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A pathway to developing and testing quality measures aimed at improving adult vaccination rates in the United States

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ABSTRACT

Despite recommendations for vaccinating adults and widespread availability of immunization services (e.g., pharmacy venues, workplace wellness clinics), vaccination rates in the United States remain low. The U.S. National Adult Immunization Plan identified the development of quality measures as a priority and key strategy to address low adult vaccination coverage rates. The use of quality measures can provide incentives for increased utilization of preventive services. To address the lack of adult immunization measures, the National Adult and Influenza Immunization Summit, a coalition of adult immunization partners led by the Immunization Action Coalition, Centers for Disease Control and Prevention, and National Vaccine Program Office, spearheaded efforts to (1) identify gaps and priorities in adult immunization quality performance measurement; (2) explore feasibility of data collection on adult immunizations through pilot testing and engaging stakeholders; and (3) develop and test quality measure specifications. This paper outlines the process by which a public-private partnership drove the development of two adult immunization performance measures—an adult immunization status measure for influenza, tetanus and diphtheria (Td) and/or tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis (Tdap), herpes zoster and pneumococcal vaccines, and a prenatal immunization status measure for influenza and Tdap vaccinations in pregnant women. These measures have recently been added to the 2019 Healthcare Effectiveness Data and Information Set (HEDIS®), a widely used set of performance measures reportable by private health plans.

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1. Background and introduction

Since 2006, the Advisory Committee on Immunization Practice (ACIP) has issued several new vaccine recommendations for adults [1]. Examples include a recommendation for tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccine (Tdap) during each pregnancy and Tdap catchup vaccination among other adults not vaccinated as adolescents [2]. In addition, the first vaccine to prevent shingles was recommended in 2008, and vaccination of high-risk and older adults with 13-valent pneumococcal conjugate vaccine (PCV13) was recommended in 2014 [3,4]. Despite recommendations for use, and expanded access to vaccines at pharmacies, worksite clinics, and other locations, vaccination rates for adults in the United States remain low [5–9]. Implementation of the Standards for Adult Immunization Practices [10] is also suboptimal with consumers reporting that less than half of their primary health care visits include assessment of their immunization status [11]. Low adult immunization coverage rates contribute to health and economic burdens, making improving adult immunization a public health priority [6,12–15].

Quality measures can be effective tools to monitor changes in new and existing programs (e.g., mandatory reporting programs, pay for reporting, pay for performance). Use of quality measurement in public and private reporting is intended to create accountability for performance and improve the quality of care at the patient and population levels, both of which are goals of accountable-care models and value-based purchasing within health insurance. Tying quality measures to payment models such

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as value-based payment structures incentivizes providers and health plans to improve the quality of health care services.

The use of quality measures in payment programs has dramatically risen in recent years [16–18]. The Medicare Access and CHIP Reauthorization Act of 2015 (MACRA) includes quality measurement as a driver of reimbursement in an effort to maximize the delivery of quality healthcare and the value of health care dollars [17] Additionally, the Medicare Advantage Star Ratings program, which rates health plans on a Five-Star Quality Rating System measures how well plans perform to a set of quality measures [18]. The 2016 star ratings are based on 2014 operations and the results determined millions of dollars in bonus payments awarded in 2017. Health plans earning at least four stars qualify for federal bonus payments; United Healthcare, the largest player in the program was awarded over $1 billion in 2017 [19]. Moreover, CMS awarded over 10.9 billion in bonus payments between 2012 and 2014 in an effort to drive improvement in quality of care and improve the level of accountability for care by physicians, hospitals and other providers [20].

