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Just implementation of human papillomavirus vaccination

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ABSTRACT

Many countries are now implementing human papillomavirus vaccination. There is disagreement about who should receive the vaccine. Some propose vaccinating both boys and girls in order to achieve the largest possible public health impact. Others regard this approach as too costly and claim that only girls should be vaccinated. We question the assumption that decisions about human papillomavirus vaccination policy should rely solely on estimates of overall benefits and costs. There are important social justice aspects that also need to be considered. Policy makers should consider how to best protect individuals who will remain unvaccinated through no fault of their own. This is especially important if these individuals are already disadvantaged in other ways and if vaccinating other people increases their risk of infection.

Human papillomavirus (HPV) infection is the world's most common sexually transmitted infection. It is a major public health concern mainly because it causes cervical cancer, a disease that kills some 250 000 women worldwide each year and affects twice as many.[1] The infection also causes other, less common cancers in both sexes.[1] Recently licensed vaccines effectively protect previously unexposed individuals against the most common cancer-causing HPV strains.[2 3]

Many countries are now in the process of implementing HPV vaccination. Who should receive the vaccine? The preferred approach has been to target early adolescent girls in an effort to protect them from developing cervical cancer later in life. But some believe that boys, who can also become infected with, and spread, the virus, should be immunised as well. Various arguments for and against such an approach have been proposed. We seek to call attention to important questions of social justice that have so far been overlooked in this debate.

THE DEBATE: PUBLIC HEALTH IMPACT VERSUS COST-EFFECTIVENESS

Proponents of vaccinating boys against HPV stress the possibility of thereby providing girls and women with additional protection against cervical cancer.[4] Immunising both sexes has the potential to generate a substantial herd immunity effect, which would indirectly protect girls and women who remain unvaccinated by reducing the risk that they come into contact with infected individuals.[5] Thus, according to Nobel laureate Harald zur Hausen, who discovered the link between HPV and cervical cancer, vaccinating boys is a question of 'gender solidarity'.[6] Proponents also cite the fact that HPV not only causes cervical cancer but has also been linked to other cancers that the vaccines probably protect against —penile cancer in men, vaginal and vulvar cancer in women, and increasing numbers of cancers of the tonsils, as well as anal, head and neck cancers in both sexes.[4 7]

Opponents of vaccinating boys are concerned that these benefits would come at too high a price. Whereas vaccinating both sexes may have a larger effect on HPV and associated cancers than vaccinating girls only, they argue that the considerable financial resources that this approach would claim are more wisely invested elsewhere, where the health improvements they would buy are larger.[8 9]

The debate over whether boys as well as girls should be vaccinated against HPV has thus often been framed in terms of public health impact versus cost-effectiveness. We believe that this is too simple a description of the problem. Society should not only consider the total balance of costs and benefits when deciding what vaccination and other public health policies to opt for. It should also strive for a fair distribution of these costs and benefits.

VACCINATION AND SOCIAL JUSTICE

Like other cherished values, distributive justice is understood differently by different people. However, many philosophers of diverse theoretical persuasions agree that justice requires special consideration for the interests of badly off individuals. Basic social benefits and burdens should be distributed in ways that prioritise the worse off over the better off.[10 11]

This is a plausible view of justice for public health activities,[12] and one that raises important questions about HPV vaccination policy. To begin with, it should be noted that no policy is likely to achieve 100% vaccine coverage. Some individuals will remain susceptible because of a range of factors beyond their own control, such as lack of knowledge, parental refusal of vaccination, or simply bad luck. By remaining at risk of infection and cancer, these individuals will be worse off than those who receive the vaccine. It should be a societal concern to protect this vulnerable group.

Protecting the unvaccinated is particularly important if that group is also disadvantaged in other respects. Further evidence is needed before it can be firmly established whether there are social disparities with regard to who are likely to remain unvaccinated. Also, the situation probably differs between and within countries. However, it cannot simply be taken for granted that all adolescents, regardless of socioeconomic position, ethnicity, parental education level and so on, are equally likely

to receive the vaccine. Emerging evidence from Sweden and Germany (J Dillner and A Schneider, personal communication) suggests that disadvantaged social groups may be over-represented among the unvaccinated. If this is the case, vaccination efforts have the potential to exacerbate existing social inequalities. They may be unable to protect already underprivileged groups as effectively as they protect the better off, adding an increased RR of HPV infection and cancer to the disadvantages that such groups already face.

