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Primary Care: A Critical Review Of The Evidence On Quality And Costs Of Health Care

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ABSTRACT Despite contentious debate over the new national health care reform law, there is an emerging consensus that strengthening primary care will improve health outcomes and restrain the growth of health care spending. Policy discussions imply three general definitions of *primary care*: a specialty of medical providers, a set of functions served by a usual source of care, and an orientation of health systems. We review the empirical evidence linking each definition of *primary care* to health care quality, outcomes, and costs. The available evidence most directly supports initiatives to increase providers' ability to serve primary care functions and to reorient health systems to emphasize delivery of primary care.

Policy makers, professional organizations, and purchasers of health care have reached an unusual consensus on the importance of revitalizing primary care. This consensus stems from agreement that primary care is in a deepening crisis, but that effective primary care can improve health outcomes and contain health care costs.

Some proposed solutions frame the crisis as a problem of insufficient numbers of primary care physicians. This framing rests on evidence that U.S. medical students are losing interest in primary care careers and that Medicare beneficiaries are beginning to report difficulty finding new primary care physicians.^{1,2} Large income differences between specialties may deter medical students from pursuing careers in primary care.³ This has prompted the Medicare Payment Advisory Commission (MedPAC) to recommend a budget-neutral payment increase for "primary care services provided by practitioners who focus on primary care."²

Other proposals frame the primary care crisis as one of insufficient capability. These proposals include efforts to not only expand the number of patients who have a primary care provider, but

also to give these providers new resources such as electronic health records and nonphysician care coordinators. The medical home and Chronic Care Model include sets of interventions intended to enhance and extend the capabilities of primary care providers.^{4,5}

A third set of proposals attempts to reorient entire health care delivery systems toward primary care. Such proposals call for rebalancing primary and specialty care in the United States—a goal that may require interventions beyond increasing the number of primary care physicians.⁶ These proposals also call for basing system-level payment and organizational design on core principles of primary care.⁷

Given the magnitude of the investment necessary to revitalize primary care, it is fair to ask what evidence supports current proposals to expand, equip, and empower primary care. In this paper we review the empirical evidence linking primary care to the quality, outcomes, and costs of health care; evaluate the strength of this evidence; and discuss the resulting policy implications.

Defining Primary Care

Three general definitions of *primary care* have been investigated.

SPECIALTY OF PROVIDER The first of these defines *primary care* according to the specialty of individual providers, identifying primary care providers based on their training as general pediatricians, general internists, family physicians, or other generalists, including nonphysician providers. This provider specialty-based definition of primary care excludes the possibility that specialists, as defined by training, may also serve primary care functions.

FUNCTIONS The second definition identifies primary care as a specified set of health care functions served by a usual source of care. Under this definition, patients are said to receive primary care when they have a usual source of care and when this source serves four essential functions. Those functions are providing first-contact care for new health problems, comprehensive care for the majority of health problems, long-term person-focused care, and care coordination across providers.⁸ Primary care functions are recognized independent of provider training, so functions served by specialists and nonphysician practitioners are also recognized as “primary care” so long as all essential primary care functions are served.

ORIENTATION OF SYSTEMS The third definition of *primary care* describes the general orientation of local or regional health care delivery systems. This definition is often measured using area-level aggregations of the provider specialty-based or function-based definitions. For example, areas are considered more primary care-oriented when they have high ratios of primary care physicians to specialists, high ratios of primary care physicians to patients, and patient populations that frequently have usual sources of care serving primary care functions.⁸

However, there are also system-level attributes that cannot be reduced to the provider specialty-based or function-based definitions. For example, systems are considered more primary care-oriented when minimal financial barriers exist to accessing primary care, communication and care transitions between primary care physicians and other health care providers are reliable, and local cultural and behavioral norms encourage patients to seek care from a primary care provider for new health conditions.^{9,10}

Literature Included

An exhaustive literature review was beyond the scope of this paper. To identify literature for inclusion, we began with recent systematic evidence reviews of the effectiveness of primary

care. Two reviews included evidence pertaining to multiple definitions of *primary care*,^{8,9} and three included evidence on just one definition.^{11–13} We then searched for studies published after these reviews, starting with articles that cited at least one of them (using the ISI Web of Knowledge and PubMed).

Studies were included if they addressed one or more of the definitions of primary care; if they measured effects on quality, outcomes, or costs; and if they presented or cited original analyses that were peer-reviewed. The full bibliography of 161 articles that form the basis of our review is provided in the online Appendix.¹⁴ To avoid redundancy, we cite a subset of these articles, choosing those that illustrate points especially pertinent to current policy proposals while attempting to reflect the overall bibliography.

