Vaccine for cervical cancer: reaching adolescents in sub-Saharan Africa

Biddlecom A, Bankole A, Patterson K. Vaccine for cervical cancer: reaching adolescents in sub-Saharan Africa. *Lancet* 2006; **367:**1299-1300.
http://www.thelancet.com

Merck's vaccine for cervical cancer is being reviewed as a priority by the US Food and Drug Administration (FDA), with a ruling due on June 8, and GlaxoSmithKline submitted an application for its vaccine in the European Union on March 9.[1,2] The issue of how best to introduce these vaccines to young people before they become sexually active is now, therefore, a research priority.

Vaccination against cervical cancer is especially important in developing countries, where nearly 80% of cases are reported and where effective methods of diagnosis—such as the Pap smear—are rarely used.[3,4] Modelling studies indicate that vaccines against human papillomavirus (HPV) could be effective in preventing cervical cancer provided all adolescents—not just those at high risk—are vaccinated before they become sexually active.[5] The need to reach large numbers of adolescents with a series of three injections is a challenge, however, especially in sub-Saharan Africa.

School-based programmes could potentially increase coverage, but in many developing countries a large proportion of children never begin school or drop out before they reach an appropriate age for vaccination. Population-weighted estimates pooled for 24 African countries, for example, show that nearly three-quarters of girls aged 10–14 years attend school at some point, but that only 53% complete primary school.[6] Furthermore, adolescents' rate of use of sexual and reproductive health services, such as obtaining contraception or seeking diagnosis and treatment of sexually-transmitted infections (STIs), is low for various reasons—embarrassment, lack of privacy, cost; few interventions (such as integrated school and facility-based interventions and a mass media with provider training) to improve this situation are effective.[7]

The table shows WHO rapid-assessment measures of injection practices[8,9] and awareness of STIs for children aged 12–14 years in Burkina Faso, Ghana, Malawi, and Uganda—part of the population in sub-Saharan Africa targeted for an HPV vaccine. The data are from national surveys of individuals aged 12–19 years in 2004.[9] The median

self-reported age of first sexual intercourse in these four countries is 16·6–17·4 years in women and 17·7–19·7 years in men.[10]

In all four countries, at least one in five girls and one in three boys aged 12–14 years reported receiving an injection in the year before the survey interview. Children in Uganda were most likely to have received an injection and received more injections overall than those in other countries. The estimates for Uganda might reflect in part a 2003 measles vaccination campaign that targeted those aged 14 years and younger, but injection frequency in 15–19 year olds is similar (data not shown).[9] Regional age-adjusted population averages for the yearly number of injections per person in Africa range from 2·0 to 2·2.[11] Doctors and nurses were the predominant sources for recent injections in all four countries. Even in Malawi, where the health system is ranked near the bottom of a league of 191 countries,[12] almost one in four 12–14 year old girls had received an injection from a doctor or nurse in the past year. Despite arguments that medical care is more accessible in urban than in rural areas, there is no consistent urban advantage to injection use in 12–14-year-old girls (figure). Only in Burkina Faso is there a significant difference by urban–rural residence.

HPV vaccine implementation in these four countries in sub-Saharan Africa via existing health-care systems, in tandem with school-based programmes, even with shortages of doctors and nurses and other infrastructure problems, should be fairly effective. The systems in place reach a substantial minority (and in Uganda, the majority) of very young adolescents in both urban and rural areas. Yet, as in other countries, awareness of HPV and other STIs is not high—fewer than half of 12–14-year-olds in the countries assessed had heard of any infections (apart from HIV) transmitted through sexual contact. Vaccine implementation in these and similar countries must, therefore, be accompanied by broad-based outreach, informing young people and their families about the need for the vaccination for the adolescents' future health and—of particular importance in many settings where desired family sizes remain high even among young people—their future ability to bear children.

**Ann E Biddlecom, Akinrinola Bankole, Kate Patterson*
Research Division, Guttmacher Institute, New York, NY 10005, USA

abiddlecom@guttmacher.org

We declare that we have no conflict of interest.

1 Merck & Co. GARDASIL®, Merck's investigational cervical cancer vaccine, to receive priority review from the U.S. Food and Drug Administration. Feb 7, 2006: http://www.merck.com/newsroom/press_releases/research_and_development/2006_0207.html (accessed March 27, 2006).

2 GlaxoSmithKline. Marketing Application for cervarix, GSK's candidate vaccine for cervical cancer, submitted in the European Union. March 9, 2006: http://www.gsk.com/media/archive.html (accessed April 3, 2006).

3 Sankaranarayanan R, Gaffikin L, Jacob M, Sellors J, Robles S. A critical assessment of screening methods for cervical neoplasia. *Int J Gyneco Obstet* 2005; **89** (suppl 2): S4-S12.

4 Goodarz D, Vander Hoorn S, Lopez AD, et al. Causes of cancer in the world: comparative risk assessment of nine behavioural and environmental risk factors. *Lancet* 2005; **366:** 1784–93.

5 Hughes JP, Garnett GP, Koutsky L. The theoretical population-level impact of a prophylactic human papilloma virus vaccine. *Epidemiology* 2002; **13:** 631–39.

