

Priority Setting for Healthcare Performance Measurement: Addressing Performance Measure Gaps for Adult Immunizations

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EXECUTIVE SUMMARY

Vaccine-preventable diseases cause unnecessary illness, hospitalizations, morbidity, and mortality for Americans of all ages. According to the Alliance for Aging Research, vaccine-preventable diseases or their complications account for 50,000 to 90,000 adult deaths in the U.S. each year.¹ Additionally, the annual direct and indirect medical cost of infectious diseases is \$120 million. Substantial measure gaps exist for adult immunization measures outside of those addressing influenza and pneumococcal disease that are used in federal programs.

NQF convened a multistakeholder committee ([Appendix A](#)) to identify and prioritize measure gaps for adult immunization that would have the greatest potential for improving healthcare quality, healthcare affordability, health disparities, and the overall health of Americans. In order to assess the comprehensiveness and the adequacy of available measures for adult immunization for specific populations, types of care, and sites and providers of care, the Committee developed a conceptual measurement framework to prioritize measurement needs ([Appendix C](#)). The framework illustrates measure gaps in specific age groups and subpopulations including young adults, pregnant women, adults, the elderly, people with chronic disease, and healthcare workers.

Priorities for Measure Development

The Committee agreed upon ten measure gap priorities:

Age-Specific Priorities

- HPV vaccination catch-up for females — ages 19-26 years and — for male — ages 19-21 years
- Tdap/pertussis-containing vaccine for ages 19+ years
- Zoster vaccination for ages 60-64 years

- Zoster vaccination for ages 65+ years (with caveats)

Composite Measure Priorities

- Composite including immunization with other preventive care services as recommended by age and gender
- Composite of Tdap and influenza vaccination for all pregnant women (including adolescents)
- Composite including influenza, pneumococcal, and hepatitis B vaccination measures with diabetes care processes or outcomes for individuals with diabetes
- Composite including influenza, pneumococcal, and hepatitis B vaccinations 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 of the Center for Disease Control and Prevention (ACIP/CDC) recommended vaccinations for healthcare personnel

To provide further guidance, the Committee identified two short-term and long-term priorities:

Short-term priorities:

- HPV vaccination catch-up for females — ages 19-26 years and — for male — ages 19-21 years
- Composite of Tdap and influenza vaccination for all pregnant women (including adolescents)

Long-term priorities:

- Composite measures that include immunization with other preventive care services
- Composite measures for healthcare personnel of all ACIP/CDC recommended vaccines

The Committee provided supporting recommendations for measurement that addressed issues of accuracy, efficiency, and focus on that which is most meaningful:

- Accuracy of Measurement – Measures that provide reliable and valid results encourage stakeholders to use the information to drive improvements in quality.
- Efficiency of Measurement – Reducing the burden and improving the value of measurement was a recurrent theme throughout the Committee discussion.
- Measuring What Is Most Meaningful – In addition to prioritizing measure gaps, the Committee considered other aspects of measurement that are meaningful to audiences such as measuring disparities, outcome measures and composite measures.

PROJECT FOUNDATION

Over the past ten years, the use of healthcare performance measurement has sharply increased in the United States. Despite the proliferation of measures, it is widely recognized that many important gaps in measurement still exist. Section 1890(b)(5) of the Social Security Act requires the National Quality Forum (NQF), as the consensus-based entity, to describe gaps in endorsed quality and efficiency measures in the Annual Report to Congress and the Secretary of the Department of Health and Human Services (HHS). Building on work done by NQF in 2011 and 2012 on the status of measure gaps more broadly,²⁻³ this project advances the aims and priorities of the National Quality Strategy (Figure 1) by identifying priorities for performance measurement; scanning for potential measures and measure concepts to address these priorities; and developing

multistakeholder recommendations for future measure development and endorsement.

In 2013, HHS contracted with NQF to systematically and comprehensively identify, analyze, prioritize, and make recommendations to fill measure gaps related to five measurement areas: adult immunizations, Alzheimer's disease and related dementias, care coordination, health workforce, and person-centered care and outcomes. Stakeholders acknowledge that the growth of performance measures has placed greater burdens and costs on providers to collect and report data. The quality measurement enterprise must prioritize measures that matter to patients and families and strategically target those aspects of care that will promote the greatest improvement in health outcomes to manage measurement resources wisely.

FIGURE 1. NATIONAL QUALITY STRATEGY AIMS AND PRIORITIES



SETTING PRIORITIES FOR ADULT IMMUNIZATION MEASUREMENT

Vaccine-preventable diseases cause unnecessary illness, hospitalizations, morbidity, and mortality for Americans of all ages. According to the Alliance for Aging Research, vaccine-preventable diseases or their complications account for 50,000 to 90,000 adult deaths in the U.S. each year.⁴ Additionally, the annual direct and indirect medical cost of infectious diseases is \$120 million. Unfortunately, adult immunization rates remain low for most recommended vaccines and are well below Healthy People 2020 objectives.⁵ The majority of existing performance measures focus on immunization for seasonal influenza and pneumococcal infections, and many are process measures—few are outcome measures. Substantial measure gaps exist for other recommended adult vaccines, and few measures addressing adult immunization other than influenza and pneumococcal disease are used in federal programs.

HHS requested that NQF identify critical areas for performance measurement to optimize immunization rates and health outcomes across adult populations, and to provide recommendations on priorities for performance measurement development and endorsement related to adult immunization. This work contributes to other ongoing HHS activities including the [Advisory Committee on Immunization Practices of the Center for Disease Control and Prevention \(ACIP/CDC\) Adult Immunization Schedules](#), the annual [National Adult Immunization and Influenza Summit \(NAIIS\)](#), the Quality and Performance Measures Workgroup of the NAIIS, [CDC's support of Immunization Information Systems and the Meaningful Use of EHRs Program](#), the National Vaccine Advisory Committee (NVAC), and the development of a national strategic plan for adult immunization supported by the National Vaccine Program Office.

Identifying and Prioritizing Measurement Gaps

Multistakeholder Committee Charge

NQF convened a multistakeholder committee ([Appendix A](#)) to identify and prioritize measure gaps for adult immunization that would have the greatest potential for improving healthcare quality, healthcare affordability, health disparities, and the overall health of Americans. The Committee also considered harmonization and alignment of measures; costs and burden of measurement; measurement of disparities; and availability of data (including electronic health records [EHRs]). The methodologic and technical challenges, such as data availability; data sharing; aggregating data from multiple locations; and reporting performance measures at different levels of analysis across all patient populations and all providers of immunization factored prominently in the Committee's discussion of measurement priorities

Environmental Scan of Measures and Measure Concepts

NQF staff conducted an environmental scan of existing measures and measure concepts related to adult immunization to inform the development of the conceptual measurement framework and the measure gap analysis. The scan facilitated a broader understanding of the existing adult immunization performance measurement landscape. A total of 225 unique measures or concepts were identified as relevant to adult immunization (see [Appendix B](#) for the sources consulted for the scan). An analysis of the identified measures revealed:

- Seventy nine measures address influenza immunization (35 percent).

- Sixty measures address pneumococcal immunization (27 percent).
- The majority of measures are process measures (69 percent).
- Only 4 of the 46 outcome measures are at the provider level; the majority are population surveillance measures.
- Fifteen composite measures provide examples of how separate measures can be combined. The composites include measures that combine different vaccines as well as composites that include immunizations with other preventive services.

Conceptual Measurement Framework

To assess the comprehensiveness and adequacy of available measures for adult immunization for specific populations, types of care, and sites and providers of care, the multistakeholder Committee developed and used a conceptual measurement framework to prioritize measurement needs ([Appendix C](#)). The framework was built on concepts identified by the Quality and Performance Measures Workgroup of the HHS Interagency Adult Immunization Task Force in 2013. These concepts include process and outcome measures, and the two critical purposes of federal measures: 1) quality improvement/provider accountability, and 2) population health and planning.⁶

The framework illustrates measure gaps in specific age groups and subpopulations including young adults, pregnant women, adults, the elderly, people with chronic disease, and healthcare workers. The age and condition-appropriate vaccinations for these groups are listed in the [adult immunization schedule](#) issued by the ACIP/CDC.

For purposes of the framework and the Committee's deliberations, process measures generally were considered to assess tasks associated with the administration of a vaccine, while outcome measures were considered primarily in the context of public health or

healthcare system surveillance and could include health outcomes such as hospitalizations, morbidity, mortality, and the costs of vaccine-preventable diseases. Another important distinction was provider- versus population-level measures, defined by NQF as follows:

Provider-level measures: Performance measures for which the level of analysis is a provider of healthcare services that is accountable for the care delivered to their patients (e.g., clinician, hospital, clinic, health plan, pharmacies, etc.)

Population-level measures: Performance measures for which the level of analysis is a community or other individuals defined by geography that are appropriate for government, community, healthcare system and multistakeholder accountability, including measures that can be utilized and assessed at multiple levels of analysis such as state, county, city, and/or community.

The Committee discussed further distinguishing between provider- and system-level measures. Although some suggested defining providers as people, and defining systems as entities (e.g., immunization tracking systems, claims databases, or hospitals in which people are working together), the Committee ultimately agreed that it was sufficient for the term “provider” to encompass both individual and system-level providers.

The Committee emphasized the importance of including measures of Immunization Information Systems (IIS) use and capabilities in the framework to advance adult immunization measurement.

Measure Gap Analysis

Using the conceptual framework and Committee input, NQF staff identified more than 30 potential measure gaps ([Appendix D](#)). The gaps were grouped into several measure categories requested by HHS: adult vaccines for which there are no NQF-endorsed measures; vaccines for specific age groups consistent with the adult

immunization schedule issued by ACIP/CDC; vaccines for specific populations such as persons with diabetes, or other chronic conditions; vaccines for healthcare personnel; composite measures including both immunizations alone and composite measures that include other clinical preventive services; outcome measures; and measures for Immunization Information Systems.

