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Policy Studies in Family Medicine and Primary Care

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IBM Watson Health

Primary Care in the United States
A Chartbook of Facts and Statistics

Prepared by:

Robert Graham Center (RGC)
1133 Connecticut Avenue NW, Suite 1100
Washington, DC 20036
www.graham-center.org
@TheGrahamCenter

IBM-Watson Health (IBM)
75 Binney St
Cambridge, MA 02142
www.ibm.com/watson-health

The American Board of Family Medicine (ABFM) & affiliated
Center for Professionalism & Value in Health Care (CPV)
1016 16th Street NW, Suite 700
Washington, DC 20036
https://professionalismandvalue.org/

Contributors:

Brian Antono, RGC
Andrew Bazemore, ABFM/CPV
Irene Dankwa-Mullan, IBM
Judy George, IBM
Anuradha Jetty, RGC
Stephen Petterson, RGC
Amol Rajmane, IBM
Kyu Rhee, IBM
Bedda L. Rosario, IBM
Elisabeth Scheufele, IBM
Joel Willis, ABFM/CPV

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Preface

Primary Care Amidst a Generational Pandemic

As we launched this project in the summer of 2019, we could scarcely have imagined that just 12 months later, the United States (U.S.) would be beleaguered in a global pandemic by the coronavirus disease 2019 (COVID-19). What is even more surprising is that we would submit a Chartbook for publication in the country facing the world's heaviest pandemic burden at that time, despite having the greatest per capita wealth and health care spending of any nation. The United States, home to 4% of the world's population, currently accounts for about a quarter of both the world's COVID-19 cases (4,000,000) and deaths (150,000).[1,2] Such dismal figures coincide with an overly specialized, and highly fragmented U.S. health care system with a long history of underinvestment in both primary care and public health.

At this moment, the only certainty seems to be more uncertainty as we find ourselves coming to grips with a "new normal." Yet, as the current situation continues to evolve, the impact of COVID-19 will be felt far beyond its population-based effects on morbidity and mortality,[3] with sequelae including:[4] severely strained management of chronic disease,[5] increase in and worsening of mental health,[6,7] and associated effects,[8] and exacerbation[9] in disparity of an already existing and uneven provision of medical and health care services[10] for vulnerable populations. Despite the challenges being endured during this pandemic, the practice of primary care stands to play a significant role in the management of these issues, employing previously underutilized technology such as telehealth, and overcoming the financial and physical limitations imposed by the pandemic on a practice model built on routinely physician office-based patient care.

Primary care is not exempt from the strain facing so many sectors of the U.S. economy, and health care in particular. Early convenience sampled surveys administered weekly to a cohort of over 700 U.S. primary care clinicians (across 49 states) suggested they experienced extreme mental stress, increased morbidity and mortality among patients from pandemic-related constraints, resource loss (due to staff sickness and/or quarantine), and existential financial strain.[11] The means by which primary care practices meet such challenges is evolving, but there is little doubt that the pandemic will leave an indelible mark on primary care access, team-structure, size, and delivery.

The health care community has also experienced a transformation in clinical care delivery. After years of lamenting the limited use, and sluggish adoption of telehealth in primary care,[12] the swift pivot and embrace of this platform by primary care clinicians and patients alike to accommodate social distancing imperatives has been remarkable. The demand and use of telehealth services has accelerated rapidly as new rules relaxed prior regulations, resulting in exponentially expanding access, billing, and services.[13] A study by The Commonwealth Fund showed that as in-person visits dropped early in the pandemic, telemedicine visits briskly peaked to 14% of weekly visits through mid-April. By mid-June, telemedicine visits declined from its peak, but remained substantially higher than pre-COVID-19 levels.[14] Unfortunately, primary care practices, that were unable to shift to virtual care, were forced to restrict certain services or to close.[11]

One model examining the financial impact of COVID-19 on U.S. primary care practices estimates that $15.1 billion is needed to neutralize revenue losses nationally.[15] Even assuming a rapid ramp up of telemedicine services to offset losses of in-person visits, a variety of scenarios estimates primary care practices losing over $65,000 per full-time equivalent (FTE) physician from current fee-for-service payment structures.[15] An example in Virginia demonstrated that a network of 12 primary care offices and 500 employees experienced 50% losses in patient volume and 60% losses in revenue by May 2020 – resulting in furloughs of 50 employees, reduced staff

hours, and significant pay cuts to clinician salaries.[16] Despite such financial challenges, clinicians and primary care practices around the country have fought hard to keep their doors open.[17]

As it currently stands, the direct costs of COVID-19 illustrate a disproportionate burden on minority communities. Black, Indigenous, Latinx, and other people of color are facing higher rates of hospitalization or death from COVID-19 compared to non-Hispanic white persons.[18] People of color have also suffered from long-standing systemic health and social inequities leading to higher rates of chronic conditions that worsen the effects of COVID-19.[19] In addition to direct costs of COVID-19 are indirect ones, or COVID collateral. These include but are not limited to missed preventive care needs, depression, anxiety, substance misuse, and domestic violence increasingly witnessed by primary care practices throughout the country.[11] Ultimately, the risks of significant morbidity and mortality from these sequelae may far outweigh the enormous damage by the initial wave of COVID-19.

With adequate attention and investment, primary care – in coordination with public and community health sectors – can mitigate both the long-established health disparities and indirect sequelae facing the American public after COVID-19 recedes. Whether this happens depends on fundamental reforms to infrastructure and associated payment models, and a renewed prioritization of core functions. Empowered to provide 'First Contact' for patients suffering directly or indirectly from COVID-19, and coordinate contact tracing, primary care can help to reduce emergency room and intensive care unit burden from unnecessary care, expense, and overwhelmed capacity. Primary care clinicians can further build on 'Continuity' relationships previously established with their patients to offer reassurance, effective triage, and certainty in a time rife with more questions than answers. The 'Comprehensive' range of services that primary care offers across the widest platform of delivery in America can reduce the collateral damage from COVID-19 to support patients with chronic diseases whose routine care was usurped by the urgency of the pandemic and to incorporate eventual vaccine and possible treatment regimens as they emerge. And finally, well-supported primary care can provide our patients and populations with 'Coordinated' care, including but not limited to mitigating challenges in accessing mental health support and services as well as securing affordable food, medications, and shelter. Alternatively, the financial apocalypse ushered in by the pandemic for many primary care practices could leave the nation with critical gaps in its most utilized and widely distributed source of care, exactly when we need it most. We hope that this Chartbook provides some utility to those seeking to better understand primary care and to those working to ensure its viability as we continue through the pandemic-engendered "new normal."

Executive Summary

Primary Care (PC) has entered a new decade facing truly dynamic times for U.S. politics, culture, health, and the system charged with its maintenance. And yet, just two years after the world's nations reaffirmed primary care's central role in the achievement of "Health for All," and as we await the first report from the National Academies of Medicine on High Performing Primary Care since 1996,[20] not much has changed.

Despite renewed interest in strengthening primary care in the United States in recent years, there remains an inadequate understanding of what primary care is and does, insufficient investment in its infrastructure and growth, inadequacy in its workforce numbers and distribution, and inefficient coordination with other sectors. In what follows, we seek to improve upon gaps in knowledge by offering a snapshot of the facts and figures that make up contemporary U.S. Primary Care. It is our sincere hope that such information not only ignites a curiosity to learn more, but simultaneously serves as a foundation to improve upon this vital health system function.

The Chartbook is loosely organized around Dr. Barbara Starfield's conceptual framing of primary care's salutary effects as "4 C's" - First Contact, Continuity, Comprehensiveness, and Coordination of care. Through these four dimensions, Dr. Starfield explained how systems emphasizing primary care achieved greater access to higher quality health care at lower costs and with greater equity across populations.

