



Healthcare Quality Reporting Program

**STEERING COMMITTEE**

1/27/14, 3-4:30pm

Department of Health, Room 401

*Facilitation: Rosa Baier, MPH and Samara Viner-Brown, MS*

*Recorder: Ann Messier*

**Voting Members**

<input type="checkbox"/> Ted Almon	<input type="checkbox"/> Michael Fine, MD ( <i>Chair</i> )	<input type="checkbox"/> Nicholas Oliver, MPA, CAE
<input type="checkbox"/> David Ashley, MD	<input type="checkbox"/> Neal Galinko, MD, MS, FACP	✓ Paula Parker, LCSW
<input type="checkbox"/> Rep. David Bennett	✓ Diane Gallagher	<input type="checkbox"/> Donna Policastro, NP, RCN
✓ Virginia Burke, Esq.	<input type="checkbox"/> Deidre Gifford, MD, MPH	<input type="checkbox"/> Louis Pugliese
✓ Tracey Cohen, MD	✓ Linda McDonald, RN	✓ Gina Rocha, RN, MPH
✓ Bradley Collins, MD	✓ Jim Nyberg	

**Agenda**

3:00pm

**Open Meeting**

*Michael Fine, MD, Chair*

- Sam opened the meeting and welcomed committee members. She let the committee know that Dr. Fine is out of the office for personal reasons and will be back by the end of the week.
- Rosa reviewed the previous meeting's action items:
  - **Improve healthcare worker flu vaccination data collection** (Rosa/Emily) – **pending**  
Emily is attending the Flu Task Force meeting and is in communication with Hannah Kim, of the Immunization Program, to ensure that facilities are aware of the requirements.
  - **Work with HAI and NH subcommittees to publish Summary Reports** (Rosa/Emily) – **completed**  
The Nursing Home and Hospital Summary Reports are complete and ready for publication. They will be shared with the committee during this meeting.
  - **Share 2014 HIT Survey with the committee** (Rosa/Emily) – **pending**  
We have been some changes made to the survey process. These changes will be discussed during the meeting.
- **Web analytics (see handouts)**  
Emily reviewed the web analytics for the program. Rosa noted that she expects to see an increase in activity on this site when new reports are released. She said it is apparent that many more people than just the committee members are viewing the reports. She did note that it is not possible to determine if people are downloading the actual

reports.

3:05pm

### **HIT Survey**

*Rosa Baier, MPH, Facilitator*

*Emily Cooper, MPH, Facilitator*

#### **– Changes to 2014 survey process**

The below changes are pending further discussion with Dr. Fine and the head of physician Licensure (Dr. McDonald). This committee's input will be communicated to Dr. Fine and Dr. McDonald as they move forward with this decision process.

- Connection to Licensure

Rosa explained that we are currently exploring the option of connecting this year's HIT survey process with the upcoming physician Licensure process. If we make this change physicians will be asked to attest to their completion of the survey when they renew their license. This will lead to an increased response rate.

This idea developed from a need by the Department of Health to collect additional information about the physician workforce in Rhode Island without requiring physicians to fill out an additional survey. If we connect the HIT survey with licensure ask providers provide location information for all of the practices where they work.

We would also need to alter the previously used question about hours of direct patient care to better gauge the number of FTE providers in Rhode Island. This would help determine a better understanding of the healthcare workforce in Rhode Island.

Connecting with licensure would also mean a change in the date of the survey and the length of the survey period. In order to connect with licensure the survey period would match the physician Licensure period, the beginning of April through the end of June.

Rosa explained this means an increased level of effort as the help desk for the survey would be open for three months, rather than three weeks. Furthermore, in past years the program has run out of funds prior to the end of the year. This is a concern because if linked with the physician licensure process, which runs through the end of the financial year, the program would need guaranteed funding through the end of the financial year.

Rosa agreed to send a hard copy of the amended survey tool to the members of the Steering Committee.

- Process for alternating years

Because physician licenses are only renewed every two years, and the HIT survey will continue to be an annual process, on alternating years the survey will be a standalone process.

On years where the survey is linked with physician Licensure, the survey notice will be sent within the renewal notice. Rosa noted that this will save the reporting program the cost of the mailing on those years.

- Survey periods for physicians, PAs and APRNs

Rosa asked the committee whether the APRN/PA survey should be linked to licensure as well. She explained that while this would help increase the response

rate for that survey, the licensure periods for the three provider types are not concurrent. This could affect data collection and analysis. The committee recommended to administer all surveys during the physician licensure period and to revisit the idea of linking the APRN and PA surveys with their licensure periods next year.

– **Discussion of revisions:**

• Stakeholders who participated in the revision process

The program requested feedback from EOHHS, Blue Cross Blue Shield of Rhode Island, Tufts Health Plan, Healthcentric Advisors' HIT consultants, the Rhode Island Quality Institute and Dr. Fine. These stakeholders were given the opportunity to review the survey, provide feedback and request changes or additions. Rosa explained that this process ensures that all stakeholders' needs are met and there is no need for duplicative surveys from multiple programs. It also ensures that all information collected is relevant and being used. Any questions that are not being used are removed from the survey to decrease the reporting burden on providers.

• Changes that we incorporated

*PQRS and Meaningful Use*

Changes were made to the PQRS and Meaningful Use questions to reflect changes in process and requirements for those programs. These changes reflect the goal of these changes, to collect up to date information and how many physicians are involved in CMS incentive programs and to what extent they are involved.

Changes were also made to better align the EHR use questions with the language and current requirements of Stage II Meaningful Use. This is most clearly seen in the addition of question regarding the use of EHR Patient Support functions.

*'Tipping Point'*

A question was added to collect information on what factors went into a provider's choice to implement an EHR. This information will help to better understand which aspects of EHR technology appeal to providers and what functions providers feel are worth the time and expense of implementing and EHR.

• Effect of changes on this year's report

These changes will not affect the 5 publically reported HIT measures. The timing of the survey will mean that these reports will not be available after the end of our fiscal year.

• Changes that will occur if we receive Medicaid matching funds

The addition of Medicaid fund would mean increased stakeholder and provider engagement once the data has been collected and analyzed. More time would be available to meet with providers and stakeholders to review the results of the survey and their implications for practice and policy in Rhode Island.

• How future changes in EHR vendor impact the survey

Domenic Delmonico asked how future changes, such as the change of Care New England's vendor to Epic, will impact the survey results. Rosa said that the survey is a point in time survey, and any future changes will be reflected in the next annual survey.

– **Next steps**

We will continue to finalize the survey and work with the Physician Licensure Board. Once the survey has been finalized, it will be shared with this committee. Survey results will not be available until this program's 2015 fiscal year (July 2014-June 2015).

3:25pm **Treatment Equality Measures**

*Rosa Baier, MPH*

*Emily Cooper, MPH*

Rosa reminded the committee that Dr. Fine had requested we look into the possibility of reporting treatment equality measures. We have researched some background information (shared with the agenda) and would like to discuss how the committee would like to proceed. Rosa asked the committee to keep in mind that the charge of this program is to publish comparative information (quality measures or satisfaction) about facilities or physicians to inform patient decision making.

– **Information currently reported for disparities and treatment inequality**

- Institute of Medicine report from Dr. Fine (attachment)
- AHRQ state snapshot: <http://nhqrnet.ahrq.gov/inhqrdr/state/select>
- AHRQ data query: <http://nhqrnet.ahrq.gov/inhqrdr/data/query>

– **Discussion of reporting inequality:**

- What measure(s) could we report at the facility or physician level?
- What data source(s) exist to support reporting?
- How should we prioritize reporting inequality relative to existing reports?
- Could we relate inequality to healthcare-acquired infections (the CDC funding)?
- What should we *cease* reporting if we were to add a new report?
- How should we define treatment inequality or disparities?
- How can inequality further the program's goals?

Attached to the minutes is a definition of disparities in healthcare. The definition is that given by the Institute of Medicine in their publication 'Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care'. It defines disparities in healthcare as racial or ethnic differences in the quality of healthcare that are not due to access-related factors or clinical needs, preferences, and appropriateness of intervention.

Gina asked what other states or programs are currently doing. Emily mentioned that Minnesota is currently reporting on disparities. Their most current report can be found here: Minnesota Health Care Disparities Report: <http://mncm.org/wp-content/uploads/2013/04/Final2012HealthCareDisparitiesReport5.10.pdf>. AHRQ is also reporting on disparities and treatment inequality at the state level, see links above. Rosa asked the group to consider how we can report on these topics in a way to fits the program's charge.

Rosa asked the committee members to review the information related to disparities prior to the next Steering Committee meeting, which is scheduled on March 24, 2014. Dr. Cohen indicated that the health plans may be able to offer assistance with this topic. Gina noted that it might be possible to get funding through a CMMI grant.

3:55pm **Nursing Home Reporting**

*Rosa Baier, MPH, Facilitator*

*Emily Cooper, MPH, Facilitator*

– **Capabilities survey**

This program worked with the Safe Transitions team at Healthcentric Advisors to conduct a survey of nursing home capabilities. We had a 100% response rate for this survey.

The objective of this survey was to collect current and complete information about Rhode Island Nursing Homes. Key data elements included facility size, types of insurance accepted, services available and diagnostic testing available. Some of this information will be used in the Nursing Home Summary Report. The dual purpose of this study was to collect information that could be shared with hospital case managers to be used during discharge planning.

The Safe Transitions team will be producing a nursing home guide for hospital case managers to use during discharge. This tool will help to ensure that the facility a patient is discharged to can accommodate their needs.

– **Summary Report**

Rosa noted that when any column in the changed, the report will be updated to reflect the change. The report is not designed to stand alone – the methods report provides additional detail.

Jim and Virginia asked about the use of Nursing Home Compare’s Five Star Rating system. Jim also asked about using only two of the four available composite measures (currently the report lists the scores for Quality of Care and Health Inspections, but not Staffing or the combined Overall Rating scores). Jim and Virginia suggested using all four of the composite measures.

The committee asked what the stars mean in the five-star rating system. Virginia explained that the overall score is based on the scores in the other three composite categories (more information is available at: <http://www.medicare.gov/nursinghomecompare/About/HowWeCalculate.html>).

Paula asked what percent of readmissions are from skilled nursing facilities versus from the community. (Note: After the meeting one of the analysts at Healthcentric Advisors reported that it is about 35% from home/community and about 28% from SNF.)

– **My InnerView’s Satisfaction Summary (see handout)**

Rosa said that data from three SNFs are not included in the report due to an oversight by the vendor. She does not expect that the report will change significantly with the addition of that data when it is available.

– **Next steps**

Rosa and Emily will discuss the committee’s concerns about the summary report further with Jim and Virginia before publishing the report.

4:15pm

**Other Business/Announcements**

*Rosa Baier, MPH*

*Emily Cooper, MPH*

*Samara Viner-Brown, MS*

– **Open Forum**

Rosa explained that we are just about ready to publish the Hospital Summary Report, but that there were a few remaining concerns among the hospital IPs. A few IPs have asked that we include the data collection periods on the report, not just the methods, and that we use NMSN data for C. difficile instead of Hospital Compare data. Rosa asked

for input from the committee on these suggestions since they differ from the opinions previously expressed by the HAI and Hospital subcommittees.

Gina Rocha stated the dashes indicating missing data do not differentiate between what is actually missing versus insufficient/not applicable data. She questioned the proposed audience for the reports. Rosa said that the reports are for case managers and for consumers, noting that the data is more aligned with the needs of the public, and the methods report will be more useful to clinicians using the report.

Rosa and Emily will discuss the remaining concerns with the HAI subcommittee chairs before publication.

– **Action items**

- Work with Dr. Fine and Dr. McDonald to finalize the HIT survey process (Rosa/Emily/Sam)
- Discuss the Hospital Summary Report revisions with the Hospital and HAI Subcommittee Chairs – (Rosa/Emily)
- Discuss the Nursing Home Report with Virginia Burke and Jim Nyberg (Rosa/Emily)

– **Next meeting: 3/24/14**



Healthcare Quality Reporting Program  
**STEERING COMMITTEE DATA UPDATES**

12/31/13

Data Updates (Reports, Oldest to Newest by Setting)	Update Frequency	Last Updated	Comments
<b>Home Health</b>			
• Clinical quality measures from Medicare	Quarterly	Nov 2009	Now links to Home Health Compare
• Patient satisfaction	2 years	June 2011	Discontinued at agencies' request
• Employee influenza vaccination rates	Annually	Sept 2013	
<b>Hospital</b>			
• Clinical quality measures from Medicare	Quarterly	May 2011	Now links to Hospital Compare
• Hand hygiene processes	Annually	March 2013	
• Surgical Care Infection Program (SCIP) Measures	Quarterly	May 2012	Now links to Hospital Compare
• Central-Line Associated Bloodstream Infections (CLABSI)	Quarterly	Sept 2012	Now links to Hospital Compare
• Pressure ulcer incidence	Quarterly	Sept 2009	Now links to Hospital Compare
• Employee influenza vaccination rates	Annually	Sept 2013	
• MRSA CLABSI incidence	Quarterly	Oct 2013	
• <i>C. Difficile</i> incidence	Once	Nov 2012	Will be reported by Hospital Compare in Jan 2014 (tentatively)
• Hospital Summary Report	Annually	Jan 2014	<b>NEW</b>
<b>Nursing Home</b>			
• Clinical quality measures from Medicare	Quarterly	Feb 2011	Now links to Nursing Home Compare
• Resident and family satisfaction	Annually	Feb 2013	2014 survey complete, reports in progress
• Employee influenza vaccination rates	Annually	Sept 2013	
• Nursing Home Summary Report	Annually	Jan 2014	<b>NEW</b>
<b>Licensed Independent Practitioners (Physicians, APRNs, PAs)</b>			
• HIT adoption	Annually	Mar 2013	2014 in progress

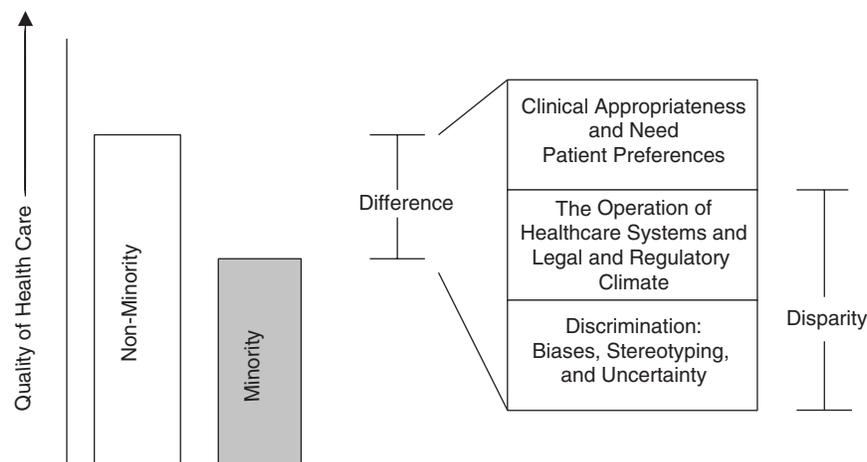
defined by cultural heritage, sociodemographic characteristics, geography (e.g., a state or a region), or diagnosis. It recognizes that such individuals will include the most vulnerable, whether the source of vulnerability is economic, the rarity or severity of the health problem, physical frailty, or physical or emotional impairment. (Institute of Medicine, 1999a; emphasis in text).

