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Advancing gender equity in HPV vaccination: A rule utilitarian case for including boys in South Africa's national programme

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We examine whether South Africa's human papillomavirus (HPV) vaccination programme aligns with rule utilitarianism principles, considering ethical and societal dimensions. From a rule utilitarian perspective, we argue that the current policy should be revised to include boys because this change would generate greater overall benefit than the current exclusionary model. Specifically, we advocate for universal access to free HPV vaccinations for all eligible adolescents in South Africa. By using a framework grounded in rule utilitarianism, we aim to highlight the perceived unfairness and ethical concerns associated with excluding boys from the current school-based, free HPV vaccination programme. We assert that this exclusion undermines the programme's broader public health benefits and moral justifiability.

Keywords. Adolescent, boys, ethical concerns, school-based HPV vaccination, gender-neutral, rule utilitarianism, South Africa.

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Human papillomavirus (HPV) is the most common sexually transmitted infection globally, affecting both men and women.[1] While public discourse and health interventions have traditionally focused on HPV's impact on women, particularly cervical cancer, there is growing recognition of the significant burden that HPV places on men and their role in its transmission.[2,3] HPV prevalence is high among sexually active males over 15 years, who serve as a major reservoir for genital infections.[2] HPV types 16 and 18, the most oncogenic strains, cause the majority of HPV-related cancers in both sexes.[2] Globally, 21% of men are infected with oncogenic HPV, with 1 in 5 carrying one or more of the high-risk types.[2] Men can develop penile, anal and oropharyngeal cancers due to HPV infection,[1] with men who have sex with men (MSM) facing specifically high risks.[4] Nevertheless, male HPV-related cancers receive less attention, and boys remain excluded from many national vaccination programmes.

In addition to the direct health impact on men, males play a critical role in the transmission of HPV, perpetuating the cycle of infection that ultimately contributes to the high rates of cervical cancer in women.[3,5] In South Africa, cervical cancer remains a leading cause of cancer-related death among women, with an estimated 10 702 new cases and 5 870 deaths annually.[6] Most of these cases are linked to HPV types 16 and 18, which circulate widely in the population and are often unknowingly carried and transmitted by men.[2-4] By not vaccinating boys, public health strategies miss a crucial opportunity to curb HPV transmission at its source. A gender-neutral vaccination policy is, therefore, not only a matter of protecting men from HPV-related cancers but also a necessary step toward reducing the overall burden of disease, including cervical cancer, in the broader population.[7]

Vaccination remains the most effective preventive measure against HPV infections in both sexes, particularly when administered before the onset of sexual activity, typically between the ages of 9 and 14 years.[1] Gender-neutral HPV vaccination, targeting both girls and boys, is significantly more effective at reducing the prevalence of HPV-related diseases and cancers compared with girls-only strategies.[7] The World Health Organization (WHO) endorses this approach, and numerous countries across both high- and middle-income contexts, such as Australia, Austria, Bermuda, Brazil, Canada, Croatia, Germany, Israel, Italy, New Zealand, the United Kingdom and the United States have adopted gender-neutral HPV vaccination programmes.[1,8] Bhutan is the first low- and middle-income country to implement a similar policy.[9] In South Africa, however, despite the HPV vaccine being approved for both boys and girls from age nine, only school-going adolescent girls receive the vaccine free of charge, leaving a significant gap in preventive efforts.

Several authors, primarily from Western contexts, present compelling ethical arguments for including boys and men in HPV vaccination programmes. These arguments draw on principles such as autonomy, social justice, gender equality, equity, deontology and utilitarianism.[10-13] The present paper evaluates whether South Africa's HPV vaccination programme aligns with rule utilitarianism principles, considering ethical and societal dimensions. From a rule utilitarian perspective, we argue that the current policy should be revised to include boys because this change would generate greater overall benefit than the current exclusionary model. Specifically, we advocate for universal access to free HPV vaccinations for all eligible adolescents in South Africa. By using a framework grounded in rule utilitarianism, we aim to highlight the perceived unfairness and ethical concerns associated with excluding boys from the school-

based, free HPV vaccination programme. We assert that this exclusion undermines the programme's broader public health benefits and moral justifiability.

