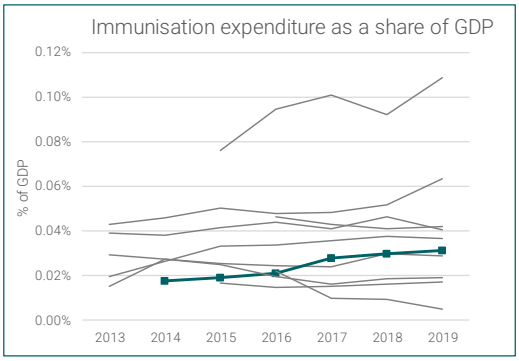
	# Programmes	Country rank
Total Immunisation programmes	24	5th
Childhood Immunisation programmes	15	8th
Adult Immunisation programmes	9	5th

Note: Countries ranked in terms of the number of programmes.

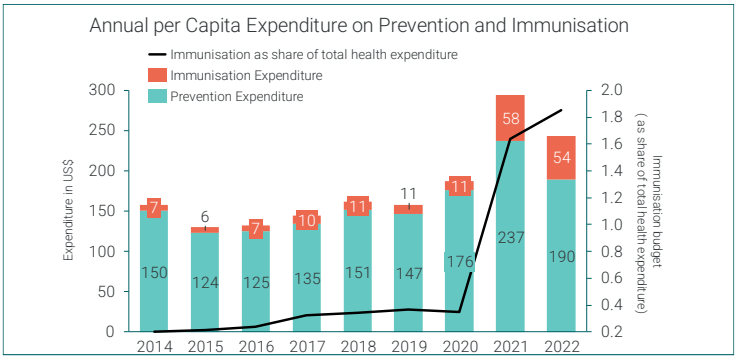


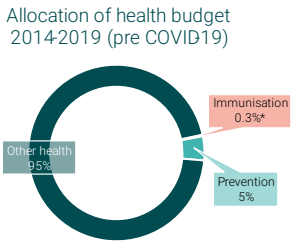
- **Influenza coverage:** There was relatively low influenza coverage in Germany across the period (between 38% and 47%). The WHO coverage target for the elderly in Europe is set at 75% (WHO, 2025b).
- **HPV coverage:** (two-dose) Coverage for adolescent females in Germany is also relatively low (between 37% and 54%), under the WHO 2030 target of 90% (WHO, 2025a).
- **Measles coverage:** MCV2 coverage is high and stable (93%).
- **Since the emergency phase of COVID-19**, adult influenza coverage saw an initial rise followed by a decline. HPV coverage plateaued, and child measles vaccination rates remained unaffected.

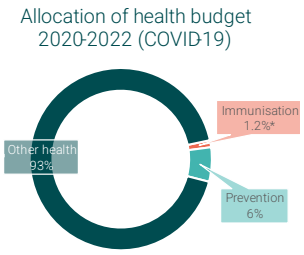
Italy



- Immunisation expenditure as a % of GDP illustrates the **low priority for spending on immunisation** in Italy over time.
- Italy had the **7th highest average immunisation expenditure** between 2013 and 2019 (0.025%)
- Italy was the **7th highest country in our analysis in terms of GDP per capita** in 2019 ($35,884).

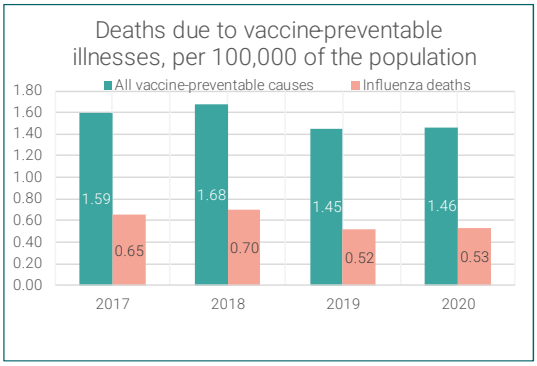


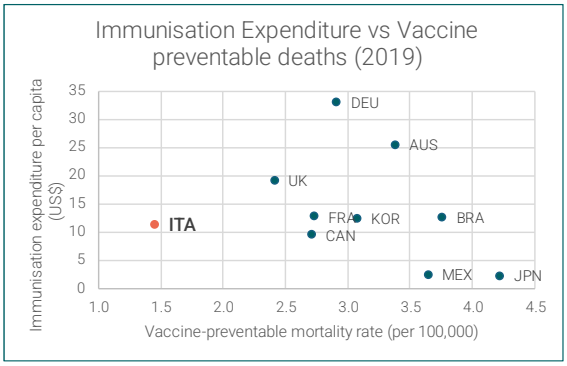




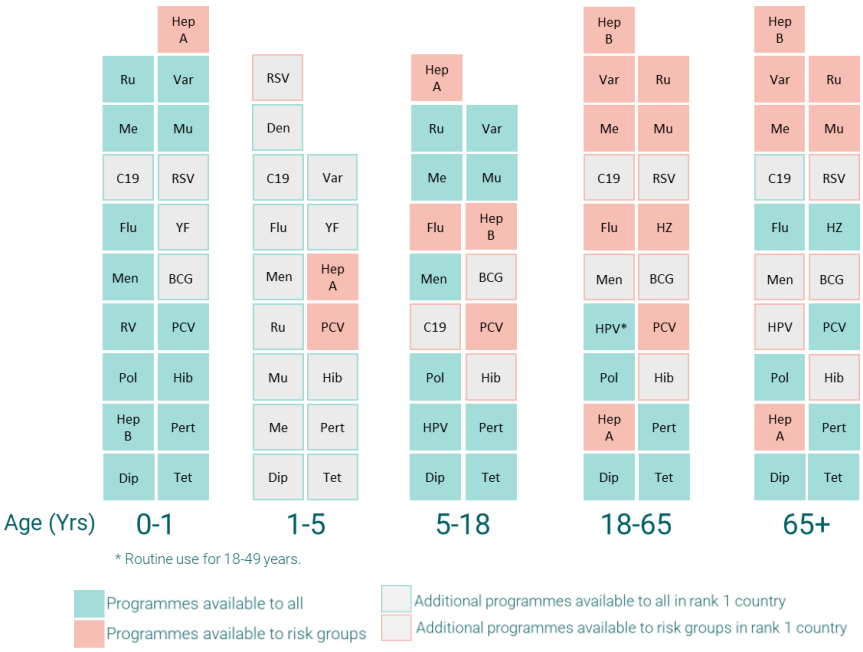
*Immunisation is shown with one decimal place due to its small proportion.
Other values are rounded to whole numbers, so totals may not sum to 100%.

- Before COVID-19, average spending on prevention and immunisation was **less than 5.5% of the total health expenditure** (HE). At $11 per person the share of total health spend per person on immunisation in 2019 was **less than half a percent**.
- During COVID-19, average spending on **prevention and immunisation grew to 7.2%** of total healthcare expenditure.
- Average immunisation spending over this period (2020 – 2022) quadrupled to over $41 per capita, but still **less than 3% of total health expenditure**.