Key Informant Interviews

NQF staff interviewed key informants to identify important measurement issues related to adult immunization ([Appendix E](#)). The informants included health plans that use measures; organizations using measures for adult immunization; organizations that have developed or are developing composite adult immunization measures; consumers; vendors; and federal agencies involved in IIS and EHR development. The Committee received summaries of the interviews prior to the in-person meeting to aid their deliberations.

Prior NQF Work on Adult Immunization

The Committee received reports from several earlier NQF projects that evaluated immunization measures for adult immunization and addressed harmonization of related measures ([National Voluntary Consensus Standards for Influenza and Pneumococcal Immunizations](#)⁷ [2008] and [Population Health \[Phase I\] – Prevention Endorsement Maintenance Technical Report](#)⁸ [2012]). The Committee noted that in the 2012 review of immunization measures for renewal of NQF endorsement, most of the measures endorsed by NQF used by the federal government have been harmonized^a as recommended in the 2008 NQF report.

Priorities for Measure Development

To prioritize the identified measure gaps, Committee members individually submitted their initial priorities among each of the identified gap areas prior to the in-person meeting. Committee members were asked to identify their priorities (more than one priority could be selected) among each of the measurement gaps areas detailed in [Appendix D](#) (i.e., adult vaccines for which there are no NQF-endorsed measures, vaccines for specific age bands, vaccines for special populations, etc.). The Committee then discussed the results ([Appendix F](#)) at the in-person meeting and agreed upon the 10 measure gap priorities listed in Table 1.

^a Harmonization is the process of editing the design of similar measures to ensure they are compatible. Measure developers can make changes to the way a topic or population is defined. Harmonization helps reduce the confusion of having measures that are similar but different.

TABLE 1. PRIORITIES FOR MEASURE DEVELOPMENT

Age-Specific Priorities	Composite Measure Priorities
• HPV vaccination catch-up for females – ages 19-26 years and – for male – ages 19-21 years • Tdap/pertussis-containing vaccine for ages 19+years • Zoster vaccination for ages 60-64 years • Zoster vaccination for ages 65+ years (with caveats)	• Composite including immunization with other preventive care services as recommended by age and gender • Composite of Tdap and influenza vaccination for all pregnant women (including adolescents) • Composite including influenza, pneumococcal, and hepatitis B vaccination measures with diabetes care processes or outcomes for individuals with diabetes • Composite including influenza, pneumococcal, and hepatitis B vaccinations 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 ACIP/CDC recommended vaccinations for healthcare personnel

Age-Specific Priorities

HPV vaccination catch-up for females ages 19-26 years and for males ages 19-21 years. Although HPV vaccination is primarily recommended for adolescents, current adolescent vaccination rates remain low (57% of girls and 35% of boys ages 13-17 years).⁹ The Committee unanimously agreed that a measure for HPV (human papillomavirus) vaccination “catch-up” for young adults was important in the short-term, particularly for women ages 19-26 who were not previously vaccinated. While HPV vaccination measures exist for adolescents, the environmental scan did not identify measures related to HPV vaccination catch-up. Similar to zoster (described below), a measure for HPV vaccination catch-up is applicable to a whole population of a specific age (as opposed to people with specific risk

factors). The efficacy of the vaccine is expected to substantially reduce the burden of disease from the 19,000 cancers in women and 8,000 cancers in men caused by HPV every year.¹⁰

Tdap/pertussis-containing vaccine for ages 19+ years. Pertussis (whooping cough) is a common disease with many cases that go unreported, particularly among adults. Although the recent pertussis epidemic in California and other frequent outbreaks have drawn attention to recommendations that pregnant women should receive Tdap vaccine during each pregnancy to reduce the risk of pertussis in new mothers and their very young infants, ACIP/CDC recommends pertussis-containing immunization for all adults. After much discussion about whether to recommend measurement for pregnant women only, the Committee agreed that a significant

proportion of the population needs protection from pertussis to reduce the risk to infants.

Zoster vaccination for ages 60-64 years. While generally supporting zoster vaccination, the Committee pointed out that this vaccine is most beneficial (prevention of herpes zoster and post-herpetic neuralgia) to an individual rather than the public because the disease is not communicable. Of the estimated 1 million cases of shingles (zoster) every year, about half occur in men and women 60 years old or older.¹¹ The Committee also considered issues related to vaccine efficacy declining with age and frailty, insurance coverage gaps in Medicare, and the lack of mandatory reporting to capture data to measure outcomes. However, the Committee ultimately recommended a measure for zoster vaccination, noting that herpes zoster affects almost 1 in 3 Americans — an estimated 1 million cases annually. The severe and debilitating pain of post-herpetic neuralgia negatively affects quality of life and uptake of the zoster vaccine is relatively low to date.

Zoster vaccination for ages 65+ years (with caveats). Measures for zoster vaccination were also identified as a priority for those ages 65 and older with specific considerations for measure development. The Committee discussed at length the declining immune response at older ages and limited life expectancy, and argued that measures for this age group would need to be nuanced. Some suggested excluding frail elders, since frailty is one of the biggest drivers of immune senescence, but issues around feasibility were raised because frailty is difficult to define and measure. Other suggestions were to exclude individuals over a certain age or keep the measure broad and further specify at the implementation level. The Committee was generally confident that a measure could be developed without causing undue burden or unnecessary vaccination but that its application would need to consider the population measured. Even for the oldest adults, it was thought better to vaccinate rather than leaving them completely unprotected.

Composite Measure Priorities

Composite including immunization with other preventive services as recommended by age and gender. Rather than separate measures for adult immunization, the Committee recommended combining core preventive services with ACIP/CDC-recommended vaccines into a composite measure. Several Committee members envisioned a composite measurement “framework,” comprised of general preventive services recommendations, including the ACIP/CDC immunization recommendations, specific to an individual’s age. If the individual belonged to a special population (e.g., those with diabetes or ESRD), components of the composite would reflect the appropriate preventive services for that specific group. The composite could adjust for the patient’s age and specific disease status. Since immunizations often are located at the bottom of a clinical preventive services list, the inclusion of adult immunizations in a preventive care composite may raise the profile of adult immunizations among providers.

Composite of Tdap and influenza vaccination for all pregnant women. A significant gap exists for measures that assess the provision of Tdap and influenza vaccines during pregnancy, and a composite measure that addresses these two vaccines during pregnancy is urgently needed. Because few prenatal care measures exist and there is a perceived difficulty in creating measures for this population, the Committee recommended developing a composite measure for Tdap and influenza and not combining it with other prenatal care services. Although there may be a timing issue related to vaccinating pregnant women for influenza given influenza’s seasonal nature, within a nine-month span, the vast majority of women would have the opportunity to be immunized. Also, since measurement is usually retrospective, the Tdap and influenza vaccinations would not have to be administered at same time (Tdap is recommended for late in pregnancy).

Composites for other special populations. For the remaining special populations from the APIC/CDC immunization schedule (individuals with diabetes, kidney failure/ESRD, and chronic liver disease), the Committee supported the concept of including recommended immunizations into a composite with other recommended care processes for each specific population. A composite measure for each specific risk group was thought to be ideal because each population has specific needs and recommendations. Combining vaccination with measures of specialty care may be particularly effective because patients visit the doctor regularly for chronic care needs. A specific measure gap was identified for the provision of hepatitis B vaccination for patients with chronic liver disease or hepatitis C. Because a measure of hepatitis A vaccination for hepatitis C patients already exists, the recommendation was to broaden it to include receipt of the full series for both hepatitis A and B vaccines.

Composite of all ACIP/CDC recommended vaccines for healthcare personnel. The Committee discussed the implications of developing measures for hepatitis B vaccination and a composite measure for influenza and hepatitis B vaccination for healthcare personnel including determining immune status of healthcare personnel and the potential for over immunizing. The Committee acknowledged potential implications for hospitals and long-term care facilities, particularly around long-term care facilities' ability to enforce and report on these measures. The Committee, however, ultimately recommended a composite measure for all ACIP/CDC-recommended vaccines, because they did not want to "pick and choose" among the recommended vaccines.

Short- and Long-Term Priorities

To provide further guidance, the Committee identified its top two short-term and long-term priorities among the list of 10 priority gap areas (see Box 1). An important consideration in this

further prioritization was balancing the cost of quality measurement with the potential benefits to patients. Short-term measure gaps should be filled quickly within 1-2 years. Longer-term measure priorities may be challenged by data sources or require more development time (2-4 years).

Box 1. Top Short- and Long-Term Priorities

Top Short-Term Priorities

1. Composite of Tdap and influenza vaccination for all pregnant women (including adolescents)
2. Measures for HPV vaccination catch-up for females ages 19-26 years and males ages 19-21 years

Top Long-Term Priorities

1. Composite including immunization with other preventive care services as recommended by age and gender
2. Composite measures for healthcare personnel of all ACIP/CDC recommended vaccines

Key Leverage Points to Drive Performance

The current use of performance measurement for promoting and increasing vaccination rates must be considered. A wide range of existing and potential leverage points (i.e., ways in which measures are—or could be—used that have an impact or promote change among various stakeholder groups) were suggested by the Committee. The leverage points generally relate to reporting programs, financial or other incentives, or technology and infrastructure supports as presented in Table 4. As measures are developed, their potential use should be considered along with which mechanism will have the highest potential impact for improving vaccination rates and outcomes.

