

Final Contract Report

Measure Inventory for Use With All-Payer Claims Databases

Prepared for:

Agency for Healthcare Research and Quality
5600 Fishers Lane
Rockville, MD 20857
www.ahrq.gov

Contract No. HHS2902001200003I, Task Order 5

Prepared by:

Stanford University (Prime Contractor)

Sheryl M. Davies, M.A.
Kathryn McDonald, M.M.

Truven Health Analytics

Erica Danielson, Ph.D.
Manju Gokhale, M.A.
Stella Chang, M.P.H.

University of California, San Francisco

Naomi S. Bardach, M.D., M.A.S.
Grace A. Lin, M.D., M.A.S.
Mitzi Dean, M.S., M.H.A.
R. Adams Dudley, M.D., M.B.A.
Emilio Galan, M.S.
Edie Wade, Ph.D.

APCD Council

Denise Love
Ashley Peters
Josephine Porter
Emily Sullivan

Stanford University

Center for Primary Care & Outcomes Research, School of Medicine
Center for Health Policy, Freeman Spogli Institute for International Studies

AHRQ Publication No. 17(18)-0022-4-EF

February 2018



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Disclaimer of Conflict of Interest

None of the investigators has any affiliations or financial involvement that conflicts with the material presented in this report.

Funding Statement

This project was funded under contract number HHS2902001200003I from the Agency for Healthcare Research and Quality, U.S. Department of Health and Human Services. The opinions expressed in this document are those of the authors and do not reflect the official position of AHRQ or the U.S. Department of Health and Human Services.

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Suggested citation: Davies SM., McDonald K, Danielson E, et al. Measure inventory for use with all-payer claims databases. Prepared under Contract No. HHS2902001200003I, Task Order 5. Rockville, MD: Agency for Healthcare Research and Quality; February 2018. AHRQ Publication No. 17(18)-0022-4-EF.

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Executive Summary

Over the past decade, a growing number of States have created all-payer claims databases (APCDs). APCDs are designed to meet the critical information needs of State agencies, inform healthcare and payment reform initiatives, and support price transparency initiatives, as well as meeting the needs of consumers and purchasers. To achieve these goals, users need valid and reliable measures that can be implemented with APCD data. While many measures exist that address cost, quality, and utilization of current care, no one has undertaken a systematic collection of potential measures or assessed the feasibility of applying these measures to current APCD data.

The overall goal of the measure inventory is to provide a useful and usable inventory of measures that can be derived from APCDs. The building blocks of this inventory are based on a [literature review and environmental scan](#) completed in January 2015. It consists of measures identified through these scans in spring 2015 as well as in consultation with a multi-stakeholder technical expert panel (TEP) and with Agency for Healthcare Research and Quality (AHRQ) Program Officer input.

We collected measures related to cost, utilization, and quality. We focused on measures relevant to ambulatory care or measures that cross settings (inpatient and outpatient measures), because APCDs are distinguished from other widely available datasets (e.g., hospital discharge data) by the inclusion of claims across multiple settings. We also focused on measures that reflected high-priority conditions, chosen based on a brief environmental scan (spring 2015) of priority conditions identified by national priority-setting groups such as the Institute of Medicine,ⁱ the National Quality Strategy team, the Centers for Medicare & Medicaid Services, and the Healthy People 2020 team.

The high-priority areas included:

- Measures that address specific high-priority conditions and services (i.e., cardiac disease, preventive services, kidney or bladder conditions, mental health and substance abuse diagnoses, diabetes, and gastrointestinal disorders) and
- Non-condition-specific measures, such as imaging and medication management.

Several use cases for APCD-based measures have been proposed in the literature, including:

- Choice, defined as measures that inform consumer or purchaser decisions;
- Negotiation, such as use of measures in price or contract negotiation;
- Accountability—measuring provider or plan quality and efficiency of care; and
- Population health and policy, to assess population health and inform and assist in policy decisions for States (e.g., efforts to assess health reform efforts or decrease cost).

In our review of the literature, environmental scan, and discussion with our TEP, we assessed which use case might best support the development and use of APCDs and might be most useful

ⁱ The Institute of Medicine is now the Health and Medicine Division of the National Academies of Science, Engineering, and Medicine.

to the States sponsoring them. We found that the State-based use case, focused on population health management, was likely the most immediately useful and feasible use case.

This inventory includes 302 measures. Provided with each measure is a brief description of the measure, measure steward, National Quality Forum (NQF) endorsement status, type of measure (cost, quality, or utilization), risk adjustment, and website or reference (if measure is from the literature) where the measure was found.

In addition, for a smaller subset of measures, we conducted a “deep dive.” Deep dive measures were chosen from high-priority topics with measures for cost, quality, and utilization. These measures contain more detailed measure specifications, information on validity and reliability testing, and use in Federal programs, among other details. For example, we demonstrate how States might use a suite of mental health measures together for population health management applications.

In summary, a large number of measures could be used with APCDs, covering a broad range of topics. We grouped measures together to assess cost, quality, and utilization for specific topic areas for an assessment of population health management within or across diseases.

Although APCD data and the measures themselves have some limitations, the measure inventory demonstrates that APCDs are potentially powerful new tools for monitoring population health. They can be used to paint a more complete picture of healthcare delivery, across payers and settings, in ways that have not previously been possible. With continued development of both APCDs and measurement, stakeholders such as States, payers, providers, and consumers can look to using the APCDs to help fulfill the Triple Aim of better health, better quality, and lower costs.

Overall Measure Inventory

Context and Rationale

Multiple stakeholders are interested in improving the value of healthcare in order to achieve the Triple Aim of better health, better quality, and lower costs. In this context, there is a call for more comprehensive datasets to enable price transparency, improve quality, and assess the effects of healthcare innovations. Over the past decade, a growing number of States have created all-payer claims databases (APCDs) to meet the critical information needs of State agencies, inform healthcare and payment reform initiatives, and support price transparency initiatives, as well as meeting the needs of consumers and purchasers.

