Title: WHO UNICEF HPV Estimates Notes WHO/UNICEF HPV vaccine coverage estimates 2024 revision (*released 15 July 2025*)

1. Introduction

The WHO and UNICEF estimates of national HPV vaccine coverage aim to describe the performance of HPV vaccination programmes. Estimates are based on data and information available to WHO and UNICEF as of 20 June 2025.

The data can be viewed and accessed on the WHO (https://immunizationdata.who.int/) and UNICEF (https://data.unicef.org/topic/child-health/immunization/) web sites.

A visual overview of global, regional and country level trends in HPV vaccine coverage can be accessed through the HPV vaccine introduction dashboard:

- https://www.who.int/teams/immunization-vaccines-and-biologicals/diseases/human-papillomavirus-vaccines-(HPV)/hpv-clearing-house/hpv-dashboard

A tool enabling visualization of HPV coverage estimate trends in the broader context of WUENIC indictors can be found at:

- https://worldhealthorg.shinyapps.io/wuenic-trends/

2. Background

HPV vaccines were first introduced in WHO member states in 2006. By 2010, 32 countries had introduced and by 2015 this had doubled to 62 countries. Most of these countries were high income or upper middle income countries.

In 2009, following the publication of the first WHO Position Paper on HPV vaccines, WHO defined a framework for monitoring coverage and impact of HPV vaccines, (https://www.who.int/publications/i/item/WHO_IVB_10.05) proposing that a summary indicator of the "proportion of girls vaccinated with 3 doses by age 15 years will be useful to compare HPV vaccine coverage trends over time and across geographic areas".

As of 2010 the Joint Reporting Form started the collection of data on HPV vaccine introduction status and the number of doses provided annually to the priority target of girls, by age (9 to 13) and dose (1,2 and 3) as per the current guidance on age and schedule for HPV vaccines in 2009.

In 2014, WHO published a second Position paper on HPV vaccines in which the schedule for the priority target of 9 to 13 year old girls was adjusted to a 2 dose schedule.

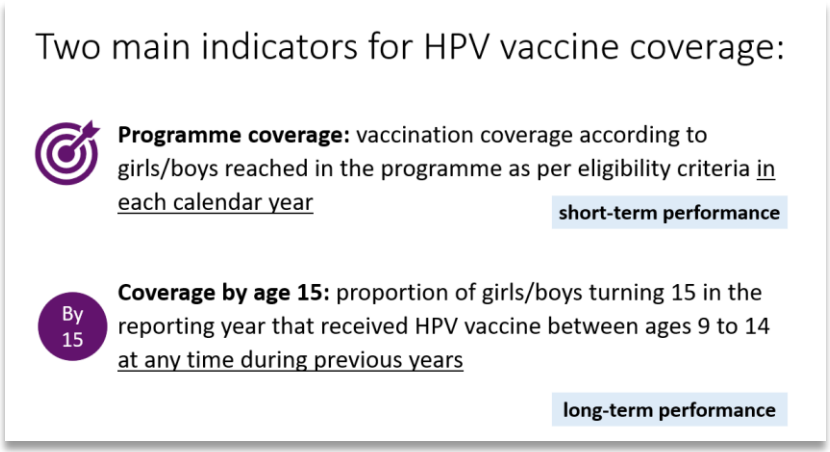
In 2014, following the inclusion of vaccination of boys in the label of the first HPV vaccine product, the first high income countries introduced to boys. WHO Position paper on HPV in 2014 acknowledged the label change but indicated HPV vaccination of males was ”not recommended as a priority, especially in resource-constrained settings”

In 2017, a third position paper was published in which the primary target population was adjusted to 9 to 14 year old girls allowing flexibility in the schedule beyond the 6 months interval (without defining a maximum interval). In addition, the position paper emphasized the importance of reaching girls through catch-up efforts with the introduction of the vaccine up to 18 years of age as possible.

In 2018, after more than 80 countries had introduced HPV vaccines, including the first low and lower middle-income countries WHO began reporting annual HPV vaccine coverage estimates informed by the WUENIC methodology and processes using the Joint Reporting Form data. Since 2010 data reporting to JRF on HPV vaccines was by individual age and dose (1,2 or 3). The latter allowed both to capture changes in schedule in countries from 3 to 2 doses in the priority target, but also continued administration of third doses to immunocompromised individuals.

