

# **User manual**

**for WHO Cervical Cancer Prevention  
and Control Costing tool:  
HPV vaccination module  
(C4P-HPV tool)**



**World Health  
Organization**



**User manual**  
**for WHO Cervical Cancer**  
**Prevention and Control Costing tool:**  
**HPV vaccination module**  
**(C4P-HPV tool)**



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User manual for WHO Cervical Cancer Prevention and Control Costing tool: HPV vaccination module (C4P-HPV tool)

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## Preface

This WHO Cervical Cancer Prevention and Control Costing (C4P) tool consists of two independent modules: human papillomavirus (HPV) vaccination and cervical cancer screening and treatment. Within the previous version of the HPV vaccination module, there are two variants. One tool retrospectively estimates spending during a Gavi demonstration project; the other tool projects future costs over a five-year scale-up to nationwide introduction using single-age cohort vaccination. These two variants of HPV vaccination module are no longer available. Given the latest epidemiological data and WHO's recommendations, the current version of the HPV vaccination module estimates costs over a five-year scale-up to nationwide introduction using multi-age cohort (MAC) vaccination through cost projection or retrospective costing.

## Acknowledgements

This manual and the related tool were developed by Ann Levin and Winthrop Morgan under supervision of Raymond Hutubessy and Karene Yeung of the Department of Immunization, Vaccines and Biologicals, World Health Organization, Geneva, Switzerland. The work was made possible by the generous support of the Global Alliance for Vaccine and Immunization (Gavi) and the Bill and Melinda Gates Foundation.

# Glossary of terms

**Annualization:** Division of total costs by life expectancy of the good, used to spread the cost of a capital good over its lifetime.

**Capital items:** Goods that last for longer than one year such as equipment.

**Cost projection:** Estimation of future costs of both recurrent and capital inputs.

**Depreciation:** Amount of capital used during one year.

**Discounting:** Accounts for time preference through calculating the present value using the discount rate.

**Economic costs:** The value of all resources utilized, regardless of the source of financing. Includes opportunity costs (the value of what is given up from not using the resources for other uses) for use of existing resources and any donated goods or services from any source. Capital costs are annualized and discounted.

**Financial costs:** Monetary outlays, with straight-line depreciation for capital goods; does not include opportunity costs for use of resources or donated goods and services from sources other than the payer(s) defined in the analysis. Definition is dependent on perspective since monetary outlays are specific to the payer(s), defined in the analysis.

**Full cost:** Baseline cost as well as the additional cost of the new intervention, including vaccine cost.

**Incremental cost:** Cost of adding a new service/intervention or a package of services/interventions over and above an existing program; inclusion of existing resources will depend on assumptions made about excess capacity (i.e., whether resources are underemployed; if there are no slack resources (e.g., all personnel time is fully allocated before the addition of the new service/intervention), then their use for the new service or intervention incurs an opportunity cost that should be included – either by measurement or assumption).

**Introduction (or start-up) cost:** Cost of initial one-time programmatic activities. Examples may include initial microplanning, initial training activities, and initial sensitization/ social mobilization/ information, education and communication (IEC); does not include routine or repeated programmatic activities such as refresher training or annual microplanning. Introduction activities may include both recurrent and capital costs; they are defined by the non-repeating nature of the activity, not the type of input.

**Investment cost:** Initial expenditures used in preparation for an intervention. These include introduction costs plus purchase of capital goods such as cold chain equipment and transport purchases, without depreciation.

**Micro-costing:** Focuses on granular accounting of input prices and quantities; disaggregates costs of particular output into specific goods and services consumed.

**Perspective:** The point of view considered for costs (and benefits, if included) in a costing study, by whom the costs were incurred. Payers are the disbursing agents for a good or service, and may differ from the original source of funding. A provider perspective includes costs incurred by health service providers (can be limited to the government), a payer perspective includes costs to the payer(s), such as government or an external partner, while the societal perspective includes all costs incurred by providers as well as clients. This tool does not analyze societal costs and benefits.

**Recurrent Cost:** Value of resources that last less than one year. Start-up activity costs may include recurrent costs.

**Retrospective data collection:** Data collection after resource use is completed.

**Straight-line depreciation:** This type of depreciation assumes that all of the benefit from the capital good is spread evenly throughout its lifetime; it involves annualizing the total costs but does not discounting.

**Time preference:** Preference for receiving goods and services at one time over another, usually expressed as wanting goods and services now rather than later in the future.

**Vaccine delivery costs:** Costs associated with delivering immunization programmes to target populations, exclusive of vaccine procurement costs.

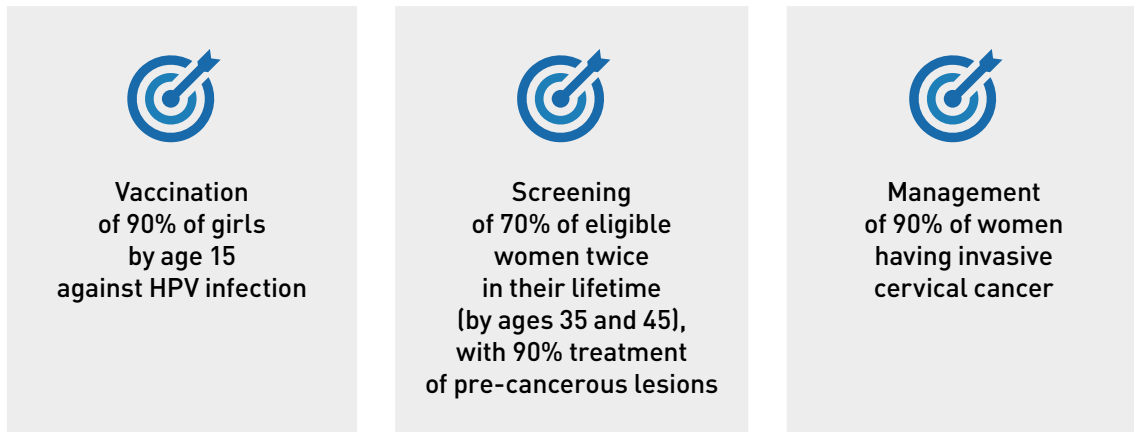
**Vaccine cost:** At a minimum includes the cost of the vaccine and diluent (if applicable); the analysis should include accounting for wastage rates; the analyst should specify whether this also includes injection supplies (syringes), international shipment, insurance, and customs/duties.



# Introduction

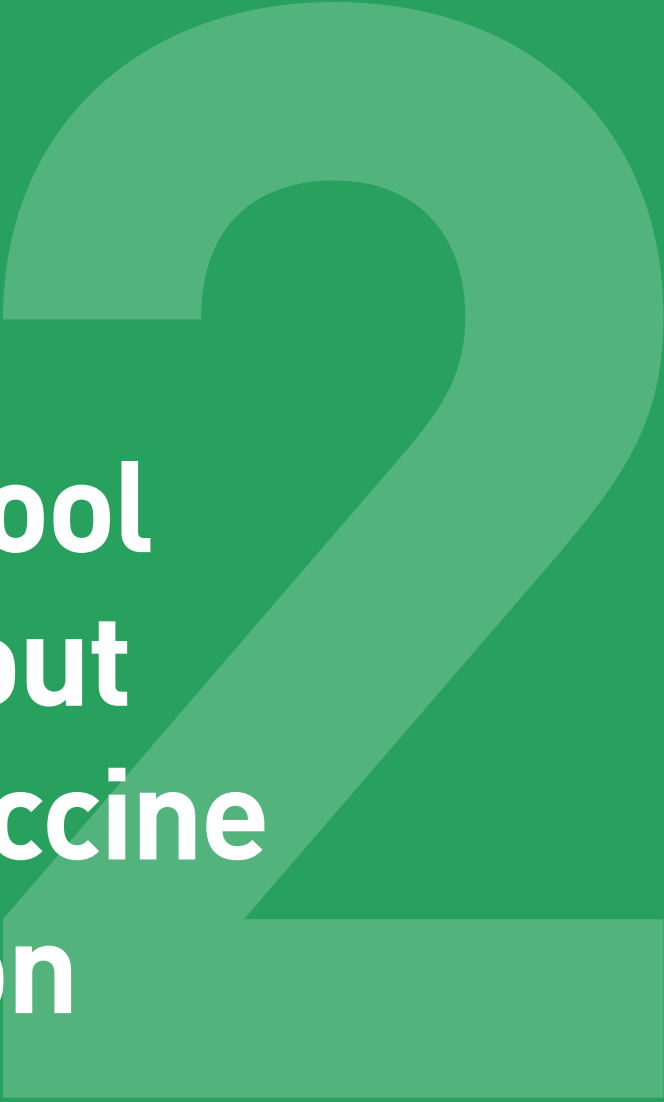
Cervical cancer is the fourth most common cancer in women worldwide in 2018, with 570,000 new cases and 311,000 deaths occurring annually (1). The highest incidence rates are in Southern Africa, Eastern Africa, Sub-Saharan Africa, Western Africa, Melanesia, and Middle Africa (2). It also ranks as the leading cause of cancer-related death in most African countries. More than 85% of these deaths occur in low- and middle-income countries (2). In addition, women living with human immunodeficiency virus (HIV) are six times as likely to have cervical cancer (3).

