Using Electronic Data for Performance Measurement
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INTRODUCTION

Rising costs combined with problems in quality have led to a crisis in US health care. To raise awareness and improve health care delivery, there has been a growing movement towards public accountability. Transparency of performance at all levels in the health care system is essential to solving this crisis.

The urgency consumers and purchasers feel for information to make well-informed decisions about health care is frequently out-of-synch with the slow pace of performance measure development and reporting. All too often, the pursuit of perfection delays the availability of good and useful information that would be relevant to consumers and purchasers, meet reasonable scientific acceptability, and be feasible to implement. Electronic data, and in particular electronic health records, hold the promise of being the means to a feasible data system more readily able to collect robust measures. Capturing performance information as a part of the processes of care facilitates efficient performance measurement and integrity of data, but as importantly can directly support providers in delivering higher quality care.

Electronic data has the ability to tackle many challenges facing health care, but it needs to be implemented in ways that fully leverage that potential while protecting patient privacy. Clearly, how information is stored electronically, who has access to it, and how it is used are important policy issues that need to be addressed. Additionally, it is imperative that safeguards are in place to protect the integrity, security, privacy, and confidentiality of an individual's information.

The Disclosure Project hosted a discussion forum on Using Electronic Data to Assess Physician Quality and Efficiency. At the forum, the strengths and limitations of using electronic data for performance measurement, with a particular focus on the most common kind to date – claims data – were provided. (Presentations and background materials are available at www.healthcare-disclosure.org/activities/forums/.) This Issue Brief delves further into describing electronic data and comparing it to other sources of performance data.

DATA COLLECTION

Data collection is a key component to performance measurement and public reporting. The method in which data are collected has important implications for the integrity of data, timeliness of information, and the burden on providers. All data collection methods - electronic, chart abstraction, self-report, or survey - have differing impacts on these as well as other areas. Advances in electronic data, such as the electronic health record, have the potential to have major positive impacts. For example, the electronic health record (EHR) can support clinical decision-making where and when it is needed. A supplemental benefit is using the data to support other activities, such as performance measurement. The burden of data collection is reduced since it is tied to the point-of-care and serves multiple purposes. Additionally, access to the information is real-time.

However, we are far from having EHRs used by every provider and we are far from having EHRs that simplify data collection for nationally standardized performance measures. Only 9% of physicians in ambulatory settings use a fully functional EHR, though it increases to approximately 24% when a more lenient definition is used (Jha et al., 2006). Understanding the current state of electronic data for use in performance assessment is a key step in being able to get to a more seamless system.

ELECTRONIC DATA

As the name implies, electronic data is information that is stored electronically. This is opposed to information that is stored on paper, for example, in a patient chart.

In health care, there are a variety of sources and types of electronic data. For a description of the most common types of electronic data and where they reside, refer to Table 1: Types of Electronic Data. While there is an abundance of data available electronically, it resides in many places and is stored in many forms. For instance, many measures can be captured by combining claims, pharmacy, and laboratory data. However, these data are often located in different places and not readily shared. Making health information exchange interoperable, a concept similar to being able to use a bank card in virtually every automated teller machine (ATM), is essential to increasing the feasibility of using electronic data for performance reporting. Furthermore, electronic data also need to be accessible in a manner that supports

