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ACTION BRIEF

Opportunities for Advancing Adult Immunization Through Quality Measurement

Immunization is widely recognized as one of the most effective primary prevention services to improve health and well-being. Immunizations have prevented countless cases of diseases and saved millions of lives over the years.[1,2]

Many diseases that used to be prevalent in the United States (U.S.) and around the world, such as polio, measles, diphtheria, and pertussis, can now be prevented by vaccination.[2] These vaccine-preventable diseases can have significant negative economic and health impacts on individuals and the healthcare system, including avoidable doctor's appointments, hospitalizations, morbidity, and mortality.[2]

Each year, approximately 40,000 to 80,000 U.S. adults die from vaccine-preventable diseases, such as influenza, pneumococcal disease, and hepatitis B, and hundreds of thousands more are hospitalized.[1] The total economic burden from vaccine-preventable diseases based on 10 vaccines recommended for U.S. adults was estimated to be $9 billion in 2015.[3] Despite the availability of immunization services, vaccination rates in the U.S. remain low and large gaps exist between national adult immunization goals and actual immunization rates.[4,5,6,7,8] Additionally, disparities in immunizations still exist and can lead to certain populations experiencing disease outbreaks more than others. In some instances, immunization rates for certain vaccines have decreased over time for vulnerable populations.[9] Disparities in immunization are the highest in racial/ethnic minorities, low-income families, and individuals with disabilities.[9]

Factors contributing to low vaccination rates include lack of patient awareness, lack of provider emphasis on immunization as preventive care, inconsistent patient vaccination history available to providers, lack of access to care, affordability and varying coverage of care, and consumer vaccine hesitancy and distrust, especially among vulnerable populations.[10] Quality measurement represents one pathway to drive change in adult immunization, through emphasizing the importance of vaccines, tracking progress, and encouraging best practices. However, substantial measure gaps currently exist for adult immunization.

Addressing these measure gaps provides an opportunity to improve healthcare quality, healthcare affordability, health disparities, and the overall health of Americans.

In 2014, the U.S. Department of Health and Human Services (HHS) commissioned the National Quality Forum (NQF) to provide multistakeholder guidance and establish priorities for performance measure development and endorsement in adult immunization, culminating in the release of the NQF report entitled **Priority Setting for Healthcare Performance Measurement: Addressing Performance Measure Gaps for Adult Immunizations**.

This report identified critical areas for performance measurement to optimize vaccination rates and outcomes across adult populations. The report also contains a conceptual measurement framework to prioritize measurement needs by illustrating measure gaps in specific age groups and subpopulations, including young adults, pregnant women, adults, the elderly, people with chronic disease and other vulnerable populations along with healthcare workers. The framework was used to identify 10 critical measure gap priorities, which include both age-specific and composite measure priorities, and to recommend two short-term and long-term priorities, which are summarized in Table 1.

Table 1: Priorities for Measure Development From 2014 NQF Report

AGE-SPECIFIC PRIORITIES	COMPOSITE PRIORITIES
HPV vaccination catch-up for females ages 19–26 and males ages 19-21 years*	Composite with other preventive care services as recommended by age and gender^
Tdap/pertussis-containing vaccine for ages 19+	Composite of Tdap and influenza vaccination for all pregnant women (including adolescents)*
Zoster vaccination for ages 54-60 years	Composite including influenza, pneumococcal, and hepatitis B vaccination measures with diabetes care processes or outcomes for individuals with diabetes
Zoster vaccination for ages 65+ years (with caveats)	Composite including influenza, pneumococcal, and hepatitis B vaccination measures with renal care measures for individuals with kidney failure/end-stage renal disease (ESRD)
	Composite including hepatitis A and B vaccinations for individuals with chronic liver disease
	Composite of all Advisory Committee on Immunization Practices (ACIP)/Centers for Disease Control and Prevention (CDC) recommended vaccinations for healthcare personnel^

