

POLICYLAB

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HIGHER EDUCATION STUDENT VACCINATION POLICIES:

HOW ADMINISTRATORS CAN
ENCOURAGE VACCINE UPTAKE

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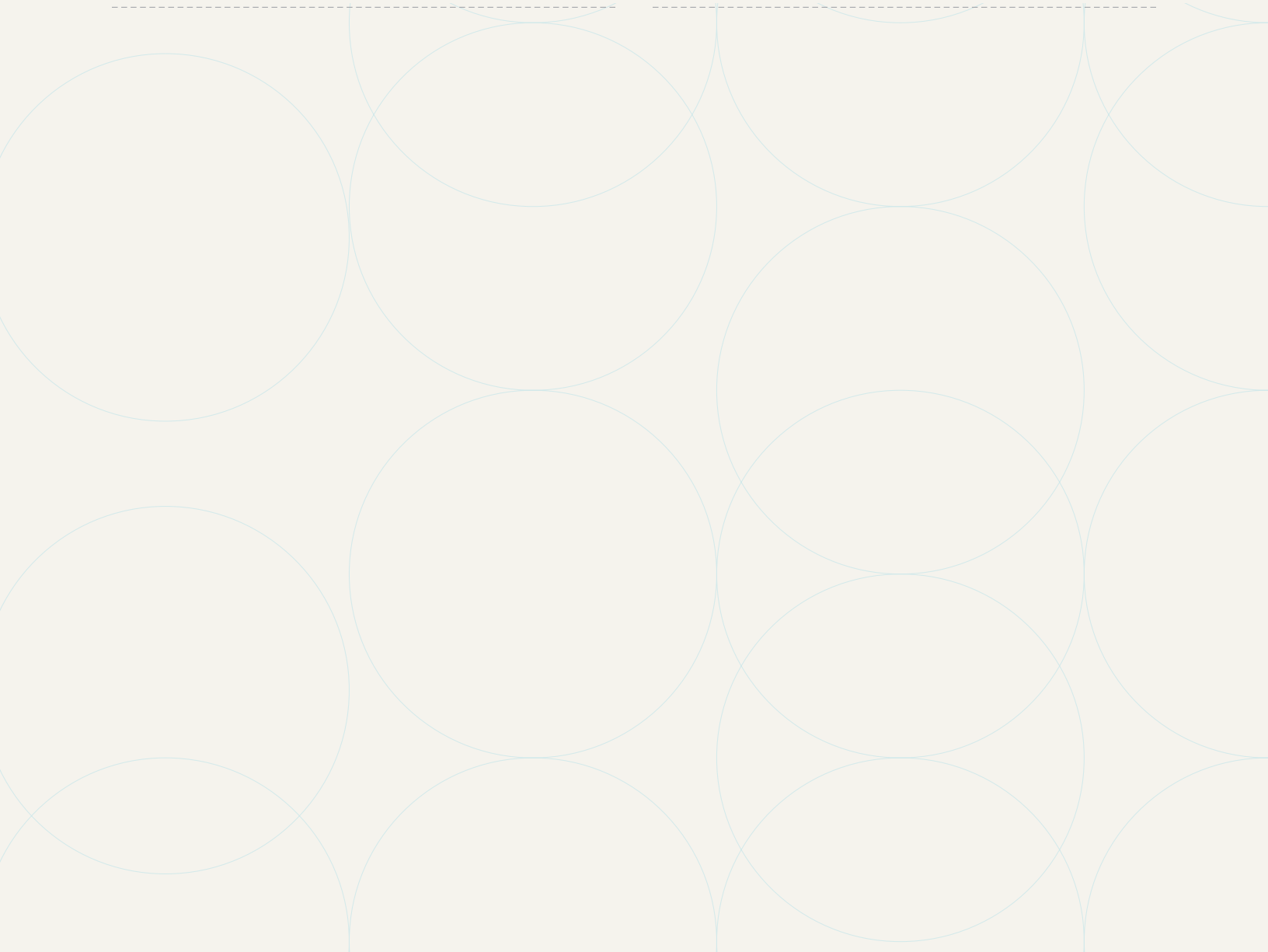
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EXECUTIVE SUMMARY

Vaccines provide higher education institutions with a cost-effective public health intervention to reduce transmission of infectious diseases, which is particularly important in high-risk campus environments like cramped dormitory-style living spaces and crowded classroom and social gathering spots.

However, even before the COVID-19 pandemic, many college and university students in the United States had not received all the recommended vaccines, endangering their health and that of the communities in which they reside and travel to, with disease outbreaks (such as mumps) becoming more common. Many higher education institutions grapple with how to best implement immunization guidelines. The COVID-19 pandemic, and the subsequent development of vaccines against SARS-CoV-2, further underscored the value of strong vaccination policies at higher education institutions.

While increasing vaccination rates at higher education institutions is vital, many challenges to achieving this exist. First, students who could be vaccinated may face barriers, such as limited experience making personal health decisions, limited knowledge about vaccines, beliefs that hinder vaccine uptake and difficulty accessing vaccines. Second, institutions have variable vaccine requirements and strategies to enforce those requirements. Finally, college health administrators face challenges, such as the high cost of storing and delivering vaccines and varying levels of institutional support.

At the same time, higher education institutions are in a unique position to affect lifelong health behaviors that benefit individual students while also improving the day-to-day health of those on their campus and in neighboring communities. Many college and university students will be making their own health decisions for the first time. Providing opportunities for students to catch up on vaccines can have the direct effect of preventing outbreaks while also encouraging students to adopt health-promoting behaviors that will follow them through the rest of their lives. Likewise, taking proactive steps to boost student vaccination levels can help institutions prevent outbreaks and improve the health of their broader communities.