The World Health Organization has recommended targets in the global strategy towards eliminating cervical cancer as a public health problem (4), which include primary, secondary and tertiary prevention: 90% of girls fully vaccinated with HPV vaccine by 15 years of age; 70% of women are screened with a high-performance test by 35 years of age and again by 45 years of age; and 90% of women identified with cervical cancer disease receive treatment. The life-course approach to cervical cancer interventions is necessary because HPV infection, precancer and cancer progress at different times in a woman's life.



Governments are introducing comprehensive cervical cancer prevention and control programmes to reduce the burden of cervical cancer in their countries. In order to plan, implement, and sustain effective cervical cancer prevention and control programmes, it is critical to understand the financial investments required over time. Programme managers and policy-makers need information on the projected costs of cervical cancer interventions in order to make decisions on the “when”, the “where” and the “what” of service introduction and scale-up. After the introduction of programme, it is also important to retrospectively estimate the cost of the programme. The opportunity costs associated with introducing HPV vaccination such as health worker time costs, donated goods, and other economic costs should also be understood. Key issues in determining sustainability and scalability include: estimation and analysis of service delivery costs, as well as costs associated with social mobilization; information, education, and communication (IEC); behaviour change communication (BCC); microplanning; training; supervision; and monitoring and evaluation.

This user guide focuses on the estimation of the costs of introducing HPV vaccination (primary prevention of cervical cancer) in a country using the Cervical Cancer Prevention and Control Costing tool: HPV vaccination module (C4P-HPV tool) version 4.2.2.



**What the  
C4P-HPV tool  
is costing out  
for HPV vaccine  
introduction**

The costing tool enables the user to estimate the value of incremental (additional) resources required to add the HPV vaccine to an existing immunization programme. That is, it only estimates the value of new resources needed and does not include the cost of other goods and services already being used for other vaccines (shared costs). For example, it does not estimate the cost of transporting HPV vaccine if this is part of the same transport used to deliver other vaccines from the central warehouse to the periphery in the country. The C4P-HPV tool can also be used to estimate the retrospective (already incurred) costs of introducing HPV vaccination.

The perspective of the tool is the government, i.e., the financial costs are an estimate of the monetary outlays of the government of introducing HPV vaccination. It does not capture the societal costs to the target population, i.e., the cost such as travel and waiting time.

The resources required to introduce HPV vaccine into the national immunization programmes (NIPs) differ from other vaccines since it has a non-traditional target population, e.g., annual cohorts of girls aged 9 years with MAC vaccination of girls aged 10–14 years in the first year. Reaching a target group of girls between 9 and 14 years is likely to rely on new delivery strategies and more intensive information, education and communication activities, and transport, leading to higher costs per girl reached compared to a new vaccine in the NIPs targeting infants. That is, since the vaccine is often administered at venues such as schools or places in the community, additional costs are incurred for outreach. More resources are also needed to explain the benefits of the vaccine to the population. The C4P-HPV tool enables the user to estimate the additional resource requirements based on the specific strategy that will be used in the country.

The C4P-HPV tool can be used to estimate service costs and coverage based on national and subnational data and needs. It provides estimates of several cost measures:

1. total costs of adding the HPV vaccine to specific regions/provinces or at the national level;
2. cost per dose administered;
3. cost per fully immunized person (FIP).

## 2.1 Cost components in C4P-HPV tool

The C4P-HPV tool allows the user to estimate the costs of activities that take place during the introduction of HPV vaccination into a national immunization programme. These activities include the following: procurement of vaccines and injection supplies, service delivery of vaccines to target population, microplanning, training, sensitization, social mobilization and IEC, supervision, monitoring and evaluation (SME), equipment and purchase for cold storage expansion, and other recurrent and capital costs.

In this section, the differences between types of costs are discussed.

### 2.1.1 Recurrent and capital costs

**Recurrent costs** are the value of resources that last less than one year. These include programme costs such as the value of personnel time, transport, maintenance, monitoring and evaluation, and supervision as well as costs of short-term training activities that last less than a year (i.e., do not include material development and initial training) are also included. [Table 1](#) presents examples of recurrent vaccination activities and the associated costs.

**Table 1. Vaccination activities and illustrative associated recurrent costs**

Vaccination activity	Recurrent costs <sup>a</sup>
Vaccine procurement and storage	Vaccines, injection supplies, freight, clearance, insurance and taxes
Service delivery	Health personnel time <sup>b</sup> , supplies, per diems, transport
Short-term training	Health personnel time, per diems, travel allowances, transport
Information, education, and communication (IEC) <sup>c</sup>	Health personnel time, printing, production of leaflets, posters, radio and television spots
Supervision	Supervisor time, driver time, per diem, transport
Monitoring and evaluation	Vaccination cards, tally sheets, personnel time, transport

<sup>a</sup> To obtain the costs, the quantity used is multiplied by the unit prices of the resources.

<sup>b</sup> Health personnel time refers to the quantity of time of each type of worker spent on service delivery. It will be multiplied by salaries and benefits of each type of personnel.

<sup>c</sup> Information, education and communication (IEC) costs include production costs but not transportation costs needed for IEC activities.

**Capital costs** are the value of resources that last longer than one year such as cold chain equipment and vehicles. The capital goods and services used in HPV vaccination include initial investments such as introduction costs (microplanning, initial training and social mobilization/IEC material development) as well as additional cold chain equipment, vehicle requirements, and incinerators. [Table 2](#) presents examples of capital resources and the associated costs.

**Table 2. Vaccination activities and illustrative associated capital costs**

<b>Vaccination activity</b>	<b>Capital costs<sup>a</sup></b>
Vaccine storage	Additional cold chain equipment requirements
Microplanning	Health personnel time, per diem, transport, venue rental
Initial training and curriculum development	Trainer time, trainee time, per diem, stationery, printing of training materials, transport, venue rental
Information, education, and communication (IEC) material development/sensitization meetings	Health personnel time <sup>b</sup> , facilitator time, per diem, transport, printing of leaflets and posters
Waste management	Additional incinerators

<sup>a</sup> To obtain the costs, the quantity used is multiplied by the unit prices of the resources.

<sup>b</sup> Health personnel time refers to the quantity of time of each type of worker spent on service delivery. It will be multiplied by salaries and benefits of each type of personnel.

Calculation of capital costs differs from recurrent ones since these are annualized and/or discounted depending on the purpose of the analysis and whether financial or economic costs are preferred. In the tool, capital costs, including one-off introduction costs such as microplanning, initial training, and initial sensitization and social mobilization, are annualized using the discount rate indicated in the **ECONOMICS** worksheet. The default discount rate is 3%.

### 2.1.2 Financial and economic costs

Both financial and economic costs are calculated in the C4P-HPV tool. The user can choose which one is most appropriate depending on the objective of the analysis. If they want to know the additional costs incurred by the Ministry of Health, for example, they should focus on the financial cost calculation.

**Financial costs** are the value of resources to the buyer and include the value of actual resources purchased for the HPV vaccine introduction such as injection supplies, outreach allowances and per diem, resources used in training and developing new communication materials.

**Economic costs** comprise the value of all outlays for the vaccine introduction as well as those already paid for by the Ministry of Health and other sources of financing, e.g., the salaries of existing health personnel, vaccines paid by partners, and time of volunteers. This analysis is useful if the user is interested in evaluating the share of different sources of finance for the vaccine introduction. For example, they may want to know the share of total costs financed by the Ministry of Health, external partners, clients and the community. This analysis gives a more complete picture of resources that are tied up in the provision of the new vaccine and their opportunity costs and should be used if a cost-effectiveness or cost-benefit analysis is to be conducted.

**Capital costs** are calculated differently depending on whether financial or economic costs are being estimated. When calculating financial costs, straight-line depreciation is used in the calculation of capital costs. That is, the cost of the item is annualized through dividing it by the useful life years of the good. For example, cold chain equipment could be expected to last for ten years and the total cost would be divided through by ten. Straight-line depreciation assumes that capital goods are used up equally over the useful time period of the item. For economic costs, capital goods are discounted as well as annualized. This type of depreciation assumes that people have time preference and prefer to use goods and services now rather than in the future.

Table 3 presents a comparison of resources included in cost estimation based on whether financial or economic costs are being calculated. For microplanning, for example, the value of personnel time spent in meetings is included in economic costs but not in financial costs.