The study committee defines *disparities* in healthcare as racial or ethnic differences in the quality of healthcare that are not due to access-related factors or clinical needs, preferences,<sup>1</sup> and appropriateness of intervention (Figure 1-1). The committee's analysis is focused at two levels: 1) the operation of healthcare systems and the legal and regulatory climate in which health systems function; and 2) discrimination at the individual, patient-provider level. Discrimination, as the committee uses the term, refers to differences in care that result from biases, prejudices, stereotyping, and uncertainty in clinical communication and decision-making. It should be emphasized that these definitions are not legal definitions. Different sources of federal, state and international law define discrimination in varying ways, some focusing on intent and others emphasizing disparate impact.

Finally, in defining *racial and ethnic minority groups*, the committee uses the definitions provided by the federal Office of Management and Budget in its proposed Revisions to the Standards for the Classification of Federal Data on Race and Ethnicity (Office of Management and Budget, 2001). The revised standards (see Box 1-1) establish five categories for "racial" groups (American Indian or Alaska Native, Asian, Black or African American, Native Hawaiian or other Pacific Islander, and White), and two categories for "ethnic" groups (Hispanic or Latino and Not Hispanic or Latino).<sup>2</sup> It should be noted that these definitions have been subject to considerable criticism, including:

<sup>1</sup>The committee defines patient *preferences* as patients' choices regarding healthcare that are based on a full and accurate understanding of treatment options. As discussed in Chapter 3 of this report, patients' understanding of treatment options is often shaped by the quality and content of provider-patient communication, which in turn may be influenced by factors correlated with patients' and providers' race, ethnicity, and culture. Patient preferences that are not based on a full and accurate understanding of treatment options may therefore be a source of racial and ethnic disparities in care. The committee recognizes that patients' preferences and clinicians' presentation of clinical information and alternatives influence each other, but found separation of the two to be analytically useful.

<sup>2</sup>Consistent with the OMB classification scheme, the terms "African American" and "black" are used interchangeably throughout this report, as are the terms "Hispanic" and "Latino."



**FIGURE 1-1** Differences, disparities, and discrimination: Populations with equal access to healthcare. SOURCE: Gomes and McGuire, 2001.

- reinforcement of the concept of “race” as reflecting genetic or biologic differences between population groups;
- failure to reflect the fluid and dynamic nature of sociopolitical identity, and
- failure to reflect the way many Americans choose to define themselves (Institute of Medicine, 1999b).

Nonetheless, the committee adopts these racial and ethnic definitions because they are commonly accepted among researchers, and most federally funded research utilizes these terms. Further, as will be noted below, access to and the allocation of healthcare resources differ with striking consistency across these population groups, making them useful in tracking disparities in care.

To summarize, racial and ethnic minorities are less likely than whites to possess health insurance (Collins, Hall, and Neuhaus, 1999), are more likely to be beneficiaries of publicly funded health insurance (e.g., Medicaid [The Henry J. Kaiser Family Foundation, 2000b]), and even when insured, may face additional barriers to care due to other socioeconomic factors, such as high co-payments, geographic factors (e.g., the relative scarcity of healthcare providers and healthcare facilities in minority communities), and insufficient transportation. These access-related factors are likely the most significant barriers to equitable care, and must be addressed as an important first step toward eliminating healthcare disparities. The

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## **UNEQUAL TREATMENT: WHAT HEALTHCARE PROVIDERS NEED TO KNOW ABOUT RACIAL AND ETHNIC DISPARITIES IN HEALTH- CARE**

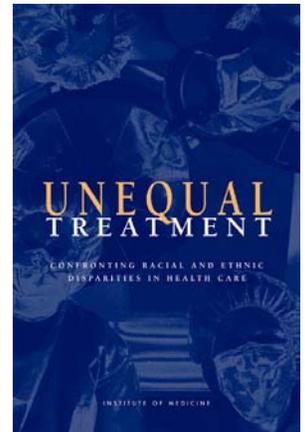
**N**ews accounts of the state of healthcare delivery seem to be full of bad news, including concerns about rising healthcare costs, patient safety and medical errors, and the growing numbers of uninsured Americans. To add to these problems, many recent news reports indicate that racial and ethnic minorities receive lower quality healthcare than whites, even when they are insured to the same degree and when other healthcare access-related factors, such as the ability to pay for care, are the same.

The Institute of Medicine (IOM) report, *Unequal Treatment: Confronting Racial and Ethnic Disparities in Healthcare*, added to the media fray when the IOM concluded that “(al)though myriad sources contribute to these disparities, some evidence suggests that bias, prejudice, and stereotyping on the part of healthcare providers may contribute to differences in care.”

This finding was alarming to many healthcare professionals, the vast majority of whom work hard under very challenging conditions to ensure that patients receive the best possible healthcare to meet their needs. How could bias, prejudice, and stereotyping contribute to unequal treatment, particularly given that healthcare providers are sworn to beneficence and cannot, by law, discriminate against any patient on the basis of race, ethnicity, color, or national origin? This brief summary of the IOM *Unequal Treatment* report addresses this question, and summarizes other relevant findings to help healthcare professionals meet the objective of providing high-quality care for all patients.

### **DO RACIAL AND ETHNIC MINORITIES RECEIVE A LOWER QUALITY OF HEALTHCARE?**

In 1999, Congress requested that the IOM assess the extent of racial and ethnic disparities in healthcare, assuming that access-related factors – such as insurance status and the ability to pay for care are the same; identify potential sources of these



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disparities, including the possibility that overt or subtle biases or prejudice on the part of healthcare providers might affect the quality of care for minorities; and suggest intervention strategies.

To fulfill this request, an IOM study committee reviewed well over 100 studies that assessed the quality of healthcare for various racial and ethnic minority groups, while holding constant variations in insurance status, patient income, and other access-related factors. Many of these studies also controlled for other potential confounding factors, such as racial differences in the severity or stage of disease progression, the presence of co-morbid illnesses, where care is received (e.g., public or private hospitals and health systems) and other patient demographic variables, such as age and gender. Some studies that employed more rigorous research designs followed patients prospectively, using clinical data abstracted from patients' charts, rather than administrative data used for insurance claims. The study committee was struck by the consistency of research findings: even among the better-controlled studies, the vast majority indicated that minorities are less likely than whites to receive needed services, including clinically necessary procedures. These disparities exist in a number of disease areas, including cancer, cardiovascular disease, HIV/AIDS, diabetes, and mental illness, and are found across a range of procedures, including routine treatments for common health problems.

## **WHAT ARE THE SOURCES OF HEALTH CARE DISPARITIES?**

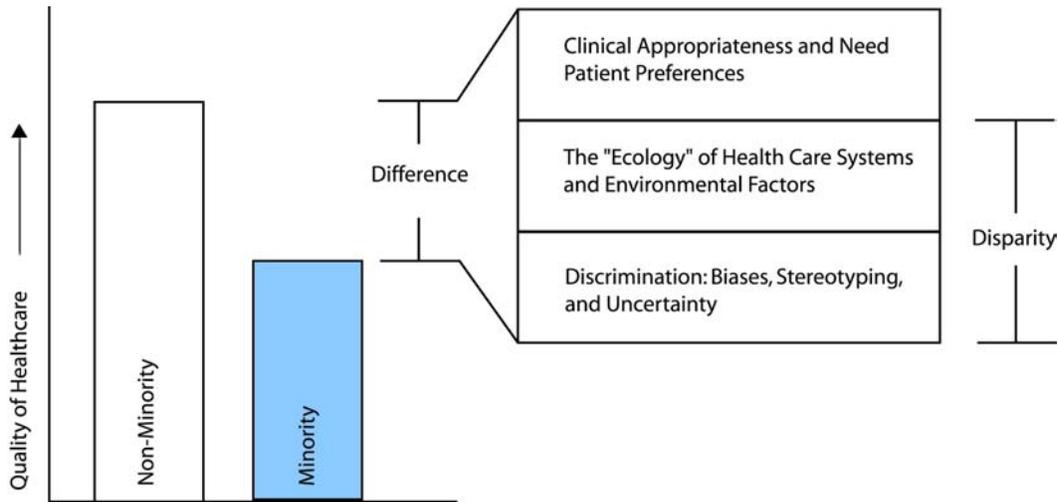
Many factors may contribute to the health care disparities observed in these studies. Some researchers suggest that there may be subtle differences in the way that members of different racial and ethnic groups respond to treatment, particularly with regard to some pharmaceutical interventions, suggesting that variations in some forms of treatment may be justified on the basis of patient race or ethnicity. In addition, patients vary in help-seeking behavior, and some racial and ethnic minorities may be more likely than whites to avoid or delay seeking care. However, the majority of studies find disparities in clinical services that are equally effective for all racial and ethnic groups. Further, the studies that the IOM reviewed suggest that racial differences in patients' attitudes, such as their preferences for treatment, do not vary greatly and cannot fully explain racial and ethnic disparities in healthcare. A small number of studies, for example, find that African Americans are slightly more likely to reject medical recommendations for some treatments, but these differences in refusal rates are generally small (African Americans are only 3-6% more likely to reject recommended treatments, according to these studies). It remains unclear why African-American patients are more likely to reject treatment recommendations. Are they refusing treatment because of a general mistrust of health care providers? Or do some decline treatment because of negative experiences in the clinical encounter or a perception that their doctor is not invested in their care? More research is needed to fully understand treatment refusal because the reasons for refusal may lead to different strategies to help patients make informed treatment decisions.

If minority patients' attitudes toward healthcare and preferences for treatment are not likely to be a major source of health care disparities, what other factors may contribute to these disparities? As shown in the figure below, the IOM study committee considered two other sets of factors that may be associated with disparities in healthcare, assuming that all populations have equal access to care. The first set of factors are those related to the operation of healthcare systems and the legal and regulatory climate in which they operate. These include factors such as cultural or linguistic barriers (e.g., the lack of interpretation services for patients with limited English proficiency), fragmentation of

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healthcare systems (as noted earlier, these include the possibility that minorities are disproportionately enrolled in lower-cost health plans that place greater per-patient limits on healthcare expenditures and available services), the types of incentives in place to contain costs (e.g., incentives to physicians to limit services), and where minorities tend to receive care (e.g., minorities are less likely to access care in a private physician's office, even when insured at the same level as whites).



Differences, Disparities, and Discrimination: Populations with Equal Access to Healthcare.  
SOURCE: Gomes and McGuire, 2001

The second set of factors emerges from the clinical encounter. Three mechanisms might be operative in healthcare disparities from the provider's side of the exchange: bias (or prejudice) against minorities; greater clinical uncertainty when interacting with minority patients; and beliefs (or stereotypes) held by the provider about the behavior or health of minorities. Patients might also react to providers' behavior associated with these practices in a way that also contributes to disparities. Research on how patient race or ethnicity may influence physician decision-making and the quality of care for minorities is still developing, and as yet there is no direct evidence to illustrate how prejudice, stereotypes, or bias may influence care. In the absence of such research, the study committee drew upon a mix of theory and relevant research to understand how these processes might operate in the clinical encounter.

### *Clinical Uncertainty*

Any degree of uncertainty a physician may have relative to the condition of a patient can contribute to disparities in treatment. Doctors must depend on inferences about severity based on what they can see about the illness and on what else they observe about the patient (e.g., race). The doctor can therefore be viewed as operating with prior beliefs about the likelihood of patients' conditions, "priors" that will be different according to age, gender, socioeconomic status, and race or ethnicity. When these priors are considered alongside information gathered in a clinical encounter, both influence medical decisions.

Doctors must balance new information gained from the patient (sometimes with varying levels of accuracy) and their prior expectations about the patient to make a diagnosis and determine a course of treatment. If the physician has difficulty accurately understanding the symptoms or is less sure of the "signal" – the set of clues and indications that

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physicians rely upon to make diagnostic decisions – then he or she is likely to place greater weight on “priors.” The consequence is that treatment decisions and patients’ needs are potentially less well matched.

### *The Implicit Nature of Stereotypes*

A large body of research in psychology has explored how stereotypes evolve, persist, shape expectations, and affect interpersonal interactions. Stereotyping can be defined as the process by which people use social categories (e.g., race, sex) in acquiring, processing, and recalling information about others. The beliefs (stereotypes) and general orientations (attitudes) that people bring to their interactions help organize and simplify complex or uncertain situations and give perceivers greater confidence in their ability to understand a situation and respond in efficient and effective ways.

Although functional, social stereotypes and attitudes also tend to be systematically biased. These biases may exist in overt, explicit forms, as represented by traditional bigotry. However, because their origins arise from virtually universal social categorization processes, they may also exist, often unconsciously, among people who strongly endorse egalitarian principles and truly believe that they are not prejudiced. In the United States, because of shared socialization influences, there is considerable empirical evidence that even well-intentioned whites who are not overtly biased and who do not believe that they are prejudiced typically demonstrate unconscious implicit negative racial attitudes and stereotypes. Both implicit and explicit stereotypes significantly shape interpersonal interactions, influencing how information is recalled and guiding expectations and inferences in systematic ways. They can also produce self-fulfilling prophecies in social interaction, in that the stereotypes of the perceiver influence the interaction with others in ways that conform to stereotypical expectations.

### *Healthcare Provider Prejudice or Bias*

Prejudice is defined in psychology as an unjustified negative attitude based on a person’s group membership. Survey research suggests that among white Americans, prejudicial attitudes toward minorities remain more common than not, as over half to three-quarters believe that relative to whites, minorities – particularly African Americans – are less intelligent, more prone to violence, and prefer to live off of welfare. It is reasonable to assume, however, that the vast majority of healthcare providers find prejudice morally abhorrent and at odds with their professional values. But healthcare providers, like other members of society, may not recognize manifestations of prejudice in their own behavior.

While there is no direct evidence that provider biases affect the quality of care for minority patients, research suggests that healthcare providers’ diagnostic and treatment decisions, as well as their feelings about patients, are influenced by patients’ race or ethnicity. Schulman et al. (1999), for example, found that physicians referred white male, black male, and white female hypothetical “patients” (actually videotaped actors who displayed the same symptoms of cardiac disease) for cardiac catheterization at the same rates (approximately 90% for each group), but were significantly less likely to recommend catheterization procedures for black female patients exhibiting the same symptoms. In another experimental design, Abreu (1999) found that mental health professionals subliminally “primed” with African American stereotype-laden words were more likely to evaluate the same hypothetical patient (whose race was not identified) more negatively than when primed with neutral words. Further, in a study based on actual clinical encounters, van Ryn and Burke (2000) found that doctors rated black patients as less intelligent, less educated, more likely to abuse drugs and alcohol, more likely to fail to comply with

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medical advice, more likely to lack social support, and less likely to participate in cardiac rehabilitation than white patients, even after patients' income, education, and personality characteristics were taken into account. These findings suggest that while the relationship between race or ethnicity and treatment decisions is complex and may also be influenced by gender, providers' perceptions and attitudes toward patients are influenced by patient race or ethnicity, often in subtle ways.

#### *Medical Decisions Under Time Pressure with Limited Information*

Indeed, studies suggest that several characteristics of the clinical encounter increase the likelihood that stereotypes, prejudice, or uncertainty may influence the quality of care for minorities. In the process of care, health professionals must come to judgments about patients' conditions and make decisions about treatment, often without complete and accurate information. In most cases, they must do so under severe time pressure and resource constraints. The assembly and use of these data are affected by many influences, including various "gestalts" or cognitive shortcuts. In fact, physicians are commonly trained to rely on clusters of information that functionally resemble the application of "prototypic" or stereotypic constellations. These conditions of time pressure, resource constraints, and the need to rely on gestalts map closely onto those factors identified by social psychologists as likely to produce negative outcomes due to lack of information, to stereotypes, and to biases (van Ryn, 2002).

