

PRIMARY CARE AND THE TRIPLE AIM

An Annotated Bibliography

Matthew Westfall

The Robert Graham Center
for Policy Studies in Family
Medicine and Primary Care
Duke University

Rebecca Luoh

Oregon Health & Science University
Massachusetts Institute of Technology

Natalie Spach

The Robert Graham Center
for Policy Studies in Family
Medicine and Primary Care
Davidson College

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EXECUTIVE SUMMARY

This bibliography was commissioned by the Family Medicine for America's Health (FMAH) initiative to demonstrate the capacity of primary care to improve America's health care system. We utilized modified Delphi and snowballing methods, interviewing more than 30 primary care experts to inform our literature search. Relying on these interviews and supplementary literature review, we created the following three-part resource.

Part I: The Value and History of Primary Care

In Part I, we establish the value of primary care in America's health care system. The presented literature typifies the importance of primary care's holistic view of the patient, one that integrates a patient's physical, mental, and social background. The biomedically focused health care system needs primary care providers who understand patients and can respond to their needs. We address how the holistic aim of primary care has evolved into today's core tenets of primary care: first contact, continuity, comprehensiveness, coordination, and community orientation. We have also selected the most influential literature reviews to date that quantitatively affirm the benefits and value of primary care.

Part II: The Primary Care Landscape

In Part II, we explore the current primary care landscape and present key emerging trends and themes. Many problems remain in the primary care workforce; the shortage and poor geographic distribution of primary care providers are most worrisome. Many in the primary care community also agree that the current delivery and payment model of primary care is flawed. In response, many new delivery models have been proposed, with the patient-centered medical home (PCMH) being the most established model. For payment, a variety of value-based alternative payment models (APMs) have been suggested, but they have been implemented with limited success. While many believe that technology can transform delivery, implementation of electronic health records (EHRs) comes with high initial costs. However, primary care delivery can become more patient-centered and comprehensive by actively engaging patients and integrating mental and public health. Primary care research is currently bogged down by many unreliable metrics, but practice-based research networks (PBRNs) promise better translation of research results to clinical practices.

Part III: Primary Care and the Triple Aim

This section presents evidence that clearly demonstrates the positive impact primary care has—and will continue to have—on the Triple Aim of improving patients' experience of care, reducing costs, and improving population health. We include studies, literature reviews, and gray literature resources. Through the literature review, we found that many studies tackled more than one objective of the Triple Aim and emphasized that the three aims are mutually dependent. To truly achieve the Triple Aim, innovations have to transform our health care system by targeting the three aims simultaneously.

INTRODUCTION

The purpose of this annotated bibliography, which was commissioned by the Family Medicine for America's Health (FMAH) initiative, is to demonstrate the value of primary care for improving America's health care system. Specifically, we looked at how primary care can achieve the Triple Aim of improving patients' experience of care, reducing costs, and improving population health. A modified Delphi method was utilized to identify important themes and to create a comprehensive list of the most important articles. Original interviewees from The Robert Graham Center for Policy Studies in Family Medicine and Primary Care, Oregon Health & Science University, and the research core team of FMAH were asked to recommend additional experts with whom we should conduct interviews. The iteration of the interview and referral process took place over the course of several months until a broad scope of diverse opinions, ideas, and perspectives had been collected to the point of saturation. Combined with our own informal literature review in PubMed, Google Scholar, and appropriate white and gray literature resources, these interviews were synthesized to form the following annotated bibliography. The Delphi and snowballing methods capitalized on the robust informal networks already present within the primary care community. One limitation to this methodology is its susceptibility to a degree of community bias.

This bibliography is a series consisting of three distinct parts. Part I examines the value of primary care in the health care system by tracing the historical evolution of primary care's value. Part II presents the landscape of current primary care research, highlighting emerging trends in primary care. Part III provides an in-depth analysis of how primary care has achieved the Triple Aim and can continue to do so.

Articles were included in this bibliography based on their regular mention by the interviewees and their high number of citations. The bibliography is by no means an exhaustive list of all influential works on primary care. However, our hope is that this informal literature review clearly demonstrates the pivotal role of primary care in remedying the problems of the U.S. health care system.

Interviewees

Andrew Morris-Singer	Jack Westfall	Marci Nielsen	Ronna New
Bill Hogg	James Mold	Mike Parchman	Andrew Bazemore
Christine Sinsky	Jen Devoe	Moira Stewart	Bob Phillips
Alex Krist	John Geyman	Paul Martin	Winston Liaw
Dixie Tooke-Rawlins	Larry Green	Perry Dickinson	Tom Bodenheimer
Eric Holmboe	Lars Peterson	Rick Glazier	Virginia Moyer
Kurt Stange	Anton Kuzel	Lisabeth Buelt	John Saultz
Deborah Cohen	Scott Field	Erika Bliss	Aaron Mendelson
Erika Cottrell	Lauren Hughes	Benjamin Miller	William Miller
Sonja Likumahuwa			

Acknowledgement

We thank the interviewees for providing their time and expertise. We would also like to thank our supervisors Sonja Likumahuwa, Jen Devoe, MD, and Andrew Bazemore, MD, for patiently guiding us and helping us improve the bibliography. We would like to thank the Graham Center

and Oregon Health & Science University for giving us the resources to make this bibliography possible. Finally, we thank Family Medicine for America's Health for initiating this project and bringing us on board.

PART I: THE VALUE AND HISTORY OF PRIMARY CARE

Our goal in Part I is to establish the value of primary care in the current health care system, by tracing the evolution that the value of primary care has undergone and describing the current value of primary care. A number of distinct but interconnected sections are presented here. We begin the first section (“Defining Value in Primary Care”) with articles that assist in framing the concept of value in primary care. The second section (“The Evolution of the Values of Primary Care”) examines historical documents that formed the foundation of primary care. These documents elucidate the development of the well-established core tenets of primary care articulated by Barbara Starfield, MD: first contact, continuity, comprehensiveness, coordination, and community orientation. The third section (“Brief Evaluation: Linking Primary Care and the Triple Aim”) covers seminal articles that quantitatively illustrate how primary care can achieve the Triple Aim.

Defining Value in Primary Care

Primary care is uniquely holistic in that it cares for the psychological and social facets of a patient’s illness, not just the biological source of the disease. The value of primary care results from its whole-patient, whole-community, whole-population orientation. The articles below help frame the value of primary care. First, we outline the goals of primary care with the Triple Aim and the Quadruple Aim (Berwick et al. 2008, Sinsky et al. 2013, Bodenheimer and Sinsky 2014). Next, we present areas of health in which primary care can be distinctly effective and beneficial for achieving Triple Aim goals (Link and Phelan 1995, Flocke et al. 1998, Mokdad et al. 2004). The final articles underscore nuances of the value of primary care (Borrell-Carrió et al. 2004, Epstein et al. 2010, Katerndahl et al. 2010, Katerndahl et al. 2015); one of these articles addresses multifaceted health care concerns beyond the biological level.

Berwick, DM, Nolan TW, Whittington J. The triple aim: care, health, and cost. Health Aff (Millwood). 2008;27(3):759-769.

In this article, Berwick sets forth the Triple Aim of health care: health care should focus on improving individual care, reducing cost, and improving population health. Achieving all three aims is important for improving the health of a population. However, individual providers often only have incentives to achieve one or two of the three aims. Berwick maintains that for health care to be sustainable for the population, all three objectives must be met. This can be achieved through “integrators” who incorporate all three aims simultaneously in their practice. Acting as central operators, integrators can improve coordination among individual providers and make the financial system more efficient, thus boosting the quality of care and improving population health while lowering costs.

Sinsky CA, Willard-Grace R, Schutzbank AM, Sinsky TA, Margolius D, Bodenheimer T. In search of joy in practice: a report of 23 high-functioning primary care practices. Ann Fam Med. 2013;11(3):272-278.

Bodenheimer T, Sinsky C. From triple to quadruple aim: care of the patient requires care of the provider. Ann Fam Med. 2014;12(6):573-576.

Sinsky and Bodenheimer’s work reveals the serious problem of physician burnout, especially in the primary care workforce. Indeed, approximately 70% of primary care physicians (PCPs) said they would choose a new specialty if given a chance to start over. The leading causes of burnout are paperwork and administrative duties, which, in many cases, do not require physicians’

professional training and could be shifted to non-physician care team members. PCP burnout has serious implications. It discourages medical students from going into primary care, thus exacerbating PCP shortages. It also negatively impacts patient care, leading to lower patient satisfaction and less adherence to treatment plans. Bodenheimer and Sinsky propose shifting from a physician-centric model to a team-based care model to address physician burnout and improve quality of care.

Link BG, Phelan J. Social conditions as fundamental causes of disease. J Health Soc Behav. 1995;35(Extra Issue):80-94.

Health inequalities between people of different socioeconomic status (SES) have long been recognized, but the reasons for these disparities remained unclear. Link and Phelan's seminal work elucidates this connection by showing that disparities persist because health is shaped by sociological processes, which are greatly affected by an individual's SES. Link and Phelan argue that because SES impacts an individual's access to resources (including money, power, and social network), SES is a fundamental determinant of health. In other words, someone of high SES possesses more resources and is better situated to obtain new information and adapt to new health risks than someone of lower SES. Thus, even if a particular risk factor (e.g., diet) or disease (e.g., tuberculosis) was eliminated, health disparities would endure. In order to alleviate the disparities, health care needs to account for the social factors that influence an individual's health. Primary care physicians are in the best position to decrease the adverse health effects of low SES by tailoring care on the basis of the patient's social background.

Flocke SA, Stange KC, Zyzanski SJ. The association of attributes of primary care with the delivery of clinical preventive services. Med Care. 1998;36(8):AS21-AS30.

Flocke and colleagues examine a sample of nearly 3,000 patients and 138 community-based primary care physicians (PCPs) to determine the relationship between the attributes of primary care and delivery of preventive care. This study specifically looks at patients' preference for their regular physician, interpersonal communication, accumulated knowledge of the patient (i.e., continuity), and coordination of care. Results suggest that higher interpersonal communication and care coordination scores correspond with up-to-date screening services, while continuity and preference for a regular physician are associated with more up-to-date immunizations. This study draws a clear connection between the tenets of primary care and the success of preventive medicine. PCPs continue to be the champions of preventive services, adding to the value of primary care.

Mokdad AH, Marks JS, Stroup DF, Gerberding JL. Actual causes of death in the United States, 2000. JAMA. 2004;291(10):1238-1245.

In this update of the seminal 1993 article *Actual Causes of Death in the United States* by McGinnis and Foege, Mokdad et al. extract the actual causes of death in the United States in 2000. Actual causes of death are defined as the "major external (non-genetic) modifiable factors that contributed to death in the United States." The researchers conducted a large MEDLINE search of English-language articles and found that the leading causes of death were heart disease, cancer, and stroke. However, more than half of the deaths were attributable to underlying root causes; tobacco resulted in 18.1% of deaths, while poor diet and physical inactivity resulted in 16.6% of deaths. By contrast, microbial agents—the target of America's biomedically focused health care—resulted in only 3.1% of deaths. Given that the root cause of death is often

preventable behavior, primary care providers are uniquely positioned to drastically improve outcomes with the effective use of preventive care.

Stange KC, Ferrer RL. The paradox of primary care. Ann Fam Med. 2009;7(4):293-299.

Much of the traditional ethos in medicine, which has undervalued primary care and overemphasized specialty care, arises from Stange and Ferrer's "paradox of primary care." As they describe it, the paradox is that primary care is associated with inferior quality of care for individual diseases; however, primary care achieves similar health outcomes at lower costs for people with chronic diseases, as well as better quality and cost outcomes for populations. This paradox arises from the interplay of reductionist and ecological fallacies, which affect current health care outcome evaluations. The clash between primary and specialty care exists as a result of inadequate analysis of the different levels and complexities of care outcomes. Disease-specific research is prone to the reductionist fallacy, whereby outcome measurements focus solely on the treatment of a specific disease. Primary care research, on the other hand, can fall prey to the ecological fallacy, whereby conclusions about individual diseases are drawn from population data. The value of primary care and specialty care is then obscured because each research enterprise gauges outcomes based on its own one-dimensional evaluation scheme. Stange and Ferrer argue that it is crucial to understand that health care should integrate information from both the disease level and the population level. Therefore, maximizing the value of health care necessitates integration of both specialty care and primary care. In assessing primary care and its relationship to the Triple Aim, value should not be viewed through a reductionist lens that focuses on individual diseases; rather, value should include considerations of population health as well. In the ideal system of complementary primary and specialty care, the real value of primary care lies in whole-person and population health, according to Stange and Ferrer.

Borrell-Carrió F, Suchman AL, Epstein RM. The biopsychosocial model 25 years later: principles, practice, and scientific inquiry. Ann Fam Med. 2004;2(6):576-582.