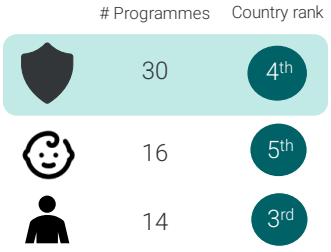




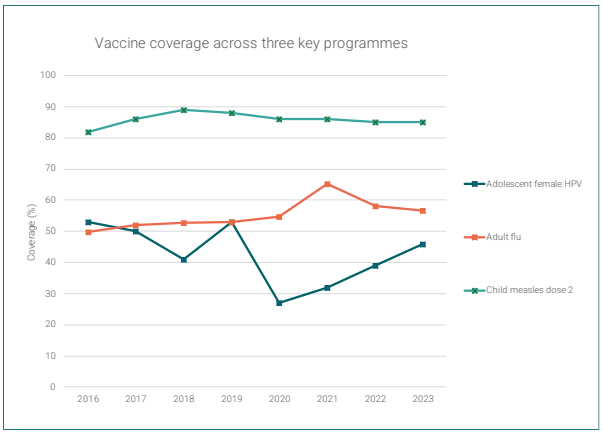
- Italy experienced roughly **1.5 vaccine preventable deaths per 100,000 annually** between 2017 and 2020. Influenza-related deaths comprise a significant proportion of vaccine-preventable deaths for the causes considered **(Between 36% and 41%).**
- Italy was an outlier in terms of **low vaccine-preventable mortality** compared to other countries in 2019. It invests moderately in prevention and immunisation compared to other countries.



- Italy ranks **higher for its adult vaccination** schedule than that for children.
- Still, promotion of child immunisation is strong, with **non-compliance leading to denied school admission** (Partouche et al., 2019).
- Other relevant child vaccines yet to be provided are RSV and COVID-19 which have been added recently by Germany and Spain (RSV) and France (COVID-19) (EpiCentro, 2023).

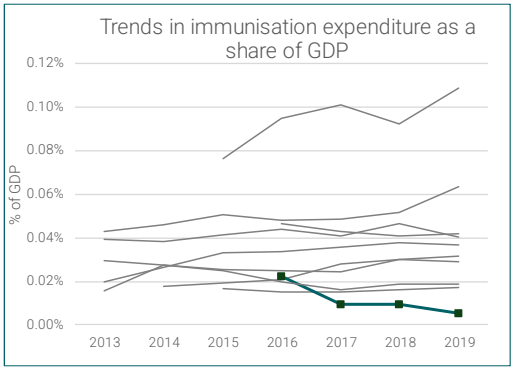


Note: Countries ranked in terms of the number of programmes.

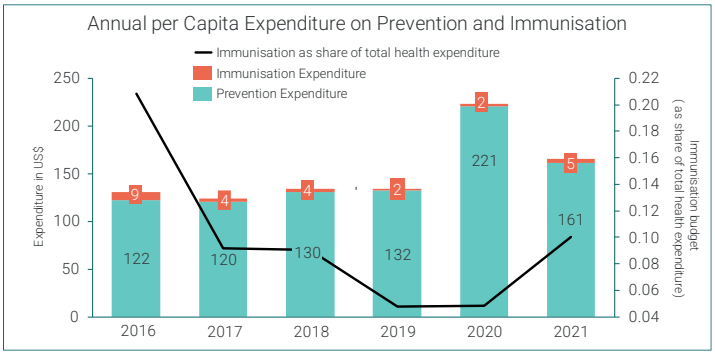


- **Influenza coverage:** Adult influenza coverage saw a notable spike in 2021, followed by a return to prior levels.
- **HPV coverage:** Adolescent HPV vaccination rates dropped significantly in 2020 but have shown a steady year-on-year increase since.
- **Measles coverage:** MCV2 vaccination rates have remained consistent throughout the period.
- **Since the emergency phase of COVID-19,** child measles saw a drop and subsequent recovery in vaccination rates, while influenza saw an increase and subsequent decline.

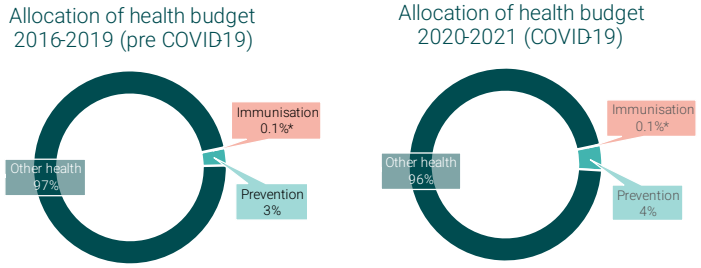
Japan



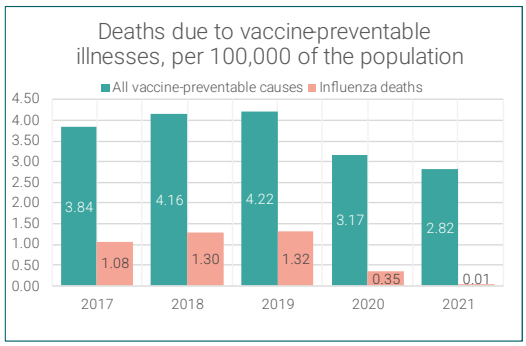
- Immunisation expenditure as a % of GDP illustrates the **low priority for spending on immunisation** in Japan over time.
- This figure is lower than in other countries. Japan had the **lowest average immunisation expenditure** between 2013 and 2019 (0.012%).
- Japan was the **6th highest country in our analysis in terms of GDP per capita** in 2019 ($40,855).

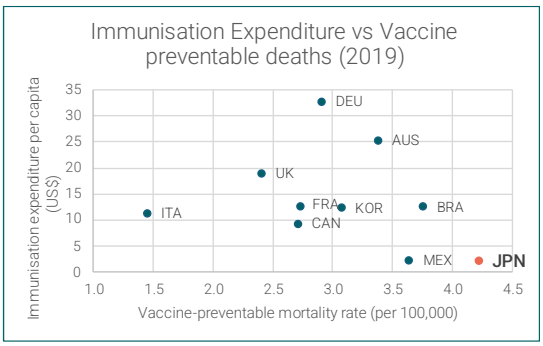


- Before COVID-19, average spending on prevention and immunisation was around **3% of the total health expenditure** (HE). At $2 per person the share of total health spend per person on immunisation in 2019 was around 0.1%.
- During COVID-19, average spending on prevention and immunisation **grew to 4.1%** of total healthcare expenditure.
- Average immunisation spending over that time, grew to $3 per capita, and remained a constant **0.1% of total health expenditure**.

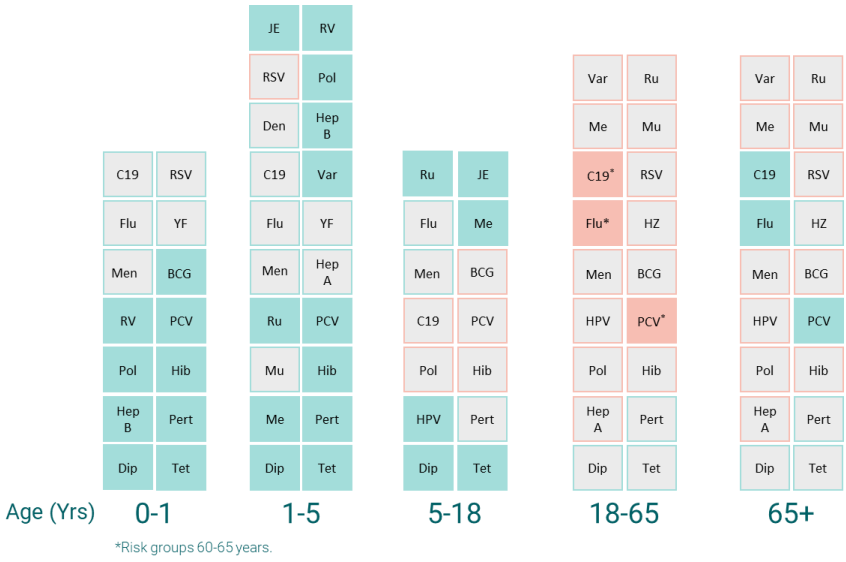


*Immunisation is shown with one decimal place due to its small proportion.
Other values are rounded to whole numbers, so totals may not sum to 100%.





