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VACCINES

INNOVATIVE VACCINATION INITIATIVES

A STAKEHOLDER CASE STUDY

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IN THIS ISSUE

Driving Public Health Goals: A Look at Successful Innovative Vaccination Initiatives

Routine vaccination as a public health initiative is one of the most cost-effective and successful health care interventions in the population-health arsenal.[1] The benefits of high vaccine uptake are multifaceted and have far-reaching implications because vaccines play a pivotal role in preventing and controlling the spread of infectious diseases within communities.[2] Despite the enormity of evidence that demonstrates the value of life-course immunization (ie, the concept of vaccination providing protection throughout and individual's life), barriers to vaccination persist and vaccination rates remain low for many routinely recommended vaccines.[3] National Health Interview Survey data from 2018 indicate that few adults in the United States have received all age-appropriate vaccines, including those against influenza; pneumococcus; herpes zoster; tetanus; tetanus and diphtheria; tetanus, diphtheria, and pertussis (Tdap); and component vaccines against hepatitis A, hepatitis B, and human papillomavirus (HPV).[3] The survey results revealed that vaccination rates remained low even among individuals who had health insurance and at least 10 physician contacts throughout the year, highlighting the need to incorporate vaccine initiatives into current practice to reduce missed vaccination opportunities.[3]

VACCINATION PROGRAMS AND INITIATIVES

Vaccine-preventable diseases (VPDs) are associated with considerable economic and clinical impact on both individuals and health care systems, as well as increased health care utilization. The treatment of VPDs in adults was associated with an estimated annual expenditure of nearly $27 billion in the United States in 2013, or $35.2 million in 2023 USD.[4,5] (Note: the adjusted number is based only on the dollar amount and do not take into account other factors such as new therapies.) To ensure a healthier future and a sustainable health system, substantial improvements in vaccine uptake are needed to reduce the burden of VPDs.

Innovative programs and vaccination initiatives are necessary to meet the challenge of increased vaccine uptake. Successful programs have demonstrated meaningful increases in vaccination rates among specific populations. For example, during 2019-2021, a pharmacist-led pneumococcal vaccine initiative which targeted patients with cancer in an outpatient oncology clinic setting showed an increase in pneumococcal vaccination rates to 20.2% compared with 6.1% in the control group—an increase of 231%.[6] Results of another program, this time for herpes zoster vaccination in community pharmacies, showed a 224% increase in vaccination rates.[7] Successful vaccination programs tailor messages to their target population, expand access and delivery of vaccines, and utilize a data-driven approach to meet effectiveness goals. All stakeholders, including payers and employer groups, have a vested interest in supporting creative and innovative approaches to vaccination initiatives as a measure of public health.

The success of these programs aids in achieving public health goals set forth by the US Department of Health and Human Services and the National Vaccine Advisory Committee (NVAC).[8] Healthy People 2030 aims to prevent infectious diseases by increasing vaccination rates (**Figure 1**).[9] In addition to maintaining public health, ensuring target populations achieve optimal vaccination rates is a requirement for the Healthcare Effectiveness Data and Information Set (HEDIS) developed by the National Committee for Quality Assurance.[10] Although HEDIS measures are used widely by a variety of commercial, federal, and state entities (including Medicaid and the Children's Health Insurance Program) to evaluate the performance of health care products, programs, and services (**Table**[11-14]), vaccine uptake remains well

(CONTINUED ON PAGE 3)

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below national targets across many populations.[15-18] Understanding the reasons behind these low rates is imperative to increasing vaccination rates.

UNDERSTANDING VACCINATION CHALLENGES

Barriers and challenges to vaccine uptake persist among different age groups and patient populations, contributing to the current suboptimal rates of vaccination. Barriers can vary depending on the type of vaccine and the target population, but they often include lack of access, high out-of-pocket costs, vaccine hesitancy, vaccine misconceptions, lack of education, and fear of immunization pain.[19-21]

RSV

Adults 65 years and older continue to face heightened vulnerability to VPDs, such as respiratory syncytial

Figure 1. Healthy People 2030 Goals Related to Vaccinations[9]

VACCINATION, GENERAL

- Increase the proportion of women who get the Tdap vaccine during pregnancy
- Increase the proportion of adolescents who get recommended doses of the HPV vaccine
- Increase the proportion of individuals who get the influenza vaccine every year

CHILDREN

- Reduce the proportion of children who get no recommended vaccines by age 2 years
- Maintain the vaccination coverage of 1 dose of the MMR vaccine in children by age 2 years
- Maintain the vaccination coverage level of 2 doses of the MMR vaccine for children in kindergarten
- Increase the coverage level of 4 doses of the Tdap vaccine in children by age 2 years

INFECTIOUS DISEASE

- Maintain the elimination of measles, rubella, congenital rubella syndrome, and polio
- Reduce infections of HPV types prevented by the vaccine in young adults
- Reduce the rate of hepatitis A
- Reduce the rate of acute hepatitis B
- Increase the proportion of individuals with vaccination records in an information system
- Increase the proportion of adults 19 years or older who get recommended vaccines

DTaP, diphtheria, tetanus, and pertussis; HPV, human papillomavirus; MMR, measles, mumps, rubella; Tdap, tetanus, diphtheria, and pertussis.