Quality measures can also inform consumer selection of health plans, providers, and health care facilities and inform employer selection of insurance options for their employees. Today, over 90% of health plans in the United States participate in the National Committee for Quality Assurance (NCQA)'s Healthcare Effectiveness Data and Information Set (HEDIS®), a tool used to evaluate the quality of care of private health plans. Measures in this dataset affect approximately 184 million beneficiaries (57% of the U.S. population). Tracking of HEDIS® measures' performance allows providers to monitor and to address gaps in performance, enables comparisons between health plans for consumers and potential insurance purchasers, and is a leading driver of quality improvement [21]. Inclusion of immunization measures in HEDIS(R) can be a means to increase immunization rates [22]. Despite changes in adult vaccine recommendations, only influenza and pneumococcal vaccination quality measures have been available for use, with no quality measures for other adult vaccinations. Composite measures that incorporate ACIP-recommended childhood vaccines have contributed to generally high pediatric immunization coverage, at or above national *Healthy People 2020* targets, and adolescent composite measurement supports increases in adolescent coverage toward national targets [23]. These composite measures are process measures (i.e., measures that are specific steps in a process that leads to a particular outcome) used to ensure vaccination occurs in a timely manner [24–26]. New composite adult vaccine measures could provide opportunities to improve adult vaccination coverage.

Recognizing the gaps in quality measures for adult vaccinations, the National Adult and Influenza Immunization Summit (NAIIS), a multi-stakeholder coalition of federal and non-federal partners working to increase adult immunization coverage rates for ACIP-recommended vaccines, sought to develop new quality measures for adult immunization [27]. Through the NAIIS quality measurement working group (QMWG), two new quality measures for adults were developed, along with a framework for a third measure set for patients with end-stage renal disease (ESRD) [27,28]. Immunization champion leaders from the National Vaccine Program Office (NVPO), the Indian Health Service (IHS), The Joint Commission, Pharmacy Quality Alliance, and the American College of Obstetricians and Gynecologists (ACOG) led the efforts of the QMWG (Table 1). This paper outlines the deliberate and comprehensive pathway taken by the NAIIS in the development and testing of two new adult immunization quality performance measures

Table 1
Member organizations of the national adult and influenza immunization summit quality measurement working group.

State and local health departments	Federal partners
• California Department of Public Health • District of Columbia Department of Health • Louisiana Department of Health • Michigan Department of Health and Human Services • Minnesota Department of Health • New York City Department of Health and Mental Hygiene • New York State Department of Health • Northwest Portland Area Indian Health Board • Virginia Department of Health	• Centers for Disease Control & Prevention • Centers for Medicare and Medicaid Services • Department of Defense • Department of Veterans Affairs • Health Resources and Services Administration • *Indian Health Service*[*] • *National Vaccine Program Office*[*]
Professional associations and networks	
• Adult Vaccine Access Coalition • Alliant Quality • American Academy of Family Physicians • American Association of Nurse Practitioners • American College of Nurse Midwives • *American College of Obstetricians and Gynecologists*[*] • American College of Physicians • American Immunization Registry Association • Avalere Health • Delmarva Foundation • Gerontological Society of America	• HealthInsight Oregon • Heartland Kidney Network • HQI Solutions • Immunization Action Coalition • Infectious Diseases Society of America • *The Joint Commission*[*] • Kidney Care Quality Alliance • March of Dimes • *Pharmacy Quality Alliance*[*] • Quality Innovation Network Quality Improvement Organization and Quality Innovation Network National Coordinating Center • Renal Physicians Association • Telligen
Academia	**Corporations**
• Johns Hopkins Bloomberg School of Public Health • University of Arkansas for Medical Science • University of Kansas Medical Center • University of California, San Diego • University of Notre Dame	• GlaxoSmithKline • Merck & Co. • Pfizer • Publix • Rite Aid • Sanofi Pasteur • Seqirus • United Healthcare

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Table 2
National quality forum priority recommendations for adult immunization measure development.

