

Round table

Cervical cancer prevention and the Millennium Development Goals

Scott Wittet^a & Vivien Tsu^a

Abstract The advent of new technologies such as the human papillomavirus (HPV) vaccine and HPV DNA tests – along with new insights into the appropriate use of low-resource technologies such as visual inspection of the cervix and treatment of cervical lesions with cryotherapy – have increased optimism about the potential for effective disease control in low-resource settings. Nevertheless, it is also important to ask ourselves how new health initiatives contribute, or fail to contribute, to major global undertakings such as achievement of the Millennium Development Goals (MDGs).

While reproductive health in general, and cervical cancer prevention in particular, are not explicitly mentioned among the MDGs, they are implied; and it is certain that women cannot contribute to sustainable development without good health. The question is, in what ways do scaled-up cervical cancer prevention activities, including introduction of the new HPV vaccines and increased access to precancer screening and treatment, contribute to attainment of the MDGs?

Bulletin of the World Health Organization 2008;86:488–491.

الترجمة العربية لهذه الخلاصة في نهاية النص الكامل لهذه المقالة. Al final del artículo se facilita una traducción al español. Une traduction en français de ce résumé figure à la fin de l'article.

Cervical cancer kills about 270 000 women every year.¹ It has been called “a case study in health equity” because most (85%) of these deaths occur in the developing world. In large part, this inequity is due to the lack of cervical cancer screening programmes in those countries – the same programmes that are taken for granted in Australia, Europe and the United States of America. And since cervical cancer affects relatively young women (mortality rates climb as women enter their forties), it results in many lost years of life – 2.7 million age-weighted years of life were lost to the disease in the year 2000.²

The biggest impacts of cervical cancer are on poverty, education, and gender equity – the first three Millennium Development Goals (MDGs). Many of those who die are breadwinners and caretakers of both children and elders. For example, in sub-Saharan Africa women head one-third of all households and in Botswana, over half of the children who have lost a parent are being cared for by grandmothers – women also at risk of cervical cancer.^{3,4}

The fabric of the family and the community is weakened significantly when these women die. This is especially true in communities also ravaged by the loss of working adults to HIV/AIDS.

In addition to the emotional trauma, cervical cancer deaths have significant economic costs over the short- and long-term (though these are seldom considered when calculating the financial burden of disease). Family members may lose work opportunities and can incur overwhelming medical costs while caring for women with cancer.⁵ Reduction in family income resulting from the death of a working-age adult can force remaining family decision-makers to prioritize immediate needs (food and shelter) over investment in human capital (e.g. education). As poverty increases, more children (especially girls) may be kept out of school for lack of school fees, books, or uniforms, but also so that they can contribute to family income through work. Cervical cancer can impact education in other ways as well, such as when schools lose experienced teachers to the disease. The

differential economic and social impact on women and girls makes it more difficult to achieve gender equity. Finally, it should be noted that lower levels of female education are linked to decreased maternal and infant health – the focus of two other MDGs.

Developing successful cervical cancer screening and human papillomavirus (HPV) vaccination programmes opens the door to many other interventions including, for older women, opportunities to screen for other cancers and reproductive problems, and for school-age girls and boys, deworming; treatment for schistosomiasis, onchocerciasis, filariasis and trachoma; iron and/or iodine supplementation; distribution of bed nets to prevent malaria; hand washing, anti-tobacco and anti-drug education; nutritional supplementation; body-awareness education; and guidance on life choice decision-making and sexual health.⁶ All of these interventions are in the immediate interest of the individual, but also will help improve maternal health and result in healthier newborns

^a PATH, 1455 NW Leary Way, Seattle, WA 98107, United States of America.

Correspondence to Scott Wittet (e-mail: swittet@path.org).

doi:10.2471/BLT.07.050450

(Submitted: 18 December 2007 – Revised version received: 4 April 2008 – Accepted: 15 April 2008)

when the girls who are screened become older.