This *Evidence to Action* brief reviews the challenges faced by higher education institutions in addressing low vaccine uptake rates and responding to infectious disease outbreaks. The brief summarizes evidence from both before and during the COVID-19 pandemic, considering routine vaccinations as well as the COVID-19 vaccine. It then lays out recommendations for college and university health administrators to strengthen vaccine uptake among students. As the country emerges from the COVID-19 pandemic, the time is ripe to implement long-term strategies and investments to improve health on campuses and within their broader communities.



BACKGROUND

Higher education settings pose unique infectious disease risks to students. Dormitory living conditions and social behaviors common in this population, including alcohol consumption, sharing drinks and utensils, sexual activity, and smoking, as well as academic and career decisions related to international travel, laboratory research, or health care work, are potential factors contributing to the transmission of infectious diseases.¹ Even before the COVID-19 pandemic, higher education institutions across the U.S. were experiencing outbreaks of vaccine-preventable diseases. Between January 2013–May 2018, there were 10 meningococcal disease outbreaks across seven states, and 75 mumps outbreaks were documented between January 2016–June 2017.²

The Advisory Committee on Immunization Practices (ACIP) at the Centers for Disease Control and Prevention (CDC) provides vaccine recommendations and schedules for use in the U.S. (see page 5). These recommendations are also endorsed by the American College Health Association (ACHA).



Recommended vaccines for adolescents and young adults

Below are the recommendations from the CDC's Advisory Committee on Immunization Practices (ACIP). These guidelines inform the American College Health Association (ACHA) and college immunization requirements, but institutional policies are also shaped by state immunization laws and employee health policies.

Centers for Disease Control and Prevention (CDC) Recommended Vaccinations for Preteens and Teens (7–18 years)³

- COVID-19
- Hepatitis A
- Hepatitis B
- Human Papillomavirus (HPV)
- Influenza
- Measles, Mumps, Rubella (MMR)
- Meningococcal ACWY
- Meningococcal B
- Pneumococcal
- Poliovirus
- Rotavirus
- Tetanus, Diphtheria, Acellular Pertussis (Tdap)
- Varicella (Chickenpox)

Centers for Disease Control and Prevention (CDC) Recommended Vaccinations for Adults (19–26 years)⁴

- COVID-19
- Hepatitis A
- Hepatitis B
- Human Papillomavirus (HPV)
- Influenza
- Measles, Mumps, Rubella (MMR)
- Meningococcal ACWY*
- Meningococcal B*
- Pneumococcal*
- Tetanus, Diphtheria, Acellular Pertussis (Tdap)
- Varicella (Chickenpox)

*Based on risk factors or shared clinical decision-making



HIGHER EDUCATION ADMINISTRATORS FACE MANY CHALLENGES IN BOOSTING VACCINATION RATES AMONG STUDENTS



MISSED VACCINATIONS IN ADOLESCENCE CONTRIBUTE TO UNDER-VACCINATED STUDENT POPULATIONS



STUDENTS HAVE LIMITED ENGAGEMENT IN DECISIONS THAT AFFECT THEIR HEALTH



LIMITED KNOWLEDGE AND STUDENT BELIEFS ABOUT VACCINES MAY HINDER VACCINE UPTAKE



STUDENTS FACE LOGISTICAL AND FINANCIAL BARRIERS IN ACCESSING VACCINES



HIGHER EDUCATION INSTITUTIONS VARY WIDELY IN THEIR VACCINE REQUIREMENTS AND MAY NOT INCLUDE ALL RECOMMENDED VACCINES



HIGHER EDUCATION INSTITUTIONS STRUGGLE TO IMPLEMENT AND ENFORCE VACCINATION REQUIREMENTS



VACCINE PROGRAMS CAN BE COSTLY AND DIFFICULT TO ADMINISTER

! MISSED VACCINATIONS IN ADOLESCENCE CONTRIBUTE TO UNDER-VACCINATED STUDENT POPULATIONS

Many routine vaccines are administered in early childhood, but not all children are vaccinated, particularly when their parents are vaccine hesitant.⁵ Available evidence shows that vaccine requirements have been associated with higher vaccination coverage among children and adolescents. All 50 states require some vaccines for school entry in K–12 settings. However, 44 states allow for religious exemptions and 15 states allow exemptions for philosophical reasons, which has contributed to under-vaccination.^{6,7}

For vaccinations recommended during adolescence, vaccine uptake is often insufficient. The CDC's National Immunization Survey (NIS) assesses the state of vaccination coverage for teens 13 to 17 years of age nationwide. The 2021 survey found 60% of adolescents were estimated to have received two doses of the Meningococcal ACWY (MenACWY) vaccine to reduce the risk of meningococcal outbreaks on campus, and 62% had received all doses of the human papillomavirus (HPV) vaccine to reduce the future risk of cervical, oral and anogenital cancers (the latter affecting both adult men and women).⁸ In a survey of college students conducted by ACHA in 2019, 60% reported receiving the HPV vaccine.⁹ The ACHA survey reported higher rates for MenACWY (72%) than the NIS. This may reflect lack of specificity about one or two doses or the fact that it focuses on youth in college, for whom one would anticipate higher MenACWY vaccination rates.