TABLE 2. KEY LEVERAGE POINTS TO DRIVE PERFORMANCE

	Providers	States/Communities	Purchasers/Payers
Reporting Programs	• Internal health system reporting. • Public reporting of vaccination rates at the facility level (i.e., measures in Hospital Compare). • Public reporting by medical groups at individual clinician level on PQRS measures. • Mandatory, rather than voluntary, reporting of vaccination rates or minimum threshold requirements. • Reporting of healthcare personnel vaccinations (i.e., influenza for healthcare personnel measure in federal reporting programs).	• Mandatory, rather than voluntary, reporting of vaccination rates. • Public reporting of national adult immunization coverage (i.e., CDC reports on national adult immunization coverage, 2012 National Healthcare Quality Report). • Public reporting of adult immunization coverage at the state or county level (i.e., Commonwealth Fund's website, "Why Not the Best?" http://www.whynotthebest.org and New York state reporting at county level).	• Minimum vaccination rate thresholds for insurers. • Inclusion of adult immunization measures in programs, e.g., NCQA HEDIS and CMS Stars programs.
Incentive Programs	• Status recognition or accreditation and certification programs. • Incentives under the Meaningful Use of Health Information Technology program. • Incentives for integrating adult immunization with preventive services. • Payment incentive programs for providers that report on immunization measures. • Payment incentive programs for providers that attain a certain threshold of vaccination rates.	• Payment incentives for states/communities to achieve a certain threshold of immunization rates. • Need-based funding for evidence-based and innovative initiatives to increase vaccination rates where lowest.	• Offering reduced premiums or copays to employers or geographic areas that achieve higher vaccination rates. • Selection of health plans or providers that have lower costs associated with vaccine-preventable disease (hospitalization, complications, mortality, etc.).
Technology Supports	• Incorporation of immunization measures in computer-based decision support systems.	• Additional funding for Immunization Information Systems (IIS) that accept and encourage submission of adult immunization data.	
Other		• Achieving – or exceeding – Healthy People 2020 vaccine-related objectives. • Harmonization of grant reporting (especially federal grants) across public health immunization programs, emergency preparedness, maternal-child health, and chronic disease management programs.	

ADDITIONAL RECOMMENDATIONS

The Committee provided supporting recommendations for measurement that addressed issues of accuracy, efficiency, and focus on that which is most meaningful.

Accuracy of Measurement

Measures that provide reliable and valid results encourage stakeholders to use the information to drive improvements in quality.

Attribution and Accountability

An important challenge related to adult immunization measurement is the issue of attribution—i.e., who will be measured and held accountable for providing vaccinations to adults. Provider attribution for measurement proves to be challenging for adult immunizations because adults receive vaccinations in a variety of places, including clinical settings (e.g., primary and specialty care, hospital, long-term care facility) and community-based settings (e.g., retail pharmacy, workplace, health fair, travel clinic). In comparison to children who are vaccinated in fewer settings (i.e., school, physician office)—and where accountability generally lies with the parents—the lines of accountability are not well defined for adults. The lack of a definitive approach for attribution leads to confusion in the provider community about roles and responsibilities, misalignment across performance measure development efforts, and lower implementation of adult immunization measures in quality improvement and/or accountability programs.

Process Measures at the Provider Level

An important consideration is the development of process measures of vaccination at the provider-level, while looking toward health outcome measures as the ultimate indicator of

impact. Because vaccination is an evidence-based intervention closely linked to health outcomes, measure development should focus on process measures at the provider level that can drive overall vaccination rates. Process measures are incredibly important to promote shared accountability between all primary and specialty care providers. Additionally, if process measures are constructed to differentiate between patients who receive the vaccine, and those who have contraindications, declined vaccination, or were not offered the vaccine, an opportunity would exist to measure “missed opportunities” and to measure provider accountability without punishing providers who may serve more vaccine-averse populations. EHR vendors caution that some contraindications, and patient refusals may be difficult to capture in eMeasures.

Complementary Immunization Providers

The expanded role of “complementary (or nontraditional) immunization providers”—pharmacy, employers and the workplace, and other community immunizers—offers the opportunity for a shared approach to accountability. Committee members expressed concern about the burden of current measurement efforts on providers, specifically primary care physicians. With the Affordable Care Act (ACA) broadening access to care and a shortage of primary care doctors, primary care doctors cannot be expected to assume the responsibility of adult immunization alone and may gain needed support from complementary providers. Responsibility, and credit, for immunization should be shared across all immunizers, especially as healthcare delivery moves towards accountable care organizations and team-based care.

Committee discussion focused on the expanded role of pharmacists and how to include them in

quality measurement efforts. Recognizing that better information transfer and communication between pharmacies and physician practices is a necessity, the pharmacy community has expressed a commitment to being held accountable in this area. Identifying a denominator for a pharmacy-based immunization measure could be challenging, given that people frequently use multiple retail pharmacies.

Employers are important immunization providers. In addition to employer promotion of vaccination and the convenience, occupational health clinics and workplace vaccination programs may reduce the out-of-pocket costs for patients and encourage higher rates of vaccination. As adult immunization quality measurement expands in the coming years, it also will be worth considering whether to hold employers accountable for ensuring that their employees are appropriately vaccinated.

Finally, it is important to recognize the patient's responsibility for seeking appropriate vaccinations, particularly given concerns about a perceived lack of need for vaccination among adults. It can be difficult to make the case for adult immunization because vaccines have varying degrees of effectiveness that may decline with age and frailty. Public awareness and education about adult immunization is needed to encourage patients to take ownership of their health and health information.

Recommendations

Committee members generally agreed that measurement focuses resources and attention on processes of care while acknowledging measurement as a costly and burdensome endeavor that should be used only when it will drive improvement. Future quality measures should support responsibility for team- and system-level immunization, which could be strengthened by:

- Encouraging all immunization providers, including complementary providers, to submit data to Immunization Information Systems (registries);
- Including complementary immunization providers in adult immunization performance measure development; and
- Harmonizing measures for all providers.

Data Quality, Reliability, and Flow of Information

The lack of complete, accurate, and reliable immunization coverage data presents a particular challenge for adults, which has been further complicated by the growing number of sites that offer immunizations. Measures are dependent on quality data and the challenges in adult immunization measurement can largely be attributed to issues with the availability and quality of data, not the measures themselves. A Committee member suggested that although measurement can drive improvement, unreliable, inaccurate measurement wastes resources and increases the possibility of harm.

Data Collection

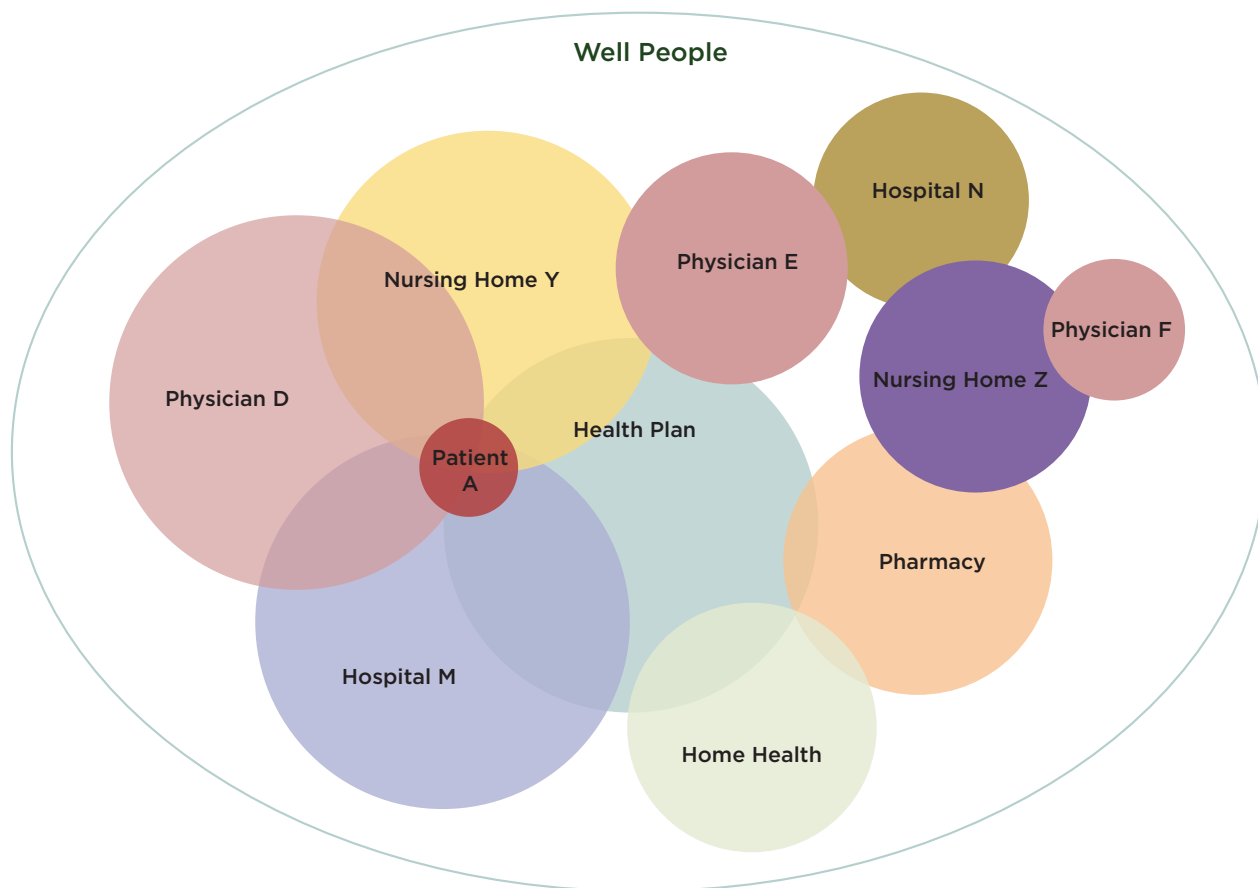
Data on adult immunization is currently collected through a number of sources, including administrative claims, Immunization Information Systems, EHRs, paper-based records, and patient surveys. Claims generally tend to be a readily available source of data; however, adults do not always submit a claim to their health plan when they receive a vaccination, which affects the reliability of claims data. Electronic or paper-based records and surveys often rely on information reported by the patient—particularly in the case of vaccines received in the distant past—which leaves patients ultimately responsible for tracking and recording their vaccination history, adding to concerns about the reliability of adult immunization data.

Information Flow

Figure 2 below offers a pictorial view of the current state of measurement, illustrating the challenges of vaccination information transfer. Individuals move between sites of care (bubbles) as they interact with various providers, but data

generally do not flow with them—the result is data in silos. These silos can lead to repeated vaccination and waste in terms of time, vaccines, and money. Each of these silos may be held responsible for patient vaccination status, increasing their burden—and burden on the system—due to the lack of data flow.

FIGURE 2. PARTICIPATION OF PATIENT A IN VARIOUS “HEALTH CARE POPULATIONS”



Source: Dr. David Nace, University of Pittsburgh Institute on Aging. Developed for the committee in-person meeting.