The analyses conducted within this Chartbook reaffirm Primary Care's standing as the largest platform of health care delivery in the United States, an idea first quantified and illustrated by the grandfather of Health Services Research, Dr. Kerr White, in 1961 – and which still holds true today. Additional analyses also confirm that the proportion of the U.S. physician workforce in primary care has diminished to 31% (Table 1), as specialist training continues to grow in the absence of a National Workforce Commission or federal agency directing workforce planning. Hopes that nurse practitioners and physician assistants might fill the gap remain. However, these groups face the same incentives to specialize as physicians, and their proportional PC contributions continue to lag anticipated levels (Table 2).

Sections II and III of the Chartbook frames basic facts and figures on patient contact with primary care, by exploring visits,and how they vary by specialty type, age and gender. Section IV tackles the frequency and range of conditions seen in primary care, and how they are changing. Remarkably, despite representing less than one-third of the physician workforce, more than 80% of patients with 8 common chronic conditions saw a primary care physician for that condition within a two-year period.

Understanding the adequacy of a future PC workforce, particularly for vulnerable areas and populations, requires successful definition of who is currently practicing primary care as well as elucidation of age and gender distributions, and graduate outputs (Figures 2-4). Recent years have seen misestimation of primary care physician supply that have potentially dangerous implications for workforce planning.[21] For example, Table 1 offers a contemporary enumeration of the total physician workforce in primary care. Other figures will help the reader understand the percentage of the current PC workforce approaching retirement age, who are serving rural communities, the distribution across practice ownership types and sizes, and how the ratios of primary care to population varies across all 50 states (Figure 5).

In Section V, new analyses inform the coordinating function of primary care, as exemplified by an evolving and multifaceted primary care team. New conceptual approaches to capturing overall investment in primary care are the subject of Section VI. Using a nationally representative data source, this section also reveals the persistent underinvestment in primary care relative to other sectors.

In Section VII, the Chartbook takes a novel look at Preventive Care Visit (PCV) utilization. Using the largest aggregation of commercial data available, we find that PCV use has steadily increased over the ten-year period of 2008-2018. However, the results also suggest that PCV utilization remains low (28.9% to 44.8% in 2018), particularly among males and in rural communities and in the Western U.S., suggesting that there remain policy and practice opportunities to improve preventive care.

While it would be a daunting task for a chartbook to paint a complete portrait of a domain as broad as primary care, we hope that readers will find the array of facts and figures collected into this one to be helpful in their understanding of primary care, well-established as the 'central' and 'essential' feature of any robust health system.

I. Introduction

In 2000, the World Health Organization (WHO) assessed the world's health systems and ranked the United States 37th out of 191 countries.[22] Despite attempts at improvement, the United States in 2020 continues to woefully underperform in key aspects of health care services including access, efficiency, quality, and equity while simultaneously spending more on health care than any other system in the world—over $3 trillion per year.[23] One major culprit is a U.S. health care system that has become increasingly fragmented in its delivery, services, and attempts at solutions begetting unsustainability, ineffectiveness, and more brokenness.[24] U.S. primary care can play a critical role in reconnecting and correcting a system capable of achieving safe, high-quality, accessible, equitable, and affordable health care for all Americans. This chartbook describes the current state of primary care in the United States presenting information from a variety of national data sources to answer questions about who, what, where, and how primary care is being delivered.

Why Primary Care?

In 1978, the nations of the world gathered at Alma-Ata and declared primary care as the key to attaining "Health for All."[25] In 1996, an Institute of Medicine (IOM) report defined 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."[26] In her seminal work, Dr. Barbara Starfield, preeminent scholar and health services researcher, conceptualized the vital role and value of primary care as 4 C's—First Contact, Continuity, Comprehensiveness, and Coordination of care. Over a 25 year career, Starfield reinforced primary care's strong association with improvement in overall health outcomes for persons and populations, including but not limited to broader access, lower costs, greater health equity, and higher quality.[27] Presently, in the U.S. primary care sits on the precipice of a broken health care system. If strengthened in well-designed, well-delivered, and well-used ways, the 4 C's of primary care can provide a solid foundation for achievement of the quadruple aim—improving quality of care, health of people and populations, reducing health care cost, and improving the work life of health care clinicians and staff.

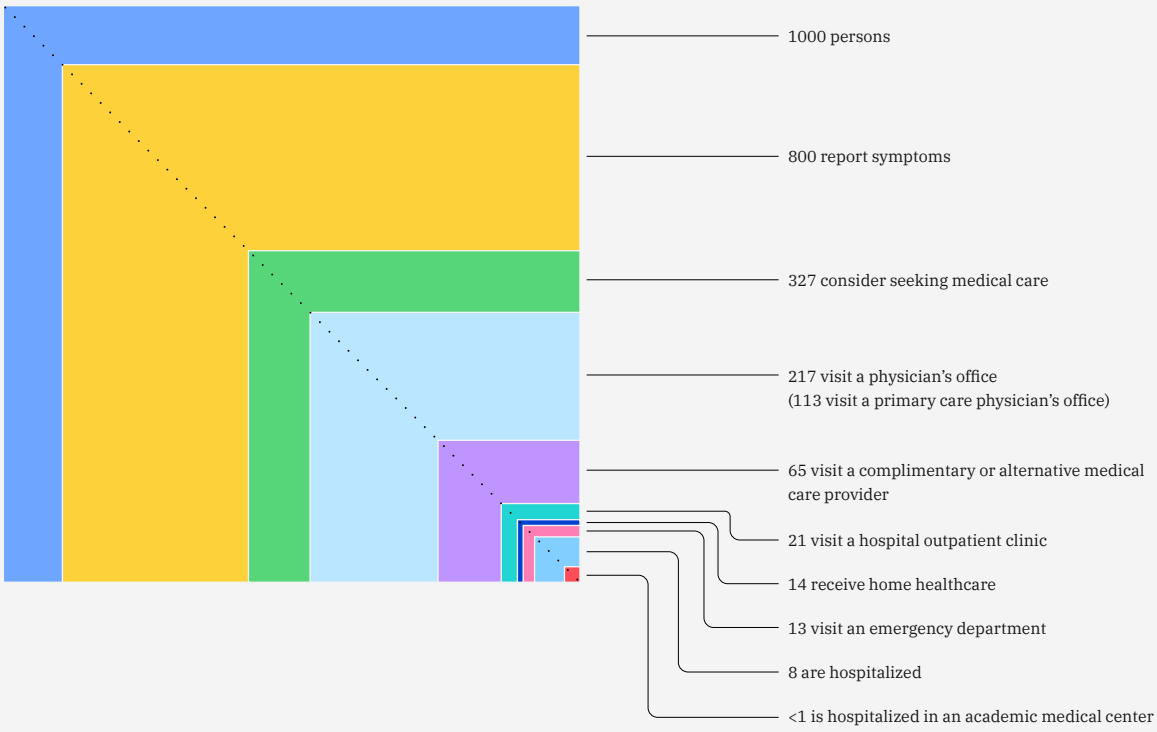
Ecology of Medical Care

Primary care remains the largest platform of health care delivery in the United States, first demonstrated by Kerr White in 1961. Forty years later, an updated and expanded estimate of the use of all health services calculated the number of Americans who experience certain health care events in a typical one-month period. Using multiple data sources and comparing primary care services to other medical specialty services, the model showed that more people seek primary care than any other type of health care service.