- Japan experiences roughly **3-4 vaccine-preventable deaths per 100,000 annually**. Influenza-related deaths comprised a significant proportion **(31%)** of vaccine-preventable deaths for the causes considered in 2019.
- In 2019, Japan was low in terms of immunisation investment, while also demonstrating the **most vaccine-preventable deaths compared to other countries.**



*Risk groups 60-65 years.

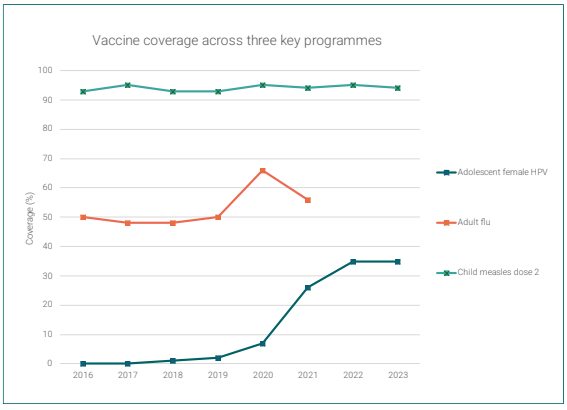
- Japan's **NIP distinguishes between fully funded vaccines and voluntary vaccines** which, despite their public health importance, require individual payment.
- Most of the voluntary vaccines are for adults and have been excluded from our analysis (NPO VPD, 2024).

Programmes available to all
Programmes available to risk groups
Additional programmes available to all in rank 1 country
Additional programmes available to risk groups in rank 1 country

Total Immunisation programmes
Childhood Immunisation programmes
Adult Immunisation programmes

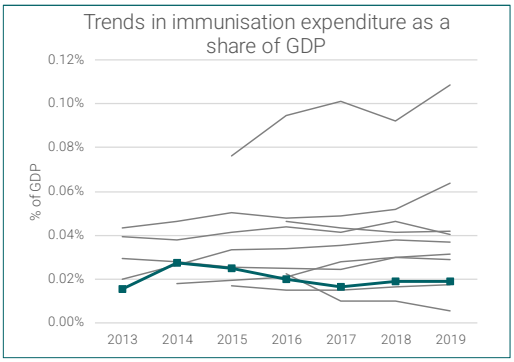
	# Programmes	Country rank
Total Immunisation programmes	17	10th
Childhood Immunisation programmes	14	10th
Adult Immunisation programmes	3	9th

Note: Countries ranked in terms of the number of programmes.

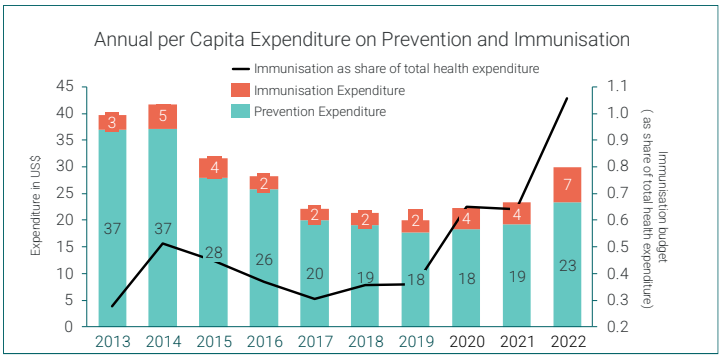


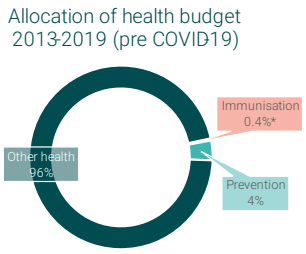
- **Influenza coverage:** Japan achieves moderate coverage levels for influenza. There was an uptick in vaccination rates in 2020, and subsequent decline. Data have not been available on adult influenza coverage in Japan since 2021.
- **HPV coverage:** Adolescent HPV vaccination rates are low over the period, but have seen a large increase since 2020, plateauing at 35% in 2023.
- **Measles coverage:** MCV2 vaccination rates have remained consistently over 90% across the period.

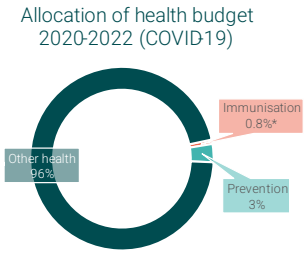
Mexico



- Immunisation expenditure as a % of GDP illustrates the **low priority for spending on immunisation** in Mexico over time.
- This figure is lower than in other countries. Mexico had the **3rd lowest average immunisation expenditure** between 2013 and 2019 (0.020%)
- Mexico was the **2nd lowest country in our analysis in terms of GDP per capita** in 2019 ($12,170).

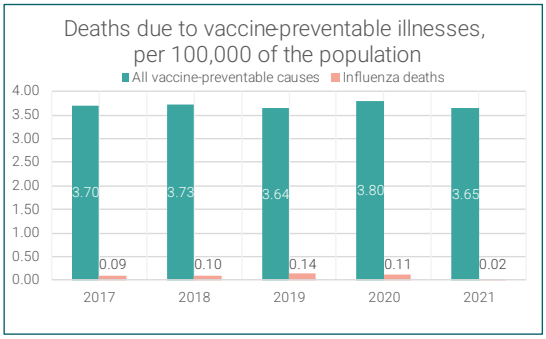


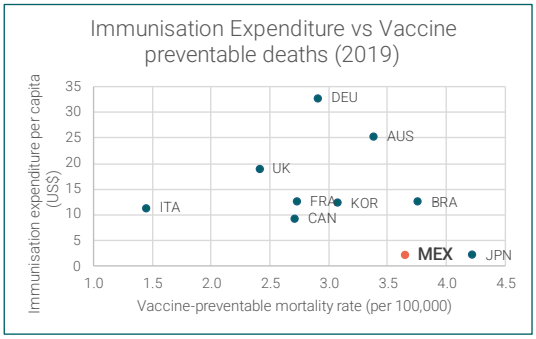




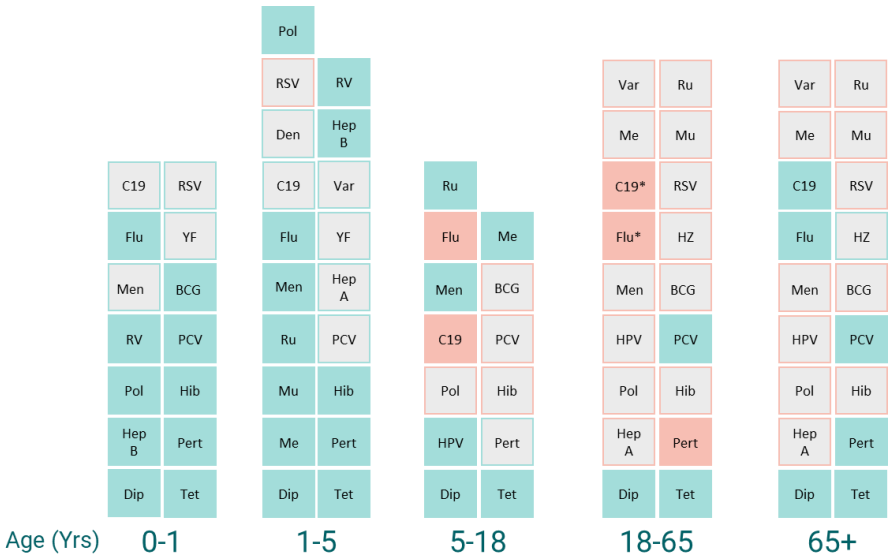
*Immunisation is shown with one decimal place due to its small proportion.
Other values are rounded to whole numbers, so totals may not sum to 100%.