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Table. Select HEDIS Vaccine Measures[11-14]

Measure	Indicator
Prenatal Immunization Status	Influenza
	Tdap
Adult Immunization Status	Influenza
	Tdap
	Herpes zoster
	Pneumococcal
Childhood Immunization Status	DTaP
	Polio
	MMR
	HiB
	Hepatitis B
	Varicella zoster
	Pneumococcal
	Hepatitis A
	Rotavirus
	Influenza

DTaP, diphtheria, tetanus, and pertussis; HEDIS, Healthcare Effectiveness Data and Information Set; HiB, haemophilus influenza type B; MMR, measles, mumps, rubella; Tdap, tetanus, diphtheria, and pertussis.

virus (RSV), due to a combination of waning immunity and a higher prevalence of comorbidities within this demographic.[22] These factors increase the susceptibility of older adults to infections as well as elevate the likelihood of experiencing severe illness.[22] Programs aimed at boosting vaccine coverage rates among adults older than 50 years are limited, leading to suboptimal uptake of vaccines in this age group (**Figure 2**).[22-25] Infants and young children also face an increased susceptibility to VPDs due to an undeveloped and immature immune system; the risk is especially high among those born premature or with weakened immune systems.[26-28]

In May 2023, the FDA approved the first RSV vaccines for adults 60 years and older (Abrysvo; Pfizer) (Arexvy; GSK).[29,30] Prior to the vaccines' approvals, the results of a March 2023 survey revealed that most older adults were not aware of RSV vaccines, with only 35% of those 60 years and older having heard of an RSV vaccine.[31] In August 2023, Abrysvo received FDA approval for use in pregnant individuals at 32 to 36 weeks' gestation to prevent lower respiratory tract disease from RSV infection in infants from birth to 6 months of age.[32] Awareness and educational campaigns will be needed to socialize the launch of these novel RSV vaccines to increase uptake in their target populations.

HPV

More than a decade has passed since the Advisory Committee on Immunization Practices (ACIP) of the CDC recommended routine use of the HPV vaccine in male adolescents in 2011, expanding on its original recommendation for vaccination in female adolescents in 2007.[33,34] Currently, the CDC recommends routine HPV vaccination starting at age 9 years and catch-up vaccination for all individuals through age 26 years. Shared clinical decision-making is recommended for some adults through age 45 years who are not adequately vaccinated.[35] However, despite the public health commitment supporting ACIP's recommendation, coverage for HPV vaccination in the United States remains comparatively lower than that of other vaccines recommended for the same age group.[24] According to data from the 2017 National Immunization Survey-Teen, 88.7% of teens had received at least 1 dose of the Tdap vaccine, and 85.1% had received at least 1 dose of MenACWY (meningococcal ACWY) vaccine between the ages of 13 to 17 years.[36] However, results of the same survey revealed that only 65.5% of adolescents had received at least 1 dose of the HPV vaccine, and just 48.6% completed the HPV vaccine series.[36] These findings highlight a notable disparity, indicating that whereas Tdap and MenACWY coverage rates are high, many teens remain unprotected against HPV infections and HPV-related cancers. According to 2013-2018 data from the National Center for Health Statistics, HPV coverage rates are further eroded among young adults, with only 21.5% of 18-26-year-olds completing the vaccine series.[37]

Five main contributing factors for low HPV vaccination coverage as outlined by NVAC are: (1) differing perspectives on risks of getting an HPV-associated cancer vs the protective benefits offered by receipt of the vaccine, (2) a substantial percentage of adolescents do not regularly visit a primary care provider for preventive care, (3) parental refusal, (4) lack of a strong recommendation from a provider relative to other adolescent vaccines, and (5) lack of HPV vaccine mandates, such as a requirement for school entry (Figure 2).[22-25] Research also has identified parental concerns about the vaccine's cost and impact on their child's sexual behavior as potential barriers to vaccine uptake.[38] Among routinely recommended pediatric vaccines, the HPV vaccine holds the distinction of being the most expensive, at a list price of $286.78 per dose, given in a 2-3-dose series per indication.[39,40] Barriers to adult immunization differ from adolescents and may include a lack of perceived need for the vaccine in a married or monogamous relationship or the perception that their health insurance may not pay for the HPV vaccine.[41] Providing vaccine education to patients and caregivers, ensuring access to immunization, and safeguarding sufficient reimbursement by third-party payers play a pivotal role in facilitating health care providers' sustained ability to provide these vaccines.[24,38,39]

Influenza

Stark inequalities continue to exist in influenza vaccine uptake among racial and ethnic groups.[3,25] During the 2021-2022 influenza season, influenza vaccination coverage was 54% among White adults, whereas coverage for Black adults, Hispanic adults, and American Indian/Alaska Native adults trailed at 42%, 38%, and 41% respectively.[25] Racial and ethnic disparities in influenza vaccination rates stem from a multitude of factors, including limited access to health care and insurance, missed opportunities for vaccination, and misinformation that leads to distrust (Figure 2[22-25]).[22,25] Structural racism and prejudice can exacerbate these disparities, further eroding confidence in influenza vaccination.[42] Mistrust in the medical system in the historical

context of systemic racism, misconceptions about vaccine safety, and heightened concerns about adverse reactions have contributed to lower vaccine coverage among individuals of racial and ethnic minority groups.[22,25] Additionally, these individuals may encounter obstacles to accessing affordable, quality health care, including lack of health insurance, difficulties in reaching health care providers due to transportation limitations, and challenges with child care, all of which perpetuate these inequalities.[25] Programs engineered to build trust and increase access through community-level interventions are needed to reduce disparities in influenza vaccination.

Low vaccine uptake carries considerable implications for both public health and managed care decision makers, reverberating through various dimensions of health care and society as a whole. Implications to public health include increased disease burden, higher rates of morbidity and mortality, and exacerbated inequalities in access to health care.[1,2,25] Managed care decision makers should consider the downstream effects of low vaccine uptake, such as increased health care utilization and potentially avoidable health care costs.[4,6] The consequences of inadequate vaccine coverage underscore the vital role of innovative strategies to promote and ensure widespread vaccine uptake.