**Table 3. Resources by vaccination activity for financial and economic costs<sup>a</sup>**

<b>Vaccination activity</b>	<b>Financial costs</b>	<b>Economic costs</b>
Procurement of vaccines and injection supplies	<ul style="list-style-type: none"> <li>• Cost of vaccines and injection supplies to government</li> <li>• Cost of freight, clearance, insurance and taxes</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Cost of vaccines and injection supplies regardless of source of financing</b></li> <li>• Cost of freight, clearance, insurance and taxes</li> </ul>
Service delivery	<ul style="list-style-type: none"> <li>• Transport (e.g., fuel, maintenance, etc.)</li> <li>• Personnel per diems to travel to vaccination sites</li> <li>• Supplies, e.g. cotton</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Value of personnel time spent on vaccination</b></li> <li>• Transport (e.g., <b>vehicles</b>, fuel, maintenance, etc.)</li> <li>• Personnel per diems to travel to vaccination sites</li> <li>• Supplies, e.g. cotton</li> </ul>
Microplanning	<ul style="list-style-type: none"> <li>• Per diems and travel allowances</li> <li>• Venue rental</li> <li>• Transport</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Value of personnel time spent in meetings</b></li> <li>• Per diems and travel allowances</li> <li>• Venue rental</li> <li>• Transport</li> </ul>
Training	<ul style="list-style-type: none"> <li>• Development of training materials</li> <li>• Per diems and travel allowances</li> <li>• Venue rental</li> <li>• Transport (e.g., fuel, maintenance, etc.)</li> <li>• Training materials</li> <li>• Stationery</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Value of personnel time spent on training</b></li> <li>• Development of training materials</li> <li>• Per diems and travel allowances</li> <li>• Venue rental</li> <li>• Transport (e.g., fuel, maintenance, etc.)</li> <li>• Training materials</li> <li>• Stationery</li> </ul>
Sensitization	<ul style="list-style-type: none"> <li>• Per diems and travel allowances</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Health worker/community mobilizers time spent in information meetings and one-to-one sessions</b></li> <li>• Per diems and travel allowances</li> </ul>

Vaccination activity	Financial costs	Economic costs
Information, education, and communication (IEC)/social mobilization	<ul style="list-style-type: none"> <li>• Facilitator time in meetings</li> <li>• Per diems and travel allowances</li> <li>• Stationery</li> <li>• Printing of materials</li> <li>• Production of TV and/or radio spots</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Value of personnel, school teacher, and volunteer time spent on material development and other activities</b></li> <li>• Facilitator time in meetings</li> <li>• Per diems and travel allowances</li> <li>• Stationery</li> <li>• Printing of posters and leaflets</li> <li>• Production of TV and/or radio spots</li> </ul>
Supervision	<ul style="list-style-type: none"> <li>• Travel allowances</li> <li>• Transport (e.g., fuel, maintenance, etc.)</li> <li>• Stationery</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Value of personnel time spent on supervision</b></li> <li>• Travel allowances</li> <li>• Transport (e.g., fuel, maintenance, etc.)</li> <li>• Stationery</li> </ul>
Monitoring and evaluation	<ul style="list-style-type: none"> <li>• Tally sheets or registers</li> <li>• Pens and pencils</li> <li>• Vaccination cards</li> <li>• Materials for surveillance</li> </ul>	<ul style="list-style-type: none"> <li>• Tally sheets or registers</li> <li>• Pens and pencils</li> <li>• Vaccination cards</li> <li>• Materials for surveillance</li> </ul>
Cold chain equipment	New cold chain equipment for cold storage expansion (annualized)	<b>New cold chain equipment (annualized and discounted)</b>

<sup>a</sup> The perspective of the tool is the government, i.e., the financial costs are an estimate of the monetary outlays of the government of introducing HPV vaccination; and the opportunity costs to be included in the economic costs are costs to the government only.

The main differences between financial and economic costing are threefold:

1. the time spent by health personnel, school teachers, and volunteers is valued in economic costing since there is an opportunity cost to this time, i.e., the workers are unable to spend time on other activities when they are occupied with HPV vaccination but are not included in financial costs since these are already paid for with government salaries;
2. the value of donated goods and services is included in economic costs but not in financial costs since there is an opportunity cost to their use;
3. capital costs are calculated differently for financial and economist costs.

A glossary of terms used in the cost analyses in the C4P tool is found in the [Annexes](#).




# The C4P-HPV tool structure



The C4P tool has five sections:

- COVER
- DASHBOARD AND ANALYSIS
- ASSUMPTIONS
- OUTPUTS
- ANNEXES

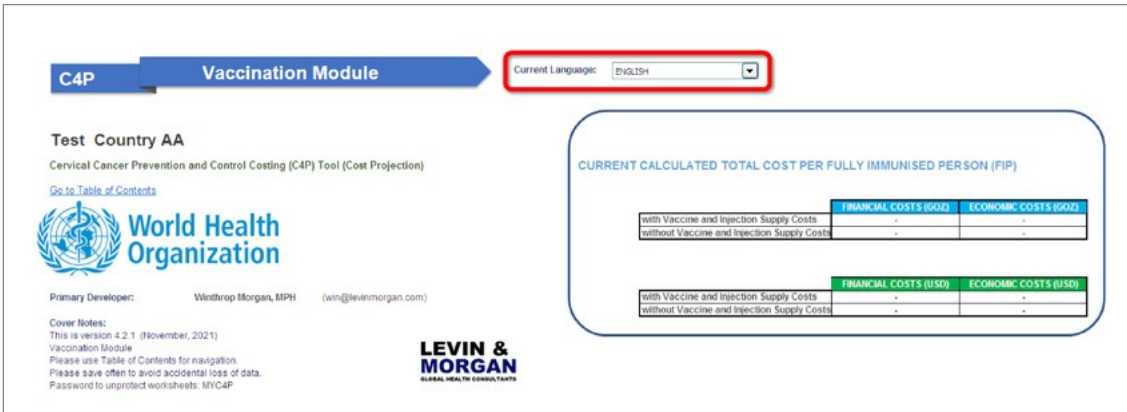
A button  at the top of each page allows the user to go to the contents page that has hyperlinks to each section. The following is a description of the sections:

---

## ■ COVER


The initial worksheet is **Cover** (Fig. 1). This worksheet shows the name of the tool, and the country name when data have been entered. It also allows a change of the current language used in the tool at the upper righthand corner and shows the total financial and economic costs per FIP of the scenario entered into the tool.

Fig. 1. Screenshot of 'Cover' worksheet



**C4P Vaccination Module** Current Language: ENGLISH

**Test Country AA**  
Cervical Cancer Prevention and Control Costing (C4P) Tool (Cost Projection)  
[Go to Table of Contents](#)

 **World Health Organization**

Primary Developer: Winthrop Morgan, MPH (win@levinmorgan.com)

**Cover Notes:**  
This is version 4.2.1 (November, 2021)  
Vaccination Module  
Please use Table of Contents for navigation  
Please save often to avoid accidental loss of data.  
Password to unprotect worksheets: MYC4P

**LEVIN & MORGAN**  
GLOBAL HEALTH CONSULTANTS

**CURRENT CALCULATED TOTAL COST PER FULLY IMMUNISED PERSON (FIP)**

	FINANCIAL COSTS (GOZ)	ECONOMIC COSTS (GOZ)
with Vaccine and Injection Supply Costs	-	-
without Vaccine and Injection Supply Costs	-	-

	FINANCIAL COSTS (USD)	ECONOMIC COSTS (USD)
with Vaccine and Injection Supply Costs	-	-
without Vaccine and Injection Supply Costs	-	-

---

## **DASHBOARD AND ANALYSIS**

Two worksheets are included under **DASHBOARD AND ANALYSIS: Dashboard** and **Analysis**. The **Dashboard** worksheet presents the results in tables and graphs. The **Analysis** worksheet shows detailed results in different sub-sections:

- Target Population Count
- Immunization Coverage
- Vaccine and Injection Supply Quantities
- Vaccine and Injection Supply Costs
- Microplanning
- Training
- Sensitization
- Social Mobilization
- Service Delivery
- Supervision
- Other
- Cold Chain Expansion
- Other Capital Investments.

---

## **ASSUMPTIONS**

Fifteen worksheets are included for entering data on **ASSUMPTIONS**. The fifteen worksheets include:

- 1. TIME\_SERIES**
- 2. LABELS** for important data points
- 3. ECONOMICS** data
- 4. COUNTS** on target population
- 5.** Immunization **COVERAGE** assumptions
- 6. VACCS\_&\_SUPPLIES** (vaccines and supplies)
- 7. SERVICE\_DELIVERY**
- 8. MICROPLANNING** activities
- 9. TRAINING** activities
- 10. SENSITISATION** activities
- 11. SOCIAL\_MOBILISATION** activities
- 12. SUPERVISION** monitoring and evaluation activities
- 13. OTHER** activities (recurrent costs only)
- 14. COLD\_CHAIN\_EXPANS**(ion)
- 15. CAPITAL\_INVESTS\_OTH** (other capital investments).