Some of the benefits of improved cervical cancer prevention are obvious – the reduction in suffering and death of mature women and the grief and economic burden felt by their families. As demonstrated above, prevention programmes can also support development in other ways, including contributing to lowering poverty, increas-

ing primary education, empowering women, improving child health and providing the basis for global partnerships. The many barriers to realizing this potential, such as the current high cost of HPV vaccine, weakness of existing cervical cancer screening and adolescent health systems, and low levels of knowledge about HPV, now are being challenged. With sufficient political will and resources, these barriers surely

can be overcome in the interest of the family and the MDGs. ■

Funding: Support for PATH's cervical cancer prevention initiatives comes from the Bill & Melinda Gates Foundation.

Competing interests: None declared.

Résumé

Prévention du cancer du col utérin et objectifs du Millénaire pour le développement

L'avènement de nouvelles technologies, comme le vaccin contre le papillomavirus humain (HPV) et les tests ADN pour ce virus, ainsi que les nouvelles perspectives d'utilisation de technologies peu onéreuses, telles que l'examen visuel du col et le traitement des lésions cervicales par cryothérapie, amènent à être plus optimiste quant aux possibilités de lutter efficacement contre ce cancer dans les pays à faibles ressources. Néanmoins, il importe aussi de se demander comment les nouvelles initiatives sanitaires contribuent ou ne contribuent pas aux entreprises mondiales majeures comme la réalisation des objectifs du Millénaire pour le développement (OMD).

Si la santé génésique en général et la prévention du cancer du col en particulier ne sont pas explicitement mentionnées en tant qu'OMD, elles le sont implicitement et il est certain que les femmes ne peuvent participer au développement durable sans être en bonne santé. Il faut donc se demander de quelles manières le développement des activités de prévention de ce cancer, et notamment l'introduction des nouveaux vaccins contre le HPV et l'élargissement de l'accès au dépistage et au traitement précancéreux, contribue à la réalisation des OMD.

Resumen

Prevención del cáncer cervicouterino y Objetivos de Desarrollo del Milenio

El desarrollo de nuevas tecnologías como la vacuna contra el papilomavirus humano (PVH) y las pruebas de ADN del PVH, unido a los nuevos conocimientos sobre el uso apropiado de tecnologías de bajo costo como la inspección visual del cuello uterino y el tratamiento de las lesiones cervicouterinas mediante crioterapia, han generado un mayor optimismo respecto a las posibilidades de combatir eficazmente esa enfermedad en los entornos con pocos recursos. No obstante, es importante también determinar los mecanismos por los que las nuevas iniciativas sanitarias podrán contribuir o no al éxito de importantes proyectos mundiales, como por ejemplo los Objetivos de Desarrollo del Milenio (ODM).

Si bien en los ODM no se mencionan explícitamente la salud reproductiva en general o la prevención del cáncer cervicouterino en particular, esas dos cuestiones figuran de forma implícita en dichos objetivos, pues es obvio que las mujeres no pueden contribuir al desarrollo sostenible si no gozan de buena salud. La cuestión que se plantea es ¿cómo contribuyen al logro de los ODM las actividades expandidas de prevención del cáncer cervicouterino, incluida la introducción de las nuevas vacunas contra el PVH y el mayor acceso al cribado y tratamiento de las lesiones precancerosas?

ملخص

الوقاية من سرطان عنق الرحم، والمرامي الإنمائية للألفية

وبرغم أن الصحة الإنجابية، بشكل عام، والوقاية من سرطان عنق الرحم، بشكل خاص، لم يرد ذكرهما صراحة في المرامي الإنمائية للألفية، إلا أنهما ذكرا بشكل ضمني. ومن المؤكد أن المرأة لا يمكنها أن تسهم في التنمية المضمونة باستمرار بدون صحة جيدة. والسؤال المطروح الآن هو: كيف يسهم النهوض بأنشطة الوقاية من سرطان عنق الرحم، بما في ذلك ابتكار لقاحات جديدة مضادة لفيروس الورم الحليمي البشري وزيادة إتاحة خدمات تحري السرطان المحتمل ومعالجته، في بلوغ المرامي الإنمائية للألفية.