**Top short-term priorities*

^Top long-term priorities

Given the evolving measurement landscape and the shift to value-based care, it is critical to reassess the priorities identified in 2014 within the context of today's healthcare environment. While many national efforts have developed goals and recommendations to improve adult immunization rates, such as NQF's foundational work in adult immunization and the Centers for Disease Control and Prevention's (CDC) Healthy People 2030, opportunities for improvement continue to exist. In August 2020, NQF, with support from GlaxoSmithKline, LLC (GSK) and through an independent educational grant from Merck & Co., Inc., launched an initiative to assess the progress made on the 2014 priorities, identify potential new priorities for measure development in adult immunization, and develop recommendations on the next steps to improve adult immunization rates through measurement. To perform this work, NQF conducted key informant interviews, a brief environmental scan, and a strategy session with a multistakeholder Expert Panel composed of clinicians, researchers, payers, administrators, patient partners, and measurement experts. The Expert Panel assessed the progress made on the 2014 priorities, discussed which priorities were still gap areas, and identified new priorities that have emerged since the 2014 report.

Vaccination for Coronavirus Disease 2019 (COVID-19): An Emerging Area

Addressing the COVID-19 pandemic is a top priority across the healthcare ecosystem. With new vaccines for COVID-19 becoming increasingly available to consumers, measure developers have begun conceptualizing measure concepts and specifications to assess vaccination rates for COVID-19 vaccines. Although there are no validated and tested measures currently available to assess these vaccination rates, the Expert Panel noted that many groups have work underway to address this matter; therefore, the Expert Panel did not assess vaccination measurement gaps for COVID-19 immunizations.

Notably, the pandemic also presents other unique opportunities to drive improvement in adult immunization. With the increased attention and momentum surrounding a mass adult vaccination campaign, the pandemic provides opportunities to address the culture of vaccination and growing vaccine hesitancy through education and positive patient-provider encounters.

Assessing Progress on Previously Identified Adult Immunization Measurement Priorities

In assessing the progress made on the 2014 priorities, the Expert Panel discussed each priority and highlighted the priorities in which the measurement landscape has evolved the most over the past seven years.

Measurement priorities that have seen the greatest progress include the composite measure for pregnant women and adolescents, Tdap/pertussis vaccination for adults, zoster vaccination for older adults, and the composite measure for individuals with kidney failure/ end-stage renal disease (ESRD).

Significant progress has been made on the composite of the Tdap and influenza vaccination for pregnant women—one of the top short-term priorities from 2014—through the development of a new quality measure. The **Prenatal Immunization Status (PRS) measure** (NQF #3484) is the percentage of deliveries in the measurement period in which women received influenza and tetanus, diphtheria toxoids, and Tdap vaccinations. The PRS measure has been endorsed by NQF, was added to the Healthcare Effectiveness Data and Information Set (HEDIS) in 2019, and has been recommended by a workgroup for future inclusion in the Medicaid Core Sets. Panelists noted that they were not aware of any unintended consequences of the measure, and healthcare stakeholders have reacted positively to the measure and are eager to use it.

Progress has also been made on several of the 2014 priorities through the development of the **Adult Immunization Status (AIS) measure**, which is part of HEDIS. The AIS measure includes the percentage of adults 19 years of age and older who are up to date on recommended routine vaccines for influenza, tetanus and diphtheria or tetanus, Tdap, herpes zoster, and pneumococcal. While the AIS measure does address multiple measurement priorities from the 2014 report, implementation and adoption challenges exist for this measure, given its unique structure as a composite measure and the revised Advisory Committee on Immunization Practices' (ACIP) pneumococcal recommendations, which were released after the measure was originally developed and altered the measure specifications. Composite immunization measures can support implementation efforts by creating consistency in desired immunization rates among many diseases, providing a sense of the overall health of a population, and providing insight into how well the healthcare system is delivering routine recommended vaccines. However, composites can also be difficult to understand and can create data collection challenges as well. Development of this measure has demonstrated the need for greater guidance and implementation assistance for composite measures for those seeking to collect and understand the data provided.