Immunization Information Systems (Immunization Registries)

Immunization Information Systems (IIS) offer a potential common pathway to sharing immunization information. IIS are “confidential, population-based, computerized databases that record all immunization doses administered by participating providers to persons residing within a given geopolitical area.”¹² An IIS system can provide immunization histories for use by a provider and also aggregate vaccination data for use in surveillance and program operations. The CDC provides funding to support IIS among the 50 states, 5 cities, the District of Columbia, and 8 Territories.¹³ There has been a concerted effort in recent years to focus on recording adult vaccinations within IIS, which many stakeholders attribute to the program requirements and incentives of the Medicare and Medicaid Electronic Health Care Record (EHR) Incentive Programs, otherwise known as “Meaningful Use” (MU). The MU program has promoted communication between EHRs and IIS by specifying that if an IIS can accept data for adults, vaccination reporting by eligible providers and hospitals is optional for MU Stage 1 and required for MU Stage 2.

An important consideration is that IIS are a nationwide network of systems, not a national system or central registry. A central repository for adult immunization history does not exist in the United States. IIS are in varying stages of development and use across states, and variation exists among the IIS, adding to their overall complexity. IIS do not have unique identifiers that are used across systems, making it difficult to track people over time if they relocate to another state. Key informants shared that a key concern for public health infrastructure, including IIS, is resource and funding constraints. IIS now have much more data to manage with the inclusion of immunization reporting in the MU program. While financial incentives from the MU program have catalyzed change among the provider and hospital communities, increased financial support for

health information technology (HIT) has lagged for many state and local public health agencies.

Despite these challenges, the Committee and key informants reiterated that standardization of data fields and greater use of IIS has the potential to create a centralized data source for immunization measurement. Further investment in communication standards among IIS and between IIS and EHRs could establish a national network that allows data capture and transmission wherever and whenever the patient receives care. Additionally, as implementation of EHRs continues to increase, it will be important to consider the development of “eMeasures” that facilitate quality measurement using these systems. Because eMeasures use the unique characteristics of EHRs to build measures, they may be more successful than simply “retooling” measures originally designed for other data sources.

Emerging Technologies

Lastly, emerging technologies, such as smart phones and mobile apps, should be considered in efforts to facilitate vaccination data capture, flow, and measurement. Although the technology is available, challenges persist related to privacy and confidentiality issues as well as data validation processes for patient-submitted data. The [MyVaxIndiana](#) web portal allows patients to look up and print out official immunization records from the state IIS regardless of their location. Another example of an emerging technology is the use of smart phones to capture vaccine bar codes, which then allows patients to send the information to providers, IIS, or apps, such as Immunize Canada. This app allows Canadians to easily record and store vaccine information, access vaccination schedules, and manage vaccination appointments for the entire family.

Recommendations

Strengthening and encouraging the use of IIS is essential to facilitating immunization data flow. Strategies to achieve this include:

- Encouraging further adoption of voluntary national data standards for IIS, which could eventually be written into legislation;
- Encouraging and incentivizing providers to submit immunization data to IIS (via EHR or other);
- Further developing IIS for all states, territories and DC to adopt CDC functional standards that include bidirectional interoperability with providers and other IIS; core data elements that include patient refusal and contraindications; and allowing patient access to IIS data; and
- Encouraging a focus on eMeasure development.

Efficiency of Measurement

Harmonization and Consolidation of Existing Measures for Adult Immunization

Reducing the burden and improving the value of measurement was a recurrent theme throughout the Committee discussion. Variations in measure constructs likely contribute to the lack of reliable, high quality adult immunization data because many “similar but different” measures are used. In 2008, an NQF-convened committee recommended standard measure constructs for flu and pneumococcal immunization measures. Ten NQF-endorsed measures for flu and pneumococcal immunization used by CMS in various quality reporting programs are harmonized with the measure construct recommended in that project’s report.

Although there is a need for additional adult immunization measures, there is also a need to reduce the number of current measures, particularly for influenza and pneumococcal immunization. Harmonization and reduction—or consolidation—of redundant measures is necessary to reduce the burden of data collection and measurement, and to make room for other important measures. At a minimum, all measures should be up to date with current ACIP/CDC

recommendations. The Committee emphasized that consolidation efforts must be clearly communicated and involve all interested parties and that there may be certain circumstances under which harmonization is not warranted.

The environmental scan of measures and measure concepts clearly point to the need for harmonization and consolidation. The measure constructs identified in the scan were found to be highly variable, even though most process measures addressed administration of the various vaccines. Variation in measure constructs included:

- Assessment of immunization status measures rather than vaccine coverage rates;
- Combining vaccine contraindications or refusals with vaccines received;
- Separate measures for different age groups rather than stratification of a single measure;
- Separate measures for vaccine refusal and contraindications rather than including refusals and contraindications as numerator categories or inclusions;
- Excluded patients removed from the denominator rather than accounted for in the numerator;
- Separate measures for special populations, such as patients with diabetes or heart disease, rather than applying a global measure for the special population; and
- Specifications that are outdated according to ACIP/CDC recommendations.

Recommendations

Focused efforts are needed to reduce redundancy, variation, and measurement burden of existing measures. Specific recommendations for measure developers include:

- Conducting measure maintenance on all existing adult immunization measures with an eye toward “aggressive consolidation”

(i.e., reducing the total number of measures because of overlap, redundancy, etc.);

- Encouraging measure developers to begin harmonization by identifying and standardizing data specifications;
- Developing new measures using the standardized data elements defined by NQF in its consensus report;
- Striving for harmonization between population and provider level measures, being cognizant of the purpose of measurement (i.e., vaccination coverage at population level; accountability at the provider level);
- Developing composite measures to incorporate harmonized adult immunization into preventive services including important subpopulations; and
- Aligning all immunization measures with ACIP/CDC recommendations and retiring all outdated measures.

Measuring What Is Most Meaningful

In addition to prioritizing measure gaps, the Committee considered other aspects of measurement that are meaningful to audiences.

Disparities in Immunization

Known disparities in adult immunization rates exist between racial and ethnic groups, and measurement is an important mechanism for identifying and targeting such disparities for improvement. While robust national data on disparities exist, data samples often are inadequate to inform local action. The solution, however, is not to put the onus of collecting this type of information solely on providers, as this could significantly add to data collection and measurement burden. The *Behavioral Risk Factor Surveillance System* (BRFSS) survey is a major data source for disparities data, but limited sample sizes make it difficult to use for improvement

locally. Some data sets from Medicare and Medicaid plans include race and ethnicity data that can be used to stratify immunization measure results, while alternative approaches—such as the RAND method using geocoding when self-reported race/ethnicity data are not available¹⁴—could be utilized to improve the data. Finally, data could be improved by encouraging more complete ascertainment of race and ethnicity in medical encounters.

Addressing disparities is not unique to immunization measurement, but it is an area in which disparities in coverage are well known. In addition to race and ethnicity, socioeconomic status, among other demographic characteristics, should be considered. Collecting data related to disparities raises the question of how to define these terms (i.e., race, ethnicity), which is not specific to immunizations. Further exploration should consider recent work by NQF, which concerns the use of valid and reliable performance measures to address healthcare disparities and cultural competency in measurement.¹⁵

Recommendations

The Committee recommended the following related to disparities for measure developers and providers:

- Gathering more robust information on disparities (e.g., through larger sample sizes or oversampling) for national surveys, such as BRFSS;
- Stratifying health plan, system- or ACO-level measures by race and ethnicity; and
- Promoting completeness of race and ethnicity data collection during healthcare encounters.

Outcome Measures

Outcome measures can demonstrate the impact and value of immunizations for preventing vaccine-preventable disease, and health plans and employers use measurement results to quantify return on investment for immunization. However, the ability to obtain accurate outcome data

from current tools, such as surveillance systems, especially when the disease is not reportable, is unclear. While employers may have a cost/value proposition related to influenza immunization, one should exercise caution when using reductions in incidence of disease as measures of impact given the potential confounders, including vaccine effectiveness. Further methodological investigation and research is warranted to develop outcome measures that sufficiently address such confounders.

While recognizing the inherent difficulty in measuring patient-reported outcomes, this is another area worthy of further investigation. Potentially significant patient-reported outcome measures may include amount of time missed from work or disability (such as reductions in activities of daily living) as a result of prolonged illness from vaccine-preventable diseases.

Composite Measures

Finally, the Committee made overarching recommendations related to the development of composite measures. Composites often are easier for patients and policymakers to understand. The Committee cautioned against all-or-nothing composite measures in which one cannot extrapolate data related to each component of the composite measure. Although a single score from a composite is important to help drive performance, drilling down to the component level makes the measure actionable by creating a feedback loop to know where to focus quality improvement efforts. Harmonization of existing measures was discussed as a crucial first step related to the development of any composite measure.