Primary Care As A Specialty

Many studies have compared care by primary care practitioners and specialists for the same condition, almost always within specialists' areas of expertise. These studies implicitly assess the impact of substituting specialists and primary care practitioners for one another, holding system-level variables constant. In such studies, *primary care practitioners* are typically defined as family physicians, general internists, general pediatricians, and other generalists, sometimes including nonphysicians.

With some exceptions, these studies generally suggest that compared to primary care providers, specialists are more likely to perform recommended care processes when treating conditions within their specialty.^{11,12} Specialists are also more likely than primary care practitioners to use new treatments and technologies, even when their effectiveness is uncertain.^{11,15,16}

OUTCOMES Fewer studies have examined differences in outcomes of care. Of these, most have focused on emergency care and follow-up for acute conditions such as myocardial infarction (heart attack) and stroke. Some studies find better outcomes for patients receiving specialist care.^{11,12} However, differences in patients' baseline health may confound these comparisons. A study using instrumental variables—more rigorous techniques to address this confounding—found no differences in outcomes.¹⁷

Studies that compare primary care physicians and specialists on their patients' health outcomes for common chronic conditions such as hypertension and diabetes offer conflicting results.^{18,19} A study of national survey data found that patients identifying primary care physicians as their usual sources of care had lower five-year mortality rates than patients identifying special-

ist physicians as their usual sources of care.²⁰

RESOURCE USE The preponderance of studies comparing levels of resource use by primary care practitioners and specialists find that patients of primary care providers have lower levels of use, such as fewer diagnostic tests and procedures, and incur equal or lower costs of care.^{11,21,22}

IMPLICATIONS The vast majority of studies comparing the care of primary care providers and specialists are observational and rely on statistical techniques to control for substantial differences between patients who receive care from primary care providers and specialists.²³ However, these differences can be difficult to measure, and unobserved differences in patient characteristics, local practice resources, and other environmental factors may undermine study results.^{11,12}

If meaningful conclusions can be drawn from studies of the provider specialty-based definition of *primary care*, they are limited to a narrow range of clinical areas in which substitution between primary care providers and specialists may be reasonable. In these areas, primary care providers may demonstrate less intensive patterns of care, but whether there are differences in quality and health outcomes remains uncertain.

Primary Care As A Set Of Functions

Studies of primary care functions fall into two categories. First, patients with a usual source of care are compared to those without a usual source. These studies seek to estimate the effects of extending stable, long-term clinical relationships to patients who lack such relationships. These studies also tend to be agnostic to the training of providers, allowing the “usual source of care” to be a primary care physician, specialist, nonphysician, or team.

Studies in the second category assess interventions that are designed to improve providers’ ability to serve the key functions of primary care, such as interventions based on the Chronic Care Model and the medical home. These studies seek to measure the effects of investing in new methods and capabilities for delivering primary care.

USUAL SOURCE OF CARE Patients reporting a usual source of care are generally more likely than others to receive recommended preventive services.^{24,25} An enduring relationship between the patient and his or her usual source of care also appears to be associated with better quality.²⁶ There is also evidence that patients with a “regular doctor” as a usual source of care, rather than a “regular practice site,” are more likely to receive preventive services.^{25,27,28} As compared to quality, the relationship between health out-

Better scores on patient experience, lower utilization, and lower costs of care are associated with having a usual source of care.

comes and having a usual source of primary care has been less well studied.

Better scores on patient experience, lower utilization, and lower costs of care are also associated with having a usual source of care. Compared to others, patients with a usual source of care have greater satisfaction with their overall health care and lower rates of emergency department use for nonurgent conditions.^{29,30} Longer relationships between patients and their usual sources of care are associated with lower rates of hospital admission and lower total costs of care among Medicare beneficiaries.³¹

NEW CARE MODELS Substantial evidence also demonstrates a positive relationship between Chronic Care Model interventions, which are designed to help providers serve the full set of key primary care functions, and both higher-quality care and improved health outcomes for asthma, congestive heart failure, depression, and diabetes.³² In contrast, evidence from medical home pilots is currently scant.³³ However, an early pilot in the Group Health Cooperative showed improvements in quality and patient experience and lower rates of emergency department use.³⁴ Because medical home demonstrations began only recently, no evidence of their impact on health outcomes is currently available.