APCDs are large-scale databases that systematically collect medical claims, facility claims, pharmacy claims, dental claims (typically, but not always), and eligibility and provider files from private and public payers.¹ Currently, 12 States have legislation mandating the creation and use of an APCD, with more than 30 States maintaining, developing, or having a strong interest in developing an APCD. Seven States have public reporting websites with cost and quality information either wholly or in part coming from APCD data.¹

The promise of APCDs is that they allow creation of a more comprehensive picture of care than is otherwise available in most States.² By collecting data from all payers, State APCDs capture encounters for all but a small minority of patients (e.g., patients who are uninsured or are covered by a Federal healthcare plan such as Veterans Affairs benefits) and across settings.

This expanded database has several advantages, including allowing patients in a well-implemented APCD to be followed over time and across settings, capturing full episodes of care, and accounting for variations in type of care received. Also, APCDs are not limited by turnover in patients among providers or payers, because the records are captured for each patient regardless of provider or payer. This unique aspect of an APCD can facilitate measures of continuity of care, coordination of care, and other traditionally difficult constructs to measure.³

Compared with single-payer databases, APCDs may have larger sample sizes, which in turn facilitate more precise estimates. However, precision depends on the condition and distribution of patients among areas or providers. Nonetheless, in theory, APCDs could facilitate measurement among smaller entities (e.g., individual providers, small areas). In addition, the ability to capture care across settings maximizes the opportunities to monitor care and access to chronic disease management, including outpatient visits and pharmacy.

Chronic diseases remain one of the most resource intensive and influential areas of healthcare, yet adequate measurement must capture care across the care spectrum. For pediatric patients, outpatient care comprises the vast majority of care, as many children are never hospitalized. Conceptually, through leveraging the unique aspects of APCDS, these data could be used to improve patient outcomes, prevent hospitalizations, and reduce costs among patient populations.

APCD uses. Measures derived from APCDs have multiple use cases, including:

- Increasing price transparency,
- Facilitating purchaser-provider negotiations or shared risk and accountability payment models,
- Informing consumers' healthcare decisions, and
- Highlighting significant variation in price, quality, and utilization.⁴

In addition, local data aggregated into APCDs can be used to understand local market functioning and assess whether spending variations across communities and market segment (e.g., outpatient, inpatient, home care, long-term care)⁵ reflect pricing, utilization, or both. APCD-based measures can assist local stakeholders in understanding how these factors affect their community, including helping clinician leaders and others identify clinical areas of over- or underutilization and allowing regulators to identify geographic areas with unusual pricing patterns.⁶

Finally, APCD-based measures can help States develop strategic plans for public health policy and assess the impact of policy changes.⁷ The data may be used to estimate disease prevalence and to identify utilization patterns and potential interventions. In research applications, APCD-based measures can identify disparities, assess utilization, facilitate comparative effectiveness studies, and evaluate targeted interventions and policy.

APCD limitations. While APCDs offer a number of advantages over other databases, like any data, they also have limitations. APCDs typically do not include:

- Uninsured patients who, because they pay entirely out of pocket do not have claims;
- Some behavioral and mental health populations;
- HIV patients;
- Worker's compensation patients;
- Tricare or Veterans Affairs data;
- Federal Employees Health Benefits Program patients; and
- Indian Health Service patients.

APCDs face obstacles in collecting some data, such as from small private insurers who do not meet minimum data thresholds, staff model health maintenance organizations (HMOs), pension plans (Employee Retirement Income Security Act), and health insurance exchange plans. Claims data do not have details included in electronic health record (EHR) data, including laboratory and biometric values or public health data, and do not capture components of bundled payments, such as specific medications given. Despite the limitations of APCDs, they are currently the most comprehensive source for population-based analysis of healthcare quality, utilization, cost, and outcomes.

To achieve the goals noted earlier, valid and reliable measures that can be implemented using APCD data are needed. While many existing measures address cost, quality, and utilization of care, no one has undertaken a systematic collection and evaluation of feasibility of applying such measures using APCD data.

Goal

The overall goal of the measure inventory is to provide a useful and usable inventory of measures that can be derived from APCDs. APCD-based measures have multiple potential uses. These measures could support States in achieving overall high-value care for their population. Physicians and physician groups have interest in using APCD-based measures to understand quality and cost in managing their own patient populations.

Consumers could use the quality and cost measures to assist in choosing providers or health plans. However, this application is limited by the lag in price and quality information and, in some cases, lack of relevant measures to support decision making.

This inventory and evaluation focuses on one use case that has currently high feasibility and supports the development of APCDs by States: facilitating population health management. The measure inventory will provide a framework and basic measure specifications for assessing existing measures for use with APCDs and will also be applicable for future measure assessment for other APCD users and use cases.

The inventory will focus primarily on measures for population health in high-priority clinical areas. In addition, we have provided indepth analysis for a small group of measures, including detailed specifications, and information such as whether the validity and reliability of those measures has been tested and their use in Federal programs.

Methods

To find measures, we conducted a literature review of articles published between 2008 and 2014 and an environmental scan of websites. This scan included individual State APCD and other public reporting websites that report overall and facility- and provider-specific measures of price, utilization, quality of care, episodes of care, and other measures based on APCDs.

We focused our efforts on major national or statewide transparency initiatives from January 2008 to December 31, 2014. In addition, we solicited suggestions from the TEP consisting of State APCD representatives, researchers, and consumer advocates and a learning network (Appendix A lists TEP and Learning Network members). Complete details of the literature review and environmental scan can be found in [AHRQ's report](#).

Initial measure selection. The literature review and environmental scan yielded 1,536 potential measures. Sources of the measures are summarized in Table 1.