ENDNOTES

- 1 *The Silver Book®: Infectious Diseases and Prevention through Vaccination*. Washington, DC: Alliance for Aging Research; 2013. Available at http://www.silverbook.org/uploads/images/Silver%20Book_Vaccination_Final.pdf. Last accessed June 2014.
- 2 National Quality Forum (NQF). *NQF Report on Measure Gaps and Inadequacies*. Washington, DC: NQF, 2012. Available at http://www.qualityforum.org/Publications/2012/05/NQF_Report_on_Measure_Gaps_and_Inadequacies.aspx. Last accessed March 2014.
- 3 National Quality Forum (NQF). *NQF Report on Measure Gaps and Inadequacies*. Washington, DC: NQF, 2012. Available at http://www.qualityforum.org/Publications/2013/03/2012_NQF_Measure_Gap_Analysis.aspx. Last accessed March 2014.
- 4 *The Silver Book®: Infectious Diseases and Prevention through Vaccination*. Washington, DC: Alliance for Aging Research; 2013. Available at http://www.silverbook.org/uploads/images/Silver%20Book_Vaccination_Final.pdf. Last accessed June 2014.
- 5 Centers for Disease Control and Prevention. *Adult Vaccination Coverage — United States*, 2010. *MMWR* 2012;61: 66-71.
- 6 Moy E, Sachs J. *HHS Perspective on Adult Immunization Measures presented at National Influenza Vaccine Summit*. Atlanta, Georgia: HHS Interagency Adult Immunization Task Force; May 14-16, 2013. Available at http://www.preventinfluenza.org/NAIIS_2013/NAIIS_6_moy-hhs-perspective.pdf. Last accessed December 2013.
- 7 National Quality Forum (NQF). *National Voluntary Consensus Standards for Influenza and Pneumococcal Immunizations*. Washington, DC:NQF, 2008.
- 8 National Quality Forum (NQF). *Healthcare Disparities and Cultural Competency Consensus Standards: Disparities-Sensitive Measure Assessment*. Washington, DC:NQF;2012.
- 9 Centers for Disease Control and Prevention. Human Papillomavirus Vaccination Coverage Among Adolescents, 2007-2013, and Postlicensure Vaccine Safety Monitoring, 2006-2014 – United States. *MMWR*, July 25, 2014; 63(29); 620-4.
- 10 Centers for Disease Control (CDC) website. Atlanta, GA:2012. Available at <http://www.cdc.gov/media/releases/2013/p0619-hpv-vaccinations.html>. Accessed July 25, 2014.
- 11 Centers for Disease Control (CDC) website. Atlanta, GA:2012. Available at <http://www.cdc.gov/shingles/about/overview.html>. Last accessed July 25, 2014.
- 12 Centers for Disease Control (CDC) website. Atlanta, GA:2012. Available at <http://www.cdc.gov/vaccines/programs/iis/about.html>. Last accessed March 2014.
- 13 Centers for Disease Control (CDC) website. Atlanta, GA:2012. Available at <http://www.cdc.gov/vaccines/programs/iis/annual-report-IISAR/index.html>. Last accessed March 2014.
- 14 Elliott MN, Fremont A, Morrison PA, et al. A New Method for Estimating Race/Ethnicity and Associated Disparities Where Administrative Records Lack Self-Reported Race/Ethnicity. *Health Serv Res*. 2008; 43(5 Pt 1):1772-1736.
- 15 National Quality Forum (NQF). *Healthcare Disparities and Cultural Competency Consensus Standards: Disparities-Sensitive Measure Assessment*. Washington, DC:NQF, 2012.

APPENDIX A:

Adult Immunizations Committee and Staff Roster

COMMITTEE MEMBERS	
Roger Baxter, MD, FACP	Co-Director, Kaiser Permanente Vaccine Study Center
Howard Bregman, MD, MS	Clinical Informatics, Epic
Eddy Bresnitz, MD, MSCE, FACP ¹	Executive Director, Adult Vaccines, Global Vaccine Medical Affairs and Policy, Merck Vaccines
Jeffrey Duchin, MD	Chief, Communicable Disease Control, Epidemiology & Immunization Section Public Health – Seattle & King County
Jennifer Heath, RN, MPH	Immunization Outreach Nurse Specialist, Minnesota Department of Health
Robert Hopkins, MC, FACP, FAAP	Professor of Internal Medicine, University of Arkansas for Medical Sciences
Joseph Hunter, MD	Staff Physician, Methodist-Le Bonheur Healthcare (McClatchy Medical Center)
Janet Jennings, MS, BS	Director, Medical Informatics, Blue Care Network
Caroline Johnson, MD	Director, Division of Disease Control, Philadelphia Department of Public Health
Megan Lindley, MPH	Deputy Associate Director for Science, Immunization Services Division, Centers for Disease Control and Prevention
James McCabe, Dip, Pharm (SA) RPh	Corporate Director, Patient Care Services, Safeway Pharmacy
Ernest Moy, MD, MPH	Medical Officer, Agency for Healthcare Research and Quality
David Nace, MD, MPH	Director, Long Term Care, University of Pittsburgh Institute on Aging
Patricia Nuzzie, BS, LVN	Project Coordinator, The Immunization Partnership
Amir Qaseem, MD, PHD, MHA, FACP	Director, Clinical Policy, American College of Physicians
Laura Riley, MD, FACOG	Medical Director, Labor and Delivery, Massachusetts General Hospital
Douglas Shenson, MD, MPH, MS, MA	Associate Clinical Professor, Yale University School of Medicine
Sandra Sommer, PHD, MS, MT (ASCP)	Quality Assurance & Policy Manager, Virginia Department of Health
Samuel Stolpe, PharmD	Associate Director, Quality Initiatives, Pharmacy Quality Alliance (PQA, Inc.)
Litjen (L.J.) Tan, PhD	Chief, Strategy Officer, Immunization Action Coalition

NATIONAL QUALITY FORUM STAFF	
Wendy Prins	Vice President, National Quality Partners
Reva Winkler	Senior Director, Quality Measurement
Juliet Feldman	Project Manager, Quality Measurement
Taylor Myers	Administrative Manager, Quality Measurement
DEPARTMENT OF HEALTH AND HUMAN SERVICES REPRESENTATIVES	
Cille Kennedy	Senior Policy Analyst, Office of the Assistant Secretary for Planning and Evaluation
Jody Sachs	Senior Scientist, National Vaccine Program Office
Shary Jones	Adult Immunizations Program Coordinator, National Vaccine Program Office

ENDNOTES

- 1 After noting the vaccine effectiveness and the slow progress toward the Health People 2020 target, Dr. Bresnitz advised the Committee of his conflict of interest and did not participate in the discussion of the herpes zoster vaccine.

APPENDIX B:

Environmental Scan References

Agency for Healthcare Research and Quality (AHRQ). National Quality Measures Clearinghouse web site. <http://www.qualitymeasures.ahrq.gov/index.aspx>. Last accessed December 2013.

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Booz Allen Hamilton, Synthesis of Evidence Related to 20 High Priority Conditions and Environmental Scan of Performance Measures, report prepared for NQF; January 2010.

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Buckley DI, McGinnis P, Fagman LJ et al. *Clinical-Community Relationships Evaluation Roadmap*. Rockville, MD: Agency for Healthcare Research and Quality (AHRQ); 2013. AHRQ Publication No. 13-MO15-EF.

Centers for Medicare & Medicaid Services, List of Measures under Consideration for December 1, 2013. <http://www.qualityforum.org/WorkArea/linkit.aspx?LinkIdentifier=id&ItemID=74245>. Last accessed December 2013.

National Center for Health Statistics. Health Indicators Warehouse web site. <http://healthindicators.gov>. Last accessed September 2013.

National Quality Forum. Quality Positioning System web site. <http://www.qualityforum.org/QPS/>. Last accessed December 2013.

APPENDIX C: Conceptual Measurement Framework

The conceptual framework was developed based on the following elements:

- Age appropriate vaccinations consistent with the adult immunization schedule issued by the Advisory Committee on Immunization Practices (ACIP) and the Centers for Disease Control and Prevention (CDC);
- Concepts of process and outcome measures; and
- The two critical purposes of federal measures: 1) quality improvement/provider accountability, and 2) population health and planning.

The framework seeks to illustrate measure gaps in specific age bands and special populations including young adults, maternity, adults, and the elderly.

Definitions

Process (measure type): A healthcare service provided to, or on behalf of, a patient. This may include, but is not limited to, measures that may address adherence to recommendations for clinical practice based on evidence or consensus. Source: NQF Glossary

Outcome (measure type): The health state of a patient (or change in health status) resulting from healthcare—desirable or adverse. Source: NQF Glossary

Composite measure: A combination of two or more component measures, each of which individually reflects quality of care, into a single performance measure with a single score. Source: NQF Glossary

Level of analysis: Level(s) at which measurement is assessed. Source: NQF Glossary

Provider-level measures: Performance measures for which the level of analysis is a provider of healthcare services that is accountable for the care delivered to patients, (e.g., clinician, hospital, clinic, health plan, pharmacies, etc.). Source: NQF Staff

Population-level measures: Performance measures for which the level of analysis is a community or other individuals defined by geography that are appropriate for government, community, healthcare system and multistakeholder accountability, including measures that can be utilized and assessed at multiple levels of analysis including state, county, city, and/or community. Source: NQF report, Population Health Endorsement Maintenance: Phase II, December 2012

Employer/facility-level measures: Performance measures for which the level of analysis is the facility or employment setting that is accountable for ensuring appropriate immunizations for healthcare personnel. Source: NQF Staff

Age groups: Specific age ranges for targeted vaccine delivery. Source: Adult Immunization Schedule

Young adult: Female – age 19-26 years;

Male – 19-21 years

Adult: 19-64 years

Senior: > 65 years

To illustrate the measurement gaps, measure counts from the environmental scan were incorporated into the framework.

(*) denotes number of NQF endorsed measures.

Conceptual Measurement Framework

Age Group	Vaccine	Provider Level		Population Level	
		Process	Outcome	Process	Outcome
	HPV	2			4
	MMR				9
	Influenza	51 (*9)		26 (*1)	1
	TD/Tdap	3			
	Varicella				
	Zoster	1		3	
	Pneumococcal	36 (*6)	5 (*2)	11	9 (*1)
	Composite - immunizations only	3	1	6	2
	Composite - immunization with preventive care				

Special Populations	Vaccine	Provider Level		Population Level	
		Process	Outcome	Process	Outcome
Maternity	Influenza	1		3	
	Tdap				
	Composite				
Diabetes	Influenza	3			
	Pneumococcal	1			
	Hepatitis B				
	Composite				
	General	1			
Chronic liver disease	Hepatitis A and B	6		1	6
	Composite				
Heart disease, chronic lung disease, chronic alcoholism	Influenza	4			
	Pneumococcal	2			
	Composite	1			
Community Acquired Pneumonia	Influenza	4	1		
Kidney failure, ESRD, dialysis	Influenza	6			
	Pneumococcal	2			
	Hepatitis B	1		1	
	Composite				

Special Populations	Vaccine	Provider Level		Population Level	
		Process	Outcome	Process	Outcome
Immunocompromised (except HIV)	Influenza	1			
	Td/Tdap				
	HPV				
	Pneumococcal				
	Composite	2			
HIV/AIDS	Influenza	2			
	Pneumococcal	2			
	Hepatitis B	6			
	Other Infections Disease	1			
	Composite				
MSM	Hepatitis A and B			1	2
	Composite				

Healthcare Personnel	Employer/ Facility- Level		Population- Level	
Vaccine	Process	Outcome	Process	Outcome
Influenza	7			
Hepatitis B			2	
Tdap				
MMR				
Varicella				
Zoster				
Composite				

Immunization Information Systems (IIS)

Provider Level	System Level
3	4

APPENDIX D:

Adult Immunization Measure Gap Areas

NQF staff used the conceptual framework to identify potential measure gaps in the areas specified by HHS in the contract. Committee members were encouraged to prioritize them and suggest additional gaps using a survey tool as part of preparation for the March 31-April 1, 2014 meeting. The following list of potential gaps for prioritization was considered by the Committee in their initial prioritization exercise. The Committee's initial results are presented in [Appendix F](#).

