EPH151

Is Greece on track to meet the 90% HPV vaccine coverage rate target by 2030? A mathematical modelling study

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Background

- Cervical cancer is the 4th most common cancer worldwide among women[1], with more than 95% of cases attributed to infection with the human papillomavirus (HPV)**[1].**
- **In Greece, in 2022, there were 268 deaths from cervical cancer. These deaths resulted in the loss of 4,536 years of life, of which 1,373 are considered productive years of life (Table 1)[2].**

Table 1: Epidemiological burden of cervical cancer in Greece[2]

	Cervical cancer
Life Year lost	4,536
Productive life year lost	1,373
Mean year lost per patient	16.9
Mean productive life year lost per patient	5.1
Indirect cost due to premature mortality (€)	18.5 M
Indirect cost due to premature mortality per patient (€)	68,123

- To eliminate cervical cancer (threshold defined as <4 age-standardized cases per 100,000 women.), the World Health Organization urges countries to achieve 90% HPV vaccination coverage rate (VCR) for girls aged 15 by 2030[3].
- A recent mathematical study estimated that if public health interventions are implemented to accelerate HPV vaccination coverage and adherence to HPV DNA-based screening—achieving 90% vaccination coverage and 75% screening participation by 2028—Greece could reach the WHO's cervical cancer elimination threshold by 2047 and potentially eradicate cervical cancer before the end of the century[4].

Aim

The aim of this study is to assess when Greece is expected to meet the 90% HPV VCR target, and to compute the cumulative number of 15-year-old girls who will remain unvaccinated by that year.

Method

To estimate the time required to reach the WHO VCR target and the number of unvaccinated girls**, a published mathematical model (Gountas et al., ERV 2024)[5] was utilized.**

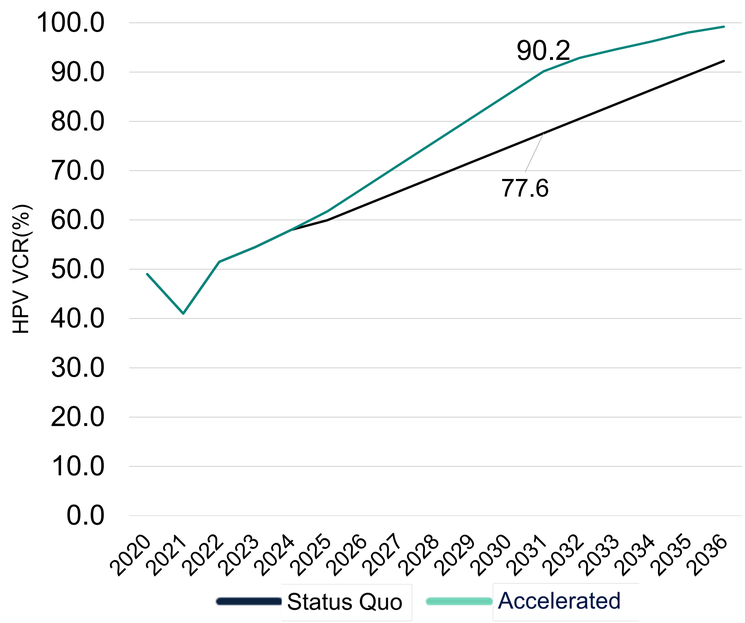
Method (cont.')

- **Several univariate regression models** (linear; exponential; logarithmic; power regression; second order and segmented linear regression models) were fitted to Greek VCR data.
- **The independent variable in the regression models was the year, while the observed vaccine coverage rate was used as the dependent variable.**
- To determine how well the model predicts an outcome, the regression model with the highest coefficient of determination (R^2, 0–1), alongside visual inspection and plausible restrictions to check for a realistic trend, was chosen to extrapolate the HPV Greek vaccine coverage rate throughout the study time horizon.
- **The tool estimated the number of girls who remain unvaccinated at age 15 based on projected VCR growth and population projections from the World Bank.**

Results

- The evolution of HPV VCR in Greece follows a logarithmic distribution, significantly influenced by the reduction in VCR observed during the COVID-19 pandemic in 2020 *(For more information regarding the HPV VCR reduction during COVID-19 pandemic, please check Gountas et al. Vaccines 2023).*
- **Should VCR continue to increase according to historical trends, it is projected that Greece will meet the 90% HPV VCR target by 2036 (Figure 1).**
- To achieve the 90% HPV VCR target by 2030, Greece would need to increase the annual incremental VCR growth rate by 77%.

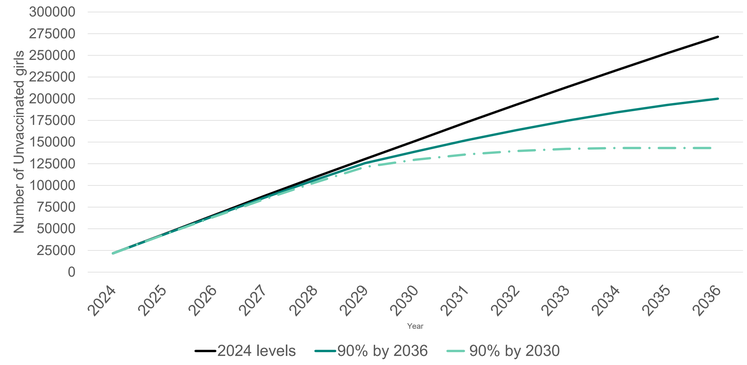
Figure 1: Expected trajectory of HPV vaccination coverage in Greece



Results (cont.')

- **The estimated number of girls remaining unprotected against HPV between 2025 and 2036 is 271k if the VCR remains constant at 59%. This number decreases to 200k if Greece meets the 90% VCR target by 2036, and further to 143k if Greece achieves the VCR target by 2030 (Figure 2).**

Figure 2: Number of Unvaccinated girls by scenario



Limitations

- The study focused only on the population of Greek adolescent girls..
- The hypothetical projection assumes the current trends are maintained going forward while assuming that all other influential factors remain constant.
- As a result, the results provide a useful starting point for decision makers to consider the prioritization of policies for increasing vaccine coverage rate by showing what may occur if nothing changes and the vaccine coverage rate continues along the same trend.

Conclusions

- **Greece is currently unlikely to meet the target of 90% HPV VCR by 2030, which would result in a significant number of girls remaining unprotected against cervical and other HPV-related cancers.**
- **Adult catch-up vaccination programs for individuals up may offer added benefit in reducing the burden of HPV-related cancers, by targeting those who were previously unvaccinated**

References

1.WHO. Cervical Cancer Fact Sheet; 2. Gountas et al ISPOR 2025; 3. Cervical Cancer Elimination Initiative, WHO 4. Palmer et al. Front. Oncol., 2025; 5. Gountas et al .ERV 2024

Disclosures

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Conduct information

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