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#### *Patient Response: Mistrust and Refusal*

As noted above, the responses of racial and ethnic minority patients to healthcare providers are also a potential source of disparities. Little research has been conducted as to how patients may influence the clinical encounter. It is reasonable to speculate, however, that if patients convey mistrust, refuse treatment, or comply poorly with treatment, providers may become less engaged in the treatment process, and patients are less likely to be provided with more vigorous treatments and services. But these kinds of reactions from minority patients may be understandable as a response to negative racial experiences in other contexts, or to real or perceived mistreatment by providers. Survey research, for example, indicates that minority patients perceive higher levels of racial discrimination in healthcare than non-minorities. Patients' and providers' behavior and attitudes may therefore influence each other reciprocally, but reflect the attitudes, expectations, and perceptions that each has developed in a context where race and ethnicity are often more salient than these participants are even aware of.

**Little research has been conducted as to how patients may influence the clinical encounter.**

### **WHAT CAN HEALTHCARE PROVIDERS DO TO HELP ELIMINATE DISPARITIES IN CARE?**

Given that stereotypes, bias, and clinical uncertainty may influence clinicians' diagnostic and treatment decisions, education may be one of the most important tools as part of an overall strategy to eliminate healthcare disparities. Healthcare providers should be made aware of racial and ethnic disparities in healthcare, and the fact that these disparities exist, often despite providers' best intentions. In addition, all current and future healthcare providers can benefit from cross-cultural education. Cross-cultural education programs have been developed to enhance health professionals' awareness of how cultural and social factors influence healthcare, while providing methods to obtain, negotiate and manage this information clinically once it is obtained. Cross-cultural education can be divided into three conceptual approaches focusing on *attitudes* (cultural sensitivity/awareness approach), *knowledge* (multicultural/categorical approach), and *skills* (cross-cultural approach), and has been taught using a variety of interactive and experien-

**Healthcare providers should be made aware of racial and ethnic disparities in health-care, and the fact that these disparities exist, often despite providers' best intentions.**

tial methodologies. Research to date demonstrates that training is effective in improving provider knowledge of cultural and behavioral aspects of healthcare and building effective communication strategies.

Standardized data collection is also critically important in efforts to understand and eliminate racial and ethnic disparities in healthcare. Data on patient and provider race and ethnicity would allow researchers to better disentangle factors that are associated with healthcare disparities, help health plans to monitor performance, ensure accountability to enrolled members and payors, improve patient choice, allow for evaluation of intervention programs, and help identify discriminatory practices. Unfortunately, standardized data on racial and ethnic differences in care are generally unavailable, and a number of ethical, logistical, and fiscal concerns present challenges to data collection and monitoring, including the need to protect patient privacy, the costs of data collection, and resistance from healthcare providers, institutions, plans and patients. In addition, health plans have raised significant concerns about how such data will be analyzed and reported. The challenges to data collection should be addressed, as the costs of failing to assess racial and ethnic disparities in care may outweigh new burdens imposed by data collection and analysis efforts.

Many other strategies must be undertaken, in conjunction with the training and educational strategies described here, to eliminate racial and ethnic disparities in healthcare. As noted in the report, these include, for example, policy and regulatory strategies that address fragmentation of health plans along socioeconomic lines, and health systems interventions to promote the use of clinical practice guidelines and promote the use of interpretation services where community need exists. In short, a comprehensive, multi-level strategy is needed to eliminate these disparities. Broad sectors – including healthcare providers, their patients, payors, health plan purchasers, and society at large – must work together to ensure all patients receive a high quality of healthcare.

**Many other strategies must be undertaken, in conjunction with the training and educational strategies described here, to eliminate racial and ethnic disparities in health-care.**

## **GUIDE TO INFORMATION SOURCES**

An increasing number of resources are available to healthcare providers and their patients to increase awareness of racial and ethnic healthcare disparities and means to improve the quality of care for racial and ethnic minorities. The following is only a partial list of some of these resources, and is not intended as an endorsement of the products or individuals and groups that produced them:

American Board of Internal Medicine. (1998). *Cultural Competence: Addressing a Multicultural Society: The ABIM Report 1997-1998*. Philadelphia: American Board of Internal Medicine.

American Medical Association. (1999). *Cultural Competence Compendium*. Chicago, IL: American Medical Association. Product Number OP209199/ Phone # 1-800-621-8335.

Betancourt JR, Like RC, and Gottlieb BR, eds. (2000). Caring for diverse populations: Breaking down barriers. *Patient Care*, Special Issue, May 15, 2000.

Lavizzo-Mourey R, and Mackenzie ER. (1996). Cultural Competence: Essential Measurements of Quality for Managed Care Organizations. *Annals of Internal Medicine* 124, pp. 919-21.

National Alliance for Hispanic Health. *Quality Services for Hispanics: the Cultural Competency Component*, Rockville, MD: U.S. Department of Health and Human Services, 2000.

In addition to these sources, the Henry J. Kaiser Family Foundation and the Robert Wood Johnson Foundation have recently joined forces to sponsor an initiative to increase dialogue among physicians regarding healthcare disparities. To learn more about this initiative, please visit the “Why the Difference?” website at [www.kff.org/whythedifference](http://www.kff.org/whythedifference).

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Gomes C, and McGuire TG. (2001). Identifying the sources of racial and ethnic disparities in health care use. Unpublished manuscript.

Schulman, K.A., Berlin, J.A., Harless, W., Kerner, J.F., Sistrunk, S., Gersh, B.J., Dube, R., Taleghani, C.K., Burke, J.E., Williams, S., Eisenberg, J., Escarce, J.J., Ayers, W. (1999). The effect of race and sex on physicians' recommendations for cardiac catheterization. *New England Journal of Medicine* 340:618-626.

van Ryn M, Burke J. 2000. The effect of patient race and socio-economic status on physician's perceptions of patients. *Social Science and Medicine* 50:813-828.



## For More Information...

Copies of *Unequal Treatment: Understanding Racial and Ethnic Disparities in Health Care* are available for sale from the National Academy Press; call (800) 624-6242 or (202) 334-3313 (in the Washington metropolitan area), or visit the NAP home page at [www.nap.edu](http://www.nap.edu). The full text of this report is available at <http://www.nap.edu/catalog/10260.html>

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## COMMITTEE ON UNDERSTANDING AND ELIMINATING RACIAL AND ETHNIC DISPARITIES IN HEALTH CARE

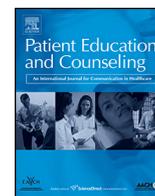
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## Can public reporting impact patient outcomes and disparities? A systematic review

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### ABSTRACT

**Objective:** Recent US healthcare reforms aim to improve quality and access. We synthesized evidence assessing the impact that public reporting (PR), which will be extended to the outpatient setting, has on patient outcomes and disparities.

**Methods:** A systematic review using PRISMA guidelines identified studies addressing the impact of PR on patient outcomes and disparities.

**Results:** Of the 1970 publications identified, 25 were relevant, spanning hospitals (16), nursing homes (5), emergency rooms (1), health plans (2), and home health agencies (1). Evidence of effect on patient outcomes was mixed, with 6 studies reporting a favorable effect, 9 a mixed effect, 9 a null effect, and 1 a negative effect. One study found a mixed effect of PR on disparities.

**Conclusion:** The evidence of the impact of PR on patient outcomes is lacking, with limited evidence that PR has a favorable effect on outcomes in nursing homes. There is little evidence supporting claims that PR will have an impact on disparities or in the outpatient setting.

**Practice implications:** Health systems should collect information on patient-relevant outcomes. The lack of evidence does not necessarily imply a lack of effect, and a research gap exists regarding patient-relevant outcomes and PR.

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## 1. Introduction

The United States healthcare system provides poor quality with significant disparities [1], where disparities can be defined as differences in health outcomes across population subgroups, often linked to social, economic, or environmental disadvantages. Public reporting (PR) has been proposed as one mechanism to reduce disparities and improve quality [2,3].

The term “public reporting” first referred to the projected assessment of practice quality using standardized patients [4]. However, the first use of the term “public reporting” to refer to healthcare in a way familiar to present readers was in 1992 [5].

Since that time, several pathways have been proposed linking PR to improved performance. Providers may be motivated by PR to improve performance to increase market share. Alternatively it is claimed that patients will use it to choose the best health care. However, it is not known how PR affects patients and disparities.

### 1.1. Existing evidence on public reporting

More than ten years ago, a review showed improvement in health outcomes among 7 PR systems [6]. In 2008, a systematic review showed inconsistent association between public reporting and effectiveness [7]. Most recently, a 2012 review found moderate evidence that quality measures improved with PR [8]. The reviews of the association between outcomes, quality, and PR have all remarked on the scarcity of the available evidence. In addition, these reviews have not examined the effect of PR on patient subgroups or disparities.

### 1.2. Disparities and healthcare reform

The National Healthcare Disparities Report of 2011 attributes the persistence of disparities to “differences in access to care, provider biases, poor provider-patient communication, or poor health literacy.” Quality of care and access continue to be suboptimal overall and worse in minority groups [9].

Improving access and reducing disparities is a key objective of the Patient Protection and Affordable Care Act of 2010 (PPACA), which provides uninsured Americans the opportunity to purchase affordable insurance from a system of state-based insurance

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exchanges, raises the income limit for eligibility for Medicaid, and introduces penalties for being without health insurance coverage. The reforms could significantly reduce disparities in insurance coverage [10], and assuming the additional coverage for 32 million previously uninsured Americans leads to greater utilization, there could be an additional 15–24 million primary care visits in 2019 [11]. Quality improvement and its relationship to disparities will thus continue to be relevant [12].

The American health care system is built on a consumerist model. Information is thought to empower patients from vulnerable groups to choose the highest quality care and provide incentives for providers to improve. According to the US Department of Health and Human Services Action Plan to Reduce Racial and Ethnic Health Disparities, “Providing incentives for quality care in these populations is critical for improving patient outcomes and creating a high-value healthcare system that promotes equity.” [13].

### 1.3. Can public reporting impact access and quality?

While there is some evidence that disparities in care can be improved by PR, especially if “quality improvement programs...tailor health care toward the cultural, linguistic, and educational needs of minorities” [14] there is evidence to doubt this claim.

First, quality improvement and PR efforts can actually increase disparities through various mechanisms. For example, providers might avoid high-risk patients likely to adversely affect their quality scores, and disproportionately low ratings might be received by healthcare organizations that cater to high-risk groups [15].

Secondly, the consumerist model according to which information diffusion leads to a decreased knowledge gap, enabling patients to “shop for quality,” has long been held by some social scientists to be based on mistaken assumptions [16]. While information might lead to greater knowledge in some groups, other less advantaged groups might not be able to take advantage of the information as quickly or reliably for their benefit.

While it might be problematic to claim that PR might help reduce disparities, the scientific literature lacks studies to judge this claim. Chien et al. [14] found only one study examining the effect of performance incentive programs on disparities, which found an increase in disparities in coronary artery bypass graft surgery rates after the implementation of New York State’s report card system. Even today we concur with their judgment of five years ago that “there needs to be more explicit attention to thinking about how policies affect disparities if we are to maximize the chance of improvement for all.” [14].

In order to evaluate the role that PR might play in improving the health of patients and, in particular, disadvantaged subgroups affected by disparities, we undertook a systematic review of the effects of PR on patients and disparities. Our goal was to assess to what extent studies of any appropriate design have examined the effects of PR on any health outcomes for patient populations, where outcomes were compared before and after PR and/or between patient groups using providers that were or were not participating in PR. We asked whether any effects on patient outcomes have been positive or negative, whether there has been any effect on health disparities, and what gaps exist in the literature regarding PR’s effect on disparities.

## 2. Methods

Our systematic review is reported according to the PRISMA guidelines [17]. A protocol is available from the authors. The key questions were as follows:

1. What is the effect of PR on patient outcomes?
2. What is the effect of PR on disparities?
3. What is the effect of PR on patient choice?
4. What are the potential sources of bias, conflicts of interest, and limitations that characterize the literature on PR and the above areas, and what is the quality of the body of evidence?

### 2.1. Data sources and searches

We searched PubMed, Scopus, PsycINFO, Sociological Abstracts, Social Science Citation Index (Web of Science), EconLit and Anthropology Plus through January 20, 2013, for primary studies relating to PR. Our original intention was to search only for studies that mentioned disparities or minorities; however, we saw that this search would potentially miss studies that assessed effects on subgroups as secondary analyses. Thus, our literature search was broadened. The final search strategy included the terms “public reporting” or “quality reporting”, and specified “health” for databases that also covered non-health topics. Title, abstract and full article reviews were performed by two independent reviewers to identify relevant publications. Conflicts were resolved by consensus.

### 2.2. Study selection

From the larger database of studies on PR we identified studies of any design with original data addressing the effects of PR on measures of morbidity, mortality, or patient-reported outcomes. We were interested in any patient-relevant outcomes, as opposed to process outcomes that may not be associated with any meaningful effects for patients. Participants could be any patient population, and the intervention any government-provided PR of health care process or outcome measures. Crowd-sourced or privately funded PR initiatives were excluded because we were chiefly interested in the effect of state- or Federally-sponsored PR initiatives, which are most closely linked to healthcare reform through the public sector (Table 1).

Studies with any length of follow-up were included, although cross-sectional studies that compared changes in patient outcomes measured by the PR instrument without a longitudinal component

**Table 1**  
Exclusion and inclusion criteria.

Review stage	Include	Exclude
Title	<ul style="list-style-type: none"> <li>✓ Any article about “public reporting”</li> <li>✓ Any article about “quality reporting”</li> </ul>	<ul style="list-style-type: none"> <li>☒ Only concerned with narrowly technical issues</li> <li>☒ Not about providers</li> <li>☒ Only concerned with epidemiological surveillance</li> <li>☒ Model or simulation</li> </ul>
Abstract	<ul style="list-style-type: none"> <li>✓ Any article, review, editorial, consensus statement, or letter to the editor relating to public or quality reporting AND one of the following:               <ul style="list-style-type: none"> <li>Preferences</li> <li>Disparities</li> <li>Minorities</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>☒ All of the above exclusion criteria</li> <li>☒ Health care reform policy discussion</li> <li>☒ Regulation description, technical implementation (e.g. “how-to”), or compliance guide</li> <li>☒ Non-formal, crowd-sourced, social-media, or Web-search based public reporting</li> </ul>

were excluded because any differences could not be attributed to the effects of PR. There were no limits on publication dates or languages. Reviews, dissertations, abstracts, unpublished reports, and commentaries were excluded because they did not report any original data, or were likely to be published subsequently in journal articles. Other exclusion and inclusion criteria are listed in Table 1.

### 2.3. Data extraction and quality assessment

Data from each article were serially extracted by a junior reviewer, then by a more senior reviewer; differences in opinion were resolved through consensus. We sought data on the following variables: setting, population, outcomes, and effect on patients, choice, and disparities. The principal summary measure was the nature of the effect on patients, positive or negative, and the nature of the effect on patient choice. Given the heterogeneity of the methods used in the articles, we did not summarize the magnitude of effect. Effects were identified and classified as either positive, negative, or none, and reported separately where studies assessed multiple outcomes or patient subgroups.

In addition to abstracting the main effects of PR on patient outcomes, we also abstracted information from any subgroups of patient populations in order to address research questions about effects of PR on disparities, i.e. differences in outcomes between subgroups due in part to social or economic disadvantage. In order to assess quality of individual studies, we also abstracted information on the reported funding source of the study, reported conflict of interest for the authors, and the major limitations presented. Information on risks of bias was tabulated and analyzed through narrative synthesis.

### 2.4. Data synthesis and analysis

No groups of studies could be pooled quantitatively due to the heterogeneity of the PR tools examined and patient outcomes reported. We summarized and described the results qualitatively, grouping the results by outcome, setting, and population for clarity of presentation. We summarized the direction of the effect on patients and the effect on patient choice as overall positive, overall mixed, null, or overall negative. We also analyzed the general direction of effect for multiple subgroups of studies; in particular, we summarized the direction of effect for the settings most represented in our review.