- Before COVID-19, average spending on prevention and immunisation was less than **4.5% of the total health expenditure** (HE). At $2 per person the share of total health spend per person on immunisation in 2019 was less half a percent.
- During COVID-19, average spending on prevention and immunisation more than doubled to **3.8% of total health expenditure.**
- Over this period, average immunisation spending more than doubled to around $5 per capita, but **still less than 0.8%** of total health expenditure.



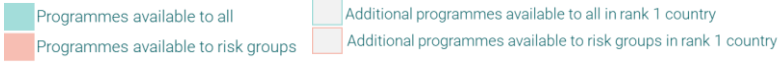


- Mexico experiences roughly **four vaccine-preventable deaths per 100,000 annually**. Influenza-related deaths comprise a low proportion of vaccine-preventable illness.
- In 2019, Mexico was low in terms of immunisation investment, while also reporting **one of highest vaccine-preventable death rates** compared to other countries.



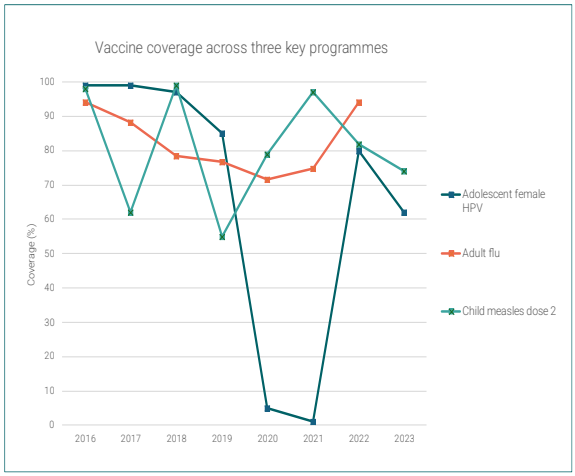
* Risk groups 18-60 years, and routine use for 60+ years.

- Despite comparable levels of economic development and geographical similarities with Brazil (Salud, 2024), Mexico is **one of the lowest ranked countries** whereas Brazil is the highest ranked country.
- Mexico's health system **does not have the same capacity** to provide as many vaccinations as Brazil (CEPI, 2024).



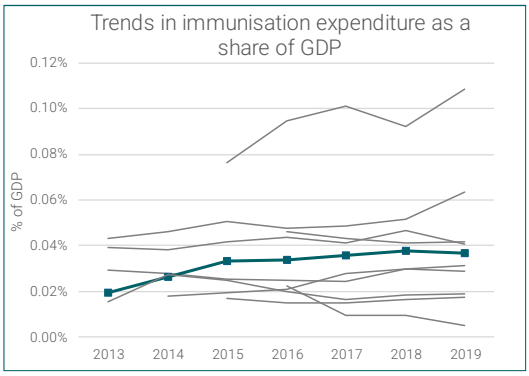
	# Programmes	Country rank
Total Immunisation programmes	21	6th
Childhood Immunisation programmes	15	8th
Adult Immunisation programmes	6	6th

Note: Countries ranked in terms of the number of programmes.

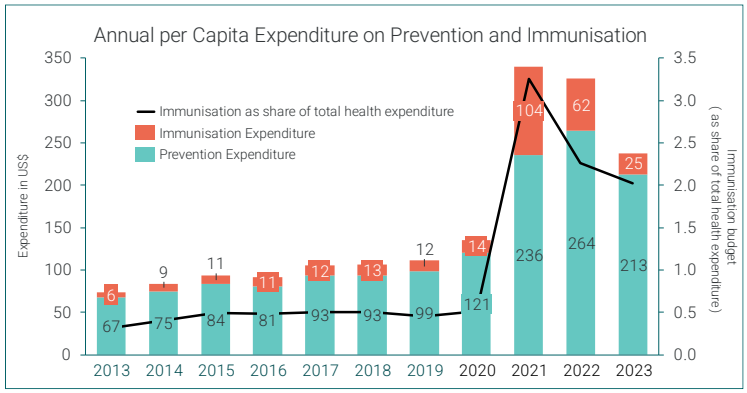


- Mexico has experienced a high degree of variability in vaccination rates over the period for these three key programmes.
- **Influenza coverage:** Prior to 2021, adult influenza vaccination rates were declining. Between 2020 and 2022 there was a notable increase, with over 90% coverage achieved in 2022. Data were not available in 2023.
- **HPV coverage:** Adolescent HPV vaccination rates were high between 2016 and 2019, experiencing a dramatic reduction during 2020 and 2021. Since 2021, coverage levels have not recovered to pre-COVID-19 levels.
- **Measles coverage:** MCV2 vaccination rates were steadily declining prior to 2020. Since 2021 there has been a subsequent uptick in reported coverage levels.

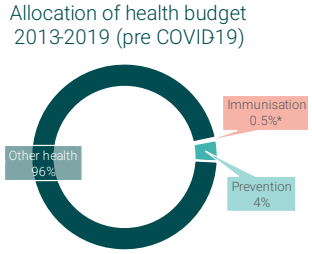
South Korea

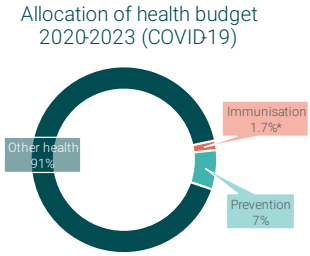


- Immunisation expenditure as a % of GDP further illustrates the **low priority for spending on immunisation** in South Korea over time.
- This figure is average compared to other countries. South Korea had the **3rd lowest average immunisation expenditure** between 2013 and 2019 (0.032%)
- South Korea was the **8th highest country in our analysis in terms of GDP per capita** in 2019 ($33,721).

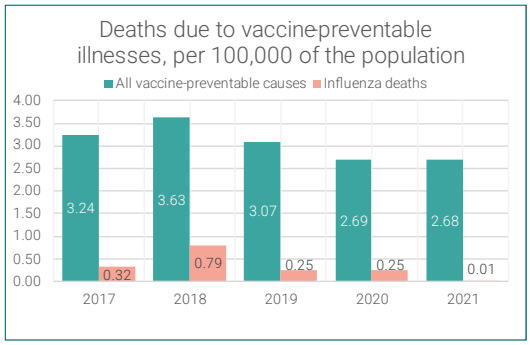


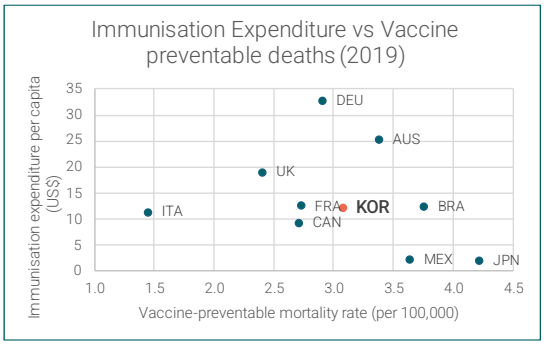
- Before COVID-19, average spending on prevention and immunisation was around **4.5% of the total health expenditure**. At $12 per person the share of total health spend per person on immunisation in 2019 was around half a percent.
- During COVID-19, average spending on prevention and immunisation nearly trebled and **grew to 8.7%** of total healthcare expenditure.
- Over this time, average immunisation spending more than quadrupled to over $51 per capita, but still **less than 2%** of total health expenditure.



