

Background

A vaccine that provides protection against 4 types of human papillomavirus infection was licensed in June 2006. This vaccine, targeted to adolescent and young adult females, promises to radically reduce the incidence of cervical cancer, abnormal Pap smears, and genital warts if widely implemented.

Despite this vaccine's promise, many questions remain about the optimal strategies for its use. Inclusion of males in vaccination programs, extension beyond the young adult age range, and altering Pap smear screening frequency in vaccinated women, are some examples of these unanswered questions.

Mathematical models that simulate the "natural history" of HPV infection have been used to try and address these questions by assessing the population-level impact vaccination could have on HPV-related diseases. However, a consistent oversight in all of these previous models is that they assume instantaneous, universal vaccination coverage of the target adolescent population. Not only does this assumption likely over-estimate the population-level benefit to vaccination, but it also fails to provide policy makers with critical information on how various public policies under consideration may ultimately affect rates of HPV-associated illnesses.

Methods

The aims of this study are:

- 1) To develop a new mathematical model that simulates vaccine uptake among underage children in order to identify parental or societal factors that influence vaccine utilization.
- 2) To combine this vaccine uptake model with existing models of HPV infection in order to evaluate the impact of various social policies under consideration on HPV-associated clinical outcomes.

The vaccine uptake model will incorporate societal and personal factors that have been shown in previous studies to impact parental vaccine acceptability. After linking this more realistic vaccine uptake model to a HPV natural history model, the "combined" model will be used to evaluate the impact of two specific social policies, school mandates and adolescent self-consent, on downstream rates of HPV-related disease.

Implications for Health and Health Policy

Understanding the parental or societal factors that impact HPV vaccine uptake allows public health providers to more effectively target interventions to improve HPV vaccine uptake. Furthermore, linking realistic simulations of vaccine uptake to HPV-related disease outcomes provides critical information for policy makers to consider when making decisions about public policies related to HPV vaccination.

For more information, please contact:

Principal Investigator: Amanda F. Dempsey, MD, PhD, MPH

Child Health Evaluation and Research (CHEAR) Unit

University of Michigan

Division of General Pediatrics

300 North Ingalls, Rm 6E08

Ann Arbor, MI 48109-5456

Telephone: 734-615-0398

Fax: 734-764-2599

Email: adempsey@med.umich.edu