

SENTINEL SURVEILLANCE OF HUMAN PAPILLOMAVIRUS GENOTYPES AMONG PATIENTS ATTENDING PUBLIC HEALTHCARE FACILITIES IN SOUTH AFRICA, 2014-2016

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Executive summary

Cervical cancer is the third most common cancer in South African women. Human papillomavirus (HPV) is one of the most common sexually transmitted infections and the mucosal types are grouped into high-risk, probable high-risk and low-risk according to their link with cancer. HPV-16 and -18 are associated with approximately 70% of cervical cancer cases. The objectives of this surveillance programme are to determine the prevalence of HPV infection and to identify individual HPV genotypes including genotypes targeted by HPV vaccines among young women attending public health care facilities in South Africa. For the period 2014-2016, single or multiple HPV infections were detected in approximately half of participants, a third of whom were characterised as high risk for cancer. HPV infection was found to be significantly higher among women who reported sexual debut at ≤ 16 years compared to those >16 years at sexual debut. The overall high HPV prevalence among young women, in particular HPV-16 and HPV-18 which are associated with majority of cervical cancers, is of concern. The high prevalence of HPV types targeted by Gardasil-9 HPV encourages use of this vaccine as it targets a larger number of HR-HPV types that cause cancer and genital warts. The high prevalence of HPV types targeted by current HPV vaccines suggests that young South African women would greatly benefit from these vaccinations.

Introduction

Cervical cancer is the third most common cancer in South African women, with age standardized incidence of 21.67 per 100 000 (95% CI: 21.06-22.27) for 2011 according to the National Cancer Registry which collects statistics for histologically diagnosed cancers in South Africa. Human papillomavirus (HPV) is one of the most common sexually transmitted infections and in women its prevalence peaks during adolescence, soon after sexual debut, and decreases with age. HPV mucosal types are grouped into high-risk (HR), probable high-risk and low-risk (LR) according to their link with cancer. HPV-6 and -11 are associated with genital warts, while HPV-16, -18, -31, -33, -52, -56 and -58 are associated with cervical cancer. Both HPV-16 and -18 are associated with approximately 70% cervical cancer cases.¹

There are currently three vaccines registered to prevent HPV infection, namely Cervarix targeting HPV-16 and -18; Gardasil targeting HPV-6, -11, -16 and -18; and Gardasil-9 targeting HPV-6, -11, -16, -18, -31, -33, -52, -56 and -58. In South Africa, the National school-based HPV vaccination programme in public schools uses a two dose Cervarix schedule. As part of South Africa's HPV vaccination strategy it is important to have baseline data on HPV in teenagers and young women so that the impact of vaccination in the long term can be assessed.² The objectives of this surveillance programme are to

determine the prevalence of HPV infection and to identify individual HPV genotypes including genotypes targeted by HPV vaccines among young women attending public health care facilities in South Africa.

Results

Study population

Study participants were recruited from public health clinics in Gauteng (Alexandra clinic), Mpumalanga (Hluvukani and Kabokweni clinic), KwaZulu Natal (Phoenix and East boom clinic), Eastern Cape (Gqebera clinic) and North West province (Jouberton clinic). The median age at first sex for the study participants was found to be 17 years (IQR, 16-18 years). All participants were heterosexually active and the majority were African. The use of condoms during their last sexual act was reported by 44.7% women. Vaginal discharge, lower abdominal pain or genital ulcers were reported in 30.9%, 15.3% and 6.6% of these women respectively.

Overall HPV prevalence

Overall HPV infection was detected in 57.6% (190/330) of participants. Of these, single HPV infection was

detected in 23.0% (76/330) while multiple (2-14) HPV infection was detected in 34.5% (114/330). HR-HPV infection was detected in 37.9% (125/330) women, probable HR-HPV infection in 15.5% (15/330) and LR-HPV infection in 40.0% (132/330, Table 1). HPV infection was found to be significantly higher among women who reported sexual debut at ≤ 16 years compared to those >16 years at sexual debut (68.5% 76/111; 52.9% 92/174 $P=0.001$ respectively).