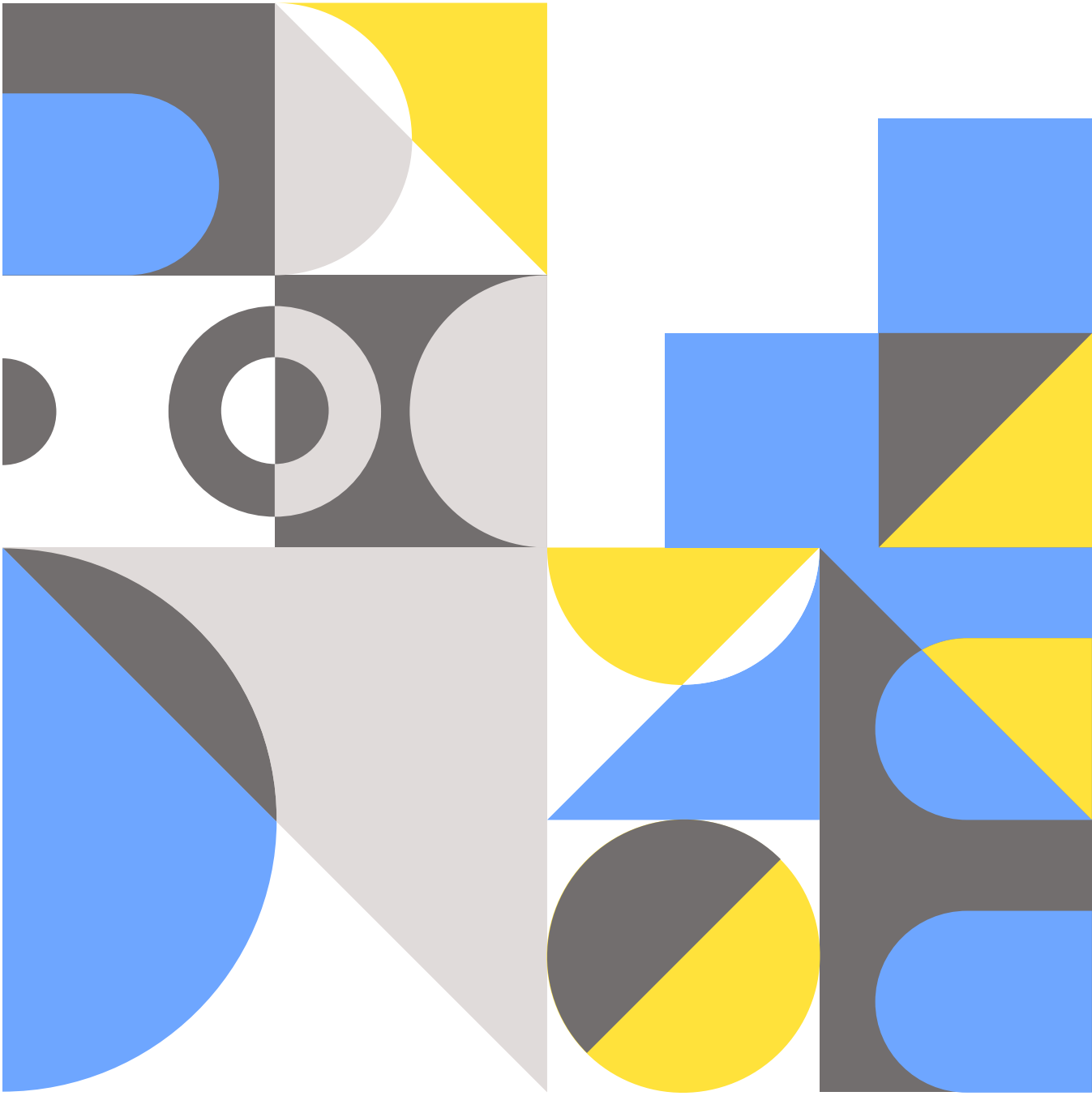
Figure 1 below shows the proportion of Americans who seek various types of health care services in an average month. For every 1,000 people in the United States:

- 800 report symptoms
- 327 consider seeking medical care
- 217 visit a physician's office (of which 113 visit a primary care physician)
- 104 visit a specialist physician
- 65 visit a complementary or alternative medical care provider
- 21 visit a hospital-based outpatient clinic
- 14 receive health services at home
- 13 visit an emergency department
- Eight are hospitalized
- Less than one person is hospitalized in an academic medical center

Figure 1. The Ecology of Medical Care, 2001



II. First Contact



Who Provides Primary Care?

Unlike many other countries, the U.S. primary care workforce lags woefully behind its specialty care counterparts. At present, primary care physicians represent only about one-third of the overall physician workforce in the United States.[28] This falls far short of the 40 percent primary care workforce recommended by the Council on Graduate Medical Education (COGME) report on Advancing Primary Care.[29] Although the 2010 COGME report outlined significant evidence demonstrating optimal health outcomes when 40 percent of the physician workforce are primary care physicians, the United States has seen a decades decline in production of primary care physicians relative to specialty physicians.[30] A closer look reveals declining trends in U.S. medical graduates choosing family medicine—14 to 8 percent among allopathic graduates from 2000 to 2005 and 34 to 29 percent among osteopathic graduates from 2001 to 2008.[29] This decline is further magnified by the looming retirement of one-quarter of the primary care physician workforce,[28] and an anticipated increase in demand for primary care physicians as the U.S. population grows larger and older. If supply and demand trends persist, the American Association of Medical Colleges (AAMC) estimates a shortage ranging between 21,100 and 55,200 primary care physicians by 2032.[31]

Primary Care Physicians

In 2019, there were more than 228,000 direct patient care physicians in the five major primary care specialties (Table 1). The major specialty of primary care is family medicine, accounting for nearly 40 percent of the total primary care physician workforce, followed by general internal medicine and general pediatrics. The number of geriatricians is relatively small. Primary care physicians make up less than one-third of the physicians who spend most of their time caring for patients.[28]

Table 1. Number of Office-Based, Direct Patient Care Physicians by Specialty, 2019

Physician Type	Number of Physicians	Percent of Primary Care Physicians	Percent Total
Total Physicians	730,026	–	100.0%
Non-Primary Care Physicians	501,089	–	68.6%
Total Primary Care Physicians	**228,936**	**100.0%**	**31.4%**
Family Physicians	91,037	39.8%	12.5%
Geriatrics	4,495	2.0%	0.6%
General Practice	5,579	2.4%	0.8%
General Internal Medicine	78,984	34.5%	10.8%
General Pediatrics	48,842	21.3%	6.7%

Source: American Medical Association (AMA) Physician Masterfile, 2019

Primary Care Nurse Practitioners and Physician Assistants

Rapid growth in the number of nurse practitioners (NPs) and physician assistants (PAs) have offered new hope for filling gaps in access to primary care. However, the well-documented decline in physicians choosing primary care appears to be shared by NPs and PAs, which have seen similar reductions in primary care as a preferred specialty choice.[32] In recent reports, debate remains over what portion of NPs and PAs enter primary care. For example, the National Commission on Certification of Physician Assistants (NCCPA) notes that only 25.8% of PAs (25,487) currently work in primary care settings, versus findings by the Agency for Health Care Research and Quality (AHRQ) in 2016 estimating 43.4% of PAs (36,119) practice primary care.[33,34] It is clear in either case that ensuring PAs and NPs entry into and retention in primary care is a challenge, much like that faced in the physician workforce. Table 2 below shows an updated estimate of the total number of PAs and NPs, and the proportion of each working in primary care based on a 'co-location' method described in the Appendix. Lacking the type of data Masterfile that is available to physicians, this is an estimate only.

