The Ethical Case for Mandating HPV Vaccination

Michelle J. Bayefsky

When the Human Papillomavirus (HPV) vaccine was approved by the FDA in 2006, public health officials and state legislators were eager to encourage adoption. Twenty-six states introduced bills proposing to mandate HPV vaccination,[1] but to date, only three have succeeded in requiring the vaccine for school entry. There are many reasons the bills failed, ranging from anger at the manufacturer, Merck, for pressuring state legislators to mandate vaccination, to the reluctance of parents to vaccinate their pre-teen children against a sexually transmitted disease. Bioethics and legal scholars were also predominantly resistant to mandating HPV vaccination,[2] citing concerns about insufficient evidence regarding the vaccine's safety, cost to the public, and the unfairness of mandating vaccines for girls only. A few scholars were tentatively supportive of vaccination, if certain conditions were met regarding the projected efficacy of the vaccine,[3] or the ability of parents to opt-out relatively easily.[4] Since that time, many of the misgivings expressed immediately after the vaccine's approval are no longer applicable, while others remain pertinent and continue to present an obstacle to mandating vaccination. This essay responds to earlier critiques of mandatory vaccination and offers a set of arguments in support of an HPV vaccine mandate. The first section will describe the risks of HPV and discuss concerns that arose in the aftermath of the vaccine's release that are no longer relevant. The second section will make the moral case for mandating HPV vaccination, based on the best interests of children, solidarity, and health equity. The final section will address concerns about implementing a vaccine mandate, including the validity of linking vaccination to school entry, the option to opt-out of vaccination, and the importance of maintaining the public's trust. We have a moral imperative to protect children from the leading cause of cervical cancer, and mandating HPV vaccination is the best way to ensure that children of all cultural, religious and socioeconomic backgrounds receive the vaccine before they have been exposed to the virus.

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Vaccine Benefits and Initial Concerns with Mandating Vaccination

Cervical cancer afflicts over 250,000 women in the United States and within five years, approximately one third of women with cervical cancer will die.[5] According to an estimate by the National Cancer Institute, in 2018, there will have been about 13,240 new cases of cervical cancer.[6] Virtually all cases of cervical cancer are caused by HPV, and HPV is also the primary cause of anal cancer, oropharyngeal cancers and vaginal cancers.[7] While cancer caused by HPV affects a relatively small proportion of Americans, many more are at risk. Approximately 79 million Americans are currently infected with genital HPV, and 14 million become newly infected each year — mostly teens and young adults.[8] Furthermore, there is currently no treatment available for HPV. Once it is acquired, screening for pre-cancer is the only approach available for preventing cancer.[9] While screening with Pap smears has been an effective method of reducing cervical cancer rates since the 1950s,[10] the ideal way to prevent HPV-associated cancer is to prevent HPV from establishing itself in its human host.

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In 2006, the world's first HPV vaccine became available. The original iteration of the vaccine protected against two particular strains of HPV (16 and 18) that are responsible for about 66% of cervical cancers. Since that time, two more vaccines have been developed that cover four and nine strains of HPV, and as of the end of 2016, only the nine-valent HPV vaccine is available in the US.[11] The CDC estimates that of the 38,793 HPV-associated cancers diagnosed annually, 28,500 are attributable to HPV types that are preventable with the nine-valent HPV vaccine.[12] At present, recommendations from the CDC's Advisory Committee on Immunization Practices (ACIP) are that the HPV vaccine be administered to male and female adolescents at age 11 or 12 years old. Vaccination is also recommended for females through age 26 and males through age 21 who were not adequately vaccinated at a younger age. (The nine-valent vaccine requires two doses separated by 6-12 months.)[13]

Early fears that mandating HPV vaccination would require a female-only population to be vaccinated with an unproven vaccine can thankfully be laid to rest.

