

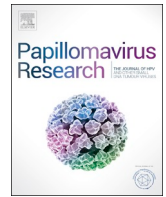


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## Papillomavirus Research

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### IPVS policy statement. Equity in cervical cancer prevention: for *all* and not just for some

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The International Papillomavirus Society (IPVS) supports best practice and evidence-based research, strategies, and policies to prevent HPV-related diseases worldwide.

With the recent call from the World Health Organization (WHO) Director General, Dr Tedros, to global entities to work towards the elimination of cervical cancer as a public health problem globally, a call supported by IPVS [2], it is vital that principles of equity (fairness) are central to activity in all countries developing strategies to eliminate cervical cancer as a public health problem [3].

This statement calls upon all parties involved in cervical cancer prevention to ensure that elimination is for *all* and not just for some.

#### 1. Cervical cancer is a disease of inequality

Globally cervical cancer is the fourth most common cause of female cancer incidence and mortality, with an estimated 570,000 new cases in

2018 and 311,000 deaths [4]. However, in lower Human Development Index countries, it is the second commonest cause of female cancer incidence and death [4] with a country's Human Development Index, Gender Inequality Index, poverty rate, health expenditure per capita, urbanization, and literacy rate all significantly related to cervical cancer incidence and mortality [5]. The Human Development Index and poverty rate at a country level each explain >52% of the global variance in cervical cancer mortality [5]. It is the most commonly diagnosed cancer in 28 countries and the most common cause of cancer death in 42 countries, the vast majority of which are in Sub-Saharan Africa and South-Eastern Asia [4]. Incidence rates are 7–10 times higher in high incidence regions of Africa compared to rates in the regions of North America, Australia/New Zealand and Western Asia (Saudi Arabia/Iraq) [4]. These stark differentials in cervical cancer burden by markers of poverty and inequality occur not only at national levels, but also within countries from across the economic spectrum.

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For example, a clear gradient in cervical cancer incidence by socioeconomic status has been documented in Australia, England, and the USA [6–8]. A meta-analysis of cervical cancer case-control studies reporting individual level socioeconomic status data, confirmed a strong relationship between socioeconomic status and cervical cancer risk [9]. The strong association between socioeconomic status and cervical cancer demonstrate that the health inequality observed for cervical cancer is a social inequity in health i.e. it is systematic, socially produced and unfair [10].

National and subnational statistics can hide significant differences in risk for subpopulations, especially smaller, more marginalised groups who may be Indigenous or from diverse cultural, ethnic, religious or faith backgrounds, to the majority of the population. For example, populations with higher cervical cancer incidence include: African American and Latina/Hispanic women in the USA [11], Indigenous women in Australia, New Zealand, and Canada [12], and women who have undergone female genital mutilation/cutting in Senegal [13].

Close attention and systematic data disaggregation will be required to ensure that achievement of elimination targets or scale up milestones, do not hide remaining populations with continuing high burdens of cervical cancer.

## 2. Explaining the increased burden in disadvantaged groups

The reasons for higher rates of cervical cancer incidence and mortality amongst disadvantaged groups are likely to be multifactorial and closely related to the social determinants of health [14]. Some established biological risk factors that are often associated with disadvantage are likely causally related, such as increased rates of smoking [15], earlier and greater parity [16], and, in some countries, HIV burden [17]. Others relate to poorer access to, or use of, prevention, diagnostic and treatment services [15,18,19]. Populations who may be less likely to engage in cervical screening include:

- Women of lower socioeconomic status or education [20].
- Women with mental health illnesses [19,21].
- Homeless women [22].
- Disabled women [23].
- Less educated women [24].
- Women who have undergone female genital mutilation/cutting [25].
- Women who experience racism [26].
- Transgender and gender diverse people with a cervix [27].
- Same-sex attracted women with a cervix [28–30].
- Women who have experienced domestic violence [31] and/or sexual violence [32,33].
- Ethnic minority populations [34,35].
- Immigrants [36,37] and refugees [38].

Social isolation, stigmatisation and marginalisation are also associated with poorer health status and outcomes across a range of diseases, including cancer [39]. Some people may hold multiple disadvantaged identities, which can result in poorer health outcomes than groups with a single marginalised identity [40].