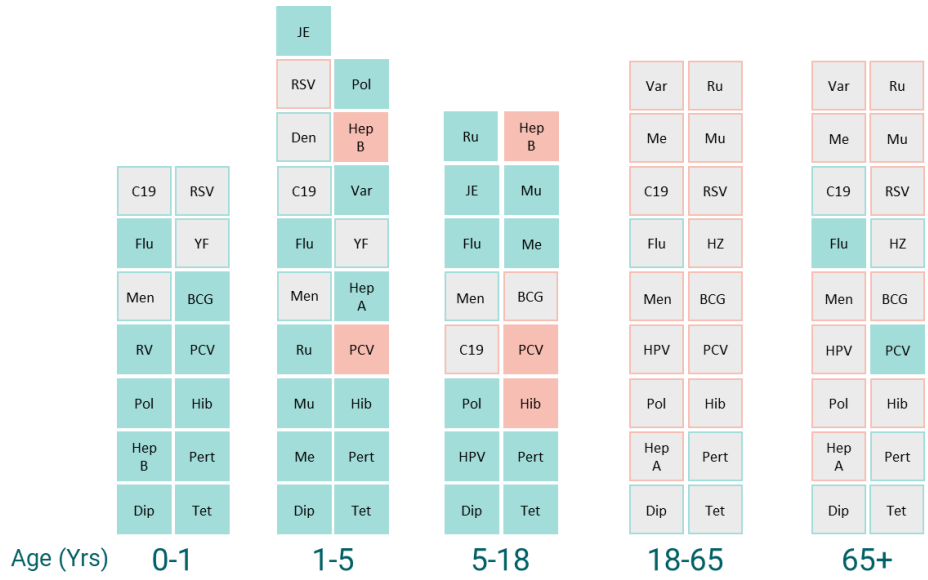


*Immunisation is shown with one decimal place due to its small proportion.
Other values are rounded to whole numbers, so totals may not sum to 100%.

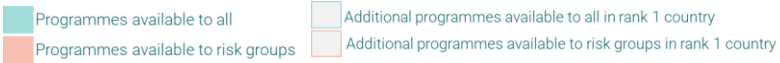




- South Korea experiences roughly **3-4 vaccine-preventable deaths per 100,000 annually**. Influenza-related deaths comprise a low proportion of vaccine-preventable illness (8% in 2019).
- In 2019, South Korea was in the mid-range of immunisation investment, while also demonstrating **average vaccine-preventable deaths compared to other countries.**

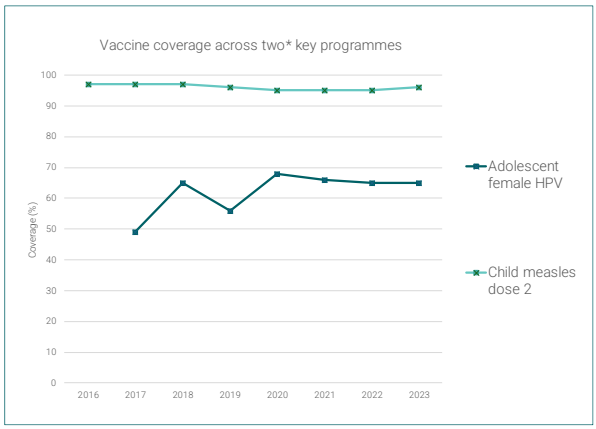


- Adult vaccinations in South Korea provide **minimal coverage**, in contrast to broader recommendations of the Korean Society of Infectious Diseases (KDCA, 2024).
- There is growing **demand to align the funded programme with national recommendations** (Choi, 2023).



	# Programmes	Country rank
Total Immunisation programmes	19	9th
Childhood Immunisation programmes	17	4th
Adult Immunisation programmes	2	10th

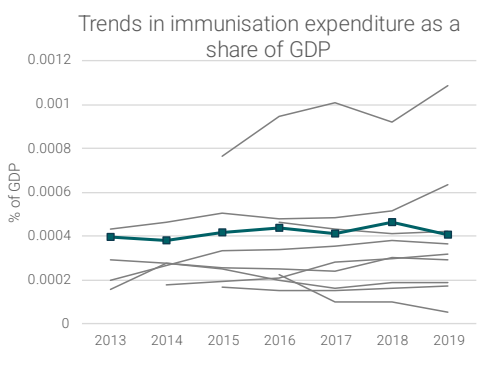
Note: Countries ranked in terms of the number of programmes.



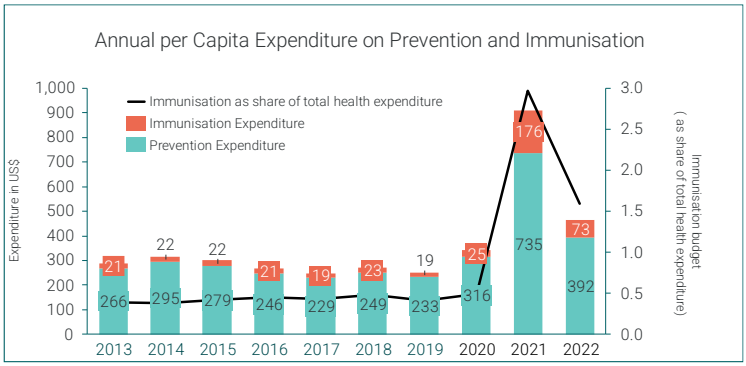
*Influenza coverage unavailable for South Korea

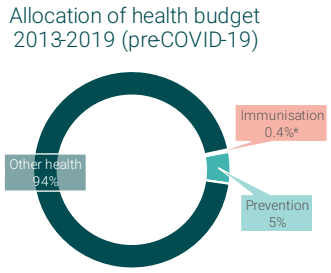
- **Influenza coverage:** Data for adult influenza coverage is not available.
- **HPV coverage:** Adolescent HPV vaccination rates have remained relatively stable, at around 65% since 2020.
- **Measles coverage:** MCV2 vaccination rates have also stayed consistently over 90% across the period.
- HPV and measles vaccination rates were relatively unaffected **during the emergency phase of COVID-19**

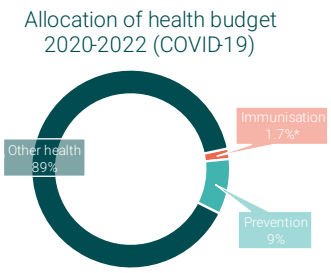
UK



- Immunisation expenditure as a % of GDP illustrates the **low priority for spending on immunisation** in the UK over time.
- However, this figure remains high compared to other countries. The UK had the **4th highest average immunisation expenditure** between 2013 and 2019.
- The UK was **the 4th highest country in our analysis in terms of GDP per capita** in 2019 ($47,082).