The composite measure for individuals with kidney failure/ESRD is the final priority from 2014 which has seen attention and progress over the past several years. In 2018, the National Adult and Influenza Immunization Summit (NAIIS) built upon NQF's prior work and reiterated the recommendation of the development of an ESRD vaccination composite measure for Medicare ESRD Program beneficiaries who are recommended to receive influenza, pneumococcal, and hepatitis B vaccines. While a vaccination-focused ESRD measure does align with CMS' Meaningful Measures Framework, the development of this measure is still evolving, given the need to balance the existing ESRD core measure set. Given the number of measures in the ESRD core measure set, it is imperative to consider the potential burden of developing and implementing more measures. Opportunities exist to continue momentum in addressing this priority by evaluating whether the current measures in the ESRD core set are topped out and could be removed from the program to enable new measures, such as the ESRD vaccination composite measure, to be incorporated. One opportunity exists through the NQF Measure Applications Partnership (MAP), which now has statutory language supporting the development of a pathway to recommend the removal of measures from federal programs.

Identifying Current Adult Immunization Measurement Priorities

Although some progress has been made on the 2014 priorities to fill gaps and improve immunization rates, many priority areas identified in the 2014 report have yet to see significant progress in these areas. Given the dramatic shifts in the healthcare landscape over the past seven years, the Expert Panel held a robust discussion to identify whether the previous priorities were still relevant, and whether any new priorities have emerged. Ultimately, the Expert Panel identified and ranked eight adult immunization measurement gap priority areas based on the potential impact and feasibility of implementation, which are summarized in Figure 1. The Expert Panel conducted the prioritization exercise twice: first, individually through a survey, and then collectively following a discussion on the results of the survey.

As noted in Figure 1, each priority was identified as either a short-term or long-term priority. The short- and long-term categories are not intended to designate the importance of a priority, but rather the categorization gives additional context to the resources, time, effort, and complexity required for implementation. While short-term measurement priorities may be addressed within one to two years, long-term priorities may require more time.

Measurement gap areas identified in Figure 1 represent true measurement gaps in which quality measures have not yet been deployed. While several of the priority gap areas identified in 2014 have been addressed through the development of new quality measures and therefore no longer appear on the list of prioritized gap areas in Figure 1, it is important to note that some of the developed measures still face implementation challenges and need continuous support to move forward. To drive true progress, stakeholders must focus on both closing the quality measure gap and supporting timely implementation of the developed measures.

Figure 1: Current Adult Immunization Measurement Priorities

PRIORITY MEASUREMENT GAP AREA

1. **All vaccine providers (e.g., clinicians, pharmacies, occupational health clinics) submitting adult immunization information to an immunization information system (IIS)***
2. **Composite of all ACIP-recommended vaccinations for healthcare personnel, with ability to stratify by healthcare setting and/or role^**
3. **Composite including hepatitis A and B vaccinations for individuals with chronic liver disease^**
4. **Composite including influenza, pneumococcal, and hepatitis B vaccination measures with diabetes care processes or outcomes for individuals with diabetes^**
5. **Composite including influenza, pneumococcal, and hepatitis B vaccinations measures with renal care measures for individuals with kidney failure/ESRD***
6. **HPV vaccination catch-up ages 19-26 years***
7. **Composite including immunization with other preventive care services as recommended by age and gender^**
8. **Zoster recombinant vaccine ages 50+ years***

**Short-term priority ^Long-term priority*

1 All vaccine providers (e.g., clinicians, pharmacies, and occupational health clinics) submitting adult immunization information to an immunization information system (IIS)*:

Many vaccine-specific priorities hinge on the ability to have data flow successfully between electronic health records (EHRs) and an IIS to ensure clear visibility into a patient's immunization history for all providers and payers. A measurement priority focused on submitting data will help drive uptake and enable the healthcare community to have more visibility into a patient's vaccination status. Of note, it is essential to include all vaccine providers, such as primary care providers, specialists, retail pharmacies, occupational health clinics, long-term care facilities, and others, given the wide-ranging sites where adults receive vaccinations. Data access and interoperability are critical to driving progress in adult immunization measurement; therefore, encouraging the use of an IIS through measurement was identified as the top priority for adult immunization measurement.