أدت التكنولوجيات الجديدة المبتكرة، مثل لقاح فيروس الورم الحليمي البشري واختبارات الدنا DNA لهذا الفيروس، وكذلك الأفكار الجديدة المطروحة بشأن الاستخدام السليم للتكنولوجيات القليلة الموارد، مثل الفحص البصري لعنق الرحم ومعالجة آفات عنق الرحم بالبرّد، أدى كل ذلك إلى مزيد من التفاؤل حول إمكانية مكافحة سرطان عنق الرحم بفعالية في الأماكن القليلة الموارد. وبرغم ذلك، حري بنا أن نسأل أنفسنا كيف تسهم المبادرات الصحية الجديدة، أو كيف تفشل في الإسهام في المهام العالمية الكبرى، مثل بلوغ المرامي الإنمائية للألفية.

References

1. Ferlay J, Bray F, Pisani P, Parkin DM. International Agency for Research on Cancer (IARC). *GLOBOCAN 2002: Cancer Incidence, Mortality and Prevalence Worldwide*. CancerBase No. 5, version 2.0. Lyon, France: IARC Press; 2004.
2. Yang BH, Bray FI, Parkin DM, Sellors JW, Zhang ZF. Cervical cancer as a priority for prevention in different world regions: an evaluation using years of life lost. *Int J Cancer* 2004;109:418-24. PMID:14961581 doi:10.1002/ijc.11719
3. *Rural women and food security*. Rome, Italy: Food and Agriculture Organization of the United Nations; 1999.
4. *Botswana situation analysis on orphans and vulnerable children*. Francistown, Botswana: United Nations Children's Fund, Ministry of Local Government Botswana; 2003.
5. Chang S, Long SR, Kutikova L, Bowman L, Finley D, Crown WH, et al. Estimating the cost of cancer: results on the basis of claims data analyses for cancer patients diagnosed with seven types of cancer during 1999 to 2000. *J Clin Oncol* 2004;22:3524-30. PMID:15337801 doi:10.1200/JCO.2004.10.170
6. Castilaw D, Wittet S. Preventing cervical cancer: unprecedented opportunities for improving women's health. *Outlook*. 2007;23(1). Available from: www.rho.org/files/PATH_outlook23_1_web.pdf [accessed on 8 May 2008].

Round table discussion

A sexual health prevention priority

Stephen Peckham^a & Alison Hann^b

Wittet and Tsu are right to point to the link between cervical cancer deaths and achieving the MDGs and the inequity in the burden of cervical cancer between developed and developing countries. Any programme that reduces cervical cancer incidence and mortality rates in low-income and lower middle-income countries is clearly to be welcomed. Addressing women's welfare, family education and thus poverty through screening, treatment and prevention will play an important role in tackling inequalities, although access to screening and vaccination is likely to be inequitable if programmes are not provided in a systematic and comprehensive way. We would argue, though, that cervical cancer screening and HPV vaccination should be seen as integral parts of, rather than separate from or instead of, a wider sexual health promotion programme.

Cervical cancer prevention can be viewed in a similar way to any other sexually transmitted infection. Screening women for cervical cancer is clearly important but a comprehensive and universal screening programme requires substantial resources and infrastructure and so the opportunity costs of such a programme need to be carefully considered. All cancer screening programmes result in unnecessary intervention or lack of intervention due to the sensitivity and specificity of tests that can be costly in terms of public spending but also in personal anxiety and distress.¹⁻³ As Wittet and Tsu report, however, new "see and treat" programmes will make an important contribution to cervical cancer treatment.

The recently developed HPV vaccine offers some hope in reducing the levels of cervical cancer but concerns have been expressed about its efficacy and the usefulness of vaccination programmes – particularly with regard to long-term effects and that it only protects against 4 out of the 200 HPV viruses. Key questions need to be asked about how vaccination is offered and to whom. It is only effective in women if given before commencing (heterosexual) sexual activity and herd immunity will only be achieved if both young men and women are vaccinated. Vaccination programme effectiveness would also need to be based on known rates of HPV infection as cervical cancer can also be caused by strains other than those for which the vaccine provides protection. Studies in the United States of America suggest that the incidence for types 16 and 18 is significantly lower than previously thought, that infection rates vary by age and most HPV infections are asymptomatic.⁴⁻⁷