Table 2. Estimates of Nurse Practitioners and Physician Assistants in Primary Care, 2020

Provider Type	Total Number	Percent in Primary Care	Number in Primary Care
Nurse Practitioners	220,332	42.8%	94,302
Physician Assistants	118,195	35.7%	42,195

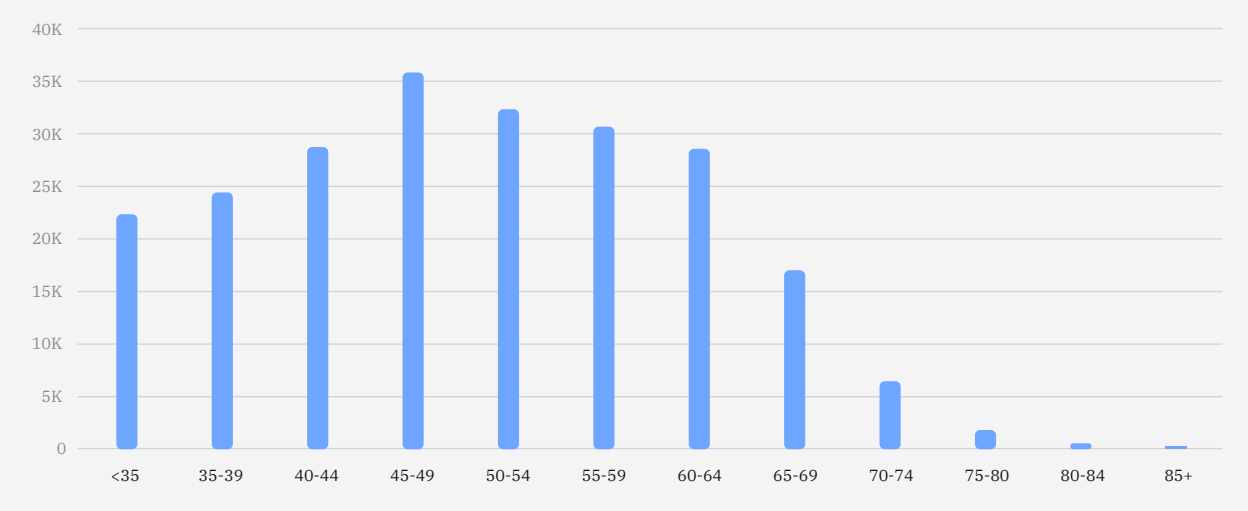
Source: Medicare Provider Enrollment, Chain, and Ownership System (PECOS), 2020

Age Distribution of Primary Care Physicians

Most primary care physicians arrive in the workforce in their late 20s, and typically remain in the workforce for 40 years. The increased interest in primary care in the late 1990s likely explains the age peak of physicians in the mid-late 40s (Figure 2). In 2019, nearly one-quarter of primary care physicians were aged 60 years and older.[28]

Compared to physicians, physician assistants (PAs) in primary care tend to be younger on average. Only 14% of primary care PAs are aged 60 years or older. The median age is 40 years.[35] Age distribution data were not available for primary care nurse practitioners.

Figure 2. Age Distribution of Primary Care Physicians, 2019



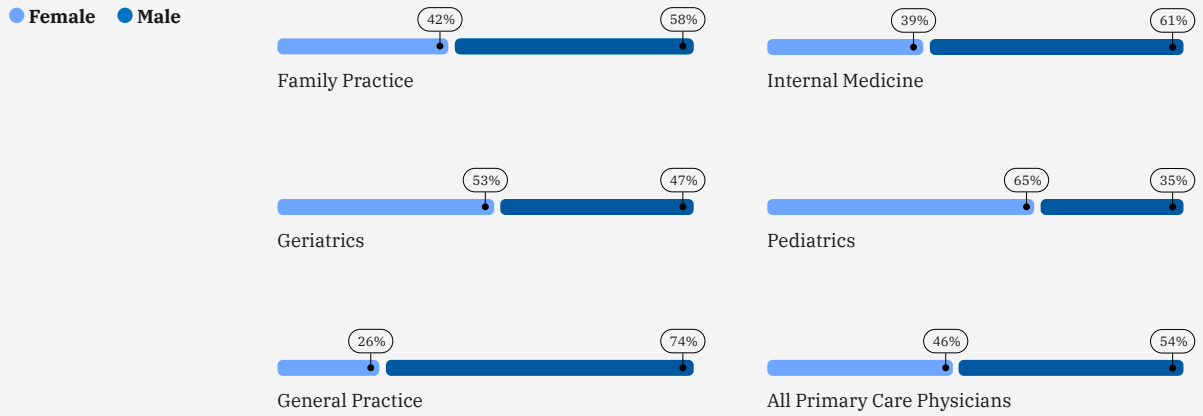
Source: American Medical Association (AMA) Physician Masterfile, 2019

Primary Care Physicians by Gender

The primary care physician (PCP) workforce in many industrialized nations is increasingly female. In recent decades, the proportion of PCPs who are women has doubled or nearly doubled, often outpacing non-primary care specialties in these industrialized countries.[36,37]

There is an increasing balance by gender across most of the primary care disciplines, and as of 2019, a majority of pediatricians, geriatricians, and nurse practitioners are women (Figure 3).

Figure 3. Primary Care Physicians by Gender and Specialty, 2019

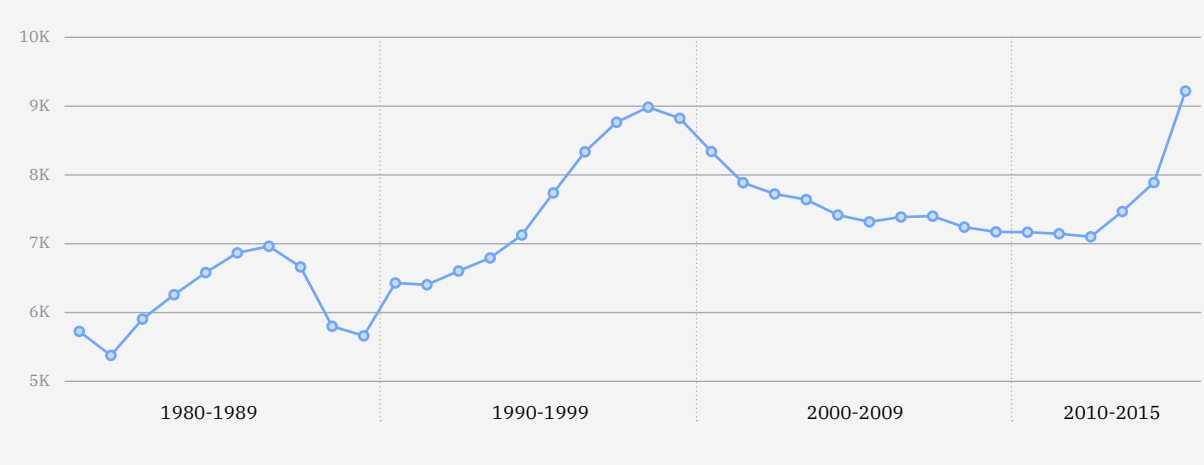


Source: American Medical Association (AMA) Physician Masterfile, 2019

Number of Graduates from Primary Care Residencies

The number of graduates from primary care residency training programs peaked in the late 1990s and subsequently declined for the next decade (Figure 4). There appears to be a growth in the number of graduates in recent years, though there is a long lag period after completion of training before a physician's practice specialty or location is certain. Data sources, such as the AMA Physician Masterfile, reflect this period of uncertainty for recent residency graduates.

Figure 4. Primary Care Physicians by Year of Residency Graduation, 1980-2015



Source: American Medical Association (AMA) Physician Masterfile, 2019

Where is Primary Care Provided?