There are many reasons for this low uptake, including a lack of primary care follow up, provider recommendation practices, and low acceptability among parents and teens.¹ Gaps in vaccine uptake among adolescents, particularly the HPV and MenACWY vaccines, also reflect significant disparities.¹⁰ For example, obese female adolescents are less likely to receive the HPV vaccine than their nonobese peers, consistent with other findings that obesity is associated with a lower likelihood of receiving recommended preventive health services.¹¹ Among adolescents, male patients have had lower uptake and completion rates of the HPV vaccine based on race and insurance, compared to their female counterparts, despite the measurable risk of oral and anogenital cancers later in adulthood and the immediate risks to potential sexual partners.^{12,13} This trend continues into the college years. HPV vaccine uptake remains low among male and female college students, and non-Hispanic Black college students had lower rates of uptake over time than non-Hispanic White students.¹⁴

International students may be under-vaccinated if vaccines were not available or difficult to access in their home countries, which may be particularly important for institutions with a large proportion of international students. For instance, Chinese international students have lower rates of HPV vaccination than U.S. college populations. This could be related to later approval of the HPV vaccine in China (2016), and knowledge of HPV and HPV vaccines among Chinese college students in the U.S. has been low.¹⁵

Students across a variety of undergraduate settings described low perceived risk from seasonal influenza, expressing beliefs such as “I do not believe I am in danger of contracting the flu,” “I don’t think flu is a serious threat to my health,” and “[I] don’t need the [vaccine] because I’m healthy.”



STUDENTS HAVE LIMITED ENGAGEMENT IN DECISIONS THAT AFFECT THEIR HEALTH

Many teens and young adults do not take an active role in their own health decisions. Teens often consider themselves passive participants in conversations about vaccinations even when included by parents and clinicians.¹⁶ Most adolescents report feeling anxious about making health-related decisions and indicate that parents have the most influence over whether they get vaccinated.¹⁷ While this does not apply to all students (and it is unclear to what extent COVID-19 may have changed adolescents’ engagement in vaccine decision-making), this lack of participation may inhibit students’ uptake of vaccines.

A lack of personal decision-making as a teen may carry over into the undergraduate years. In a Children’s Hospital of Philadelphia (CHOP) research study that relied on interviews with a small group of undergraduate students (n=33), most stated that they still strongly value their parents’ input concerning vaccine decisions.¹⁸ These findings were similar to other studies that indicated parent and family opinions play a significant role in determining whether college students choose to receive specific vaccines, such as HPV and influenza vaccines.^{19–21} For example, women* in college were more likely to complete the HPV vaccine series when they engaged in a joint mother–daughter decision rather than a self-only or parent-only decision.²²



LIMITED KNOWLEDGE AND STUDENT BELIEFS ABOUT VACCINES MAY HINDER VACCINE UPTAKE

College students may have little knowledge about vaccines in general and, more specifically, about vaccines recommended or required by schools.¹⁸ Several studies have demonstrated a lack of knowledge about specific vaccines, such as the HPV and seasonal influenza vaccines.^{19,21,23,24}

For example, students across a variety of undergraduate settings described low perceived risk from seasonal influenza, expressing beliefs such as “I do not believe I am in danger of contracting the flu,” “I don’t think flu is a serious threat to my health,” and “[I] don’t need the [vaccine] because I’m healthy.”^{25–29} In CHOP research conducted prior to the COVID-19 pandemic, students and university administrators both reported low perceived risk for vaccine-preventable disease outbreaks.^{18,30} These factors may contribute to a low prioritization of vaccines, even though many students report generally positive attitudes toward vaccines.^{18,23,26}

Some students also express vaccine hesitancy and fear related to vaccines. In surveys conducted across a variety of undergraduate settings, many students reported beliefs that influenza vaccines could give someone influenza and that the influenza vaccine was ineffective.^{24–26,28,29,31} Students, even some who received HPV vaccines, have also expressed concerns about HPV vaccine safety.¹⁹

Many of these beliefs were echoed in early literature surrounding COVID-19 vaccines. Students described fears about unknown side effects, getting COVID-19 from the vaccine, fear of needles and a belief that vaccines would be ineffective.³² In addition, surveys have indicated detrimental effects from the politicization of COVID-19 vaccines. Some students have expressed religious opposition, concerns stemming from negative media coverage and distrust of the U.S. government. These type of concerns can play out disproportionately across different communities by race or political affiliation.^{33,34,35}

* The term “women” is reflective of language used by the authors of the study cited. It’s important to note that this terminology may not be inclusive of all gender identities included in the study.



STUDENTS FACE LOGISTICAL AND FINANCIAL BARRIERS IN ACCESSING VACCINES

To get vaccines, students must be able to easily access locations that provide them. While many higher education institutions have health centers, not all do, and there is incomplete information on the role that health centers play in providing vaccination services and whether they offer all recommended vaccines. Furthermore, in CHOP's research that surveyed college students, many stated that they had not previously used school health services.¹⁸

Student health centers often provide a wide range of vital services, including routine lab testing, nutrition counseling and screening for sexually transmitted infections. Many students report positive interactions with campus health centers and the broader supports offered by student health services (such as health information from flyers and health promotion events).³⁵⁻³⁷ At the same time, reports from students and interviews with college and university health leaders reveal that some centers have had concerning rates of misdiagnosis, challenges with patient safety, low staffing levels and insufficiently credentialed staff.³⁸ There is little oversight of student health centers as most are not licensed by states and there are no national regulations that govern them. Indeed, only about 220 colleges and universities nationwide have accredited health centers.³⁸

Out-of-pocket costs for vaccines may present another barrier for students. If vaccines are not covered by the school or insurance, or there is uncertainty about what insurance covers, students may be less likely to get them. As an example, students have stated that they would be much more likely to get vaccinated against HPV if the vaccine was free.³⁶⁻³⁸ However, many schools fund their health services largely through student health fees, relying on state funding, insurance billing, out-of-pocket charges or a combination of these to make up the difference.^{19,39}

In a CHOP review of vaccine requirements available on 216 college websites, 187 schools offered vaccines at their student health centers, but only 68.5% of these health centers accepted insurance.¹⁹ Additionally, student health centers are less likely to accept public insurance, such as Medicaid, raising significant concerns about equity for students who depend on this program (such as some low-income students and former foster youth).⁴⁰ Health centers may also cover some services only if a student has university-sponsored insurance, which may contribute to differential access for students who waive this coverage, such as students who remain on their parents' plans and may have high cost-sharing.³⁶

Uninsured students may be especially dependent on student health centers if they lack other affordable places to receive care. Related to international students, supporting them to receive required and recommended vaccines raises financial and equity issues regarding what burden the institution should shoulder versus the students. In short, out-of-pocket costs may pose a barrier for both insured and uninsured students and student health centers may support vaccine delivery but are not the only mechanism through which vaccines can or should be provided.