---

## ■ **OUTPUTS**

Five worksheets are provided under **OUTPUTS**:

1. **COUNTS\_and\_COVERAGE\_Summary** (target populations and coverage summary)
2. **COST\_SUMMARY** (activity quantities and cost summary)
3. **COLD\_CHAIN** expansion
4. **CAP\_OTH** (other capital investments)
5. **COSTS\_DETAILED\_SUMMARY** (detailed cost outputs).

---

## ■ **ANNEXES**

The last set of worksheets is for the **ANNEXES**. This section includes all of the detailed costing worksheets for calculating ingredients costs and has seven worksheets:

1. **MICRO\_DETAILED\_COST\_WKSHT** for microplanning
2. **TRAIN\_DETAILED\_COST\_WKSHT** for training
3. **SD\_DETAILED\_COST\_WKSHT** for service delivery
4. **SENS\_DETAILED\_COST\_WKSHT** for sensitization
5. **SOCMOB\_DETAILED\_COST\_WKSHT** for social mobilization
6. **SUPV\_DETAILED\_COST\_WKSHT** for supervision
7. **OTHER\_DETAILED\_COST\_WKSHT** for other recurrent costs.

### 3.1 Colour-coding in C4P-HPV tool

In the C4P-HPV tool, cells are color coded and shaded to indicate their purpose (Table 4). That is, the cell color, text color, or border indicates whether these are for:

- inputting data
- hyperlinks
- labels
- worksheet colors.

Fig. 2 shows an example of color coding in the LABELS worksheet.

Table 4. Color coding in C4P-HPV tool

Cell	Cell Color	Text Color	Border
Inputting	Salmon	Black	Solid Line
Hyperlinks	White	Magenta	None
Labels (titles)	Blue	White	None
Assumption worksheets	Orange	Black	None
Output worksheets	Blue	White	None
Detailed costing worksheets	Orange	Black	None

Fig. 2. Example of color coding used in the 'LABELS' worksheet

The screenshot shows a web-based form titled "Labels for Important Data Points" under the heading "Cervical Cancer Prevention and Control Costing (C4P) Tool (Cost Projection)". The form is organized into several sections, each with a blue header bar:

- Primary Level Name:** A blue header bar is followed by a label "Primary Level Name" and a salmon-colored input field containing "Test\_Country AA".
- Notes and Sources of Information:** A salmon-colored header bar is followed by three salmon-colored input fields, each containing the placeholder text "[user notes here]".
- Target Population Labels:** A blue header bar is followed by labels "Target Groups Category 1" and "Target Groups Category 2", and two salmon-colored input fields containing "Target Group Name 1" and "Target Group Name 2".
- Target Subgroup Labels:** Labels "Target Subgroups Category 1" and "Target Subgroups Category 2" are followed by two salmon-colored input fields containing "IN-SCHOOL" and "OUT OF SCHOOL".

## 3.2 Software requirements for C4P-HPV tool

The C4P-HPV tool is designed to be used with Microsoft Excel 2010 or greater so that it can make use of the dropdown menu feature.



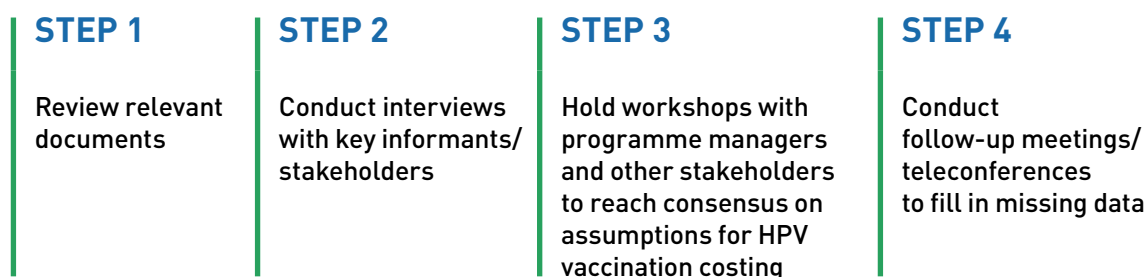
# Data collection and input



## 4.1 Data collection team

The data collection team should include persons with a mix of interdisciplinary skills such as a person familiar with the national immunization programme, a person familiar with costing of health services, and a person knowledgeable about the health system.

To collect data to enter into the C4P-HPV tool, it is recommended that the team consider conducting the following steps:



The **document review** should include government documents such as strategic plans on cervical cancer prevention and control; cancer, HIV, reproductive health, and NIP as well as government data on population size and education. Other documents from WHO and Globocan for statistics about incidence of HPV, cervical cancer, and HIV in the country should also be reviewed. Other data can be gathered from NIP budgets on microplanning and training.

The data collection team should conduct **interviews with key informants** to gather background and programmatic data such as the size of the target population, the service delivery strategies planned for vaccination (e.g., in school or at fixed facilities or a combination of both), and the plans for implementation of HPV vaccination. They should also discuss where to obtain data on resource prices and quantities required for data entry into the tool.

If possible, the data collection team should consider conducting a **workshop on the HPV vaccination costing**. The workshop will give them the opportunity to present the objectives of the costing, discuss and achieve a consensus on the costing exercise's assumptions, and have discussions among public and private programme stakeholders regarding scale-up, communication strategies, and how to address implementation challenges.

The team will also need to conduct some **follow-up meetings/teleconferences** to collect any missing costing data. They should alert the programme managers in advance that some follow-up meetings will be required to complete the exercise. These meetings can occur remotely if the team is not available to meet in-person.



## 4.2 Gathering and entering data for C4P-HPV tool

Before entering data into the tool, the user should examine the worksheets under **ASSUMPTIONS** and determine whether there is consensus on the service delivery strategy to be used, i.e.:

- will the vaccination take place at schools, health facilities, campaigns, or other venues?
- what will the age group of the target populations be?
- what is the plan for training?
- what other assumptions are required for HPV vaccination in their country?
- will the vaccine be phased-in or delivered nationwide?

Having information on the service delivery strategy is a necessary input into the tool.

After the strategy has been defined and the data entered, the tool can be used to estimate/project the costs of implementing one strategy or compare the costs of implementing two or more strategies. For example, the government may want to compare the costs of introducing HPV vaccine at schools vs. at health facilities. In that case, the user should make a copy of the C4P-HPV tool and fill in the costs for each of the strategies so that these can be compared.

After identifying the strategies to be costed in the C4P-HPV tool, the data required for analysis should also be gathered together. A list of data that needs to be collected for the tool is given in [Annex 2](#). The user can either enter the information into data collection sheets or directly into the tool. They also can start entering the data into the tool as soon as they have gathered these.

## 4.3 Entering data into ASSUMPTIONS worksheets

As mentioned above, the data entry worksheets are found under:

- |   |  |
|---|--|
| <b>1. TIME_SERIES</b>                                     | <b>9. TRAINING</b> activities                                  |
| <b>2. LABELS</b> for important data points                | <b>10. SENSITISATION</b> activities                            |
| <b>3. ECONOMICS</b> data                                  | <b>11. SOCIAL_MOBILISATION</b> activities                      |
| <b>4. COUNTS</b> on target population                     | <b>12. SUPERVISION</b> monitoring and evaluation activities    |
| <b>5. COVERAGE</b>  | <b>13. OTHER</b> Activities (recurrent costs only)             |
| <b>6. VACCS_&amp;_SUPPLIES</b><br>(vaccines and supplies) | <b>14. COLD_CHAIN_EXPANS(ion)</b>                              |
| <b>7. SERVICE_DELIVERY</b>                                | <b>15. CAPITAL_INVESTS_OTH</b><br>(other capital investments). |
| <b>8. MICROPLANNING</b> activities                        |  |

### 4.3.1 TIME\_SERIES

The worksheet entitled **TIME\_SERIES** is for entering information on the type of analysis and the start year of the cost analysis (Fig. 3). The first question is whether it is a cost projection or a retrospective costing. That is, is it estimating future costs of introducing the vaccine or is it analyzing costs that were already incurred. Then the user will need to enter the first year of this cost analysis (usually the year of HPV vaccine introduction).

Fig. 3. Screenshot of 'TIME\_SERIES' worksheet

The screenshot shows a form titled "Time Series - Assumptions Costing Start Year and Term" from the "Cervical Cancer Prevention and Control Costing (C4P) Tool (Cost Projection)". The form has a dropdown menu labeled "Cost Projection or Retrospective?" with "Cost Projection" selected. Below it is a text input field for "First Costing Year" with the value "2019". A light blue callout box on the right contains the text: "TIP: Select Cost Projectic determine which are." and "POINTE: Sélectionnez la prev déterminera les zone".