Table 1. Number of measures or number of public reports for potential use with APCDs

Literature Review	65 papers*
NQF Administrative Claims Measures	
Ambulatory quality	143 measures
Resource	9 measures
National Quality Measures Clearinghouse	
Episode measures	141 measures
Cost measures for physicians	74 measures
APCD Public Reports	7 public reporting websites
Other Public Reports With Cost or Resource Measures†	7 public reporting websites or reports
Other Measure Stewards or Resources	
NCQA relative resource use measures	5 measures
Quality Alliance Steering Committee	22 measures
APCD Showcase	41 reports
Bridges to Excellence	4 NQF-endorsed measures
HealthPartners	2 NQF-endorsed measures

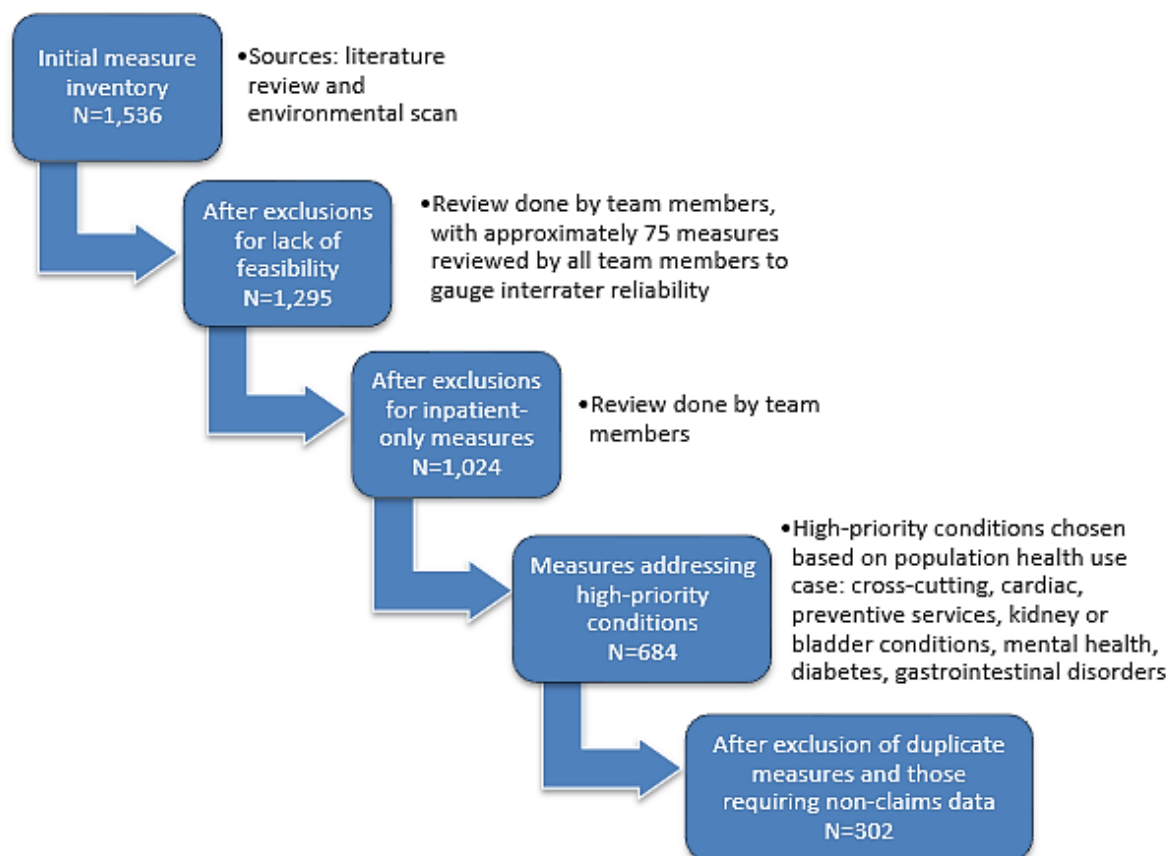
NQF: National Quality Forum; APCD: all-payer claims database; NCQA: National Committee on Quality Assurance.

*These papers provide measures or potential measures either by describing one measure that is specific to the study question, using claims data, or describing the use of a group of measures that are already in use and are described elsewhere (e.g., NQF-endorsed measures, Centers for Medicare & Medicaid Services measures).

†From a list compiled in *Evidence-based Practice Center Technical Brief Protocol. Public Reporting of Cost Measures in Health*.⁸

To better prioritize measures for the inventory, we narrowed the measures to a more manageable subset that we could examine in greater detail. We applied the following exclusion criteria, based on measure name only: (1) not feasible to be measured with APCD data; (2) inpatient only measure (inventory will focus on measures that are outpatient measures or cross settings, as other data sources are available for inpatient measures); (3) lower priority conditions for population health; and (4) duplicate measures. See flowchart (Figure 1) for the selection process.

Figure 1. Measure inventory measure selection process



APCD use cases considered in creating the measure inventory. In a 2012 report, Chernew and Painter describe three potential uses for measures using APCDs, pointing out that “different audiences have different perspectives, needs, and capacities for understanding and using information.”⁹

- Choice: managerial, consumer, or purchaser decisions
- Negotiation (e.g., to set provider reimbursement rates)
- Accountability (e.g., global cost budgeting; public reporting to policymakers, public or private purchasers, oversight organizations, or entities such as accountable care organizations (ACOs) and Aligning Forces)

In addition, in our discussions with the TEP and through our environmental scan, we learned that many States are leveraging APCD data for policy purposes. They are using the data both to assess the health of their population and to inform the design of healthcare reforms to improve access and value and to assess the effects of such reforms.

Below, we provide further details on these different uses, examples of measures in each category, and examples, either from the published literature or from the environmental scan, of how APCDs have been used to support them.

Measures that support accountability. Accountability measures seek to hold providers accountable for the quality and efficiency of the care they deliver and are of interest to purchasers and policymakers. Many purchasers participate in initiatives seeking to hold the healthcare system, as a whole, accountable for care spending. Policymakers want to assess whether major innovations across a geographic region are effective in improving value, including innovations such as ACOs created under the Affordable Care Act.

Examples of types of measures supported by APCDs and of potential interest to policymakers include, at the State level¹⁰:

- Cost of adverse health events.
- Differences in cost and utilization between the Medicaid and commercially insured populations.
- Variation in provider reimbursement rates and total medical expenditures by type of service.
- Out-of-state healthcare migration patterns.
- Gaps in health prevention and promotion programs.
- Total cost of care for State residents.