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HIGHER EDUCATION INSTITUTIONS VARY WIDELY IN THEIR VACCINE REQUIREMENTS AND MAY NOT INCLUDE ALL RECOMMENDED VACCINES

While all 50 states require some vaccines for entry into K–12 schools, fewer states specify requirements for students who attend institutions of higher learning. In a study that examined requirements in 34 states, most of these requirements relate specifically to hepatitis B and meningococcal vaccines, though some states also require other routine vaccinations.³⁹ Individual higher education institutions are often primarily responsible for deciding whether to require vaccines.

In the CHOP study mentioned on page 9 that analyzed college and university websites, researchers abstracted information to determine which vaccines are required at each institution (Figure 1).⁴¹ There was significant variability in vaccine requirements across schools, with many institutions requiring few or no vaccines. While the MMR vaccine was most commonly required (about 88% of institutions), none required HPV or influenza vaccines. While not reflected in the study findings, it is worth noting that some institutions also differ on requirements based on living situation, requiring vaccines for students in congregate living and not for commuters.

The sizeable proportion of institutions that did not require an MMR vaccine (12%) is concerning, particularly given the transmissibility of these three diseases. Measles, among the most contagious of infectious diseases, requires very high levels of population immunity to prevent transmission. Recent measles outbreaks in the U.S. demonstrate the vulnerability of under-immunized communities.^{1,39} Further, the increase in the frequency of mumps

outbreaks in university settings also underscores the importance of vaccine requirements.⁴² Other studies have similarly identified wide variation and limitations in college and university requirements for the MMR and varicella vaccines.^{1,43}

Also of particular concern are requirements, or lack thereof, related to meningococcus. The college setting is known to be a fertile ground for this bacterium. MenACWY, one of two vaccines for meningococcus, was the second most-required vaccine, but only about half of campuses required it (52%). Further, a second meningococcal vaccine, MenB, was the least-frequently required, despite that MenB is the dominant circulating strain nationally among college-age youth.⁴⁴ Many students are likely to end up on college campuses remaining susceptible to meningococcus. Given the devastating effects of bacterial meningitis and the recent history of meningococcal outbreaks on college campuses, these data are disheartening.

In the 2021–2022 school year, approximately 680 higher education institutions required COVID-19 vaccines for students.⁴⁵ However, as the pandemic evolved, higher education policies did as well, with some institutions subsequently dropping their mandates or updating their policies related to booster dosing.⁴⁶ The pandemic also affected higher education institutions in other ways, with some institutions requiring the influenza vaccine for the first time for students (note that the data reflected in Figures 1 and 2 are from before the pandemic) in the context of their COVID-19 requirements.



HIGHER EDUCATION INSTITUTIONS STRUGGLE TO IMPLEMENT AND ENFORCE VACCINATION REQUIREMENTS

CHOP's research also revealed that some institutions lack vaccine policy enforcement strategies, which may limit accountability for adherence to vaccine requirements.² In the 216 college and university websites examined, 17% of schools had no published enforcement strategy for vaccine requirements (Figure 2). Those using enforcement strategies most commonly mentioned the following mechanisms: housing holds, registration holds and, in the most stringent cases, fines and/or being removed from courses. A separate survey conducted among ACHA member schools reported similar enforcement strategies.² However, there is currently little evidence to support the effectiveness of these strategies for promoting vaccine compliance. Further research

in this area is recommended, and it is possible that lessons will emerge from research into the COVID-19 pandemic.

Furthermore, schools that have a significant mix of students who commute or do not live on campus may have less leverage with these students who are not in university-supported congregate living. While a difference in risk hasn't been elucidated, these students, and potentially their parents, may have differences in perceived risk related to vaccine-preventable diseases.

Figure 1

VACCINE REQUIREMENTS OF 216 INSTITUTIONS AS LISTED ON COLLEGE/UNIVERSITY WEBSITES AS OF 2018¹

NUMBER OF VACCINES REQUIRED	NUMBER OF INSTITUTIONS (%)
At least one	203 (94%)
Three or more	104 (48%)
More than state policy required	140 (65%)

TYPES OF VACCINES REQUIRED	NUMBER OF INSTITUTIONS (%)
HPV	0
Influenza	0
Meningococcal ACWY	112 (51.9%)
Meningococcal B	2 (0.93%)
MMR	191 (88.4%)
Tdap (tetanus, diphtheria and pertussis)	54 (25%)
Varicella (chickenpox)	58 (27%)

Figure 2

VACCINE ENFORCEMENT STRATEGIES AT 216 INSTITUTIONS AS LISTED ON COLLEGE/UNIVERSITY WEBSITES AS OF 2018¹

ENFORCEMENT STRATEGIES	%
Registration hold	67.1%
Housing restriction	14.8%
May not attend class	5.1%
Monetary fine	5.1%
None listed	17.1%
Other*	11.1%

* Includes dismissal of students from school or placing a health hold that prevents students from accessing other services at the student health center

\$ VACCINE PROGRAMS CAN BE COSTLY AND DIFFICULT TO ADMINISTER

Higher education administrators may struggle to meet students' vaccine needs because of high costs associated with vaccine administration. The procurement, storage, and tracking of vaccines at student health services may require additional personnel and staff training, incurring a high cost for universities.