When HPV vaccine mandates were first proposed, some argued that the safety and efficacy of the vaccine were not sufficiently established, and the lack of long-term data regarding the vaccine's efficacy were particularly troubling.[14] Over the ten years since the introduction of the vaccine, data on the safety and efficacy of the HPV vaccine have been very reassuring. Nearly 90 million doses have been distributed since 2006, and 92% of side effects were classified as "non-serious," including pain, redness and swelling where the shot is administered, and fainting during administration.[15] Side effects that were considered to be "serious" included headache, nausea, vomiting, and fever and the rare anaphylactic reaction.[16] With regards to efficacy, clinical trials have demonstrated that the rates of seroconversion following vaccination with the nine-valent vaccine are greater than 99%, and prevention of high-grade pre-cancerous changes in cervical cells is 96.7%.[17] Epidemiological data have shown that in the four years after the vaccine was released, HPV infections in teen girls in the US decreased by 56%.[18]

The long-term effectiveness of the vaccine continues to be monitored, but current studies that have followed vaccinated individuals for ten years show no evidence of weakened protection over time.[19] While it is impossible to know for certain that there are no negative long-term effects, the same is true of any new vaccine, and other vaccines have been mandated within the first decade since their introduction. For example, the pneumococcal conjugate vaccine (PCV) became available in 2000 and was mandatory in nearly every state by 2008 or earlier. Over ten years after the HPV vaccine's release, we can be sufficiently confident in the vaccine that prior hesitations regarding safety and efficacy should not stand in the way of mandating vaccination.

Another early objection to mandating the HPV vaccine was that it was initially recommended only for females and not males. While the American Academy of Pediatrics (AAP) was generally supportive of the new vaccine, they opposed a mandate, and the AAP president-elect at the time, Dr. Renee Jenkins, was quoted as saying: "There are people who are concerned about gender discrimination because it's a policy that would keep girls out of school and not boys, because it's a vaccine for girls."[20] The vaccine was recommended first for girls because studies in males lagged behind studies in females, and it was not clear whether the cost/benefit ratio was sufficient to warrant vaccination of boys.[21] After additional studies were completed, and "estimates of disease and cancer resulting from HPV, cost-effectiveness, and programmatic considerations" were analyzed, ACIP extended its recommendation to boys in 2011.[22] Since HPV vaccination is now recommended for both boys and girls, the concern that a vaccine mandate would unfairly target girls is no longer applicable.

Early fears that mandating HPV vaccination would require a female-only population to be vaccinated with an unproven vaccine can thankfully be laid to rest. The remaining sections of this paper will address other, deeper critiques of mandatory HPV vaccination that pose ongoing obstacles to mandating the vaccine.

The Moral Case for Mandating HPV Vaccination

Despite the ACIP recommendations, the efforts of public health officials promoting the vaccine, and the support of pediatricians,[23] HPV vaccination rates in the US remain low. In 2015, only 41.9% of females aged 13-17 had completed the dose regimen for the HPV vaccine, with 62.8% having received the first dose. Among males in the same age group, 28.1% had completed the regimen and 49.8% had received the first dose. By contrast, 81.3% of adolescents aged 13-17 have received the MenACWY vaccine for meningitis, 86.4% have received the Tdap vaccine for tetanus, diphtheria

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and pertussis, 90.7% have received the MMR vaccine for measles, mumps and rubella, 91.1% have received the vaccine for Hepatitis B, and 94.9% had received at least one dose of the varicella vaccine. (Whether a child should receive one or two doses of the varicella vaccine depends on whether the child has had chickenpox previously.)[24] The disparity in vaccination rates is not a coincidence; the vaccines with much higher vaccination rates are the same vaccines that are mandated by law. While laws differ slightly from state to state, nearly every state in the US requires the MMR, Tdap, varicella, MenACWY and Hepatitis B vaccines for daycare, kindergarten, grades 1-12, or college and university entrance.[25] Because of the rates enumerated above, mandates are widely considered to be an extremely effective method for ensuring high vaccination rates.[26]