Over a hundred years ago, Abraham Flexner noted the disproportionate geographic distribution of physicians[38] – an enduring access problem re-emphasized in numerous federal agency reports and expert panels in recent decades. According to the Organisation for Economic Co-operation and Development (OECD), the number of physicians per 1,000 residents in the United States is slightly lower than the average in other similarly developed OECD countries — 2.6 for the United States compared to the OECD average of 3.5.[39] However, significant state-level variation exists within the United States.[40]

Compared to any other specialty group, family physicians, primary care nurse practitioners, and primary care physician assistants are more likely to provide care in rural and remote areas. The number of providers at practice sites also varies significantly, but as recently as 2016, the majority of clinic sites have five or fewer providers.[41]

Ratios of Primary Care Professionals to Population

There are 223.1 physicians per 100,000 persons in the United States. Of those, nearly one-third (70/223.1) are primary care physicians (Table 3). There are 111.7 primary care providers overall per 100,000 population, including physicians, physician assistants, and nurse practitioners. This translates to one primary care physician for about every 1,429 people in the United States, and one primary care professional for every 895 people.[28,42,43]

There are substantial variations across the primary care specialties and professions. Pediatric and geriatric physician ratios are adjusted for the appropriate population ages. Physician assistant and nurse practitioner ratios are considerably higher because of the smaller number of professionals. Table 3 shows both the number of health care professionals per 100,000 population and the ratio of persons per provider.[28,42,43]

Table 3. Primary Care Professionals per 100,000 Population by Specialty, 2019

Specialty	Providers per 100,000	Persons per Provider
Family Medicine	27.8	3,594
General Practice	1.7	58,643
General Internal Medicine	24.1	4,142
Geriatrics*	8.6	11,664
General Pediatrics+	66.5	1,503
Primary Care Nurse Practitioners	28.8	3,470
Primary Care Physician Assistants	12.9	7,754
All Primary Care Physicians	70.0	1,429
All Primary Care Providers	111.7	895
All Physicians	223.1	448

Sources:
American Medical Association (AMA) Physician Masterfile, 2019 (Physicians)

Medicare Provider Enrollment, Chain, and Ownership System (PECOS), 2020 (NP/PA)

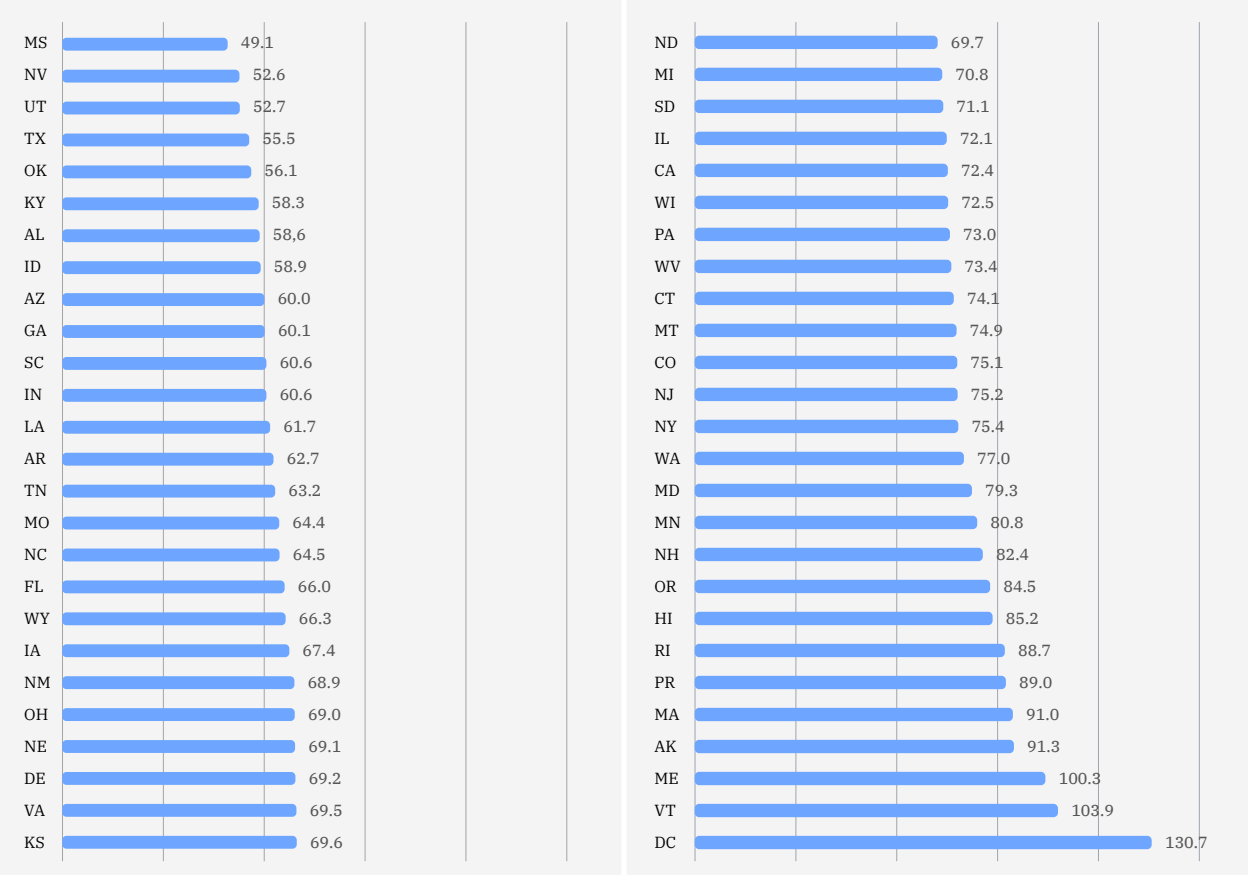
United States Census Bureau, 2018 population estimates

*Population: Persons over age 65
+Population: Persons under age 18

Primary Care Physician to Population Ratios by State

The number of primary care physicians per 100,000 population varies significantly by state (Figure 5). Mississippi has the lowest, with 49.1, and Vermont the highest, with 103.9 primary care physicians per 100,000 people. The District of Columbia has an even higher physician-to-population ratio of 130.7. The Northeast, Northwest, and northern Midwest regions have the highest ratios of primary care physicians per population.[28]

Figure 5. Primary Care Physicians per 100,000 Population by State, 2019



Source: American Medical Association (AMA) Physician Masterfile, 2019; United States Census Bureau, 2019 population estimates [44]

Primary Care Physicians by Rural/Urban Geography

Table 4 shows that primary care physicians are better represented in rural areas than specialist physicians. Among primary care physicians, family physicians and general practice physicians are more highly concentrated in rural areas compared to geriatricians, internists, and pediatricians. Conversely, geriatricians, internists, and pediatricians are as highly concentrated in urban areas as specialist physicians.

Table 4. Primary Care Physicians by Rural-Urban Commuting Area (RUCA) Designation

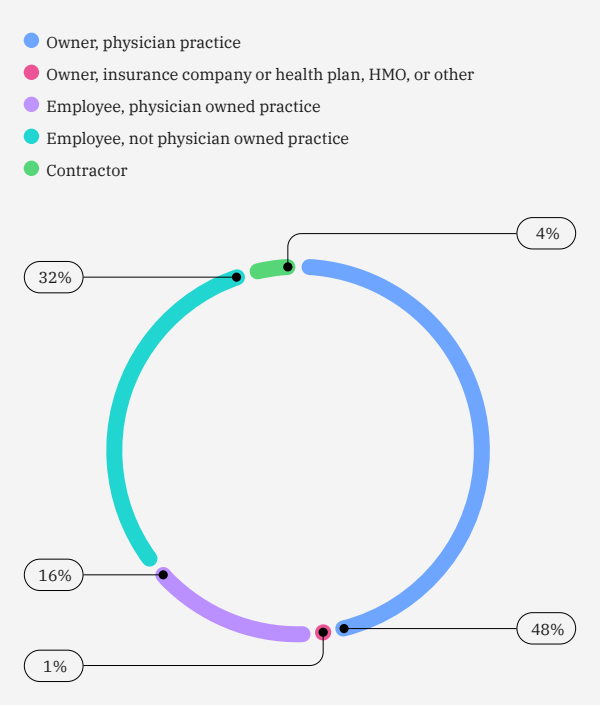
Rural Status	Percent of U.S. Population	Non-Primary Care	Primary Care	Family Medicine	Geriatrics	General Practice	Internal Medicine	Pediatrics
Urban	84.2%	95.1%	91.8%	87.6%	95.9%	87.6%	94.7%	95.1%
Large Rural	8.7%	3.3%	4.5%	6.2%	2.3%	5.8%	3.3%	3.2%
Small Rural	4.1%	0.9%	2.2%	3.8%	0.9%	3.6%	1.1%	1.0%
Isolated Rural	3.0%	0.4%	1.1%	2.1%	0.6%	2.3%	0.5%	0.4%

Sources: American Medical Association (AMA) Physician Masterfile, 2019
American Community Survey (ACS), 5-Year Summary File, 2014-2018 population estimates[45]
Rural-Urban Commuting Area (RUCA) Codes[46]

Primary Care Practices by Ownership

Some primary care physicians own their practices, while others work as employees of another physician, as employees in non-physician owned practices, or as independent contractors (Figure 6). The majority of primary care offices are owned by a physician or physician group. Nearly half (48%) of primary care physicians are full or partial owners of their practices, which is a decline compared to our previous calculation.[47] Conversely, the other half (48%) of primary care physicians belong to a rapidly growing cohort of employed physicians. Of the 48% employed primary care physicians, two-thirds work in non-physician owned practices while one-third work in physician owned practices. A small percentage of primary care physicians (4%) are independent contractors.