The South African HPV vaccination programme

The Cervical Cancer Prevention and Control Policy recommends HPV vaccination for girls aged nine to 12.[14] Since 2014, South Africa has provided free HPV vaccinations as part of the Integrated School Health Programme, a collaborative effort between the Departments of Basic Education and Social Development.[14] The national HPV vaccination campaign is directed at school-going adolescent girls. Initially, the programme focused on fourth-grade girls in public schools who were at least nine years old and had parental consent.[15] By 2024, the programme expanded to include adolescent girls in private schools.[16] Despite the vaccine being approved for both genders, there is no explicit policy justification for excluding boys from the programme. The primary focus of cervical cancer prevention may explain this disparity. Currently, HPV vaccination for boys is only accessible through private medical facilities.[17]

The national school-based HPV vaccination programme has encountered both success and challenges. Between 2014 and 2020, the programme's most significant success was that 75% of adolescent girls received at least one dose of the HPV vaccine, with 61% completing the full two-dose regimen.[17] However, various challenges emerged, mainly during the COVID-19 pandemic, which led to a sharp decline in vaccination coverage to just 3%.[18] This drop was primarily due to lockdowns, school closures, the collapse of school health services, insufficient facilities, cold chain failures, and poor vaccine management.[18] In response, the programme shifted its focus to vaccinating grade five girls who had missed their doses in 2020.[18] Other ongoing challenges include reduced social mobilisation, poor monitoring systems, vaccine hesitancy, challenges in obtaining informed consent, managing adverse events, misinformation spread on social media, and school absenteeism, all of which have negatively affected the uptake of the HPV vaccine.[15,17]

The current school-based vaccination programme in South Africa faces significant challenges, including high attrition rates owing to missed doses or lack of follow-up. A gender-neutral approach could enhance overall vaccine coverage and community protection as it diversifies the target population and distributes the burden of prevention more equitably.[3-5] Furthermore, offering the vaccine to both sexes may normalise HPV vaccination and reduce gendered stigma, potentially improving acceptance and uptake.[10-13]

Benefits of a gender-neutral HPV vaccination programme

Applying a rule utilitarian framework to South Africa's HPV vaccination policy, adopting the rule that 'all eligible adolescents, regardless of gender, should receive free HPV vaccination' would yield greater overall benefit than the current girls-only approach. Limiting vaccination to girls restricts access and ignores the wider public health benefits of vaccinating boys. Scientific evidence, endorsed by leading authorities such as the WHO, strongly supports gender-neutral programmes.[1,3-5,7,9] Vaccinating both sexes offers significant direct and indirect benefits, especially in South Africa, where high human immunodeficiency virus (HIV) prevalence and increased HPV-related risks among MSM heighten the need for broader protection.

Direct benefits

HPV vaccination protects women against cervical cancer and other HPV-related diseases.[1,3] Similarly, vaccinating boys provides direct protection against genital warts and anal, penile and oropharyngeal cancers.[4,5,7] Studies confirm the vaccine's effectiveness in preventing HPV infection and associated diseases in men.[4,5,7] Moreover, HPV infection increases the risk of acquiring HIV,[19] suggesting that gender-neutral vaccination could contribute to reducing HIV incidence, particularly in high-prevalence settings such as South Africa.

Indirect benefits

Vaccinating both sexes indirectly benefits society by reducing transmission rates, thereby protecting unvaccinated individuals or those for whom the vaccine was ineffective.[7] This protective effect, known as herd immunity, occurs when a significant portion of a population is vaccinated, inhibiting disease transmission.[13] Gender-neutral strategies enhance herd immunity and lower the disease burden more effectively than female-only programmes.[7,9] This is crucial for MSM, who are excluded from the protective benefits of herd immunity in female-only vaccination programmes.[3,4] According to Diez-Domingo *et al*.[4], even a persistent 70% vaccination coverage in female-only programmes is insufficient to protect MSM from HPV-related diseases. Furthermore, vaccinated individuals are less likely to transmit HPV to partners, offering broader community protection.[3,5] Overall, gender-neutral vaccination strengthens herd immunity and reduces HPV prevalence across the population.

Considerations for MSM and individuals living with HIV in South Africa

Studies in Cape Town show high anal HPV infection rates among MSM, especially those co-infected with HIV.[19] HIV-positive MSM face a significantly higher risk of developing anal cancer compared with the general population.[19] In response, South African guidelines recommend HPV vaccination for all HIV-infected men and women and MSM up to 40 years of age, regardless of CD4+ count, antiretroviral therapy (ART) status, or viral load.[20] However, HPV vaccination is a preventive measure and does not treat existing HPV infections or related diseases.[1]

Ethical framework: Rule utilitarianism

Utilitarianism, a consequentialist theory developed by Jeremy Bentham (1748 – 1832) and John Stuart Mill (1806 – 1873), evaluates morality based on outcomes, aiming for the 'greatest good for the greatest number'.[21] Central to utilitarian ethics is the Principle of Utility, which seeks to maximise happiness and minimise suffering, giving equal consideration to everyone's well-being.[21] An action is judged solely by its consequences: equal amounts of happiness are valued equally, regardless of who experiences it.[21] Three core propositions characterise utilitarianism: the primacy of consequences, the centrality of happiness, and the equal consideration of each individual's happiness. The right action is thus one that produces the best overall balance of happiness over unhappiness.[21]

Rule utilitarianism, a variant of this theory, assesses the morality of rules rather than individual acts. It holds that 'an act is right if and only if it is permitted by a system of rules whose general acceptance maximises overall well-being.'[22] Actions are morally justified if they follow rules that, when generally adopted, produce a greater societal benefit. For example, a rule mandating that physicians prioritise patients by clinical severity rather than discriminatory factors in healthcare promotes equitable access and overall well-being.