The Best Interests of Children

Vaccinating as high a proportion of the population as possible is not simply a box to be checked by public health officials; it is a moral imperative, for several reasons. The most fundamental reason for promoting universal vaccination, as has been argued for other vaccines,[27] is that it is in the best interest of the children receiving the vaccine. The HPV vaccine protects children from serious harm and carries minimal risk, creating a favorable risk-benefit ratio and satisfying a key criterion of medical decision-making on behalf of children.[28] For the rare case in which the risks outweigh the benefits for a particular child (e.g., a child with an allergy to the vaccine formula) an exemption can apply. (Opt-out provisions will be discussed later in the paper.) For the vast majority of children, however, vaccination is in their best interest. Furthermore, although universal vaccination has the secondary benefit of protecting society as a whole from HPV, vaccination is not akin to carrying out research on children for generalized gain; the vaccine is proven to be safe and effective, and it directly benefits the children who are vaccinated by protecting them from the harmful consequences of HPV, regardless of future sexual behavior. As Joseph Balog writes, we may promote ideal safe sex practices that we hope would reduce exposure to HPV, but these ideals "are not realistic enough, nor likely to occur soon and often enough, to match the effectiveness of a vaccine that is available now to eliminate real and immediate harm."[29]

After the vaccine's introduction, a number of scientists and ethicists argued that it is not the role of the government to decide what is in a child's best interest, and that mandating vaccination impinges on parental autonomy.[30] Indeed, parents who have objected to mandatory vaccination resent the use of compulsion by the state, which they say violates their right to make decisions for their own children.[31] It is understandable for parents to be protective of their children and resistant to state efforts that they see as potentially harmful to their children, or antithetical to their parenting practices. It is also important to acknowledge and respect the wide latitude that parents are given when making decisions on behalf of their children. However, if our ultimate goal is to look after the best interests of the child, who will be directly affected by the vaccination decision,[32] we cannot take for granted that parents will always make the choice that is in their child's best interest. For example, despite the thorough debunking of the myth that vaccines cause autism, some parents continue to refuse MMR vaccination out of fear that their child will "get" autism.[33] Overestimating the harm of vaccination because of a discredited medical theory is not in the best interest of the child, despite the parents' sincere concern for their child's health. Similarly, some parents underestimate the likelihood that their child will be exposed to HPV, and subsequent harm caused by HPV — either at all or within the time-frame suggested by the ACIP recommendations. One Rhode Island parent protesting the state's mandate stated that she rejected vaccination because "A 12-year-old is not going to be going out and having sex and contracting an STD."[34] While it is true that few children are willingly engaged in sexual activity at that age,[35] the purpose of the vaccine is to immunize children before they are exposed to HPV. Furthermore, numerous studies have demonstrated that parents routinely underestimate their children's sexual activity.[36] If parents are frequently out of touch with their child's sexual behaviors, their ability to adequately weigh the risks and benefits of HPV vaccination and make an informed decision on behalf of their children is compromised, even if they fully intend to act in their child's best interest.

Other parents may refuse HPV vaccination because they do not wish to discuss sex with their children. Parents protesting the Rhode Island mandate felt that the law crossed "the line with personal and family values" and would force parents to have "appropriate discussions" with their children before vaccination.[37] Some have even speculated that HPV vaccination could promote risky sexual behavior, though there is no evidence that is the case.[38] There is ample evidence, however, that parent-child communication about sexual activity starting before the child's sexual debut correlates with less risky sexual behavior for the child.[39] Resisting HPV vaccination on the basis of wanting to delay conversations about sex is therefore unlikely to be in the best interest of the child.

Parents may also refuse vaccination because they want their children to abstain from sex until a much