TABLE 1: TYPES OF ELECTRONIC DATA

TYPE	DESCRIPTION	SOURCE
Enrollment and Benefits	Data that describes the characteristics of patients enrolled in health insurance plans and their individual benefits.	Public and Private Insurers
Medical and Pharmacy Claims	Information submitted by providers through standardized forms (e.g., UB-92 and HCFA 1500) for payment of rendered services.	Public and Private Insurers
Laboratory Results	Data that describes the type of tests performed and results of the tests.	Laboratories, Providers
Electronic Health/Medical Record	Comprehensive clinical and administrative longitudinal data (e.g., patient demographics, progress notes, medications, vital signs, radiology reports, laboratory results) on individual patients may be generated by encounters in one or multiple care delivery settings.	Providers
Uniform Hospital Discharge Data Set	A defined data set that gives a description of a hospital discharge. It contains information on both insured and uninsured patients (e.g., age, sex, race, residence, length of stay, diagnosis, physicians, procedures, and sources of payment). Many states require hospitals to routinely submit this information or a subset of it.	States, Hospitals
Hospital Discharge Abstract	A summary record of a patient's stay in the hospital, usually completed upon a patient's discharge.	Hospitals
Health Care Costs and Utilization Project (HCUP)	A collection of databases that bring together information from state and federal governments, hospital associations, and private industry on patient-level hospital care data. http://www.ahrq.gov/data/hcup/#hcup	Agency for Healthcare Research and Quality
Patient Registry	A database used to track patients with identified diseases and/or treatments over time. It typically includes patient information/characteristics, diagnoses, scores on assessments, as well as treatments provided.	Providers, States, Private Industry
Clinical Trial	Research study designed to evaluate the effectiveness and safety of treatments (e.g., medications or medical devices) by monitoring their effects in humans or animals. In exchange for participation, there is often no fee for treatment.	Government Health Agencies, Researchers, Private Industry

based guidelines on laboratory and medication orders), resource utilization (e.g., office visits, tests), and cost-efficiency (e.g., relative costs for episodes of care). For each, the performance measurement that can be conducted is defined by the content of available claims data. For example, claims data indicate if a test has been performed (process) but not the results of the test (outcome).

Types of information in claims data that are commonly used in performance measurement include:

- Diagnosis and procedure codes – based on International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM)

- Procedure codes – based on American Medical Association's Current Procedural Terminology (CPT)

- Products and supply codes – based on Health Care Financing Agency (now CMS) Common Procedure Coding System (HCPCS) Level II

- Drug codes – based on the National Drug Codes (NDC)

For more comprehensive information, see Standardized Coding Systems & Claims Forms at the end of this document.

performance measurement. Consumers and purchasers can improve the efficacy of using electronic data for performance measurement, for suggestions see above.

To date, many performance measurement initiatives that use electronic data have relied on professional (e.g., practitioner) and facility (e.g., hospital) claims data. The benefits of claims data include having standardized information on a sizeable patient population with little burden or cost. Since claims data were not originally designed to assess performance, the clinical content is not comprehensive enough for measures to cover the full spectrum of care.

Nonetheless, claims data can be effectively used to assess many aspects of performance. Typical types of performance measurement using claims data include: outcomes of care (e.g., death, complications, hospital readmission), processes of care (e.g., immunizations, Pap smears, evidence-

Claims data may also contain information on patient demographics, which are useful in defining the relevant population for a measure. For instance, age (52-69) and gender (female) demographics are used to identify the appropriate population for the National Committee for Quality Assurance HEDIS® breast cancer screening measure. Women are at a greater risk for breast cancer than men and if both genders were included in the assessment the relative percentage of each gender would influence the results. A related concept is risk adjustment, that is using statistical methods to account for patient-related factors that may influence performance results. The modest clinical information in claims data limits the scope of possible risk adjustment models. Reasonably accurate risk adjustment models have been constructed in some areas from claims data and it is also possible to augment claims data with additional clinical data for a more robust risk adjustment model.

OTHER DATA COLLECTION METHODS

In addition to electronic data, other methods of collecting performance information include chart abstraction and self-report by providers or patients. Chart abstraction involves going through a patient's medical record to manually collect the data of interest (if it is documented). While it has historically been considered the standard source for obtaining performance information with its rich clinical information, like all methods of data collection it has advantages as well as disadvantages (see Table 2: Pros and Cons of Various Data Collection Methods). Self-report is having a defined population, such as patients or providers, supply the information of interest through a structured method. Rigorously developed standardized surveys that minimize drawbacks associated with self-reporting are used for patient-reported performance measures for accountability (e.g., CAHPS). Physician recognition programs (e.g., NCQA's Physician Practice Connections) rely on providers to submit evidence that support their designation as a higher quality provider. Precise specifications and auditing are important to ensuring the integrity of data being supplied by those being measured.