National quality forum recommendations	
Age-specific	(1) HPV catch-up for ages 19–26
	(2) Tdap vaccine for ages 19–59
	(3) Zoster vaccine for ages 60–64
	(4) Zoster vaccine for ages ≥ 65
Composite	(5) Composite with other preventative services (e.g. inclusive of diabetes care for diabetic population)
	(6) Composite—Tdap and influenza for pregnant women
	(7) Composite—Influenza, pneumococcal, and Hepatitis B in individuals with diabetes
	(8) Composite—Influenza, pneumococcal, and Hepatitis B in individuals with end-stage renal disease
	(9) Composite—Hepatitis A and B in individuals with chronic liver disease
	(10) Composite of all ACIP vaccines for health care workers (i.e., all routinely ACIP-recommended vaccines for adults and those specific to health care workers such as Hepatitis B)

Notes: ACIP = Advisory Committee for Immunization Practices; HPV = human papilloma virus vaccine; Tdap = tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccine. The report did not specify PPSV23 and PCV13 pneumococcal vaccines since the NQF report was published prior to the ACIP recommendations for PCV13 vaccination of adults. The only pneumococcal vaccine recommended by ACIP when the NQF report was published was PPSV23 vaccine.
Source: [31].

for the 2019 HEDIS® measure set, and the development of recommendations to the Centers for Medicare & Medicaid Services (CMS) regarding vaccinations for the ESRD population. The pathway included three main action steps: (1) identifying gaps in the adult immunization quality performance measurement landscape; (2) exploring feasibility of data collection through pilot testing and cross-sector interest and support; and (3) developing and testing the measure specifications. Advocating for these new measures to be included in quality improvement and incentive programs tied to payment will be critical to increasing adult immunization coverage rates.

2. Action steps

2.1. Action 1: Identifying gaps in the adult immunization quality performance measurement landscape

The National Quality Strategy, the Nation's blueprint for achieving high-value health care, seeks to achieve better patient-centered quality care, healthier communities, and more affordable care [29]. In alignment with the National Quality Strategy, the US Department of Health and Human Services (HHS) commissioned the National Quality Forum (NQF) to provide multi-stakeholder guidance on priorities for performance measure development and endorsement in adult immunization [30]. The NQF confirmed that there were gaps in adult vaccination-related quality measures, as existing measures were limited to influenza and pneumococcal vaccinations [31]. Given the current emphasis on implementing and adopting quality measures, the lack of quality measures for most adult vaccinations was deemed a missed opportunity to improve adult vaccination implementation. HHS and NQF engaged in a deliberate process to identify measures to close critical gaps in the measurement landscape for adult immunizations with the goal of improving adult vaccination rates [31]. The NQF issued a report that prioritized measurement needs with a focus on vaccines most commonly recommended for adults. Specifically, the NQF report identified 10 measures as priorities for investment that, if created and utilized, could drive improvement in adult immunization [31] (Table 2).

Considering the NQF framework and recommendations (Table 2), the member organizations of the NAIIS QMWG (Table 1) selected three specific measure activities to act on: (1) development of a composite measure for the vaccination of pregnant women to prevent infant pertussis and maternal and infant influenza illnesses and related complications, (2) development of a composite measure for adult immunizations of routinely recommended vaccines (i.e. influenza, tetanus and diphtheria (Td) and/or Tdap, herpes zoster, pneumococcal), and (3) development of recommendations to CMS on immunization measurement (i.e., influenza, pneumococcal, and hepatitis B vaccines) for the Medicare ESRD program [27,28,32,33] (Table 3). Composite measures were prioritized since they offer the ability to monitor the implementation of multiple ACIP-recommended adult immunizations and provide insight into the overall performance of health systems' implementation of adult vaccination recommendations [34].

