

ENDING CERVICAL CANCER IN OUR LIFETIME: THE CONTRIBUTION OF PINK RIBBON RED RIBBON

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Cervical cancer is growing burden on women's health today in low- and middle-income countries. Using existing tools for primary prevention (preventing the disease through vaccination against the human papilloma virus (HPV)) and secondary prevention (reducing the impact of disease by detecting and treating early lesions), along with innovative, cost-effective technologies and strategic partnerships, can save the lives of millions of women. Pink Ribbon Red Ribbon is, an affiliate of the George W Bush Institute, is active in making this happen.

The burden of cervical cancer

Cervical cancer is a growing cause of women's mortality in low- and middle-income countries (LMICs). In 2015, approximately 560,000 new cases of cervical cancer were diagnosed worldwide, with 85% of cases in less-developed regions (1). In 2016, cervical cancer surpassed pregnancy-related complications as a cause of death among reproductive-age women in LMICs (2). The World Health Organization (WHO) projects there will be 609,000 new cases worldwide by 2020 if prevention efforts are not increased (3). Cervical cancer is preventable, with effective and inexpensive tools available, but is one of the two leading causes of cancer deaths in sub-Saharan Africa (4). HIV-positive women have a four-to-five times greater increased risk of developing cervical cancer, making HIV-positive women in sub-Saharan Africa especially vulnerable (5). Cervical cancer poses a potent threat for African women as well as their families: given the onset of the disease in women's prime productive years, the social and economic burden imposed on families can be devastating. The considerable costs of cancer care due to lack of or weak health insurance systems leads to large out-of-pocket payments. Additionally, the stigma associated with cancer leads to late stage-presentation at hospitals, resulting in higher costs and unnecessary suffering.

Pink Ribbon Red Ribbon® (PRRR), an affiliate of the George W Bush Institute, is a global public-private partnership that leads coordinated action to save women and girls' lives from cervical and breast cancer in sub-Saharan Africa and Latin

America. PRRR mobilizes resources from governments, multilateral organizations, foundations and corporations and engages with national leaders to build long-term, country-led, sustainable programmes for the control of breast and cervical cancers.

There are tools available today to eliminate cervical cancer deaths in 30 years. Using existing tools for primary prevention (preventing the disease through vaccination against the human papilloma virus (HPV)) and secondary prevention (reducing the impact of disease by detecting and treating early lesions), along with innovative, cost-effective technologies and strategic partnerships, can save the lives of millions of women.

Partnerships

Cervical cancer prevention and treatment involve many disparate parts of the health system. Partnerships are needed in service delivery and beyond to strengthen health systems and ensure women and girls have access to cervical cancer services. Partnerships can be used to raise awareness, more effectively pool and utilize funds, and ensure increased focus on the disease.

Incorporating cervical cancer screening into existing health platforms, such as HIV care and treatment and sexual and reproductive health services, can spur innovative programmes and scalable solutions. For example, PRRR has successfully leveraged funding from the President's Emergency Plan for AIDS Relief (PEPFAR) to include cervical cancer screening and treatment of precancerous lesions in HIV programmes

in Botswana, Ethiopia, Tanzania and Zambia, and will extend to Mozambique and Namibia in 2017. Through the PEPFAR integration model, women's most frequent encounters with the health system are harnessed to provide additional services, saving both time and money for patients, providers, funders and health systems. Significant opportunities exist to integrate cervical cancer screening into reproductive health programming, when women are already at the health centre for other services.

This model has been expanded to the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM). In October 2016, GFATM approved the reallocation of savings from Zambia's HIV programme to fund cervical cancer screening and treatment, making it the first country to successfully reprogramme GFATM HIV resources for cervical cancer control, as allowable per a 2015 board decision to provide support for co-infections and co-morbidities. In April 2017, PRRR and GFATM signed an agreement to help countries allocate funds for cervical cancer control programmes, both in new funding requests and in reallocation of HIV programme savings.

Collecting population-based data on service coverage, morbidity and mortality, and harmonizing patient referral and tracking systems provides information on the quality of cancer services and survival rates. UNAIDS included cervical cancer indicators against which countries are expected to report in its 2017 Global AIDS Monitoring Guidance document (6). By providing tools that align to international guidelines, countries can improve data systems, better monitor their progress, and thereby ensure expansion of prevention and treatment services to those most at risk. Similarly, the "Improving Data for Decision-Making in Global Cervical Cancer Programs" consortium, led by the CDC Foundation, and of which PRRR is a member, is finalizing global toolkits and guidance to enhance the quality, coverage, and scale of interventions against the disease.

Primary prevention

To eliminate cervical cancer, we need to accelerate primary prevention through HPV vaccination coverage in sub-Saharan Africa. About 40% of the total population of the continent is under 15 years of age, and this "youth bulge" is largely within the target age for HPV vaccination (7). This presents an opportunity to achieve a cervical cancer-free generation of African women, and securing the health of this generation is crucial (8).