IMPLICATIONS Observational studies of primary care relationships are subject to many of the same methodological weaknesses as studies of primary care as a provider specialty. Patients who choose to (or who are able to) maintain a usual source of care may differ from those who do not, and these differences may influence study findings.

In addition, many patients are free to switch sources of care and may do so if they are dissatisfied.³⁵ If patients can switch providers, then in cross-sectional studies, longer continuous relationships may be an effect of rather than a cause of high-quality care. Prospective evaluations of interventions based on the Chronic Care Model

Populations of countries with higher ratings of “primary care orientation” experience better outcomes and incur lower costs.

may be less likely than cross-sectional studies to have these particular methodological drawbacks. Evaluations that measure study outcomes for the same patient population before and after intervention allow for stronger inferences about the effect of the intervention on patients.

Primary Care As A Health Systems Orientation

Studies of primary care as a health systems orientation measure this orientation in many ways. Some studies use aggregated provider specialty data, measuring primary care physician-to-specialist ratios and primary care physicians per capita. Other studies measure system-level factors like the presence or absence of barriers, such as copayments, to accessing primary care functions.

Other system-level factors measured in these studies include the position of primary care providers within health systems, such as their central role in managed care plans, and policies that influence interactions between primary care providers and specialists. The units of analysis in such studies are typically geographic areas or large health systems.

GEOGRAPHIC REGIONS Many observational studies comparing U.S. regions have found that higher primary care physician-to-specialist ratios are associated with superior health outcomes, including lower mortality; fewer emergency department visits, hospitalizations, and procedures per capita; and lower costs.^{8,36–39} However, high rates of health care cost growth do not appear to be associated with regional primary care physician-to-specialist ratios.⁴⁰

Greater numbers of primary care physicians per capita have been associated with lower rates of preventable hospitalization.⁴¹ However, recent methodological advances have allowed the

detection of nuanced relationships between primary care physicians per capita and population health outcomes. For example, in the United Kingdom, an analysis using instrumental variables to account for the endogeneity of primary care physician supply (that is, the propensity of primary care physicians to locate in areas with particular health profiles) revealed a greater positive association between self-reported population health and primary care physician supply than had previously been appreciated.⁴²

On the other hand, the first and, to our knowledge, only analysis of primary care physician supply to use advanced spatial analytic techniques found that greater numbers of primary care physicians per capita were associated with lower mortality in certain areas of the United States—primarily the Midwest—and higher mortality in other areas, such as South Florida.⁴³

INTERNATIONAL COMPARISONS International comparisons between industrialized countries suggest that the populations of countries with higher ratings of “primary care orientation” experience better health outcomes and incur lower health care costs than the populations of countries with lower degrees of primary care orientation. These ratings are based on factors including the presence of low or no copayments for primary care, requirements for first-contact care with primary care providers, and guidelines to facilitate care coordination between providers.^{8,10}

CHANGES OVER TIME Studies of system-level change over time illustrate how systems can be reoriented. For example, reforms that strengthened the role of primary care in Spain’s health care system (including the establishment of primary care health centers) were implemented in a staggered fashion, with some areas implementing reform before others and some areas not implementing any reform at all. At ten years, this reform was associated with reductions in hypertension- and stroke-related mortality, with regions of early implementation having the largest reductions relative to areas without reform.⁴⁴

In California, a managed care intervention that provided and required primary care physicians for Medicaid enrollees was associated with fewer hospitalizations for ambulatory care-sensitive conditions.⁴⁵ In Medicare managed care plans, an increase in copayments for office-based health care—a financial barrier to seeking primary care—was associated with subsequent increases in rates of hospitalization.⁴⁶

IMPLICATIONS Methodological concerns about observational studies, including the potential for confounding by unmeasured variables, apply to system-level studies of primary care. Unobserved system-level properties could account for some

reported results. For example, geographic areas may have local cultures that encourage patients to seek care from primary care providers before seeing specialists. These areas may therefore attract more primary care physicians than specialists, raising the primary care physician-to-specialist ratio. Positive health outcomes in these areas may also be attributable to local cultures, but without measures of these cultures, health outcomes will appear to be driven by the primary care physician-to-specialist ratio.

Interpreting System-Level Studies

Observed associations between high primary care physician-to-specialist ratios, better health outcomes, and lower costs of care may not necessarily mean that primary care physicians provide better, higher-value care than specialists. In other words, system-level relationships may not simply be the sum of provider-level effects. It is possible that when primary care physician-to-specialist ratios are high, primary care physicians and specialists both alter their behavior.