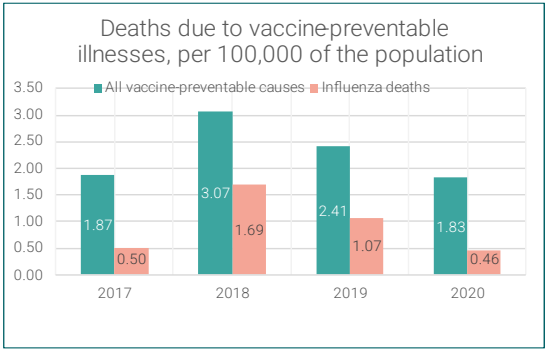


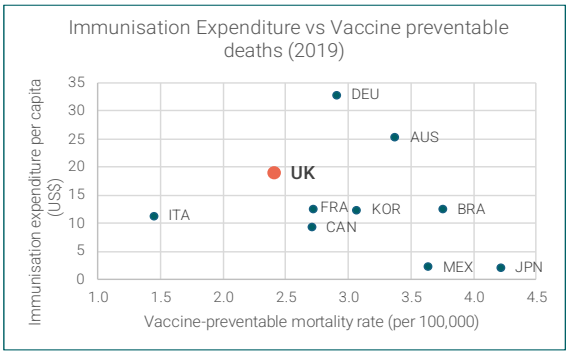




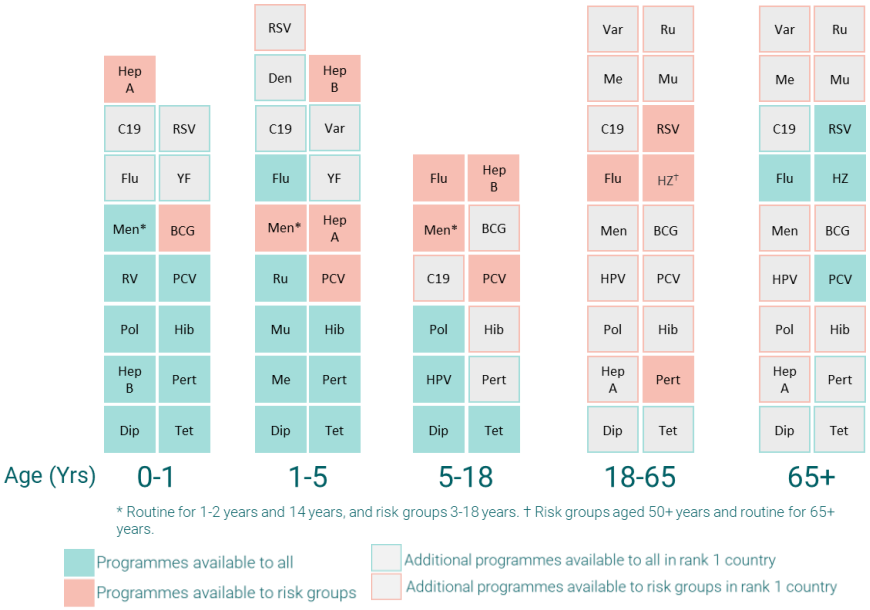
*Immunisation is shown with one decimal place due to its small proportion.
Other values are rounded to whole numbers, so totals may not sum to 100%.

- Before COVID-19, average spending on prevention and immunisation was **less than 5.5%** of the total health expenditure (HE). At $19 per person, the share of total health spend per person on immunisation in 2019 was **less than half a percent.**
- During COVID-19, spending on prevention and immunisation more than doubled to **10.7% of total HE**.
- Average spending on immunisation over this period more than quadrupled to $91 per capita, but still **less than 1.7%** of total health expenditure.





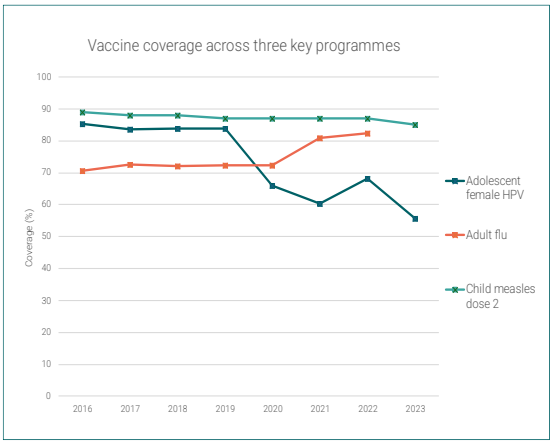
- The UK experiences roughly **2-3 vaccine-preventable deaths per 100,000 annually**. Influenza-related deaths comprise a significant proportion **(between 27% and 55%)** of vaccine-preventable deaths for the causes considered.
- In 2019, the UK was the 3rd biggest investor in immunisation and prevention, while also demonstrating **relatively low vaccine-preventable deaths compared to other countries.**



- The UK ranks **6th for the number of child immunisation** programmes, delivered through a primary care network and school provision.
- It has a **limited adult vaccination** framework with only 5 programmes, structured around risk groups until age 65 (UK Health Security Agency, 2024).
- At the time of analysis, COVID-19 was not part of the national schedule (the Green Book).

	# Programmes	Country rank
Total Immunisation programmes	21	6th
Childhood Immunisation programmes	16	5th
Adult Immunisation programmes	5	7th

Note: Countries ranked in terms of the number of programmes.



- **Influenza coverage:** The UK performs well in adult influenza uptake, with over 70% coverage across the period and exceeding the WHO coverage target for the elderly in Europe of 75% in 2021 and 2022.
- **HPV coverage:** HPV vaccination for adolescent females was high (around 85%) from 2016 to 2019 but has since dropped, falling short of the WHO 2030 target of 90%.
- **Measles coverage:** MCV2 coverage for children remains high but saw a slight decline between 2022 and 2023.
- **Since COVID-19,** there was an increase in coverage for adult influenza, and a downward trend in coverage for adolescent HPV. There has been a slight decline in uptake for child measles. vaccination between 2022 and 2023.

Appendix B: The International Classification of Health Accounts (ICHA)

HCTOT:	All functions (Total health care expenditure)
HC.1	Curative care
HC.2	Rehabilitative care
HC.3	Long-term care (health)
HC.4	Ancillary services (non-specified by function)
HC.5	Medical goods (non-specified by function)
HC.6	Preventative care
HC.7	Governance, and health system and financing administration
HC.0	Other health care services not otherwise classified
HC.6:	Preventive care (Prevention expenditure)
HC.6.1	Information, education and counselling programmes
HC.6.2	Immunisation programmes
HC.6.3	Early disease detection programmes
HC.6.4	Healthy condition monitoring programmes
HC.6.5	Epidemiological surveillance and risk and disease control programmes
HC.6.6	Preparing for disaster and emergency response programmes
HC.6.2	Immunisation programmes (Immunisation expenditure)
	In order to prevent the development of a disease, before or after exposure, through the use of pharmaceutical products, such as vaccines. This is primary prevention. It can involve consumption by specific individuals in a campaign or in continued programme operations. The expenditure involved in the consultation, both for the time and skills of the personnel and the purchase of the vaccine itself, should be accounted for.