In this article, Borrell-Carrió et al. reexamine George Engel's biopsychosocial model and its impact on clinical practice and research in medicine. Engel's model is often considered a new medical paradigm because it rejects the biomedical-centric model of industrialized medicine in favor of a holistic approach that considers the biology, psychology, and sociology of illness. Engel's work abandoned the general reductionist trend discussed in Stange and Ferrer's "paradox of primary care" and the tendency in medicine to treat patients as objects; dehumanize and disempower them with exclusive focus on the biomedical issue; and ignore the subjective aspects of patient experience. Although it does not directly mention primary care or family medicine, this more modern take on the biopsychosocial model is a necessary inclusion because it informs the value of primary care. Like the article by Stange and Ferrer (above), this article is a clear reminder that value is multidimensional. Value in primary care—or any specialty—is not simply a matter of ending cellular disequilibrium, just as disease itself is not purely a product of a single-faceted biological problem. Good clinical care includes serious consideration of each patient's subjective experience and the impact of the patient's psychological state and social surroundings. Indeed, Borrell-Carrió and colleagues spend much of the article discussing the intimate relationship between the biopsychosocial model and relationship-centered care. As demonstrated by idealized models such as the Chronic Care Model and the patient-centered medical home (PCMH), primary care leads the way in adopting the holistic, biopsychosocial model with its sustained commitment to relationship-based, patient-centered care delivery.

Epstein RM, Fiscella K, Lesser CS, Stange KC. Why the nation needs a policy push on patient-centered health care. Health Aff (Millwood). 2010;29(8):1489-1495.

In this succinct work, Epstein et al. convincingly argue why the U.S. health care system should be patient centered. The authors emphasize that while “patient-centered” care appears to be an elusive concept, it can be defined. The authors state that patient-centered care should strive to achieve “a state of shared information, shared deliberation, and shared mind.” Patient-centered care depends on the patients and clinicians having a healing relationship in which clinicians know each patient as a person, thus allowing them to share information and make clinical decisions together. Patient-centered care is essential, because it not only improves patients’ experiences, but it has also been shown to improve medication adherence, disease outcomes, and quality of life without incurring additional costs. The best way to achieve patient-centered care is to build care infrastructure that enables easy communication among clinicians and flexibility to adapt to new situations. Patient-centered care is a tangible goal that can be measured and achieved. In the increasingly fragmented U.S. health care system, policy makers need to push for care that the public wants, which is care based on listening to and responding to patients’ needs. Primary care providers are in the best position to offer such care.

Katerndahl D, Wood R, Jaén CR. A method for estimating relative complexity of ambulatory care. Ann Fam Med. 2010; 8(4):341-347.

Katerndahl D, Wood R, Jaén CR. Complexity of ambulatory care across disciplines. Healthc (Amst). 2015;3(2):89-96.

Katerndahl et al. examine the relative complexity of patient encounters in ambulatory care settings across 14 different specialties, including family medicine; general internal medicine; pediatrics; obstetrics/gynecology; cardiology; dermatology; neurology; oncology; general and orthopedic surgery; urology; ophthalmology; ear, nose, and throat (ENT); and psychiatry. They utilize a measurement of complexity that takes into account volume, diversity, variability, and time limitations. General internal medicine and family medicine have the most complex encounters, especially in light of how short the visits generally are in these specialties. The high degree of encounter complexity in primary care demonstrates another unseen facet of the value of primary care, namely, that primary care and generalist physicians are responsible for managing a broad spectrum of complex patients. Primary care is not specific to a disease, symptom, or organ. Its value is in patient centeredness that allows for the care of diverse patients and conditions.

The Evolution of the Values of Primary Care

“One of the essential qualities of the clinician is interest in humanity, for the secret of the care of the patient is in caring for the patient.”

-Dr. Francis Peabody, The Care of the Patient

“The good physician treats the disease; the great physician treats the patient who has the disease.”

-Sir William Osler

A discussion of the historical legacy of primary care may initially seem out of place in a resource exploring the value of primary care for achieving the Triple Aim. Indeed, the articles in the following section offer little explicit quantitative or qualitative evidence for the value of primary care. Nonetheless, these articles trace the historical trajectory of the primary care function and represent the links that connect Peabody and Osler's historical generalism to modern primary care. Moreover, these works define Starfield's pillars of primary care. It is impossible to substantiate the value of primary care without first outlining the literature that led to the creation of its underlying principles. Many of these works explain why primary care should be the foundation of health care systems (Lord Dawson of Penn 1920, White et al. 1961, Green et al. 2001, Donaldson et al. 1996, Institute of Medicine [IOM] 2001, World Health Organization [WHO] 1978, WHO 2008). Others trace primary care's integration with community-oriented primary care (COPC) and public health (Millis 1966, American Medical Association 1966 [the "Willard Report"], National Commission on Community Health Services 1967 [the "Folsom Report"], The Folsom Group 2012, Longlett et al. 2001, IOM 2012).

Lord Dawson of Penn. Ministry of Health. Consultative Council on Medical Allied Services. Interim report on the future provision of medical and allied service. London: His Majesty's Stationery Office; 1920.

In this foundational piece, Lord Dawson makes a number of recommendations for community health programs and argues for an increased role and proper infrastructural support for the "general practitioner." As medicine advances, the lines between preventive and curative medicine, as well as the lines between individual and community health, are blurring and becoming interconnected. According to this report, the general practitioner alone is equipped to offer preventive medicine and reorient the individual-based practice to a community-based practice. Lord Dawson's recommendations in 1920 were the origin of many public health and preventive medicine recommendations that were made in the next century.

White KL, Williams TF, Greenberg BG. The ecology of medical care. N Engl J Med. 1961; 265(18):885-892.

Green LA, Fryer GE Jr, Yawn BP, Lanier D, Dovey SM. The ecology of medical care revisited. N Engl J Med. 2001;344(26):2021-2025.

In these seminal works, White, Green, and colleagues define the "ecology of medical care" by describing the general rates of utilization at different hierarchical levels of the health care system. Relying on data from different studies in the United States and the United Kingdom, White et al. determine that in a given month, out of 1,000 adults, "750 will experience an episode of illness, 250 of these will consult a physician, [nine] will be hospitalized, [five] will be referred to another physician, and [one] will be referred to a university medical center." These numbers are admittedly rough estimates, but they depict the general rates at which patients access different levels of the health care system. Green et al. utilize updated and less disparate data to reinvestigate the ecology of medical care. They state, "Of 1,000 men, women, and children in the United States, we estimated that on average each month, 800 experience symptoms, 327 consider seeking medical care, 217 visit a physician in the office (113 visit a primary care physician and 104 visit other specialists), 65 visit a professional provider of complementary or alternative medical care, 21 visit a hospital-based outpatient clinic, 14 receive professional health services at home, 13 receive care in an emergency department, [eight] are hospitalized, and less than [one] (0.7) is admitted to an [academic medical center] hospital." From this foundational work comes

the notion that primary care is the workhorse of the medical system, engaging the vast majority of patients. White, Green, and colleagues describe an ecology of medical care that demonstrates primary care's pivotal role as the principal point of entry into health care for patients, as well as the need for research in this space to better define and understand components of care.

Longlett SK, Kruse JE, Wesley RM. Community-oriented primary care: historical perspective. J Am Board Fam Pract. 2001;14(1):54-63.

Longlett and colleagues chronicle the long history of community-oriented primary care (COPC) and its development in the United States. The concept of COPC originated with Will Pickles, the "Grand Old Man of General Practice," in the 1920s and 1930s. Pickles described community-based population health interventions that formed the foundation for modern COPC. In the 1940s in South Africa, Sydney and Emily Kark devised the term "community-oriented primary health care," which was eventually shortened to "community-oriented primary care." The Karks focused their efforts on interventions such as the provision of basic sanitation and improvements in nutrition in impoverished communities; their interventions were unprecedented globally. Spurred by political turmoil in South Africa, the Karks' immigration to the United States and Israel began the spread of the ideas of COPC. Longlett et al. describe the gradual recognition of COPC in the United States, as well as continued complications in its application to primary care systems. As Rick Glazier described in an interview, countries like Canada and the United States have fully adopted COPC, insofar as primary care physicians recognize their responsibility to the population health of their patients. However, there is less general acceptance of the fundamental ideal of COPC, which is that community orientation encompasses a concern for *all* members of a community, not simply those individuals who frequent the halls of a clinic.

Millis JS. The graduate education of physicians. The report of the Citizens Commission on Graduate Medical Education. Chicago, Ill: American Medical Association; 1966.

Along with the Willard and Folsom reports, the Millis Report represents one of the most important defining works in primary care history. Responding to calls for every individual to have a "primary physician," the report was commissioned by the American Medical Association (AMA). The report provides a robust foundation for the graduate medical education of primary care physicians. It calls for the creation of "family practice" as a board-certified specialty. Provisions requiring periodic recertification show the commission's commitment to create a legitimate and rigorous family medicine specialty. The report also introduces the need for evidence-based medicine to help family physicians fulfill their increasingly comprehensive roles and manage rapid medical advances. Ultimately, the work of Millis and colleagues created the infrastructure upon which family medicine training grew.

American Medical Association. Ad Hoc Committee on Education for Family Practice. Council on Medical Education. Meeting the challenge of family practice. Chicago, Ill: American Medical Association; 1966.

Sponsored by the American Medical Association (AMA), this report (also known as "the Willard Report") aimed to revive and improve the concept of the "general practitioner." Like the Millis and colleagues, Willard et al. recognized the call for "primary physicians" and, through a synthesis of expert opinions, created the concept of the family physician. The family physician "would work in both individual health service and in partnership with families and communities, using diagnostic and epidemiologic skills" (Larry Green, MD), which is basically identical to the

personal physician concept described in the Folsom Report. Much of the Willard report focuses on further defining the unique nature of family physicians and their invaluable role as comprehensive health managers who balance the growing emphasis on specialty care. Willard's family physician—together with Folsom's personal physician—epitomizes the past, present, and future of the family medicine physician in the United States.

National Commission on Community Health Services. Health is a community affair. Cambridge, Mass: Harvard University Press; 1967.

The Folsom Group. Communities of solution: the Folsom Report revisited. Ann Fam Med. 2012;10(3):250-260.

The Folsom Group returns to the seminal 1967 National Commission on Community Health Services report *Health is a Community Affair* (also known as “the Folsom Report”) for old but salient recommendations for improving U.S. health care following the Patient Protection and Affordable Care Act (ACA). The authors note that, although the ACA incorporates steps to support patient centeredness and bolster a dwindling primary care workforce, it includes no real blueprint for the implementation of “integrated, community health services that meet the unique needs of every community.” The Folsom Group summarizes the legacy of the Folsom Report and argues for the implementation of its ideals to remedy some of the current inadequacies of the U.S. health care system. The revisitation piece is particularly timely because it suggests the integration of primary care and public health, and promotes the concept of the personal physician. More specifically, the report introduces the idea of a “community of solution,” stating that community health systems must be community oriented to manage highly complex and multifaceted problems. Policy makers have implemented a number of recommendations from the Folsom Report, such as developing community health centers, creating the National Health Service Corps, and establishing “family practice” (i.e., family medicine) as a new specialty. However, as The Folsom Group describes, the current lack of economic sustainability of the health care system, a more established primary care workforce, and the explosion in health information technology (HIT) have opened a window for full modern implementation of the “communities of solution” of the original Folsom Report. The Folsom Report and the revisitation article by The Folsom Group demonstrate the long-term trajectory of the integration of public health and primary care, as well as of the enduring call for personal physicians.

Together, the Millis, Willard, and Folsom reports form much of the foundation of modern primary care and family medicine. These reports underscore the need for some type of personal physician who is oriented toward a relationship with the patient and the community.

Donaldson MS, Yordy KD, Lohr KN, Vanselow NA, eds. Primary care: America's health in a new era. Washington, DC: National Academies Press; 1996.

This seminal Institute of Medicine (IOM) report proposed a redefinition of primary care, which has been widely adopted. The Committee on the Future of Primary Care defines primary care as “the provision of integrated, accessible health care services by clinicians who are accountable for addressing a large majority of personal health care needs, developing a sustained partnership with patients, and practicing in the context of family and community.” The committee stresses the patient-physician relationship and the focus on patients' communities as invaluable aspects of primary care. Moreover, as health care becomes increasingly complex, primary care physicians serve as guides for patients navigating the confusing health care system. The committee believes

primary care is essential to health care as “a logical foundation of an effective health care system.” Efforts to bolster primary care in America are central to improving quality of care and population health, and potentially lowering costs.

Institute of Medicine. Committee on Quality of Health Care in America. Crossing the quality chasm: a new health system for the 21st century. Washington, DC: National Academies Press; 2001.