Measures that support population health and policy efforts. Population health measures may address health status outcomes of a population, whether health is equitably distributed in the population, determinants of health, and costs of healthcare for a defined population. They may also be useful in planning public health and system-level quality improvement interventions.¹¹ For example:

- States are interested in finding gaps in disease prevention and health promotion services (e.g., what percentage of the population has had age-appropriate cancer screenings?)¹²;
- ACOs may be interested in tracking utilization of services such as medication use, test results, preventive screenings, and other health services for the population within their system;
- Clinics may want to track disease-specific outcomes for specific physicians or the clinic population as a whole¹³; and
- Clinics and individual providers may want to compare their performance with other clinics or State or regional benchmarks, which is a known mechanism by which quality measures have driven improvements.¹⁴

Given the early stage of development for most APCDs, with implications for data quality and completeness and the need for State policymakers to see a return on investment for resources needed to establish APCDs, this use case may be the most feasible and beneficial. States using the data to evaluate population health and assess policy or interventions, including State measurement of innovative healthcare models (e.g., ACOs), highlights the value of investing in a strong APCD.

Measures that support negotiation. These measures are similar to measures that support choice, in that they show provider-level comparisons. Choice measures and negotiation measures differ in terms of relevant levels of comparison. The relevant level of comparison for negotiation measures would be entities with which a payer or employer might negotiate, such as a hospital, medical group, or laboratory group. Individual provider levels of comparison would therefore be unlikely to be necessary for negotiation.

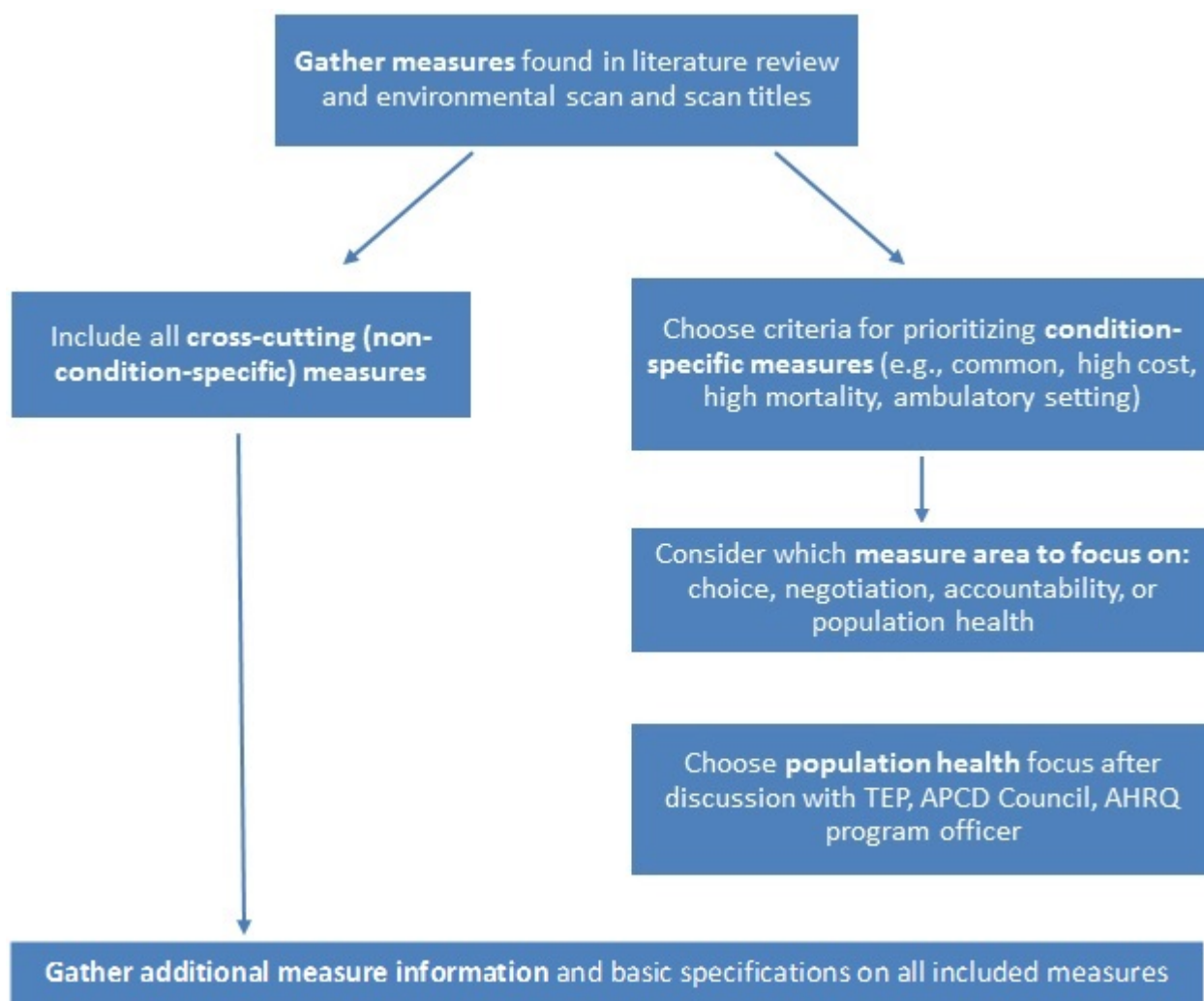
Measures that support choice. Consumers looking to choose a new primary care doctor, specialist, or hospital for a procedure or set of procedures may use choice measures to help them decide. Insurers or large self-insuring employer purchasers might also use choice measures to identify preferred providers—high-value hospitals or medical groups the purchasers incentivize employees or members to use. Measures that fall under this category have several characteristics:

- They are “shoppable” (i.e., measures that focus on discrete episodes of care that are predictable, nonurgent, and subject to deductibles).¹⁵ These shoppable conditions (elective procedures, maternity care, colonoscopy, etc.) afford the time and provide the motivation to seek and compare information.¹⁶ Ginsburg, et al., delineate specific characteristics for effective price shopping situations: (1) service is not complex; (2) case is not urgent; (3) diagnosis has been made; (4) bundled payments are the norm for the service; and (5) insurance benefit structure provides incentives to choose cheaper options.¹⁷
- For cost measures, patient-specific costs such as patient out-of-pocket prices, allowable charge (payment made by plan plus payments made by patients), or billed charge are available.
- Good evidence to support choice should present both cost and quality data for comparison, in order to avoid consumers preferentially choosing higher cost providers, using cost as a proxy for quality.¹⁶

Measures focused on quality and price transparency can be used to support consumer and employer group choices of high value providers. While in some states this use case is included in the legislation that establishes the APCD, it is not a universal use case. This is likely because of existing barriers to using APCDs (e.g., timely availability of data, adequate sample sizes for individual or small group practices, accuracy of patient attribution to providers, limited data on costs, etc. for this use case. Hence, the consumer choice use case may be aspirational at present, or a second stage use case. The focus on population health will likely be more immediately useful to states and provide added value.

Approach to prioritizing measures. After identifying measures, we then categorized and organized the inventory. We classified measures by clinical condition. Non-condition-specific measures such as imaging or medication management were grouped as “cross-cutting” measures. In an effort to make the inventory manageable and useful, we prioritized measures for common, high-cost, or high-mortality conditions and those applicable to the State-based population use case. **Figure 2** shows the inventory prioritization process.

Figure 2. Initial measure prioritization process



To identify high-priority conditions, we scanned the environment for high-priority condition lists from national provider, policymaker, and consumer organizations (Appendix B lists organizations and links to condition lists). We chose the conditions that were common among most of the lists we found.

The specific conditions of interest included in the measure inventory are:

- Cross-cutting measures across conditions (e.g., imaging, medications, utilization, tests, access, surgical procedures, chronic conditions, patient safety, supplies) (n=124).
- Mental health and substance abuse diagnoses (n=47).
- Preventive services measures (n=36).
- Diabetes (n=22).
- Cardiac disease (n=21).
- Childbirth or reproductive health (n=19).
- Kidney or bladder conditions (n=16).

- Gastrointestinal disorders (n=12).
- Back pain (n=5).

We based our prioritization algorithm on potential use cases of the measure inventory as described above: choice, negotiation, accountability, and population health and policy, using the criteria in **Table 2**. Based on conversations with our TEP, APCD Council, and AHRQ program officer, we further refined our measure inventory on the population health use case.

Table 2. Measure prioritization criteria according to audience

Consumers	Policymakers	Payers	Providers
Common	Common	Common	Common
Shoppable	Costly	Costly	Consensus on management of disease
High morbidity and mortality	High morbidity and mortality	High morbidity	High morbidity and mortality

Measure Inventory Use

In this section, we describe the steps recommended to identify applicable APCD-based measures from the measure inventory to be used by different stakeholders and audiences.

Step 1: Choosing topics of interest. This measure inventory covers a broad group of conditions as well as cross-cutting (non-condition-specific) measures. The condition-specific measures were chosen using the criteria important to various stakeholders interested in APCDs (consumers, providers, payers, policymakers—see **Table 2** above):

- The condition is common,
- The condition has high costs,
- The condition has high morbidity or mortality, and
- The measure is applicable to the ambulatory setting (either cross-setting from inpatient to outpatient, or outpatient).

We focused on ambulatory measures because there is less information on measures in this area and because it takes advantage of one of the strengths of APCDs, the ability to track patients across settings.

Practical tip—inventory formatting and structure: The inventory is formatted in Excel. Condition-category files can be downloaded, or the full measure inventory can be downloaded as one file, for users interested in more than one condition category. For conditions with multiple subcategories, the Excel file can be filtered by subcategories. The full inventory can be filtered by condition as well as by subcategory. (The section “Measure Inventory Navigation” has additional information.)

Step 2: Considering the use case. As noted above, the choice of use case can guide the selection of measures. Specifically, it will be useful to consider the audience for the measures and how they will use the measures. Doing so helps users assess the specific goals of measurement and which measure types will be more compelling than others (e.g., needing more

outcome measures than process measures, or robust quality measures to pair with and complement cost measures to more adequately capture healthcare value).

Practical tip: Because many of the measures apply to multiple use cases, we did not categorize measures in the measure inventory according to use case. However, knowing the relevant use case can inform the choice of measures and thus is a useful step before choosing measures for implementation. Measures within the Excel files can be filtered according to measure type (e.g., cost, quality, or utilization).

Step 3: Choosing measures from the inventory. After considering topics of interest and use cases, the next step is to choose specific measures. In the Box below, we present several points of consideration when choosing specific measures for use from the measure inventory. These are based on findings from the literature and environmental scan we performed in 2015, as well as input from the TEP convened for this project.

Practical tip—Inventory Rows and Columns for use in finding measures: In the measure inventory, each row is a measure (or a set of related measures) and the columns are various measure characteristics (e.g., name, website, measure steward) and potential criteria for choosing the measures (e.g., condition of focus, measure type—cost, quality, utilization, etc.). The columns can be filtered in order to show only the measures within a certain category in the column (e.g., Mental Health and Substance Abuse measures only).

Categories for Consideration in Choosing Measures for Use With APCD Data

- Purpose of measurement (choice, negotiation, accountability, population health and policy)
- Condition of focus (Is the condition common, is it costly, or does it have high morbidity or mortality?)*
- Whether there is a quality measure to pair with a cost or utilization measure to allow a value assessment*
- Type of cost data (reimbursement rates, out-of-pocket payment, etc.)*
- Level of measurement (e.g., regional level, clinic or medical group, individual clinician)*
- Rigor of measure development (e.g., reliability and validity testing, risk adjustment for cost measures, whether tested for the level proposed for your use case)**
- Salience: Whether endorsed by the National Quality Forum, or whether already used in a national payment or public reporting program (e.g., Physician Compare or Physician Quality Reporting Program)**
- The potential impact of measurement (e.g., policy implications at the state level, ability to help address disparities)

* Category labeled for all measures in the large measure inventory.