Adult Vaccines for which there are no NQF-endorsed Measures

- Measures for zoster vaccination
- Measures for Td/Tdap vaccination
- Measures for varicella vaccination
- Measures for “catch-up vaccination” (HPV, MMR)

Vaccines for Specific Age Bands

Ages 19-59 years:

- Measures for HPV “catch-up”
- Measures for meningococcal vaccination in appropriate patients
- Measures for Td/Tdap

Ages 60-64 years:

- Measures for zoster vaccination
- Measures for Td/Tdap vaccination

Ages 65+ years:

- Measures for zoster vaccination
- Measures for Td/Tdap vaccination

Vaccines for Special Populations

Pregnancy:

- Measures for Tdap vaccination
- Measures for Influenza vaccination (most current flu measures exclude pregnant patients)
- Measures for Tdap and influenza vaccination
- Measures for Post-partum varicella vaccination

Diabetes:

- Measures for Hepatitis B vaccination

Kidney failure/ESRD:

- Measures for Hepatitis B vaccination

Chronic liver disease:

- Measures for Hepatitis A vaccination
- Measures for Hepatitis B vaccination

Vaccines for Healthcare Personnel

- Measures for hepatitis B
- Composite measure for flu and Hep B

Composite Measures of Adult Immunization

- An “up to date for all age-appropriate vaccines” measure for all adults
- Composite measure of required vaccines for different age groups, i.e., 19-59 years, 60-64 years, 65+ years
- Composite measure(s) for preventive care that include vaccinations
- Composite measures for special populations that include vaccination with other important care processes for a disease or condition

Outcome Measures

- Patient-reported outcome measures
- Outcome measures for health plans, systems or ACOs, e.g., hospitalizations, morbidity, mortality or resource use, for vaccine-preventable diseases.

Immunization Information Systems

- Measures of proportion of providers that submit adult immunization information to an IIS via EHR or other means).
- Measures of other vaccine providers (pharmacies, occupations health clinics, etc.) that submit adult immunization information to an IIS.
- States that track adult immunizations in their registry.

APPENDIX E:

Key Informants

NQF staff interviewed the following individuals to explore specific aspects of adult immunizations performance measurement to provide additional input to the Committee prior to their in-person meeting.

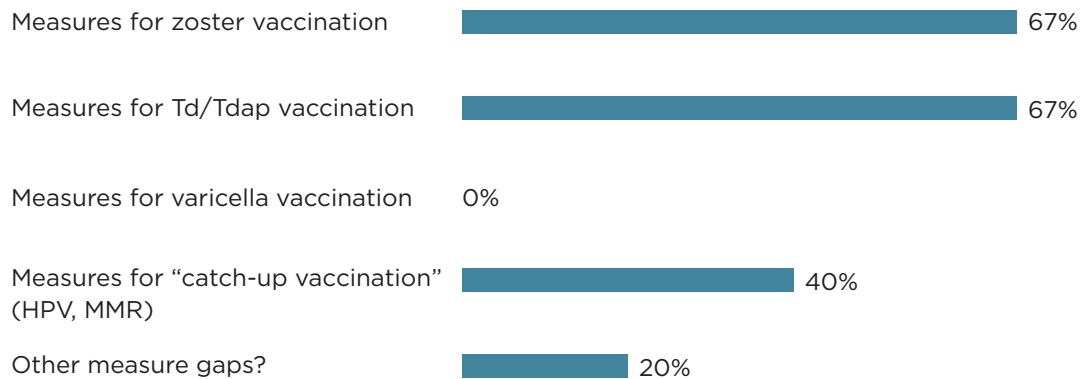
KEY INFORMANTS	
Andrew Baskin, MD	National Medical Director for Quality and Provider Performance Measurement, Aetna
Howard Bregman, MD, MS	Clinical Informatics, Epic
Sepheen Byron, MHS	Director, Performance Measurement, National Committee for Quality Assurance
Jim Daniel, MPH and Lauren Wu, MHS	Public Health Coordinator and Policy Analyst, HHS Office of the National Coordinator for Health Information Technology
Amy Groom, MPH	Immunization Program Manager, Indian Health Services
Senka Hadzic, MPH	Process Analyst, Institute for Clinical Systems Improvement
Troy Knighton, MEd, EdS, LPC, et al.	National Seasonal Flu & IDPIO Program Manager, Veterans Administration
Karen Nielsen, MBA, MPA, et al.	R&D, Analytics and Business Intelligence, Siemens Medical Solutions
Lee Partridge	Senior Health Policy Advisor, National Partnership for Women and Families
Gary Urquhart, MPH	Chief, Immunization Information Systems Support Branch, Centers for Disease Control and Prevention

APPENDIX F:

Preliminary Prioritization of Measure Gaps

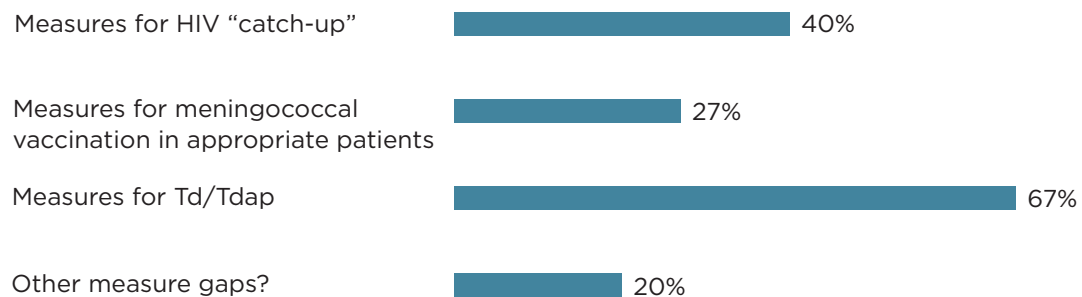
The Committee used an iterative process to arrive at their recommendations on measure gaps. Below are the Committee's initial prioritization results which informed discussions at the in-person meeting. Committee members could select more than one priority for each question.

QUESTION 1. ADULT VACCINES FOR WHICH THERE ARE NO NQF-ENDORSED MEASURES



Respondents = 15 (2 skipped)

QUESTION 2. AGES 19-59 YEARS



Respondents = 15 (2 skipped)

QUESTION 3. AGES 60-64 YEARS

Measures for zoster vaccination  62%

Measures for Td/Tdap vaccination  38%

Other measure gaps?  23%

Respondents = 13 (4 skipped)

QUESTION 4. AGES 65+ YEARS

Measures for zoster vaccination  71%

Measures for Td/Tdap vaccination  29%

Other measure gaps?  21%

Respondents = 14 (3 skipped)

QUESTION 5. PREGNANCY

Measures for Tdap vaccination  20%

Measures for Influenza vaccination (most current
flu measures exclude pregnant patients)  20%

Measures for Tdap and influenza vaccination  73%

Measures for post-partum varicella vaccination  13%

Other measure gaps?  20%

Respondents = 15 (2 skipped)

QUESTION 6. DIABETES

Measures for Hepatitis B vaccination  85%Other measure gaps?  38%

Respondents = 13 (4 skipped)

QUESTION 7. KIDNEY FAILURE/ESRD

Measures for Hepatitis B vaccination  92%Other measure gaps?  33%

Respondents = 12 (5 skipped)

QUESTION 8. CHRONIC LIVER DISEASE

Measures for Hepatitis A vaccination  33%Measures for Hepatitis B vaccination  67%Other measure gaps?  25%

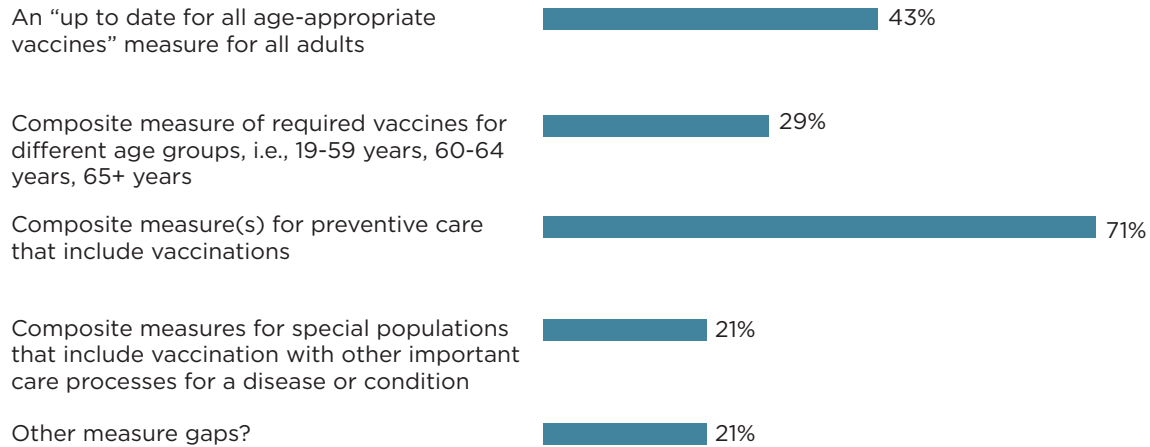
Respondents = 12 (5 skipped)