The fragmentation and ineffectiveness of the current health care system is well known. The IOM committee vividly illustrates that there is a chasm between the current health care system and the effective, coordinated system that America wants. The gap is ever growing, fueled by the overly complex system and a worsening chronic disease epidemic. The committee presents six goals for health care, including timely access, efficient delivery, and patient-centered care. They also recommend 10 principles for redesigning health care; these include transparency, coordination, and patient centeredness. The committee also lays out broad systemic changes that need to occur, such as facilitating translation of scientific evidence into practice, increasing use of information technology (IT), aligning payment incentives with delivery, and improving the preparation of the workforce. The committee warns that the chasm will continue to grow, but an effective health care system can be attained by building a more robust primary care foundation and implementing numerous other reforms.

World Health Organization, and United Nations Children’s Fund. Primary health care. Geneva: World Health Organization; 1978.

World Health Organization. The world health report 2008—primary health care: now more than ever. Geneva: World Health Organization; 2008.

The Declaration of Alma-Ata in 1978 was the first international acknowledgement of primary health care’s (PHC’s) importance, stating that PHC should serve as the foundation of all national health care systems. Recognizing that health is shaped by social processes, the International Conference on Primary Health Care declared that people-centered and community-oriented PHC models “have the potential to” alleviate social inequalities. At the time the report was published, this concept was radical. Unfortunately, PHC has been misconstrued by many as medical care for the poor, which has ultimately impeded its successful implementation. However, in 2008, the World Health Organization (WHO) renewed its efforts to push for PHC because of several concerning trends: growing health disparities; increasing complexity of illnesses; and skyrocketing costs. Moreover, current health care focuses on treating single diseases and achieving short-term results, not on overall health. Many citizens are dissatisfied with their countries’ health care systems and are steadily recognizing the value of PHC, which has garnered unprecedented global attention. Its implementation is essential “now more than ever.” The WHO reminds us that PHC should not be oversimplified; it is an ideological shift from disease-focused health care to people-centered health care. Overall, the WHO maintains that PHC is a feasible approach for tackling today’s complex health problems insofar as it offers affordable, quality care to all populations.

Institute of Medicine. Committee on Integrating Primary Care and Public Health. Primary care and public health: exploring integration to improve population health. Washington, DC: National Academies Press; 2012.

The Committee on Integrating Primary Care and Public Health issued this report at the request of the Health Resources and Services Administration (HRSA) and Centers for Disease Control and Prevention (CDC). The committee emphasizes the importance of integrating primary care and public health, especially in the public sector. They maintain that integration would foster information sharing between the two entities; for example, primary care can receive information about population health and tailor treatment accordingly, while public health can gather patient information for monitoring purposes. The committee admits that “the evidence base supporting integration is not robust,” due to the low number of studies that have examined such integration. However, with articles and case studies, the committee illustrates how integration can help health care achieve the Triple Aim. The committee makes many recommendations for HRSA and the CDC to realize this integration. Despite the historic chasm between primary care and public health, this IOM report represents significant progress in joining together these two functions to improve health care.

Brief Evaluation: Linking Primary Care and the Triple Aim

This section presents a sneak peak of the literature connecting primary care and the Triple Aim. Only the most influential works are presented here. A more in-depth analysis of this connection is presented in Part III of this bibliography.

Starfield B, Shi L, Macinko J. Contribution of primary care to health systems and health. Milbank Q. 2005;83(3):457-502.

This is likely the most important article in defining the value of primary care. Starfield et al. unabashedly lay out why primary care should be the foundation of health care. Their extensive literature review and quantitative focus consistently illustrate the significant role primary care has in improving people’s health. The authors robustly support each argument with multiple studies from locales, counties, and states throughout the United States and in other countries. They clearly show that an increase in the number of primary care physicians results in better health outcomes, and sufficient primary care decreases the impact of socioeconomic disparity on health. Moreover, populations that have primary care as their regular source of care have significantly lower mortality. Primary care is also associated with lower health expenses. Starfield and colleagues further demonstrate that primary care can provide preventive care that decreases the need for an excessive amount of specialty care. In one of the first studies to use data to comprehensively describe the value of primary care, Starfield et al. revolutionize primary care research. They also send a clear message to policy makers that primary care is the solution to a better health care system because it can achieve seemingly impossible results: better quality of care and population health at an affordable rate.

Phillips RL Jr, Bazemore AW. Primary care and why it matters for U.S. health system reform. Health Aff (Millwood). 2010;29(5):806-810.

Phillips and Bazemore’s work functions as a landscape analysis of modern primary care. This article includes numerous important and interconnected sections: an exploration of the historical evolution of primary care; an overview of the underlying systemic value of primary care; a discussion of current funding and workforce inadequacies; and a brief introduction to new trends and delivery models. Phillips and Bazemore’s work is an effective overview of the state of

primary care within the modern health care system, and it links many of the issues discussed in Part II of this bibliography.

PART II: THE PRIMARY CARE LANDSCAPE

In Part II, we explore the current primary care landscape and present emerging themes. The presentation format in this section is different from that of Part I. For each key topic area, there is a summary of the area's current status, compiled from expert opinions and our own literature search. Following the summary, a list of representative literature is presented, with a short description of each article's findings. While each topic area is presented separately, they often overlap and interact with one another. For example, technology can enhance delivery, ease the integration with public health or mental health, and facilitate coordination with other health care professionals. We strove to point out such overlap in each area. Our hope is that this section will give readers an understanding of the academic consensus regarding primary care, as well its multifaceted nature.

Workforce

It is well documented that there is a primary care provider shortage and that the shortage will intensify in the next 20 years. The shortage is caused a number of factors, including the large income gap between primary care physicians and subspecialty physicians, and serious burnout among primary care physicians (PCPs). Both of these factors discourage medical students from pursuing primary care. The poor geographic distribution of physicians is also a problem, resulting in many areas with provider shortages and, consequently, poor quality of care and population health. To remedy the shortage, governmental programs such as scholarships and loan repayment programs are needed to spur medical students' interest in primary care. Increasing numbers of nurse practitioners (NPs) and physician assistants (PAs) may also help alleviate the shortage as their autonomy increases. With the rise in popularity of team-based care delivery, physicians' training also needs to adapt, so that future physicians can collaborate smoothly with other health care professionals.

Bodenheimer T, Pham HH. Primary care: current problems and proposed solutions. Health Aff (Millwood). 2010;29(5):799-805.

This is an excellent overview of the current problems within the primary care workforce. The authors point out that an overall shortage and poor geographic distribution of PCPs cut patients off from timely access to primary care. The authors emphasize that physicians can increase their patient panel size by utilizing team-based care, as well as by increasing the number of non-physician providers and delegating more responsibility to them.

Sinsky CA, Willard-Grace R, Schutzbank AM, Sinsky TA, Margolius D, Bodenheimer T. In search of joy in practice: a report of 23 high-functioning primary care practices. Ann Fam Med. 2013;11(3):272-278.

Sinsky et al.'s work reveals the serious problem of physician burnout, which is usually caused by excessive amounts of administrative work. Physician burnout needs to be addressed because it has been shown to negatively impact the quality of care and patients' outcomes.

Petterson SM, Phillips RL Jr, Bazemore AW, Koinis GT. Unequal distribution of the U.S. primary care workforce. Am Fam Physician. 2013;87(11): Online. National Association of Community Health Centers (NACHC), The Robert Graham Center for Policy Studies in Family Medicine and Primary Care, Capital Link. Access granted: the primary care payoff. Washington, DC: NACHC and Graham Center; 2007.

Petterson et al. summarize the geographical maldistribution of PCPs in the United States; there are few PCPs in rural and inner-city areas, where they are greatly needed. The maldistribution has caused almost 20% of Americans to become “medically disenfranchised” (i.e., individuals who do not have easy access to good primary care).

Bodenheimer T, Chen E, Bennett HD. Confronting the growing burden of chronic disease: can the U.S. health care workforce do the job? Health Aff (Millwood). 2009;28(1):64-74.

The authors explain why patients who have chronic diseases are best treated by a multidisciplinary team of PCP and public health workers, advocating for coordination among these groups. The authors also show that the rise of nurse practitioners (NPs) and physician assistants (PAs) may not completely eliminate the PCP shortage.

Petterson SM, Phillips RL Jr, Bazemore AW, Teevan Burke B, Koinis GT. Relying on NPs and PAs does not avoid the need for policy solutions for primary care. Am Fam Physician. 2013;88(4):230.

The authors find that an increasing proportion of NPs and PAs are not practicing in primary care, preferring to work in other specialties. Thus, policy makers should not continue to expect that NPs and PAs can fill the PCP workforce gap.

Green LV, Savin S, Lu Y. Primary care physician shortages could be eliminated through use of teams, nonphysicians, and electronic communication. Health Aff (Millwood). 2013;32(1):11-19.

The authors use simulation methods to show that if PCPs share patient responsibilities with other physicians and coordinate with other health care professionals, each physician can have a larger panel size and still provide patients with timely access to care. The authors conclude that transitioning to team-based care can eliminate most of the projected PCP shortage.

Schuetz B, Mann E, Everett W. Educating health professionals collaboratively for team-based primary care. Health Aff (Millwood). 2010;29(8):1476-1480.

The authors argue that the education of physicians should become “collaborative education,” emphasizing training that fosters collaboration among different health care professionals. As health care is increasingly delivered by a team, physicians’ education should help them adapt to working within a team.

New Models of Primary Care Delivery

Many innovations in primary care delivery have been proposed to combat the fragmented delivery of the current health care system. Below, we describe a few of the most popular models.

Patient-Centered Medical Home

The delivery model that has garnered the most attention recently is the patient-centered medical home (PCMH). The PCMH emphasizes the core tenets of primary care, describing a team-based approach to delivering primary care that is accessible, comprehensive, coordinated, and patient centered. While people have different expectations regarding what a PCMH should accomplish, the general model has been endorsed by multiple physician and commercial organizations. Evidence of the effectiveness of the PCMH is mixed: the model has been found to improve health, but its effect on cost is less clear. However, lasting support for PCMH implementation

represents continued support for primary care. The PCMH is being continually implemented and refined in multiple state-level demonstration projects, and the evidence for PCMH continues to grow.

Patient-Centered Primary Care Collaborative. Joint principles of the patient-centered medical home. Washington, DC: Patient-Centered Primary Care Collaborative; 2007.

This document presented by the American Academy of Family Physicians (AAFP), American Academy of Pediatrics (AAP), American College of Physicians (ACP), and American Osteopathic Association (AOA) lays out a brief history of the PCMH and its core values. The joint principles are the foundation of the recent PCMH movement and suggest the community's underlying commitment to the core tenets of primary care.

American Academy of Pediatrics Ad Hoc Task Force on Definition of the Medical Home. The medical home. Pediatrics. 1992;90(5):774.

The AAP issued this report as a reminder that children should have access to medical homes so that they can receive continuous care. The report also lays out services that these medical homes should offer in order to deliver care that adheres to the core tenets of primary care.

Stange KC, Nutting PA, Miller WL, et al. Defining and measuring the patient-centered medical home. J Gen Intern Med. 2010;25(6):601-612.

Using a multi-method approach, the authors developed measurements for assessing the “medical-homeness” of a particular PCMH. The authors propose evaluating each attribute of a PCMH that was laid out in the *Joint Principles of the Patient-Centered Medical Home*.

Berenson RA, Hammons T, Gans DN, et al. A house is not a home: keeping patients at the center of practice redesign. Health Aff (Millwood). 2008;27(5):1219-1230.

The authors discuss the different expectations surrounding what a PCMH should accomplish. Some believe a PCMH should focus on delivering patient-centered care, while others see care coordination as the ultimate goal of a PCMH.

Rosenthal TC. The medical home: growing evidence to support a new approach to primary care. J Am Board Fam Med. 2008;21(5):427-440.

The author conducted an extensive literature review of more than 200 references to evaluate studies of existing medical homes according to the PCMH attributes laid out in the *Joint Principles of the Patient-Centered Medical Home*. The author found that, overall, the PCMH does improve the quality of care and patient satisfaction, but an alternative payment model needs to be developed to support PCMH implementation.

Grumbach K, Grundy P. Outcomes of implementing patient-centered medical home interventions: A review of the evidence from prospective evaluation studies in the United States. <http://www.cms.org/uploads/GrumbachGrundy2010OutcomesPCPCC.pdf>. Accessed October 29, 2015.

This large evidence review provides a significant amount of data and evidence for the benefits of the PCMH.

Nielsen M, Langner B, Zema C, Hacker T, Grundy P. *Benefits of implementing the primary care patient-centered medical home: a review of cost & quality results, 2012.*

https://www.pcpcc.org/sites/default/files/media/benefits_of_implementing_the_primary_care_pcmh.pdf. Accessed October 29, 2015.

This is another review by the Patient-Centered Primary Care Collaborative (PCPCC) of PCMH interventions and their impact on Triple Aim goals.

Friedberg MW, Schneider EC, Rosenthal MB, Volpp KG, Werner RM. *Association between participation in a multipayer medical home intervention and changes in quality, utilization, and costs of care. JAMA. 2014;311(8):815-825.*

The authors evaluate the Pennsylvania Chronic Care Initiative (PACCI), a statewide multipayer medical home intervention that sought to improve care with technical assistance and financial incentives. Practices in the pilot group reported improvement in outcomes but not in cost.