** Category given for measures with deep dive information (the section “Deep Dive Inventory” has more information).

Of the categories above, those supported in the full measure inventory are marked with a *, those supported only by the “deep measure inventory” are marked with a **, and those that depend on the local or State context are not marked.

Organizations interested in using measures that are not fully tested (e.g., a measure may have been tested for health plan use but not for physician group use) may want to consider consulting with a measurement expert as they implement the measures at the untested level, to ensure that the measure accurately captures meaningful variations in care or cost.

Measure Inventory Limitations

Due to the specific focus of the inventory and the rapidly changing world of measurement, the inventory has some limitations:

- We focused on high-yield national aggregate sources of measures, such as NQF and NCQA, State APCD reports and public reporting websites, and English-language peer-reviewed literature. We did not search internationally and the environmental scan was limited to websites found through online APCD Council materials; State-specific APCD reports, task force materials, policy briefs, and webinars; national and State-specific measure inventories; relevant AHRQ-sponsored materials; and white papers and the grey literature starting from 2008.
- We focused on high-priority conditions and topic areas, so the measures focusing on other conditions are not included.
- For physician groups or ACOs interested in using APCD to assess variations in costs and quality across referral providers (e.g., cardiologists managing referred arrhythmia cases), the measures in the inventory are not necessarily tested with that use case in mind, likely because it is a relatively new use case.
- Detailed specifications are not available for all the measures in the inventory, particularly for measures used only in State APCD reports and public reporting websites. For measures without specifications, users may need to contact measure stewards.
- The initial measure gathering was completed in March 2015. Information on each measure was then updated during the spring and summer of 2016. Since then, new measures may have been developed, or existing measures may have changed or gained or lost NQF endorsement.
- With the new nationwide use of ICD-10 codes starting in October 2015, measures that have definitions based on ICD-9 will need to be translated into ICD-10, in order to be used to analyze claims submitted after ICD-10 implementation. Of note, for the past several years, in preparation for ICD-10 implementation, NQF has required measure stewards submitting administrative claims-based measures for endorsement to submit definitions based on ICD-10 in addition to those based on ICD-9. Hence, NQF-endorsed measures in the inventory should have ICD-10 definitions available (although they may not have been tested using those definitions).

Practical tip: The column “Web Site” provides an online link to the measure or additional information on the measure.

Measure Inventory Navigation

This section describes the structure of the measure inventory and how to manipulate it to find measures of interest.

Table 3. Measure inventory variables

Variable Name	Description
Web Site	Link to online source of information on the measure
Measure Name	Measure name (or paper title if from literature review)
NQF # if applicable	National Quality Forum Number, for use in searching the Quality Positioning System website: http://www.qualityforum.org/QPS/QPSTool.aspx
Measure Steward	Measure developer, who reviews measure for evidence and specification updates
Condition of Focus	Specific condition that is the focus of the measure or a label for cross-cutting, non-condition-specific measures
Measure Condition Subcategory	Subcategories within conditions of focus (e.g., Congestive Heart Failure as a subcategory of Cardiac)
Measure Type	Cost, Quality, or Utilization
Quality Category	Process, Outcomes, Not applicable
Measure Description	Description of the measure
Numerator Statement	Numerator statement or additional detail on measure if there is no numerator/denominator
Denominator Statement	Denominator statement or Not applicable
Age Group	Pediatric, Adult, Not specified
Risk Adjustment	A yes/no variable regarding whether the measure has risk adjustment calculated
Type of Cost	Out of pocket, Charge, Reimbursement, or “Not applicable”; free text if more complex information
Level of Analysis	Level at which measure was intended or tested for measurement (e.g., State, County, ZIP Code, Hospital, Facility, Clinic Group, Clinician)
Data Source	For the measure source in the inventory, type of data used to calculate the measure; or intended type of data, if measure not implemented in source
Unique Project ID	Internal project unique ID; used to match technical specifications to the measures in the deep dive

Practical tip—using filters: To assist users in finding measures, we enabled filters across the columns of the inventory Excel files.

- Filters can be used to sort the columns alphabetically or numerically. For example, one can sort the measure inventory according to condition alphabetically from A→Z by going to the “Condition” column, selecting the drop-down menu button, and choosing “Sort Ascending.” Excel automatically recognizes whether a list is text or numeric and sorts alphabetically or by number.

- Filters can also be used to show specific rows grouped by one or more categories within a column. For example, one can show only cost measures by going to the “Measure Type” column, selecting the drop-down menu button, and checking off all the categories with cost. An efficient way of checking them off is to type “cost” into the search bar inside the drop-down menu, which will then automatically check off only the categories with “cost” in them.

Because we searched for measures at a specific time and measures appropriately evolve, some measures may have been updated, gained or lost endorsement by NQF or other national bodies, or changed in other ways. We recommend checking the source website for each measure, using the link in the measure inventory.

If the measure has an NQF number, the National Quality Forum Quality Positioning System (QPS) website has indepth information on each measure. The measures can be located in QPS by entering the NQF number in the search bar at the top of the QPS website home page (<http://www.qualityforum.org/QPS/QPSTool.aspx>).

Stratified Analyses

Some of the APCD condition-specific reports include stratified analyses by age and gender. The strength of this approach is a more nuanced understanding of the variations. Limitations include that some of the measures have not been tested for use in stratified analyses, so apparent differences by patient characteristics such as age, gender, or race/ethnicity may not be statistically significant if the number of patients eligible for the measure within each subgroup is too small.

Another limitation is that some stratifications do not reflect clinical practice. For example, a stratified analysis by gender may not inform practice or policy if guideline-recommended care does not differ by gender and if there is no *a priori* evidence of a known disparity. Stratification by race and ethnicity and socioeconomic status to identify disparities in care may also be possible but requires having those data in the claims database, which varies.

Deep Dive Inventory

Context and Rationale

The overall measure inventory consists of a complete inventory of the measures as discussed above. While the overall inventory consists of a large group of measures, we sought to review a smaller set of measures for which we would be able to gather greater detail and describe how the measure might be used for specific use cases.