2 Composite of all ACIP-recommended vaccinations for healthcare personnel, with the ability to stratify by healthcare setting and/or role^:

While a composite of all ACIP-recommended vaccinations for healthcare personnel was identified as a priority in 2014, progress has been limited due to challenges related to implementation in diverse healthcare settings with varying needs and resources. Difficulty in accessing data for ACIP-recommended vaccines (aside from influenza) due to inconsistent data collection, particularly in long-term care facilities that have a limited ability to enforce and report on these measures, has impeded progress. To drive advancement, the field needs to dive deeper into the data to understand different groups within the healthcare community and structure this measure so that it can encourage widespread use. Given that vaccine targets may vary based on age, healthcare personnel types, and settings, it is critical to be able to stratify by healthcare setting and/or role to understand variation and gaps in vaccine coverage rates for all healthcare workers.

3 Composite including hepatitis A and B vaccinations for individuals with chronic liver disease^:

The prevalence of hepatitis A and B continues to increase, and limited progress has been made in immunizing individuals with chronic liver disease with the hepatitis A and B vaccines over the past seven years. Given the current opioid epidemic that our nation is facing and the uptick in hepatitis A and B outbreaks in the context of the opioid crisis, vaccination for viral hepatitis is more important than ever before. While a measure of hepatitis A vaccination for individuals with hepatitis C already exists, broadening it to include receipt of the full series for both hepatitis A and B vaccines is a critical step in protecting individuals with chronic liver disease.

4 Composite including influenza, pneumococcal, and hepatitis B vaccination measures with diabetes care processes or outcomes for individuals with diabetes^:

A composite measure for individuals with diabetes presents a unique measurement opportunity, as this population typically has repeated care visits for prevention of disease with a consistent provider. Measurement offers a significant opportunity to drive progress in vaccination for individuals with diabetes, given the likelihood of increased patient-provider interactions, decreased likelihood of provider changes and varying vaccination sites, and more data and registry information availability. While individuals with diabetes may receive their vaccinations from more consistent providers than other adult populations, the data capture for the vaccines included in this priority may vary based on vaccine type; as a result, this priority may take longer to see progress.

5 Composite including influenza, pneumococcal, and hepatitis B vaccinations measures with renal care measures for individuals with kidney failure/ESRD*:

Although progress is underway for this priority area, a measure has not been developed and a measurement gap still exists. To balance measurement burden, progress on this priority may require the reassessment of existing measures in the current ESRD core set to identify which measures are topped out and/or are no longer valuable to collection data on.

6 HPV vaccination catch-up ages 19-26 years*:

While on-time HPV vaccination (i.e., vaccination at 11-12 years old) is the goal, with 51 percent of adolescents having not yet completed the HPV vaccine series, prioritizing an HPV vaccination catch-up measure is an important mechanism to drive improvement in immunization rates[11] To align with the ACIP's recommendation for HPV vaccine, this priority includes both males and females, which is a slight modification to the related 2014 priority that was previously set.

7 Composite including immunization with other preventive care services as recommended by age and gender^:

Measuring immunizations alongside other essential preventative care services signals the importance of immunizations as preventative care; however, progress on this priority has been limited due to challenges related to time during the patient-provider encounter and a lack of incentives for incorporating immunizations into adult preventative care visits. These challenges are further amplified by the wide variation in locations where adults receive vaccinations, leading to questions about ownership and attribution. Adding immunizations to other recommended preventative care services may highlight the importance of immunization as a preventative care service among providers and patients.

8 Zoster recombinant vaccine ages 50+ years*:

With recent changes in the zoster vaccine, the Expert Panel felt it was essential to revise the previously identified 2014 priority to reflect the recombinant vaccine. Given the high efficacy of the recombinant zoster vaccine and the wider age-range of eligible recipients, ensuring the vaccine reaches older populations is critical. Because the prevention of herpes zoster and post-herpetic neuralgia yields an individual benefit rather than a community benefit and subsequently has a lower public health impact, the Expert Panel ranked this measure concept lower than the other measures included on this priority list that focused on the prevention of communicable diseases.

Additional Recommendations to Support Improving Adult Immunization Rates Through Measurement

While quality measures represent one mechanism for improving adult immunization rates, other drivers of change can support the ability of quality measures to drive true progress in immunization rates. To further close existing measurement gaps in adult immunization measures, attention must also be given to implementation challenges.