Similarly, we summarized the direction of the effect of PR on disparities. We evaluated the quality of the body of evidence using the GRADE approach [18]. This approach evaluates the quality starting from a “baseline” quality associated with a given study design, and then further refines the estimate of quality given various quality domains.

## 3. Results

We identified 1970 records through our database search (see Fig. 1). As is frequently the case in such reviews, most studies were excluded at the title or the abstract level. After reaching the abstract level, many studies, 523 of 605, were found not to be relevant to our key questions. Finally, at the full-text level, 57 of 82 studies were excluded for lack of relevance to our questions, lack of original data, or unpublished manuscript. We included 25 studies in our systematic review. For characteristics of the included studies, see Table 2. The publication year of the studies varied from 2002 to 2012. One study was carried out in the Netherlands [25] and one in Italy [42]; the remaining studies were carried out in the US. The majority of the studies ( $N = 16$ ) were carried out in hospitals [19,21–23,26,28–30,32–36,38,43,44]. In five studies, the

setting was nursing homes or skilled nursing facilities [20,24,38–40], in one study, emergency rooms [25], and in two studies, health plans [27,42]. Home health care was the setting for one study [31]. No studies were conducted in the outpatient setting.

### 3.1. Outcomes reported in the studies and sources of PR information

A number of studies shared common or multiple aims. Many studies ( $N = 14$ ) had among their research aims the effect of PR on inpatient mortality [19,21,22,26,28–30,32–37,43], and two studies examined the effect of PR on hospitalization or rehospitalization [19,31]. Six studies included outcomes relevant to activities of daily living (ADLs) or other quality measures for nursing home residents [20,24,31,38–40]. Four studies examined cardiovascular outcomes apart from mortality or hospitalization, involving either coronary artery bypass graft (CABG), percutaneous coronary intervention (PCI), or heart failure [19,22,37,43]. Other aims in these studies included quality measures appropriate to the outpatient setting including vaccinations and cancer screening [42], general quality of care [22,37], case mix [22,32], and market share or patient choice [34,40]. One study examined patient-reported satisfaction and other measures of patient experience [23].

Various sources of PR information were used. Nine used various states' public reporting mechanisms for outcomes of CABG or PCI [19,22,26,28,29,32–34,43]. One study used state-level PR data from the Minnesota Department of Human Services [42]. Four studies used Nursing Home Compare [20,38–40], of which one used, as well, the On-Site Compliance Review [20]. Three studies used Hospital Compare [35–37], one used data from the Hospital Quality Incentive Demonstration project of the CMS [30], and one study used data from the Hospital Quality Alliance [25]. Two studies used patient surveys [23,27]. One study used Home Health Compare [31]. One study used information from the Regional Outcome Evaluation Program from the region of Lazio in Italy [44].

### 3.2. Effect on patient outcomes, disparities, and choice

Table 2 summarizes the effect of PR on patients and patient choice. In general, the effect of public reporting on patients was mixed. Six studies reported a positive effect on patients, nine reported a mixed effect, that is, some positive effects on patients and some negative or null, eight reported a null effect, and one reported negative effects.

Among the five studies set in nursing homes, three showed a positive effect on patients and two showed a mixed effect. Three of the studies set in nursing homes were carried out by the same first author. As opposed to the studies conducted in the hospital setting, the studies in nursing homes did not address mortality, but rather quality measures appropriate to the setting, such as activities of daily living. For example, Werner and colleagues [39], in a study of 13,683 skilled nursing facilities in the U.S., found improvement in both reported and unreported measures associated with PR, that is, improvement in measures of pain, delirium, and walking, as well as in measures not reported for the purpose of PR (improved pain, locomotion, shortness of breath, bladder incontinence, respiratory infection, urinary tract infection, and activities of daily living [ADLs]).

Among the studies set in hospitals, four showed a mixed effect, two showed a positive effect, seven showed a null effect, and one showed a negative effect. Most of the studies set in hospitals were in populations undergoing cardiac surgery and using PR information from a CABG or PCI reporting database. For example, Carey and colleagues examined mortality, admission, and repeat procedures among patients in California hospitals undergoing cardiac surgery from 1998 to 2004, finding that risk-adjusted in-hospital mortality

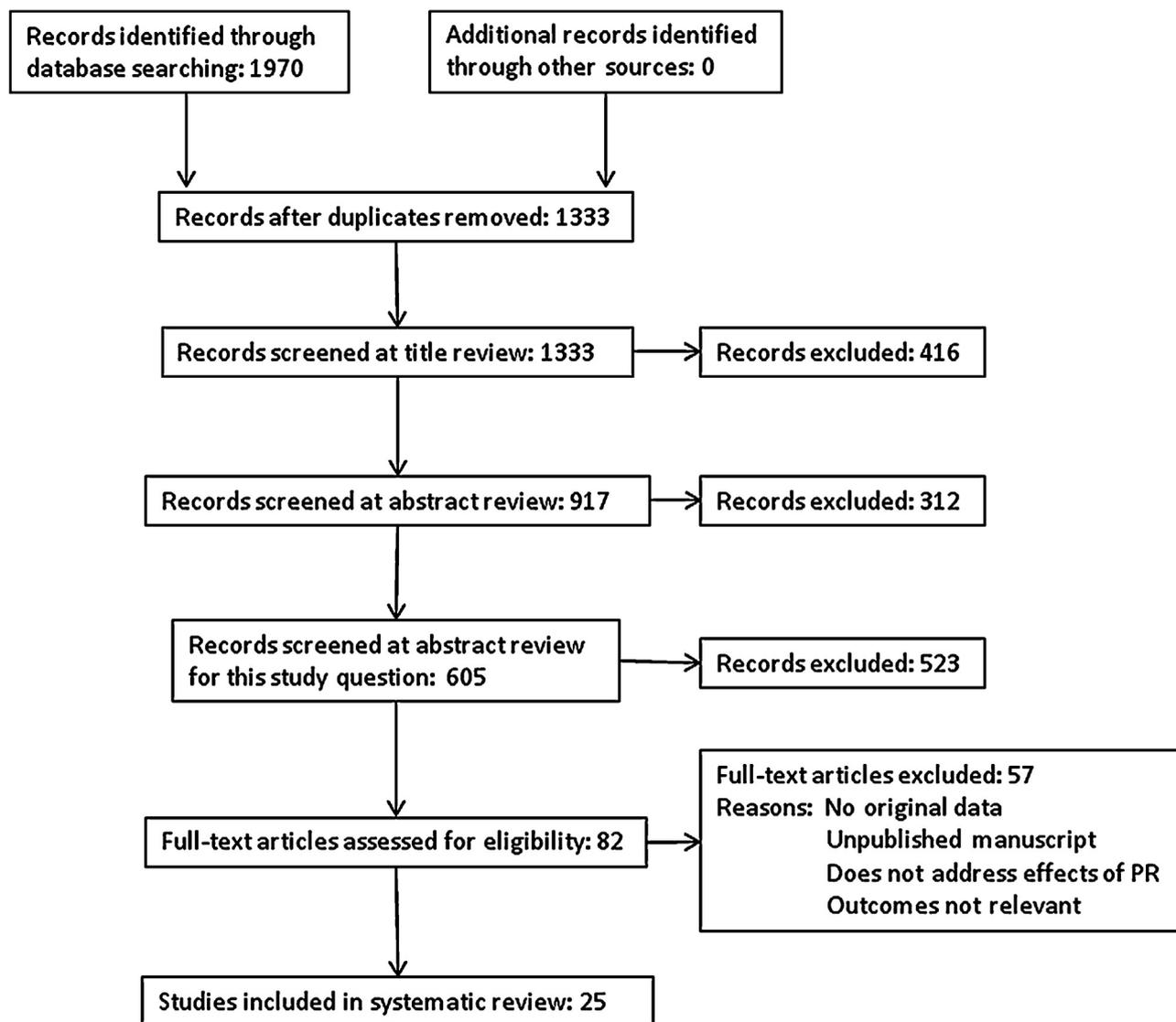


Fig. 1.

for CABG, CABG plus valve or aneurysm, and valve procedures decreased during 2003 and 2004 compared with 1998 through 2002.

Of the three studies conducted in settings other than nursing homes or hospitals, the effect on patients was mixed. Friedberg showed no difference in antibiotic use, waiting time, or pneumonia diagnosis in the emergency department [25], and Jung found mixed evidence for improvement among home health agencies [31]. Hendriks found improved health plan ratings among users in Holland [27] and Snowden found mixed trends in quality measures among users of public health plans after the initiation of PR [42].

Two studies showed a positive effect of PR on patient choice, increasing the proportion of patients who chose high-quality facilities [32,38].

Regarding the effect of PR on disparities, Snowden et al. assessed the differences to which best practices on a variety of measures were achieved in the state of Minnesota, USA, between state and Federally funded public health care programs and private programs, from 2007 (when PR started there) till 2009. The gap between private and public plans narrowed for some measures, widened for others, and did not significantly change in the rest

[42], but no analysis controlling for patient or health system characteristics was conducted.

### 3.3. Sources of bias and quality concerns

Many studies were funded by more than one organization. In seven studies, funding came from a federal or national agency [21,33–37,43,44]; in three studies support came from a non-governmental organization, university or foundation [29,33,37]. In several cases ( $N = 4$ ) funding came from state-level departments of health or insurance agencies [32,36,37,42]. In the remainder of studies, no information was given on source of funding for the research.

Potential conflicts of interest on the part of the authors was reported in three studies; in two studies, the authors included employees of the state agency responsible for PR [26,42]. In one study the CMS was a funder [21], which could have constituted a conflict of interest given that the CMS administers Hospital Compare, the mechanism of public reporting in that study.

We summarize the quality domains in Table 3 according to the GRADE approach; quality assessments of the individual

**Table 2**  
Characteristics of included studies and effects of public reporting on patients, patient choice, and disparities.

Author, year	Setting	Population	Public reporting mechanism	Outcomes	Effect on patients	Effect on patient choice	Effect on disparities
Carey et al. [19]	H	CSurgPts	California Cardiac Surgery and Intervention Project	Mortality, readmission, repeat procedure	+	NI	NI
Clement et al. [20]	NH	NHRes	Nursing Home Compare, OSCR	Restraints, pressure sores	+/-	NI	NI
Werner and Bradlow [38]	NH	NHRes	Nursing Home Compare	Pain, delirium, walking	+	NI	NI
Werner [39]	NH	NHRes	Nursing Home Compare	Reported and unreported measures	+	NI	NI
Werner [40]	NH	NHRes	Nursing Home Compare	ADLs	+	+	NI
Jung [31]	HH	HHPts	Home Health Compare, OASIS	ADLs, emergent care, hospitalization	+/-	NI	NI
Li [32]	H	CSurgPts	California CABG Outcomes Reporting Project	Mortality, case mix	0	NI	NI
Romano [34]	H	CSurgPts	California CABG Outcomes Reporting Project	Mortality, market share, patient selection	0	+	NI
Jha and Epstein [29]	H	CSurgPts	NY CABG report cards	Mortality	+/-	NI	NI
Moscucci [33]	H	CSurgPts	Coronary Angioplasty Reporting System in New York	Mortality	0	NI	NI
Dranove et al. [22]	H	CSurgPts	NY and PA CABG report cards	Patient health; case mix; CABG quality; mortality; cost	-	NI	NI
Guru [26]	H	CSurgPts	Ontario (Canada) CABG performance report cards	Mortality	0	NI	NI
Hollenbeak [28]	H	CSurgPts	PHC4	Mortality	+	NI	NI
Ryan [35]	H	Patients with MI, heart failure, pneumonia, or CABG	Hospital Compare	Mortality	0	NI	NI
Ryan et al. [36]	H	Patients with heart failure, hip fracture, pneumonia, stroke, or GI hemorrhage	Hospital Compare	Mortality	0	NI	NI
Werner [37]	H	Patients with MI, heart failure, pneumonia	Hospital Compare	Mortality; care for heart failure, MI, pneumonia	+/-	NI	NI
Jha et al. [30]	H	Patients with MI, CHF, CABG, pneumonia	Premier HQID	Mortality	0	NI	NI
Friedberg et al. [25]	ED	Patients with respiratory symptoms	Hospital Quality Alliance data on antibiotic timing in pneumonia	ED diagnosis of pneumonia, antibiotic use, waiting time	0	NI	NI
Elliott et al. [23]	H	Medical, surgical, maternity inpatients	HCAHPS	Measures of patient experience	+/-	NI	NI
Hendriks et al. [27]	HP	Health plan users in Holland	Kiesbeter.nl	Rating of health plan	+	NI	NI
Feng Lu [24]	NH	NHRes	NHQJ	ADLs, bowel function, transfer, depression, other NH quality measures	+/-	NI	NI
Clough et al. [21]	H	Inpatients with multiple diagnoses	CHQC	Mortality	0	NI	NI
Snowden et al. [42]	HP	Patient enrolled in the Minnesota Health Care Programs and patients in private/Medicare managed care programs	Minnesota Health Care Disparities Report	Various health quality measures including vaccination, cancer screening, and treatment of asthma, URIs, diabetes, and hypertension	+/-	NI	+/-
Joynt et al. [43]	HP	Medicare beneficiaries older than 65 with primary discharge diagnosis of acute MI as initial episode of care	NY, MA, and PA PCI public reports	Mortality, PCI rates	+/-	NI	NI
Renzi et al. [44]	H	Patients with acute MI, hip fractures, and maternity patients (in Italian hospitals)	Regional Outcome Evaluation Program, P.Re.Val.E	PCI rates, hip fracture operations, Cesarean sections	+/-	NI	NI

Abbreviations: H, hospital; NH, nursing home; HP, health plans; CSurgPts, cardiac (i.e. PCI, CABG, valvular) surgery patients; NHRes, nursing home residents; MI, myocardial infarction; CABG, coronary artery bypass graft; GI, gastrointestinal; CHF, congestive heart failure; OSCR, On-Site Compliance Review; OASIS, Outcome and Assessment Information Set; NY, New York; PA, Pennsylvania; PHC4, Pennsylvania Health Care Cost Containment Council; HQID, Hospital Quality Incentive Demonstration; HCAHPS, Hospital Consumer Assessment of Healthcare Providers and Systems; NHQJ, Nursing Home Quality Initiative; CHQC, Cleveland Health Quality Choice; ADLs, Activities of Daily Living; ED, emergency department; +/-, mixed effect reported, some outcomes improving and some worsening; -, all reported outcomes worsened; +, all reported outcomes improved; 0, null effect; NI, not investigated.

studies are available in a Web appendix. The studies were done with observational methodologies, as opposed to randomized clinical trials, and thus the quality of the body of evidence is at most low at baseline. Given the likely existence of publication bias, as many internal and pilot studies concerning PR likely

never are prepared for publication, the quality is reduced somewhat further.

We found a number of limitations in the studies. As many PR programs are global, that is, applying to all hospitals of a given type, pre-post methods were used and no contemporaneous

**Table 3**  
Quality of the body of evidence.

Quality dimension	Characteristic	Effect on quality
Design	Observational studies	Low baseline quality
Risk of bias	Minimal	No change
Consistency	Consistent	No change
Directness	Direct	No change
Precision	Precise	No change
Publication bias	Likely	Decrease (−1)
Effect	Not large	No change
Dose–response	None shown	No change
Residual confounding	Might increase or decrease effect	No change
Summary quality of evidence		Very low

control group was available for comparison. Furthermore, information was often not available on the frequency with which hospitals or nursing homes dropped out or self-removed from the public reporting mechanism in question. Finally, unmeasured aspects of hospital, nursing home, or patient characteristics could have explained variation in outcomes with and without public reporting.