OVERVIEW OF INNOVATIVE PROGRAMS

The Community Preventive Services Task Force suggests employing a blend of community-centered strategies to increase vaccination rates within specific populations.[43] These strategies might encompass initiatives to bolster community demand, facilitate vaccination service accessibility, or reduce missed vaccination opportunities by health care providers.[38]

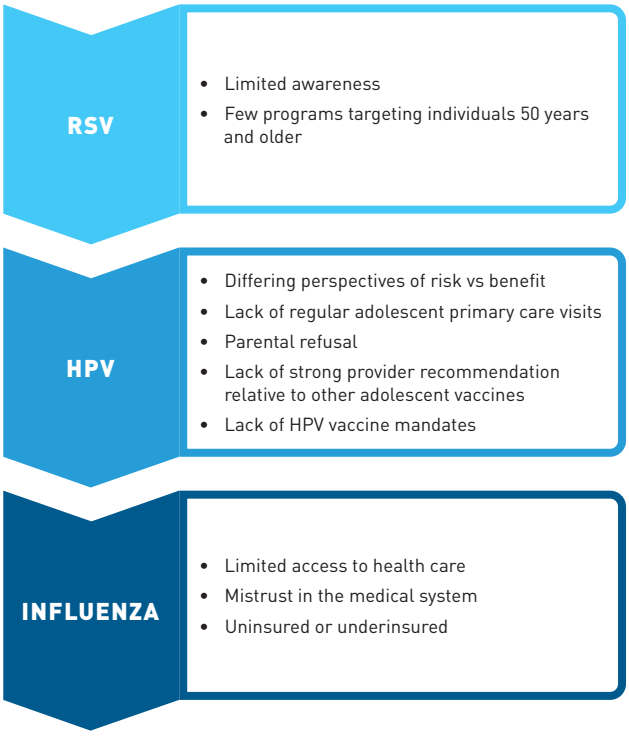
HPV Vaccination NOW: This is Our Moment, an innovative social media campaign by the South Carolina Cancer Alliance and Hollings Cancer Center at the Medical University of South Carolina, achieved success in building confidence in and increasing parental awareness of HPV vaccination in South Carolina through the use of ads with messages vouching for the safety and efficacy of the HPV vaccine.[44] Social media platforms such as Facebook and Twitter were engaged to target parental awareness during the 2019 period of back-to-school medical appointments, reaching more than 33,000 individuals and gaining 1122 followers.[44]

Another example is a study conducted between 2020 and 2021 that tested a new approach involving a household-based outreach program via the use of Epic's MyChart patient portal messages and/or interactive voice response telephone calls. During this period, vaccination for influenza increased by 3.3%.[45] These program examples spotlight the success of novel and inventive approaches to vaccination campaigns.

KEY COMPONENTS OF SUCCESSFUL INNOVATIVE PROGRAMS

These common threads can be identified throughout successful innovative vaccination programs: tailored messaging and communication strategies; creative access and delivery mechanisms; and data-driven approaches and continuous evaluation (**Figure 3**).[25,45,46]

Figure 2. Challenges Associated With Vaccine Uptake by Vaccine Type[22-25]

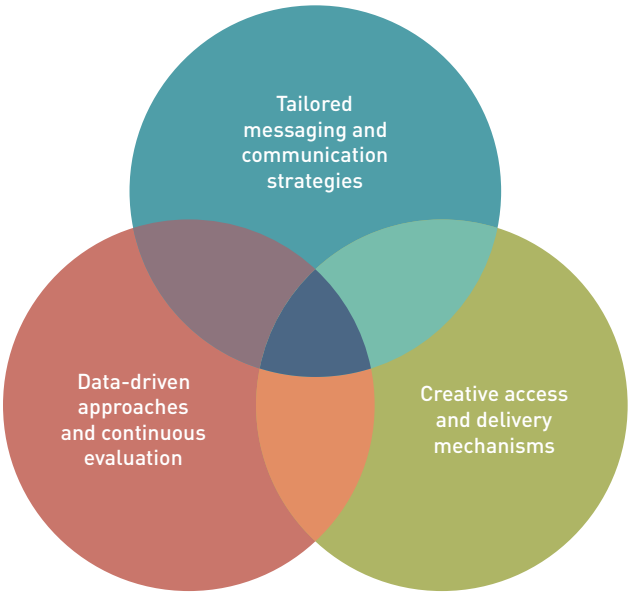


HPV, human papilloma virus; RSV, respiratory syncytial virus.

Effective messaging techniques are essential to reach the targeted population for vaccination. A qualitative review demonstrated that more successful pharmacy-based interventions involved active, in-pharmacy communication such as proactive conversations, screenings, and recommendations about vaccinations rather than passive communication through leaflets and posters.[46] Newer technology and digital platforms can be harnessed for communication strategies targeting a specific audience, such as the social media campaign described earlier, by creating a digital footprint and engaging with individuals.[44] Collaboration with community influencers and trusted sources is needed to combat misinformation and promote accurate, culturally responsive vaccine messages.[25]

Expanding access to vaccines through creative delivery mechanisms is necessary to increase vaccine uptake in historically underserved communities. Pop-up site programming efforts, such as Partnering for Vaccine Equity: Equity in Adult Vaccination, bring vaccines to communities through nontraditional vaccine settings. This initiative, launched by the CDC in 2020, has helped decrease disparities in COVID-19 vaccination rates by offering vaccines in libraries, barbershops, thrift stores, restaurants, and grocery stores.[25] In addition, building upon an existing framework for health care