## 3. Addressing inequalities: key principles

Human rights-based principles are central to addressing and reducing local, subnational, national, regional, and global health inequalities. As part of the 2030 Agenda for Sustainable Development adopted at the United Nations Summit in September 2015, 193 Member States agreed that *no one will be left behind* [1]. States pledged to undertake systematic data disaggregation, in an effort to help measure implementation of the Sustainable Development Goals (SDGs), including goals of relevance to cervical cancer prevention [1]. A strategic priority of the Immunization Agenda 2030 is: ‘To ensure that everyone has

equitable access to vaccines, irrespective of their geographical location, gender, socioeconomic status or any other factor, that might prejudice their access to services’ (P.13) [41]. Identifying who is missing out on HPV vaccination and cervical screening and understanding why requires disaggregated data, attention to the root causes of exclusion, addressing gender inequity, and the development and implementation of interventions in partnership with affected communities that benefit marginalised populations [42,43].

Recommendations for action to reduce disparity in the cervical cancer burden.

IPVS supports action by IPVS members and stakeholders (healthcare and research communities, research funding bodies, relevant non-government organizations, governments and policy makers) to:

- Acknowledge the right of all women, transgender, and gender diverse people with a cervix, to equal protection against, and treatment of, cervical cancer and other HPV-related diseases, consistent with the United Nations Declaration of Human Rights [44] and the International Covenant on Economic, Social and Cultural Rights (Article 12: The Right to Health) [45].
- Ensure that equity considerations are front and centre in all strategies designed to deliver cervical cancer elimination at local, sub-national, national, regional and global levels. Best practice principles for addressing social inequities in health can provide useful frameworks for the development of systematic effective strategies [10,46,47].
- Support Universal Health Coverage, which should be a driving force to prevent disparity in cancer outcomes caused by lack of access to health care. Equally, advocacy for the rights of girls and women globally, and for effective measures to reduce poverty, are integral parts of any sustained solution to address inequity in cervical cancer prevention.
- Explore the utility of self-sampling in their setting. Self-sampling for genital HPV based cervical screening is a promising, scalable strategy to extend the reach of cervical screening programs to more women, especially those who currently have barriers to acceptance of a speculum examination [48,49]. Policies and implementation research to provide self-sampling, and the associated screening pathway, in an accessible, safe, culturally appropriate, and affordable way to all women, transgender and gender diverse people should be a priority.
- Strive for the participation and leadership of marginalised populations in research design, implementation of interventions, data collection, analysis, disaggregation, dissemination, self-identification, transparency, privacy and accountability in order to achieve equity in cervical cancer prevention as part of the Sustainable Development Goals.

*Prepared by Julia Brotherton and Cristyn Davies, on behalf of IPVS Policy Committee (Suzanne M Garland, Margaret Stanley, Anna-Barbara Moscicki, Anna R Giuliano, Julia Brotherton, Andreas Kaufmann; Neerja Bhatla; Joel Palefsky; Karen Chan; Yin Ling Woo).*

## References

- [1] Transforming Our World: the 2030 Agenda For Sustainable Development in A/RES/70/1, United Nations General Assembly, USA, 2015.
- [2] S. Garland, et al., IPVS statement moving towards elimination of cervical cancer as a public health problem, *Papillomavirus Res.* 5 (2018) 87–88.
- [3] V. Tsu, C. Levin, Making the case for cervical cancer prevention: what about equity? *Reprod. Health Matters* 16 (32) (2008) 104–112.
- [4] F. Bray, et al., Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries, *CA A Cancer J. Clin.* 68 (6) (2018) 394–424.
- [5] G. Singh, R. Azuine, M. Siahpush, Global inequalities in cervical cancer incidence and mortality are linked to deprivation, low socioeconomic status, and human development, *Int. J. MCH. AIDS.* 1 (1) (2012) 17–30.
- [6] AIHW, *Cervical Screening in Australia 2019*, Australian Institute of Health and Welfare, Canberra, Australia, 2019.