Rule utilitarians advocate for consistent adherence to rules that optimise happiness and minimise suffering across various contexts.[22] These may include public health policies such as vaccination, quarantine measures, and rules upholding autonomy, human rights, and non-discrimination.[13] While individual autonomy remains an essential ethical consideration, it must be balanced against public health interests. Thus, requiring or strongly encouraging HPV vaccination for all adolescents can be ethically justified, provided that it avoids undue harm and promotes public health.

Justification for rule utilitarianism as a framework of analysis and evaluation

Rule utilitarianism is highly relevant in public health, where the goal is to maximise population well-being while distributing resources fairly.[13] A rule utilitarian approach supports policies such as expanding HPV vaccination to boys, which may require upfront investment but yield long-term societal benefits. Rule utilitarianism enables the evaluation of immediate costs and benefits of policy changes and broader implications for health and justice.[13] This theory offers a more reliable and systematic framework for assessing the overall utility of public health policies. The choice of rule utilitarianism as a framework for analysing and evaluating the South African HPV vaccination policy is grounded in several reasons.

Firstly, rule utilitarianism provides a stable foundation for policymaking by formulating general rules to produce the greatest good over the long term.[23] This allows for consistent, predictable outcomes while focusing on maximising utility. Secondly, rule utilitarianism is well-suited to evaluating laws and policies, as it considers the aggregate consequences of consistently applying rules across cases, ensuring fairness and predictability. Savulescu *et al*.[23] note that many laws are grounded in rule utilitarianism because they aim to generate the best possible outcomes for society. Laws and policies, by nature, are rule-based systems, making rule utilitarianism a natural fit for assessing their ethical implications.[23] Publicly funded systems similarly adopt utilitarian principles to maximise population health outcomes.[13] Lastly, rule utilitarianism incorporates societal norms, moral principles, and ethical standards into its evaluations.[22] Rule utilitarianism respects existing rules and moral values while promoting overall well-being. Given that South African health policies derive from legal frameworks,[23] applying rule utilitarianism allows for a comprehensive and structured ethical analysis of the HPV vaccination policy, considering both immediate outcomes and long-term societal impacts.

Does rule utilitarianism justify gender-based eligibility for HPV vaccination?

The rule utilitarian framework prioritises the overall well-being generated by adherence to specific rules.[21,22] When evaluating gender-based HPV vaccination eligibility, rule utilitarianism considers health impact, equity, non-discrimination and herd immunity.[10] In terms of health impact, rule utilitarianism would assess whether limiting HPV vaccination to a specific gender, such as girls only, maximises general well-being by lowering the prevalence of HPV-related illnesses, such as cervical cancer. Rule utilitarianism promotes rules that support equity and non-discrimination; therefore, the burden of disease and potential health benefits for both genders would be considered.[21] A policy that discriminates against boys may be regarded as unethical if it maintains gender-based inequities in health outcomes or fails to maximise overall well-being.[10] Finally, rule utilitarianism considers how vaccination laws affect society as a whole.[23] Herd immunity, which can shield both sexes from HPV-related illnesses, would be assessed to see if a gender-based policy impairs it.[4] The general welfare of society may suffer if herd immunity is undermined because of gender-based limitations.

A policy restricting access based on financial means could be ethically problematic from a rule-utilitarian perspective, as it may lead to lower vaccination rates, reduced herd immunity, and an increased incidence of HPV-related diseases, ultimately diminishing overall well-being.[3-5,7] Rule utilitarianism values accessibility and public health; therefore, it supports equal access to healthcare.[10] Policies limiting access based on financial status risk health disparities and undermine societal well-being, particularly for children whose families are expected to afford vaccination yet face barriers to this preventive care.[17]

South Africa's current policy adopts a rule that prioritises the vaccination of girls based on the premise that cervical cancer represents the most significant health burden.[14,15] The policy perpetuates inequalities in access to vaccine benefits, hindering the policy's potential to achieve the greatest good for the majority. More importantly, this strategy overlooks the greater public health benefits of including boys in the vaccination programme.[3-5,7] If South Africa's HPV vaccination policy remains unchanged, unvaccinated groups, such as boys, could face a growing burden of HPV-related morbidity and mortality.[2] We propose changing the current policy to include boys because this is the most beneficial course of action under rule utilitarianism. The revised rule would read: 'All eligible adolescents, regardless of gender, should receive free HPV vaccination.' This rule would produce greater utility than the current policy, which limits vaccination to girls.