This is an important point when considering the primary prevention of cervical cancer and HPV infection. Cervical cancer is usually a sexually transmitted disease, yet as many as two-thirds of women who are infected with the HPV virus will not develop cervical cancer. Primary prevention strategies providing factual information regarding transmission of sexually transmitted infection (STI) and the teaching of safer sex negotiation skills are potentially highly effective at a relatively low cost.⁸ Condom use has been shown to help prevent the transmission of the HPV virus as well as other STIs. However, in many circumstances it is not always possible for women to negotiate the use of the condom, especially within marriage. Of particular interest, therefore, are current studies being undertaken in Nairobi and Zimbabwe to examine the use of the diaphragm as a tool to prevent the transmission of not only HPV, but also HIV and other STIs.^{9,10} The advantage of the diaphragm for women is that her partner is not necessarily aware that she is using the device, which can be cleaned and reused.

While of obvious benefit and importance, cervical cancer screening programmes and HPV vaccination are not in themselves totally effective strategies. Screening may detect early (or more advanced) lesions but this is not without problems. Likewise, a population vaccination programme for HPV also raises questions that have, so far, not been answered satisfactorily. Primary prevention through education and promotion of safe sexual practices must, therefore, remain a key plank of any programme aimed at reducing cervical cancer deaths in the long term and substantially contributing to the MDGs. ■

References

1. Raffle AE, Alden B, Quinn M, Babb PJ, Brett MT. Outcomes of screening to prevent cancer: analysis of cumulative incidence of cervical abnormality and modelling of cases and deaths prevented. *BMJ* 2003;326:901. PMID:12714468 doi:10.1136/bmj.326.7395.901
2. Dyer O. Government fails to meet targets for sexually transmitted infections. *BMJ* 2003;326:900. PMID: 1157074
3. Fahey MT, Irwing L, Macaskill P. Meta analysis of Pap Test accuracy. *Am J Epidemiol* 1995;141:680-689. PMID:7702044

^a London School of Hygiene and Tropical Medicine, Keppel Street, London, England.

^b School of Health Science, University of Wales, Swansea, Carmarthen, Wales.

Correspondence to Stephen Peckham (e-mail: stephen.peckham@lshtm.ac.uk).

4. Winer RL, Lee SK, Hughes JP, Adam DE, Kiviat NB, Koutsky LA. Genital human papillomavirus infection: incidence and risk factors in a cohort of female university students. *Am J Epidemiol* 2003;157:218-226. PMID:12543621 doi:10.1093/aje/kwf180
5. Ho GYF, Bierman R, Beardsley L, Chang CJ, Burk RD. Natural history of cervical human papillomavirus infection in young women. *N Engl J Med* 1998;338:423-8. PMID:9459645 doi:10.1056/NEJM199802123380703
6. Dunne EF, Unger ER, Sternberg M, McQuillan G, Swan DC, Patel SS, et al. Prevalence of HPV infection among females in the United States. *JAMA* 2007;297:813-9. PMID:17327523 doi:10.1001/jama.297.8.813
7. Zimmerman RK. Ethical analysis of HPV vaccine policy options. *Vaccine* 2006;24:4812-20. PMID:16603278 doi:10.1016/j.vaccine.2006.03.019
8. Shepherd J, Peersman G, Weston R, Napuli I. Cervical cancer and sexual lifestyle: a systematic review of health education interventions targeted at women. *Health Educ Res* 2000;15:681-94. PMID:11142076 doi:10.1093/her/15.6.681
9. Bakuski EA, Kungu D, Duerr A, Tevi-Benissan C, Sunderam M, Cohen CR. Acceptability of the diaphragm among women at risk for sexually transmitted diseases in Nairobi, Kenya [Abstract no. MoPeD3658Int]. *Int Conf AIDS, 7-12 July 2002*.
10. Van Der Straten A, Mi Suk Kang, Posner S, Kamba M, Chipato T, Padian N. Predictors of diaphragm use as a potential sexually transmitted disease/HIV prevention method in Zimbabwe. *Sex Transm Dis* 2005;32:64-71. PMID:15614123 doi:10.1097/01.olq.0000148301.90343.3a