Currently available HPV vaccines are effective against the HPV types most commonly associated with cervical cancer, specifically types 16 and 18, which are responsible for 70% of cases (9). Recent studies conducted in developed economies showed that high HPV-vaccination population coverage

resulted in a 90% decrease in HPV infections (10). Gavi, the Vaccine Alliance, is an international organization that brings together public and private sectors to create equal access to vaccines for children living in the world's poorest countries as defined by GNI (Gross National Income) per capita, according to World Bank data. Through Gavi's support in vaccine procurement and implementation, including negotiating a price of US\$ 4.50 per dose for eligible countries, 23 countries in sub-Saharan Africa have conducted or are currently implementing a HPV vaccine demonstration programme, and three countries will have nationwide programmes by 2017 (11). However, Gavi does not cover the full operational and delivery costs for administering the vaccine, which countries are expected to co-finance, and this negotiated rate does not apply to middle-income countries.

PRRR supports HPV vaccination programmes in partner countries through vaccine delivery, cold chain support (an uninterrupted, temperature-controlled system for storage and distribution), technical assistance, and implementation of innovative information and communication strategies to improve uptake of the vaccine. The introduction of a new vaccine is not a one-time event, but a challenging process that includes targeted public awareness and advocacy to policy-makers and gate-keepers; community mobilization and education of parents and their daughters to address concerns on side effects and myths and misconceptions; investments in health worker training and vaccine delivery systems; and infrastructure investments in storage and cold chain support (12). Furthermore, health systems were not originally designed to address adolescent health needs, since they are no longer in the childhood immunization programmes, and not yet in the reproductive age group. To reach adolescents, it is essential to integrate both innovative demand generation and multi-channel school and community-based approaches.

In 2013 in Botswana, a non-Gavi eligible country, PRRR supported a two-year HPV vaccination demonstration project. Due to the successful demonstration, Botswana rolled out its self-funded nationwide programme two years earlier than planned, and to date has fully vaccinated over 71,000 girls by the third year of the nationwide programme. In Zambia, PRRR supported a three-year HPV vaccination demonstration project from 2014 to 2016. An evaluation after the first two years highlighted the need to improve uptake of the vaccine. Health educators were re-trained and a social media campaign to engage the community was launched, contributing to increased acceptance rates in the third year, in which 94% of girls in the target cohort completed their vaccination. Following this accomplishment, Zambia plans to apply to Gavi to support the nationwide roll-out starting in 2018. In both instances, PRRR and partners filled in programme gaps that

were not financially supported through Gavi resources or national budgets, and these complementary activities need to be included in comprehensive vaccination programmes.

Despite these successes and anticipated future reduction of cervical cancer incidence, the impact of HPV vaccination will not be evident for the next one to two decades at the current immunization approach. Women who are currently of reproductive age are not eligible for HPV vaccination and need to be screened for cervical precancer and cancerous lesions.

Secondary prevention

Of cervical cancer cases, 85% occur in LMICs, but evidence shows that 95–99% of women in sub-Saharan Africa have never been screened (13). The WHO recommends a same-day approach for screening and treatment of precancerous lesions in LMICs to reduce loss to follow-up (14). The current standard of care is visual inspection with acetic acid (VIA), during which vinegar is applied directly to the cervix, causing lesions to appear white in colour, followed by treatment through cryotherapy, an ablative treatment to freeze off lesions, or loop electrosurgical excision procedure (LEEP), which involves a small electrical wire loop to remove abnormal cells. Innovations in screening and treatment can increase coverage and protect more women against cervical cancer.

VIA is an inexpensive approach, as it does not require specialized equipment and can be provided by trained non-physician healthcare professionals, but has moderate specificity and sensitivity and depends on the skill and experience of individual providers to identify precancerous lesions (15). HPV diagnostic testing is confirmatory for HPV, and when this objective method is coupled with immediate treatment, reduces the incidence of cervical cancer (16). Pairing HPV testing with digital cervicography, a diagnostic medical procedure in which pictures are taken of the cervix to be submitted for interpretation, enables health workers to more accurately identify lesions that can be treated on-site or referred for LEEP or advanced cancer treatment. HPV diagnostic testing is expected to increase the efficiency of cervical screening programmes by decreasing the number of women that need visual inspection: depending on the general HPV infection rate and HIV prevalence in a population, 15–25% of women screened will test positive for HPV (17). The possibility of self-sampling may also increase access, as many women avoid cervical cancer screening because of concerns about privacy, embarrassment, and pain, without loss in accuracy of the test (18). PRRR is working with partners to pilot HPV testing in Peru and Botswana and digital cervicography in Ethiopia in an effort to increase efficiency and effectiveness of screen-and-treat programmes.

Treatment through cryotherapy, while effective, requires

a reliable source of gas. Gas tanks are expensive, heavy and cumbersome in field settings, and can leak significant portions of their volume in transit (19). Gas stock-outs often mean that women must come back for treatment another day. Data from PRRR partners show that about 36% of these women never return. The logistical challenges make scaling cryotherapy difficult in settings with inconsistent supply chains and large distances to cover (20). New devices such as battery-operated thermal coagulators will eliminate the need for gas and other consumables and thereby save money: PRRR partners in Tanzania estimate that a thermal coagulator will pay for itself compared to cryotherapy after screening 816 women, approximately within a year, and eliminate all recurring cryotherapy costs afterwards (21). Furthermore, the devices are faster than cryotherapy – each treatment takes about one minute – minimizing waiting time for clients and healthcare providers.