WHO convened an HPV expert meeting (Barcelona, Spain, December 2018) with Gavi, technical experts and selected countries representatives to define priority indicators. The meeting validated the 2009 proposed summary indicator on population protection by age 15 as a useful standardized measure that would be comparable across countries. Experts proposed to develop an additional indicator of programme coverage during the last calendar year, in order to reduce the time lag between routine vaccination (eg at age 9) and reporting on coverage by age 15 This programme indicator would provide more timely and actionable coverage data to inform HPV programme strategies (see definitions in figure below).

In July 2019 the first WHO/UNICEF HPV estimates were published for each country that had reported HPV vaccine introduction and provided coverage data through the JRF between 2010 and 2018.



Between 2019 and 2024 data collection on HPV evolved following the biannual update of the overall JRF data collection tool. Notably, data collection was extended to include admin data (by age and dose) on vaccines provided to boys; reported denominator size and admin coverage for the first dose and final dose for females and males, as well as official coverage.

HPV vaccination programme strategies (Schedule, eligible target, delivery strategy) change over the years in many countries. Changes include reducing schedule from 3 to 2 or 1 dose; moving from multi-age cohorts (MAC) vaccination approaches to single-age cohort approach in the routine programme (or vice versa); increasing eligibility or conducting wide age catch-up campaigns to populations 15 or older; incorporating male vaccination strategies. The current reporting and indicators system is set up to accommodate data collection and develop trend data over time irrespective of these changes.

3. Country status: HPV vaccine introduction and data availability

Introduction status

147 (out of respectively 194 WHO and 195) UNICEF Member States) had introduced HPV vaccine for girls in the national immunization schedule by 31 December 2024.

- 4 new introductions were reported: Kazakhstan, Mali, Mongolia Timor-Leste.
- In 2 countries introduction is limited to subnational level in 2024: Moldova and Philippines.

Coverage data reporting and valid estimates

- 145 Member states reported data on HPV vaccination coverage (as per the cutoff date 20 June 2024).
- 3 countries submitted the eJRF report timely, but did not include 2024 HPV coverage data: Kuwait, Greece, Monaco
- 2 countries where HPV is in the national schedule did not submit the 2024 eJRF report to WHO by 27 June 2024: Israel, USA

Other indicators on gender and schedule:

- 79 Member States included boys vaccination (54% of the 147 introductions).
- 65 Member States (44% of the 147 introductions) reported implementing the single-dose schedule. Note that for countries with single dose schedule first dose coverage (eg. PRHPV1_F) and completed schedule coverage (PRHPVc_F) are reported as identical.

Countries that have not introduced HPV vaccine as per 31 December 2024 :

Afghanistan, Algeria, Angola, Azerbaijan, Belarus, Benin, Burundi, Central African Republic, Chad, China, Comoros, Congo, Cuba, Democratic People's Republic of Korea, Democratic Republic of Congo, Djibouti, Egypt, Equatorial Guinea, Gabon, Ghana, Guinea, Guinea Bissau, Haiti, India, Iran, Iraq, Jordan, Lebanon, Madagascar, Namibia, Nepal, Niger, Oman, Pakistan, Papua New Guinea, Russian Federation, Somalia, South Sudan, Sudan, Syria, Tajikistan, Tunisia, Turkey, Ukraine, Venezuela, Viet Nam, Yemen.

4. METHODOLOGY

Definition of the introduction status

WHO and UNICEF begin developing estimates of HPV vaccine coverage, when Member States report or confirm the introduction of the HPV vaccine into the national immunization schedule, including when HPV vaccination is at subnational level only.

Irrespective of whether HPV vaccine is introduced sub-nationally, or is started during the course of the calendar year (eg October), or is restricted due the vaccination strategy (e.g. adolescents attending public schools) and as a result doesn't cover the entire eligible cohort(s) of girls in the national population, the WHO/UNICEF HPV coverage estimates always use the entire national cohort of the corresponding eligible age/target age group for the full calendar year as a denominator. Subnational vaccination with eg. reported coverage of >90% may therefore result in a WHO/UNICEF HPV estimate of <10%.