Addressing potential counter-arguments from a utilitarian perspective

From a utilitarian perspective, objections to free gender-neutral HPV vaccination often centre on resource allocation, cost-effectiveness and the potential for unequal benefit distribution. Critics may argue that limited healthcare resources should target populations with the highest disease burden to maximise overall well-being.[1] As HPV-related cancer rates are higher in females,[6] prioritising female vaccination could appear more efficient. Such targeted interventions are often viewed as justified and ethically acceptable in resource-limited contexts. However, research shows that gender-neutral vaccination reduces disease prevalence across both sexes and provides broader, long-term public health benefits.[2-5,7] The burden of HPV-related diseases, including cancer, extends to both genders, although

unevenly distributed.[2,3] By providing gender-neutral coverage, we address the burden on both sexes and reduce the overall disease prevalence more effectively.[7]

Some may argue that from an economic perspective, gender-neutral HPV programmes must be evaluated for cost-effectiveness.[24] If universal coverage substantially raises the cost per quality-adjusted life year (QALY) without proportional health benefits, it may seem an inefficient use of resources.[25] However, cost-effectiveness studies vary, and a broader societal view may still support gender-neutral vaccination.[25] Importantly, the recent adoption of a single-dose HPV vaccine regimen in South Africa could further strengthen the case for including boys by reducing programme costs.[16] Although incremental costs may rise, substantial health benefits, including cancer prevention and improved quality of life, ethically justify the investment in gender-neutral HPV vaccination.[3]

Proponents of a utilitarian view may argue that ethical trade-offs exist between achieving equity and maximising overall well-being. Some may contend that gender-neutral vaccination could result in uneven benefits between sexes, making targeted vaccination appear more efficient from a purely utilitarian perspective.[23] However, gender-neutral vaccination aligns more closely with principles of equity and non-discrimination, ensuring equal access to preventive healthcare.[10-12] It upholds the fundamental tenets of justice by providing disease prevention without gender-based exclusion.

Finally, concerns may arise that universal HPV vaccination could divert resources from other urgent health priorities, especially where high vaccination rates have already reduced HPV transmission significantly.[1] In such cases, some utilitarian arguments might favour reallocating resources to areas with greater unmet needs. Health economists often conduct resource allocation analyses to assess the potential impact of healthcare investments on various health priorities.[25] However, public health strategies require balancing specific health priorities with broader societal goals. Gender-neutral vaccination supports broader public health goals by reducing disease burden across both sexes and alleviating strain on healthcare systems.[3-5,7] It also aligns with the WHO's commitment to advancing gender equity in health. By considering the broader societal impact, gender-neutral HPV vaccination remains consistent with utilitarian principles of maximising overall well-being.

Policy recommendations

This article recommends that South Africa adopt a gender-neutral HPV vaccination policy based on the rule utilitarian justification that doing so will generate the greatest overall benefit. The current girls-only policy follows a rule that prioritises high-risk populations but fails to maximise utility or promote health equity. A revised rule: 'All eligible adolescents, regardless of gender, should receive free HPV vaccination,' would result in broader population-level benefits, enhance herd immunity, and address gender disparities in access to preventive care. Moreover, the policy should incorporate public health messaging that addresses the benefits of HPV vaccination for boys, training for healthcare providers, and efforts to negotiate lower vaccine prices to ensure sustainability.[7,9] Prioritising inclusivity in HPV vaccination aligns with ethical public health practices and strengthens South Africa's commitment to health for all.

Conclusion

The exclusion of boys from South Africa's HPV vaccination policy is inconsistent with the principles of rule utilitarianism. By perpetuating inequities, limiting vaccine coverage, and missing the broader benefits of gender-neutral vaccination, the current approach falls short of promoting the greatest good. Although utilitarian counter-arguments regarding resource constraints and prioritisation merit consideration,[1,23-25] scientific evidence and ethical reasoning favour a gender-neutral strategy that maximises overall well-being and upholds principles of justice and equity.[2-5,7,9-13] Gender-neutral vaccination addresses the burden of HPV-related diseases across sexes, enhancing public health outcomes.[3-5,7,9] Ethical evaluations of HPV vaccination must extend beyond utility to encompass fairness, equal access, and the protection of individual rights.[10-13] Future policy decisions should strive to balance these considerations to truly advance society's overall well-being.

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