Appendix C: Data availability for coverage

FIGURE C.1: DATA AVAILABILITY FOR COVERAGE OF ADULT IMMUNISATION PROGRAMMES

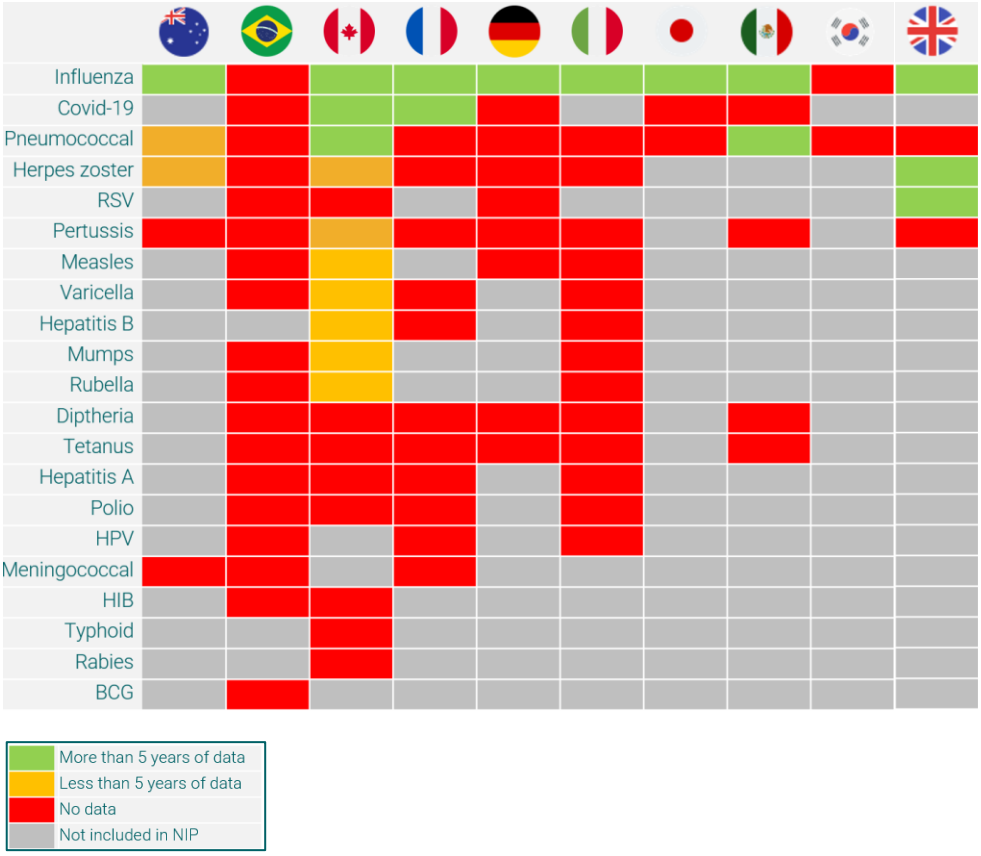


FIGURE C.2: DATA AVAILABILITY FOR COVERAGE OF ADOLESCENT IMMUNISATION PROGRAMMES

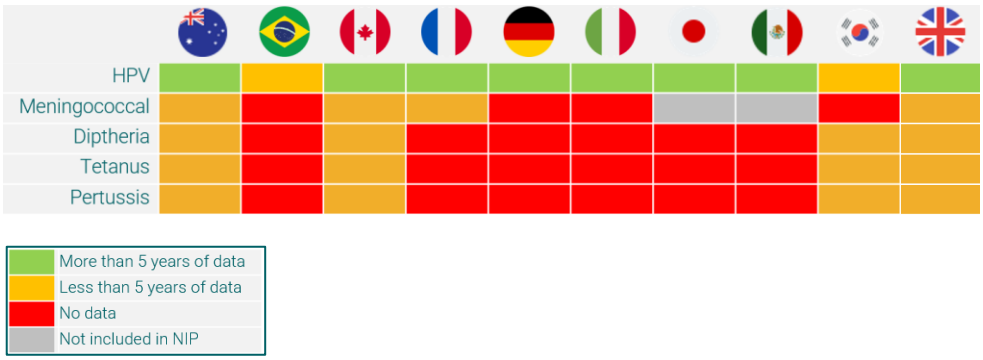
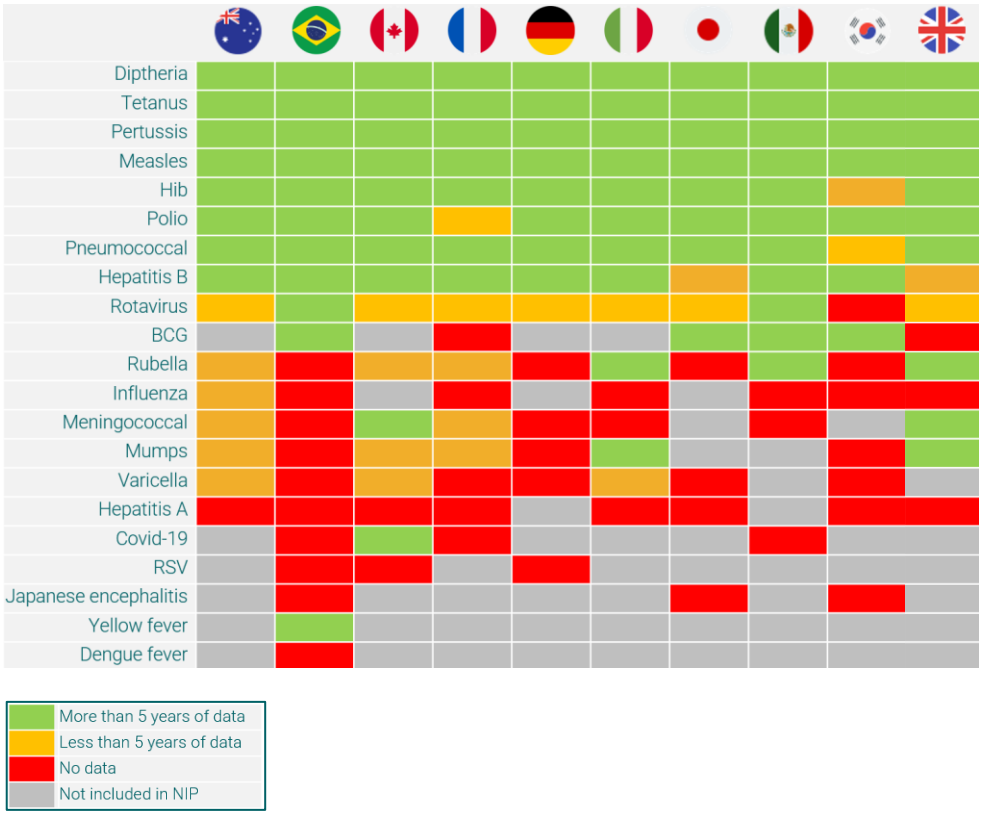


FIGURE C.3: DATA AVAILABILITY FOR COVERAGE OF CHILD IMMUNISATION PROGRAMMES


Diptheria
Tetanus
Pertussis
Measles
Hib
Polio
Pneumococcal
Hepatitis B
Rotavirus
BCG
Rubella
Influenza
Meningococcal
Mumps
Varicella
Hepatitis A
Covid-19
RSV
Japanese encephalitis
Yellow fever
Dengue fever
More than 5 years of data
Less than 5 years of data
No data
Not included in NIP

Appendix D: Robustness check using PPP-adjusted expenditure

FIGURE D.1: PREVENTION EXPENDITURE VS GDP PER CAPITA (2019)