The framing for the smaller set of measures for a “deeper dive” includes two potential use cases, anchored in specific conditions or areas of interest. The illustrative use cases are state policy decision making, and physician or medical group population management.

Methods

With input from our TEP in March 2016, we chose three areas of interest for the deep dive measures. We asked the TEP to consider the potential use cases of state policy decision making for population health, accountability to States and other stakeholders, provider choice for consumers and employers, and negotiation. We also asked them to use the following questions in choosing the areas of interest:

- Considering a variety of perspectives (physician, public health, State), is this a high-priority condition?
- Would you anticipate variation in cost, utilization, or quality among providers, payers, or populations?
- For the condition under consideration, are measures of cost, quality, and utilization a useful grouping of measures? Are they complementary to each other? If not, is it relevant to have complementary measures for the use case?
- Does the diagnosis and treatment for the condition cross healthcare settings?

After a webinar-based discussion with the TEP and with input from the AHRQ program officer, three conditions were chosen in order to look for measure candidates for a deeper dive:

- Diabetes mellitus
- Mental health (not including substance abuse due to lack of consistently available data)
- Medication usage (as a cross-cutting topic area)

Use of the Deep Dive Measure Inventory

The deep dive inventory consists of a subset of 13 measures within the three topic areas chosen as described above. These subsets of measures were chosen as examples of groupings of measures that capture cost, quality, and utilization within the topic areas of interest.

In choosing these measures, we already had available the details included in the main measure inventory, but we did not have the deeper measure information. Hence, before the deep dive, we did not know information about the measures such as level of rigor used in testing, nor whether benchmarks were available, or if measures were used in public reporting or payment programs.

Practical tip: The included for greater indepth assessment are marked in the “Deep Dive Measure?” column in the overall measure inventory file.

Table 4. Additional variables for the deep dive measures

Variable Name	Description
Numerator Exclusions	Criteria for exclusion from the numerator
Denominator Exclusions	Criteria for exclusion from the denominator (the eligible population)
Risk Adjustment Methods	High-level description of risk adjustment approach
Measurement Period	Duration over which measurement occurs (1 year of data, 2 years, etc.)
Year Developed or Used (or Endorsed, for NQF)	Year of development or most recent revision, endorsement (for NQF), or publication (for literature review measures)
Validation Testing	Yes or No
Validation Approach (What Outcomes)	Validation testing that was used (outcome tested and type of validity)
Reliability Testing	Yes or No
Reliability Testing Results	Results of the reliability testing if done and available
Benchmarks Available	Performance benchmarks available to assess comparative performance (e.g., statewide average to interpret hospital performance)
CMS Publicly Reported	Hospital Compare, Physician Compare, or No
Use in Federal Program	Whether used in a Federal program in spring 2016 and, if so, which program (e.g., PQRS, VBP, Meaningful Use)
Core Measure	Whether the measure is a CMS core measure in 2016 (Yes, No)

Technical Specifications for the Deep Dive

We have collected publicly available technical specifications for the 13 measures in the deep dive. These specifications, or links to the specifications, are included in the PDF for each deep dive measure.

Lessons Learned

Below are lessons learned from this process that may be useful while choosing measure sets:

- Broad measures within a condition category vs. condition-specific detailed process measures: When choosing measures for State population health management or policy decision making, you may find that some measure groupings provide a big picture snapshot of how many people are accessing what type of care and the costs for treating a condition or set of conditions (e.g., mental health conditions). Other measure sets may drill down more specifically on exact processes and costs of care for a specific condition (e.g., depression, discussed below). States may want both types of measure sets, one for overall sense of healthcare spending and utilization across a large population, and another for more specific actionable information regarding management of a specific population.
- Within some topics, robust sets of high-quality measures may not be available for all three areas of cost, quality, and utilization. For example, in maternity and childbirth, few measures of quality are in the inventory, likely because most maternity quality measures were exclusively related to inpatient quality of care, while the measure inventory focused on outpatient measures.

- Many measures were not rigorously tested for validity and reliability. Others may have been tested for reliability and validity for a specific level of analysis (e.g., health plan) but not another (e.g., physician group). While this variation does not preclude use of the measure for performance assessment at the untested level, caution should be used in this circumstance, and it may be useful to consult with a measurement expert.

Sample Use Case: Mental Health Measures for State-Based Use

To illustrate how the measure inventory might be used, we chose a measure suite from the group of measures for which we did more indepth analysis.

We considered the State-based use case of managing a population of patients with a common, high-morbidity condition, choosing Mental Health as our condition of interest. In reviewing the Mental Health measures, we saw that many were process quality measures focused on depression, with few cost or utilization measures for depression specifically.

The broader category of Mental Health included Mental Health cost and utilization measures that were not diagnosis specific (e.g., “Mental Health Counseling office outpatient visits, Costs,” Unique ID 1491). This situation highlights the difference between quality measures, which tend to focus on condition-specific clinical processes of care, and cost and utilization measures, which can be less likely to focus on specific processes and populations.

This difference presents two potential framing approaches for creating a measure suite to assess progress on the Triple Aim:

1. High-level description of care delivery (cost, quality, utilization) for a sector of care (e.g., mental health)
2. Condition-specific (e.g., depression) assessment of care delivery, which is more likely to have a robust set of quality measures but potentially not robust cost and utilization measures.

In either framework, policymakers are likely to want to understand costs and burden of disease, variations in cost, and variations and deficiencies in quality. Thus, in some cases, there may be a tradeoff between having a complete measure suite and choosing the most robust measures possible. However, our example also demonstrates the power of APCDs for monitoring the health of a population in several different ways, depending on the measures chosen, to paint a more complete picture of healthcare delivery.

Future of APCD Measurement

Currently, there are two major limitations to using APCDs for measurement. The first pertains to the quality, availability, and access to the data contained in APCDs. The second pertains to missing data elements, issues with data completeness and accuracy, and data standardization guidelines that are still in development. Difficulty with data linkage and aggregation and resource limitations have all been cited as key barriers to using APCDs for measuring healthcare value. However, as APCDs mature, improvements in data quality and availability are likely.