Figure 3. Key Components of Successful Innovative Programs[25,45,46]



services and settings can close the missed vaccination opportunity gap. Provider services can help close this gap and improve vaccination rates; research has shown that recommendations from a provider remain a strong predictor of vaccination.[19,47-49]

Data analytics and measured outcomes analysis can be utilized in program design and evaluation of interventions. As a resource allocation tool, data can inform where efforts are most critically needed. For example, vaccine administration data from the Utah Statewide Immunization Information System was used to conduct one of the first studies to utilize state immunization information system data to identify missed opportunities for HPV vaccination.[46] Deidentified vaccination records of more than 25,000 females (aged 11-26 years) who received at least 1 dose of the Tdap, meningococcal, and/or influenza vaccines between 2008 and 2012 were included in the analysis to identify missed opportunities for HPV vaccination. Missed opportunities were defined as any clinical encounter with a provider where the patient did not receive an HPV vaccine but received at least 1 of the other adolescent vaccinations previously mentioned.[50] According to the analysis, approximately 44% of clinical encounters were found to be missed opportunities, highlighting the importance of data utilization to measure intervention outcomes.[50] The identification of such missed opportunities gives providers a better understanding of the efficacy of vaccine delivery systems in place and can help guide decisions and strategies to optimize future initiatives and allocate resources.

Regular monitoring and evaluation of program effectiveness can highlight successes, such as an analysis demonstrating increased adolescent HPV and meningococcal uptake rates through Arizona's statewide immunization registry following the implementation of school-entry vaccine requirements.[51] Immunization records of nearly 950,000 children aged 11 and 12 years from the Arizona State Immunization System from 2007 to 2008 were analyzed in a 2013 study to illustrate the effects on meningococcal vaccine uptake following the implementation of a 2008 school-entry vaccine requirement for children entering the 6th grade. Results showed that adolescent meningococcal immunization rates in Arizona significantly increased ($P < .0001$) after the implementation of the vaccine requirement.[51] Among children aged 11 years, vaccination rates increased from 20.1% to 48.2% from the 2006-2007 school year to the 2007-2008 school year. Among 12-year-olds, rates increased from 21% to 40.3%.[51] Continuous monitoring and program feedback can drive iterative improvements, utilizing data to guide enhancements and recognize value.

IMPLICATIONS FOR HEALTH CARE DECISION MAKERS

Inherent costs are associated with any intervention, and health care decision makers will require confirmation of cost-effectiveness and return on investment for continued program sustainability. There is an abundance of evidence to show that the economic burden of VPDs in the United States is staggering; in 2015 VPD costs among individuals 19 years and older were estimated at $9 billion (adjusted to $11.77 billion 2023 USD).[5,52] Almost 80% of the financial burden, or $7.1 billion, was attributed to unvaccinated individuals, underscoring the potential cost-savings of increasing vaccine uptake.[52] Results of cost-effectiveness studies have consistently demonstrated the economic value of vaccination. The results of a 2022 meta-analysis on the cost-effectiveness of HPV vaccination delivery strategies showed an incremental cost-effectiveness ratio of approximately $79,000 per life years saved, a value that is within typically accepted willingness to pay thresholds in the United States.[53,54] HPV vaccination has been shown to significantly reduce the risk of most cervical cancers and other HPV-attributable cancers, preventing morbidity and mortality from HPV-related diseases and mitigating costs associated with treatment.[41,55] The results of a systematic review of influenza and pneumococcal vaccination studies conducted from 1980 to 2016 showed the majority of outcomes reported either cost-savings or cost-effectiveness ratios of $50,000 or less per quality-adjusted life year.[56] Because the financial benefits of vaccination programs may be seen in moderate- to long-term outcomes, continued studies demonstrating the economic value to health care decision makers are needed for stakeholder support.

Policy makers are tasked with incorporating innovative approaches into the decision-making process. To be successful, vaccine policies should follow a utilitarian doctrine to maximize the benefit to the greatest number of people within the target population while minimizing the burden on the individual.[57] Vaccine policy should be equitable and ensure no widening of current health disparities or mistrust

in the health care system.[58] Limited research has been conducted on public health scaling and sustainment strategies.[59] More evidence is needed for consideration of the long-term sustainability of vaccination programs and integration into existing medical models.

CONCLUSIONS

By employing multifaceted strategies, innovative programs are of paramount importance in boosting vaccine uptake. These programs not only tailor messaging to resonate with diverse populations, dispelling misconceptions and countering vaccine hesitancy, but also introduce inventive approaches that increase accessibility in the community. By strategically placing vaccination services in potentially unconventional settings such as workplaces or community centers, they effectively remove logistical barriers that might deter individuals from seeking immunization. Innovative programs actively foster trust and credibility by engaging with community influencers and leveraging digital platforms to disseminate accurate information. This approach is especially vital in addressing disparities in vaccine uptake among different demographic groups, including marginalized populations, by building bridges of understanding and dispelling historic mistrust. Moreover, these programs are rooted in data-driven methodologies, continuously evaluating their impact and adapting strategies based on real-time feedback. This adaptability ensures that interventions remain responsive to evolving circumstances and preferences, maximizing their effectiveness over time.