Cervical cancer prevention and the Millennium Development Goals

Jacques Milliez^a

Cervical cancer, a complication of HPV infection, is the second most common cancer in women, with 500 000 new cases each year worldwide, 80% of which occur in low-resource countries in Africa, Latin America and south-east Asia. More than half of women with cervical cancer will die, with deaths projected to rise by almost 25% over the next 10 years according to WHO.¹ In Europe and the United States of America, a woman has a 70% chance of surviving cervical cancer whereas the chance of survival is only 58% in Thailand, 42% in India, and 21% in sub-Saharan Africa.¹ In low-resource countries, only 41% of women with cervical cancer have access to appropriate treatment.¹ Now that immunization against HPV is available, will it meet its expectations?

In medically advanced countries, about 30–40% of women do not comply with available cervical cancer screening.² Whether these women will encourage their teenage daughters to have the HPV vaccine is questionable and depends strongly on health insurance coverage. In addition, immunization against the carcinogenic HPV strains 16 and 18 only prevents 70% of cervical cancers.³ Therefore, it does not exempt women from further regular cervical screening when also considering that the duration and optimal protection of the initial immunization is unknown and that boys are not yet included in the immunization programme.⁴

In low-resource countries where cervical cancer screening programmes and treatments are scarce or absent, HPV vaccine raises considerable expectations, but just as many objections. HPV subtypes vary between regions in the world and the strains targeted by the currently marketed vaccines may not prevail in low-resource countries where no extensive epidemiologic study of HPV-typing has been conducted. A full immunization procedure, three shots over six months, is expected to cost US\$ 360.¹ Such a cost is unaffordable for the one billion individuals living on less than US\$ 1 per day, unless the vaccine is distributed by state-subsidized programmes. Health authorities in low-resource countries, already overwhelmed with public health demands, will have to set priorities when allocating limited resources. The same painful choices are now imposed on international agencies and private foundations with the advent of the HPV vaccine, which puts an additional burden on their available funding. Equity requires dividing the means according to the needs, provided a hierarchy can be established among those needs. Given the HIV epidemic, the devastation caused by malaria or tuberculosis, maternal mortality that is responsible for twice as many women's deaths as cervical cancer, and the four million infants dying each year of avoidable disease, it is likely that the HPV vaccine will be given a low priority. Furthermore, considering that famine is endemic in at least 37 countries, urgent wheat, rice and millet provision competes with the supply of vital drugs. The World Trade Organization and WHO compete in spreading their endeavours with shrinking funds. If the Monterrey consensus (which was the outcome of the United Nations International Conference on Financing for Development in 2002)⁵ pledge that urged developed countries to divert 0.7% of gross national product to worse-off populations is not fulfilled, it is very likely that the 2015 MDGs will trail away, regrettably cervical cancer prevention above all. ■

References

1. Johnson TRB, Adanu RMK. Contemporary issues in women's health. The new HPV vaccine- not quite time to celebrate. *Int J Gynaecol Obstet* 2007;97:86-8. doi:10.1016/j.ijgo.2007.02.004
2. Milliez J. Non surgical prevention of cancer of the uterine cervix. *Bull Acad Natl Med* 1997;181:1415-31. PMID:9528185
3. Brun JL, Riethmuller D. Prophylactic and therapeutic vaccination against papilloma virus. *J Gynecol Obstet Biol Reprod (Paris)* 2007;36:631-41. PMID:17822860
4. Hammoud M. HPV vaccine: not immune to controversy. *Int J Gynaecol Obstet* 2008;101:123-4. PMID:18299132 doi:10.1016/j.ijgo.2008.01.009
5. International conference on financing for development. Monterrey, Mexico. March 2002. Available from: <http://www.un.org/french/ffd/pressrel/22apress.htm> [accessed on 16 May 2008].

^a Saint Antoine Hospital, Paris VI University, Paris, France.
Correspondence to J Milliez (e-mail: j.milliez@sat.aphp.fr).