Implementing new vaccine policies is an added barrier since there may be unanticipated costs of purchasing and storing vaccines along with the cost of setting up and running vaccine clinics. Ongoing maintenance of vaccine supplies, records, monitoring rates, quality assurance and development of billing practices may be significant additional costs to consider if the infrastructure does not exist.



WHY HIGHER EDUCATION INSTITUTIONS SHOULD PRIORITIZE VACCINATION



THE HEALTH OF STUDENTS, STAFF AND BROADER COMMUNITIES IMPROVES WITH HIGHER VACCINATION RATES



INCREASED VACCINATION RATES CAN HELP REDUCE THE LIKELIHOOD AND COST OF INFECTIOUS DISEASE OUTBREAKS



HIGHER EDUCATION INSTITUTIONS CAN ENCOURAGE STUDENTS TO BE PROACTIVE ABOUT THEIR HEALTH



THE HEALTH OF STUDENTS, STAFF AND BROADER COMMUNITIES IMPROVES WITH HIGHER VACCINATION RATES

Illness can cause significant harm to physical and mental health and well-being. College students who experienced university-based mumps outbreaks have described significant stress related to isolation, academics and missing out on campus activities, highlighting the importance of preventing outbreaks through vaccination.⁴⁵ While research continues to emerge, the COVID-19 pandemic also caused well-reported harms to student mental health, with students often citing fear of infection for themselves and loved ones alongside the impact of academic and life disruption.^{2,47} Higher rates of vaccination among student populations can help protect students and school staff. For instance, influenza vaccinations have been associated with significant reductions in missed class days, missed work days and academic impairment among students.¹

Students also are typically not isolated to campus—they interact with members of local communities and travel frequently, such as over breaks or to study. This also looks different for commuter students. As a result, infections among students may ripple out to broader communities. During the COVID-19 pandemic, death rates in communities home to colleges and universities rose faster than in communities in other parts of the nation.⁴⁵ Across the country, there were tensions between students and local residents over campus outbreaks and campuses were viewed as a source of infection for communities.² As such, preventing campus outbreaks can help protect the broader community while also improving institution-community relations.

↓ INCREASED VACCINATION RATES CAN HELP REDUCE THE LIKELIHOOD AND COST OF INFECTIOUS DISEASE OUTBREAKS

A highly vaccinated student population can also help reduce the monetary and nonmonetary costs associated with infectious disease outbreaks, which pose enormous challenges to higher education administrators. Administrators who experienced mumps outbreaks on campuses highlighted difficulties enforcing exclusion policies, including problems finding housing for exempted students and preventing infected students from attending classes and campus activities.⁴⁸

Responding to outbreaks is also very expensive. While costs can vary widely, responding to serogroup B meningococcal disease outbreaks have cost colleges and universities anywhere from \$50,000 to over \$1 million.⁴⁹ During the 2020 and 2021 fiscal years, U.S. colleges and universities suffered an estimated \$24 billion in losses from COVID-19-related expenses alone, with a further \$85 billion estimated loss in revenues (Figure 3).⁵⁰

💡 HIGHER EDUCATION INSTITUTIONS CAN ENCOURAGE STUDENTS TO BE PROACTIVE ABOUT THEIR HEALTH

While many students still rely heavily on their parents for health decisions, interviews and surveys have also shown that some adolescents and young adults are taking increasing responsibility for their own health decisions, including preventive health behaviors.⁵¹ In interviews with undergraduate students conducted by CHOP and the Philadelphia Department of Public Health, most students viewed health providers as their most-trusted source of vaccine information and many had positive views of vaccines in general, particularly required vaccines.⁵² In 2021, nearly 75% of youth aged 14–24 stated they intended to get the COVID-19 vaccine, and reports emerged of youth defying their parents to get vaccinated.^{2,53} Many young adults wish to make positive health decisions and higher education institutions have a unique opportunity to help students gain self-efficacy in managing their health.



Figure 3

DISEASE OUTBREAKS AT COLLEGES CAN BE COSTLY

Cost of response to a serogroup B meningococcal outbreak for colleges and universities:

\$50,000 to over \$1 million.⁴⁹

Estimated loss for U.S. colleges and universities from COVID-19-related expenses (during 2020 & 2021):

\$24 billion⁵⁰

Estimated loss in revenue for U.S. colleges and universities due to COVID-19:

\$85 billion⁵⁰



WHAT HEALTH AND SCHOOL ADMINISTRATORS CAN DO TO INCREASE VACCINATION RATES

While the following menu of recommendations is tailored to administrators at higher education institutions, these institutions can best serve their students, and the public at large, with support from a range of stakeholders. K-12 education systems are already playing a strong role in ensuring that children and teens receive recommended vaccinations, while also being an important source of health information throughout childhood. Health care providers play a vital role in encouraging vaccinations throughout childhood, but also have an important opportunity when it comes to preparing youth for the transition to adult care. State policymakers can support higher education institutions by implementing vaccine requirements and providing funding.

Where available, the recommendations that follow also include examples of innovation and leadership on these issues at higher education institutions.