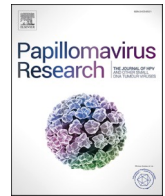
- [7] V. Benard, et al., Examining the association between socioeconomic status and potential human papillomavirus-associated cancers, *Cancer* 15 (113) (2008) 2910–2918.
- [8] L. Shack, et al., Variation in incidence of breast, lung and cervical cancer and malignant melanoma of skin by socioeconomic group in England, *BMC Canc.* 26 (8) (2008) 271.
- [9] S. Parikh, P. Brennan, P. Boffeta, Meta-analysis of social inequality and the risk of cervical cancer, *Int. J. Cancer* 105 (5) (2003) 687–691.
- [10] M. Whitehead, G. Dahlgren, Concepts and Principles for Tackling Social Inequities in Health: Levelling up Part 1, World Health Organization, Geneva, Switzerland, 2006.
- [11] US Cancer Statistics Working Group, U.S. Cancer Statistics Data Visualizations Tool, Based on November 2018 Submission Data (1999–2016), U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute, June 2019, [www.cdc.gov/cancer/dataviz](http://www.cdc.gov/cancer/dataviz).
- [12] S.P. Moore, et al., Cancer incidence in indigenous people in Australia, New Zealand, Canada, and the USA: a comparative population-based study, *Lancet Oncol.* 16 (15) (2015) 1483–1492.
- [13] A. Osterman, et al., Female genital mutilation and noninvasive cervical abnormalities and invasive cervical cancer in Senegal, West Africa: a retrospective study, *Int. J. Cancer* 144 (6) (2019) 1302–1312.
- [14] L. Williams-Brennan, D. Gastaldo, D.C. Cole, Social determinants of health associated with cervical cancer screening among women living in developing countries: a scoping review, *Arch. Gynecol. Obstet.* 286 (6) (2012) 1487–1505.
- [15] A. Sauer, et al., Current prevalence of major cancer risk factors and screening test use in the United States: disparities by education and race/ethnicity, *Cancer Epidemiol. Biomark. Prev.* 28 (4) (2019) 629–642.
- [16] I.C.o.E.S.o.C. Cancer, Cervical carcinoma and reproductive factors: collaborative reanalysis of individual data on 16,563 women with cervical carcinoma and 33,542 women without cervical carcinoma from 25 epidemiological studies, *Int. J. Cancer* 119 (5) (2006) 1108–1124.
- [17] G. Liu, et al., HIV-positive women have higher risk of human papilloma virus infection, precancerous lesions, and cervical cancer, *AIDS* 32 (6) (2018) 795–808.
- [18] V. Bacal, et al., Is immigrant status associated with cervical cancer screening among women in Canada? Results from a cross-sectional study, *J. Obstet. Gynaecol. Can.* 41 (6) (2019) 824–831.
- [19] E. Harder, et al., Factors associated with non-participation in cervical cancer screening - a nationwide study of nearly half a million women in Denmark, *Prevent. J.* (111) (2018) 94–100.
- [20] T. Akinyemiju, et al., Life-course socioeconomic status and breast and cervical cancer screening: analysis of the WHO's Study on Global Ageing and Adult Health (SAGE), *BMJ Open* 6 (11) (2016).
- [21] E. Eriksson, et al., Participation in a Swedish cervical cancer screening program among women with psychiatric diagnoses: a population-based cohort study, *BMC Public Health* 19 (1) (2019) 313.
- [22] C. Vuillermoz, et al., Cervical cancer screening among homeless women in the Greater Paris Area (France): results of the ENFAMS survey, *Eur. J. Cancer Prev.* 26 (3) (2017) 240–248.
- [23] D. Shin, et al., Disparities in cervical cancer screening among women with disabilities: a national database study in South Korea, *J. Clin. Oncol.* 36 (27) (2018) 2778–2786.
- [24] B. Willems, P. Bracke, The education gradient in cancer screening participation: a consistent phenomenon across Europe? *Int. J. Public Health* 63 (1) (2017) 93–103.
- [25] A. Abdullahi, et al., Cervical screening: perceptions and barriers to uptake among Somali women in Camden, *Public Health* 123 (10) (2009) 680–685.
- [26] C. Mouton, et al., Impact of perceived racial discrimination on health screening in black women, *J. Health Care Poor Underserved* 63 (1) (2010) 93–103.
- [27] T. Kiran, et al., Cancer screening rates among transgender adults, *Can. Fam. Physician* 65 (1) (2019).
- [28] J.K. Tracy, A.D. Lydecker, L. Ireland, Barriers to cervical cancer screening among lesbians, *J. Women's Health* 19 (2) (2010) 229–237.
- [29] J. Tracy, N. Schluterman, D. Greenberg, Understanding cervical cancer screening among lesbians: a national survey, *BMC Public Health* 13 (442) (2013).
- [30] M. Agenor, et al., Sexual orientation disparities in Papanicolaou test use among US women: the role of sexual and reproductive health services, *Am. J. Public Health* 104 (2014).
- [31] S. Hanson, et al., Cancer risk in socially marginalised women: an exploratory study, *Soc. Sci. Med.* 220 (2019) 150–158.
- [32] L. Cadman, et al., Barriers to cervical screening in women who have experienced sexual abuse: an exploratory study, *BMJ Sex. Reprod. Health.* 38 (4) (2012) 214–220.
- [33] M. Farley, J. Golding, J. Minkoff, Is a history of trauma associated with a reduced likelihood of cervical cancer screening? *J. Fam. Pract.* 51 (10) (2002) 827–831.
- [34] T. Andreassen, et al., Attendance to cervical cancer screening among Roma and non-Roma women living in North-Western region of Romania, *Int. J. Public Health* 63 (5) (2018) 609–619.
- [35] L. Marlow, J. Wardle, J. Waller, Understanding cervical screening non-attendance among ethnic minority women in England, *Br. J. Canc.* 113 (5) (2015) 833–839.
- [36] A. Lofters, et al., Low rates of cervical cancer screening among urban immigrants: a population-based study in Ontario, Canada, *Med. Care* 48 (7) (2010) 611–618.
- [37] Leinonen, M., et al., Barriers to cervical cancer screening faced by immigrants: a registry-based study of 1.4 million women in Norway. *Eur. J. Public Health.* 27(5): p. 873–879.
- [38] J.A. Anaman, I. Correa-Velez, J. King, A survey of cervical screening among refugee and non-refugee African immigrant women in Brisbane, Australia, *Health Promot. J. Aust.* 28 (3) (2017) 217–224.
- [39] A. Fleisch Marcus, et al., Relationships between social isolation, neighborhood poverty, and cancer mortality in a population-based study of US adults, *PLoS One* 12 (3) (2017) e0173370.
- [40] C. Davies, et al., Australians of diverse sexual orientations and gender identities, in: T. Dune, K. McLeod, R. Williams (Eds.), *Culture, Diversity and Health in Australia: towards Culturally Safe Health Care*, Allen and Unwin, Sydney, Australia, 2020.
- [41] WHO, Developing Together the Vision and Strategy for Immunization 2021–2030. Immunization Agenda 2030: A Global Strategy to Leave No One behind. Draft One, World Health Organization, Geneva, Switzerland, 2019.
- [42] L. Gostin, et al., 70 years of human rights in global health: drawing on a contentious past to secure a hopeful future, *Lancet* 392 (10165) (2018) 2731–2735.
- [43] A. Ohchr, Human Rights-Based Approach to Data: Leaving No One behind in the 2030 Agenda for Sustainable Development, United Nations, Geneva, Switzerland, 2018.
- [44] UN General Assembly, Universal Declaration of Human Rights, United Nations, Paris, France, 1948217 [III] A Paris, *art 1*.
- [45] B. Saul, D. Kinley, J. Mowbray, *The International Covenant on Economic, Social and Cultural Rights: Commentary, Cases, and Materials*, Oxford University Press, Oxford, 2014.
- [46] M. Whitehead, G. Dahlgren, The concepts and principles of equity and health, *Int. J. Health Serv.* 22 (3) (1992) 429–445.
- [47] J. Eslava-Schmalbach, et al., Conceptual framework of equity-focused implementation research for health programs (EquIR), *Int. J. Equity Health* 18 (80) (2019).
- [48] B. Wood, A. Lofters, M. Vahabi, Strategies to reach marginalized women for cervical cancer screening: a qualitative study of stakeholder perspectives, *Curr. Oncol.* 25 (1) (2018).
- [49] M. Arbyn, et al., Detecting cervical precancer and reaching underscreened women by using HPV testing on self samples: updated meta-analyses, *BMJ* 363 (2018).