Definition of the coverage indicators

Name	Abbreviation	Numerator	Denominator
HPV Programme coverage for females or males for first dose or completed schedule	PRHPV (F or M) and 1 (first dose) or C completed schedule)	Doses provided to the target population (age(s), or grade(s)) during the reporting calendar year. (by first or final dose, female or male)	Total size of cohort nationally of the corresponding age(s) in the target population
HPV by 15 year coverage for females or males for first dose or completed schedule	15HPV (F or M) and 1 (first dose) or C completed schedule)	Doses provided to the girls (or boys) between 9 and 14 year old during any year prior to the reporting year (including any final doses to 15 year olds, as per schedule during the reporting calendar year) (by first or final dose, female or male)	Single cohort of 15-year-old girls (or boys) in the reporting year.

Data sources

Primary data source

Each year, WHO and UNICEF jointly review data submitted by Member States to the agencies. The primary source for developing the estimates is the Joint Reporting Form on Immunization (eJRF) due by April each year. The eJRF provides information on the HPV programme, delivery mode and eligibility and administrative data on national immunization coverage. eJRF may also include data based on population-based surveys.

*Additional data sources on HPV vaccination***:**

- **Data from MoH national immunization programme websites on HPV** can be used for countries that do not report HPV coverage data through the eJRF to WHO and for which data on HPV coverage is available on the website of the Ministry of Health. On occasions additional data (age disaggregated or historical data) may be available on the official website beyond what is reported through the eJRF, and it may be used to complete the estimation.
- **Data from implementation partners,** such as WHO Country Offices and global partners involved in HPV programme introduction, implementation and monitoring, when available, can be used to triangulate or complement HPV programme and coverage data reported through eJRF

Additional sources on population size and income classification

1. **Estimated population data from the UN Population Division**[1] for 2024 was used to establish target size for denominators for country level estimates. For calculating regional and global vaccination coverage figures, the 2024 HPV revision of the ***World Population Prospect*** *from the United Nations Population Division*, published in July 2024, was used**.** The World Population Prospect 2024 was published on 11 July 2024 and replaced the 2022 revision. More details can be found here: https://population.un.org/wpp/
2. **Disaggregation by World Bank country and lending groups** use the latest classification issued by the WB. In this update the 2025 fiscal year classifications are used (https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups)

Methodological consideration on defining target populations (denominators)

As a default, since HPV estimate production began in 2018, United Nations Population Division (UNPD) data on the size of population cohorts is used to calculate denominators for the WHO/UNICEF HPV estimates. Given the new target cohorts for EPI programmes for HPV vaccination, in countries considerable uncertainty exists around determination of accurate denominator size in countries. The eJRF started to collect data on country reported denominators from countries in 2022 which in some cases is used as denominator for the estimates.

Currently, a country can justify the use of the national denominator data by providing additional information on its accuracy (eg date of last census; use of electronic individual immunization registry). As a rule, country reported denominators can be accepted except when difference with UN data is more than 10%.

[1] United Nations, Department of Economic and Social Affairs, Population Division (2022). *World Population Prospects 2022, Online Edition*.

Members States with very small populations (eg island states), including those for which the UNDP does not provide age disaggregated estimates are an exception. In these cases, the denominators provided by countries are accepted. This is particularly the case when using UNDP data would lead to coverages close to or greater than 100%.

Adjustments

WHO and UNICEF HPV estimates are based on country reported administrative data. Context-specific adjustments can be made to the reported data as per the methodology described in HPV vaccination introduction worldwide and WHO and UNICEF estimates of national HPV immunization coverage 2010–2019 (see also supplementary materials). Main scenarios when adjustments can be made include:

- When countries use wide age range eligibility (eg. all 9 to 14 year eligible for HPV vaccination, year after year) adjustments to the denominator can be made in years following the introduction to correct for population in that same age range that was already vaccinated in previous year(s).
- When countries do not report data on HPV coverage for a given year, data are considered from earlier and later years and interpolations or extrapolations can be made to estimate coverage for the missing year(s).
- When countries report HPV coverage in multiple fields in the JRF and there is considerable variation between the numbers (for example, between doses reported in the numerator for official administrative coverage and doses reported in school-based vaccination in the JRF), based on all available (programme) information about the country an adjustment could be made by selecting the most credible source.
- When survey data are available for the reporting or earlier years, adjustments to the reported or calculated coverage estimates can be made. Coverage survey data for HPV may pertain to several age cohorts (e.g. cohorts from 15 to 18 year old, respectively vaccinated 1 to 4 years ago.) This may result in adjustment to coverage estimates for multiple years prior to the reporting year.
- When corrections are made to HPV estimates based on survey data in previous years, a correction factor can be applied to reported admin coverage in subsequent years. This methodology will be described in more detail and be available in a subsequent methodological update.