Some may not agree with the view that policy makers have a special responsibility to benefit individuals who are, immunity-wise or in other respects, disadvantaged. Most would agree, however, that health policies should at least not make the disadvantaged even worse off than before. Vaccination can have such effects. An important concern about the rubella vaccination programmes introduced in many countries in the 1970s was that programmes reaching only moderate (about 50%) coverage among small children may increase the risk of infection among unvaccinated adolescents and adults.[13] A retrospective study confirmed that this phenomenon in fact occurred in Greece.[14]

Could similar effects occur in the HPV case? The validity of analogy depends on a range of factors, including whether the transmission network structures of the two infections are sufficiently comparable.[15] There is room for debate. HPV is transmitted mainly through heterosexual contact, whereas rubella is a contagious disease, generally also spread from girls to girls and from boys to boys. However, overall increases in sexual risk-taking behaviour[16] together with increasing incidence and prevalence of infection with oncogenic HPV types[17] arguably make HPV infection more comparable to contagious diseases than to classic venereal diseases such as syphilis. While this question remains open, it may be unwise to rule out the possibility that HPV vaccination policies exclusively focused on protecting individuals who actually receive the vaccine may achieve this goal only at the cost of increasing risks of infection and cancer in individuals who remain susceptible.

The key question for policy makers concerned with avoiding the possibility that vaccination creates or reinforces social inequality is thus how to protect the unvaccinated. Screening followed by treatment of detected cervical lesions is one already established approach, accredited with large reductions in cervical cancer incidence and mortality.[18] Screening has its imperfections, however, including limited coverage in certain countries and regions, and among certain groups, notably the young.[18]

Another approach to protecting the unvaccinated is to opt for a vaccination programme sufficiently broad to generate strong herd immunity against the most common oncogenic HPV strains. This would protect unvaccinated individuals by decreasing their exposure to infection. Herd immunity against common sexually transmitted infections is most effectively achieved by reducing the proportion of infected and susceptible individuals of both sexes.[19] The extent to which the reported 30–70% vaccine coverage[20 21] among girls only is capable of protecting unvaccinated individuals through herd immunity is under debate,[22] and recent modelling studies are inconclusive because they assume the coverage to be higher.[23] In contrast, vaccination of both sexes seems to generate herd immunity from 30% vaccine coverage and onwards.[5] Hence vaccinating boys as well as girls appears to make sense from a social justice perspective: it potentially protects individuals that other approaches would unfairly leave at risk of infection and cancer.

THE RELEVANCE OF COST-EFFECTIVENESS

Vaccinating both sexes against HPV may not be the most cost-effective approach.[24] However, it is not unreasonable for a society committed to social justice to opt for a vaccination policy with a less than optimal overall balance of costs and benefits. Justice may be allowed to have its price.

This is not to say that cost-effectiveness is irrelevant from a social justice point of view. Any choice of vaccination strategy comes with an opportunity cost: it is also a choice to forego other ways in which the resources that it employs could have been used instead. Policy makers face the task of addressing a multitude of social injustices in the public health context and elsewhere. A more inclusive and therefore costlier HPV vaccination strategy may require foregoing more opportunities to rectify injustices in other areas compared with a less inclusive and less costly approach. This potential drawback of vaccinating both sexes needs to be considered alongside the potential advantage of achieving a fair distribution of the benefits of protective HPV immunity. However, the opportunity cost of an inclusive strategy may not be as high as one might think. Recent tenders for national vaccination programmes indicate a much lower vaccine price than many cost-effectiveness analyses have assumed.

To what extent a commitment to social justice supports vaccinating boys as well as girls against HPV, all things considered, remains an open question. In any case, future vaccination policy debate needs to take social justice into serious consideration—in addition, of course, to other ethical concerns detailed elsewhere.[25] This means supplementing the standard goals of effectiveness and cost minimisation with a goal of just distribution, or perhaps reconceptualising effectiveness itself so as to accommodate distributive concerns.[12] Left unqualified, however, these standard goals are clearly insufficient.

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