### 4.3.2 LABELS

This worksheet (Fig. 4) is used to enter information on country characteristics such as country name, target population, and service delivery types. Once this information is entered, then the names are automatically entered into the worksheets throughout the workbook. The steps to fill out this sheet are the following:

1. In the first section, the user should fill in the **country name** for the analysis.
2. In the second section, they should fill in the names of the target populations for the analysis. For example, fill in the target populations such as 9-year-old girls as the first target group and 9–14-year-old girls as the second target group. Then the target subgroups could be in-school and out-of-school.
3. In the third section, fill in the vaccine and dose labels. First fill in the type of vaccine such as HPV or Gardasil. Then label each vaccination dose, e.g., HPV1 as the first dose and HPV2 as the second dose.
4. In the fourth section, fill in the names of **service delivery types**. These can be for single vaccination (one person to be vaccinated each time) and group vaccination (a group of persons to be vaccinated per group). That is, enter the location for single vaccination such as health facility on site and health facility outreach. For the group vaccination type, the team could fill in school visit or remote vaccination visit.

Fig. 4. Screenshot of 'LABELS' worksheet

↳ **Labels for Important Data Points**

↑ **Cervical Cancer Prevention and Control Costing (C4P) Tool (Cost Projection)**

---

↳ **Primary Level Name**

Primary Level Name

Primary Level Name

**Notes and Sources of Information**

↳ **Target Population Labels**

Target Population Labels

Target Groups Category 1

Target Groups Category 2

**Target Subgroup Labels**

Target Subgroups Category 1

Target Subgroups Category 2

### 4.3.3 ECONOMICS

In this worksheet (Fig. 5), the user should enter various economic data. First the foreign and local currency names to be used in the analysis should be indicated. It is necessary to have a foreign currency for commodities that are traded internationally such as vaccines.

The team should enter data on exchange rates between the local and foreign currencies as well as the annual discount rate. This information can be found on the Ministry of Finance website or at other economic websites. The team should also enter the sources of information that were used so that these can be verified and replicated.

Fig. 5. Screenshot of 'ECONOMICS' worksheet

↳ **Economic**

↑ **Cervical Cancer Prevention and Control Costing (C4P) Tool (Cost Projection)**

---

↳ **Economic - Currencies**

Currencies	Currency Name	Currency Code
Foreign Currency	United States Dollars	USD
Local Currency	Gozintas	GOZ

↳ **Economic - Rates**

Exchange Rate : 1 USD = (# GOZ)

Annual Discount Rate Category 1  << 3.0% is standard for health costing analyses.

**Notes and Sources of Information**

### 4.3.4 COUNTS

This worksheet (Fig. 6) is used to enter data on the number of schools and health facilities where HPV vaccination can be offered and the assumptions about the target populations. Note that there are separate sections in some cases for retrospective costing and cost projection.

Fig. 6. Screenshot of 'COUNTS' worksheet

Population Count	Year	Annual Population Growth Rate (%)
Target Group Name1 - Projected	99,999	2019
Target Group Name1 - IN-SCHOOL Proportion (%) (Projected Calculation)	Proportion (%)	50.0%
Target Group Name1 - OUT OF SCHOOL Proportion (%) (Projected) - AUTOCALCUL	Proportion (%)	50%

Notes and Sources of Information

[user notes here]

[user notes here]

[user notes here]

In the first section, the user should specify the number of schools that will conduct group vaccination visits and the average number of targeted girls (or boys) per school. In addition, the user should enter the numbers of health facilities that will provide HPV vaccination and that will conduct routine HPV vaccination outreach services. Also, the average number of routine outreach vaccination activities that will be conducted in a health facility in a year as well as the average number of persons that will be vaccinated during a routine outreach service activity should also be specified.

The second section is for a cost projection. The user should enter the number of girls (or boys) in the target population as well as the annual population growth rate. They should also enter the in-school proportions of the target populations. These should be specified for the two target groups stated in **LABELS** worksheet.

If this is a retrospective costing, the user should go to the third section to enter the numbers of the entire target populations and the numbers of person in schools.

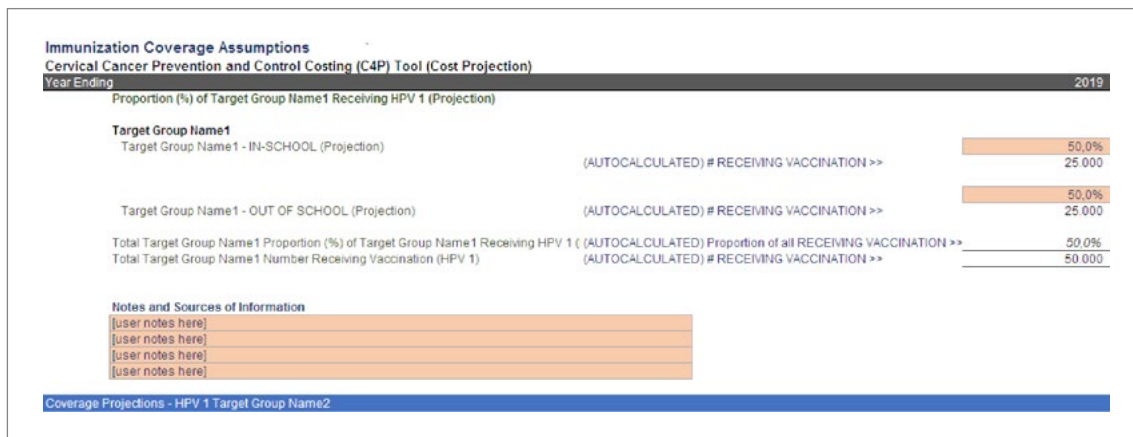
### 4.3.5 COVERAGE

This worksheet is for entering the coverage for the target populations (Fig. 7). This needs to be entered for each year, dose number and target group. For example, if there are two target population group, say 9-year-old girls and 10–14-year-old girls, the user should enter

the coverage for the first and second doses for each year and each group. It is assumed that there will be some dropout between the first and second doses.

Note that the user will enter the targeted coverage if they are conducting cost projection and actual coverage achieved if they are conducting retrospective cost analysis.

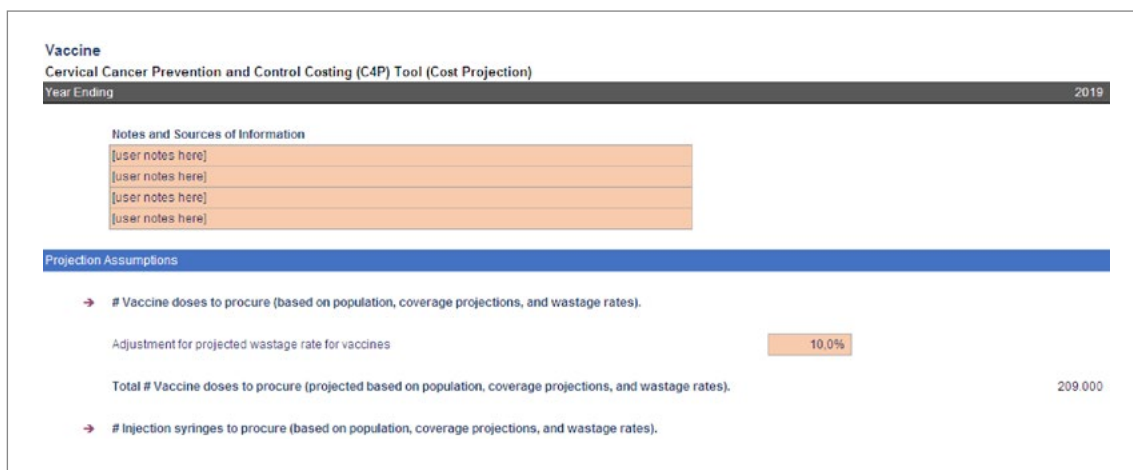
Fig. 7. Screenshot of 'COVERAGE' worksheet



#### 4.3.6 VACCS\_&\_SUPPLIES

In this worksheet, the user should enter information on the procurement costs of vaccine per dose, cost of an injection supply (syringe), cost of a safety box, and wastage rates for vaccines, injection syringes and safety boxes. The amount and proportion of costs that will be subsidized by donors should also be entered. For example, if Gavi will pay for 80% of the HPV vaccine market cost, the user should first enter the subsidy amount to be the same as the market cost, then enter 80% for the proportion of vaccine procurement being subsidized (see Fig. 8).

Fig. 8. Screenshot of 'VACCS\_&\_SUPPLIES' worksheet



### 4.3.7 SERVICE\_DELIVERY

This worksheet is for entering information on the types of service delivery that will be used to provide the vaccine to the target populations (Fig. 9). The average number of vaccine doses that will be delivered through a single vaccination service delivery activity is assumed to be one in the tool. The user should enter the average number of vaccine doses that will be delivered through each group vaccination service delivery activity for each year.