STRENGTHEN AND EVALUATE VACCINE REQUIREMENTS



EDUCATE STUDENTS ABOUT VACCINE REQUIREMENTS IN A CONTEXT AND FORMAT THAT BALANCES HEALTH EQUITY AND HEALTH LITERACY



INVEST IN STUDENT HEALTH CENTERS AND QUALITY IMPROVEMENT INITIATIVES



UTILIZE DATA-DRIVEN APPROACHES AND IMPROVED DATA TRACKING SYSTEMS TO REDUCE COSTS



ESTABLISH EXTERNAL PARTNERSHIPS TO HELP DELIVER VACCINES



ENSURE THAT VACCINATION-RELATED COMMUNICATIONS LEVERAGE EVIDENCE-BASED BEST PRACTICES AND STUDENT VOICES



ADDRESS VACCINE HESITANCY BY PROVIDING VACCINE EDUCATION TO STUDENTS AND PARENTS



DEVELOP OUTBREAK PLANS THAT INCLUDE VACCINE INTERVENTIONS

STRENGTHEN AND EVALUATE VACCINE REQUIREMENTS

The ACHA recommends that institutions require the vaccines listed in its “Immunization Recommendations for College Students.”⁵³ Because the recommended vaccines for college students prevent diseases that are communicable in congregate living, group dining, classroom, or social settings, implementing vaccine requirements can help institutions reduce the risk of outbreaks. This would also be consistent with public health standards for similar communal living arrangements such as military barracks or nursing home facilities. To further strengthen their requirements, higher education institutions should consider ending nonmedical exemptions for required vaccines.

However, there is also a need to build the evidence base for the effectiveness of vaccine mandates in driving vaccine uptake in higher education settings. Administrators could partner with researchers to evaluate efforts that introduce and implement requirements. Separate evaluations of enforcement strategies comparing enrollment restrictions with more focused requirements related to housing or participation in specific activities, like many that were implemented during the COVID-19 pandemic, would also be of value.

EDUCATE STUDENTS ABOUT VACCINE REQUIREMENTS IN A CONTEXT AND FORMAT THAT BALANCES HEALTH EQUITY AND HEALTH LITERACY

When enforcing requirements, higher education institutions should ensure that all students understand the role of required and recommended vaccines in working towards improved health for the college and local community. Students should understand the benefits of immunizations for themselves, their family, other members of the school community, and people they may encounter through travel, volunteer efforts or work activities.

Access to required vaccines can be especially challenging for international students, who may have had limited access to vaccines in their home countries, different vaccine requirements or schedules, or for whom documentation may be different or require translation.⁵⁴ Other student groups who may benefit from targeted outreach and education include those who are immune compromised or have other special health needs and those who will be traveling internationally as part of the college experience.

In the context of emerging infectious disease threats, higher education institutions should also be prepared to offer targeted support to student populations who appear to be at the highest epidemiological risk. This will require efforts to promote inclusiveness well before an outbreak or public health emergency. For instance, when mpox[†] emerged as a global health threat in 2022, transgender, gay, bisexual and other men who have sex with men accounted for the majority of cases.⁵⁵ Experts dedicated to gay and bisexual men’s health described frustration at neglect of the disease spread and poor communication about how to address it, which was often believed to stem from well-intentioned efforts to avoid stigmatization. Students who are members of marginalized communities may have the most to gain from targeted vaccination and health literacy campaigns.

Higher education institutions can roll out strong communication to emphasize the role of individual health decision-making in achieving healthier communities. They can build robust and effective outreach strategies related to vaccination by making them part of orientation, community-building events and school spirit initiatives, as well as by ensuring that incoming students have early and clear information about pre-matriculation requirements. Communication initiatives should also include clear, updated information about how to acquire vaccines on campus or in the surrounding community, and they should be accessible to students in a variety of modalities. Outreach and public education initiatives benefit from being student-driven as much as possible with messaging strategies that are current and evidence-based.^{17,18}

* As discussed, these include all vaccines recommended by the Advisory Committee on Immunization Practices for teens and young adults.

† Formerly known as monkeypox

For many college students, vaccination may be the first opportunity to make a health care decision independent from their parents, creating a unique opportunity for colleges and universities to play a critical role in supporting informed health care decision-making among the next generation of adults.

Despite relatively high levels of education, many college students have limited health literacy and digital health literacy skills.^{‡,56} Institutions can support students' emerging digital health literacy skills while improving access and acquisition of vaccines by utilizing digital tools that can educate, schedule visits, communicate reminders and store health data. For many college students, vaccination may be the first opportunity to make a health care decision independent from their parents, creating a unique opportunity for colleges and universities to play a critical role in supporting informed health care decision-making among the next generation of adults.



INVEST IN STUDENT HEALTH CENTERS AND QUALITY IMPROVEMENT INITIATIVES

Student health centers support the mission of higher education institutions in many ways, yet they are often not well-supported or well-integrated with other parts of the institution. Like other parts of the health care system, student health centers faced enormous stress and constraints throughout the COVID-19 pandemic. College health leaders described staff shortages and burnout as they cope with continued issues from COVID-19, surges in demand from delayed preventive care and a student mental health crisis.^{30,57} Even for schools with established student health centers, more can be done. For instance, silos often exist between student health, academic, and administrative offices, leading to inconsistent messaging around important health topics like vaccines. One example where this is often seen is in insufficient communication related to matriculation requirements.

Higher education institutions with student health centers may seek accreditation to improve the quality of their services. While there is limited evidence on the effects of accreditation in campus health centers specifically, accreditation in other ambulatory care settings has led to improved health outcomes and equity, as well as lower costs.⁵⁸ These improvements to student health centers may help elevate the delivery of all services, including vaccine administration, and increase student trust.