The Expert Panel identified numerous domains in which advancements will support the ability of measurement to improve vaccination rates, including data and interoperability, the accuracy of measurement, and disparities and health equity.

Interoperability, data sharing, and the flow of high quality information represent critical steps in advancing the measurement of adult immunization. Stakeholders must partner together to facilitate complete, accurate, and reliable immunization data to support providers and payers having a clear picture of a patient's immunization history and status. As patients continue to receive vaccinations from more settings, the flow of accurate information becomes even more critical. To drive progress in interoperability, the number of providers reporting to immunization systems must increase. While the top measurement priority identified in this Action Brief (i.e., all vaccine providers submitting adult immunization information to an IIS) will help to identify gap areas and drive progress, additional opportunities exist to leverage current immunization measures that require stakeholders to share data. Amplifying existing measures and requiring their use will help to drive progress without adding to measurement burden. Requiring and incentivizing the use of existing quality measures that require providers and health plans to share EHR immunization data with an IIS (and vice versa) will lead to more data sharing and interoperability.

With an understanding that adults often go to multiple settings for vaccination, it is imperative to recognize that the burden, responsibility, attribution, and credit for immunizations should be shared across all providers performing vaccinations. These providers include primary care providers, specialists, pharmacists, employers, and others, noting that vaccination can occur at various locations and sites. The reality that adults receive vaccines from multiple sites contributes to the differences in immunization rates between adult and pediatric populations, as children more frequently receive their vaccinations from one consistent provider at well-child visits. This shared responsibility for adult vaccination is a critical component of attribution and contributes to the accuracy of adult immunization recording. Recent advancements in adult immunization measurement, including the development of the AIS and PRS measures, have highlighted the implementation challenges surrounding attribution and care coordination. For example, in the AIS measure, which includes multiple vaccines, attribution becomes increasingly challenging because the different vaccines could be administered by different providers or settings. Opportunities exist for adult immunization providers, professional associations, and public health agencies to learn from colleagues who have successfully deployed pediatric immunization measures to help replicate the immunization reporting culture in the adult environment. Exploring this dichotomy between adults and pediatrics is a timely endeavor, especially considering the current mass vaccination efforts for the COVID-19 vaccine are focused on adult populations.

Additionally, disparities in adult immunization rates continue to be an area that needs improvement, and measurement is a driving factor for both identifying and targeting disparities, and improving health equity. While tackling health disparities may be difficult, public health initiatives for children have shown that change is possible. One way to identify gaps and drive progress across populations with lower immunization rates is for healthcare stakeholders to gather robust information on disparities. Stakeholders must encourage the collection of complete race, ethnicity, social economic status, and other social factors to support stratifying health plan-, system-, or accountable care organization (ACO)-level data by these factors. Given the lack of currently available race and ethnicity data, stakeholders may need to explore the use of proxy data. In addition to stratifying existing measures and measure concepts on social factors, measures pertaining to health equity in the immunization space will help to highlight the impact of social determinants of health and disparities. By identifying and removing barriers to immunization, disparities can be reduced.

A Path Forward

With a growing focus on vaccination across the U.S., there is an increased opportunity for healthcare stakeholders to reaffirm the importance of adult immunizations. Stakeholders, including clinicians, researchers, payers, administrators, patient partners, advocates, and measurement experts, should continue to raise the health and economic benefits of adult immunization and use the priorities and recommendations outlined in this Action Brief to advance the measurement and uptake of vaccinations. By understanding and recognizing priority gap areas in adult immunization measurement, vaccine providers, health plans, measure developers, and others should seek to close measurement gaps to drive improvements in adult immunization rates, ultimately improving health outcomes, reducing disparities, and decreasing costs.

Key Contributors

NQF appreciates the insights of the key contributors who participated as Expert Panelists at the January 13-14, 2021 strategy session and/or who participated in key informant interviews. The conclusions, findings, and opinions expressed by individuals who contributed to this publication do not necessarily reflect the official position of any contributor's affiliated organization.

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This project is being delivered by NQF with support from GlaxoSmithKline, LLC (GSK) and through an independent educational grant from Merck & Co., Inc.

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