In addition, there are limitations to the measures themselves. As more States develop APCDs and public reporting websites based on APCD data, it is critical to find valid measures that are relevant to stakeholders and feasible to implement on a large scale. Multiple methodological issues have arisen in pursuit of this goal. Key measurement issues include:

- Inadequate measurement science that may threaten the validity and reliability of measures.
- Lack of standardization of measure concepts and specifications.
- Difficulties in implementing measures due to privacy concerns, denominator deficiency, difficult or inaccurate provider attribution, inadequate risk adjustment, or provider reluctance to participate in public reporting initiatives.
- Measure gaps, including methodological gaps and gaps in existing measures.
 - For example, as illustrated in the sample case of mental health conditions using the deep dive measures, not all conditions had robust and well-tested measures for cost, quality, and utilization.
 - In addition, a review of the column in the Overall measure inventory titled “Level of Analysis” shows that some measures were tested at one level of analysis but not others (e.g., tested for health plan measurement, but not clinician group measurement).

These addressable methodological issues and measure gaps will need to be surmounted in order for States and others to fully realize the potential of APCDs in increasing healthcare value and should be kept in mind when using the measure inventory.

Conclusion

APCDs hold promise as a way for policymakers, payers, providers, and consumers to gain information and insight about healthcare quality, cost, and utilization that can be used to help achieve higher quality and lower cost care. Measurement using APCDs is still a developing field; however, we found a variety of measures in high-priority clinical areas such as diabetes, mental health, and cardiac disease that could be successfully applied to APCD data.

This measure inventory provides a roadmap to a measurement program using APCD data, with examples of measures that can be derived from APCDs. We also provide a “deep dive” demonstrating that measure suites containing cost, quality, and utilization measures pertaining to high-priority conditions such as mental health do exist for use in APCDs.

Stakeholders interested in using APCD data should be aware that some measure areas may need further development, with attention paid to developing measure suites in order to achieve the goals of improving population health and achieving high-value care and price transparency. Overall, however, APCDs remain the most comprehensive source of data for monitoring the health of populations, particularly across settings, and evaluating the impact of programs aimed at improving healthcare at the population level.

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Appendix A. Technical Expert Panel and Learning Network Members

Marilyn Schlein Kramer, M.B.A.
Vice President/General Manager
Provider and Health Plan Markets
Health Data & Management Solutions, Inc.
Former Deputy Executive Director
Commonwealth of Massachusetts
Center for Health Information and Analysis
Boston, Massachusetts

Jonathan Mathieu, Ph.D.
Vice President for Research & Compliance
and Chief Economist
Center for Improving Value in Health Care
Denver, Colorado

David Newman, J.D., Ph.D.
Executive Director
Health Care Cost Institute
Washington, DC

Kenneth Park, M.D.
Vice President
Real World Evidence Solutions
IMS Health
Former Vice President,
Payer and Provider Solutions
Anthem, HealthCore
Plymouth Meeting, Pennsylvania

Doris Peter, Ph.D.
Director
Health Ratings Center
Consumer Reports
New York, New York

Norman Thurston, M.A.
Director
Office of Health Care Statistics
Utah Department of Health
Salt Lake City, Utah

Rachel Werner, M.D., Ph.D.
Associate Professor of Medicine
University of Pennsylvania
Senior Fellow
Leonard Davis Institute of Health
Economics
Core Faculty
Center for Health Equity Research and
Promotion
Veterans Affairs Medical Center
Philadelphia, Pennsylvania

Learning Network Members

APCD Council
National Association of Health Data
Organizations

Appendix B. Prioritization of Conditions for Measure Inventory

Organizations from which high-priority condition lists were reviewed

Source	Full Title	Link to Source
Institute of Medicine	100 Initial Priority Topics for Comparative Effectiveness Research	http://www.nationalacademies.org/hmd/~media/Files/Report%20Files/2009/ComparativeEffectivenessResearchPriorities/Standard%20Alone%20List%20of%20100%20CE R%20Priorities%20-%20for%20web.ashx
National Quality Strategy	Annual Progress Report to Congress: National Strategy for Quality Improvement in Health Care: 2013 Report, Appendixes A and B 2014 Report, Figure	2013 Report: https://www.ahrq.gov/workingforquality/reports/2013-annual-report.html 2014 Report: https://www.ahrq.gov/workingforquality/reports/2014-annual-report.html
Center for Medicare & Medicaid Innovation	Priority Measures for Monitoring and Evaluation	http://innovation.cms.gov/Files/x/PriorityMs rMontEval.pdf (no longer online)
National Quality Strategy	Input to the Secretary of Health and Human Services on Priorities for the National Quality Strategy, 2011	http://www.qualityforum.org/WorkArea/linkit.aspx?LinkIdentifier=id&ItemID=68238
Healthy People 2020	Healthy People 2020 Leading Health Indicator Topics	https://www.healthypeople.gov/2020/leading-health-indicators/2020-LHI-Topics
National Quality Forum (NQF)	NQF 2012 Multiple Chronic Conditions Measurement Framework – Appendixes B and C	http://www.qualityforum.org/Projects/Multiple_Chronic_Conditions_Measurement_Framework.aspx
Health Resources and Services Administration (HRSA)	HRSA Core Clinical Measures	https://www.hrsa.gov/sites/default/files/quality/toolbox/pdfs/hrsacoreclinicalmeasures.pdf
Medical Expenditure Panel Survey (MEPS)	MEPS Topics: Priority Conditions -- General	http://meps.ahrq.gov/data_stats/MEPS_topics.jsp?topicid=41Z-1
Office of the Assistant Secretary for Health (OASH)	OASH List of Chronic Conditions	http://www.cdc.gov/pcd/issues/2013/12_0239.htm#Development
Patients Like Me	Patients Like Me: Conditions	https://www.patientslikeme.com/conditions
American Academy of Pediatrics	AAP Agenda for Children -- Strategic Plan	https://www.aap.org/en-us/about-the-aap/aap-facts/AAP-Agenda-for-Children-Strategic-Plan/Pages/AAP-Agenda-for-Children-Strategic-Plan.aspx