To illustrate this point, a recent survey of primary care physicians found that those in the highest-spending regions of the *Dartmouth Atlas of Health Care* were significantly more likely than those in the lowest-spending regions to report more aggressive use of discretionary visits, tests, and interventions.⁴⁷ In other words, care by primary care physicians in high-cost areas is not the same as care delivered by primary care physicians in low-cost areas. This finding echoes recent spatial analyses suggesting that adding more primary care physicians in regions such as South Florida may increase mortality rates.⁴³ Such analyses offer evidence that adding more primary care providers in high-spending areas could have deleterious effects if local provider cultures and other system-level characteristics are not simultaneously reoriented.⁴⁸

The State Of The Evidence

The best evidence that strengthening primary care may improve the quality, outcomes, and cost of care comes from studies of primary care as an orientation of health systems and as a set of functions delivered by a usual source of care. Evidence supporting interventions that improve providers' ability to fulfill primary care functions (such as the Chronic Care Model) and reorient health systems (for example, by expanding managed care) is particularly compelling. However, the evidence regarding primary care as a provider specialty has limited validity and unclear interpretability, because policy interventions to substitute primary care providers for specialists

National health reform legislation incorporates several provisions intended to strengthen primary care.

(or vice versa) would affect health systems in ways that have not yet been estimated.

Policy Implications

HEALTH REFORM The recently passed Patient Protection and Affordable Care Act of 2010 incorporates several provisions intended to strengthen primary care. These provisions include expanding the primary care workforce, equipping primary care practitioners with new capabilities, and reorienting the current delivery system through payment and organizational reforms. Our review of the evidence supports efforts to enhance providers' ability to serve primary care functions and to reorient health systems toward primary care. However, unless these efforts are successful, there is less evidence that broadly increasing the number of U.S. primary care practitioners will improve health outcomes and constrain the growth of health care spending.

ONGOING EFFORTS Programs to better equip providers to serve key primary care functions are already under way, and the evidence supports their expansion and continued evaluation. Policy actions may take the form of payment reform (for example, reducing the role of fee-for-service payment), provision of in-kind support (for example, ongoing investment in health information technology), and technical assistance (for example, a primary care "extension service").⁴⁹ The medical home model includes all of these elements. However, the novelty, complexity, and variety of medical home interventions increase the importance of careful evaluation before the model is implemented widely.^{33,50}

BEYOND INCREASING NUMBERS Reorienting health systems will involve steps other than increasing the number of physicians trained in primary care. Meaningful system-level change also includes modifying patients' expectations (for example, encouraging patients to select the primary care provider as the first contact

for new symptoms), improving public perceptions of primary care, reallocating capital investments toward community-based primary care and away from high-technology procedural services of limited population health impact, and improving communication between specialists and primary care providers.⁴⁹ Payment reforms—both to reduce the role of fee-for-service payment and to narrow the payment gap between cognitive and procedure-based services—may go a long way toward achieving reorientation, even if workforce composition is slow to respond.⁵¹

ROLE OF SPECIALISTS Specialists may play a variety of important roles in strengthening primary care. The evidence does not support barring specialists from serving as medical homes for selected groups of patients. However, to find support in the published literature, specialist practices wishing to function as medical homes must serve all of the essential functions of primary care, including comprehensiveness and care coordination. None of the evidence reviewed in this article supports the idea of providing “primary care” for a single body part or health condition.

USUAL SOURCES OF CARE Policy interventions may also combine the system-level and function-based definitions of *primary care*. For example, some have noted that stable longitudinal relationships between patients and their usual

sources of care are influenced by patient, provider, and regulatory factors such as those relating to maintenance of insurance.⁵² Policies that facilitate usual sources of care, either by stabilizing health insurance or by minimizing the disruptive impact of insurance switches on patient-provider relationships, may be helpful.

Conclusion

Whatever policy interventions emerge from the recently enacted health care reform law, health system attributes that have grown over decades are unlikely to reorient themselves swiftly toward primary care, even in the face of strong incentives. Our reading of the evidence suggests that these systems exert a powerful influence over the care that individual providers deliver to their patients. In the absence of targeted efforts to reorient local health systems and enhance the capabilities of primary care providers, simply expanding the number of primary care physicians may miss a crucial opportunity to improve health care delivery in the United States.

On the other hand, based on the existing evidence, the determined pursuit of primary care as a health systems orientation is likely to have beneficial effects on the quality, outcomes, and cost of U.S. health care. ■

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