Fig. 9. Screenshot of 'SERVICE\_DELIVERY' worksheet

The screenshot displays the 'Service Delivery - Annual Assumptions' section of a spreadsheet. It includes a header for 'Cervical Cancer Prevention and Control Costing (C4P) Tool (Cost Projection)' and a 'Year Ending' field set to 2019. A blue header bar reads 'Average Number of Vaccinations Delivered During Service Delivery Activities (Projection or Retrospective)'. Below this, a sub-header asks for the 'Average Number of Vaccinations Delivered During Service Delivery Activities (Projection or Retrospective)'. A table lists three activity types with their respective average numbers of vaccinations: 'Average Number of Vaccinations Delivered During Single Vaccination Service Delivery Type 1 Activity' (1), 'Average Number of Vaccinations Delivered During Single Vaccination Service Delivery Type 2 Activity' (1), and 'Average Number of Vaccinations Delivered During Group Vaccination Service Delivery Activity Type 1 Activity (Projection or Retrospective)' (19.0). A final row shows 'Average Number of Vaccinations Delivered During Group Vaccination Service Delivery Activity Type 2 Activity (Projection or Retrospective)' with a value of 99.0. Below the table is a section for 'Notes and Sources of Information' with four placeholder rows. At the bottom, another blue header bar reads 'Proportion and Number of Vaccinations Delivered, by Year and Service Delivery Type (Projection)', followed by a sub-header 'Proportion of Vaccinations Delivered (Projection)' and the text 'HPV 1'.

Average Number of Vaccinations Delivered During Service Delivery Activities (Projection or Retrospective)	
Average Number of Vaccinations Delivered During Service Delivery Activities (Projection or Retrospective)	
Average Number of Vaccinations Delivered During Single Vaccination Service Delivery Type 1 Activity	1
Average Number of Vaccinations Delivered During Single Vaccination Service Delivery Type 2 Activity	1
Average Number of Vaccinations Delivered During Group Vaccination Service Delivery Activity Type 1 Activity (Projection or Retrospective)	19.0
Average Number of Vaccinations Delivered During Group Vaccination Service Delivery Activity Type 2 Activity (Projection or Retrospective)	99.0

Notes and Sources of Information

[user notes here]
[user notes here]
[user notes here]
[user notes here]

Proportion and Number of Vaccinations Delivered, by Year and Service Delivery Type (Projection)

Proportion of Vaccinations Delivered (Projection)

HPV 1

Note that there are separate sections in the worksheet for cost projection and retrospective costing.

For cost projection, the user should then enter the proportion of vaccinations delivered through each of the single or group vaccination service delivery activity for each dose. These proportion should sum up to 100%.

For retrospective costing, the user should enter the following numbers:

1. actual number of each service delivery activities providing vaccinations to a single person completed;
2. actual number of vaccinations provided through each group vaccination service deliver activity;
3. actual number of each group vaccination service deliver activities completed.

After identifying the numbers of vaccines administered and the number of activities, all users (regardless of cost projection or retrospective costing) should go to rows 235 for the unit costs of vaccination activities. Users should select from the dropdown menu and indicate the currency used and whether they want to directly input estimates of the financial

and economic costs of a single vaccination service delivery or whether they want to conduct detailed costing. If no detailed costing is required, they should enter the estimates of financial and economic costs for each year. If they conduct detailed costing, they should use the hyperlink to go to the detailed costing worksheet. For the detailed costing, they will enter cost assumptions on personnel, allowances, supplies and materials, and other costs. The estimates will then be shown in this **SERVICE\_DELIVERY** worksheet automatically.

The user should fill out the other sections on service delivery types similarly, e.g., group vaccination service delivery.

### 4.3.8 MICROPLANNING

This worksheet is for entering data about microplanning costs (Fig. 10). The user can enter cost information for up to four types of microplanning activities, e.g., national, regional, district, and sub-district levels. They have the option of either putting in a 'guesstimate' of the cost of the activity (e.g., \$2,000) or to conduct a detailed estimate using the **detailed activity costing** worksheet. The user should specify which option to choose by clicking on the dropdown menu for 'select costing input method' and selecting either 'enter cost estimate directly' or 'use detailed cost worksheet.' They should then enter data according to the option that they selected (Fig. 11 for a screenshot of the **MICRO\_DETAILED\_COST\_WKSHT**). The user can click on the link to the **microplanning detailed costing** worksheet.

Fig. 10. Screenshot of 'MICROPLANNING' worksheet

The screenshot displays the 'Microplanning Activities - Annual Assumptions' worksheet for the 'Cervical Cancer Prevention and Control Costing (C4P) Tool (Cost Projection)' for the year ending 2019. The form includes a dropdown for 'Year Ending' set to 2019, a text field for 'Microplanning Activity #1 (Not in Use) Name', and a dropdown for 'Selected Input Currency' set to USD. The 'Selected Costing Input Method' is set to 'Enter Cost Estimates Directly'. Below this, there are two sections: 'A. Detailed Costing Worksheet Estimate' and 'B. Direct User Entry Cost Estimate'. Section A shows a table with columns for 'GOZ' and 'USD', with rows for 'Financial Cost of a Single Microplanning Activity #1 (Not in Use) Activity' and 'Economic Cost of a Single Microplanning Activity #1 (Not in Use) Activity', both showing zero values. Section B shows a table with a 'USD' column and rows for 'Financial Cost of a Single Microplanning Activity #1 (Not in Use) Activity' and 'Economic Cost of a Single Microplanning Activity #1 (Not in Use) Activity', both showing zero values. An 'ERROR CHECK (CHECKS IF OVERRIDE INPUT ECONOMIC COST IS LESS THAN FINANCIAL COST)' is present with a value of -1. At the bottom, there is a 'Notes and Sources of Information' section with a text area for user notes.

In the detailed activity costing worksheet, the user is asked to enter information on the personnel that are involved in microplanning, personnel allowances, supply and material costs, and any other costs for each type of microplanning activity.

In the **MICROPLANNING** worksheet, the user should also enter the number of activities of each type that are planned or already incurred.

Fig. 11. Screenshot of 'MICRO\_DETAILED\_COST\_WKSHT' worksheet

The screenshot displays the 'MICRO\_DETAILED\_COST\_WKSHT' worksheet with the following content:

**Microplanning - Detailed Costing Worksheets (OPTIONAL)**  
**Cervical Cancer Prevention and Control Costing (C4P) Tool (Cost Projection)**

---

**Microplanning Activity #1 (Not in Use) - Detailed Activity Costing Worksheet - Instructions**

Microplanning Activity #1 (Not in Use) - Detailed Activity Costing Worksheet - Instructions

This detailed costing worksheet can be used to document the types and amounts of resources required to complete a single instance of an activity. When completed, it will automatically provide a single activity cost in the general assumption worksheet. The user may then choose to use the results of the detailed costing in the model, or override the detailed costing and insert alternate cost estimates.

---

**Microplanning Activity #1 (Not in Use) - Detailed Activity Costing Worksheet - Currency Selection**

Microplanning Activity #1 (Not in Use) - Detailed Activity Costing Worksheet - Currency Selection

Currency Used for Cost Inputs

Imported from Econ Module  
USD  
GOZ

Exchange Rate (from Economics) 1.234,5

---

**Microplanning Activity #1 (Not in Use) - Detailed Personnel Cost Assumptions**

Microplanning Activity #1 (Not in Use) - Detailed Personnel Cost Assumptions

### 4.3.9 TRAINING

This worksheet is for entering data about training costs and is set up in the same way as the **MICROPLANNING** worksheet. It asks the user to specify whether they will enter the cost estimates directly or use the detailed costing worksheet in the dropdown menu. Then they should enter the training cost estimates or fill out the training detailed costing worksheet (**TRAIN\_DETAILED\_COST\_WKSHT**) for each type of training activity. They should also enter the number of training activities that are planned or already incurred.

### 4.3.10 SENSITISATION

This worksheet is for entering data about sensitization costs and is set up in the same way as the **MICROPLANNING** worksheet. It asks the user to specify whether they will enter the cost estimates directly or use the detailed costing worksheet in the dropdown menu. Then they should enter the sensitization cost estimates or fill out the sensitization detailed costing worksheet (**SENS\_DETAILED\_COST\_WKSHT**) for each type of sensitization activity. They should also enter the number of sensitization activities that are planned or already incurred.



### 4.3.11 SOCIAL\_MOBILISATION

This worksheet is for entering data about social mobilization or IEC costs and is set up in the same way as the **MICROPLANNING** worksheet. It asks the user to specify whether they will enter the cost estimates directly or use the detailed costing worksheet in the dropdown menu. Then they should enter the social mobilisation cost estimates or fill out the social mobilisation detailed costing worksheet (**SOCMOB\_DETAILED\_COST\_WKSHT**) for each type of social mobilisation activity. They should also enter the number of social mobilisation activities that are planned or already incurred.

### 4.3.12 SUPERVISION

This worksheet is for entering data about supervision costs and is set up in the same way as the **MICROPLANNING** worksheet. It asks the user to specify whether they will enter the cost estimates directly or use the detailed costing worksheet in the dropdown menu. Then they should enter the supervision cost estimates or fill out the supervision detailed costing worksheet (**SUPV\_DETAILED\_COST\_WKSHT**) for each type of supervision activity. They should also enter the number of supervision activities that are planned or already incurred.

