EPH114

Impact of the COVID-19 pandemic on HPV vaccinations in Switzerland and Greece: Road to recovery

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Introduction

- The COVID-19 pandemic has led to significant reductions in the administration of HPV vaccines among adolescents in the European Region, resulting in a substantial number of adolescents missing an opportunity to get vaccinated.[1,3] Since the extent and trends in vaccine deficits vary by country, decision makers need country-specific, evidence-based information regarding HPV vaccine dose deficit to plan public health interventions
- Switzerland and Greece are countries where a significant decline in the number of HPV doses distributed during the pandemic period was observed, representing different HPV vaccination delivery systems:
  - **Greece:** HPV vaccination is performed only by general practitioners or pediatricians, and the HPV deficit concerns only adolescent girls[4]
  - **Switzerland:** Mixed HPV vaccination delivery system (both school-based vaccination and vaccination by pediatricians or general practitioners). The HPV vaccination deficit concerns both adolescent boys and girls[5]

Objective

To describe the COVID-19-related HPV vaccine deficit accumulation and to estimate the magnitude and duration of future catch-up required to clear the deficit in Switzerland and Greece.

Methods

Data sources

- Country-specific number of monthly HPV vaccine doses was sourced from IQVIA vaccine sales database (Switzerland)[6] or monthly vaccine sales data (Greece), for the period January 2019–December 2021

Description of the tool

- To estimate the HPV vaccination dose deficit and the time and catch-up rates needed to clear the deficit, a previously published COVID-19 recovery calculator was used[3]
- The tool describes the course of the HPV vaccination deficit through three sequential non-overlapping periods. The COVID-19 impact period simulates the time when the administration of the HPV vaccine was impacted by the pandemic. The transition period lasts between the end of the COVID-19 period and the start of the catch-up period, in which the percentage change in vaccination uptake gradually increases. The catch-up period represents the time during which monthly vaccination uptake rates are higher relative to the corresponding month in the reference period (**Table 1, Figure 1**)

Quantifying the HPV dose deficit during the COVID-19 pandemic

- During the observed period, the dose deficit was estimated by subtracting the number of monthly doses distributed during the COVID-19 pandemic (ie, years 2020, 2021) from the number of doses distributed in the corresponding month of the pre-pandemic year (2019) (**Figure 1**)
- For Greece, where the COVID-19 impact period lasted longer than the observed period, the missing data (ie, 3 months) were imputed. Imputation was calculated by summing the monthly doses distributed in the years 2019 (the last pre-pandemic year) and 2021 to estimate the relative yearly difference in distributed doses, then multiplying the relative yearly difference by the corresponding doses administered in each month of 2019 (**Figure 1**)

Figure 1. Schematic outline of the analysis for each country

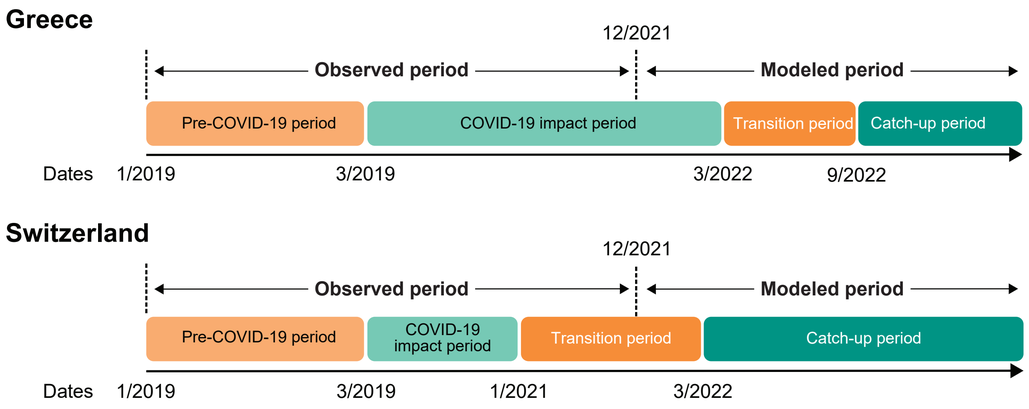


Table 1. Model parameters by country

	Switzerland	Greece
Targeted population	Girls/boys 11-14 y/o	Girls 11-13 y/o
Start of COVID-19 period	03/2020	03/2020
Transition period	01/2022[a]	03/2022
Start of catch-up period	03/2022	09/2022

[a]A gradual increase in the number of vaccine doses disseminated in Switzerland was observed already in 2021 and assumed to be continued until the start of the catch-up period.