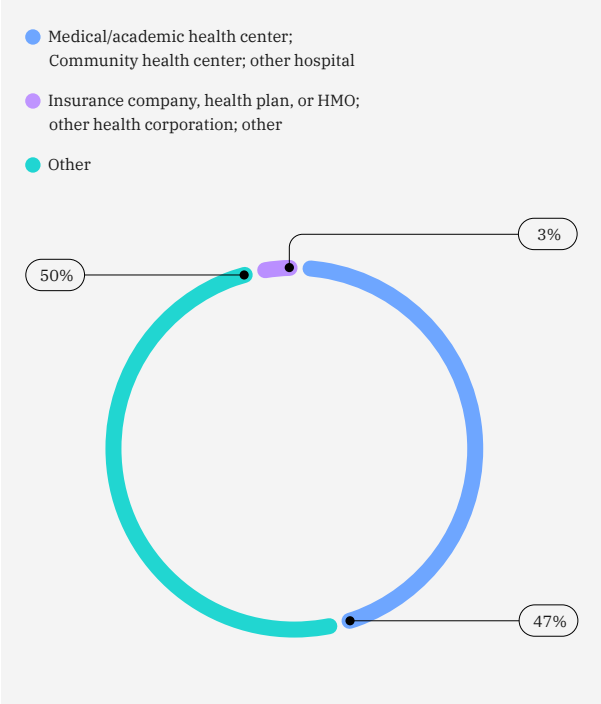
Figure 6. Primary Care Physicians by Employment Status



Source: National Ambulatory Medical Care Survey (NAMCS), 2016

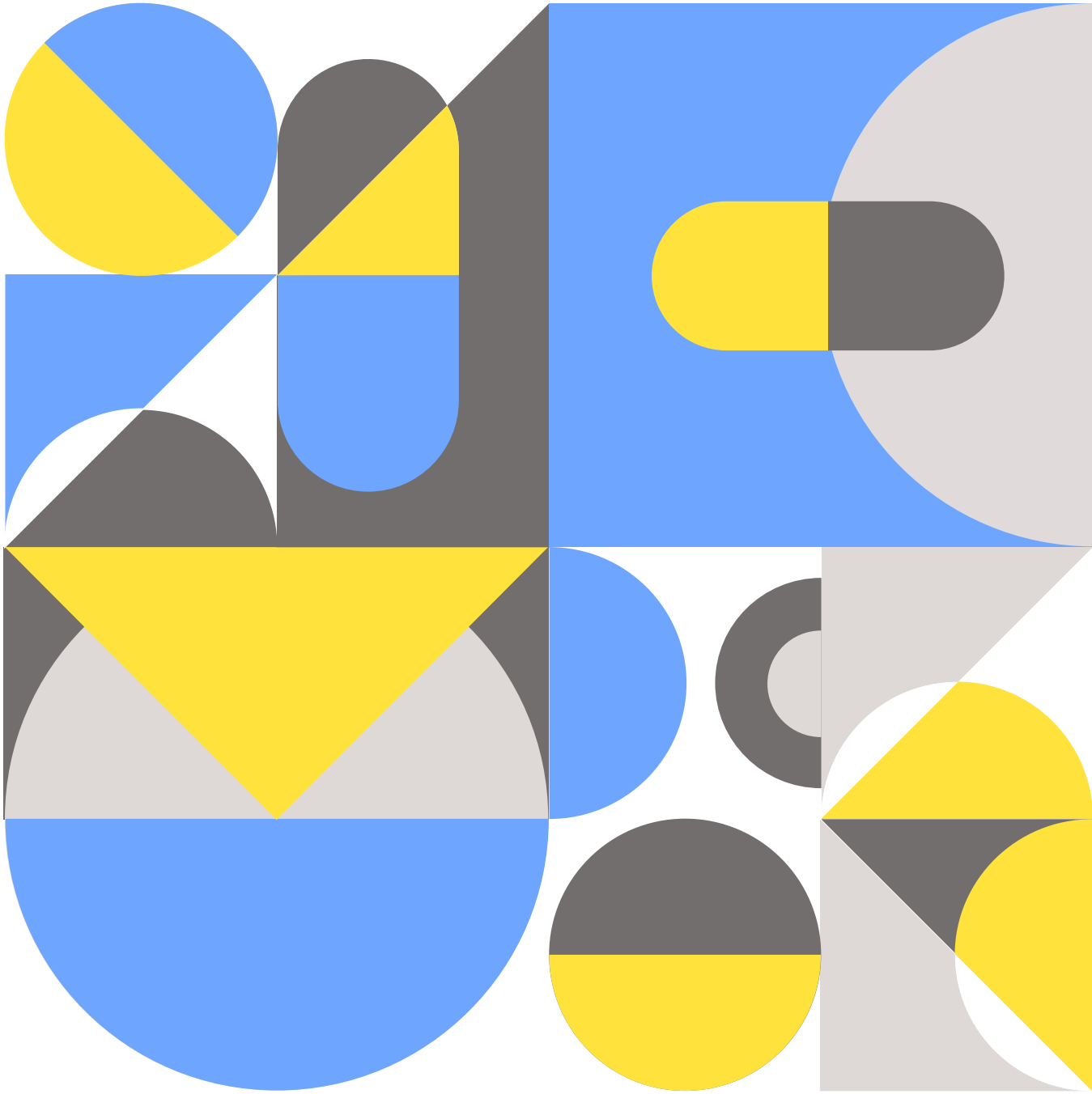
Of the primary care physicians who work in non-physician owned practices, half (50%) are in practices owned by insurers, health plans, HMOs, or other corporate entities. Approximately 47% are in medical, academic, or community health centers (Figure 7).

Figure 7. Distribution of Primary Care Physicians in Non-Physician Owned Practices



Source: National Ambulatory Medical Care Survey (NAMCS), 2016

III. Continuity



Who Visits Primary Care Practices?