### 4.3.13 OTHER (for recurrent costs only)

This worksheet is for entering data about other recurrent activity costs and is set up in the same way as the **MICROPLANNING** worksheet. It asks the user to specify whether they will enter the cost estimates directly or use the detailed costing worksheet in the dropdown menu. Then they should enter the other activity cost estimates or fill out the other activity detailed costing worksheet (**OTHER\_DETAILED\_COST\_WKSHT**) for each type of activity. They should also enter the number of other activities that are planned or already incurred. One example of a cost that can be entered here is shipping, customs, storage, and distribution to facilities.

### 4.3.14 COLD\_CHAIN\_EXPANS

This worksheet is for entering data about cold chain expansion costs. The user should fill in the names of cold storage equipment types, capacity per unit (cm<sup>3</sup>), financial\* price per unit, economic\* price per unit, and useful life years\*\* (Fig. 12). They should also specify the number of units to be purchased each year in the righthand table. The user should also enter any notes on calculations or estimates in the table entitled 'Notes on Calculations/Estimates'.

---

\* The financial price per unit is the amount that the government (or other payer if the analysis is done from its perspective) will expend for the cold chain if the analysis is conducted from the perspective of the government. The economic price per unit takes into account any resources used, regardless of the source of financing.

\*\* Useful life years are the expected life of the capital equipment such as cold chain equipment.

Fig. 12. Screenshot of 'COLD\_CHAIN\_EXPANS' worksheet

**Cold Chain Expansion**  
Cervical Cancer Prevention and Control Costing (C4P) Tool (Cost Projection)

Year Ending \_\_\_\_\_

Cold Chain Expansion - Assumptions (Annual)

Required Cold Storage Expansion

Input Currency for Cold Storage Equipment Prices:

Name of Cold Storage Equipment	Capacity per Unit (cm3)	Price per Unit Financial (USD)	Price per Unit Economic (USD)	Useful Life Years	Total Expansion (cm3)	TOTAL ALL YEARS
Cold Storage Equipment Type 1	-	-	-	-	-	-
Cold Storage Equipment Type 2	-	-	-	-	-	-
Cold Storage Equipment Type 3	-	-	-	-	-	-
Cold Storage Equipment Type 4	-	-	-	-	-	-
Cold Storage Equipment Type 5	-	-	-	-	-	-

#### 4.3.15 CAPITAL\_INVESTS\_OTH

This worksheet is for entering data about other capital investment costs. The user should fill in the names of other capital investments, financial\* price per unit, economic\* price per unit, and useful life years. They should also specify the number of units to be purchased each year in the righthand table. The user should also enter any notes on calculations or estimates in the table entitled 'Notes on Calculations/Estimates.'

## 4.4 What's in the ANNEXES section

This section includes the detailed costing worksheets for the activities: microplanning, training, service delivery, sensitization, social mobilization/IEC, supervision, and other costs (recurrent costs only).

\* The financial price per unit is the amount that the government (or other payer if the analysis is done from its perspective) will expend for other capital investment if the analysis is conducted from the perspective of the government. The economic price per unit takes into account any resources used, regardless of the source of financing.

# Results



This chapter is about the results from the tool, which are found in three places in the tool:

1. Outputs worksheets
2. Analysis worksheet
3. Dashboard.



## 5.1 Outputs

The **OUTPUTS** section includes five worksheets. These worksheets show counts, coverage rates, and financial and economic costs for resources used. The worksheets are the following:

### 1. COUNTS\_and\_COVERAGE\_Summary

Provides counts of target groups by year expected to be vaccinated; also provides coverage for each dose by year;

### 2. COST\_SUMMARY (Fig. 13)

Presents the financial and economic costs by year and input, including costs of vaccines and injection supplies by year; costs of each activity for HPV vaccination microplanning, training, sensitization, social mobilization/ IEC, and supervision; other recurrent activity costs; costs of each single and group vaccination service delivery activity. Note that financial costs include the inputs paid for by the government while economic costs include all inputs including donated goods, regardless of the source of financing. Costs are presented in both local and international currencies;

### 3. COLD\_CHAIN

Presents the financial and economic costs of cold storage equipment in both local and international currencies;

### 4. CAP\_OTH

Presents the financial and economic costs of other capital investments in both local and international currencies;

### 5. COSTS\_DETAILED\_SUMMARY

Presents the summary of detailed costs (personnel, allowances, supplies and materials, and other direct costs) of activities for HPV vaccination.

Fig. 13. Screenshot of 'COST\_SUMMARY' worksheet

Activity Quantities and Cost Summary	
Cervical Cancer Prevention and Control Costing (C4P) Tool (Cost Projection)	
Year Ending	2019
<b>Vaccines and Injection Supplies- Financial (Local Currency)</b>	
Financial	
GOZ	
Vaccines	
Vaccine Costs (Projected) Local Currency - Financial	-
<b>Total Financial (GOZ)</b>	-
Syringes	
Syringe Costs (Projected) Local Currency - Financial	-
<b>Total Financial (GOZ)</b>	-
Safety Boxes	
Safety Box Costs (Projected) Local Currency - Financial	-
<b>Total Financial (GOZ)</b>	-
<b>Vaccine and Injection Supplies- Economic (Local Currency)</b>	
Economic	

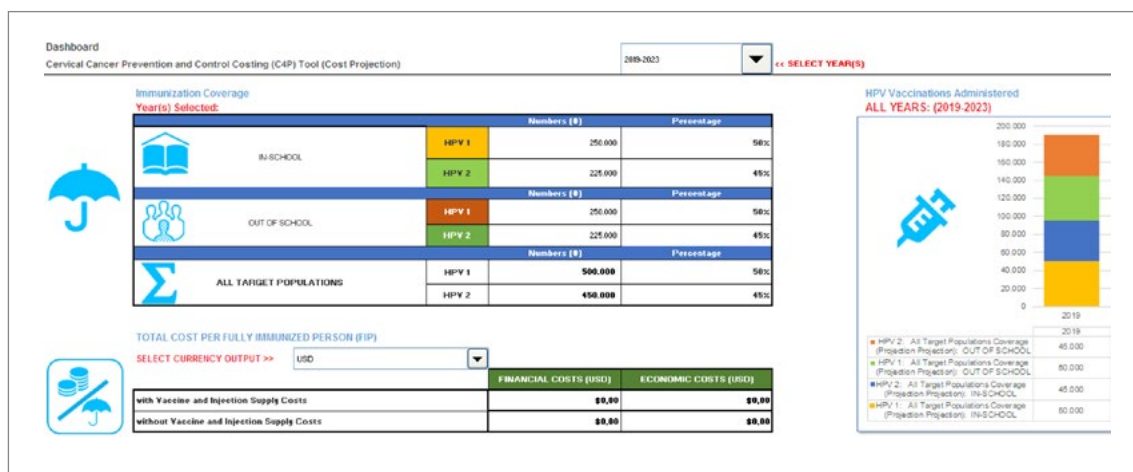
## 5.2 Analysis

This worksheet shows the target population counts, vaccination coverage rates by target populations, and financial and economics costs of each input and activity in local and international currencies.

## 5.3 Dashboard

This worksheet summarizes the results (Fig. 14). It shows the number and percentage of target population by dose that are vaccinated in and out-of-school. It also shows the total cost per fully immunized person as well as financial and economic costs by activity for the five year period and individual years. Note that there is a dropdown menu at the top of the sheet for selection of years for the display of results.

Fig. 14. Screenshot of 'Dashboard' worksheet



The total costs are divided into introduction costs, recurrent costs, and initial investment costs.

- **Introduction** (or start-up costs) are the cost of initial one-time programmatic activities such as microplanning, initial training activities, initial sensitization, and initial social mobilization.
- **Recurrent** costs are the value of resources that last less than one year.
- **Initial investment** costs are initial upfront costs (without depreciation).

# Analysis of results



## 6.1 Validation of results

After completing the data entry, the costing team should review the findings in the dashboard to see if these seem reasonable. One of the best ways to accomplish this is to create a table (see [Table 5](#)) that shows the findings for each year so that these can be compared. The team should examine whether the costs follow expected patterns. For example, the cost projections for vaccines and injection supply costs should increase since the target population will be larger each year due to population growth. If any of the numbers don't follow the expected patterns, the team should go back into the tool and see whether the data were entered correctly. Then they can correct any errors of data entered in the tool.