Health care decision makers play a pivotal role in championing and implementing innovative approaches to enhance vaccine uptake. Their active support in allocating resources, advocating for policy changes, and fostering collaboration among stakeholders is instrumental in creating an environment conducive to the success of innovative vaccination programs. Health care decision makers are urged to prioritize the implementation of innovative programs. By recognizing the long-term benefits of increased immunization rates in preventing disease burdens and reducing health care costs, decision makers committed to innovative programs have the power to substantially enhance public health outcomes, reduce disease burden, and ensure a more resilient health care system for all. •

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Implementing Collaborative Efforts to Improve HPV Vaccination Rates: Insights From Members of the Pittsburgh Business Group on Health

Editors from *AJMC* spoke with members of the Prevention Task Force-HPV Initiative of the Pittsburgh Business Group on Health (PBGH), a nonprofit coalition aimed at helping employers to maximize health care benefits for their employees through education, advocacy, and group purchasing initiatives. Members of the coalition represent more than 2 million lives and are responsible for managing almost $7 billion in annual health care spending. The goal of the initiative is to increase human papillomavirus (HPV) vaccination rates among employees of members of the task force, and the public. Key opinion leaders from the PBGH, University of Pittsburgh Medical Center (UPMC), Rite Aid, American Eagle Outfitters (AEO), Duquesne University, and Highmark Inc, discussed their collaborative efforts to increase HPV vaccination rates by targeting diverse age groups, leveraging employer and insurer involvement, and using multifaceted strategies to enhance accessibility and awareness.

***AJMC*: What prompted the PBGH to develop a task force aimed at increasing HPV vaccination rates?**

Diane McClune, BSN, MBA, a strategic consultant for the PBGH shared that during the COVID-19 pandemic, the group recognized the challenge members were facing in encouraging employees to utilize preventive services, as evidenced by the marked decrease in the number of individuals accessing these services. The task force chose to focus on HPV vaccination because it affords protection against cervical, vulvar, vaginal, anal, oropharyngeal, and other head and neck cancers caused by HPV.[1] "It just makes medical and financial sense [to focus on HPV vaccination]," explained PBGH member **Timothy Law Sr, DO, MBA**, chief medical officer at the Highmark Plan. "Cancer is the second leading cause of death in the United States and costs of treating cancer are expected to exceed $240 billion by 2030.[2,3] If the medical community can shift from a reactive health care model to one that is proactive and can find and prevent these cancers earlier, that's something we should all be moving toward," said Law.

***AJMC*: Why did you choose to participate in the task force?**

As a health plan, Highmark's involvement in the task force was guided by the organization's HPV vaccination rates, a critical component of the Immunizations for Adolescents metric set forth by the National Committee for Quality Assurance (NCQA).[4] HPV vaccination emerged as a notable concern, explained Law, because rates were below the national average. The COVID-19 pandemic prompted the team to acknowledge that although many initiatives were focused on educating patients on the importance of COVID-19 vaccination, HPV vaccination efforts were mainly aimed at providers. "We must not overlook our role in shaping patient expectations and requests," explained Law. "As payers, it's important to recognize that our focus tends to be primarily on influencing health care providers; however, requests [for services] from patients have shown to be more impactful on health care services than directives [to providers] from health insurance plans."

Faina Linkov, PhD, MPH, department chair and associate professor of health administration and public health at the Rangos School of Health Sciences at Duquesne University in Pittsburgh, has been involved with the PBGH through its collaboration with the university's Department of Health Administration and Public Health for several years. "My interest in joining this task force stemmed from my background in gynecologic oncology as an epidemiologist," explained Linkov. "I spent many years at Magee Women's Hospital and Magee Research Institute, focusing on endometrial and ovarian cancers. Through this work, I recognized the importance of addressing the problem of cervical cancer morbidity and mortality. Despite the availability of a vaccine, there are still almost 12,000 new cases of cervical cancer in the United States each year.[5] As a public health researcher and advocate, I find it concerning that not everyone is taking advantage of preventive strategies due to various barriers. Our group can play a vital role in improving women's health in the United States and globally, particularly in addressing this issue."

Alexander Babatunde Olawaiye, MD, professor of gynecologic oncology at the University of Pittsburgh and Magee-Womens Hospital of UPMC shared similar reasonings for UPMC's participation. "Cervical cancer typically affects women in the prime of their adult lives, typically between the ages of 35 and 44, leading to personal tragedy and a loss of productivity.[6] Although screening has been particularly effective in reducing the incidence of squamous cell [cervical] cancer, adenocarcinoma is more challenging to detect and its incidence is on the rise, especially among younger women,[7]" said Olawaiye. "One of my most important roles is to let people know the magnitude of the situation and how much we can do for people."

***AJMC*: What age groups were the targeted population for these efforts?**

McClune shared that initially, the task force primarily focused efforts on young children under the care of their parents. As additional experts joined the group, the approach broadened to target other demographic subgroups. The efforts [now] extend beyond pediatricians to include primary care physicians, internal medicine practitioners,

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>
> Timothy Law Sr, DO, MBA
> Chief Medical Officer
> Highmark

and OB-GYNs treating young adults up to age 45. The group has collaborated with universities in Maryland and extended the reach to West Virginia, Pennsylvania, and Delaware, targeting individuals in their twenties to mid-twenties who are now making independent health care decisions.

PBGH member **Tammy Fennessy**, director of benefits at AEO, explained that the HPV vaccination efforts at AEO target adults over the age of 18 because the average age of their employees is 23 years. "Roughly 23,000 to 26,000 individuals fall within the 23 to 26 age bracket out of our 40,000 employees," said Fennessy. "For this group, [we felt] it's crucial to raise awareness about the potential missed opportunities for [HPV] vaccination. Even if they've been exposed to only a few strains, the vaccine can protect them from the rest, preventing potential cancer in the future. Our goal is to provide accurate education, dispel misconceptions, and empower them to make informed choices for their health."