RISK ADJUSTMENT

While not required for most process measures, the ability to perform reliable risk adjustment is crucial for any outcome measure reported publicly. Claims data do not always have the appropriate clinical information, but this sometimes can be addressed with additional effort. For instance, the addition of three variables representing patient comorbidities to the claims derived risk adjustment model for coronary artery bypass graft (CABG) has been shown to produce adequate risk adjustment (Hannan et al., 2003). Additionally, changes in the collection of clinical data can be made to assist in better performance measurement. As with all measurement, a central question is whether the benefit of routinely collecting clinical data outweighs the burden of collection.

TABLE 2: PROS AND CONS OF VARIOUS DATA COLLECTION METHODS

	PROS	CONS
Electronic health record	Clinical detail Low reporting cost (after adoption) Timely	Low adoption Initial high cost Incomplete Inaccuracies Inter-provider variability
Claims	Widely available Low reporting cost	Limited clinical detail Does not capture uninsured Incomplete Inaccuracies Inter-provider variability
Chart abstraction	Clinical detail	Incomplete Inter-provider Variability High burden High cost Poor handwriting
Patient self-report	Patient-centered Low burden	Potentially costly Limited clinical detail
Physician self-report	Clinical and non-clinical Issues	Variability across specialties "gaming" of results

CLAIMS DATA VERSUS CHART ABSTRACTION

Feasibility

Given the nascent state of electronic clinical data, most discussions concerning the feasibility of data collection for public reporting center on the use of claims data compared to chart abstraction. As mentioned previously, the main advantage of chart abstraction over claims data is the depth of clinical information. However, this advantage can carry a steep price. From retrieving the appropriate records to training abstractors, it is a process that requires extensive time and resources to complete. Given this burden, it is not surprising that chart abstraction is expensive. Claims data, on the other hand are relatively inexpensive. These data are collected as a course of doing business, have a standard electronic format (See Standardized Coding Systems & Claims Forms at www.healthcaredisclosure.org/activities/publications), and are stored electronically, making it easy to access and utilize the information. Additionally, claims databases encompass a large number of individuals whereas the expense of chart abstraction greatly limits the size of the measured population.

Reliability

In addition to feasibility, a common concern that arises when assessing data sources is their integrity, such as missing information, data accuracy, and variation across providers. For a comparison between claims data and chart abstraction on issues of feasibility and reliability, refer to Table 3: Comparison of Claims Data vs. Chart Abstraction. Studies have shown that the degree of disagreement between claims and chart abstracted information in ranking providers on performance is small (Dresser et al., 1997; Fowles et al., 1997). In both instances, public reporting has been shown to improve the quality of information collected.

CONCLUSION

The current state of electronic data is better at capturing some dimensions of performance than others. It is evident that to advance the state of performance measurement and public reporting more robust clinical information needs to be captured electronically. Undoubtedly, moving beyond the reliance on claims data to the use of other types of electronic data like the electronic health record will facilitate more comprehensive and efficient outcomes-based performance reporting.

TABLE 3: COMPARISON OF CLAIMS DATA VS. CHART ABSTRACTION

CLAIMS DATA	CHART ABSTRACTION
Limited clinical detail	Clinical detail
Widely available	Not part of conducting business
Low burden and cost	High burden and cost
Missing claims (e.g., non-covered services/products)	Information on care provided by other MDs often missing
Incomplete coding	Incomplete documentation
Errors in coding (inadvertent and deliberate)	Errors in recording information
Variations in coding	Variation in terminology, abbreviations, symbols and criteria
Limited breadth and depth of codes	Presumed diagnosis can limit what patient information is recorded
NA	Problems with legibility

A Note on Privacy and Security
Clearly, how information is stored electronically and who has access to it is important to address. It is imperative that safeguards are in place to protect the privacy and security of patients' health information

RESOURCES

Consumer-Purchaser Disclosure Project. Measures to Market: Accelerating Progress toward Sustainable Business Models for Physician Performance Measurement and Reporting in Ambulatory Health Care, 2006. www.healthcaredisclosure.org/activities/publications/

Consumer-Purchaser Disclosure Project. Using electronic data to assess physician quality and efficiency, 2006; www.healthcaredisclosure.org/activities/forums.