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older age or until marriage. However, studies have demonstrated that abstinence-only sex education does not decrease rates of teen pregnancy, and may actually contribute to the high teenage pregnancy rates in the US.[40] Parental expectations of abstinence will therefore be unrealistic for some families, and vaccine refusal for this reason will leave pre-teens and teens unprotected if they engage in sexual activity against their parents' wishes. Parents who expect abstinence may be unaware of the rates of unintended teen pregnancy and other negative health outcomes, including among teens who have been taught to abstain from sex. If so, their ability to make informed vaccination decisions is undermined. Alternatively, parents may be aware that children who are taught abstinence are at risk for contracting HPV, but they still refuse vaccination in order to present a consistent message to their children. If so, parents are subjecting their child to the risk of contracting a potentially lethal virus for the sake of impressing the principle of abstinence on their child. Given the realities of adolescent sexual activity, vaccine refusal on this basis is not in the child's best interest. As James Colgrove wrote in a 2006 perspective on compulsory HPV vaccination, society has an interest in "safeguarding the welfare of children who may be harmed by the choices of their parents or guardians."[41] Requiring vaccination ensures that parents cannot act against their child's best interest for a variety of reasons, and that children are not denied the protection of vaccination because of their parents' beliefs — religious, cultural or otherwise.

The "best interests" argument is morally compelling and makes up the essence of why all children should receive the HPV vaccine. Legally, a "best interests" standard has been employed primarily in family law for determining child custody. It has also been referenced as a threshold for justifying state intervention on behalf of children in a medical context,[42] though other principles seem to carry most of the legal weight.[43] Courts have found it challenging to apply the "best interests" standard literally in medical decision-making because it carries a risk of subjectivity and paternalism. Instead, courts have mainly relied on standards that are more clear-cut — like the justification that the state can override parental autonomy if an intervention is imminently necessary to save a child's life.[44] For example, parents who are Jehovah's Witnesses cannot refuse a blood transfusion on behalf of their child,[45] and parents must appropriately restrain their children in automobiles.[46] Can the threat of contracting HPV be considered "imminent" and "life-saving"? We do not know when a given child will begin to engage in sexual behavior, and for some children, the threat of exposure to HPV could very well be imminent. As for life-saving, there is significant mortality associated with the cancers caused by HPV, so preventing HPV infection can be considered life-saving.

One could counter by saying that the likelihood that a child will contract HPV shortly after vaccination, develop pre-cancerous lesions that are not found by screening and treated, and ultimately die of HPV-associated cancer is too remote to consider vaccination "life-saving."[47] This logic, however, could be applied equally to other vaccines that have already been mandated. For example, it is similarly unlikely that Hepatitis B will be contracted by pre-teen children, ultimately leading to their deaths. Ruling out an HPV vaccination mandate on the basis of "imminent" and "life-saving" standards would also require us to reject other existing vaccine mandates.

In cases where the child's life is not in imminent danger, there is no single, accepted legal approach. In the past, courts have used the reasoning that children have a "right to a normal life" for allowing state intervention in cases of child neglect.[48] Another standard that has been proposed is that the state may intervene when parental refusal of a medical treatment "places the child at significant risk of serious preventable harm."[49] Both of these approaches can be used to support mandatory HPV vaccination; suffering from HPV-associated cancer is not part of a "normal life" and the vaccine protects against a serious and preventable harm.

Ultimately, the legality of mandatory vaccination, for HPV and other diseases, does not rest on the best interests of the children, or the well-being of the children receiving the vaccine. It rests on the public health necessity of protecting the population from preventable morbidity and mortality. In the 1905 case *Jacobson v. Massachusetts*, the United States Supreme Court decided that states have the right to mandate vaccination as long as vaccination is "for the common good," "necessary for the public health or the public safety," "reasonable" and not "arbitrary or oppressive."[50] By limiting the spread of the disease, the state is promoting the common good, which affords it the right to override parental autonomy. Although the courts rooted the legality of mandatory vaccines in their public health benefits, the primary ethical basis for pursuing universal vaccination lies in the protective effect for the children who are vaccinated.