In 2016, Americans made nearly 900 million visits to office-based physicians with almost half of those visits made to primary care physicians.[48] As previously discussed, many Americans also seek primary care services from nurse practitioners and physician assistants, though their scope of practice varies by state and by practice site. The benefits to populations that establish a relationship with primary care are numerous in the literature. Consistently, studies show a link between having a primary care provider and improved patient health outcomes with a simultaneous reduction in overall cost for health care services and utilization.[49,50]

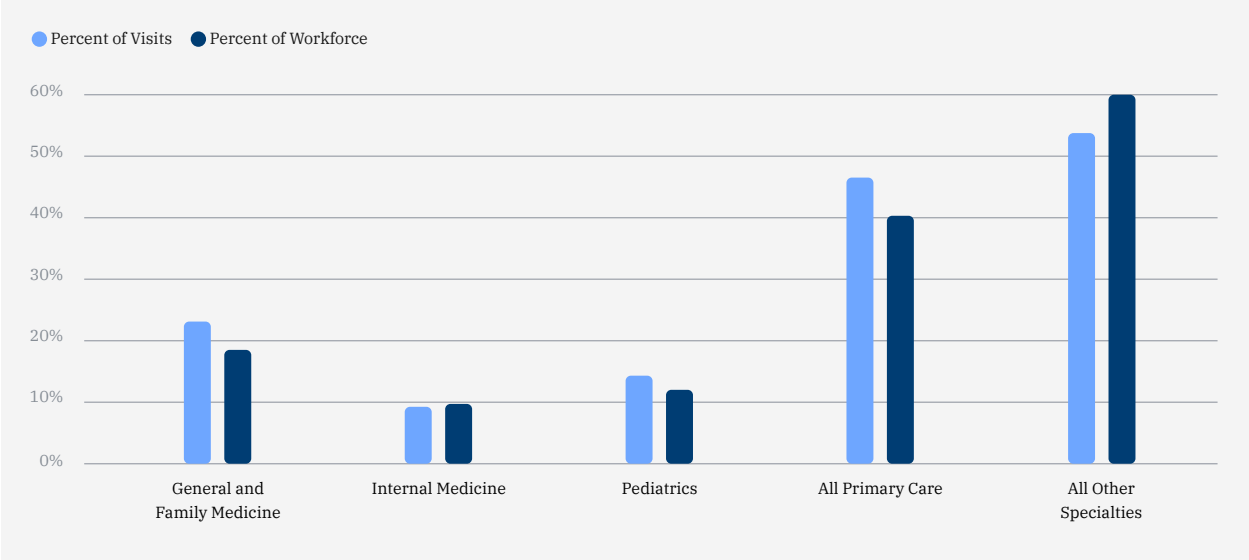
Office Visits to Physicians by Specialty

The largest number of office-based primary care physician visits (over 200 million) were to family medicine or general practice physicians (Table 5). Visits to general pediatricians and general internists represent the second and third-most visited primary care specialties, with more than 207 million combined visits.

Table 5. Physician Office Visits by Specialty

Physician Specialty	Number of Visits	Percent of Visits
General and Family Medicine	202,494,171	22.9%
Internal Medicine	81,700,886	9.2%
Pediatrics	126,063,214	14.3%
All Primary Care	**410,258,271**	**46.4%**
Other Medical Specialties	238,945,991	27.0%
Surgical Specialties	234,520,916	26.5%
All Visits	**883,725,178**	**100.0%**

Figure 8. Visits to Office-Based Physicians by Specialty



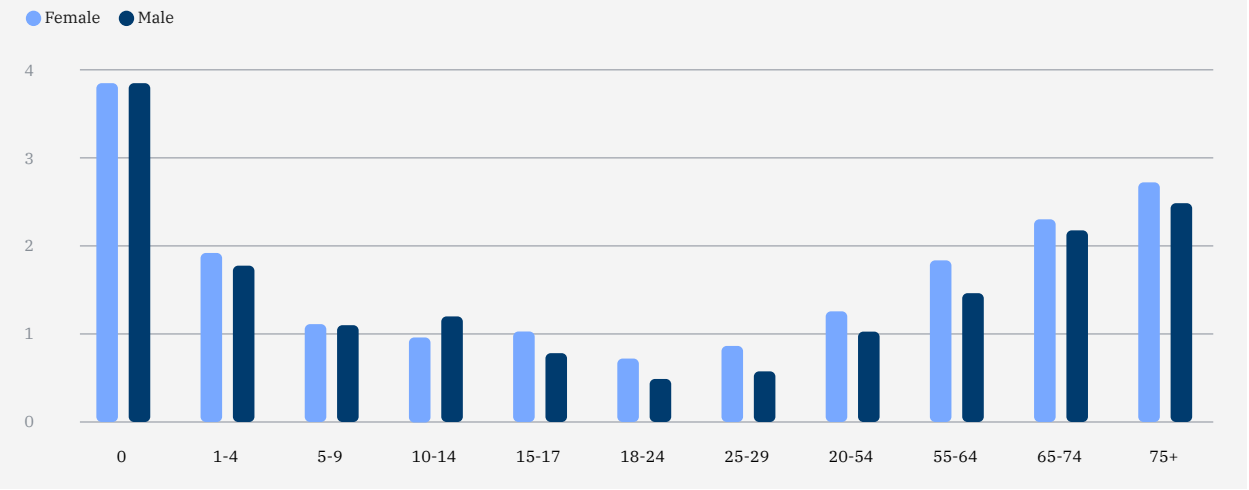
Source: National Ambulatory Medical Care Survey (NAMCS), 2016

Figure 8 shows the proportion of office visits to primary care physicians and specialists compared to each specialty's percentage of total workforce.

Outpatient Visits to Primary Care Physicians by Patient Age and Sex

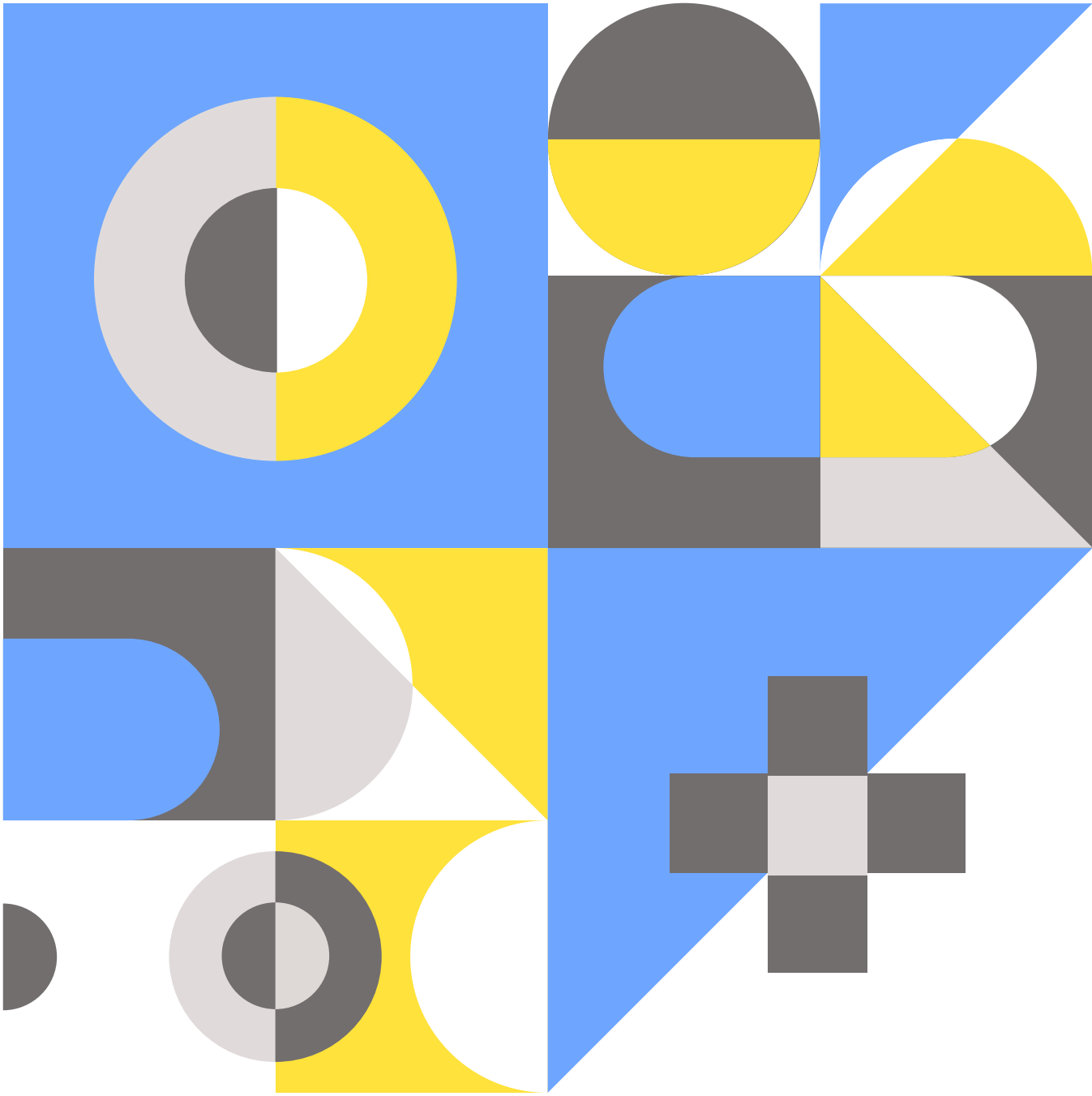
The number of visits to primary care physicians varies by age and sex (Figure 9). According to the Medical Expenditure Panel Survey (MEPS),[51] which provides nationally representative information about all health services in the United States, the youngest (< 1 year) and oldest patients (75+ years) tend to visit primary care offices most frequently. The youngest age group averages nearly 4 visits per year; older age groups average 2.5 to 3 visits per year. Across all age groups, females have a higher mean number of primary care office visits (1.47) per year than males (1.24).