6 Hewett PC, Lloyd CB. Progress toward education for all: trends and current challenges for sub-Saharan Africa. In: Lloyd CB, Behrman JR, Stromquist NP, Cohen B, eds. The changing transitions to adulthood in developing countries: selected studies. Washington DC: The National Academies Press, 2005: 84–117.

7 Speizer IS, Magnani RJ, Colvin CE. The effectiveness of adolescent reproductive health interventions in developing countries: a review of the evidence. *J Adolesc Health* 2003; **33:** 324–48.

8 WHO. Injection practices: rapid assessment and response guide. Geneva: World Health Organization, 2002.

9 Guttmacher Institute. Special tabulations from the 2004 national survey of adolescents in Burkina Faso, Ghana, Malawi and Uganda (forthcoming).

10 Bankole A, Singh S, Woog V, Wulf D. Risk and protection: youth and HIV/AIDS in Sub-Saharan Africa. New York: The Alan Guttmacher Institute, 2004.

11 Hutin YJF, Hauri AM, Armstrong GL. Use of injections in healthcare settings worldwide, 2000: literature review and regional estimates. *BMJ* 2003; **327:** 1075.

12 WHO. The world health report 2000. Geneva: World Health Organization, 2000.

	Unweighted number	Proportion (%) receiving any injections in past 12 months (95% CI)	Mean number of injections per person per year (95% CI)	Proportion (%) reporting an injection (in past 12 months) from a doctor or nurse (95% CI)	Proportion (%) aware of STIs, apart from HIV/AIDS (95% CI)
Burkina Faso					
Girls	1272	21.0 (18.1 - 24.2)	0.5 (0.4 - 0.6)	20.8 (17.9 - 24.1)	15.0 (12.6 - 17.8)
Boys	1333	30.6 (27.7 - 33.6)	0.7 (0.6 - 0.8)	29.9 (27.1 - 32.9)	19.1 (16.2 - 22.3)
Ghana					
Girls	936	40.7 (36.8 - 44.6)	0.9 (0.8 - 1.0)	37.1 (33.4 - 41.1)	25.5 (21.7 - 29.8)
Boys	967	50.8 (46.8 - 54.8)	1.4 (1.1 - 1.6)	45.3 (41.5 - 49.2)	27.5 (24.1 - 31.2)
Malawi					
Girls	944	25.2 (21.8 - 29.0)	0.5 (0.4 - 0.6)	23.8 (20.4 - 27.7)	48.3 (43.9 - 52.7)
Boys	905	34.3 (30.7 - 38.0)	0.8 (0.7 - 0.9)	28.3 (24.5 - 32.5)	49.9 (45.8 - 54.1)
Uganda					
Girls	1282	60.0 (57.0 - 62.9)	2.0 (1.8 - 2.1)	46.2 (43.1 - 49.4)	37.5 (34.8 - 40.3)
Boys	1198	69.9 (67.2 - 72.4)	2.3 (2.1 - 2.5)	58.1 (54.9 - 61.3)	37.7 (34.3 - 41.2)

Table: **Injection practices and knowledge of STIs apart from HIV in 12-14-year-olds[9]**

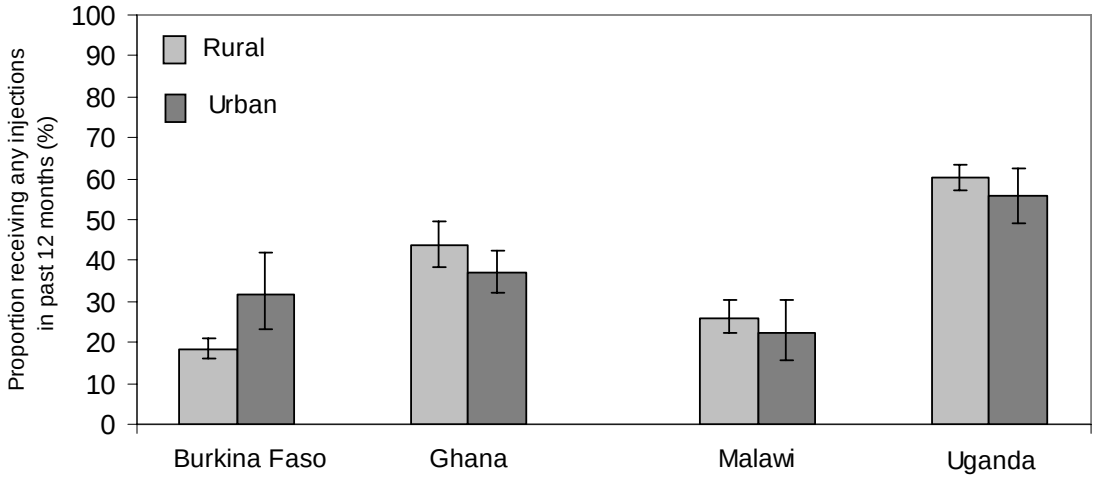

Figure: **Proportion of girls aged 12-14 years who received any injection in past 12 months by country and rural-urban residence[9]**
Vertical bars=95% CIs.