Solidarity

A second ethical basis for mandating HPV vaccination stems from the public health benefits of vaccination and the concept of solidarity. Vaccination against HPV should be universal not only for the sake of each vacci-

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nated individual, but for the sake of the community as a whole, and those who are most vulnerable within the community. In the context of vaccines, "benefit to the community" has a very tangible meaning; the ultimate goal of mandatory vaccination is to guarantee coverage of a high enough proportion of the population to establish herd immunity. The proportion needed to develop herd immunity against HPV has not yet been defined, but preliminary findings reinforce the hypothesis that the higher the vaccination coverage, the greater the herd effects (lower prevalence of HPV infection beyond the direct effects of vaccination).[51] Even with mandatory vaccines, we sometimes struggle to achieve herd immunity, particularly when states allow broad authority for parents to opt-out of vaccination. It is therefore understandable that without a mandate, HPV vaccination rates are only around 40%, and rates will realistically remain low until vaccination is mandated.

vaccination, the concept is nonetheless an important underpinning to public health ethics, and captures a cultural sense of obligation felt by many people, at one level or another.[53]

Debate over whether to mandate HPV vaccination has largely avoided the notions of mutual obligation and solidarity, and even shied away from discussing the societal benefits of vaccination. Reluctance to emphasize broader benefits was especially apparent in earlier debates about including males in the ACIP vaccination recommendations. ACIP focused heavily on the benefits that the HPV vaccine would bring to boys in order to justify extending its recommendations. They noted, as an aside, that vaccination of males may result in a reduction of infection, disease and cancer in females, through herd immunity. However, they did not have sufficient data to support that claim and did not base their recommendation for males on the possibility of achieving herd immunity. Some even argued

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The concept of solidarity asks us to move beyond the simple utilitarian calculus that the health of many should trump the autonomy of the individual. We are not merely self-interested individuals, we are interdependent members of society who live in and benefit from the community around us, and in turn have communal obligations.[52] What sorts of contributions, monetary or otherwise, should be considered obligatory for members of society is both ethically complex and politically fraught. People will weigh the values of personal liberty and societal gain differently, based on their perception of the magnitude of the liberty sacrifice and the gravity of the social benefit. One could argue that adding the HPV vaccine to a pre-existing list of mandatory vaccines, given its proven safety and efficacy, amounts to a minor sacrifice of personal liberty. One additional shot is a small burden relative to the possibility of eradicating HPV-associated cancers from the community. However, some parents might wish to refuse vaccination on the basis of the concerns discussed above, and may feel the cost to personal liberty acutely. While preaching solidarity will not appease staunch opponents to mandatory

that due to the smaller risk of HPV-associated cancers in males as compared to females, males should not be required to receive the HPV vaccine. Benjamin Lemke used a "Modified Hand Formula" to calculate how much society should spend to reduce the disease burden of HPV through implementing a vaccine mandate. He weighed social economic burden and personal burden (in terms of "sacrificing constitutionally protected liberty interests") against an estimate of the human costs of HPV,[54] and according to his calculus, mandatory vaccination would be justified in females only.

What Lemke, ACIP and others failed to consider, however, were moral reasons for vaccinating males in addition to females — in particular, the concept of solidarity. Even if females are more susceptible to HPV-associated cancers than males (which is debatable), the possibility of decreasing the incidence of cancer in females through vaccination of their male counterparts[55] is, in and of itself, a reason to vaccinate males. Our society is filled with mothers, sisters, partners and daughters. To argue that vaccinating males is unjustified unless males themselves benefit suffi-

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ciently — according to an extremely narrow definition of 'benefit' — is to ignore the fact that human beings are closely interconnected to one another. The well-being of the individual is inextricably bound to the well-being of the community, especially with regards to communicable disease.

Solidarity not only requires us to think seriously about what we, as members, owe society at large, it also urges us to stand together with those who are most vulnerable. There are always people who are particularly susceptible to an infection or sensitive to its consequences — whether due to biological or social fragility. Vaccinating as many people as possible, and establishing herd immunity, allows us to protect those people by eventually eliminating the disease from the population. How far we should all go to guarantee protection for the most vulnerable members of society is also a question of competing values, and people will differ in their answers. However, getting the two doses of the HPV vaccine is a minor practical burden and seems like a reasonable task to require of everyone in order to eradicate HPV from the community and spare those who are particularly at risk.

This section has argued for mandating HPV vaccination for three reasons: 1) universal vaccination is in the best interests of children, 2) solidarity requires that we make minor sacrifices for the good of the community and the most vulnerable among us, and 3) mandatory vaccination will help reduce health disparities in rates of HPV-associated cancer.