QUESTION 9. VACCINES FOR HEALTHCARE PERSONNEL

Measures for Hepatitis B vaccination  53%Composite measure for influenza
and Hepatitis B vaccination  40%Other measure gaps?  73%

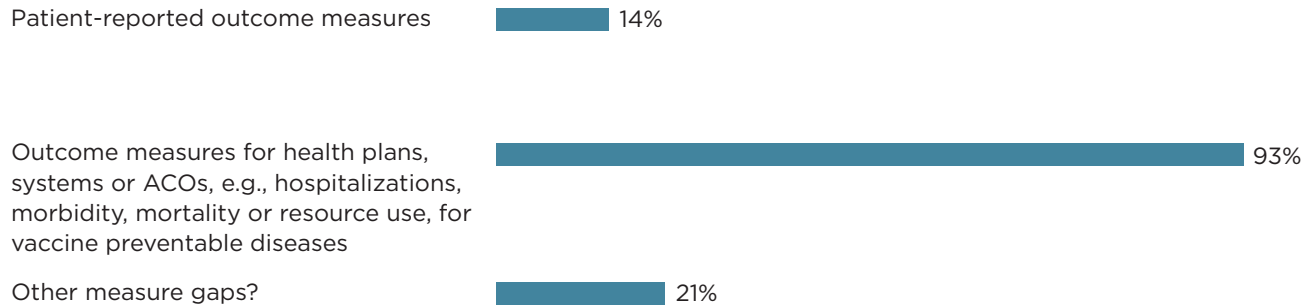
Respondents = 15 (2 skipped)

QUESTION 10. COMPOSITE MEASURES OF ADULT IMMUNIZATION



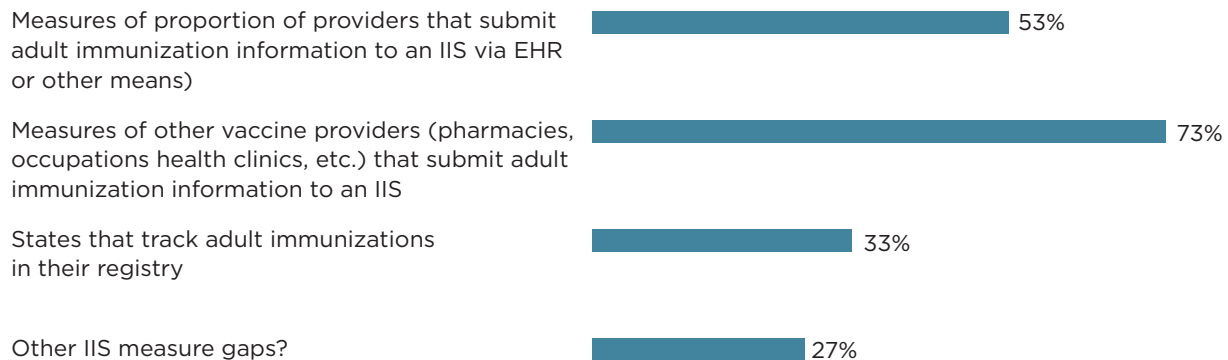
Respondents = 14 (3 skipped)

QUESTION 11. OUTCOME MEASURES



Respondents = 14 (3 skipped)

QUESTION 12. IMMUNIZATION INFORMATION SYSTEMS



Respondents = 15 (2 skipped)

APPENDIX G: Public Comments

Conceptual Framework

GlaxoSmithKline

Deborah Fritz

GlaxoSmithKline supports the conceptual framework used to assess the health care environment in Adult Immunizations, particularly its alignment to the adult immunization schedule issued by the Advisory Committee on Immunization Practices (ACIP) and Centers for Disease Control and Prevention (CDC). We support the dual emphasis for the development of both process measures at the provider level and outcome measures at the population health level. While the outcomes measured for adult immunizations are typically seen and measured at the population health level, the work provided to improve care, close care gaps and drive immunization rates occurs daily at the provider level demonstrating the importance and need for strong process measures.

> *NQF Response*

Thank you for your comments. The Committee agrees that the framework emphasizes alignment with APIC/CDC guidelines and the need for both process and outcome measures.

Highmark

Christine Pozar

Adult immunizations are an area that needs more focus particularly on the education aspect of the vaccine efficacy.

> *NQF Response*

Adult Immunization was selected by the federal government for this “gap filling” work because of the need for more focus on immunizations for adults beyond influenza and pneumococcal. Improving immunization rates and improved health outcomes requires educational effort as well as measurement and incentives. Education about the expected differences in vaccine efficacy for adults compared to

children will be needed to foster shared accountability with patients to encourage vaccination.

Priorities for Measure Development

Sanofi Pasteur

Judith Coates

Regarding the overarching composite measure, it is important that it not be limited to an “all or nothing” measure and also includes data from each component of the composite measure. It is very important to align measures and consolidate to avoid duplication and confusion.

There is a focus on Tdap for pregnant women but it is also important to target all adults (ages 19-64) as recommended by ACIP, especially for those in close contact with an infant.

It is important to include a measure for influenza vaccination for all 19-50 year old adults.

NQF is to be applauded for seeking alignment of measures for ACIP recommended vaccines for adults.

> *NQF Response*

The Committee discussions of composite measures remained at a general level. The methodology used to develop a composite measure will be determined by the measure developer. NQF 2013 report on Composite measures (http://www.qualityforum.org/Publications/2013/04/Composite_Performance_Measure_Evaluation_Guidance.aspx) discusses various considerations for composite measures, including maintaining the data for the components to assist in quality improvement. Committee members noted that composite measures would encourage provision of all recommended vaccinations. The measure for Tdap for all adults is included in the Committee recommendations. Measures for influenza vaccination for all ages, including 19-50 years, already exist and was not considered for filling a gap in measurement.

American Immunization Registry Association
Alison Chi

Comments from AIRA also provided under “General Comments.”

Your report contains recommendations and strategies to strengthen and encourage use of IIS for adult measurement (p 11). AIRA’s comments follow:

1st bullet: “Encouraging and incentivizing providers to submit immunization data to IIS (via EHR or other)”

Yes, we agree – with additional funding for IIS, and as long as adult providers are not prioritized over pediatric providers when incentives are given.

2nd bullet: “Encouraging further adoption of voluntary national data standards for IIS, which could eventually be written into legislation.” We suggest omitting “which could eventually be written into legislation.” AIRA is currently exploring the benefits of IIS certification, and supports continued development of national standards for IIS.

3rd bullet: “Further developing IIS for all states, territories and DC to adopt CDC functional standards that include bidirectional interoperability with providers and other IIS; core data elements that include patient refusal and contraindications; and allowing patient access to IIS data.” We support CDC functional standards (which currently include interoperability) and CDC core data elements (which currently include patient refusal and contraindications). The CDC functional standard about patient access reads: “With appropriate levels of authentication, IIS can provide copies of immunization records to individuals or parents/guardians with custodial rights.” Many IIS currently provide records to consumers through a paper-based system using a Consent for Release of Medical Information. Direct, online access to IIS data by consumers is still much debated because of authentication concerns. Though it is a worthy goal, other methods of providing records to consumers may prove more feasible and preferable, such as through online access to their own provider’s medical record once bidirectional data exchange is achieved.

· 4th bullet: “Encouraging a focus on eMeasure development.” AIRA supports the development of measures that use EHR, IIS, and other sources of electronic data.

> NQF Response

The Committee agrees that adult and pediatric providers should be treated equally but acknowledges that adult immunization rates lag far behind rates of child vaccination and specific incentives may be needed to promote greater adult vaccination rates as well as more resources to expand capacity for measurement and reporting, particularly using IIS. The Committee appreciates your suggestions for bullets 2,3 and 4 but decided to keep the original language.

GlaxoSmithKline
Deborah Fritz

GSK supports the age-specific priorities and composite measure priorities identified by the committee. However, we strongly recommend revising the recommendation on Tdap/pertussis-containing vaccine for ages 19-59 (p. 4) to apply to all adults ages 19 and older, in order to be consistent with ACIP recommendations.

The current ACIP recommendations for vaccination of adults over the age of 19 years state “Any adult 19 years of age and older who has not received a dose of Tdap should get one as soon as feasible – to protect themselves and infants.” (<http://www.cdc.gov/vaccines/vpd-vac/pertussis/recs-summary.htm>) We would also note that the initial ACIP Adult Tdap vaccination recommendations of 2005 recommending Tdap for adults 19-64 years of age were updated in 2012 to include adults 65 years of age and older i.e., “Providers should not miss an opportunity to vaccinate persons aged 65 years and older with Tdap.” (<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6125a4.htm>)

We recommend that the committee consider prioritizing an adult immunization composite measure with the longer-term goal to develop a composite measure that includes both immunization and preventive services. We support the concept of composite measure priorities identified by the committee. However, we recommend caution on the composite that would include immunizations with other preventive services. We understand the rationale for aligning immunization with other age-based and disease-specific preventive services as an effort to raise the profile of adult immunization

among providers. We are concerned that technical challenges for developing such a measure could delay the development of a composite measure for adult immunization.

> NQF Response

Thank you for your suggestions. The report will be amended regarding the age for Tdap vaccination to align with ACIP/CDC guidelines. The Committee focused on Tdap vaccination for the pregnant population for the short term. The Committee discussed the likely challenges in developing a composite measure for immunizations and preventives measures. Those methodologic challenges are the reason the recommendation is for the longer term.

Highmark

Christine Pozar

Broadly, there are too many vaccine measures. We suggest that they should be combined either into population age-specific prevention measures or standalone disease specific targeted measures.

> NQF Response

The Committee agrees there are too many immunization measures. The recommendations for harmonization and consolidation speak to that issue as well as the recommendations for composite measures.

March of Dimes

Cynthia Pellegrini

The March of Dimes, a unique collaboration of scientists, clinicians, parents, members of the business community, and other volunteers affiliated with chapters representing every state, the District of Columbia and Puerto Rico, appreciates the opportunity to submit comments on the draft report, *Priority Setting for Health Care Performance Measurement: Getting to Measures that Matter for Adult Immunization*, released on June 14, 2014.