Health administrators can also consider training and quality improvement initiatives related to vaccinations.⁵⁹ For instance, New York University hosts the National College Health Immunization Collaborative, a multi-center learning collaborative focused on increasing influenza, HPV and MenB vaccination rates.⁶⁰ Student health centers commit to having at least one staff member join eight remote learning sessions and take asynchronous learning modules. In an evaluation of the cohort from the 2017–2018 academic year, 45 institutions had higher influenza and HPV vaccination rates post-intervention.⁶¹

Finally, student health centers should have public health emergency preparedness plans in place and practice them. In a 2019 report from the Accreditation Association for Ambulatory Health Care (AAAHC), 11% of 64 college and university health center sites surveyed were not conducting scenario-based drills.⁶² The AAAHC recommends that such drills be conducted at least quarterly. Administrators can support these efforts by ensuring that health centers have time dedicated to quality improvement and practice, including for disease outbreaks.

‡ Health literacy refers to “the degree to which individuals can obtain, process, understand, and communicate about health-related information needed to make informed health decisions.” Digital health literacy refers to the ability to understand, navigate and act on health information from digital sources.



UTILIZE DATA-DRIVEN APPROACHES AND IMPROVED DATA TRACKING SYSTEMS TO REDUCE COSTS

As part of the needed investment in student health centers, investing in an electronic medical record (EMR) has been shown to facilitate immunization tracking and yield a tremendous return. High-quality EMRs include a patient portal that allows easy data entry and interfaces with state immunization registry databases. Having the ability to rapidly generate a report of unimmunized individuals is critically important as matriculation deadlines approach, or to quickly identify and support vulnerable persons in the event of an outbreak or public health emergency.⁶³

With EMRs, student health centers can easily integrate alerts on vaccine initiation. A pilot study at the University of Utah found that EMR alerts improved HPV vaccine initiation rates among college-aged males.⁶⁴ Johns Hopkins University similarly achieved increased HPV vaccination rates across their young adult student body after implementing a strategic toolkit that included EMR prompts.⁶⁵



ESTABLISH EXTERNAL PARTNERSHIPS TO HELP DELIVER VACCINES

Partnerships with key stakeholders, including local and state public health departments and local hospitals, can help higher education institutions overcome barriers to vaccine delivery. In CHOP interviews with college and university health administrators (n=10), respondents cited partnerships with other school departments, pharmaceutical companies, immunization coalitions and health care providers as facilitators of college vaccine programs.⁶⁶ These partnerships generally centered around bringing vaccines to campuses that were unable to administer them alone, including implementation of mass vaccination and mobile clinics.

For example, Colorado Christian University (a small, private undergraduate institution) partnered with a local pharmacy in a pilot project to offer influenza vaccinations.⁶⁷ More students were vaccinated at the clinic during the five hours it was open than at the university health center during the entire influenza season. However, the pharmacy encountered difficulties processing payments from some students' health insurance plans, meaning that 15% of the total cost was absorbed by the pharmacy. While this model is promising, higher education institutions and their partners will need to consider how to cover such funding gaps.



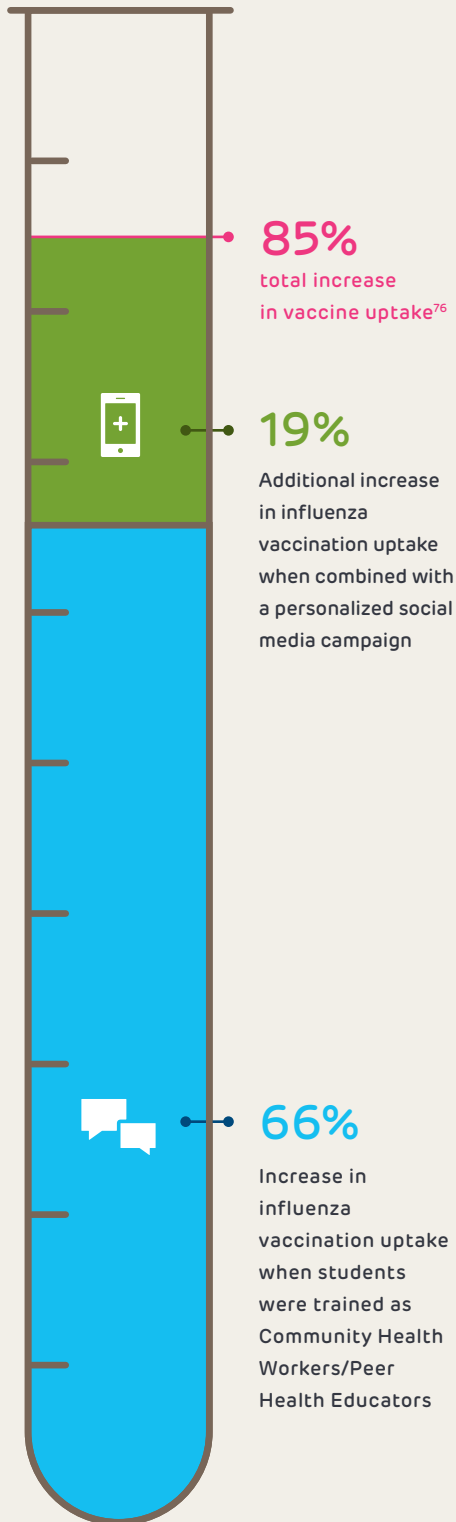
ENSURE THAT VACCINATION-RELATED COMMUNICATIONS LEVERAGE EVIDENCE-BASED BEST PRACTICES AND STUDENT VOICES

A strong communication strategy to increase visibility and facilitate access to vaccinations among students is important, and there are a number of approaches that institutions can take. Florida State University and Georgia Southern University implemented campaigns utilizing signage, website information, and social media posts to promote HPV vaccinations and influenza clinics, respectively.^{68,69} The University of Georgia used signage, emails, and social media to promote influenza mobile clinics, learning that emails were the most-effective method of communication.⁷⁰ All of these universities achieved increased vaccination rates after the interventions.

Partnerships with key stakeholders are generally centered around bringing vaccines to campuses that were unable to administer them alone, including implementation of mass vaccination and mobile clinics.