Health Equity

A final moral reason for mandating HPV vaccination is for the sake of health equity. We have long known that black and Hispanic women suffer disproportionately from cervical cancer.[56] Recent studies have revealed that racial disparities in rates of cervical cancer, and cervical cancer mortality, are even larger than previously estimated.[57] These disparities are generally attributed to reduced access to care, including cancer screening (particularly for Hispanic women)[58] and the quality of cancer treatment.[59] Public health institutions have attempted to increase screening rates in minority communities and among uninsured and publicly insured women, but the disparities have persisted.[60]

Given the disparities in HPV-associated cancers, minority populations in the US stand to gain the most from vaccination against HPV.[61] The CDC's Vaccines for Children (VFC) program has offered to help with payment for the HPV vaccine,[62] but the barrier to vaccination is not only cost-related. Unless parents have a relatively high level of health literacy, a particular concern for protecting against HPV-associated disease, or a pediatrician who strongly recommends vaccination, they simply may not know about the vaccine. Studies have shown that awareness of HPV,[63] and HPV vaccination rates,[64] are lower among black and Hispanic women as compared to non-Hispanic whites. For mandated vaccines, by contrast, there is no evidence of racial disparity in rates of vaccination.[65] Black and Hispanic children receive these vaccines at comparable rates to other children, suggesting that mandates would be an effective tool for reducing disparities in vaccination and cervical cancer. Mandating vaccination is not a substitute for improved education, screening and treatment in minority populations, but it can be an important means of achieving greater health equity with respect to HPV-associated disease.

This section has argued for mandating HPV vaccination for three reasons: 1) universal vaccination is in the best interests of children, 2) solidarity requires that we make minor sacrifices for the good of the community and the most vulnerable among us, and 3) mandatory vaccination will help reduce health disparities in rates of HPV-associated cancer. The final section of this paper will discuss concerns regarding implementation of a vaccine mandate.

Ethical Issues in Implementing an HPV Vaccine Mandate

Arguments against mandating the HPV vaccine have, to a great extent, focused on issues related to implementation of a mandate. Specifically, many opponents have questioned the validity of linking HPV vaccination to school entry, like other mandatory vaccines. The Supreme Court affirmed in the 1922 case *Zucht v. King* that mandatory vaccination laws could be tied to school attendance. The reasoning provided was that policies linking vaccination to school attendance "confer not arbitrary power, but only that broad discretion required for the protection of the public health."[66] Since *Zucht*, state governments, ethics and legal scholars have attempted to delineate more precisely the circumstances under which a vaccine can be justly mandated. The prevailing theory is that vaccines ought to

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be mandated when the disease poses an "immediate risk of rapid transmission" within the school environment.[67] HPV, some argue, does not meet these criteria, since it is not imminently transferable through normal classroom activities.[68]

Opel, et al. explain the traditional reasoning as follows: tying vaccination to school entry means that if a child does not receive the vaccine, he or she will be denied the right to school education. Therefore, denial of this fundamental right is only justifiable when vaccination is necessary to prevent a disease outbreak that will keep large numbers of children from attending school (due to "either illness or fear of contracting the disease from other schoolchildren"). HPV does not meet this qualification because it does not threaten to keep children out of school.[69] Although Opel, et al.'s reasoning is sound, they do not explain why the only acceptable justification for restricting access to public education for one child is access to public education for a greater number of children. Though public schooling is indeed a fundamental right, surely there are other societal goals that might supersede this right. For example, the societal goal of preventing future harm related to communicable disease, and the collective interest in limiting the spread of disease by achieving herd immunity. Opel, et al. acknowledge that choosing not to require HPV vaccination for school entry will almost certainly reduce rates of immunization.[70] While it is theoretically possible to mandate vaccination through another means, alternative strategies have yet to be fully explored and the infrastructure for school-entry mandates is already in place. Furthermore, tying vaccination to school entry is not truly intended to limit access to school education. While there are lower rates of vaccination among home-schooled children,[71] there is little evidence to suggest that students who would otherwise have attended school were homeschooled because their parents refused vaccination.[72] Finally, there are already precedents for vaccine mandates that do not meet the conditions stipulated by Opel, et al. and others. Hepatitis B is mandatory in nearly all states, and it is transmitted through birth, sex, needle sharing, and direct contact with blood — not normal school activities. The tetanus part of the Tdap vaccine protects against an illness that is not communicable between humans at all. The traditional justification for tying vaccination to school entry not only fails to comprehensively weigh the risks and benefits of HPV vaccination, it also does not reflect the realities of mandatory vaccination today.