Similar to AEO, HPV vaccination efforts at Rite Aid pharmacy are targeted to individuals between the ages of 19 and 26 years. The decision to target this age group stemmed from vaccination laws for pharmacists and a focus on capturing those individuals who may not have received the vaccination in childhood, explained **Adam James, PharmD**, manager of clinical and immunization programs for Rite Aid Corporation. "We primarily target the age group of 19 to 26 within our pharmacy using our identification system. This age range was chosen because, in some states, [pharmacists] cannot vaccinate individuals younger than 18, and we aimed for a uniform approach across all states," said James. "Our main goal is to get those who missed HPV vaccination in their pediatric years and are now adults caught up, specifically those aged 19 to 26." For those individuals who are older than 26, the team focuses on providing education to support shared decision-making around the choice to receive the vaccination.

According to McClune, the partnership with Rite Aid has been essential to the task force goals. "Our partnership with Rite Aid has enhanced access to HPV vaccines," she said. "The HPV vaccine involves a 2-dose regimen and ensuring that individuals receive that crucial second dose has been a considerable challenge. For those individuals who might face delays in scheduling a doctor's appointment, they can easily visit a nearby pharmacy. The convenience factor [of pharmacies] cannot be overstated."

***AJMC*: What are some of the strategies your organization used to increase HPV vaccination rates?**

At AEO, Fennessy said that the efforts to increase HPV vaccination among employees were multifaceted. The introduction of a new employee benefits program branding presented Fennessy with a unique opportunity to highlight HPV awareness information in newsletters. Educational materials primarily originated from the in-house benefits team, of which Fennessy is a member. "I had the support of 2 associates on my team who share a passion for curating our monthly newsletter," explained Fennessy. "We take care to ensure that the content addresses pertinent topics in a clear and comprehensive manner. Our team reviews the content to identify any potential issues or confusion and to make any necessary improvements."

In addition to the newsletters, the benefits team at AEO is hoping to produce a potential video testimonial or a TED Talk with the help from other prevention task force committee members, to showcase questions that associates may have about HPV vaccines. According to Fennessy, short videos recently produced by AEO's corporate communications team have been well received, encouraging the team to explore additional video content as a powerful tool to reach employees. "We're also considering hosting small group discussions, featuring experts in pediatric and adult health care, with prepared questions to ensure informative and comfortable conversations," said Fennessy.

To facilitate onsite vaccination services, Fennessy shared that the partnership with Cigna and their parent company, Evernorth [created] a perfect space to share information about HPV vaccines. "In partnership with Evernorth, AEO operates 4 health care centers. These centers serve 60% of our medically enrolled population, and we offer services to nonenrolled individuals as well," said Fennessy. "Working with Evernorth/Cigna allows us to reach a broader audience and have our population engage with nurses with whom they have built trusting relationships. HPV vaccination is a challenge because we can't order large quantities without knowing if there's demand and we require educational support for the registered nurses at our health care centers to emphasize the importance of HPV vaccination. Our plan is to have Evernorth/Cigna representatives engage with the local hospital systems. These representatives could potentially present in our onsite cafes, engage 1-on-1 or in a group format with our associates, distribute educational materials, and answer questions or address concerns [associates] may have." Starting January 1, 2024, the well-being program that AEO offers through their Cigna medical plans will offer a $25 gift card incentive for AEO employees for HPV vaccination.

In addition to a strong partnership with their insurer, Fennessy highlighted collaboration efforts with providers and community organizations near their large distributions center so that employees can easily connect with these groups. "There is a focus on building relationships with community-based organizations, which poses some different challenges for employers," shared Fennessy. "As an

organization, we've already taken steps in this direction by providing our employees with access to resources through the Aunt Bertha program,[8] which enables individuals to enter their zip code and discover a wide range of community-based resources, such as food assistance, medication support, housing aid, and utility assistance. We've been using this program for about 2 years now, sharing relevant resources based on our employees' zip codes." To ensure that individuals can effectively connect with and utilize these resources, AEO also has established partnerships with Olathe Medical System in North Kansas and Lehigh Valley Health System in the Hazleton area. "This approach significantly enhances trust-building and ensures that we prioritize sensible health care decisions, emphasizing the importance of proximity and familiarity." Fennessy said. In addition, because one of AEO's major distribution centers is primarily staffed by 95% of the workforce who are not proficient in English, the team has been committed to approaching prevention initiatives with cultural sensitivity. "The trust factor is paramount," said Fennessy. "We've made considerable efforts to ensure accurate translations of our benefit programs, that communications are provided in the relevant dialects, and to have our health center in Hazleton staffed with a bilingual nurse. Our goal is to remain vigilant in addressing the needs of our marginalized populations."

Rite Aid implemented a range of strategies to enhance accessibility to the HPV vaccine among both customers and employees. To capture customers, the team developed scheduling tools in addition to offering walk-in appointments. They found that having the option to schedule an appointment at a specific time offered convenience and predictability and this scheduler tool is now widespread across retail pharmacies. "Our primary focus is providing as many pathways to vaccination as possible," said James. "Whether it's through scheduling, walking in, or being approached by our pharmacists during a visit for another reason, our goal is to maximize accessibility." The team also addressed the challenge of ensuring individuals receive their second or third HPV vaccine shot through a systematic approach. "Our program identifies customers who require specific vaccines based on age or previous doses in a series," explained James. "For HPV, which necessitates multiple doses, our system reminds us to contact the customer at the appropriate time. We can then reach out to the customer via text or email, providing them with a schedule or a link to book their second HPV shot. This approach has considerably improved our series completion rates. Although our system currently doesn't integrate with state registries, our pharmacists have bidirectional access, allowing them to check a patient's vaccination history."

