nature portfolio

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Reporting Summary

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Statistics

For all statistical analyses, confirm that the following items are present in the figure legend, table legend, main text, or Methods section.

n/a	Confirmed
☐	☒ The exact sample size (*n*) for each experimental group/condition, given as a discrete number and unit of measurement
☒	☐ A statement on whether measurements were taken from distinct samples or whether the same sample was measured repeatedly
☒	☐ The statistical test(s) used AND whether they are one- or two-sided *Only common tests should be described solely by name; describe more complex techniques in the Methods section.*
☒	☐ A description of all covariates tested
☒	☐ A description of any assumptions or corrections, such as tests of normality and adjustment for multiple comparisons
☒	☐ A full description of the statistical parameters including central tendency (e.g. means) or other basic estimates (e.g. regression coefficient) AND variation (e.g. standard deviation) or associated estimates of uncertainty (e.g. confidence intervals)
☒	☐ For null hypothesis testing, the test statistic (e.g. *F*, *t*, *r*) with confidence intervals, effect sizes, degrees of freedom and *P* value noted *Give P values as exact values whenever suitable.*
☒	☐ For Bayesian analysis, information on the choice of priors and Markov chain Monte Carlo settings
☒	☐ For hierarchical and complex designs, identification of the appropriate level for tests and full reporting of outcomes
☒	☐ Estimates of effect sizes (e.g. Cohen's *d*, Pearson's *r*), indicating how they were calculated

Our web collection on statistics for biologists contains articles on many of the points above.

Software and code

Policy information about availability of computer code

Data collection	The database is built using the structured query language (SQL) and securily stored at Karolinska´s server.
Data analysis	The mathemathical model is described in a thorough separate paper that contains all information to replicate the analysis. It is reference 11 (Type-Specific Human Papillomavirus Biological Features: Validated Model-Based Estimates | PLOS ONE)

For manuscripts utilizing custom algorithms or software that are central to the research but not yet described in published literature, software must be made available to editors and reviewers. We strongly encourage code deposition in a community repository (e.g. GitHub). See the Nature Portfolio guidelines for submitting code & software for further information.

Data

Policy information about availability of data

All manuscripts must include a data availability statement. This statement should provide the following information, where applicable:

- Accession codes, unique identifiers, or web links for publicly available datasets
- A description of any restrictions on data availability
- For clinical datasets or third party data, please ensure that the statement adheres to our policy

Investigators interested in accessing these data for the purposes of future studies can do so by contacting the Swedish National Cervical Screening Registry (nkcx.se) after an Institutional Review Board approval has been obtained; and a Data Use Agreement being filled.

Human research participants

Policy information about studies involving human research participants and Sex and Gender in Research.

Reporting on sex and gender	The study aims for faster cervical cancer elimination. Cervical cancer is restricted to subjects of the female sex. The population registry specifies the sex of the individual and the sex registered in the population registry is included in the personal identification number that is stated on all issued ID documents in Sweden and was collected from all enrolled subjects. All subjects with a registered female sex born 1999-1994 who provided informed consent were eligible for the study. Transgender males (subjects born as females, but having changed sex) were not eligible as the protocol had specified females. However, transgender males received the vaccine and the screening as a compassionate out-of-study measure. As all data refers to subjects of the female sex, sex-stratified data is not presented
Population characteristics	All subjects in the entire population were eligible if they were of female sex, born 1999-1994 and provided informed consent. Invitations used the actual population registry and the population characteristics of the study is thus identical to the population characteristics of Sweden.
Recruitment	Population-based invitations were issued to the entire population, both by electronic push messages, SMS and physical letters. We used 2 concomitant strategies: 1. The women could book a convenient time and place themselves ("campaign") or 2. A time and place was included in the invitation ("organised screening"). This is described in the manuscript in detail on page 10-11. Possible biases by determinants of attendance can not be excluded. However, as a large part of the population was enrolled it is likely that the enrolled subjects are representative of the population.
Ethics oversight	The Swedish National Ethical Review Agency (a government agency) and the Swedish Medical Products Agency.

Note that full information on the approval of the study protocol must also be provided in the manuscript.

Field-specific reporting

Please select the one below that is the best fit for your research. If you are not sure, read the appropriate sections before making your selection.

☒ Life sciences ☐ Behavioural & social sciences ☐ Ecological, evolutionary & environmental sciences

For a reference copy of the document with all sections, see nature.com/documents/nr-reporting-summary-flat.pdf

Life sciences study design

All studies must disclose on these points even when the disclosure is negative.

Sample size	As the aim was faster cervical cancer elimination in the population of Sweden, the entire population was targeted
Data exclusions	Lack of informed consent was the only exclusion criterion.
Replication	The HPV testing was performed by the Swedish cervical screening program used the cervical screening program quality assurance system. This involves a series of quality checks for proficicency including reproducibility. Separate repeat analysis for the samples in this study was not done. The overall proficiency of the testing is published.

Randomization	The study targeted all women. A control group was not ethical, as vaccination and screening are known to prevent cancer. Evaluation is therefore using a before-after design.
Blinding	As there was no control group blinding is not relevant.

Reporting for specific materials, systems and methods

We require information from authors about some types of materials, experimental systems and methods used in many studies. Here, indicate whether each material, system or method listed is relevant to your study. If you are not sure if a list item applies to your research, read the appropriate section before selecting a response.

Materials & experimental systems

n/a	Involved in the study
☒	☐ Antibodies
☒	☐ Eukaryotic cell lines
☒	☐ Palaeontology and archaeology
☒	☐ Animals and other organisms
☐	☒ Clinical data
☒	☐ Dual use research of concern

Methods

n/a	Involved in the study
☒	☐ ChIP-seq
☒	☐ Flow cytometry
☒	☐ MRI-based neuroimaging

Clinical data

Policy information about clinical studies

All manuscripts should comply with the ICMJE guidelines for publication of clinical research and a completed CONSORT checklist must be included with all submissions.

Clinical trial registration	NCT04910802
Study protocol	The full protocol is available in the open repositories of the Swedish National Review Agency and the Swedish Medical Products Agency
Data collection	Used file transfer from the HPV screening laboratory tests, and vaccination status, and the physical informed consent documents
Outcomes	The primary outcome measure is the prevalence of HPV (overall and type-specific prevalence of HPV will be obtained from the routine HPV screening programs in the regions that offer HPV screening to this age group). As secondary outcome measures, the trial includes: a)number of women with histopathologically confirmed cervical intraepithelial neoplasia grade 2, 3, or cervical cancer (CIN2 +), to be measured through registry linkages by HPV type in the lesion; b) consumption of resources (measured as number of screening and treatment visits), c) number of women with obstetrical complications (such as preterm births, measured through registry linkages), and d) number of women with cervical specimens found to be benign (treatments for cervical abnormalities, measured as excised cervical specimens, found to be benign, measures through registry linkages)

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