A second question relating to implementation of a vaccine mandate is whether and what opt-out provisions should be permitted. Philosophical exemptions preserve an outlet for personal autonomy for those parents who are adamantly opposed to vaccination, and also limit the number of legal challenges that the state will face for enforcing a vaccine mandate. Religious exemptions allow a small minority of families who have religious reasons to resist vaccination to do so. On the other hand, religious exemptions are difficult to enforce,[73] and broader opt-out provisions risk jeopardizing the herd immunity that was established as a result of mandatory vaccination. For example, there has been a resurgence of measles in certain populations, where anti-vaccine activism has convinced enough parents to opt out for rates to fall beneath the threshold for herd immunity.[74] This paper has argued that universal vaccination is the ethical objective, for the sake of individual children and the community as a whole. Permitting only medical and religious exemptions is most consistent with this goal. However, public policy must always balance pursuit of the stated objective with maintenance of the public trust. Some have argued that if parents are resentful of a stringent vaccine mandate, they may lose faith in the public health system,[75] or may even refuse to vaccinate their children for other diseases.[76] Whether parents will be so resistant of HPV vaccination that they will become permanently mistrustful of the public health system, or refuse other vaccines, is ultimately an empirical question. Of the three places where HPV vaccination has been mandated, Rhode Island and Washington, D.C. have allowed religious and medical exemptions only.[77] Rates of HPV vaccination for females are now well above average, and rates of other vaccination are on par with other states.[78] Virginia, by contrast, created a special exemption for HPV, which allows parents to opt out for any reason.[79] As a result, rates of completion of the HPV vaccine series in Virginia are actually lower than the national average.[80] Thus it appears so far that limiting exemptions to religious and medical exemptions can increase rates of HPV vaccination without decreasing the rates of vaccination for other diseases. Furthermore, the experience with the Hepatitis B vaccine gives us reason to believe that parental opposition to vaccination will not be permanent. There was considerable debate over mandating the Hepatitis B vaccine, and after the vaccine was mandated, the debate faded over time.[81] Nonetheless, states that implement vaccine mandates must be cognizant of the public's reaction and carefully monitor vaccine uptake for HPV and other vaccines in the years to follow.

Implementing a vaccine mandate is a complicated task that requires consideration of practical and political concerns. In addition to deciding whether to require HPV vaccination for school entry, what opt-

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out provisions to permit, and how best to maintain the public trust, states must also consider how much money they are willing to spend on implementing the vaccine, and how to educate the public in order to increase vaccine uptake and minimize vaccine refusal.

Conclusion

Cervical cancer is a preventable cause of morbidity and mortality in the United States, and one that disproportionately afflicts underserved communities. This paper has argued that mandating the HPV vaccine can help reduce the harm caused by HPV, which is in the best interest of children, the community as a whole, and the most vulnerable among us. Early arguments regarding the safety and efficacy of the vaccine, and the unfairness of requiring vaccination of females only, are no longer relevant. While parental autonomy is a significant factor that must be considered, ultimately, it is not sufficient to override the moral imperative to prevent avoidable suffering and death caused by HPV. It is important to maintain the public trust to the extent possible, and in practice, it may be difficult for state legislators to pass a mandate without securing parental support in advance. Assurance of the vaccine's safety, public education to broaden awareness, and the moral case for mandating vaccination can all be critical for augmenting parental support.

Note

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