Nielsen M, Gibson A, Buelt L, Grundy P, Grumbach K. *The patient-centered medical home's impact on cost and quality: annual review of evidence 2013–2014. Washington, DC: Patient-Centered Primary Care Collaborative; 2015.*

In this report, the PCPCC reviews PCMH initiatives from late 2013 through 2014. The literature review reveals that in more than half of the 28 published studies, the PCMH reduced inappropriate ED utilization and cut costs of care.

Chronic Care Model

The Chronic Care Model (CCM) is another model that has robust support in the primary care community. The CCM is quite old, having emerged from a movement in the 1990s that aimed to improve care for millions of Americans living with chronic illness. The rise of the CCM marks a significant paradigm shift away from the biomedical model of medical care toward care that seeks to maximize quality of life through prevention services and health maintenance. The CCM's growth in primary care has pushed providers to deliver more effective and comprehensive care of chronic illnesses. The CCM's focus on treating chronic diseases has been integrated into the current PCMH movement, thus broadening the scope and benefits that primary care can provide.

Wagner EH, Austin BT, Von Korff M. *Organizing care for patients with chronic illness. Milbank Q. 1996;74(4):511-544.*

Motivated by the severe lack of care for individuals who had chronic conditions at the time, Wagner et al. presented a model of care redesigned to address the urgent needs of these patients. Wagner's model has become the standard for how chronic care should be delivered in primary care.

Bodenheimer T, Wagner EH, Grumbach K. *Improving primary care for patients with chronic illness. JAMA. 2002;288(14):1775-1779.*

Bodenheimer T, Wagner EH, Grumbach K. *Improving primary care for patients with chronic illness: the Chronic Care Model, part 2. JAMA. 2002;288(15):1909-1914.*

Bodenheimer et al. lay out the essential elements of the CCM. In the highly cited second article in the two-part series, the authors conducted a comprehensive literature review and found that in the majority of studies, the CCM resulted in improved outcomes and reduced costs.

Coleman K, Austin BH, Brach C, Wagner EH. Evidence on the Chronic Care Model in the new millennium. Health Aff (Millwood). 2009;28(1):75-85.

Coleman et al. conducted a literature review of articles regarding the CCM published from 2000–2009 and reported that the evidence for improved care and outcomes is not definitive and needs additional research. However, results suggest that redesigning practices to incorporate the CCM will improve the quality of care. Additionally, despite significant up-front costs for reorganization, the CCM appears to be cost effective from a societal standpoint.

Improving Chronic Illness Care website. <http://www.improvingchroniccare.org/>. Accessed October 30, 2015.

The website of Improving Chronic Illness Care, a Robert Wood Johnson Foundation program, reports on the current status of CCM implementation and research.

Teamlet Model and Health Coaching

A growing trend running parallel to the PCMH movement emphasizes the growing importance of non-physician providers. A number of different interventions are granting non-physician providers additional responsibilities in an attempt to offset physicians' overload. Some non-physician providers are being retrained as health coaches who work to actively engage patients and guide them through both the health care system and their own care plans.

Bodenheimer T, Laing BY. The teamlet model of primary care. Ann Fam Med. 2007;5(5):457-461.

In the teamlet model, non-physician providers are retrained as health coaches who meet with patients before, after, and between visits to facilitate patient flow and allow more efficient use of physicians' time without sacrificing continuity or comprehensiveness.

Thom DH, Hessler D, Willard-Grace R, et al. Does health coaching change patients' trust in their primary care provider? Patient Educ Couns. 2014;96(1):135-138.

The study reports that patients who received health coaching in primary care settings trusted their providers more. This result suggests that utilizing health coaches may improve patients' experience of care.

Kivelä K, Elo S, Kyngäs H, Kääriäinen M. The effects of health coaching on adult patients with chronic diseases: A systematic review. Patient Educ. 2014;97(2):147-157.

Kivela et al. conducted a literature review to examine the impact of health coaches on patients with chronic diseases. Their review found that health coaching improved patient's physiological, behavioral, psychological, and social health. However, more research is needed to determine health coaching's long-term effects and cost effectiveness.

Phillips RL Jr, Han M, Petterson SM, Makaroff LA, Liaw WR. Cost, utilization, and quality of care: an evaluation of Illinois' Medicaid primary care case management program. Ann Fam Med. 2014;12(5):408-417.

Phillips et al. evaluated the Medicaid program in Illinois that focused on case management interventions. Significant costs savings, reductions in utilization, and improved quality of care associated with the case management interventions were reported.

Hot-spotting

A model that is quickly gaining traction in the primary care community, hot-spotting involves identifying and treating “high utilizers” (i.e., patients who frequently visit the emergency department [ED]). High utilizers are identified through electronic health record (EHR) data mining. A case manager intervenes in high utilizers’ vicious cycle of going in and out of the ED, coordinating the patients’ care to ensure coordination and continuity. Case management of high utilizers has been shown to be effective in improving patients’ health and decreasing spending. While case management is not exclusively part of primary care, primary care providers are in the best position to provide comprehensive and continuous management of high utilizers, thus improving patients’ health and decreasing overall costs.

Hunt KA, Weber EJ, Showstack JA, Colby DC, Callaham ML. Characteristics of frequent users of emergency departments. Ann Emerg Med. 2006;48(1):1-8.

The authors analyzed data from a population-based survey and found that frequent users of the ED only comprise 8% of the population but are responsible for 28% of adult ED visits. The authors also show that frequent users tend to have low income, and poor physical and mental health.

Okin RL, Boccellari A, Azocar F, et al. The effects of clinical case management on hospital service use among ED frequent users. Am J Emerg Med. 2000;18(5):603-608.

A case manager, in collaboration with a primary care provider, carried out a comprehensive case management intervention that provided housing, psychotherapy, and other treatments for high utilizers. The intervention was found to decrease ED utilization and overall costs, and improve patients’ mental health.

Simon GE, Manning WG, Katzelnick DJ, Pearson SD, Henk HJ, Helstad CS. Cost-effectiveness of systematic depression treatment for high utilizers of general medical care. Arch Gen Psychiatry. 2001;58(2):181-187.

The authors report that treating high utilizers with a depression management program significantly improved their mental well-being. Since high utilizers of health care are more susceptible to mental disorders, providing them with mental health treatment is essential to improve their health outcomes and decrease their utilization of the ED.

Sadowski LS, Kee RA, VanderWeele TJ, Buchanan D. Effect of a housing and case management program on emergency department visits and hospitalizations among chronically ill homeless adults: a randomized trial. JAMA. 2009;301(17):1771-1778.

Homeless adults, who are far more likely to have chronic medical conditions, are often high utilizers of the ED. A housing and care management intervention for chronically ill, homeless adults was found to significantly decrease ED utilization and may save money for the health care system in the long run.

Gawande, A. The hot spotters. New Yorker. January 24, 2011;41-51.

Atul Gawande describes how family physician Jeffrey Brenner, MD, started “hot-spotting,” using health data to identify and treat patients who are “super utilizers” of the health care system.

Hot-spotting has improved the health of these patients dramatically and can significantly cut costs; one practice cut costs by 25%. This article captured much attention nationally.

Payment Models

Complete health care delivery reform would not be possible without reforming fee-for-service (FFS), the current payment methodology, which encourages fragmentation and volume of care. There is national consensus that FFS must be changed to reform the health care system. Alternative payment models (APMs) such as pay for performance (P4P) and shared savings, are value based. P4P involves financially rewarding providers for meeting certain quality measures, while shared savings rewards providers if they spend less on patients. Both aim to correct incentives without revamping the existing FFS model. Evidence suggests that neither significantly improves care or cuts costs, although P4P is very popular politically. Another APM is bundled payment, in which multiple services for a particular medical condition are bundled and paid together. While bundled payment has been shown to effectively reduce costs by encouraging coordination, it involves complicated logistics that make bundled payments hard to implement successfully. Reference pricing is a new and promising APM in which payers would only reimburse for a procedure up to a competitive price. More studies are needed, but reference pricing has resulted in providers charging less for certain surgical procedures and medications, which has resulted in lower overall costs.

Miller HD. From volume to value: better ways to pay for health care. Health Aff (Millwood). 2009;28(5):1418-1428.

Miller reviews the different APMs on the spectrum between FFS and full capitation, especially focusing on episode-of-care and risk-adjusted capitation. He also discusses why certain medical conditions are more suited to a particular APM.

Oregon's Office for Health Policy and Research. Healthcare payment reform: alternative payment methodologies. June 2013. http://www.oregon.gov/oha/ohpr/rsch/docs/alternativepaymentmethodologiesreport_june2013.pdf. Accessed October 29, 2015.

This report evaluates completed and ongoing statewide and nationwide APM studies. Bundled payment was found to improve both quality and costs, while shared savings, P4P, and PCMH only improved quality.

Rosenthal MB, Frank RG, Li Z, Epstein AM. Early experience with pay-for-performance: from concept to practice. JAMA. 2005;294(14):1788-1793.

The authors conducted a large natural experiment on 300 large physician organizations and found that a small P4P (5% of capitation payments) did not produce significant increases in quality. The authors suggest that the financial reward of P4P may need to be substantially increased to see significant improvements in quality.

Campbell SM, Reeves D, Kontopantelis E, Sibbald B, Roland M. Effects of pay for performance on the quality of primary care in England. N Engl J Med. 2009;361(4):368-378.

The authors investigate the P4P intervention in primary care introduced by the government of the United Kingdom in 2004. They found that the intervention did accelerate improvements, but the improvements did not continue once quality measures were achieved.

Nelson L. Lessons from Medicare's demonstration projects on value-based payment. January 2012. https://www.cbo.gov/sites/default/files/112th-congress-2011-2012/workingpaper/WP2012-02_Nelson_Medicare_VBP_Demonstrations_1.pdf. Accessed October 29, 2015.

Physician Group Practice (PGP) is a notable Medicare demonstration project commissioned by the Centers for Medicare & Medicaid Services (CMS) that implemented shared savings and P4P interventions in 10 large providers. Most groups did improve their care to meet the P4P quality measures, but the author suspects that the groups might have met the measures even without the intervention. The project also did not result in cost savings for Medicare.

*Schneeweiss S, Walker AM, Glynn RJ, Maclure M, Dormuth C, Soumerai SB. Outcomes of reference pricing for angiotensin-converting-enzyme inhibitors. *N Engl J Med*. 2002;346(11):822-829.*

In 1997, British Columbia, Canada, introduced reference pricing for angiotensin-converting enzyme (ACE) inhibitors for elderly patients. The authors studied approximately 37,000 patients and found that patients did not stop treatment because of the new policy. Moreover, health care utilization did not increase, so cheaper medications appeared to be as effective as more expensive medications.

*Robinson JC, Brown TT. Increases in consumer cost sharing redirect patient volumes and reduce hospital prices for orthopedic surgery. *Health Aff (Millwood)*. 2013;32(8):1392-1397.*

In 2011, the California Public Employees' Retirement System (CalPERS) implemented reference pricing by setting a payment limit for knee and hip surgeries. The policy caused providers to lower the cost of surgery for CalPERS members significantly, saving money for both CalPERS and its members.

Delivery and Payment: Integrated Models

Certain delivery models have been paired with specific APMs to align the payment and delivery incentives. Payment models that have been implemented with the PCMH range from slightly traditional FFS with some adjustments to full capitation. However, successful implementation of the PCMH requires APMs that value care coordination. One model that has integrated delivery and payment reform is direct primary care (DPC), a fully capitated system in which patients pay providers a monthly fee directly, thus eliminating third-party payers. Providers give patients comprehensive primary care services. Direct primary care has entered mainstream conversation, and some believe that it is the best way to deliver primary care. No studies have evaluated DPC, but DPC providers claim that they improve patients' health, increase patients' and physicians' satisfaction, and lower costs. There have also been ambitious experiments that combine delivery and payment innovations. Many have been initiated by the Center for Medicare & Medicaid Innovation (CMMI), established by the ACA. Results from these experiments have the potential to influence how primary care will be improved in the future.

Bailit M, Phillips K, Long A. Paying for the medical home: payment models to support patient-centered medical home transformation in the safety net. Seattle, Wash.: Bailit Health Purchasing and Qualis Health; 2010. <http://www.co.fresno.ca.us/viewdocument.aspx?id=47520>. Accessed October 29, 2015.

This report compares and contrasts 10 payment models for the PCMH, ranging from modified FFS to full capitation. One model does not appear to emerge as the best payment model for the PCMH.

Patient-Centered Primary Care Collaborative Payment Reform Task Force. Payment reform to support high-performing practice: report of the Payment Reform Task Force. Washington, DC: Patient-Centered Primary Care Collaborative; 2010.

<https://www.pcpcc.org/sites/default/files/media/paymentreformpub.pdf>. Accessed October 29, 2015.