Prevalence of HPV types targeted by HPV vaccines

The genotype distribution was as follows: 5.5% women were infected with HPV-6, 3.9% with HPV-11, 7.0% with HPV-16, 6.1% with HPV-18, 2.1% with HPV-31, 1.2% with HPV-33, 3.0% with HPV-52, 3.0% with HPV-56 and 7.6% with HPV-58 (Figure 1). A proportion of 11.5% (38/330) were infected with one or more HPV types targeted by Cervarix HPV vaccine (HPV-16/18), 19.1% (63/330) with one or more HPV type(s) targeted by Gardasil HPV vaccine (HPV-6/11/16/18) and 29.4% (97/330) with one or more HPV type(s) targeted by Gardasil-9 HPV vaccine (HPV-6/11/16/18/31/33/52/56/58, Figure 2).

Table 1: Human papillomavirus (HPV) prevalence in young women (N=330) attending family planning clinics in South Africa, 2014-2016. Risk groups refer to probable links to cancer.

HPV infection	n	%
Any HPV	190	57.6
Single HPV infection	76	23.0
Multiple HPV infections	114	34.5
High-risk HPV infection	125	37.9
Probable high-risk HPV infection	51	15.5
Low-risk HPV infection	132	40.0

Any HPV infection: HPV infection with any of the 37 HPV types detected by Roche Linear Array HPV genotyping assay.

Single HPV infection: Infection with one HPV type.

Multiple HPV infections: infection with more than one HPV types.

High-risk HPV infection: infection with HPV-16, -18, -31, -33, -35, -39, -45, -51, -52, -56, -58 or -59.

Probably high-risk HPV infection: Infection with HPV-26, -53, -66, -67, -68, -70, -73 or -82.

Low-Risk HPV infection: Infection with HPV-6, -11, -40, -42, -54, -55, -61, -62, -64, -69, -71, -72, -81, -83, -84, -89 (HPV-CP6108) or -IS39.