This paper will focus on the development of the adult immunization status (AIS) and prenatal immunization status (PIS) measures. However, the NAIIS also provided recommendations to CMS regarding ACIP-recommended vaccines (i.e. influenza, pneumococcal and hepatitis B vaccines) for the ESRD population. These recommendations, transmitted to CMS on April 18, 2018 noted gaps in vaccination of patients with ESRD, recommended development of a composite vaccination measure, harmonization of any new vaccination measure with other adult vaccination measures, and encouraged CMS to use multiple data sources for immunization metrics. Recommendations also included encouraging submission of vaccine administration records to the appropriate immunization information systems (IIS) and requiring a query of the IIS to be performed prior to vaccine being administered [32]. The NAIIS encouraged CMS to further consult organizations and institutions involved in direct patient care, health care payments, and reimbursement (e.g., managed care organizations, dialysis providers, and health care insurance carriers) for ESRD care regarding the proposed measure, given the complexity and transitions of care for persons who progress from chronic kidney disease to renal failure and dialysis. No further ESRD measure development or testing was done by the NAIIS.

2.2. Action 2: Exploring feasibility through pilot testing: The Indian health service (IHS) experience

To better understand the feasibility of a composite adult vaccination measure, the NAIIS asked IHS to pilot test such a measure. IHS is the federal agency responsible for providing health care to approximately 2.2 million American Indian and Alaska Native (AI/AN) people in 37 states through a network of IHS-funded health care facilities. Members of the AI/AN population experience disproportionate rates of many chronic and infectious diseases compared to non-Hispanic white and general US populations, including higher rates of morbidity and mortality for some VPDs [35–37]. Because of this, the provision of ACIP-recommended vaccines is a high priority for the agency. IHS has established internal policies to support the availability and delivery of vaccines across the IHS health care system. Such policies include ensuring all

Table 3
National adult and influenza immunization summit measure activities: measure description and intent.

Measure and intended target	Measure description	Intent
Adult Immunization Status (AIS) The work of the NAIIS on the AIS lead to the development and testing of the NCQA measure which is in HEDIS® 2019	The percentage of members 19 years of age and older who are up-to-date on recommended routine vaccines for annual influenza*, tetanus and diphtheria (Td) and/or tetanus toxoid, reduced diphtheria toxoid and acellular pertussis (Tdap), herpes zoster and pneumococcal (the 13-valent pneumococcal conjugate vaccine (PCV13) and the 23-valent pneumococcal polysaccharide vaccine (PPSV23).	The intent of this measure is to assess routine vaccination for adults as per Advisory Committee on Immunization Practices (ACIP) recommendations.
Prenatal Immunization Status (PIS) The work of the NAIIS on the PIS lead to the development and testing of the NCQA measure which is in HEDIS® 2019	The percentage of deliveries on or after 37 gestational weeks in which women received influenza and Tdap vaccinations.	This measure assesses receipt of important prenatal vaccines, which protect women and their infants from influenza and tetanus, diphtheria and pertussis as per ACIP recommendations.
End-Stage Renal Disease (ESRD) Immunization Status The work of the NAIIS resulted in a letter to the Centers for Medicare & Medicaid Services (CMS) providing recommendations for measure development in this population	Medicare ESRD Program beneficiaries who are recommended to receive influenza, pneumococcal* and hepatitis B vaccines	The intent of this measure is to assess routine vaccination for ESRD dialysis patients in Medicare as per ACIP recommendations.

Notes: The measurement period for the AIS and PIS measures are January 1 – December 31; however the specifications for the numerator and denominator for each vaccine are specific to the vaccine and the ACIP-recommendation. For example, influenza vaccination is specified per influenza season which ranges from July 1 to June 30 of the following year. The measure specifications can for the AIS and PIS can be found in HEDIS® 2019.

* The letter from NAIIS to Medicare recommending an adult composite measure for patients with ESRD did not specify PCV13, PPSV23, or both pneumococcal vaccines [32].