Examined scenarios

- Base case: Clearing the deficit by the end of 2024
- Optimistic: Clearing the deficit by the end of 2023
- Pessimistic: Clearing the deficit by the end of 2025

Results

Description of the HPV vaccination deficit creation

- **Greece:** The percentage reduction in annual HPV dose distribution during 2020 and 2021, compared to the reference period of 2019, was 4.8% and 12.3%, respectively
- **Switzerland:** During 2020, HPV vaccine administration was reduced by 14.8% compared to 2019. In the second year of the pandemic, the relative reduction in the number of vaccine doses disseminated was lower (7.9%)

Cumulative deficit of HPV vaccine doses

Table 2. Cumulative deficit of HPV vaccine doses

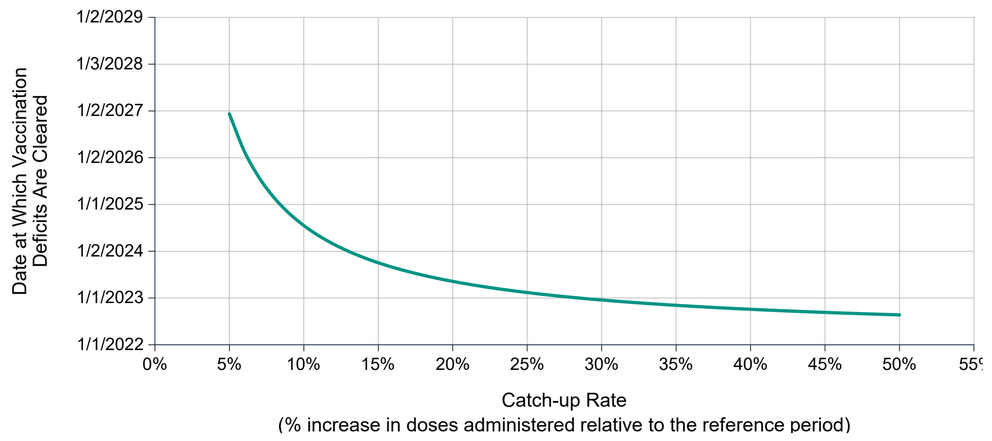
	Switzerland	Greece
Accumulated deficit of doses at start of the catch-up period	42,680	31,000
Accumulated deficit at start of catch-up period as % of total annual doses administered during 2019	24.4%	21.7%
Accumulated deficit as a function of the number of months of 2019*	2.9	2.6

Table 3. Catch-up rates required to clear the cumulative deficit of missed doses

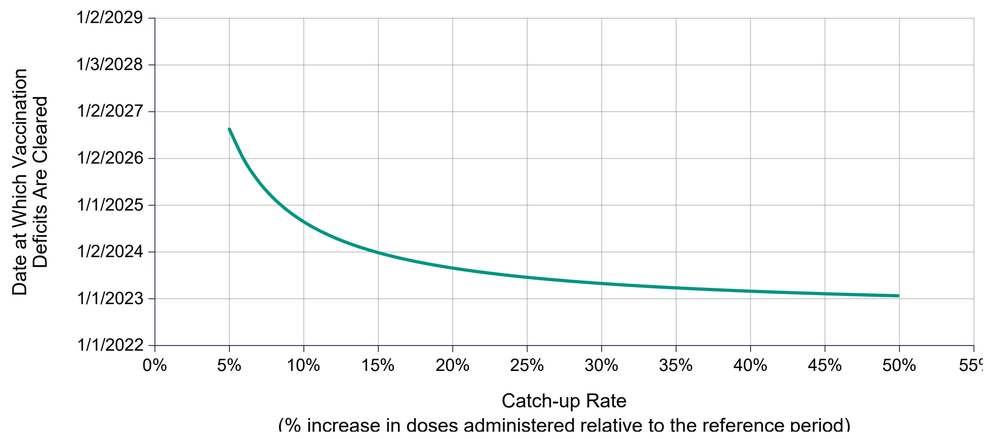
	Switzerland	Greece
Base case		
Additional number of HPV doses per month (% of total annual doses disseminated during 2019)	1,226 (8.4%)	975 (8.2%)
Optimistic scenario		
Additional number of HPV doses per month (% of total annual doses disseminated during 2019)	1,840 (12.6%)	1,545 (13.0%)
Pessimistic scenario		
Additional number of HPV doses per month (% of total annual doses disseminated during 2019)	930 (6.3%)	715 (6.0%)

Figure 2. Catch-up rate vs time required to clear the deficit in A) Switzerland B) Greece

A) Switzerland



B) Greece



Limitations

- The model does not incorporate demographics (eg, population growth)
- Based on vaccination schedule, individuals may be potentially eligible for multiple HPV vaccine doses during adolescent years. In order to keep the model parsimonious and interpretable, this model does not distinguish by dose number that is missed (1st dose vs 2nd or 3rd dose)

Conclusions

- Despite country-specific differences, the projected cumulative deficit of missed doses was substantial in both countries
- To optimize the effectiveness of HPV vaccination catch-up programs, interventions should be country-specific
- HPV immunization should be a public health priority, and significant catch-up vaccination initiatives to reverse the deficit and prevent long-term public health and economic consequences should be implemented

References

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Disclosures

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