James partnered with the organization's benefits department to implement efforts to increase HPV vaccination rates among Rite Aid employees. "Collaboration with our benefits department has been instrumental in increasing HPV vaccination rates among our employees," said James. "We realized that many of our employees fell within the age range for HPV vaccination, and so we partnered with our benefits department to disseminate educational materials that included information on co-pays and the overall value of being vaccinated. We emphasized that our stores offer easy access to the vaccine, making it convenient for our associates to protect themselves. This shift in focus allowed us to extend our expertise in vaccinations to our own workforce. By providing comprehensive education on the effectiveness and simplicity of HPV vaccination, we've ensured that our associates are well informed and empowered to make decisions that protect their health. This experience has broadened our perspective, demonstrating the value of considering our entire employee population in our efforts to increase vaccination rates."

At Duquesne University, Linkov actively engaged students in a campaign to increase HPV vaccination rates. The objective was inspiring students to recognize the considerable impact they can make with their efforts. To achieve this, Linkov shared that the project is framed as a part of students' public health fieldwork and capstone projects, wherein students work closely with the director of public health programs. "This semester, several students are currently working with the PBGH to develop HPV vaccine–targeted efforts as part of their fieldwork," explained Linkov. "We hope that after completing this fieldwork, they will incorporate the ideas and work into their capstone projects. The initiative is relatively new; however, our approach involves a collaborative effort, with multiple individuals working together to convey a centralized message."

According to McClune, the PBGH itself initiated advocacy efforts suggested by individuals within the group. One noteworthy addition was Lyn Robertson, DrPH, MSN, BSN, director of cancer screening and external partnerships for health equity and community outreach and engagement at UPMC Hillman Cancer Center. A member of the PA Cancer Commission, the cancer center helped shape the PA cancer plan spanning from 2019 to 2023. This plan included directives on HPV vaccination. The addition of a representative from the local Allegheny County Medical Society and a board member of the PA Medical Society, resulted in endorsement of the a statewide standard for HPV management. In addition, PBGH task force members conducted informational sessions for providers and employee groups, emphasizing the importance of vaccination. The PBGH also encouraged sharing social media campaigns, text messages, portal updates, and video content among the group to make resources adaptable and accessible for employers of all sizes.

At UPMC, the largest employer in Pennsylvania with nearly 100,000 employees, Olawaiye leveraged his position as a vice department chair to connect with UPMC's Employee Health program, which focuses on employee well-being and preventive measures. Although the program initially encouraged HPV vaccinations, it did not have a specific cervical cancer prevention program. Olawaiye partnered with the head of the program to address this gap and implement a targeted effort to prevent cervical cancer among UPMC employees.

***AJMC*: Why is it essential to public health that employers and insurers focus efforts on the health and well-being of their employees or members and their dependents?**

McClune shared that the PBGH has strong employer involvement, with about 65% to 70% of members being self-funded. Prevention measures for cancer are imperative to decrease the impact on patients, employees, dependents, and the substantial associated costs.

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>
> Tammy Fennessy
> Director of Benefits
> AEO

"Prevention is a critical aspect of public health, as it allows us to intervene before diseases take root," added Linkov. "[Health] plans with a strong focus on preventative services can significantly contribute to the health and well-being of their employees and dependents."

Law shared that payer participation in initiatives such as these is vital to breaking down stereotypes. "Unfortunately, health plans can be perceived as having ulterior motives. In reality, we're deeply committed to community health and providing the right care at the right time," said Law. "Highmark's unique position as a blended health organization, closely aligned with partners like Allegheny Health Network, Penn State Health, Christiana Care, Delaware, Lehigh Valley, and others, sets us apart. We all contribute to vaccine accessibility by eliminating cost-sharing, ensuring vaccines are readily available at community pharmacies, and conducting outreach efforts. This collaborative approach benefits not only us but other health plans, allowing us to prevent this particular cancer more effectively."

***AJMC*: How did the task force work with employers in the initiative to assist with analyzing data to determine target populations for their campaigns?**

According to Law about 60% of Highmark's membership, which comprises approximately 7 million lives covered across dental and medical services, is composed of self-funded employer groups. Law's team informs these groups about the percentage of individuals within the age group susceptible to various diseases and whether these individuals have received the appropriate vaccinations.

McClune shared that the PBGH is currently working with a local data analytics group, Innovu, to validate their data projections and expects to have data available in the first or second quarter of 2024. Once the validated data become available, PBGH will encourage employers to assess their historical data, compare it to the present, and consider implementing tailored campaigns aimed at their respective populations. "We are simplifying the implementation process to replicate the positive outcomes we anticipate," shared McClune. "Our collaboration with Innovu allows us to examine employer data regionally, both within and beyond our network and extending to a national level. [For example,] Innovu's [preliminary] insights have already provided valuable information, revealing an average vaccination rate of 35% to 40% across the board, with notably lower rates—[approximately] 5%—seen for individuals aged 25 to 45 years."

Fennessy shared that AEO also plans to further analyze their data in 2024. The self-insured employer plans to work in conjunction with Cigna to gain a baseline to start from for future campaign efforts. According to Fennessy, "Our primary focus for measurement will be the vaccine uptake. We plan to collaborate with Cigna to analyze historical data and track year-over-year trends in vaccine uptake. This analysis will be broken down by age groups, and during our vaccination campaigns, we will further dissect the data by location, income level, ethnicity, and more. This comprehensive approach will help us assess our progress and identify specific populations where we may need to improve outreach."