ACIP-recommended vaccines are automatically added to the IHS Core Formulary (i.e., the list of prescription drugs and supplies that are used by practitioners and determined by a health plan or health system to offer the greatest overall value), and incorporating provider reminders for all age-based vaccines and for certain vaccines recommended for high-risk patients into the IHS electronic health record. In addition, facility-level vaccine coverage reports for children, adolescents, and adults are available on demand. Aggregate vaccine coverage reports from across all IHS facilities for all routinely recommended vaccines are published quarterly and allow the agency and individual facilities to monitor coverage and inform quality improvement activities. Use of these data helps to drive improved performance at the individual practice and clinic levels by focusing on evidence-based strategies proven to increase rates (e.g., reminder recalls).

Recognizing that recommendations, standards, and guidance alone are insufficient to drive change, IHS added a further accountability mechanism to ensure strategic vaccine objectives were achieved by incorporating influenza and pneumococcal vaccine coverage measures into their federally required annual Government Performance and Results Act (GPRA) report [38], which serves as the agency's overall clinical performance measurement system. Where feasible, IHS also aligns their immunization and other performance measures with *Healthy People 2020* goals.

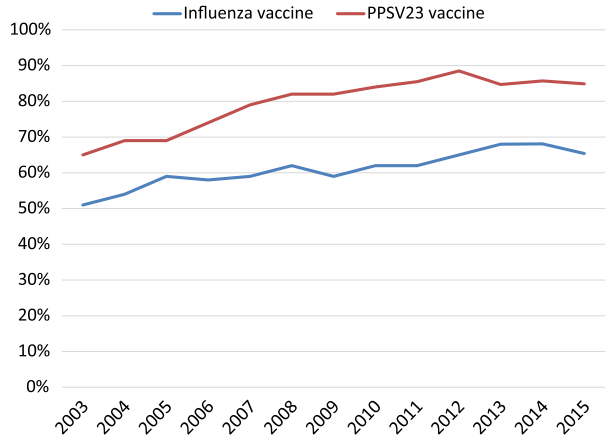

Fig. 1. Indian health service vaccine coverage for annual influenza vaccination and for receipt of a 23-valent polysaccharide pneumococcal vaccination (PPSV23) among adults 65 years and older, 2003–2015. Note: PPSV = 23-valent polysaccharide pneumococcal vaccine.

Since 2005, IHS has seen steady increases in influenza and pneumococcal vaccine coverage among adults 65 years and older (Fig. 1), driven in part by the implementation of individual influenza and pneumococcal coverage quality measures. In recognition of the changes in the adult immunization schedule, increased national focus on adult immunization [1,12], and the updated NVAC Standards for Adult Immunization Practice [10], IHS sought to update its adult immunization performance measures to expand beyond influenza and pneumococcal vaccines. In the absence of an existing comprehensive *Healthy People 2020* or other adult vaccination performance measure, IHS developed a composite adult vaccination measure to assess their overall adult vaccination delivery system and allow for standardized comparisons across its health care facilities.

During 2012–2015, IHS developed, tested, and evaluated the feasibility and usefulness of their adult immunization composite measure as a performance measure [39]. This measure included influenza, either pneumococcal vaccine (i.e., the 13-valent pneumococcal conjugate vaccine [PCV13] or the 23-valent pneumococcal polysaccharide vaccine [PPSV23]), Td, Tdap, and zoster vaccines. In 2016, IHS included their adult immunization composite measure with and without influenza vaccine as a developmental GPRA measure to test its utility as a performance measure for the agency. In 2017, IHS opted to replace the then-current IHS pneumococcal vaccine GPRA measure, which looked at the provision of PPSV23 vaccine in adults 65 years and older, with the adult composite measure excluding influenza vaccine, but maintained a separate influenza vaccine measure. The development, testing, and adoption of an adult vaccine composite measure by IHS for GPRA provided critical experience and insight for the development of an adult vaccine composite measure.

IHS sought to improve implementation of adult vaccination recommendations and increase adult immunization coverage rates through a framework for driving quality improvement in their health system. IHS began with engagement of IHS executive leadership to seek a commitment to focus on immunization quality improvement. Quality improvement leadership then set policy to support the NVAC Standards for Adult Immunization Practice.