In this PCPCC report, current payment models of PCMH are evaluated based on the core tenets of primary care as well as the ease of implementation of each model. The authors also present recommendations for refining payment models for PCMH.

Wu WN, Bliss G, Bliss EB, Green LA. Practice profile. A direct primary care medical home: the Qliance experience. Health Aff (Millwood). 2010;29(5):959-962.

Von Drehle D. Medicine is about to get personal. Time. December 22, 2014.

The *Health Affairs* article and *Time* narrative describe Qliance, a DPC practice in Seattle, WA. The authors report that Qliance has seen staggering improvements in patient and provider satisfaction, patient outcomes, and overall costs.

McCorry D. Direct primary care: an innovative alternative to conventional health insurance.

<http://www.heritage.org/research/reports/2014/08/direct-primary-care-an-innovative-alternative-to-conventional-health-insurance>. Accessed October 29, 2015.

McCorry provides an in-depth analysis of the benefits and costs of DPC, including associated legal obstacles and policy recommendations for the successful implementation of direct primary care.

Taylor EF, Dale S, Peikes D, et al. Evaluation of the Comprehensive Primary Care Initiative: first annual report. Princeton, NJ: Mathematica Policy Research; 2015.

Comprehensive Primary Care (CPC) is a CMS initiative launched in 2012 that seeks to innovate and transform primary care in almost 500 practices. The initiative provides delivery (i.e., technical support and data feedback) and financial support (i.e., monthly payments and shared savings). The ambitious initiative is ongoing, but improved outcomes and decreased utilization have been reported.

Patient-Centered Primary Care Collaborative. Multi-payer advanced primary care practice (MAPCP). <https://www.pcpcc.org/initiative/multi-payer-advanced-primary-care-practice-mapcp>. Accessed October 29, 2015.

In the Multi-Payer Advanced Primary Care Practice (MAPCP) initiative, advanced primary care, which emphasizes continuity and integration, was evaluated in participating practices in eight states. The providers were paid according to a FFS payment model, supplemented with P4P and shared savings. The initiative is ongoing, but so far cost savings have been reported.

McCarthy D, Mueller K. Community Care of North Carolina: building community systems of care through state and local partnerships. June 2009.

http://www.commonwealthfund.org/~media/Files/Publications/Case%20Study/2009/Jun/1219_McCarthy_CCNC_case_study_624_update.pdf. Accessed October 29, 2015.

Community Care of North Carolina (CCNC) is a partnership between the state and community care networks that function as PCMHs to provide high quality primary care for those enrolled in Medicaid or the Children's Health Insurance Program (CHIP). CCNC has improved health outcomes of patients, and it saved nearly \$1 billion from 2007 to 2010.

Technology

Electronic health records (EHRs, similar to electronic medical records) can help health care achieve the Triple Aim by greatly increasing the efficiency of care delivery. Several studies estimated that EHRs have the potential to generate huge cost savings. However, EHRs' rudimentary functionality and limited utilization indicate that the U.S. health care system is still far away from achieving EHRs' full potential. EHRs do have many benefits, enabling providers to better document clinical encounters, actively engage patients, and follow patients longitudinally. However, there are also many barriers to EHR implementation: it is expensive, hard for providers to adapt to, and riddled with incompatibility across platforms. Providers also cannot modify EHR as they see fit. The costs and benefits result in providers' love-hate relationship with EHR systems. EHR functionality needs to be improved—especially for primary care—to support continuity, comprehensiveness, and patient centeredness. Aside from EHR functionality, the biggest problem is the lack of data utilization. EHRs gather health data that can be harnessed to inform clinical care and improve population health, but this potential has not yet been utilized.

Hillestad R, Bigelow J, Bower A, et al. Can electronic medical record systems transform health care? Potential health benefits, savings, and costs. Health Aff (Millwood). 2005;24(5):1103-1117.

Having conducted an extensive and quantitative literature review, the well-known and optimistic RAND study estimated that EHRs could potentially cut costs by \$81 billion.

Congressional Budget Office. Evidence on the costs and benefits of health information technology. <https://www.cbo.gov/sites/default/files/cbofiles/ftpdocs/91xx/doc9168/05-20-healthit.pdf>. Accessed October 29, 2015.

The Congressional Budget Office's (CBO's) literature review found mixed results for EHRs' benefits and disputed the results from the RAND study. However, the CBO emphasizes that data utilization is an untapped resource of EHRs that has great potential.

Chaudhry B, Wang J, Wu S, et al. Systematic review: impact of health information technology on quality, efficiency, and costs of medical care. Ann Intern Med. 2006;144(10):742-752.

The authors conducted a comprehensive literature review and found that health IT does improve quality and efficiency, but the effect on cost is less clear.

Linder JA, Ma J, Bates DW, Middleton B, Stafford RS. Electronic health record use and the quality of ambulatory care in the United States. Arch Intern Med. 2007;167(13):1400-1405.

The authors conducted a retrospective and cross-sectional analysis and found that EHR use was not associated with high-quality ambulatory care. However, at the time, only 18% of ambulatory visits reported using EHR.

Miller RH, Sim I. Physicians' use of electronic medical records: barriers and solutions. Health Aff (Millwood). 2004;23(2):116-126.

Through qualitative studies, the authors found that barriers to EHR adoption include high financial cost, substantial time investment to learn the system, and poor compatibility among EHR platforms.

Dolan PL. Doctors' love-hate relationship with EHRs. Amednews.com. May 7, 2012.

Dolan lays out how an EHR is a double-edged sword: EHRs have many benefits (e.g., improved documentation, increased rates of reimbursement), but there are many downsides as well (e.g., less time for patients, productivity loss while physicians are adapting to EHRs).

Wang SJ, Middleton B, Prosser LA, et al. A cost-benefit analysis of electronic medical records in primary care. Am J Med. 2003;114(5):397-403.

The authors conducted a cost-benefit analysis on Partners HealthCare and found that the EHR provided a net benefit of \$86,400 per provider for a five-year period. Benefits mainly resulted from savings in drug expenditures, decreased radiology utilization, and better documentation for billing.

Cebul RD, Love TE, Jain AK, Hebert CJ. Electronic health records and quality of diabetes care. N Engl J Med. 2011;365(9):825-833.

In a study of 46 “priority primary care providers,” EHR use was reported to improve diabetes care and outcomes significantly.

Krist AH, Beasley JW, Crosson JC, et al. Electronic health record functionality needed to better support primary care. J Am Med Inform Assoc. 2014;21(5):764-771.

The consensus statement from the AAFP, AAP, American Board of Family Medicine (ABFM), and North American Primary Care Research Group (NAPCRG) states that meaningful use (MU) objectives need to be improved to better support accessibility, continuity, comprehensiveness, and patient centeredness.

Patient Engagement

The notion that primary care should be patient centered is well established, but evidence shows that current care needs much improvement to achieve patient centeredness. There is emerging consensus that in order for care to be patient centered, providers need to engage and involve patients so that their care can be more personalized. Better patient engagement has been shown to improve patients' experience and control costs. Patient engagement is considered to be necessary for health care to achieve the Triple Aim. The Patient Activation Measure (PAM) is a dominant and reliable measure of how engaged patients are, which can inform care. One dominant model of practicing to achieve patient-centered care is shared decision making, in which both physicians and patients participate in making medical decisions. Other proposed ways of increasing patient engagement include increasing patients' health literacy, using decision

aids to inform patients of treatment options, and improving patient safety. As primary care becomes increasingly integrated with public health and further incorporates the social determinants of health into clinical care, more measures will be necessary to increase and support community engagement to improve population outcomes.

Epstein RM, Fiscella K, Lesser CS, Stange KC. Why the nation needs a policy push on patient-centered health care. Health Aff (Millwood). 2010;29(8):1489-1495.

Epstein et al. convincingly argue why our health care system should be patient centered, emphasizing that patient-centered care is a tangible goal for which policy makers should push. The authors explain what patient-centered care means, why it is important, and how it can be measured and achieved.

Carman KL, Dardess P, Maurer M, et al. Patient and family engagement: a framework for understanding the elements and developing interventions and policies. Health Aff (Millwood). 2013;32(2):223-231.

This excellent summary of the positive effects of patient engagement (i.e., better outcomes, improved patient safety, and lower costs) also provides a framework for how patients can be engaged.

Coulter A, Ellins J. Effectiveness of strategies for informing, educating, and involving patients. BMJ. 2007;335(7609):24-27.

This meta-literature review shows that although different types of patient engagement impact patients differently, overall, patient engagement does lead to better care.

Charmel PA, Frampton SB. Building the business case for patient-centered care. Healthc Financ Manage. 2008;62(3):80-85.

This article demonstrates that patient engagement resulted in improved safety of patients by decreasing adverse events and malpractice claims.

Hibbard JH, Stockard J, Mahoney ER, Tusler M. Development of the Patient Activation Measure (PAM): conceptualizing and measuring activation in patients and consumers. Health Serv Res. 2004;39(4 Pt 1):1005-1026.

This article established the Patient Activation Measure, which has become the dominant measure for evaluating how engaged patients are.

Hibbard JH, Greene J. What the evidence shows about patient activation: better health outcomes and care experiences; fewer data on costs. Health Aff (Millwood). 2013;32(2):207-214.

This article provides a great review of the extensive research that has been done with the PAM. In particular, it shows how highly activated patients have better health outcomes, increased satisfaction, and lower utilization. Patient activation can be increased with the right intervention, and policies that increase patient activation can help health care move toward the Triple Aim.

Charles C, Gafni A, Whelan T. Shared decision-making in the medical encounter: what does it mean? (or it takes at least two to tango). Soc Sci Med. 1997;44(5):681-692.

Charles et al. establish the fundamental principles of shared decision making in the context of clinical care.

Barry MJ, Edgman-Levitan S. Shared decision making—the pinnacle of patient-centered care. *N Engl J Med*. 2012;366(9):780-781.

The authors explain how patient centeredness can be achieved through shared decision making. The authors cite the example of decision aids, which can be used to inform patients of relevant clinical evidence and have been shown to engage patients effectively.

Norman N, Bennett C, Cowart S, et al. Boot Camp Translation: a method for building a community of solution. *J Am Board Fam Med*. 2013;26(3):254-263.

This article describes Boot Camp Translation, a research method in which community members translate and disseminate biomedical research advances into easily accessible community resources. Boot Camp Translation allows for better engagement with patients and communities.

Westfall JM, Fagnan LJ, Handley M, et al. Practice-based research is community engagement. *J Am Board Fam Med*. 2009;22(4):423-427.

Westfall and colleagues argue that practice-based research “provides a model that mixes scientific inquiry and community engagement.” Practice-based research offers a unique opportunity to actively engage patients and communities to inform research.

Integration of Mental Health

There is emerging consensus that integration of mental health into primary care is necessary for achieving the Triple Aim. Many patients have comorbid conditions, including mental health disorders, and primary care remains the point of first contact for these patients. Moreover, the current body of evidence shows that integration does improve health outcomes. However, most completed studies have focused on patients with depression and used specific treatment protocols, and their results may not be generalizable to the whole population. Research on integration in other disease contexts and with more heterogeneous populations is needed.

Additional research on implementation is also needed to decrease the initial cost of implementation, which is currently unsustainable without substantial grant funding, in spite of the fact that integration will likely cut costs in the long run. Overall, the integration of mental health and primary care enables primary care to become truly coordinated and comprehensive, but a better understanding of implementation strategies and payment models is needed before integration can occur at a national level.

Kwan BM, Nease DE Jr. The state of the evidence for integrated behavioral health in primary care. In: Talen MR, Burke Valeras A, eds. *Integrated Behavioral Health in Primary Care*. New York, NY: Springer; 2013:65-98.

This comprehensive summary of the current evidence on integration shows that research thus far has been focused primarily on depression. There are gaps that research needs to fill, including studies in other disease contexts and implementation strategies.

World Health Organization, World Organization of Family Doctors (Wonca). *Integrating mental health into primary care: a global perspective*. 2008.

http://www.who.int/mental_health/resources/mentalhealth_PHC_2008.pdf. Accessed October 29, 2015.

This report lays out the reasons that integration can achieve the Triple Aim by increasing access and improving outcomes. It also provides the 10 principles that need to be followed to achieve integration and summarizes exemplary integration models from other countries.

Dickinson WP, Miller BF. Comprehensiveness and continuity of care and the inseparability of mental and behavioral health from the patient-centered medical home. Fam Syst Health. 2010;28(4):348-355.

It is well known that primary care needs to be comprehensive and continuous to provide high-quality care. The authors argue that in order to achieve comprehensiveness and continuity, primary care needs to provide care that responds to behavioral health problems.

Baird M, Blount A, Brungardt S, et al.; Working Party Group on Integrated Behavioral Healthcare. Joint principles: integrating behavioral health care into the patient-centered medical home. Ann Fam Med. 2014;12(2):183-185.