**Table 5. Illustrative results table (in local or foreign currency)**

<b>Programme activity</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>	<b>Total</b>
Vaccine and injection supply costs						
Service delivery						
Microplanning						
Training						
Sensitization						
Social mobilization						
Supervision						
Other recurrent activities						
Cold chain expansion						
Other capital investments						
<b>Total</b>						

## 6.2 Identification of cost drivers

The next step is to identify the financial and economic cost drivers for HPV vaccination. These are the costs that comprise the major share of the total financial and economic costs. To identify the cost drivers, the team should estimate the percent of total costs that comprise each programme activity. For example, a driver for economic costs could include procurement of vaccine and injection supplies. [Table 6](#) shows an example of an analysis of cost drivers for a country. In this illustrative example, for both financial and economic costs, the cost drivers are vaccine procurement, service delivery, and sensitization/social mobilization.



**Table 6. Illustrative proportion of total costs spent on programme activities**

<b>Programme activity</b>	<b>% of total financial cost</b>	<b>% of total economic cost</b>
Vaccine and injection supply costs	53% <sup>a</sup>	69%
Service delivery	31%	23%
Microplanning	1%	0.3%
Training	3%	1.7%
Sensitization / social mobilization	10%	4%
Supervision and monitoring	3%	2%
<b>Total</b>	<b>100%</b>	<b>100%</b>

<sup>a</sup> This cost is for government expenditure on vaccines (co-pay for Gavi-eligible countries).

## 6.3 Scenario analysis

The team can conduct scenario analysis through varying the assumptions in the tool to see how the total financial and economic costs are affected. They can run separate scenarios through copying the base version of the tool and changing some of the assumptions in each tool. Then the team should compare the results from the different scenarios to assess which variation in assumptions has the most impact. The results from the different scenarios should be put into a table or chart.

## 6.4 Budget impact

Once the team is satisfied with the costing results, they should compare the total annual costs of introducing HPV vaccination with the costs of the national immunization programme. These costs can be obtained from available cost exercises of immunization programme strategic plans (e.g., cMYPs) or available data on annual programme expenditures from the Joint Reporting Form.

## 6.5 Presentation of results

The results can be presented in tables and charts. The results should be written up in a report that presents the total costs, financial and economic costs per fully immunized person, annual costs, and scenarios. Also, the findings on cost drivers and budget impact should also be presented.

## References

1. Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal A. Global Cancer Statistics 2018: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 cancers in 185 countries. *CA Cancer J Clin*. 2018;68(6):394–424.
2. Arbyn M, Weiderpass E, Bruni L, de Sanjosé S, Saraiya M, Ferlay J et al. Estimates of incidence and mortality of cervical cancer in 2018: a worldwide analysis. *Lancet Global Health*. 2020;8(2):e191–e203.
3. Stelzle D, Tanaka LF, Lee KK, Khalil AI, Baussano L, Shah ASV et al. Estimates of the global burden of cervical cancer associated with HIV. *Lancet Global Health*. 2021;9(2):e161–e169.
4. Global strategy to accelerate the elimination of cervical cancer as a public health problem. Geneva: World Health Organization; 2020 (<https://apps.who.int/iris/handle/10665/336583>, accessed 22 March 2023).

# Annexes

# Annex 1. List of data type requirements

## ■ COSTING VARIABLES

- Costing approach: cost projection or retrospective costing
- First costing year

## ■ PROGRAMME VARIABLES

- Immunization coverage goal (%) by year, dose, and target group
- Number of schools giving vaccinations (#)
- Number of health facilities providing vaccinations (#)
- Target population labels
- Target group population counts

## ■ ECONOMIC VARIABLES

- Exchange rate (local currency to USD 1)
- Annual discount rate (%)

## ■ PROCUREMENT VARIABLES

- Vaccine cost per dose
- Injection syringe cost
- Safety box cost
- Additional costs of shipping such as freight, handling, and insurance
- Vaccine wastage rate (%)
- Syringe wastage rate (%)
- Safety box wastage rate (%)
- Safety box capacity (#)
- Subsidized cost per dose of vaccine (unloaded)
- Unsubsidized cost per dose of vaccine (unloaded)
- Proportion of vaccine procurement subsidized (%)
- Proportion of syringe procurement subsidized (%)
- Proportion of safety box procurement subsidized (%)
- Doses per fully immunized person (FIP) (#)

## ■ SERVICE DELIVERY VARIABLES

### Single vaccination service delivery

- Proportion of vaccinations administered through each single vaccinations for each dose (%)
- Average cost of each single vaccination service delivery activity or detailed costs (e.g., personnel costs [salaries and benefits] by type and time spent, travel allowance, quantities of supplies and materials multiplied by unit prices, and other costs)

### Group vaccination service delivery

- Average number of vaccinations delivered during each group vaccination service delivery type for each dose (#)
- Proportion of vaccinations administered through each group vaccinations for each dose (%)
- Average cost of each group vaccination service delivery activity or detailed costs (e.g., personnel costs [salaries and benefits] by type and time spent, travel allowance, quantities of supplies and materials multiplied by unit prices, and other costs)

## ■ MICROPLANNING VARIABLES

- Names of microplanning activities (e.g., national microplanning meeting)
- Number of each type of microplanning activity (e.g., six regional microplanning meetings) (#)
- Average cost of each microplanning activity or detailed costs (e.g., personnel costs [salaries and benefits] by type and time spent, travel allowance, quantities of supplies and materials multiplied by unit prices, and other costs)

## ■ TRAINING VARIABLES

- Names of training activities (e.g., curriculum development meeting, national training of trainers meeting, regional training meeting)
- Number of each type of training activity (#)
- Average cost of each training activity or detailed costs (e.g., personnel costs [salaries and benefits] by type and time spent, travel allowance, quantities of supplies and materials multiplied by unit prices, and other costs)

## ■ SENSITIZATION VARIABLES

- Names of sensitization activities (e.g., national, regional and district-level sensitization meetings)
- Number of each type of sensitization activity (#)
- Average cost of each sensitization activity or detailed costs (e.g., personnel costs [salaries and benefits] by type and time spent, travel allowance, quantities of supplies and materials multiplied by unit prices, and other costs)

## ■ SOCIAL MOBILIZATION AND IEC VARIABLES

- Names of social mobilization/ IEC activities (e.g., development of brochure or handout meetings, community meetings, meetings with religious leaders)
- Number of each type of IEC Social Mobilization Activity (#)
- Average cost of each social mobilization and IEC activity or detailed costs (e.g., personnel costs [salaries and benefits] by type and time spent, travel allowance, quantities of supplies and materials multiplied by unit prices, and other costs)

## ■ SUPERVISION, MONITORING & EVALUATION VARIABLES

- Names of supervision, monitoring and evaluation activities (e.g., national, regional and district-level supervisions)
- Number of each type of supervision activity (#)
- Average cost of each supervision activity or detailed costs (e.g., personnel costs [salaries and benefits] by type and time spent, travel allowance, quantities of supplies and materials multiplied by unit prices, and other costs)

## ■ COLD CHAIN EXPANSION

- Names of Cold Storage Equipment (#)
- Capacity of each cold chain storage unit
- Price of each cold chain storage unit (fill in financial cost only if purchased by government; always enter price per unit for economic cost)
- Useful life years per cold chain storage equipment (#)

## ■ OTHER ACTIVITY (RECURRENT COSTS ONLY)

- Names of other activities
- Number of each type of other activity (#)
- Average cost of each activity or detailed costs (e.g., personnel costs [salaries and benefits] by type and time spent, travel allowance, quantities of supplies and materials multiplied by unit prices, and other costs) (#)

## ■ OTHER CAPITAL INVESTMENTS

- Names of other capital investment (#)
- Capacity of each capital investment
- Price of each capital investment (fill in financial cost only if purchased by government; always enter price per unit for economic cost)
- Useful life years per capital investment (#)

## Annex 2. Data collection table on local salaries and per diems in local currencies

	Salaries including benefits	Per diem
National EPI manager		
National administrator		
National surveillance officer		
National cold chain officer		
Other (specify)		
National EPI training and communication officer		
National data manager		
National assistant data officer/manager		
National supplies officer		
National driver		
Second level (regional/provincial) medical officer		
Second level (regional/provincial) health officer		
Second level (regional/provincial) cold chain/logistician		
Second level (regional/provincial) reproductive and child health coordinator		
Second level (regional/provincial) assistant cold chain officer		
Second level (regional/provincial) cold chain officer		
Second level (regional/provincial) school health coordinator		
Second level (regional/provincial) secretary		
Second level (regional/provincial) driver		
Third level (e.g. district) medical officer		
Third level (e.g. district) health officer		
Third level (e.g. district) health secretary		
Third level (e.g. district) cold chain/logistics officer		
Third level (e.g. district) reproductive and child health coordinator		



	<b>Salaries including benefits</b>	<b>Per diem</b>
Third level (e.g. district) school health coordinator		
Third-level (e.g. district) assistant cold chain officer/ technician		
Third-level (e.g. district) secretary		
Third-level (e.g. district) driver		
Health facility clinical officer in charge		
Health facility nursing officer/nurse midwife		
Health facility health officer/health assistant		
Health facility laboratory assistant		
Health facility driver		
Health facility volunteer		
School Teacher		



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