**Update**

**Papillomavirus Research**

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## Erratum regarding missing Declaration of Competing Interest statements in previously published articles

Declaration of Competing Interest statements were not included in the published version of the following articles that appeared in previous issues of Papillomavirus Research.

The appropriate Declaration/Competing Interest statements, provided by the Authors, are included below.

1. "Immunotherapy for HPV associated cancer" [Papillomavirus Research, 2019; 8: 100176] <https://doi.org/10.1016/j.pvr.2019.100176>

Declaration of competing interest: The authors were contacted after publication to request a Declaration of Interest statement.

2. "HPV vaccination in HIV infection" [Papillomavirus Research, 2019; 8: 100174] <https://doi.org/10.1016/j.pvr.2019.100174>

Declaration of competing interest: The authors were contacted after publication to request a Declaration of Interest statement.

3. "Role of DNA methylation in HPV associated lesions" [Papillomavirus Research, 2019; 7: 180–183] <https://doi.org/10.1016/j.pvr.2019.03.005>

Declaration of competing interest: The authors were contacted after

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4. "Oral HPV prevalence and HPV vaccination among special needs population in the US" [Papillomavirus Research; 2019; 8: 100182] <https://doi.org/10.1016/j.pvr.2019.100182>

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5. "IPVS Policy Statement addressing the burden of HPV disease for Indigenous peoples" [Papillomavirus Research, 2019; 9: 100191] <https://doi.org/10.1016/j.pvr.2019.100191>

Declaration of competing interest: The authors were contacted after publication to request a Declaration of Interest statement.

6. "IPVS policy statement. Equity in cervical cancer prevention: for all and not just for some" [Papillomavirus Research, 2020; 9: 100192] <https://doi.org/10.1016/j.pvr.2019.100192>

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