Drafted and endorsed by multiple family medicine organizations, this article establishes the principles of integration that a PCMH needs to achieve true coordination and integration of mental health care into primary care.

Petterson S, Miller BF, Payne-Murphy JC, Phillips RL. Mental health treatment in the primary care setting: patterns and pathways. Fam Syst Health. 2014;32(2):157-166.

Through an extensive study of Medical Expenditure Panel Surveys (MEPS), the authors found that primary care continues to be the main source of care for mental health patients. Patients most often seek help from primary care or mental health providers exclusively, and integration of the separate providers is necessary to improve patient access and health outcomes.

Agency for Healthcare Research and Quality. A guidebook of professional practices for behavioral health and primary care integration: observations from exemplary sites. March 2015. http://integrationacademy.ahrq.gov/sites/default/files/AHRQ_AcademyGuidebook.pdf. Accessed October 29, 2015.

The authors conducted a qualitative study of eight high-performing primary care organizations with integrated mental health care. The study reveals individual- and organization-level professional practices that will facilitate successful integration.

Kathol RG, Butler M, McAlpine DD, Kane RL. Barriers to physical and mental condition integrated service delivery. Psychosom Med. 2010;72(6):511-518.

The authors conducted key informant interviews at 11 primary care practices with integrated mental health care. The interviews show that the greatest barrier to successful integration is financial; the current segregated reimbursement for physical and mental health care needs to be overcome before full integration of mental health care into primary care can occur.

Davis M, Balasubramanian BA, Waller E, Miller BF, Green LA, Cohen DJ. Integrating behavioral and physical health care in the real world: early lessons from Advancing Care Together. J Am Board Fam Med. 2013;26(5):588-602.

The authors studied Advancing Care Together, a program designed to test strategies of integration. They found that integration involves many challenges related to factors including resistance to changes in workflow, leadership and culture, and data tracking.

Integration of Public Health and Social Determinants of Health

It is well established that the two traditionally separate identities, primary care and public health, should become integrated (summarized below; for a detailed description, see the historical works in Part I). This integration would allow information flow that can improve population health. Public health can better grasp the health status of a community, and primary care could become more community oriented. The push for integration was initiated by the Folsom Report almost 50 years ago and renewed by the IOM in 2012, but full integration has not yet occurred. An important goal in public health is to improve the stark health disparities in America. It is well known that the social determinants of health (SDH) influence morbidity and mortality, contributing to health inequalities. SDH have become a cornerstone of primary care because primary care providers understand their patients' SDH and, thus, can help alleviate health disparities by tailoring treatment. Primary care is also community oriented, and providers can utilize their connections in the community to get help for their patients. Efforts that target SDH must continue, because addressing SDH has the potential to improve patient outcomes and population health, and possibly to reduce costs as well.

National Commission on Community Health Services. Health is a community affair. Cambridge, Mass: Harvard University Press; 1967.

This seminal report argues that all patients should have a personal physician; it also maintains that the integration of public health and primary care is necessary to achieve the “communities of solution.”

The Folsom Group. Communities of solution: the Folsom Report revisited. Ann Fam Med. 2012;10(3):250-260.

This is a revisitation of the original Folsom Report in the context of the ACA; it calls for renewed focus on full integration of primary care and public health.

Institute of Medicine Committee on Integrating Primary Care and Public Health. Primary care and public health: exploring integration to improve population health. Washington, DC: National Academies Press; 2012.

This is a crucial IOM report that outlines strategies to successfully integrate primary care and public health.

Westfall JM. Cold-spotting: linking primary care and public health to create communities of solution. J Am Board Fam Med. 2013;26(3):239-240.

Westfall argues that implementation of local initiatives that link primary care and public health can decrease “cold spots” (i.e., underserved areas) and, in doing so, eliminate “hot spots” (i.e., areas of high utilization).

Braveman P, Egerter S, Williams DR. The social determinants of health: coming of age. Annu Rev Public Health. 2011;32:381-398.

The authors present a comprehensive review of the research on SDH and provide robust evidence from the literature on the impact of socioeconomic determinants (e.g., income, ethnicity) on health. The authors also identify gaps in SDH research that need to be filled.

Woolf SH, Johnson RE, Phillips RL Jr, Philipson M. *Giving everyone the health of the educated: an examination of whether social change would save more lives than medical advances. Am J Public Health. 2007;97(4):679-683.*

Woolf et al. compare the impact of funding for education versus funding for health care. They estimate that the ratio of the number of averted deaths due to better education for the population and the number of averted deaths due to medical advances is 8:1. The authors conclude that correcting education-associated disparities would save more lives than medical advances. They further recommend that policy makers heavily invest in reducing educational disparities rather than investing in medical advances.

Blendon RJ, Buhr R, Cassidy EF, et al. *Disparities in physician care: experiences and perceptions of a multi-ethnic America. Health Aff (Millwood). 2008; 27(2):507-517.*

Blendon et al. analyzed results from a national survey that the Robert Wood Johnson Foundation released in 2007, and they found that minority groups perceive the quality of physician care to be worse than white Americans do. Because patients' perception of health care quality impacts their health outcomes, the authors recommend policies to address varied perceptions and experiences to improve patient outcomes.

Bikson K, McGuire J, Blue-Howells J, Seldin-Sommer L. *Psychosocial problems in primary care: patient and provider perceptions. Soc Work Health Care. 2009;48(8):736-749.*

Bikson et al. assessed the type and severity of psychosocial problems in primary care patients at the Veterans Affairs Greater Los Angeles Healthcare System (VAGLAHS). The patients reported an average of five psychosocial problems, and 32% wanted to see a social worker. To best improve patients' health, primary care providers need to keep SDH in mind and coordinate with local social services.

Williams DR, Costa MV, Odunlami AO, Mohammed SA. *Moving upstream: how interventions that address the social determinants of health can improve health and reduce disparities. J Public Health Manag Pract. 2008;14(Suppl):S8-S17.*

The authors evaluated studies with interventions that addressed SDH, both inside and outside the health care system. Because of the success of numerous non-medical interventions, the authors argue that policy makers need to pay greater attention to improve social policies that will ultimately result in better health for more Americans.

Institute of Medicine. *Capturing social and behavioral domains and measures in electronic health records: Phase 2. Washington, DC: National Academies Press; 2014.*

The IOM committee emphasizes the importance of recording factors related to SDH in the EHR. Only four are currently recorded: alcohol use; race and ethnicity; residential address; and tobacco use and exposure. However, the IOM committee recommends seven additional domains that can impact health and should be regularly assessed; these include education, depression, income, and social connections.

Bazemore AW, Cottrell EK, Gold R, et al. *Community vital signs: incorporating geocoded social determinants into electronic records to promote patient and population health. J Am Med Inform Assoc [published ahead of print July 14, 2015].*

<http://jamia.oxfordjournals.org/content/early/2015/07/10/jamia.ocv088.long>. Accessed October 29, 2015.

The authors describe “community vital signs” (Community VS), a new metric for assessing a patient that provides an aggregated overview of the social and environmental factors impacting patient health. Knowing a patient’s Community VS can allow providers to tailor treatment and facilitate coordination with community services.

Adler NE, Stead WW. Patients in context—EHR capture of social and behavioral determinants of health. N Engl J Med. 2015;372(8):698-701.

Adler and Stead underscore the importance of incorporating SDH into EHRs. They also examine the Patient Health Questionnaire, IOM’s proposed method of incorporating SDH into EHRs and conclude that using the questionnaire is expensive, but the benefits will override the costs.

Measurement and Metrics

Blumenthal and McGinnis argue that the current state of metrics and performance measurement in health care can be reduced to two truisms: improvement requires measurement, and too much of a good thing can be a bad thing. Indeed, huge leaps in analytical and research capabilities arising from IT growth and EHR implementation have catalyzed rapid proliferation of metrics and performance measures. Research efforts to improve clinical care and achieve the Triple Aim have rebounded to measure such improvements. However, as the 2015 IOM report and Blumenthal and McGinnis note, the current metrics landscape is characterized by a lack of focus, coordination, and efficiency. Developing and adopting metrics for primary care is particularly difficult because of the paradox of value in primary care. The value of primary care arises at the population level at which public health initiatives can have profound ecological impacts on patients. However, its value is also in the maintenance of a patient-centered relationship. Stange et al. note that, in spite of widespread agreement on the core tenets of primary care, metrics directly measuring the core tenets are rarely used to gauge the success or failure of care. Renewed focus on implementation of key primary care metrics is a health system priority. Realization of this goal will be a challenge given the complexity of primary care interactions.

Institute of Medicine. Vital signs: core metrics for health and health care progress. Washington, DC: National Academies Press; 2015. <http://www.iom.edu/vitalsigns>. Accessed October 29, 2015.

The IOM critiques the unfocused, uncoordinated, and inefficient nature of current health care metrics and recommends its own set of 15 metrics to serve not as ends, but as means to accomplish U.S. health goals.

Blumenthal D, McGinnis JM. Measuring vital signs: an IOM report on core metrics for health and health care progress. JAMA. 2015;313(19):1901-1902.

This is a concise overview of the IOM’s findings and conclusions about measuring success in health care.

Stange KC, Etz RS, Gullett H, et al. Metrics for assessing improvements in primary health care. Annu Rev Public Health. 2014;35:423-442.

Stange et al. call for increased utilization of metrics focused on the tenets of primary care and incorporation of the complexity of clinical encounters in combination with a community health orientation.

Hibbard JH, Greene J, Daniel D. What is quality anyway? Performance reports that clearly communicate to consumers the meaning of quality of care. Med Care Res Rev. 2010;67(3):275-293.

The study reports that consumers are better able to understand and see the value of information when a general framework and plain language are utilized. The authors also suggest that research results need to be simplified so that the public can understand and utilize them.

Balasubramanian BA, Cohen DJ, David MM, et al. Learning Evaluation: blending quality improvement and implementation research methods to study healthcare innovations. Implementat Sci. 2015;10:31-41.

Balasubramanian et al. evaluate the methodological approach “Learning Evaluation” in the context of a primary care and behavioral health integration program. Learning Evaluation, which combines qualitative and quantitative data collection into a real time feedback loop, may be helpful for evaluating and implementing health care innovations.

Epstein RM, Street RL Jr. The values and value of patient-centered care. Ann Fam Med. 2011;9(2):100-103.

Epstein and Street describe the value of patient centeredness and the difficulty of establishing proper metrics to incentivize further growth of this approach to care.

Practice-Based Research Networks

Practice-based research networks (PBRNs) are part of a growing research infrastructure, connecting and tailoring medical advances to different clinical settings. PBRNs test whether the discoveries of academic medical centers (with small, homogenous, highly controlled samples and settings) can be translated to everyday practice. PBRNs connect practices and local resources to ensure that biomedical advances are applied in a way that is most appropriate for unique and diverse communities. Recent efforts to integrate primary care and public health hinge on the growing utilization of PBRNs as a source for community-level data, and as an engine for cultural change and reorientation to community health. PBRNs are part of the unique nature of primary care research and represent the final link in the scientific research pipeline between the bedside and the clinic. More than 125 PBRNs function nationwide.

Mold JW, Peterson KA. Primary care practice-based research networks: working at the interface between research and quality improvement. Ann Fam Med. 2005;3(Suppl 1):S12-S20.

In this seminal work, the authors suggest that there is a large disconnect between research and practice, and between discovery and implementation. PBRNs are becoming more important as they bridge the gap by engaging community stakeholders for research.

Westfall JM, VanVorst RF, Main DS, Herbert C. Community-based participatory research in practice-based research networks. Ann Fam Med. 2006;4(1):8-14.

Westfall et al. utilized a questionnaire distributed to PBRNs to explore the prevalence of community-based participatory research. Among PBRNs that responded, none reported using full participatory research methods, although half had some mechanism for community involvement. This article argues for increased utilization of community engagement to enhance PBRN research.

Westfall JM, Mold J, Fagnan L. Practice-based research—“blue highways” on the NIH roadmap. JAMA. 2007;297(4):403-406.

In this seminal work on PBRNs, Westfall et al. call for increased emphasis on the translation of research from patient to practice and utilization of practice-based research to yield more clinically useful outcomes.

Devoe JE, Sears A. The OCHIN community information network: bringing together community health centers, information technology, and data to support a patient-centered medical village. J Am Board Fam Med. 2013;26(3):271-278.

Devoe and Sears describe a “patient-centered medical village” as a PBRN that focuses on sharing IT expertise, resources, and data across previously disconnected community practices. The PBRN can support public health innovations and serve as a true example of the “community of solution,” as first described in the Folsom Report.

Green LW. Making research relevant: if it is an evidence-based practice, where's the practice-based evidence? Fam Pract. 2008;25(Suppl 1):i20-i24.

In this critique of the current inadequacies of the scientific research pipeline, Green states that studies with potential clinical implications are often weeded out of systematic reviews. Furthermore, characterization of clinical settings as homogenous often hinders successful translation from research to practice. Green recommends a number of changes to the scientific pipeline, including increased utilization of PBRNs and practice-based evidence.