Figure 4

INCORPORATING STUDENT VOICES IN MESSAGING CAMPAIGNS CAN HAVE A POSITIVE EFFECT ON VACCINE UPTAKE⁷⁶



When possible, higher education institutions might incorporate evidence-based theories of behavior change and social marketing within messages and campaigns. For instance, the University of Georgia initiative applied the “4 Ps” principle of effective marketing (addressing product, price, place and promotion) in its multimodal outreach campaign. Highlighting the positive effects of vaccination on others may also be effective in messaging. In surveys, students have indicated that they would be more likely to get an influenza vaccine if they were informed how their vaccination could protect other at-risk individuals.³⁰ Likewise, students have described reducing viral transmission as a key motivator for both influenza and COVID-19 vaccination.⁷¹⁻⁷³

Institutions can also incorporate student voices to inform and help deliver campaigns. Students can provide unique insights to their peers and social norms can be a powerful motivator for young adults. Students who believed that other young adults were likely to get influenza and COVID-19 vaccines were more likely to express an intention to vaccinate themselves.⁷⁴ This finding echoes earlier research showing that norms-based approaches may encourage HPV vaccine uptake among college-aged women.^{27,28} Undergraduate students have suggested that more inclusive and sex-positive signage and messaging in student health clinics may help promote inclusiveness for LGBTQIA+ students.⁷⁵

Higher education institutions might invite students to participate in campaign creation and also mobilize students as peer messengers. A program at Harvard University that trained undergraduates as Community Health Workers/Peer Health Educators increased influenza vaccination uptake by 66%. When this initiative was combined with a personalized social media campaign, the increase rose to 85% (Figure 4).⁷⁶

Text reminders may also help improve vaccination rates on campus. Randomized controlled trials have shown that text reminders are effective in increasing influenza vaccine uptake among child and adult patients, and more recent research has indicated that text reminders may be effective in encouraging COVID-19 vaccinations.^{32,56,77,78} Institutions can also use incentives as a motivator to increase vaccine uptake, such as gift cards, meal points and swag. There is evidence of these approaches successfully increasing influenza vaccine uptake in the workplace and they could be tailored to the higher education setting with an hypothesized similar outcome.⁷⁹

ADDRESS VACCINE HESITANCY BY PROVIDING VACCINE EDUCATION TO STUDENTS AND PARENTS

Because many students have reported valuing their parents' views on vaccines, institutions might conduct pre-matriculation education to both students and parents. This could help promote acceptance of vaccine recommendations, counter beliefs that may hinder vaccine uptake and increase parental endorsement of institutional requirements. A previous PolicyLab *Evidence to Action* brief, "Addressing Vaccine Hesitancy," describes in detail how improving public vaccine education awareness effectively addresses vaccine hesitancy.⁸⁰

At the same time, the college years present an important opportunity to encourage young adults' own agency about health decisions. As such, post-enrollment education is also vital. Implementing simple educational interventions can promote knowledge about vaccines and influence intent to vaccinate. Four southern Historically Black Colleges and Universities (HBCU) provided five 60-minute lectures to African American female students about the dangers of HPV, the value of HPV vaccination and the subsequent importance of cervical cancer screening.⁸¹ Joliet Junior College, a community college in Illinois, provided a presentation to incoming nursing students about influenza vaccination, which included slides as well as two videos (including one from CHOP's Vaccine Education Center).⁸² Both of these interventions increased knowledge and intention to vaccinate among participants.

DEVELOP OUTBREAK PLANS THAT INCLUDE VACCINE INTERVENTIONS

The COVID-19 pandemic served as a reminder that while higher education administrators are often well-versed in developing emergency plans, it could be beneficial to revisit emergency planning with a focus on a proactive public health response. These plans should include how to collaborate with the local health department to respond to infectious disease outbreaks and how to accommodate students who will need to be isolated. Outbreak plans can also help universities plan for unanticipated expenses and secondary effects.

Outbreak plans would also need to be aligned with communication and education strategies, including how universities will work with media outlets to ensure they have medically accurate and balanced information.⁸³ As with preventive vaccines, universities might utilize a wide range of communication channels. Students surveyed during a MenB outbreak reported receiving information from many sources and they expressed a desire for multiple communication channels, including email, posters and social media.⁸⁴

Institutions can also incorporate student voices to inform and help deliver campaigns. Students can provide unique insights to their peers, and social norms can be a powerful motivator for young adults. Students who believed that other young adults were likely to get influenza and COVID-19 vaccines were more likely to express an intention to vaccinate themselves.⁷⁴

LOOKING AHEAD

As the nation emerges from the COVID-19 pandemic, higher education institutions can seize on the momentum to implement long-term practices to reduce future infectious disease outbreaks on campuses. Given the investment required for many of the approaches laid out in this brief, these institutions will also need to consider how to evaluate their vaccine-related initiatives to determine the most effective use of resources. To this end, they may benefit from partnerships with researchers and quality improvement experts.

The recommendations in this brief, alongside best practices that may continue to emerge from research into the COVID-19 pandemic, are intended to help colleges and universities improve engagement with and education for their student populations, employ the use of vaccinations to improve campus health, guide students to greater self-efficacy in making health-related decisions, and, ultimately, protect the health of those on their campuses and in their neighboring communities.

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Founded in 2008, PolicyLab is a Center of Emphasis within the CHOP Research Institute, one of the largest pediatric research institutes in the country. At PolicyLab, our experience caring for children and families informs our “evidence to action” approach to improving children’s health.

The Vaccine Education Center (VEC) was launched in October 2000 to provide accurate, comprehensive, and up-to-date information about vaccines and the diseases they prevent.

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