In order to examine whether excluded studies might not have suffered from the gaps of the body of evidence included in our review, we examined the 57 full-text articles which we excluded through lack of relevance to our key questions, lack of original data, or through being an unpublished manuscript. None of them addressed the outpatient setting. One study did directly address disparities in terms of difference of utilization among minority groups; however, it did not directly assess the effect of PR on disparities in care or patients [41].

## 4. Discussion and conclusion

### 4.1. Discussion

Our findings show that it is unclear whether PR can contribute to the improvement of quality of care, as it pertains to outcomes important to patients. We found consistent evidence that PR positively affected patients in the nursing home setting, though this should be understood in the context of a low quality of evidence. Furthermore, only one study on the effects of PR in our review addressed disparities – identified as an important task for health care reform efforts – and that to a limited extent.

Increased patient access to health care as provided by the PPACA is meant in large measure to take place in the outpatient setting, in increased patient visits with primary care providers. However, we found no evidence in the literature of the possible effects of PR in the outpatient setting. Most fundamentally, we found very little evidence that PR positively affects patient choice, a mechanism posited to explain the potential role of PR in health care reform, though what evidence we did find showed a positive effect. Of the two studies associated with a positive effect on choice, one was in the nursing home setting and the other in hospitals, making it difficult to generalize conclusions about the effect on choice to all settings.

There are several possible reasons for the minimal evidence provided in this review for the effect of PR on disparities. One is that our search was not broad enough and missed those studies that address the effect of public reporting on patient subgroups. Some studies might have not collected information on subgroups, or done so without comparing effects of PR. Another possibility is that these studies, in fact, already considered patient subgroups by controlling for race, socioeconomic status, or gender in the analyses. However, it is possible that such an analysis itself

overlooks the significant disparities among patient subgroups for the outcomes that they considered. Statistical methods have recently been developed to examine population heterogeneity in such research and could be of use here [42].

Our review has a number of limitations. We limited our review to studies that included the terms “public reporting” or “quality reporting,” so we could have missed studies if they used some other term to refer to the same phenomenon. We excluded studies which did not include a comparison group, so might have overlooked studies which explicitly addressed a vulnerable group. In addition, given the heterogeneity in methods and measures already mentioned, we could not perform a meta-analysis. We did not perform a gap analysis according to the method of Saldanha and colleagues [45] and thus might have overlooked significant gaps in the literature remarked upon by the authors. Nevertheless, ours is the first systematic review examining the effect of PR on patients, focusing on demand-side and not supply-side information, and is the first to examine the literature for evidence on PR's effect on disparities and patient choice.

### 4.2. Conclusion

In summary, our review shows that the evidence supporting the effect of PR on outcomes is mixed, and of low quality in general, with consistent evidence of a positive effect of PR in the nursing home setting. The evidence to judge the effect of PR on disparities is minimal. Most significantly, we found only one study reporting the effect of PR on patient subgroups affected by disparities, with the evidence mixed [42].

Further, we found no studies focusing on the effect of public reporting in the outpatient setting. We are therefore left with a significant hole in our knowledge concerning the effect of public reporting on disparities.

Thus, it is unclear whether the expected increases in coverage and access to primary care under the PPACA, a time when many new patients are seeking new providers [47], will actually result in any improvements in health care quality for vulnerable and underserved populations.

We believe that the relationship between PR and disparities is complicated by an underlying contradiction. PR initiatives aim to improve population health. However, if PR is prioritized according to the wants and needs of relatively advantaged groups, individual patients from disadvantaged groups such as are impacted by disparities might not see their preferences reflected in the process. As is well known, an effective practitioner pays attention to the patient as an individual, responding to her needs and the items on her agenda as she prioritizes them.

Thus, while PR might have been conceived as an initiative to empower individuals, unless the system of PR recognizes individual differences between patients, using technologies and delivery systems that can adapt to such differences, the heterogeneity of patients might be overlooked.

Future work should seek to broaden this search to examine the relationship between public reporting and patient subgroups, understanding how patients in minority and disadvantaged subgroups are affected by such initiatives. In particular, qualitative and mixed methodologies should explore the patient experience of PR in a variety of health systems. Such mixed methodologies should help to clarify the quantitative questions, leading to a study of the relationship between public reporting and disparities.

### 4.3. Practice implications

Our results have implications for patients, purchasers, and providers. These findings suggest that patients might consider using PR information regarding nursing homes as it may be associated

with positive outcomes, though the nature of the causal relationship is unclear. The consistency of the positive effect of PR in the nursing home setting is intriguing, perhaps explained by the greater longitudinality and chronicity of the NH setting compared to hospitals: nursing home residents stay longer in those facilities than hospital patients, thus making it easier to track improvements, and more likely that outcomes are more relevant and closer in time to patients' care [46]. In addition, nursing homes might already possess the centralized infrastructure in health information technology to make quality improvement feasible.

In response to the need by patients from disadvantaged subgroups for information from providers, hospitals, and health plans about outcomes relevant to them, health care systems should ask patients what information they are most seeking and provide it to them, tailored to their particular subgroup. The goal of such information would be to improve the implementation of PR systems, focusing on patient-relevant outcomes, in all relevant subgroups, including the disadvantaged, and in all sectors of the US health care system.

Most importantly, the lack of evidence which we found supporting the effect of PR on patient-related outcomes and disparities does not necessarily imply a lack of effect. In fact, the US Agency for Healthcare Research and Quality recently issued a request for applications for funding to advance the science of PR. Future research in this area should bridge the gap between PR and the broad literature on patient education and communication in the service of patient-centered care.

### Conflict of interest

No author has any conflict of interest to declare.

### Role of funding

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### Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at <http://dx.doi.org/10.1016/j.pec.2013.03.003>.

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# Addressing Health Care Disparities Using Public Reporting

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## Abstract

The literature highlights that disparities in health care performance exist. Publicly reporting data about disparities at an actionable level is needed. The Minnesota Health Care Disparities Report is designed to publicly report medical group health care performance rates for patients enrolled in state/federally funded programs. In addition, differences between patients enrolled in state-funded public programs and those in private or Medicare programs at statewide and medical group levels are presented. The endeavor is a cooperative one between Minnesota Community Measurement, an independent nonprofit community organization, and the Minnesota Department of Human Services, the state Medicaid agency. Public reporting makes transparent the gaps in the delivery of health care between patients enrolled in these programs at a medical group level and can facilitate quality improvement locally, where accountability lies and actions to address disparities can occur.

## Keywords

health care public reporting, disparities, health care measurement, health care quality improvement

A large body of literature documents disparities that exist in the delivery of health care in the United States. Studies have examined the reasons for and consequences of racial, ethnic, sex, and socioeconomic disparities in utilization of health care services and the diagnosis and clinical management of many conditions.<sup>1–3</sup> Among these factors, socioeconomic status (SES) emerges as a fundamental determinant of health.<sup>4</sup> Patients of lower SES have higher rates of disease that are compounded by their inability to access and maintain continuity with health care providers.

Health disparities across levels of SES begin prenatally, with women of lower SES receiving less prenatal care to ensure a healthy delivery. Disparities in receipt of childhood immunizations and preventive care emerge at infancy. By preteen years, children of lower SES report lower health status and a higher incidence of risk behaviors that present disadvantages to life and health into adolescence and adulthood, where disparities in preventive health and health care outcomes become striking.<sup>1,4,5</sup> Studies also show that persons of lower SES receive less ambulatory and hospital care.<sup>2,6</sup> Whether measured by income, educational achievement, or occupational status, lower SES is associated with health care disparities such as fewer Papanicolaou tests, mammograms, childhood and influenza immunizations, asthma services, and diabetic eye examinations.<sup>1–8</sup>

The literature highlights the need to directly and indirectly address disparities in health status and in health

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The authors declared the following potential conflicts of interest with respect to the research, authorship, and/or publication of this article: Ms Snowden and Ms Vetta are employed by Minnesota Community Measurement (MNCM). MNCM has a contractual relationship with the Minnesota Department of Human Services to produce the Health Care Disparities Report. MNCM subcontracts with Data Intelligence Consultants to conduct the data aggregation, rate calculations, and analyses included in the Health Care Disparities Report. Dr Carlson is a principle owner of Data Intelligence Consultants. Data Intelligence is a subcontractor of MNCM on the Health Care Disparities Report and other data management and analyses projects. Ms Kunerth and Dr McRae are employed by the Minnesota Department of Human Services. Their employer contracts with MNCM to produce the Health Care Disparities Report. As the funder of this report, they had the opportunity to review, comment, and provide input on the article. The authors disclosed no other potential conflicts of interest. The authors disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This work was supported by the Minnesota Department of Human Services (Contract Number B01113).

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care. Increasing accountability for these health and health care disparities is warranted because the evidence showing that low-income patients face barriers to obtaining high-quality health care continues to grow. For some quality indicators, the gaps between groups defined by SES and by race or ethnicity actually have grown.<sup>8</sup> Health care providers at all levels (eg, clinics, medical groups, health systems) should examine health care performance data stratified according to insurance status, race, ethnicity, and SES in order to build a foundation for understanding and reducing disparities.<sup>3,9,10</sup>

Numerous reports highlight health care quality measures at national and state levels from organizations such as the National Committee for Quality Assurance (NCQA) and, more recently, the Agency for Healthcare Research and Quality. Included in these reports are analyses of populations showing significant disparities. However, despite decades of reporting, health care quality has improved but access to high-quality care has not and disparities based on demographic factors such as SES persist. NCQA's reported rates of quality at a health plan level by payer type (commercial, Medicaid, Medicare) consistently show differences; these gaps have been present since at least the early 1990s. Disparities within the health care system are unacceptable.

Data at the national level do not offer the detailed information necessary for health systems or providers to recognize and address disparities within their own systems. The lack of adequate data at a local level has been identified as a key barrier to recognizing and acknowledging that patient populations within the same medical group/clinic may not be receiving the same rates of optimal care.<sup>11</sup> Health care personnel working daily within a medical group often have the best understanding of patients and system processes that will offer opportunities for improvement.<sup>11</sup> The motivation to improve is driven in part by public reporting that places a priority on medical group-level results and comparison to peers.

This article describes the development and release of the Minnesota Health Care Disparities Report,<sup>12</sup> which was designed to publicly report health care performance rates at a medical group level for 2 patient populations enrolled in Minnesota health plans: state/federally funded public programs and private/Medicare managed care programs. The state/federally funded public programs are called Minnesota Health Care Programs (MHCP). In general, enrollees in MHCP have lower SES and incomes than enrollees in private programs; disparities experienced by people with low incomes are likely to be experienced by those in MHCP. Most MHCP enrollees receive health care coverage through managed care; only those enrolled in managed care are included in the Health Care Disparities Report. This report compares rates between these 2 patient populations and makes transparent the gaps in care that exist between enrollees in MHCP and those enrolled in

private insurance programs at a medical group level (ie, 1 or more clinic sites operated by a single organization). Before this report became available, national and state-level reports of differences in care were dismissed as being either primarily because of patient factors and issues outside of medical group control or because of the perception that disparities existed elsewhere—other medical groups or health systems—“but not in my medical group.” This report supplies objective data and brings accountability to medical groups, allowing them to reflect on their own disparities and identify areas for improvement within their medical group.

### *Minnesota Community Measurement Annual Public Reporting*

The Health Care Disparities Report is produced by Minnesota Community Measurement (MNCM), under contract with the Minnesota Department of Human Services (DHS). MNCM is an independent nonprofit community organization, whose mission is to accelerate the improvement of health by publicly reporting health care information. It strives to be the trusted source for performance measurement and public reporting of health care data that are used by providers to improve care and by patients to make better health care decisions. MNCM is a collaborative of community stakeholders (ie, medical groups, clinics, physicians, hospitals, health plans, employers, consumer representatives, quality improvement organizations) that work together on health care measurement and reporting. Their core vision is to drive change toward health care that is safer, more effective, patient-centered, timely, efficient, and equitable. MNCM's quality of care measures are supported by evidence-based standards of care developed by the Institute for Clinic Systems Improvement and endorsed by the National Quality Forum.

The Health Care Disparities Report has been produced annually since 2007. This “first in the nation” effort highlighted differences (both statewide and at a medical group level) in the degree to which best practices were achieved for patients enrolled in MHCP compared with patients enrolled in private and/or Medicare programs. All patients included in this report, both in MHCP and in private or Medicare programs, are enrolled in managed care programs. Performance measures are selected by DHS for their relevance to patients enrolled in MHCP. Some measures assess how well providers care for patients with chronic health care conditions (Living with Illness measures); another category reflects how well providers care for patients with common acute illnesses (Getting Better measures); a third category includes measures that reflect how well providers keep individuals healthy and identify disease at an early stage (Staying Healthy measures). Table 1 lists all measures by reporting year.

**Table 1.** MNMCM Health Care Disparities Report Performance Measures by Report Year

Measure	Category	Reporting Year
Optimal Diabetes Care	Living with Illness	2007, 2008, 2009
Controlling High Blood Pressure	Living with Illness	2008, 2009
Use of Appropriate Medications for People with Asthma	Living with Illness	2007, 2008, 2009
Treatment for Children with Upper Respiratory Infection	Getting Better	2007, 2008, 2009
Testing for Children with Pharyngitis	Getting Better	2007, 2008, 2009
Breast Cancer Screening	Staying Healthy	2007, 2008, 2009
Cervical Cancer Screening	Staying Healthy	2007, 2008, 2009
Colorectal Cancer Screening	Staying Healthy	2009
Chlamydia Screening in Women	Staying Healthy	2007 <sup>a</sup> , 2008 <sup>a</sup> , 2009 <sup>b</sup>
Childhood Immunization Status (Combo 3)	Staying Healthy	2007, 2008, 2009

Abbreviation: MNMCM, Minnesota Community Measurement.

<sup>a</sup>Chlamydia Screening in Women ages 16-25.

<sup>b</sup>Chlamydia Screening in Women ages 16-24.

## Methods

Data for the Health Care Disparities Report originated from health plan administrative claims databases supplemented by medical record review for some measures that require clinical data. The data for most measures were collected by health plans using NCQA technical specifications for the Healthcare Effectiveness Data and Information Set (HEDIS). MNMCM developed the numerator specifications for the optimal Diabetes Care measure, an all-or-none composite measure.

Data reported in a calendar year reflect care delivered in the prior year. Health plans use 2 data collection methods to obtain data for reported measures. Some measures, referred to as administrative measures, are wholly derived from health plan claims data, and medical groups are publicly reported if at least 30 patients meet the measurement specifications. Measures that require clinical data are referred to as hybrid measures because health plans first use claims data to identify eligible patients and then use claims data and/or chart review to obtain clinical data on a random sample of patients. Sampling requires weighting to represent the eligible patients in the population. Because hybrid results are based on a sample, medical groups are publicly reported at a higher threshold of at least 60 patients.

The MNMCM sampling process begins with the sample of patients drawn by the health plan to meet HEDIS requirements. The HEDIS sample is supplemented with additional samples of patients at the medical group level to ensure that as many medical groups as possible meet the reporting threshold. The use of sampling requires that results for hybrid measures be adjusted (weighted) to reflect the larger eligible population from which the sample was drawn. The weighting method takes into account

3 sampling strata: health plan, health plan product (public or private), and medical group.

To calculate medical group rates, patients must be assigned to a medical group. MNMCM has developed an attribution logic that uses health plan claims data to assign a patient to the medical group visited most frequently during the measurement year. In the case of an equal number of visits, the patient is assigned to the medical group at which the most recent visit took place. This attribution logic is used for most measures; however, 2 measures (Appropriate Treatment for Children with Upper Respiratory Infection [URI] and Appropriate Testing for Children with Pharyngitis) focus on acute care needs and, therefore, a patient is assigned to the medical group where the acute service was delivered.