Mays GP, Hogg RA, Castellanos-Cruz DM, Hoover AG, Fowler LC. Public health research implementation and translation: evidence from practice-based research networks. Am J Prev Med. 2013;45(6):752-762.

This study of PBRNs indicates that they are an effective tool for catalyzing the translation and implementation of research at the community and public health levels.

PART III: PRIMARY CARE AND THE TRIPLE AIM

In this section, we dive deeper into the literature to examine how primary care can contribute to each facet of the Triple Aim. Our original goal was to separate the literature based on which facet of the Triple Aim each article addressed. However, during the literature search, we found that most studies addressed two or three facets of the Triple Aim simultaneously. These studies also emphasize that the aims are mutually dependent, thus making separation difficult and illogical. To address the above concerns, we adopted a format for this section in which the article is labeled with a symbol (as shown below) on the basis of which facet of the Triple Aim the article discusses. Articles with multiple labels consider more than one of the aims. We hope that this format allows for easy viewing while preserving the Triple Aim's interconnected nature.

★ = Patient experience; \$ = Reduced costs; + = Population health

★\$+ Starfield B, Shi L, Macinko J. *Contribution of primary care to health systems and health. Milbank Q.* 2005;83(3):457-502.

This is likely the most important article in defining the value of primary care. Starfield et al. unabashedly lay out why primary care should be the foundation of health care. Their extensive literature review and quantitative focus consistently illustrate the significant role primary care has in improving people's health. The authors robustly support each argument with multiple studies from locales, counties, and states throughout the United States and in other countries. They clearly show that an increase in the number of primary care physicians results in better health outcomes, and sufficient primary care decreases the impact of socioeconomic disparity on health. Moreover, populations that have primary care as their regular source of care have significantly lower mortality. Primary care is also associated with lower health expenses. Starfield and colleagues further demonstrate that primary care can provide preventive care that decreases the need for an excessive amount of specialty care. In one of the first studies to use data to comprehensively describe the value of primary care, Starfield et al. revolutionize primary care research. They also send a clear message to policy makers that primary care is the solution to a better health care system because it can achieve seemingly impossible results: better quality of care and population health at an affordable rate.

★\$+ Ferrer RL, Hambidge SJ, Maly RC. *The essential role of generalists in health care systems. Ann Intern Med.* 2005;142(8):691-699.

Ferrer and colleagues argue that primary care is traditionally underfunded and undervalued because it functions as a positive externality in economics. Specifically, because consumers do not realize primary care's benefits, it becomes undervalued and undersupplied. Ferrer et al. assert that only a systems perspective can completely capture the often hidden benefits of primary care. The rest of the article covers primary care benefits at the population level, including benefits for health care systems, populations, and public health. Like the 2005 article by Starfield et al., this article presents robust evidence of the efficacy of primary care for achieving the Triple Aim. Ferrer et al. conclude with national and international examples of the benefits of primary care, as well as future directions for improvement.

★\$+ Kringos DS, Boerma WG, Hutchinson A, van der Zee J, Groenewegen PP. *The breadth of primary care: a systematic literature review of its core dimensions. BMC Health Serv Res.* 2010;10(1):65-77.

This article expands on Starfield and colleagues' work by focusing on European primary care systems and literature, which are infrequently considered in the primary care debate in the United States. Kringos et al. provide an in-depth analysis of the complexities of primary care. They divide primary care into three complex levels: 1) structure; 2) process; and 3) outcome. Each level has its own dimensions. Structure refers to how primary care is delivered in the context of political and economic realities; it includes governance, economic conditions, and workforce development. Process includes Starfield et al.'s primary care tenets: first access, continuity, coordination, comprehensiveness, and community orientation. Outcome includes quality of care, efficiency of care, and equity of health, which serve as alternative outcome indicators to those of the Triple Aim. Kringos et al.'s review of international primary care systems has a similar flow to the logic model of this bibliography or Mold's logic model (which is covered later in this section); it demonstrates the multidimensional complexity of primary care systems. This work functions as an updated European corollary of Starfield et al.'s 2005 article in *Milbank Quarterly* and uses numerous European examples to suggest significant benefits of primary care-based systems.

★\$+ Friedberg MW, Hussey PS, Schneider EC. *Primary care: a critical review of the evidence on quality and costs of health care. Health Aff (Millwood). 2010;29(5):766-772.*

Friedberg et al. partition evidence on the value of primary care based on its three most common definitions: the specialty of the provider; its function to provide care; or its orientation in a health care delivery system. Care outcomes based on the specialty of the provider yield unclear results. However, evidence indicates that primary care's function and primary care-oriented health care systems all contribute to the three facets of the Triple Aim. Friedberg and colleagues maintain that reorienting care delivery to a primary care focus represents the best hope for improving the current lackluster outcomes. They also discuss the policy implications of the Patient Protection and Affordable Care Act (ACA) and instances in which systems successfully transitioned to primary care-based delivery models. While it is not an exhaustive literature review, this work includes significant evidence of primary care's potential for achieving the Triple Aim.

★\$+ Shi L. *The impact of primary care: a focused review. Scientifica (Cairo). 2012;2012:432892.*

Shi's comprehensive review represents a continuation of his work with Starfield. The review is partitioned into Shi's own formulation of the Triple Aim: improved quality of care, improved health outcomes, and reductions in disparities. He separates articles and analysis based on these three outcomes. Apart from this novel organization, the review is useful for its preliminary discussion of both the definition of primary care and methods of measuring primary care outcomes. Otherwise, this review includes many of the same studies—albeit updated—as Starfield's work.

★\$+ Bodenheimer TS, Smith MD. *Primary care: proposed solutions to the physician shortage without training more physicians. Health Aff (Millwood). 2013;32(11):1881-1886.*

Bodenheimer and Smith propose primary care system reforms that will allow for increased capacity and achievement of Triple Aim goals. Their primary proposition is a so-called “five-wedge transformation.” The five wedges are clinicians, non-clinician licensed practitioners, non-licensed personnel, patients, and technology. The authors show that increased responsibilities for non-physician providers in team-based models are associated with improved patient experience

and allow significant increase in capacity. Team-based care frees up time and resources for physicians to manage higher level problems while decreasing costs and improving quality of care. Ultimately, proposed practice reforms like the five-wedge transformation support more efficient use of time by primary care providers that will allow movement toward the Triple Aim. The Patient-Centered Medical Home's Impact on Cost and Quality, Review of Evidence, 2013-2014. - See more at: <https://www.pcpcc.org/resource/patient-centered-medical-homes-impact-cost-and-quality#sthash.07mRjD8t.dpuf>

★\$+ Nielsen M, Gibson L, Buelt L, Grundy P, Grumbach K. *The patient-centered medical home's impact on cost and quality: annual review of evidence, 2013–2014*. Washington, DC: Patient-Centered Primary Care Collaborative; 2015.

Nielsen et al. examined recent evidence on patient-centered medical home (PCMH) interventions and their efficacy in achieving the Triple Aim. The authors examined 28 peer-reviewed studies, state government program evaluations, and industry reports that accessed PCMH interventions. Of the 28 studies, 17 showed improvements in cost, 24 showed improvements in utilization, 11 showed improvements in quality, 10 showed improvements in access, and eight showed improvements in satisfaction with care. Despite historically mixed evidence on such interventions, this report suggests that the PCMH movement is taking primary care in the right direction.

★\$+ Mold JW. *How primary care produces better outcomes –a logic model*. *Ann Fam Med*. 2014;12(5):483-484.

Mold's article contains both a comprehensive literature review and a compelling logic model that connects attributes of primary care to the Triple Aim. Based on an extensive literature review, Mold defines the core attributes of primary care as accessibility, coordination, sustained care, comprehensiveness, partnership with patients, and person centeredness. The two overarching concepts for these six attributes are integration and accountability. Mold also decides upon eight desired outcomes, 15 intermediate outcomes, and 14 mechanisms for achieving the intermediate outcomes. He presents a logic model that visually demonstrates how the primary care attributes are connected to the mechanisms, to intermediate outcomes, and to desired outcomes. This white paper is a living document that Mold and colleagues routinely update and repost to the North American Primary Care Research Group (NAPCRG) website. The exhaustive nature of Mold's literature review, in combination with the direct connection between primary care and the Triple Aim, necessitate inclusion of this white paper.

★\$ Saultz JW, Albedaiwi W. *Interpersonal continuity of care and patient satisfaction: a critical review*. *Ann Fam Med*. 2004; 2(5):445-451.

In this literature review, Saultz and Albedaiwi explored continuity of care and its relationship to the Triple Aim. They found significant evidence that continuity of care can achieve all three facets of the Triple Aim. Nineteen of the 22 reviewed studies suggested an association between continuity of care and improved patient satisfaction. Of the 40 studies reviewed regarding care outcomes, 23 reported a positive association in all outcomes, 12 reported a positive association in at least one outcome, and only two reported instances of continuity of care making outcomes worse. Inconsistencies in the evaluation of continuity and the absence of random physician assignment mitigated some of the impact of these results. Additionally, Saultz and Albedaiwi raise concerns about the bidirectional effect of continuity and satisfaction, arguing that it is hard

to tell “whether continuity leads to satisfaction or satisfaction leads to continuity.” Despite the need for additional research on continuity and outcomes, an established body of literature suggests this tenet of primary care contributes to improved patient satisfaction and reduced costs.

★\$ *Kronman AC, Ash AS, Freund KM, Hanchate A, Emanuel EJ. Can primary care visits reduce hospital utilization among Medicare beneficiaries at the end of life? J Gen Intern Med. 2008;23(9):1330-1335.*

Kronman et al. conducted a retrospective analysis of Medicare data on a random, nationally representative sample of more than 78,000 Medicare beneficiaries to determine the impact of primary care visits in the last year of life. Additional primary care visits preceding death were associated with fewer hospital days at the end of life, lower costs, less in-hospital death, and fewer preventable hospitalizations for congestive heart failure or chronic obstructive pulmonary disease. For Medicare-eligible patients, primary care is particularly important given the impending health system costs of an aging baby boomer generation. Reducing costs and preventable hospitalization among the elderly will be critical to manage costs and provide high quality of life for this population.

★\$ *Wu WN, Bliss G, Bliss EB, Green LA. Practice profile. A direct primary care medical home: the Qliance experience. Health Aff (Millwood). 2010;29(5):959-962.*

Wu and colleagues examined preliminary results from Qliance, a direct primary care (DPC) medical home, and its impact on patient experience and cost. The capitated payment model of a DPC system drastically reduces overhead costs. This allows the practice to reduce physicians’ patient panel size, charge patients lower rates, and generate higher revenue. Qliance’s patients are saving at least 35% on comprehensive primary care services. At the same time, providers are able to collect approximately 2.6 times more revenue, enabling them to cut their panels by around 40%. This all translates into longer, more comprehensive visits with lower cost to patients while also reducing risks of physician burnout.

★+ *Franks P, Fiscella K. Primary care physicians and specialists as personal physicians: health care expenditures and mortality experience. J Fam Pract. 1998;47(2):105-109.*

Franks and Fiscella utilized a nationally representative sample of more than 13,000 adult respondents from the National Medical Expenditure Survey (NMES) to compare the quality and cost of care of patients who had a primary care physician as their personal physician with patients who had a specialist as their personal physician. Patients who had a primary care physician were reported to feel healthier, spend less annually, and have lower mortality rates. After controlling for insurance status, demographics, health perceptions, and smoking status, primary care physicians were still associated with 33% lower health care expenditures and adjusted mortality.

★+ *Baicker K, Chandra A. Medicare spending, the physician workforce, and beneficiaries’ quality of care. Health Aff (Millwood). 2004;23(3):W4-184-W4-197.*

Baicker and Chandra studied the relationship between Medicare spending and quality of care. Although it is counterintuitive, they found that spending and quality of care have an inverse relationship: increased spending is associated with decreased quality of care and health outcomes. This initial discovery led them to investigate the makeup of the provider workforce

and its ultimate impact on outcomes and costs. This study has become famous among primary care proponents due to a number of specific findings. Baicker and Chandra found that states with more specialists rank worse in quality of care than states with fewer specialists. Additionally, a greater number of specialists is associated with increased Medicare spending. By contrast, states with more “general practitioners” (GP) reported better quality of care. Furthermore, Medicare data suggest that GPs are associated with reduced per-capita spending. In spite of some questions about interstate comparisons, this often-cited study demonstrates a clear link between primary care and the Triple Aim. For primary care advocates, it provides an enduring battle cry: primary care providers and generalists improve outcomes and reduce costs while specialists do the opposite.