Linkov encouraged health care systems to prioritize making such data accessible for research and evaluation. "The goal is not to pass judgment on health care systems or vaccination rates, but rather to facilitate mutual learning," she said. "When we openly share data, we can identify areas for improvement collectively. For instance, if our county's or health care system's vaccination rate is below national averages, and we observe similar numbers in other health care systems, it becomes evident that collaborative efforts can make a substantial impact, breaking down silos and fostering shared progress."

***AJMC*: How are you planning on measuring program success?**

Law shared that Highmark prioritizes rigorous data measurement. To ensure accountability, the team mandates clear ROI goals for every initiative. For the vaccines initiative, a dedicated marketing team assesses the goals, such as increasing vaccine rates among those aged 9 to 26 years, and determines the desired impact. The team utilizes their expertise to decide on the most effective strategy, whether it's direct-to-consumer, engaging health care professionals, or a combination of both. Law explained that setting a blanket target, such as achieving 100% vaccination among the entire 7 million people in the relevant age group, was not realistic. Instead, the team at Highmark set goals based on the specific populations. This nuanced approach was crucial because even minor changes in vaccination rates among these groups can result in meaningful overall improvements. "We focus on several key metrics to measure success," said Law. "Firstly, we assess and monitor gaps in health care access within our population. Secondly, we analyze the percentage of our population covered by our interventions. Additionally, we're employing predictive analytics to identify individuals at risk of developing cervical cancer in the future. Our key performance indicators center on closing the vaccination gap within the target age group. Currently, we've achieved over 40% vaccination coverage, significantly surpassing the national average of [approximately] 33%. This marks a notable 5 to 7-point increase from 2020 or 2019, as previously reported. Further, although our [HPV] vaccine program is relatively new and the eligible age range has recently expanded, we closely track cervical cancer rates. Our goal is to ultimately reduce the incidence of cervical cancer, particularly in the 30 to 50 age group and among older individuals. We remain vigilant in monitoring these metrics to gauge the impact of our efforts." In addition, Law highlighted that once individuals

start engaging with the health care system, there is an opportunity to communicate on additional essential health care interventions beyond HPV vaccination.

***AJMC*: What advice would you have for other organizations that might be looking to implement similar initiatives among their members or employees?**

Law offered the following advice for managed care decision makers and clinicians considering similar initiatives with their members:

- ***Size Doesn't Matter:*** Regardless of your plan's size, these initiatives can be effective. Whether you serve 500,000 or 5 million members, the key is to leave no stone unturned in improving access to health care services.
- ***Meet People Where They Are:*** Prioritize meeting the needs of both providers and patients. Offer initiatives that provide easy access to resources, such as a provider center. This resource hub should offer essential materials, from HPV vaccine information to preventive care details, such as colonoscopies.
- ***Be a Conduit to Care:*** Health plans are conduits to care and can utilize coverage to facilitate connections between providers and members. The aim should always be to make this connection seamless and user-friendly, ensuring that the plan remains a conduit, not an obstacle. This approach ensures access to quality care for all, regardless of plan size.

Linkov's advice for another university seeking to develop a similar program is to foster multilevel collaboration and communication. "Programs such as Public Health, Health Administration, and Masters of Health Administration are excellent choices for those interested in pursuing these types of initiatives," she explained. "In my experience, it is also essential to success to ensure students involve all stakeholders—providers, faculty, employers, community partners, and in some cases, even clergy for their cross- and multidisciplinary expertise. Gathering input from a diverse range of voices, including students and younger individuals, ensures perspectives are not overlooked. Inclusivity is the key to success."

Some key recommendations for pharmacies seeking to enhance HPV vaccine accessibility from James are to:

- ***Debunk Myths and Provide Clear Information:*** Ensure that accurate information about HPV and HPV vaccination is readily available and dispel common misconceptions.
- ***Highlight the Prevalence of HPV:*** Educate individuals about the high likelihood of HPV infection over a lifetime. Stress that there are no reliable indicators for determining who will clear the virus naturally and who may face long-term health effects, including the risk of cancer.
- ***Promote Vaccination for All, Regardless of Health Status:*** Emphasize that even healthy individuals should receive the HPV vaccine because HPV doesn't discriminate based on underlying health conditions. Unlike some diseases where certain factors increase risk (eg, smoking or diabetes), no such correlations have been found with HPV.
- ***Emphasize Gender-Neutral Vaccination Recommendations:*** Dispel the misconception that HPV primarily affects female patients and is only related to cervical cancer. Communicate that HPV impacts both men and women equally and stress that HPV vaccination benefits everyone by preventing various types of cancers.
- ***Focus on Age-Appropriate Vaccination:*** Ensure that everyone understands the age eligibility for HPV vaccination. Although the vaccination can start as early as age 9, many individuals may need catch-up vaccinations as adults. Communicate that those individuals aged up to 26 years are strongly recommended for vaccination, and it remains a viable option for individuals aged up to 45 years based on personal risk factors.

Fennessy recommended that to develop an initiative like this in a similar role at another organization, employers should start with a thorough analysis of the population demographics. "If your organization's population is predominantly Gen Z, like ours, for example, initiatives focused on HPV vaccination are crucial to implement as part of a cancer prevention campaign." If the employee population falls outside of the recommended age ranges for HPV, another initiative may be more appropriate.

McClune shared that whereas programs developed for large employers are vital, it's important not to overlook the majority of workers who are employed by organizations with 200 or fewer employees. Smaller employers who are looking to develop initiatives can leverage resources from organizations such as Highmark, UPMC, Rite Aid, and Merck for educational materials. These resources are tailored to the general public's understanding, avoiding medical jargon, and are available in multiple languages and can be easily customized by employers. In addition, these resources come in various formats, from informative cartoons to more direct materials addressing the impact of cancer types such as head and neck cancers, particularly among men. •

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