



Title	Reduction in the Risk of Cervical Cancer by Vaccination Against Human Papillomavirus (HPV) – A Health Technology Assessment
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Reference	2007; 9(1). ISBN 978-87-7676-496-6. www.sst.dk/publ/Publ2007/MTV/HPV/HPV_vaccination.pdf

Aim

To investigate the prerequisites for and consequences of introducing human papillomavirus (HPV) vaccination in Denmark; to analyze circumstances of HPV infection, cervical cancer, and appropriate vaccines; to study attitudes toward and acceptance of HPV vaccination; to discuss the ethical aspects of HPV vaccination; and to assess the health economics of an HPV vaccination program.

Conclusions and results

Both of the existing vaccines protect against the HPV types at which they are aimed. HPV infection is a prerequisite for cervical cancer, and both vaccines will likely have an effect of at least the same magnitude on cervical cancer risk. Since the published studies have a maximum followup of 5 years it is impossible to predict the duration of protection. HPV vaccination might only postpone infection, and a booster vaccination could be necessary. The published studies have the limitation that only selected population groups were vaccinated, particularly women aged 16 to 23 years with a history of fewer than 5 sexual partners.

HPV vaccines are well tolerated, and have shown no serious adverse reactions. The vaccine is approved for use together with other vaccines, eg, measles, mumps, and rubella (MMR). Focus groups suggested it would be optimal to vaccinate at 12 years of age when children see a doctor for their second MMR vaccination. We found no studies of vaccine interaction during co-administration with MMR vaccination. The existing vaccine is approved for women and men, but there has been little experience with using the vaccine in men, and its efficacy has not been determined for boys and young men.

If annual vaccination of 12-year-old girls achieves 70% coverage without a catch-up program, a cost-effect ratio of about DKK 85 000 (USD 15 500, EUR 11 400) is estimated per gained year of life, excluding indirect costs. A catch-up program for the group aged 13 to 15

years involves a relatively large increase in the life benefit while the cost-effectiveness ratio will only increase from DKK 85 000 (USD 15 500, EUR 11 400) per gained year of life to DKK 89 000 (USD 16 200, EUR 11 900) per gained year of life. Inclusion of 12-year-old boys in the vaccination program implies a doubling of the annual vaccination costs, and the additional effect is relatively modest. A catch-up program can achieve the same effect at a lower cost for girls aged 13 to 19 years. These analyses involve uncertainty and variability. To meet part of this uncertainty, scenario and sensitivity analyses have been carried out for selected parameters.

Knowledge about the duration of protection from vaccine, occurrence of rare adverse effects, and net effectiveness in terms of the public health will only be known in years to come. The basis for the decision to which this HTA contributes is thus vitiated by uncertainties, and it may not be possible to solve the unanswered questions within a short time frame.

Recommendations

The screening program against cervical cancer should continue in its present form. Vaccinated women should be informed of the importance of continuing in this program.

Methods

Methods included literature reviews, qualitative focus group interviews, and economic analysis based on a mathematical simulation model.