Rates and 95% confidence intervals (CIs) for measures are reported in the Health Care Disparities Report at the statewide and medical group levels. It is important to note that the statewide level reflects the total number of eligible persons enrolled in health plans submitting data to MNMCM and does not represent the entire population of Minnesota. Likewise, medical group rates are based on health plan public and private insured patients and do not reflect all patients seen at the medical group.

CIs are calculated using a recommended method for calculating the CI for a binomial proportion.<sup>13</sup> A further discussion of this method and the formula for calculation of the CI can be found on the National Institute of Standards and Technology Web site.<sup>14</sup> A complete description of the measures and the methods used by MNMCM for sampling, weighting, attribution, and public reporting also may be found in the 2009 Health Care Disparities Report posted on the MNMCM Web site ([http://www.mnmc.org/site/?page=our\\_work&view=2](http://www.mnmc.org/site/?page=our_work&view=2)).

The Student *t* test was applied to test the null hypothesis that the difference between the 2 proportions (Other Purchasers – MHCP) was zero (the working hypothesis being  $P_{\text{Other Purchasers}} \neq P_{\text{MHCP}}$ ). Statistical significance was determined using a 2-tailed test with  $P < .05$  indicating significance after adjusting for multiple tests. The difference (Other Purchasers – MHCP) was reported for each measure. Measures with 3 years of data were analyzed for improvement in performance rate over time using a general linear model. All statistical analyses were performed using SAS, version 9.2 (SAS Institute, Cary, NC).

## Results

Because MNMCM's public reporting practices use standardized measure definitions, appropriate comparisons can be made by health care professionals and health care consumers. There have been performance rate differences between Other Purchasers and MHCP for every measure in every year that the report has been published. With the exception of the Chlamydia Screening measure, every measure shows significantly lower performance rates for MHCP patients at the statewide level.

The reports also show differences in performance rates at the medical group level and that there is wide variability in performance rates between medical groups. Although most medical groups have lower MHCP performance rates, there are medical groups achieving health care best practices for their MHCP patients at a higher rate than the statewide average, and the reports highlight these medical groups.

The fact that these reports are issued annually allows medical groups to see progress over time and continues to highlight the pressing need for improvement. In the 2009 Health Care Disparities Report, 7 of the 10 reported measures had statewide performance rates for MHCP and private/Medicare programs that could be compared over 3 years. Two measures could not be compared to previous years, and 1 measure could be compared for 2008 and 2009 only. Statewide performance rates for 6 measures improved over time for patients enrolled in both MHCP and private/Medicare insurance programs. Performance rates for all measures are displayed in Table 2.

Table 2 also displays gaps in the achievement of health care best practices for patients enrolled in MHCP compared with patients enrolled in private or Medicare programs for each reporting year. The gaps were calculated by subtracting the MHCP rate from the private/Medicare rate. In the table, a positive difference means that the private/Medicare rate was higher than the MHCP rate—physicians successfully achieved health care best practices in treating patients enrolled in private or Medicare programs more often than they did in treating patients enrolled in MHCP. A negative difference means that the

MHCP rate was higher than the private/Medicare rate—physicians successfully achieved health care best practices in treating patients enrolled in MHCP more often than they did in treating patients enrolled in private/Medicare programs. All but 2 of the 25 differences reported in Table 2 are positive, indicating a consistently higher quality of care, or at least adherence to the standards, for those in the private or Medicare programs.

Statewide trends in gaps can be reviewed for 7 measures. For 5 of these measures, the statewide gap narrowed over time, largely because improvement was greater for those in MHCP. The gap narrowed significantly ( $P < .05$ ) for only 1 of these measures. The statewide gap widened for 2 measures, largely because improvement was greater for those in private or Medicare programs. The gap widened significantly ( $P < .05$ ) for 1 of these measures.

In addition to reporting statewide performance rates and the gaps between MHCP and private/Medicare programs, the Health Care Disparities Report also includes this information at the medical group level, where increased accountability lies and actions to address disparities can occur. For all measures, performance rates are displayed from highest to lowest so that medical groups can compare their performance rate with that of their peers. There are 352 comparisons of performance in MHCP and private/Medicare programs within medical groups in the 2009 Health Care Disparities Report. About two thirds of these show greater adherence to the standards in the private/Medicare programs than in MHCP. Eliminating Chlamydia Screening in Women and Appropriate Treatment for Children with URI, which demonstrate greater compliance in MHCP, reveals that 83% of comparisons show greater compliance in the private/Medicare programs. In other words, the experiences of those enrolled in private or Medicare programs at the statewide level are also found within most medical groups for most measures.

The Health Care Disparities Reports include analyses that highlight the highest performing medical groups and those with the greatest improvement from the previous year. The reports also review medical group performance over time, identifying patterns of consistent improvements and declines from previous years. Printed reports are distributed to medical groups, health plans, the media, and legislators and also are posted on the MNMCM Web site ([http://www.mnmc.org/site/?page=our\\_work&view=2](http://www.mnmc.org/site/?page=our_work&view=2)).

## Discussion

The public reporting of medical group performance rates and the additional analyses comparing patients enrolled in MHCP and private/Medicare programs have made performance rate gaps visible to medical groups, health plans, and the wider community. Since its launch in February 2009, more than 3000 visitors have downloaded the 2009

**Table 2.** Statewide Performance Rates for MHCP Patients Over Time

Measure	Purchaser	Report Year			Progress Over Time (2007-2009)
		2007	2008	2009	
Optimal Diabetes Care	MHCP	6.5%	7.8%	9.9%	Gap widened <sup>a</sup>
	Private Purchasers	11.4%	13.7%	16.8%	
	Difference	4.9% <sup>b</sup>	5.9% <sup>b</sup>	6.9% <sup>b</sup>	
Controlling High Blood Pressure	MHCP	<sup>c</sup>	62.2%	63.6%	Gap widened
	Private Purchasers		65.5%	69.9%	
	Difference		3.3% <sup>b</sup>	6.3% <sup>b</sup>	
Use of Appropriate Medications for People with Asthma	MHCP	88.1%	87.0%	87.6%	Gap widened
	Private Purchasers	92.6%	92.8%	92.8%	
	Difference	4.5% <sup>b</sup>	5.8% <sup>b</sup>	5.2% <sup>b</sup>	
Treatment for Children with Upper Respiratory Infection	MHCP	83.8%	85.3%	87.1%	Gap narrowed
	Private Purchasers	85.0%	86.1%	87.0%	
	Difference	1.2% <sup>b</sup>	0.8% <sup>b</sup>	-0.1%	
Testing for Children with Pharyngitis	MHCP	73.0%	78.9%	80.7%	Gap narrowed
	Private Purchasers	85.9%	86.7%	88.2%	
	Difference	12.9% <sup>b</sup>	7.8% <sup>b</sup>	7.5% <sup>b</sup>	
Breast Cancer Screening	MHCP	57.6%	60.1%	61.9%	Gap narrowed
	Private Purchasers	77.1%	77.4%	77.9%	
	Difference	19.5% <sup>b</sup>	17.3% <sup>b</sup>	16.0% <sup>b</sup>	
Cervical Cancer Screening	MHCP	71.9%	73.2%	71.0%	Gap narrowed
	Private Purchasers	79.0%	78.6%	76.8%	
	Difference	7.1% <sup>b</sup>	5.4% <sup>b</sup>	5.8% <sup>b</sup>	
Colorectal Cancer Screening	MHCP	<sup>c</sup>	<sup>c</sup>	39.2%	n/a
	Private Purchasers			68.0%	
	Difference			28.8% <sup>b</sup>	
Chlamydia Screening in Women	MHCP	<sup>d</sup>	<sup>d</sup>	56.1%	n/a
	Private Purchasers			44.8%	
	Difference			-11.3% <sup>b</sup>	
Childhood Immunization Status (Combo 3)	MHCP	68.2%	72.0%	74.7%	Gap narrowed <sup>a</sup>
	Private Purchasers	78.3%	79.8%	79.7%	
	Difference	10.1% <sup>b</sup>	7.8% <sup>b</sup>	5.0% <sup>b</sup>	

Abbreviation: MHCP, Minnesota Health Care Programs.

<sup>a</sup>Statistical significance determined using a general linear trend model with  $P < .05$  indicating significance.

<sup>b</sup>Statistical significance determined using a 2-tailed test with  $P < .05$  (with adjustment for multiple test error) indicating significance.

<sup>c</sup>Not measured.

<sup>d</sup>Change in measure specifications; comparisons over time are not appropriate.

Health Care Disparities Report from the MNCM Web site. News stories about the release of the reports have increased their visibility. Media attention has helped put this information in context and convey messages about the meaning and importance of this information.

Publicly reporting medical group performance rates also provides a framework of standardized measures so that appropriate comparisons between medical groups can be made. Based on a qualitative study using interviews with medical directors and clinic administrators,<sup>15</sup> the ability of medical groups to compare performance rates against other medical groups has helped create a competitive environment that drives change. A primary finding of this study was that placement among peers matters whether comparing between competing medical

groups or comparing clinic sites within a medical group. Improving overall performance rates becomes the focus that mobilizes the entire care team to improve processes in the medical group. However, although these efforts may improve overall performance rates, they may not necessarily reduce the disparities highlighted by the Health Care Disparities Report. Medical group surveys conducted by MNCM following the release of the 2009 Health Care Disparities Report indicate that more than half have used information in the report for targeted quality improvement purposes (data available from Minnesota Community Measurement by submitting a request to [info@mncm.org](mailto:info@mncm.org)).

Although it is important to develop and implement quality improvement interventions for all patients, reducing gaps may require more creative interventions for

specific populations of patients within the medical group. For example, data from the 2009 report showed that the Colorectal Cancer Screening rate was significantly lower for patients enrolled in MHCP compared with patients enrolled in private/Medicare programs; it also was the measure with the largest gap between these patient populations. In January 2010, partially in response to the 2009 Health Care Disparities Report, a large medical group announced an effort to provide more timely colorectal cancer screening for their African American patients, a large number of whom were enrolled in MHCP. The initiative involved implementation of decision support in their electronic health records to assist staff and providers to recommend screening earlier to African American patients. This has become an important population to target because guidelines now recommend colorectal cancer screening for African American patients starting at the earlier age of 45, while the recommendation for the general population is age 50. This medical group has seen a 27% improvement in their colorectal cancer screening rates for African American patients since implementing this initiative.

Other creative strategies have been as simple as establishing same-day appointments for multiple procedures. For one medical group, identifying women due for a mammogram and offering an immediate opportunity to obtain one during a clinic visit increased access to this important service and led to a 10 percentage point improvement in their Breast Cancer Screening performance rate for MHCP patients since 2007. Same-day appointments are particularly helpful for lower income populations who lack resources (eg, transportation, child care) that otherwise would prohibit them from returning for basic primary care services such as cancer screenings or immunizations.

Since the 2007 Health Care Disparities Report, the Childhood Immunization Status measure has had a significant reduction in the gap between patients enrolled in MHCP and those enrolled with Other Purchasers. After implementing changes based on previous reports from MNCM, one medical group achieved a rate improvement from 48% to 85% of children enrolled in MHCP over a 3-year period. According to the medical group's medical director, this significant improvement was achieved by taking extra steps to allay the fears some parents have about vaccine safety, using a template in the electronic medical record that allows the doctor to recommend and track alternative vaccine schedules that some parents want, and counseling parents during well-child checkups.

Reporting results at a medical group level not only heightened awareness of the disparities problem, it also increased the visibility of the variation between medical

groups. Until now, MNCM's focus has been to develop standardized measures and publicly report results that are used by providers to improve care. We continue to see wide variation in rates each year. In response, we are beginning to collect anecdotal evidence of practice patterns from high-performing clinics. Future reports will include the best practices of these high-performing medical groups in an effort to spread implementation across all medical groups and accelerate improvement.

## Conclusion

Improving performance rates for all patients requires a thorough examination of performance data at a medical group or clinic level in addition to data at national, state-wide, and health plan levels. The public reporting of health care performance rates can serve as an impetus to quality improvement, particularly when rates are reported at a medical group level or eventually at the clinic level where more accountability lies and actions to address disparities are more likely. Disparities within the health care system are unacceptable. Results from this report show that it is possible for medical groups and clinics to achieve optimal health outcomes for patients regardless of their insurance program. Improvement also will require an understanding of the unique needs of patients and implementation of targeted interventions to meet those needs.

## Declaration of Conflicting Interests

The authors declared the following potential conflicts of interest with respect to the research, authorship, and/or publication of this article: Ms Snowden and Ms Vetta are employed by Minnesota Community Measurement (MNCM). MNCM has a contractual relationship with the Minnesota Department of Human Services to produce the Health Care Disparities Report. MNCM subcontracts with Data Intelligence Consultants to conduct the data aggregation, rate calculations, and analyses included in the Health Care Disparities Report. Dr Carlson is a principle owner of Data Intelligence Consultants. Data Intelligence is a subcontractor of MNCM on the Health Care Disparities Report and other data management and analyses projects. Ms Kunerth and Dr McRae are employed by the Minnesota Department of Human Services. Their employer contracts with MNCM to produce the Health Care Disparities Report. As the funder of this report, they had the opportunity to review, comment, and provide input on the article. The authors disclosed no other potential conflicts of interest.

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# Racial and Ethnic Disparities in Influenza and Pneumococcal Immunization Rates among Medicare Beneficiaries

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**Eighty-five percent of all flu and pneumonia deaths in 2010 occurred among adults age 65 and older. Yet, despite lack of Medicare cost sharing for flu and pneumonia vaccines, significant numbers of older adults don't get immunized and racial and ethnic disparities in immunization rates persist.**

## Introduction

Influenza (commonly called flu) and pneumonia are infectious respiratory diseases that are vaccine-preventable. Yet together they represented the ninth leading causes of death in the United States among all ages in 2010. During the same year, influenza and pneumonia represented the seventh leading causes of death among people age 65 and older. In fact, more than 85 percent of flu and pneumonia deaths combined occurred among adults age 65 and older.<sup>1</sup>

Influenza is responsible for, on average, more than 200,000 hospitalizations each year in the United States,<sup>2</sup> and together, flu and pneumococcal pneumonia result in thousands of potentially preventable deaths each year.<sup>3</sup>

Flu and pneumonia immunization rates among *all* older adults are significantly below the Healthy People 2020 goals of 90 percent for each vaccine.<sup>4</sup> Immunization rates among African Americans and Hispanics are substantially below those of their white counterparts.<sup>5</sup> These data highlight the need to improve efforts to ensure

that all Medicare beneficiaries receive these important vaccines and especially beneficiaries who are members of racial and ethnic minority groups for which the immunization rates are disproportionately low.