Thereafter, the IHS quality improvement workforce implemented operational and clinical activities such as provider and facility dashboards and changes in clinical workflow to operationalize the effort to drive up coverage rates. Finally, to ensure accountability, IHS integrated results from the adult composite measure into its GPRA reporting mechanisms, providing a feedback loop that monitors coverage rates and holds IHS leadership responsible for meeting quality measure benchmarks and outcomes. Each IHS Area Director is responsible for meeting the coverage targets of the adult composite measure in the clinics and hospitals, located in their IHS geographic area, ensuring that national figures do not mask variations at the local and regional levels and facilitating accountability and transparency in quality improvement.

2.3. Action 3: Developing and testing measure specifications: Adult immunization status and prenatal immunization status measures

Building on the IHS's experience, the NAIIS was interested in exploring the feasibility of a composite adult measure for use beyond a federal health system. The NAIIS QMWG developed draft measure specifications (i.e. inclusion and exclusion criterion based on ACIP-recommendations) for an AIS composite measure of routinely recommended vaccines for adults that could be broadly utilized (Table 3). Unlike the IHS composite measure, the NAIIS AIS composite measure included influenza vaccine. While the IHS measure required only one pneumococcal vaccination (either PPSV23 or PCV13 or both) to meet the measure specifications, the QMWG included both PPSV23 and PCV13 vaccines as separate component vaccines within the measure. The QMWG also developed a draft PIS composite measure for influenza and Tdap vaccination during pregnancy. NVPO awarded two contracts to NCQA to examine the feasibility of the drafted composite measures for prenatal and adult immunizations, and to further refine development and testing of these measures for inclusion in HEDIS® 2019.

NCQA tested and refined these measures, utilizing existing clinical quality performance data from participating health plans (Table 3). For the PIS measure, member-level measure testing and data collection were performed in three commercial plans and two Medicaid plans. For the AIS composite measure, measure testing and data collection were conducted with three plans that included commercial, Medicare, and Medicaid member-level immunization data. At the time of testing only one herpes zoster vaccine was licensed and available for use. The current measure specification includes all ACIP-recommended vaccines including a new herpes zoster vaccine licensed in 2018. The measures leveraged the HEDIS® Electronic Clinical Data Systems domain, a new reporting method that harnesses electronic clinical data including administrative claims, electronic medical records, case management systems, clinical registries and immunization information systems (http://www.ncqa.org/hedis-quality-measurement/ecds). Results from testing confirmed that the measures are feasible to report and that there were substantial gaps in the delivery of immunization services supporting the need for the measures. A recent paper by Shen et al. using National Health Interview Survey (NHIS) data also noted these gaps in coverage in that the composite coverage for adults aged $\geq$ 19 years including receipt of Tdap in the past 10 years and influenza vaccination was 11.9%, ranging from 6.3% in adults aged 60–64 years to 13.7% in adults aged 19–59 years. In a composite including any Td-containing vaccine in the past 10 years, coverage including influenza vaccination for adults aged $\geq$ 19 years was 23.4%, ranging from 12.6% (adults aged 60–64 years) to 25.7% (adults aged 19–59 years) [40]. Both AIS and PIS composite measures, have recently been included in the HEDIS® 2019 set of health care performance measures [22]. Measures in first year of testing are not mandatory but will be thereafter. These two adult composite immunization measures complement the current set of childhood and adolescent composite measures that are in HEDIS® while advancing and promoting adherence to standards of care for adult immunization.