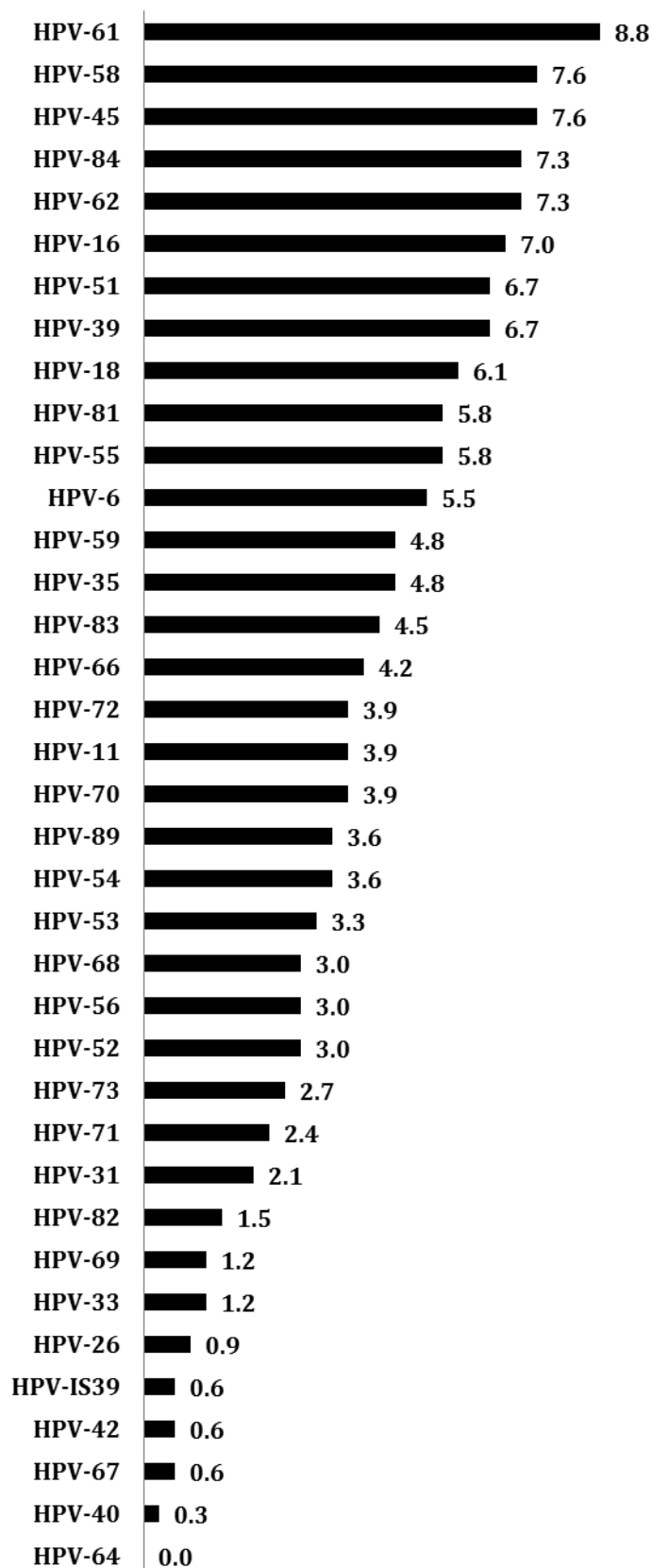


Figure 1: The prevalence of individual human papillomavirus (HPV) genotypes in young women attending family planning clinics in South Africa, 2014-2016.

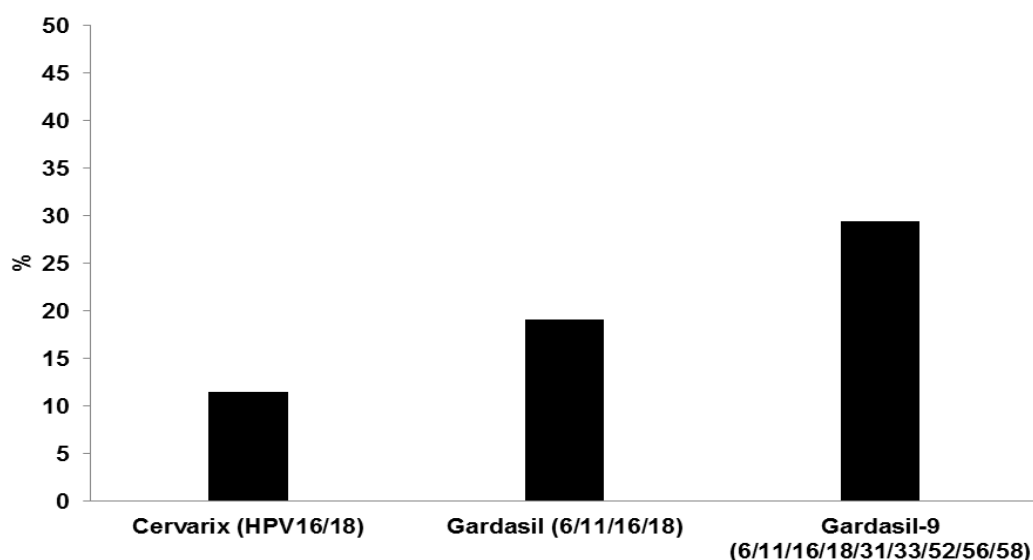


Figure 2: The prevalence (percentage) of human papillomavirus (HPV) types targeted by the Cervarix, Gardasil and Gardasil-9 vaccines in women attending family planning clinics in South Africa, 2014-2016.

Discussion and conclusions

The overall high HPV prevalence (58.2%) among young women attending family planning clinics, and in particular HPV-16 and HPV-18 which are associated with majority of cervical cancers, is of concern. The observed high HPV prevalence among women who reported sexual debut at ≤ 16 years confirms the importance of HPV vaccination in younger age groups in order to protect against acquisition of infection.

The high prevalence of HPV types targeted by Gardasil-9 HPV encourages use of this vaccine as it targets a larger number of HR-HPV types that cause cancer and genital warts. With high vaccine coverage, Gardasil-9 may protect against approximately 90% of cervical cancer cases. Coverage of more than 90% was achieved in 2014 when the South Africa National Department of Health introduced a national school-based HPV vaccination programme in public schools for

girls aged 9-10 years. These findings encourage continued large scale roll-out of HPV vaccination to South African girls and the setting up of catch-up vaccinations in older age groups in the hope of reducing HPV prevalence and associated disease in South Africa. The high prevalence of HPV types targeted by current HPV vaccines suggests that young South African women would greatly benefit from these vaccinations.

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