## Adult Immunization Recommendations and Medicare Coverage

The Medicare population is especially susceptible to complications associated with flu and pneumonia because both diseases often exacerbate underlying chronic conditions, such as heart or lung disease, asthma, and diabetes.<sup>6</sup> For example, research suggests that acute respiratory infections, including influenza, may precipitate major cardiovascular events, such as acute coronary syndrome.<sup>7</sup>

The Advisory Committee on Immunization Practices (ACIP) is an expert panel selected by the Secretary of the U.S. Department of Health and Human Services to advise the nation on how to reduce vaccine-preventable diseases. The ACIP, which develops standards for routine

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vaccine administration, including dosage, periodicity schedules, and contraindications for pediatric and adult populations, recommends the following:

- An *annual* influenza vaccine for all people age 6 months and older.
- When vaccine supply is limited, vaccine priority groups to include adults ages 50 and older and all people who live in long-term care facilities.
- A *one-time* vaccination for pneumococcal pneumonia for all adults age 65 and older.<sup>8</sup>

The Medicare program covers pneumococcal and influenza vaccines for people age 65 and older in accordance with ACIP recommendations. Medicare pays for both the cost of the vaccines and their administration by participating providers. No coinsurance or copayments are associated with either vaccine, and beneficiaries are not required to meet the annual Medicare deductible in order to receive them. Finally, when five years have elapsed since the initial pneumococcal vaccine,

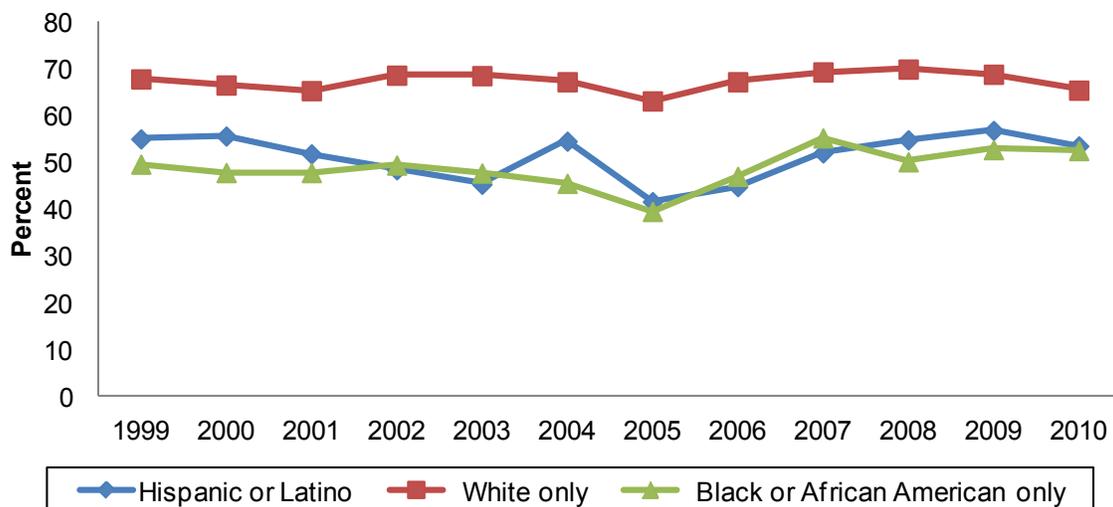
Medicare will cover a booster vaccine for people in high-risk categories.<sup>9</sup>

### Disparities in Immunization Rates among Medicare Beneficiaries

Despite Medicare's coverage of influenza and pneumonia vaccines at no out-of-pocket cost to beneficiaries, the number of beneficiaries who are immunized is less than optimal, with even lower rates noted among African Americans and Hispanics. In 2010, just over half of African American and Hispanic adults age 65 and older (53 percent and 54 percent, respectively) reported receiving the influenza vaccine that year, compared with 65 percent of white adults in the same age group (figure 1).<sup>10</sup> Influenza immunization disparities persist, even after controlling for other factors such as socioeconomic status, health status, and the presence of risk factors for influenza.<sup>11,12</sup>

The gap is even wider for lifetime pneumonia immunization rates among adults age 65 and older. In 2010, only 46 percent of African Americans and 39 percent of Hispanics reported having

**Figure 1**  
Percent of Adults Age 65 and Older who Received an Influenza Vaccination Within the Past 12 Months, 1999–2010



Source: AARP Public Policy Institute Analysis of National Health Interview Survey, 1999–2010.

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ever received the vaccine, compared with 63 percent of their white counterparts (figure 2).<sup>13</sup> Although pneumonia coverage rates have modestly improved over the past decade for all racial and ethnic groups, disparities in pneumonia immunization rates persist; with the degree of the disparities observed today almost matching those observed more than a decade ago (figure 2).<sup>14</sup>

### Factors Associated with Racial and Ethnic Immunization Disparities among Medicare Beneficiaries

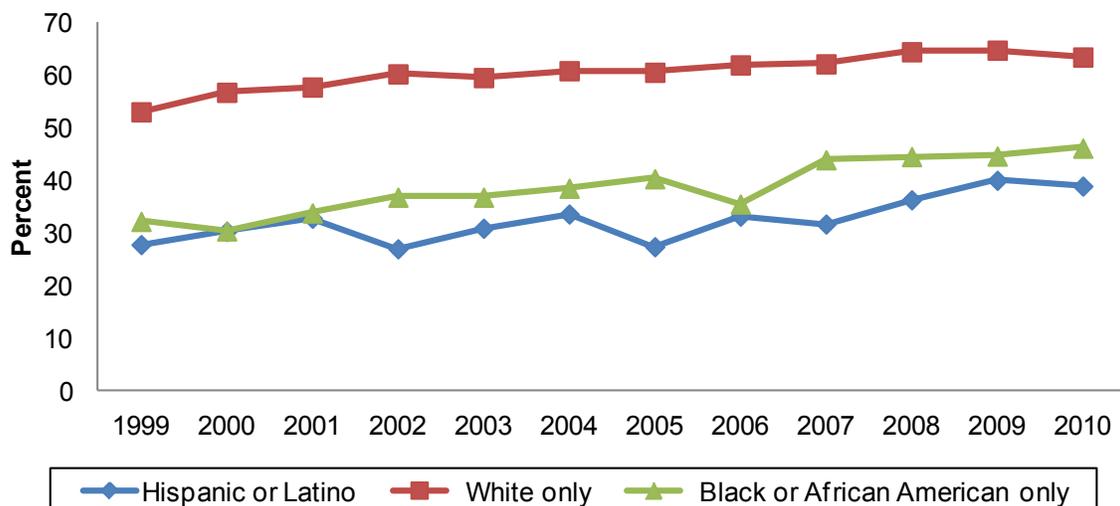
Research shows the following factors are associated with low flu and pneumococcal pneumonia immunization rates among African Americans and Hispanics:

- Cultural and linguistic barriers that limit access to care;<sup>15</sup>
- Living in linguistically isolated areas and newer immigrant destinations;<sup>16</sup>
- Consumer lack of awareness about the need for the vaccinations;<sup>17</sup>
- Consumer fear that the vaccines will cause severe illness;<sup>18</sup>
- Distrust of immunizations due to memories of the Tuskegee syphilis experiments;<sup>19</sup>
- Few consumer-initiated visits to providers to receive the vaccines;<sup>20</sup>
- Provider underestimation of the safety and efficacy of the vaccines;<sup>21</sup>
- Provider lack of familiarity with age-based immunization recommendations;<sup>22</sup>
- Provider failure to recommend age-appropriate immunizations to older adults;<sup>23</sup> and
- Provider failure to institute ACIP recommendations for standing-order programs that authorize nurses or pharmacists to administer vaccinations according to an institution- or clinician-approved protocol.

### Conclusion

Although the Medicare program pays for influenza and pneumococcal

**Figure 2**  
Percent of Adults Age 65 and Older who Have Ever Received a Pneumococcal Vaccination, 1999-2010



Source: AARP Public Policy Institute Analysis of National Health Interview Survey, 1999–2010.

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vaccinations for all beneficiaries, racial and ethnic disparities persist among African Americans, and Hispanics. The challenge of increasing the take up of vaccines is twofold:

- Educating patients in culturally competent, linguistically appropriate

ways about the benefits of vaccination so they can engage in responsible disease prevention; and,

- Educating providers and health systems about the importance of prioritizing adult vaccination, especially among racial and ethnic minorities.

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### Endnotes

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<sup>3</sup> Murphy et al., op. cit.

<sup>4</sup> Healthy People 2020 is a set of health objectives for the nation to achieve over the second decade of the century. Healthy People 2020 was developed through a broad consultation process, built on the best scientific knowledge, and designed to measure progress over time. U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion, *Healthy People*, <http://www.healthypeople.gov/About/whatis.htm>

<sup>5</sup> U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion, *Healthy People*, op. cit.

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<sup>8</sup> Centers for Disease Control and Prevention, National Immunization Program, Advisory Committee on Immunization Practices, 2010, <http://www.cdc.gov/vaccines/recs/default.htm>.

<sup>9</sup> People who receive a pneumococcal vaccine before age 65 should receive another dose after they turn age 65 and after five years have elapsed since their first dose. People who are immunocompromised should receive a follow-up vaccine. Centers for Disease Control and Prevention, “Recommended Adult Immunization Schedule—United States, October 2006–September 2007,” *Mortality and Morbidity Weekly Report* 55(40) (October 13, 2006): Q1–Q4, <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5540a10.htm>; Centers for Medicare and Medicaid Services, Adult Immunization, 2009–2010 Immunizers’ Question and Answer Guide to Medicare Coverage of Seasonal Influenza and Pneumococcal Vaccinations: Steps to Promoting Wellness Adult Immunizations, <http://www.cms.hhs.gov/adultimmunizations/>.

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# Where Are We on the Diffusion Curve? Trends and Drivers of Primary Care Physicians' Use of Health Information Technology

*Anne-Marie Audet, David Squires, and Michelle M. Doty*

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**Objective.** To describe trends in primary care physicians' use of health information technology (HIT) between 2009 and 2012, examine practice characteristics associated with greater HIT capacity in 2012, and explore factors such as delivery system and payment reforms that may affect adoption and functionality.

**Data.** We used data from the 2012 and 2009 Commonwealth Fund International Health Policy Surveys of Primary Care Physicians. The data were collected in both years by postal mail between March and July among a nationally representative sample of primary care physicians in the United States.

**Study Design.** We compared primary care physicians' HIT capacity in 2009 and 2012. We employed multivariable logistic regression to analyze whether participating in an integrated delivery system, sharing resources and support with other practices, and being eligible for financial incentives were associated with greater HIT capacity in 2012.

**Principal Findings.** Primary care physicians' HIT capacity has significantly expanded since 2009, although solo practices continue to lag. Practices that are part of an integrated delivery system or share resources with other practices have higher rates of electronic medical record (EMR) adoption, multifunctional HIT, electronic information exchange, and electronic access for patients. Receiving or being eligible for financial incentives is associated with greater adoption of EMRs and information exchange.

**Conclusions.** Federal efforts to increase adoption have coincided with a rapid increase in HIT capacity. Delivery system and payment reforms and federally funded extension programs could offer promising pathways for further diffusion.

**Key Words.** EMR adoption, primary care physicians, shared resources, financial incentives, health information exchange, small physician practices

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National trends in physicians' use of health information technology (HIT) are clear: in 2001, 18 percent of office-based physicians had implemented either a partial or full electronic medical record (EMR), 48 percent had done so in

2009, and 72 percent in 2012 (Hsiao and Hing 2012). Less is known about the nature of the progress in areas such as computerized physician ordering or clinical decision support. Furthermore, little is known about how external factors such as shared technical assistance programs and delivery system and payment reforms are impacting adoption. Studies have described significant variation in EMR adoption by physician practice size, setting, and physician age (Decker, Jamoom, and Sisk 2012). Documented barriers include costs, the lack of expertise, and technical support infrastructure (Audet et al. 2004; DesRoches et al. 2008; Boonstra and Broekhuis 2010; Patel et al. 2013).

The Health Information Technology for Economic and Clinical Health (HITECH) Act of 2009 injected unprecedented resources to build the national HIT infrastructure. Those resources support several programs, including the “Meaningful Use” incentives, technical assistance through regional extension centers, and the creation of health information exchange communities. In addition, the Patient Protection and Affordable Care Act (ACA) of 2010 fostered payment and delivery system reforms, such as an increased focus on the patient-centered medical home model and accountable care organizations (ACOs). These initiatives aim to create and support an environment and infrastructure where all primary care practices can provide advanced primary care, regardless of their size or setting.

In this study, we use results from two international surveys of primary care physicians—the first conducted in 2009, before the ACA and in the very early stages of deployment of HITECH funds, and the second in 2012—to describe trends in adoption of HIT functionalities. While HIT adoption in a cross-national context has been reported elsewhere (Schoen et al. 2009, 2012), this study further explores the factors that may facilitate or hinder HIT adoption and functionality in the United States.

## DATA AND METHODS

### *Data*

This study primarily uses data from the 2012 Commonwealth Fund International Health Policy Survey of Primary Care Physicians, conducted in 11

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countries (Schoen et al. 2012), and restricts the analysis to U.S. respondents. The survey was conducted by Harris Interactive by postal mail between March and July; the response rate was 35 percent. The sample consisted of 1,012 primary care physicians—39 percent in family practice, 36 percent in internal medicine, 22 percent in pediatrics, and 3 percent in general practice—randomly drawn from the AMA Masterfile. Responses are weighted by gender, age, region, and specialty. We compared unweighted respondents and nonrespondents by region, years in practice, and type of practice (i.e., solo, group) and found similar proportions in both groups, suggesting that our sample is representative of the physicians in the AMA Masterfile. However, the low response rate does introduce potential bias.

Data from the 2009 Commonwealth Fund International Health Policy Survey of Primary Care Physicians (Schoen et al. 2009) are also used to explore changes in HIT adoption over time. Both survey instruments are available in the online Appendix. The 2009 survey was conducted following the same methodology as in 2012; the response rate in 2009 was 39 percent.

### *HIT Functionality*

Respondents were asked whether they use electronic patient medical records in their practice. They were also asked about several electronic HIT functions. Using the same methodology as Schoen et al. (2012), we grouped 15 HIT questions into four domains related to (1) *generating patient information*; (2) *generating patient registry and panel information*; (3) *electronic order entry*, and (4) *electronic decision support* (Table 1 includes a list of questions under each domain). Respondents who reported using electronic medical records and two or more functions within each of the four domains were considered to have “multifunctional” *HIT capacity*. Physicians with *electronic exchange capacity* reported having at least two of the following: the ability to electronically exchange clinical summaries or laboratory test results with doctors outside their practice, or to receive hospital discharge reports via remote access. Practices providing *electronic access for patients* offered patients two or more of the following: the option to request appointments or referrals online, email about a medical question, request online prescription refills, or view test results on a secure website.

### *Integrated Delivery System and Sharing Resources*

We characterized respondents by whether they reported being part of an integrated system such as Kaiser or the V.A. In addition, the survey asked

Table 1: Health Information Technology (HIT) Capacity among U.S. Primary Care Physicians 2009 and 2012

	2009 (N = 1,442), %	2012 (N = 1,012), %
Uses electronic patient medical records	46	69***
Computerized ability to generate patient information		
List medications taken by an individual patient, including those prescribed by other doctors	30	45***
List lab results for an individual patient, including those ordered by other doctors		43
Can provide patients with clinical summaries for each visit		43
<i>Can electronically generate patient information: 2 + of above 3 functions</i>		44
Computerized ability to generate patient registry and panel information		
List patients by diagnosis	42	50***
List patients due/overdue for tests or preventive care	29	42***
List all patients taking a particular medication		37
List patients by lab result	29	42***
<i>Can electronically generate patient registry and panel information: 2 + of above 4 functions</i>		46
Computerized order entry management: routinely...		
Order laboratory tests electronically	38	54***
Prescribe medication electronically	40	64***
Able to electronically send prescriptions to the pharmacy <sup>†</sup>	34	66***
Electronically track all laboratory tests until results reach clinicians	28	41***
<i>Routinely uses computerized order entry management: 2 + of above 4 functions</i>		68
Computerized decision support: routinely...		
Receive electronic alert/prompt about potential drug dose/interaction problems	37	58***
Receive computerized reminder for guideline-based intervention/screening tests	20	33***
Receive computerized alert/prompt to provide patients with test results	22	35***
Send patients reminders for preventive/follow-up care through computerized system	18	22***
<i>Routinely uses computerized decision support: At least 2 of the above 4 functions</i>		45
Multifunctional HIT capacity: <i>Uses EMRs and at least two electronic functions for generating patient information, generating panel information, order entry management, and routine decision support</i>		27
Electronic information exchange		
Can electronically exchange clinical summaries with doctors outside practice		33

continued

Table 1. *Continued*

	2009 (N = 1,442), %	2012 (N = 1,012), %
Can electronically exchange laboratory/diagnostic tests with doctors outside practice		35
Usually receive hospital discharge reports through remote access		12
<i>Able to electronically exchange information: 2 + of above 3 functions</i>		32
Electronic access for patients: Practice allows patients to...		
Request appointments or referrals online		30
Email about a medical question or concern		34
Request refills for prescriptions online		36
View test results on a secure website		28
<i>Electronic patient engagement: 2 + of above 4 functions</i>		35

Statistically different: \* $p < .05$ , \*\* $p < .01$ ; \*\*\* $p < .001$ .