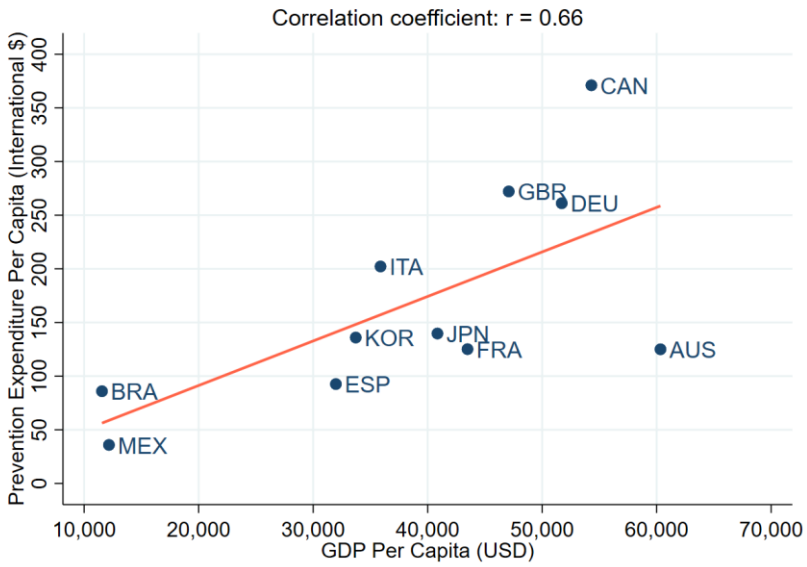


FIGURE D.2: IMMUNISATION EXPENDITURE VS GDP PER CAPITA (2019)

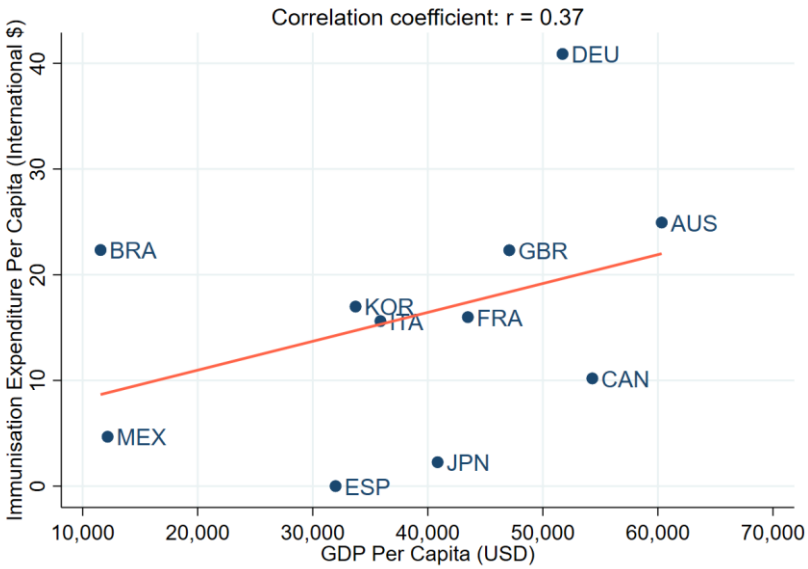


FIGURE D.3: PREVENTION EXPENDITURE VS VACCINE PREVENTABLE DEATHS

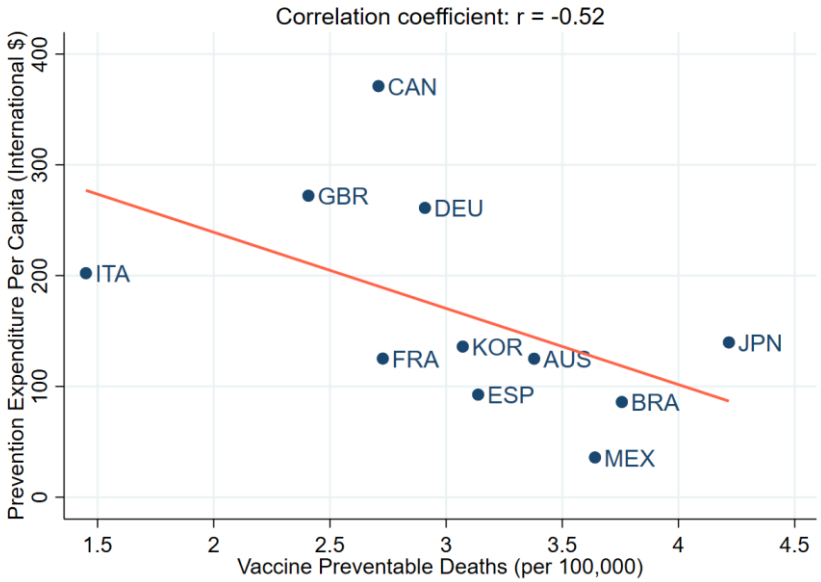


FIGURE D.4: IMMUNISATION EXPENDITURE VS VACCINE PREVENTABLE DEATHS

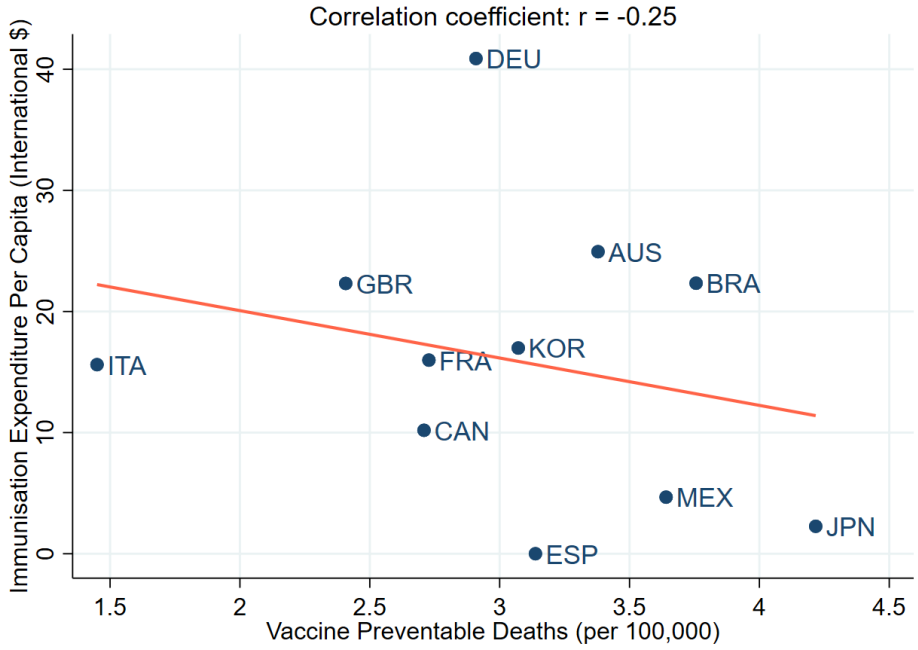


TABLE D.1: REGRESSION ANALYSIS OF THE ASSOCIATION BETWEEN IMMUNISATION EXPENDITURE (PPP ADJUSTED, INT $) AND VACCINE-PREVENTABLE DEATHS (2017-2019)

	Vaccine-preventable deaths per 100,000 of the population
Immunisation expenditure per capita (INT $)	-0.0327* (0.0122)
GDP per capita (USD)	0.0000262 (0.0000219)
Total population	0.000000012 (6.44e-09)
Time trend	0.00463 (0.0638)
Constant	-7.725 (129.0)
N (number of countries x number of years)	30

Notes: Pooled Ordinary Least Squares (OLS) regression analysis. Robust standard errors included in parentheses below coefficients.
** p<0.05, ** p<0.01, *** p<0.001*

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- The costs of treating, or failing to treat, specific diseases and conditions
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- Incentives, disincentives, regulation and the costs of R&D for pharmaceuticals and innovation in medicine
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