2.4. Next steps: Incentivize vaccination through adoption of new adult measures

The shift from fee-for-service to value-based purchasing and alternative payment models represents an opportunity to provide additional incentives for providers, facilities, and health plans to improve adult and prenatal vaccination by utilizing the newly developed adult and prenatal immunization measures. The IHS adult composite measure was designed as a facility-level measure for IHS, while the AIS and PIS composite measures that were developed and tested for HEDIS® target the health plans. Inclusion of these composite measures into multiple levels within the healthcare enterprise (i.e., the macro system of state or federal reported measures, meso-system of health plan or health system measures, and micro system of clinical practice–level measurement) can provide opportunities to increase adult vaccination coverage rates [41]. The NAIIS seeks to support the adoption of these two new HEDIS® measures broadly across these levels of measurement where feasible. Specific implementation processes will depend on the type of payment model or level of measurement specific to the quality payment or incentive program at each health care system level.

Having valid, actionable, auditable, and relevant benchmarks available for measurement is central to align incentives for adult immunizations. Consistent use of these new immunization measures across multiple programs can strengthen service delivery across the fragmented vaccine delivery system. Partners may have an interest in utilizing measures to drive coverage of key interventions like immunizations. For example, large employers such as the Office of Personnel Management (OPM), the U.S. federal government agency responsible for providing health benefits to more than eight million individuals, seek to provide affordable and quality insurance coverage for their beneficiaries. Like other employers, OPM can hold health plans responsible for delivery of quality care and improving population health by leveraging available tools like measures to provide better service, experience, and value for their beneficiaries; OPM has recently requested legislative authority to modify the government contribution based on plan performance [42]. Employers can drive outcomes of interest by modifying payment to health plans. Thus, the availability of immunization measures for use by employers can also help drive increased coverage of adult immunizations.

The NAIIS seeks to ensure these new measures can be widely adopted in federal programs with new payment models driven by CMS initiatives. For example, Shared Savings Programs targeting Accountable Care Organizations strive to improve communities of care, lower costs, and advance population health [16]; provider-based incentive programs like the Merit-based Incentive Payment System (MIPS) [43] change the way Medicare rewards clinicians for value over volume, streamlining multiple quality programs under the MIPS. While plans for Medicaid vary from state to state, the Affordable Care Act required the HHS Secretary to establish core sets of adult [44] and child [45] measures that are selected for use by each state to drive improvements in specific outcomes in their population. Adoption of new measures into Medicare and Medicaid quality measure sets can occur through the annual landscape review of new HEDIS® measures.

In order to drive further use of these measures, NAIIS determined that endorsement by NQF may be an important next step. NQF uses a transparent, consensus-building process, bringing together diverse health care stakeholders from the public and private sectors to foster quality improvement. NQF-endorsed measures are used in

more than 20 federal public reporting and pay-for-performance programs as well as in private sector and state programs to assess physicians', hospitals', and other providers' performance on specific high-quality care measures. Providers also can utilize NQF-endorsed measures to benchmark their performance relative to their peers and national standards. Receiving NQF endorsement for quality measures can incentivize adoption of these adult immunization measures into some health care programs. Approximately two-thirds of all measures that the federal government uses in its health care programs are NQF-endorsed; widespread use of NQF-endorsed measures is also seen in hospitals and health plans at the state, regional, and local levels. These AIS and PIS composite measures have been submitted to NQF for consideration.

3. Conclusion

As payment for health services shifts from fee-for-service models to value-based purchasing, it is important to ensure that meaningful measures [46] are available for use in programs that track and measure performance; to provide feedback to providers regarding their performance; and to improve the health of populations by incentivizing high-value care like immunizations. With two new adult immunization measures now available for adoption, various programs and payment models can use these measures to support smarter spending in prevention toward healthier population outcomes. These new measures, along with existing childhood and adolescent immunization measures, complement the continuum of care that immunizations offer in protecting the population from vaccine-preventable diseases and disability.

4. Disclaimer

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the National Vaccine Program Office, US Centers for Disease Control and Prevention, Indian Health Service, and US Department of Health and Human Services. Use of trade names and commercial source is for identification only and does not constitute endorsement by the National Vaccine Program Office, US Centers for Disease Control and Prevention, Indian Health Service, or the US Department of Health and Human Services.

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Declaration of interests

None declared.

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