Conclusion

Cervical cancer affects women, their families, and communities, disrupting lives as well as the stability that women often provide as heads of households, economic contributors and caretakers. To achieve reductions in cervical cancer incidence and mortality, the global community cannot continue business as usual. Innovative approaches in service delivery and accelerated adoption and scale-up of new technologies are necessary investments to ensure that women do not die of a preventable cancer.

There are several opportunities to accelerate the progress in cervical cancer prevention, and with strategic investments and partnerships, cervical cancer can be eliminated within a lifetime. However, advanced treatment for cervical cancer remains a significant challenge. Many more investments are needed in research, planning, training, and capital expenditure to provide adequate treatment services for invasive disease. Comprehensive cervical cancer control programmes aim to reduce the burden of disease by reducing HPV infections, access to screen-and-treat for precancerous cervical lesions, and providing timely treatment of invasive disease and palliative care. Through innovative partnerships, these goals can be achieved, but it is critical that the third, and most challenging of these points, is addressed with the same attention as primary and secondary prevention. ■

Dr Adetoun Olateju joined Pink Ribbon Red Ribbon in 2014 after completing a graduate degree in Public Health at Harvard University. She manages the partnership's portfolio in Botswana, Ethiopia and Tanzania; and oversees monitoring and evaluation across the partner countries. After earning her medical degree from Igbinedion University in Nigeria, she worked on several

projects focused on health systems strengthening, reproductive health, malaria control and noncommunicable disease research extensively in West Africa. She coordinated implementation science research across university teaching hospitals in South-West Nigeria, under the H3-Africa Research consortium, a network of research universities funded by the National Institutes of Health and the Wellcome Trust. In 2012, she was a fellow at the ECOWAS/West African Health Organization (WAHO) in Burkina Faso, with secondment to IntraHealth International in Senegal, where she worked on health system strengthening, and sexual and reproductive health projects funded by USAID and the Bill & Melinda Gates Foundation. Prior to WAHO, she led the malaria control efforts in select states in North-Central Nigeria under the Global Fund Malaria Grants.

Meera Sarathy joined Pink Ribbon Red Ribbon in 2016 as a country programme manager, after completing her graduate degrees at Johns Hopkins University in public health and business administration. She manages the partnership's portfolio in Zambia, Namibia, Mozambique, and Peru, and coordinates breast cancer activities across the partner countries. While at Hopkins, she served as a graduate intern at Jhpiego on the Accelovate project, supporting new technologies to improve women's health in low- and middle-income countries, and as a graduate intern with the Bill & Melinda Gates Foundation, where she analyzed financing and economics of immunization programmes. She previously has worked at Population Services International, coordinating programmes in West and Central Africa, in development at Partners in Health, and served in the Peace Corps in Senegal as a health extension agent.

Julie Wieland joined Pink Ribbon Red Ribbon in 2016 as a programme associate. Prior to joining Pink Ribbon Red Ribbon, she was with Venture Strategies Innovations conducting monitoring and evaluation projects that address women's health in Rwanda, collaborating with Ministries of Health and Justice to develop monitoring plans and tools and supervise projects. She previously served as a clinical researcher in thoracic oncology at San Diego Cancer Center and as a medical volunteer in South Africa collecting and analyzing data on the integration of policies and services in the area of HIV-TB. She currently serves on the Alumni Board of Directors for Child, Family, Health International.

Celina Schocken is a prominent public health leader with extensive experience working on healthcare issues in the developing world. Ms Schocken advises non-profits and companies on innovation, product launch and go-to-market strategies for new technologies in global health. Most recently, Ms Schocken was the CEO of Pink Ribbon Red Ribbon, a public private partnership focused on cervical and breast cancer. Working with Global Good,

the Bill & Melinda Gates Foundation, Jhpiego, and several startups, she led technology development efforts related to cervical cancer, postpartum hemorrhage, drug quality, and reproductive health.

Previously, Ms Schocken was Director of Policy and Advocacy at Merck for Mothers, and Director of International Organizations at Population Services International (PSI), where she managed PSI's work with the Global Fund to Fight AIDS, Tuberculosis, and Malaria and other multilateral organizations. She has also served as Chief Advisor to the Rwandan Minister of State for HIV/AIDS and Other Epidemics, whom she assisted to draft national policies related to HIV/AIDS, and to coordinate the implementation of multi-million-dollar HIV/AIDS programmes throughout the country.

Prior to her position with the Government of Rwanda, Schocken held positions as Country Director of Columbia University's programmes in Rwanda, and with the William J Clinton Presidential Foundation, where she co-authored Rwanda's national plan for HIV/AIDS treatment and care. In 2005, she was a fellow at the Council on Foreign Relations.

Ms Schocken received her juris doctor and master's degree in public policy from the University of California, Berkeley, and a MBA from New York University, the London School of Economics and Political Science, and HEC Paris. She earned her bachelor's degree from the University of Chicago, Phi Beta Kappa.

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