†Only asked of those who report occasionally or routinely electronically prescribing medication.

Source. 2009 and 2012 Commonwealth Fund International Health Policy Surveys of Primary Care Physicians.

respondents whether they have formal arrangements with external organizations to share technical support for clinical information systems or quality improvement consultants or support. Those that reported either or both arrangements were characterized as sharing resources.

### *Financial Incentives*

Our analysis characterized respondents by whether they received or had the potential to receive financial support for any of the following: managing patients with chronic disease or complex needs; providing enhanced preventive care activities; adding nonphysician staff to their practice team; having non-face-to-face interactions with patients; or making home visits.

### *Practice Size*

Practice size was categorized into four groups: solo, 2 to fewer than 10 physicians, 10 to fewer than 20 physicians, and 20 or more physicians.

### *Analysis*

Trends between 2009 and 2012 in the percentage of physicians reporting various HIT functions were examined (Table 1). Bivariate analyses and

multivariable logistic regression of the 2012 data examined the association of HIT capacity with practice size, participation in an integrated delivery system, sharing resources, and eligibility for financial incentives, controlling for physician age, gender, urbanicity, and census region (Tables 2

Table 2: Practice Characteristics and HIT Capacity, U.S. Primary Care Physicians (2012)

	<i>Unweighted N</i>	<i>Uses Electronic Patient Medical Records</i>	<i>Multifunctional HIT Capacity<sup>†</sup></i>	<i>Can Electronically Exchange Information with Other Providers<sup>‡</sup></i>	<i>Electronic Access for Patients<sup>§</sup></i>
U.S. total	1,012	69%	27%	32%	35%
Formal arrangements with other practices/groups to share technical support for clinical information systems, and/or quality improvement consultants or support					
Yes	376	83***	38***	49***	47***
No	580	59	20	21	27
Part of integrated system (e.g., Kaiser, the V.A.)					
Yes	276	87***	41***	51***	56***
No	721	63	22	24	27
Receives or eligible for targeted financial incentives <sup>¶</sup>					
Yes	342	76***	31*	39***	40**
No	653	65	25	27	32
Practice size <sup>††</sup>					
Solo	238	49	11	19	23
2 to <10	485	70***	29***	32***	32*
11 to <20	99	84***	32***	41***	38**
20 or more	145	90***	45***	45***	61***

Statistically different: \* $p < .05$ , \*\* $p < .01$ ; \*\*\* $p < .001$ .

<sup>†</sup>Uses EMR, and has at least two electronic functions for: generating patient information, generating panel information, order entry management, and routine clinical decision support. See Table 1 for further details.

<sup>‡</sup>At least two of three functions: can electronically exchange records with other doctors, test results with other doctors, or usually receives hospital discharge reports through remote access. See Table 1 for further details.

<sup>§</sup>At least two of four functions: practice allows patients to request appointments/referrals online, email about a medical question, request online prescription refills, or view test results on a secure website. See Table 1 for further details.

<sup>¶</sup>Receives or has the potential to receive targeted financial support for managing patients with chronic disease or complex needs; providing enhanced preventive care activities; adding nonphysician staff to your practice team; having non-face-to-face interactions with patients; or making home visits.

<sup>††</sup>Asterisks indicate statistical difference from practices with fewer than two FTE physicians.

Source. 2012 Commonwealth Fund International Health Policy Survey of Primary Care Physicians.

Table 3: Factors Associated with HIT Capacity among U.S. Primary Care Practices: Shared Resources, Integrated Delivery System, Financial Incentives, and Practice Size, Based on Logistic Regression (2012)

	Uses Electronic Patient Medical Records		Multifunctional HIT Capacity <sup>†</sup>		Can Electronically Exchange Information with Other Providers <sup>‡</sup>		Electronic Access for Patients <sup>§</sup>	
	Odds Ratio	p-value	Odds Ratio	p-value	Odds Ratio	p-value	Odds Ratio	p-value
Shares technical support for clinical information systems and/or quality improvement consultants or support (reference = no)	1.83	.001	1.54	.006	2.49	<.001	1.56	.004
Part of an integrated delivery system (reference = no)	2.30	<.001	1.54	.009	2.15	<.001	2.32	<.001
Receives or eligible for targeted financial incentives <sup>¶</sup> (reference = no)	1.42	.034	1.25	.146	1.49	.009	1.28	.100
Practice size (reference = solo)								
2 to <10	1.74	.001	2.33	<.001	1.44	.080	1.16	.433
10 to <20	3.22	<.001	2.18	.011	1.53	.141	1.19	.531
20 or more	5.57	<.001	3.73	<.001	1.67	.052	2.56	<.001

Model adjusted for physician age, gender, practice location (urban/rural mix), and census region.

<sup>†</sup>Uses EMR, and has at least two electronic functions for: generating patient information, generating panel information, order entry management, and routine clinical decision support. See Table 1 for further details.

<sup>‡</sup>At least two of three functions: can electronically exchange records with other doctors, test results with other doctors, or usually receives hospital discharge reports through remote access. See Table 1 for further details.

<sup>§</sup>At least two of four functions: Practice allows patients to request appointments/referrals online, email about a medical question, request online prescription refills, or view test results on a secure website. See Table 1 for further details.

<sup>¶</sup>Receives or has the potential to receive targeted financial support for managing patients with chronic disease or complex needs; providing enhanced preventive care activities; adding nonphysician staff to your practice team; having non-face-to-face interactions with patients; or making home visits.

Source. 2012 Commonwealth Fund International Health Policy Survey of Primary Care Physicians.

and 3). Missing data were not excluded from the denominator, and the percentage of missing respondents ranged from 1 to 7 percent. We found no evidence of multicollinearity in our models. All analyses were conducted using Stata (version 12).

## RESULTS

### *Trends in Adoption of EMRs among Primary Care Physicians, 2009–2012*

Between 2009 and 2012, U.S. primary care physicians' adoption of EMRs rose 50 percent, from 46 to 69 percent (Table 1). The use of HIT increased in all areas, but relatively more so in order entry management: the proportion of physicians able to send prescriptions electronically to the pharmacy nearly doubled from 34 to 66 percent; electronic prescribing increased from 40 to 64 percent; and electronic ordering of laboratory tests from 38 to 54 percent.

Although the use of HIT for decision support generally lags behind other domains, progress has been made. In 2012, one-third of physicians received electronic prompts to provide patients with test results (35 percent) and reminders for guideline-based interventions or screening tests (33 percent), up from one-fifth in 2009. The ability to receive electronic alerts or prompts about drug dosing or potential interaction problems increased from 37 to 58 percent between 2009 and 2012. Twenty-two percent of physicians report that their practices send patient reminders for preventive or follow-up care—an increase of 4 percentage points since 2009.

Less than half of physicians in 2012 can use HIT to generate information about each patient, although these functions have become more common since 2009. Physicians' ability to generate information about their panel electronically has also increased since 2009, including being able to list patients by diagnosis (50 vs. 42 percent), those overdue for preventive care (42 vs. 29 percent), or by specific laboratory results (42 vs. 29 percent).

### *Multifunctional HIT Capacity, 2012*

In 2012, 44 percent of physicians can generate *patient information* and 46 percent can generate *patient registry and panel information* using at least two HIT functions; 45 percent use at least two *electronic decision support* functionalities; and 68 percent use at least two HIT functions for *order entry management* (Table 1). Slightly over a quarter (27 percent) of physicians are “multifunctional” users of EMRs, meaning they use an EMR and have at least two electronic

functions for generating patient information, panel information, order entry management, and routine decision support.

### *Electronic Information Exchange, 2012*

Thirty-three percent of primary care physicians report the ability to exchange clinical summaries with other doctors, and 35 percent can share laboratory or diagnostic tests with doctors outside their practice (Table 1). Even fewer physicians (12 percent) indicate that when their patients are discharged from a hospital they usually receive information about the admission through a remote server. In total, 32 percent of physicians have at least two HIT functions that allow them to electronically exchange or acquire information outside their practice.

### *Electronic Access for Patients, 2012*

Roughly one-third or fewer of physicians offer electronic access to their patients so they can view test results on a secure website (28 percent), request an appointment or a referral online (30 percent), email them about a medical concern (34 percent), or refill prescriptions online (36 percent) (Table 1). In total, 35 percent of doctors offer their patients at least two of these forms of electronic access.

### *Factors Associated with Adoption of HIT*

Based on bivariate analysis, physicians who are part of an integrated delivery system, who have formal arrangements with other practices to share resources, or who are eligible for financial incentives have higher rates of HIT adoption (Table 2). They are significantly more likely than physicians without these characteristics to use EMRs; to have multifunctional HIT capacity; to be able to electronically exchange information with other providers; and to offer patients electronic access to information, appointments, or prescription refills.

Practice size is also a major determinant of physicians' use of EMRs and HIT capacity, including exchanging patient information electronically and providing electronic access to their patients. Half of physicians in solo practices report using EMRs, compared to 90 percent of those in practices with 20 or more physicians; likewise, there is a 4-fold difference between solo and large practices in achieving multifunctional HIT capacity (11 vs. 45 percent).

Table 3 shows the net effects of practice size, sharing resources, being part of an integrated delivery system, and receiving or being eligible for financial incentives, also controlling for physician location, census region, age, and gender. Practice size remains an important determinant of HIT capacity even after controlling for all other covariates. Sharing resources is strongly associated with EMR use (OR = 1.83,  $p = .001$ ), multifunctional HIT capacity (OR = 1.54,  $p = .006$ ), electronically exchanging patient information (OR = 2.49,  $p \leq .001$ ), and electronic access for patients (OR = 1.56,  $p = .004$ ). Participating in an integrated delivery system also has an independent effect on EMR adoption and HIT capacity, holding all other covariates constant. Physicians who receive or are eligible for financial incentives are more likely to use EMRs (OR = 1.42,  $p = .034$ ) and be able to electronically exchange patient information with physicians outside of their practice (OR = 1.49,  $p = .009$ ) than those not eligible for incentives.

## DISCUSSION

Given the public and private investment in building the national HIT infrastructure, it is important to track the adoption of HIT as well as explore factors that can accelerate or hinder the pace of adoption among all practices, regardless of their size or setting. Our analysis of national surveys of primary care physicians conducted in 2009 and 2012 demonstrates that HIT adoption is increasing but some HIT functionalities are more prevalent than others. With one exception (drug alerts) electronic decision supports are used only by at most one-third of physicians. Physicians' ability to electronically access clinical data and use it to manage individual patients or a panel of patients is progressing, although less than half of physicians have reached that level of functionality.

Two of the functions least adopted—electronic patient access and health information exchange—have been prioritized in the second stage of Meaningful Use. Success in this case will depend on physicians forging different types of partnerships with their patients and with the other service providers to whom they refer. The number of models and tools that include HIT as a way to engage patients continues to grow (Delbanco et al. 2010; Wasson et al. 2012). On the other hand, electronic exchange of clinical information will likely remain a significant challenge for some time—one that goes beyond technical and financing solutions and requires new relational approaches that address issues of trust, competition, autonomy, privacy, and security (Wright et al. 2010).

Integrated delivery systems have the financial capacity to invest in HIT and quality infrastructures that can benefit physicians who are part of such networks (Shih et al. 2008). In our study, twice as many physicians in an integrated delivery system reported high HIT functionality. However, only one-fourth of physicians said they practice in such a setting and these structural characteristics are hard to change. On the other hand, results suggest that financial incentives and technical assistance, which are more flexible and potentially applicable to large numbers of physicians, have the potential to enable practices, regardless of size and setting, to achieve high levels of HIT proficiency.

Our study finds that only 39 percent of physicians surveyed said they had formal arrangements to share technical support or quality improvement consultation. Yet physicians who said they share technical support were significantly more likely to use EMRs and have multifunctional HIT capacity than physicians who did not share these resources. Shared technical assistance programs were also associated with the ability to exchange health information with other providers.

These results suggest that attention should be placed on technical assistance programs that can effectively outreach to practices in a variety of settings, such as the Office of the National Coordinator's Regional Extension Center program deployed nationwide through federal funding (Grumbach and Mold 2009; Mostashari, Tripathi, and Kendall 2009; Abrams, Schor, and Schoenbaum 2010; Ryan et al. 2013). States' Medicaid agencies could also purchase or create incentives for practices to invest in such programs (Highsmith and Berenson 2011). Independent practice associations, which were originally created to help practices negotiate complex risk-based managed care contracts, are now also evolving as organizations that can provide infrastructure support to networks of practices (Lake, Higgins, and Ginsburg 2011). Delivery system models being tested and implemented through health care reform such as ACOs also hold promise for physicians, who could benefit from economies of scale if the ACO invests in HIT and quality improvement infrastructure.

Incentives were not significantly associated with multifunctional HIT capacity or patient electronic access but were associated with EMR use and electronic exchange of information. Payment reforms that reward value over volume will make investment in quality infrastructure more sustainable than in the past. For example, incentives for managing more complex patients, shared savings, capitation, and global budgeting create a business case for investing in the tools that are necessary to deliver high-quality and efficient care.

The strength of this study is that both surveys were conducted among a nationally representative sample of primary care physicians and contained many of the same questions, allowing us to trend adoption of a rich set of HIT functions. However, some limitations are noted. First, self-reported data collected through surveys are subject to social desirability bias. Second, our response rate is 35 percent and it is hard to predict the direction of any potential bias. Physicians with higher levels of adoption might be more willing to respond to the survey or physicians who are challenged with adoption might be more willing to voice their concerns. However, our estimate of EMR adoption in 2012 (69 percent) among primary care physicians (PCPs) is within range of other national studies that have reported EMR adoption among PCPs (58 percent using 2011 CDC/NCHS Physician Workflow Study; 75 percent using 2012 National Electronic Health Record Survey) (Jamoom et al. 2012; Office of the National Coordinator for Health Information Technology 2013).

## CONCLUSION

The adoption of EMRs and more advanced HIT functionalities continues to increase. Although the gap in HIT capacity between solo and larger practices persists, study findings suggest that new strategies to narrow this gap—such as delivery system reforms, payment reforms, and extension programs that provide resources such as staff and technical support to networks of practices—are promising. To further accelerate HIT adoption, investments will need to be made in research, development, and knowledge translation, so that learning can be disseminated to practices of all kinds across the country. Continued federal investment in HIT can play a pivotal role in ensuring that all practices, regardless of their size or setting, have the necessary tools and resources available to take full advantage of the power of health information technology.

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## SUPPORTING INFORMATION

Additional Supporting Information may be found in the online version of this article:

Appendix SA1: 2009 International Survey of Primary Care Doctors.

Appendix SA2: 2012 International Survey of Primary Care Doctors.

Appendix SA3: Author Matrix.