5. Notes on aggregated coverage estimates for global, regional and other country groupings

Aggregated estimates by global, regional, and other country groupings are estimates based on the coverage indicators (both programme and "by 15" indicators, first dose and completed schedule) weighted by population size of the country. The ponderation is done using the size of the 15-year-old cohort as provided by the United Nations Population Division (UNPD). Rationale for a selected single age of 15 for the ponderation is to avoid bias in the population ponderation based on the age at vaccination that varies from 9 to 14 in routine HPV vaccination and that is reflected in the Programme Coverage indicator. UNDP POP Division data as single source, rather than country-based denominators, is chosen to avoid bias due to difference sources for population size determination.

The population estimate time-series data are published by the UNPD every two years as part of the World Population Prospects (WPP) with a release date usually taking place during June/July. The current WUENIC release uses the WPP 2024 revision for the global, regional and country grouping ponderation.

All countries are included in global and regional calculations. For countries where no WHO/UNICEF HPV vaccine coverage estimate is available - when the vaccine is not introduced or coverage data not available - a value of zero is assigned for the estimate.

Note that the doses (numerator) and the target number (denominator) calculated for these population adjusted, aggregated coverage measures (regional and global) may underestimate the actual number of girls reached and doses provided in the calendar year: This is due to the methodology which projects the coverage onto a single age cohort, which may vary in size from the actual cohort and which does not reflect vaccination of multiple age cohorts.

6. **Country consultation process for developing the coverage estimates**

WHO and UNICEF encourage countries to review and comment on the draft HPV country profile reports and answer any questions specially addressed to the country regarding its data. In May/June of each year draft HPV country profile reports are shared with countries through he WHO regional offices and countries can submit comments and additional information through the third week of June.

In past years, selected regional or sub-regional consultations have been organized to review country data and estimates. There have also been consultations with individual countries on request. Such consultations generally have contributed to improve the understanding of HPV coverage estimation and can further improve the overall quality of the reporting and estimation.

7. CHANGES BETWEEN 2023 AND 2024 HPV REVISIONS:

Database structure change.
None

Changes in estimates due to updates in empirical data between revisions result from:

- Updated coverage data submitted by Member States and previously reported time series were revised.

- 2023 or prior years data reported late, and not included in 2023 revision of coverage estimates (between 27 June 2024 and 20 June 2025)
- New (survey) data becoming available after 2023 revision (between 27 June 2024 and 20 June 2025)

Annex 1: List of countries where WHO/UNICEF estimates of HPV vaccine coverage estimates are different (>5 %-points) from reported official coverage data

WHO/UNICEF HPV coverage estimates are generally based on reported number of doses provided to the target population for the numerator. UN population division data on cohort size are default source for calculating the denominator data for establishing the coverage estimate. This means that the reported, official HPV estimates are in principle not used for establishing the WHO/UNICEF HPV estimates and may therefore differ.

Below are countries where one of the WHO/UNICEF HPV estimates (Programme indicator, Female, Male, first dose and/or complete schedule programme coverage) differs from the reported coverage data by varying levels.

Difference between WHO/UNICEF estimates and (reported) Official Coverage	Country ISO code
-50% or more	DOM, GRD, JPN, UGA
-20 to -49%	ARE, ERI, ETH, GMB, GTM, LCA, LKA, MEX, MLT, MNE, MOZ, MRT, MUS, PER, PHL, SWZ, TLS
-5% to -19%	AUS, BHR, BRB, BTN, FIN, FJI, GUY, HND, IDN, KHM, LAO, LCA, LTU, MDA, MDV, MKD, MLT, MMR, MYS, PRT, RWA, SAU, SGP, SRB, SUR, SYC, TTO, VCT, ZAF
Between -5% and +5%	
+ 5% to + 19%	BGR, BHS, CIV, CMR, COL, CZE, FSM, FEO, LVA, MWI, NRU, SLE, SVK, TON, URY
+20% or more	BGD, CHL, ECU, FJI, KEN, LVA, MHL, MRT, NZL, PLW, PRY, SEN, SLB, SVK, ZMB

Note: Negative (-) values indicate official estimates are higher than WHO/UNICEF estimates; positive (+) values indicate official estimates are below WHO/UNICEF estimates; countries can be represented more than one time (different indicators).