\$+ *American College of Physicians. How is a shortage of primary care physicians affecting the quality and cost of medical care? A comprehensive evidence review. Philadelphia, Pa.: American College of Physicians; 2008.*

This white paper from the American College of Physicians includes a summary, literature annotations, and a list of references on primary care’s contribution to the Triple Aim. This exhaustive resource summarizes a large amount of literature and provides overwhelming evidence in favor of primary care’s benefits. It serves as a primer for policy pieces that call for increased national focus on primary care; adoption of patient-centered, physician-guided delivery; and restructuring of payment models. All of these are responses to problems that plague primary care and impede its ability to serve as the linchpin of American health care.

\$+ *Kravet SJ, Shore AD, Miller R, Green GB, Kolodner K, Wright SM. Health care utilization and the proportion of primary care physicians. Am J Med. 2008;121(2):142-148.*

Kravet and colleagues conducted a retrospective cross-sectional analysis using the Area Health Resource Files to investigate the impact of primary care physicians on health care utilization and cost. They report that a higher proportion of primary care physicians is associated with decreased annual utilization. In an average-sized metropolitan area, each 1% increase in the proportion of primary care physicians is associated with a reduction of 503 admissions, 2,968 emergency department visits, and 512 surgeries. Primary care physicians have a huge capacity to improve outcomes and dramatically reduce costs at the population level.

\$+ *Coleman K, Austin BT, Brach C, Wagner EH. Evidence on the Chronic Care Model in the new millennium. Health Aff (Millwood). 2009;28(1):75-85.*

Coleman et al. conducted a literature review of articles published from 2000–2009. Their findings confirm the value of the Chronic Care Model (CCM) for improving quality of care. The article begins with a brief historical overview of the CCM before presenting significant evidence that CCM implementation improves quality of care and decreases costs. Evidence for improved care outcomes is not definitive and additional research is needed, but the authors suggest that redesigning practices to follow the CCM can improve care quality. Additionally, despite significant upfront costs for reorganization, the CCM appears to be cost-effective in the long run. Coleman and colleagues demonstrate the continued need for investment in and implementation of the CCM in primary care.

✚ Kringos DS, Boerma W, van der Zee J, Groenewegen P. *Europe's strong primary care systems are linked to better population health but also to higher health spending. Health Aff (Millwood).* 2013;32(4):686-694.

Kringos et al. used 2009–2010 data from the European Union's Primary Health Care Activity Monitor for Europe to analyze the effect of a strong primary care system on population health and cost. They found that primary care is associated with significantly improved population health, lower rates of avoidable hospitalization, and improved health and social equality. Although stronger primary care systems are associated with higher health expenditures, they also are associated with slower health care spending growth, which suggests that primary care has the potential to curb runaway spending.

✚ Bazemore A, Petterson S, Peterson LE, Phillips RL Jr. *More comprehensive care among family physicians is associated with lower costs and fewer hospitalizations. Ann Fam Med.* 2015;13(3):206-213.

Bazemore and colleagues analyzed a random and nationally representative sample of physicians drawn from the 2010 American Medical Association (AMA) Physician Masterfile. The authors created two measures of comprehensiveness of care; one was based on American Board of Family Medicine (ABFM) practice patterns data, and the other was based on Berenson-Eggers Type of Service (BETOS) codes. The full final sample included 3,652 family physicians who provided the plurality of care to 555,165 Medicare beneficiaries 65 years of age or older. Based on self-reported ABFM data, increased comprehensiveness of care is associated with reduced Medicare costs but not reduced hospitalization. Increased BETOS scores are associated more strongly with reduced spending and decreased hospitalization. Despite certain limitations, this study demonstrates clear movement toward achieving the Triple Aim via comprehensive care provided by family physicians and primary care providers.

★ Egnew TR. *The meaning of healing: transcending suffering. Ann Fam Med.* 2005;3(3):255-262.

Egnew studied the meaning of the physician's role by analyzing the interplay between the holistic concept of healing and the more modern curative role of disease eradication. As he describes, the true physician healer is meant to “establish [connectional] relationships with his or her patients and guide them in reworking their life narratives to create meaning in and transcend their suffering.” On the other hand, he describes health care industrialization as “[delegitimizing] the suffering contained in the patient's story.” True patient care requires a recognition of the physician's role as more than an episodic curer of disease, but as a healer with a meaningful relationship with the patient. Reinvigorating the primary care function of patient centeredness to deliver holistic patient care is critical for improving patients' experience of care and achieving the Triple Aim.

★ Coulter A, Ellins J. *Effectiveness of strategies for informing, educating, and involving patients. BMJ.* 2007;335(7609):24-27.

Coulter and Ellins conducted a comprehensive literature review of more than 100 studies to evaluate the effectiveness of different strategies for engaging patients. One strategy is to increase health literacy by disseminating relevant clinical information that is easy for patients to absorb. Indeed, leaflets on cancer have been shown to reduce patients' anxiety and empower them. Another strategy is to facilitate shared decision making through decision aids, which was shown

to improve treatment decisions. Engaging patients also improves patients' safety by encouraging self-care; patients take responsibility for their own health by adhering to treatments and tracking their health. The authors conclude that patient engagement is a powerful and effective way to improve patients' health by empowering patients to take control of their illnesses.

★ *Epstein RM, Fiscella K, Lesser CS, Stange KC. Why the nation needs a policy push on patient-centered health care. Health Aff (Millwood). 2010;29(8):1489-1495.*

In this succinct work, Epstein et al. convincingly argue why the U.S. health care system should be patient centered. The authors emphasize that while "patient-centered" care appears to be an elusive concept, it can be defined. The authors state that patient-centered care should strive to achieve "a state of shared information, shared deliberation, and shared mind." Patient-centered care depends on the patients and clinicians having a healing relationship in which clinicians know each patient as a person, thus allowing them to share information and make clinical decisions together. Patient-centered care is essential, because it not only improves patients' experiences, but it has also been shown to improve medication adherence, disease outcomes, and quality of life without incurring additional costs. The best way to achieve patient-centered care is to build care infrastructure that enables easy communication among clinicians and flexibility to adapt to new situations. Patient-centered care is a tangible goal that can be measured and achieved. In the increasingly fragmented U.S. health care system, policy makers need to push for care that the public wants, which is care based on listening to and responding to patients' needs. Primary care providers are in the best position to offer such care.

★ *Lown BA, Rosen J, Marttila J. An agenda for improving compassionate care: a survey shows about half of patients say such care is missing. Health Aff (Millwood). 2011;30(9):1772-1778.*

Lown and colleagues reviewed whether the health care currently delivered to patients is compassionate. They found that there is a disconnect between patients and providers; only 54% of patients reported receiving compassionate care while 78% of physicians said that they provide compassionate care. The deficit of compassionate care demonstrates a clear opportunity for primary care providers to improve patients' experience of care. Indeed, Lown et al. cite the decrease in primary care providers and care for hospitalized patients as factors contributing to patient dissatisfaction. They suggest system reforms that will allow primary care providers to maintain continuous contact with their patients. As the point of first contact, primary care is uniquely positioned to provide more compassionate care and improve patients' perceptions of care.

\$ *Raddish M, Horn SD, Sharkery PD. Continuity of care: is it cost effective? Am J Manag Care. 1999;5(6):727-734.*

Raddish and colleagues collected patient level data from six health maintenance organizations (HMOs) to measure the effect of continuity of care on cost. Collected data consisted of almost 13,000 patients, more than 99,000 outpatient visits, 1000 hospitalizations, and 240,000 prescriptions. After controlling for patient characteristics, they found that an increased number of primary care or specialty providers per patient is associated with increased utilization and cost. It seems that having more than one primary care provider per patient results in fragmented care. Raddish et al. demonstrate the possibility that costs can be drastically reduced by prioritizing continuity of care from a personal, patient-centered primary care provider.

\$ De Maeseneer JM, De Prins L, Gosset C, Heyerick J. *Provider continuity in family medicine: does it make a difference for total health care costs?* *Ann Fam Med.* 2003;1(3):144-148.

De Maeseneer and colleagues utilized a sample of more than 4,000 patients to determine the impact of primary care provider continuity on overall care costs. Participants were split into two cohorts, one of which utilized family medicine providers continuously and the other non-continuously. The continuous use cohort reported lower total costs of care. Moreover, multivariate regression suggested that provider continuity is one of the most important ways to decrease health care costs. Primary care providers have the potential to drastically reduce overall health care costs by emphasizing continuity in their patient encounters.

✦ Macinko J, Starfield B, Shi L. *The contribution of primary care systems to health outcomes within Organization for Economic Cooperation and Development (OECD) countries, 1970-1998.* *Health Serv Res.* 2003;38(3):831-865.

The authors conducted a cross-sectional, time-series analysis to assess the impact of primary care on health outcomes in 18 wealthy Organization for Economic Cooperation and Development (OECD) countries. Strength of primary care systems was assessed by structural characteristics (including health system finance and accessibility) and practice features (e.g., comprehensiveness, continuity, coordination, community orientation). Health outcomes were assessed by all-cause mortality, life expectancy, and premature mortality. The authors found that primary care is associated with better health outcomes, even when controlling for other health determinants. In spite of limitations (including not considering the quality of care delivered), the study powerfully illustrates the importance of effective primary care and its ability to improve population health. Currently, most countries' primary care system performance remains stagnant, which makes the World Health Organization's (WHO's) 2008 call for movement toward primary health care more pressing than ever.

✦ Starfield B, Shi L, Grover A, Macinko J. *The effects of specialist supply on populations' health: assessing the evidence.* *Health Aff (Millwood).* 2005;W5-97-W5-107.

A critical precursor to Starfield et al.'s *Milbank Quarterly* article, this work explores the effect of primary care provider supply in the United States. Despite high health care spending and a number of physicians per capita similar to that of the rest of the developed world, the United States has poor population health outcomes. Starfield and colleagues found that a greater number of primary care providers is associated with lower mortality rates, while a greater number of specialists is associated with higher mortality, even after controlling for socioeconomic status and geography. This study suggests that having too few primary care providers relative to the number of specialists results in poor population health outcomes in the United States. Moreover, primary care can improve access issues, thus improving population health. This study is one of many by Starfield et al. that define a clear connection between primary care and improved population health.

✦ Macinko J, Starfield B, Shi L. *Quantifying the health benefits of primary care physician supply in the United States.* *Int J Health Serv.* 2007;37(1):111-126.

Macinko, Starfield, and Shi conducted a literature review to examine how the supply of primary care physicians and non-physicians impacts population health outcomes. They assessed 10 PubMed studies culled from literature produced between 1985 and 2005 to predict the effect of changes in number of primary care physicians on population health. Results suggest that

increased primary care supply is associated with significant improvements in health outcomes, regardless of year or geography. By aggregating and balancing the studies, the authors estimated that an increase of one primary care physician per 10,000 people is associated with a 5.3% reduction in mortality. Macinko et al. expanded upon their previous work and presented yet another piece of compelling evidence that primary care improves population health outcomes.

✦ *Goodman DC, Grumbach K. Does having more physicians lead to better health system performance? JAMA. 2008;299(3):335-337.*

Goodman and Grumbach sought to change the conversation about the impending physician workforce shortage. They argue that current health care failures are not because of a provider shortage, but rather because of a problem with provider distribution. Poor U.S. health outcomes result from having too many providers in areas that do not need them and not enough providers in areas that do need them. However, primary care can help alleviate the maldistribution problem because, unlike other physicians who gravitate toward overserved areas, primary care physicians are known for their ability to penetrate underserved areas. Goodman and Grumbach's analysis of the deficiencies of the physician workforce shows the possibility that primary care is a means of solving physician distribution issues and achieving the Triple Aim.

✦ *Kruk ME, Porignon D, Rockers PC, Van Lerberghe W. The contribution of primary care to health and health systems in low-and middle-income countries: a critical review of major primary care initiatives. Soc Sci Med. 2010;70(6):904-911.*

Kruk et al. completed a comprehensive literature review to examine primary care's impact on health in middle- and low-income nations. Their findings suggest primary care can achieve the Triple Aim, which is consistent with research conducted in the United States and other industrialized nations. In less developed countries, growing primary care initiatives are drastically increasing access to care and health equity, and strengthening health systems. Primary care is catalyzing economic, infrastructural, and social development by providing populations of developing countries with improved health at a low cost. This evidence shows the necessity of continued efforts to support the primary care system.

✦ *Chang CH, Stukel TA, Flood AB, Goodman DC. Primary care physician workforce and Medicare beneficiaries' health outcomes. JAMA. 2011;305(20):2096-2104.*

Chang et al. completed an ecological analysis of the primary care workforce that is similar to Baicker and Chandra's seminal 2004 article. Baicker and Chandra's analysis hinges on the number of primary care physicians per capita in a given state. Chang and colleagues applied a more robust methodology; instead of just measuring the number of physicians, they calculated the number of primary care full-time equivalents (FTEs). In other words, Chang et al. measured the amount of primary care services that providers delivered to patients. Consistent with Baicker and Chandra's findings, this study found that areas with more primary care services have fewer hospitalizations, lower mortality, and slightly lower costs.