Dresser MV, Feingold L, Rosenkranz SL, et al., Clinical Quality Measurement. Comparing Chart Review and Automated Methodologies. Med Care, 1997; 35(6): p. 539-52.

Fowles JB, Fowler E, Craft C, et al., Comparing Claims Data and Self-Reported Data with the Medical Record for Pap Smear Rates. Eval Health Prof, 1997; 20(3): p. 324-42.

Hannan EL, Kilburn H, Lindsey ML, Lewis R. Clinical versus administrative data bases for CABG surgery. Medical Care, 2003; 30(10):892–907.

Jha AK, Ferris TG, Donelan K, et al., How Common Are Electronic Health Records In The United States? A Summary Of The Evidence. Health Affairs, 2006; 25, p. w496-w507.

Standardized coding systems are used to support the processing of billions of claims that are submitted to insurers each year. Of these, over 98% of hospital claims are submitted electronically for Medicare and over 80% of all facility claims are submitted electronically. Below is a listing of the most common coding systems, with a brief description and link to more information.

The International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM)
ICD-9-CM is the official system of assigning codes to diagnoses and procedures associated with hospital utilization in the United States. It also is used in assigning codes to physician office utilization. The National Center for Health Statistics (NCHS) and the Centers for Medicare and Medicaid Services (CMS) are the agencies responsible for overseeing all changes and modifications to the ICD-9-CM.
http://www.cdc.gov/nchs/about/otheract/icd9/abticd9.htm

Current Procedural Terminology (CPT®), Fourth Edition, (CPT4)
CPT4 is a set of identifying codes that are used primarily to identify medical services and procedures furnished by physicians and other health care professionals. This code set is maintained and copyrighted by the American Medical Association. Recently, a new category of codes called CPT Category II (CPT II) have been developed to support tracking of performance measurement. These codes are optional and not tied to new payments, thus lacking the financial incentive for completion.
http://www.ama-assn.org/ama/pub/category/3113.html
http://www.ama-assn.org/ama/pub/category/12886.html

CMS Common Procedure Coding System (HCPCS)
The HCPCS is divided into two principal subsystems, referred to as level I and level II. Level I of the HCPCS is comprised of CPT4, described previously. Level II of the HCPCS is used primarily to identify products, supplies, and services not included in the CPT4 codes, such as ambulance services, durable medical equipment, prosthetics, and orthotics. Since October 2003, authority for maintaining the HCPCS Level II Codes has been delegated to CMS. Recently, a new category of codes call G-codes have been established for assessing quality of care. These codes were developed to support CMS's Initiative Physician Quality Reporting Initiative (formerly known as Physician Voluntary Reporting Program).
http://www.cms.hhs.gov/MedHCPCSGenInfo/
http://www.cms.hhs.gov/MLNMattersArticles/downloads/MM4183.pdf

National Drug Codes (NDC)
NDC is the coding system for drugs made for commercial distribution. The Food and Drug Administration maintains NDC codes in the Drug Registration and Listing System (DRLS) database.
http://www.fda.gov/cder/ndc/

These standardized coding systems are used in claims forms that are submitted by providers to insurers for payment. The UB-04 and the CMS 1500 are the primary claims forms.   The UB-04 is used by institutional providers and payers for the processing of health care claims. Recently, the UB-04 form was updated from the UB-92. The National Uniform Billing Committee (http://www.nubc.org/) oversees the UB forms. The CMS 1500 is used by non-institutional providers and payers for the processing of health care claims forms. Recently, the CMS 1500 was updated from the HCFA 1500. The National Uniform Claim Committee (http://www.nucc.org) oversees the forms for non-institutional providers.

For a copy of the UB-04 form, go to:
http://healthcaredisclosure.org/docs/files/UB04form.pdf

For a copy of a CMS 1500 form, go to:
http://healthcaredisclosure.org/docs/files/1500form.pdf