The March of Dimes applauds the work of the Adult Immunizations Committee in producing a draft report with thoughtful recommendations for vaccination of adults, including pregnant women. We strongly support your identification of Tdap and influenza

vaccination for pregnant women as one of the Composite Measure Priorities among the Priorities for Measure Development (Table 1) presented in the report.

The March of Dimes strongly supports vaccination of pregnant women in keeping with the recommendations of the Centers for Disease Control and Prevention's Advisory Committee on Immunization Practices (ACIP) and the American College of Obstetricians and Gynecologists (ACOG). At this point in time, ACIP and ACOG recommend that all pregnant women receive both the tetanus toxoid, reduced diphtheria toxoid, acellular pertussis (Tdap) vaccine and flu vaccine during each pregnancy. Tdap should optimally be administered between 27 weeks and 36 weeks of gestation. In addition to protecting mothers from these diseases, Tdap vaccination has been shown to decrease morbidity and mortality among vulnerable newborns in the first months of life. Similarly, influenza vaccination reduces the risks of influenza for a woman during her pregnancy as well as for her infant. Influenza vaccination has also been associated with decreased rates of premature birth.

Despite the well-recognized benefits of Tdap and influenza immunizations for pregnant women and their infants, maternal immunization rates in the U.S. remain disturbingly low. Estimates of influenza vaccination coverage among pregnant women during the 2012-2013 influenza season showed that just over half of pregnant women reported getting vaccinated before or during their pregnancy. Tdap immunization rates are reportedly only about 30%, with many Tdap immunizations taking place outside the time range recommended for optimal efficacy.

Efforts to increase vaccination rates among pregnant women will require initiatives along many fronts. The March of Dimes applauds identification of Tdap and influenza vaccination for pregnant women as a priority for performance measurement to increase immunization rates and improve health outcomes for both mothers and infants.

While the report does not address the detailed specifications for priority composition measures, the March of Dimes would emphasize that receipt of both the Tdap and flu vaccines is vital for all pregnant females. We urge you to work to ensure that any composite measure is structured to include pregnant

women of all ages, including the often-overlooked and underserved adolescent population, to drive quality improvement for all women and infants.

The March of Dimes appreciates this opportunity to comment on the draft report of the Adult Immunizations Committee.

> *NQF Response*

The report will be amended to clarify that Tdap and influenza vaccination is for all pregnant women, including adolescents, as intended by the Committee.

General Comments

American Immunization Registry Association

Alison Chi

The American Immunization Registry Association (AIRA) is a membership organization that promotes the development and implementation of immunization information systems (IIS) as an important tool in preventing and controlling vaccine preventable diseases. The organization provides a forum through which IIS programs, and interested organizations, individuals and communities combine efforts, share knowledge, and promote activities to advance IIS and immunization programs.

AIRA appreciates the opportunity to comment on the National Quality Forum's "Priority Setting for Health Care Performance: Getting to Measures that Matter for Adult Immunizations." Overall, AIRA is very supportive of NQF's statements about the role that IIS can play in improving and measuring adult immunization coverage. We appreciate your recognition that expanding use of IIS for adult immunizations will require more funding. We cannot emphasize this need enough. IIS are already doing more than originally anticipated and often with less funding. And although many IIS currently accept adult immunization data, many are running into capacity issues. To perform well as lifespan registries, IIS need more resources to handle the influx in data, increased number of participating providers (including complementary), increasing number of interfaces with EHR systems, infrastructure enhancements, and adult-specific software development.

Additional comments are provided in the Comment box for "Priorities for Measures".

> *NQF Response*

The Committee acknowledged that the promise of IIS to facilitate data collection and measurement requires additional resources to build greater capacity and interoperability for a national system.

ACOEM

Patrick O'Connor

The American College of Occupational and Environmental Medicine (ACOEM) applauds the inclusion of Adult Immunization measures in the NQF effort to define gaps in quality and efficiency measures and to develop multistakeholder recommendations for future measure development and endorsement. We believe that employers have a major stake in the outcomes of adult immunizations, one which we in ACOEM do not believe was fully recognized in the draft report. We believe an employer representative should be specifically represented on the NQF Adult Immunizations Committee.

Employers have a vested interest in the health of the population as it directly impacts their economic outcomes. Employers bear a substantial burden as a result of worker ill-health in terms of direct (health care costs) and indirect (cost of absence, replacement workers, lost productivity etc.) costs. Employers have significant influence over process elements that drive adult immunization rates. Employers can influence the health care benefit design they purchase and often contract with vendors to provide adult immunizations to augment the success rates, especially for but not limited to annual influenza immunization. Employers are frequently the locus for delivery of adult immunizations through travel health programs, on-site or near-site employee health clinics, employee health fairs or other vaccine-promotion programs such as voucher programs for remote employees. Finally, employers can serve as an important communication channel for important health initiatives.

The role of employers in enabling health should not be underestimated. Employers will bear a productivity impact of ill-health but can also influence health through communication channels and other positive social determinants of health.

We endorse the report's acknowledgement of the challenges imposed by disparate data sources for adult immunizations and the recommendation for national immunization registries.

Healthcare Providers should be evaluated on their process and outcomes performances on these actions: establishing a behavioral norm of collecting adult immunization history at least once a year; periodically taking and updating a complete immunization history for all adult patients; coordinating the provision to their adult patients any and all appropriate immunizations ; entering any and all immunizations delivered into the appropriate immunization registry; state registries should include patient opt-out clauses for dissemination of information to all involved in administering vaccinations with access to registries by all involved with administering vaccines; advocating for and implementing (where available) adult immunization data integration between and among practice/clinic information systems, hospital information systems, community immunization registries, other provider information systems.

> NQF Response

The Committee agrees that employers are an important stakeholder for promoting adult immunizations. The report will be amended to emphasize that point.

NQF encourages ACOEM to nominate potential Committee members during the "Call for Nominations" for various projects -- see www.qualityforum.org for ways to become involved. The suggestions on healthcare provider evaluation might be appropriate components of a composite measure or a solid quality improvement program to support the measures recommended by the Committee.

Minnesota Department of Health Immunization Program

Jennifer Heath

Thank you for the opportunity to provide comments on the draft report Getting to Measures that Matter for Adult Immunizations. These comments are being submitted on behalf of the Minnesota Department of Health Immunization Program. We would like to suggest that NQF designate a timeframe to

discontinue the measure for HPV catch-up. Providers should be encouraged to give the vaccine at the recommended age of 11 years when it is most effective. This is reinforced by existing quality measures in the HEDIS program. If the measure for adults were continued indefinitely, providers could justify delaying immunization past the recommended age because they would be incentivized to do so. We suggest the measure for HPV catch-up be limited to three years or less.

The use of composite measures is excellent approach. Since public health departments often play an active role in assuring general preventative services recommendations are followed (e.g. cancer screening, diabetes prevention, asthma control etc.), composite measures would leverage the partnerships that have already been created. Composite measures also acknowledge that continuity of care is essential to the prevention of disease, and are a way to demonstrate health care system accountability for this process.

MDH is working to improve vaccination rates among pregnant women and the measures suggested are in line with efforts to prevent pertussis and influenza among new mothers and their infants. Because the prenatal care provider community is highly engaged, and most women have access to care during their pregnancies, this measure is highly feasible to collect. We support the committee's recommendation to prioritize this measure.

Minnesota's Immunization Information System, the Minnesota Immunization Information Connection (MIIC) is one of the strongest tools we have to support adult immunization measurement. We agree with that this is a key leverage point to drive performance, as MIIC can be used for a data collection tool as well as a tool for public reporting of immunization rates. The development and maintenance of an effective IIS is an asset to all health care providers and public health. We recommend that NQF promote the acceptance of adult immunization data as a standard for all IISs.

Providers in the pharmacy, workplace and community are crucial to immunizing adults and represent a welcome expansion of the provider community. These providers are an important group to engage in quality measurement, especially in the use of an IIS. When all providers submit immunization

data, the system becomes more reliable allowing for accurate measures of community or state-level coverage. Additionally, an IIS has the ability to attribute a specific vaccination to a pharmacy or other complementary provider. Receiving this level of data would encourage partnerships between complementary and clinical settings, and enhance continuity of care.

> NQF Response

The Committee agrees that the HPV catch-up recommendation is for the near term, consistent with APIC/CDC Immunization schedule. Such a measure, however, does not currently exist and must be developed and implemented. Hopefully, improved rates of adolescent HPV immunization will make an HPV “catch up” measure unnecessary in the future. Committee members note that the HEDIS measure does not include boys.

Highmark

Christine Pozar

Adult immunization education measures may be more valid to track since there is a shift in delivery of vaccinations to local pharmacies and Senior Centers. Providers have less to do basically as a result of “free immunization clinics and lower cost at service areas such as grocery stores where impact can be capitalized.

Recommend mandatory, rather than voluntary, registry reporting of immunization information.

> NQF Response

While education of patients and communities on the importance of immunization is required, the impact to patients is realized when vaccination occurs. The Committee strongly recommends that complementary immunization providers be included in measurement and reporting to IIS. Providers, however, should be aware of every patient’s vaccination status as part of the general medical history regardless of where the vaccination is given. Committee members acknowledged the burden imposed by data collection and reporting but generally believe that mandatory reporting is the most likely approach to realize rapid gains in vaccination rates.

GlaxoSmithKline

Deborah Fritz

GlaxoSmithKline appreciate the opportunity to provide feedback and input into the NQF Priority Setting for Health Care Performance Measurement: Getting to Measures that Matter for Adult Immunizations Report. We are pleased to see this effort to identify, analyze, prioritize, and make recommendations for filling measure gaps related to Adult Immunizations. We commend the Committee on its work on the assessment of the Adult Immunization landscape and identification of important issues regarding measurement accuracy and efficiency; focusing on the two which is most meaningful, shared responsibility and data challenges.

> NQF Response

Thank you for comments and support of the recommendations.

NATIONAL QUALITY FORUM
1030 15TH STREET NW, SUITE 800
WASHINGTON, DC 20005
www.qualityforum.org