Figure 9. Primary Care Office Visits by Age and Sex, 2017



Source: Medical Expenditure Panel Survey (MEPS), 2017

IV. Comprehensiveness



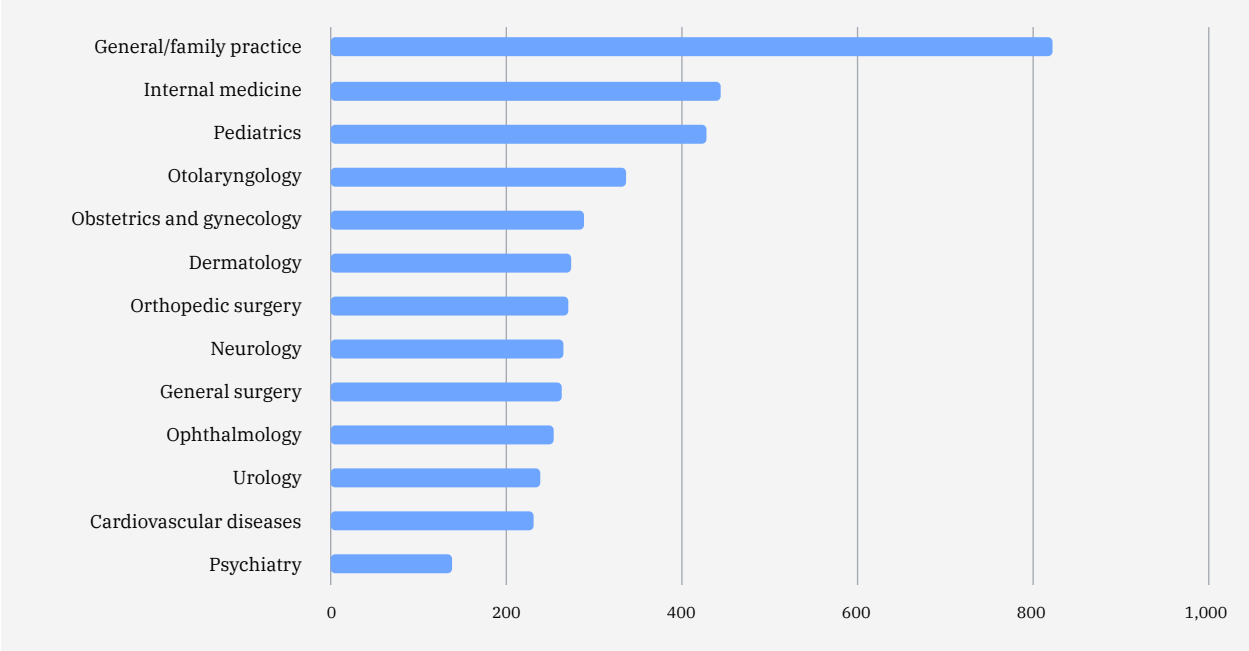
What Medical Conditions do Primary Care Physicians Address?

Primary care physicians care for patients of all ages and with a broad range of acute and chronic physical and psychological conditions, including multiple chronic conditions. Primary care physicians also deliver clinical preventive services, provide patient education, and perform procedures from minor (e.g. skin biopsy) to major (labor and delivery). Comprehensive care delivers better clinical outcomes for patients and lowers overall health spending for the health system.[52]

Primary Care Physicians' Scope of Practice

Primary care physicians continue to care for the broadest range of conditions and illnesses among the physician specialties. One lens on the scope of physician practice is the distribution of the diagnosis codes in their billing for services rendered. The number of diagnosis codes used by primary care physicians is broader than that of non-primary care physicians, whose diagnosis codes cluster around the organs or illnesses of their specialty. Figure 10 indicates the number of unique International Classification of Disease, Tenth Revision (ICD-10) diagnosis codes by primary care and selected specialties. Primary care physicians treat a wide range of conditions along the spectrum of ICD-classified conditions.

Figure 10. Scope of Practice by Number of ICD-10 Diagnosis Codes for Primary Care and Selected Physician Specialties



Source: National Ambulatory Medical Care Survey (NAMCS), 2016

Table 6. Patients with Chronic Conditions Who Visited or Talked to a Physician, 2017

Condition	Total Patients	Saw Primary Care Physician		Saw Subspecialist	
Hypertension	61,329,148	49,859,952	81%	44,001,040	72%
Arthritis	27,601,748	22,029,728	80%	22,303,648	81%
Diabetes	24,984,656	20,862,664	84%	18,365,792	74%
Asthma	19,485,934	15,721,782	81%	12,798,045	66%
Glaucoma	4,838,642	3,880,411	80%	4,555,869	94%
Macular Degeneration	2,724,906	2,212,159	81%	2,603,656	96%
Congestive Heart Failure	1,797,097	1,440,255	80%	1,545,735	86%
Parkinson's	598,042	514,940	86%	506,450	85%

Source: Medical Expenditure Panel Survey (MEPS), 2017

Primary Care for Patients with Chronic Conditions

Chronic conditions are prolonged in duration. They include hypertension, arthritis, diabetes, heart disease, and asthma. Today, six of every ten adults in the United States have at least one chronic condition.[53] Primary care physicians care for a large portion of patients with chronic diseases. Primary care nurse practitioners and physician assistants see patients with these chronic diseases as well. However, data about the care they provide are not easily accessible. Within a group of eight common chronic diseases, primary care physicians see a large proportion of patients with these conditions (Table 6). For example, 61 million Americans with high blood pressure sought care in 2017 and 81% of them visited a primary care physician.

More people with hypertension, diabetes, and asthma visit a primary care physician each year than visit a specialist for treatment of these conditions. Even people with less common, severe chronic diseases, such as Parkinson's disease, generally see a primary care physician each year, in addition to seeing a specialist, such as a neurologist.

Changes in Primary Care Scope of Practice

Scope of practice is changing across the primary care disciplines, none so dramatically perhaps as in family medicine. As the figures above and below reflects, family physicians are increasingly likely to care for complex, multimorbid patients in the outpatient and community setting, and less likely to report care in a hospital setting they once commonly tread. Similar trends have been observed in other settings of care for family physicians – e.g. prenatal care, home visits, nursing home care, and obstetric care.[54] Not all of these trends reflect trainee intent, and early studies linking broader scope to positive policy outcomes and lower burnout suggest the need for further research on the impact that shifting scope may have on patients and health systems.[55]

Table 7. Family Physicians' Self-Reported Provision of Inpatient Care, 2013-2018

Year of Survey	2013	2014	2015	2016	2017*	2018*
Total FPs surveyed	10,673	10,064	8,464	8,886	8,675	8,727
FPs reporting inpatient care	3,637	3,386	2,551	2,551	2,182	2,091
Share of FPs reporting inpatient care	34.1%	33.6%	30.9%	28.7%	25.2%	23.9%

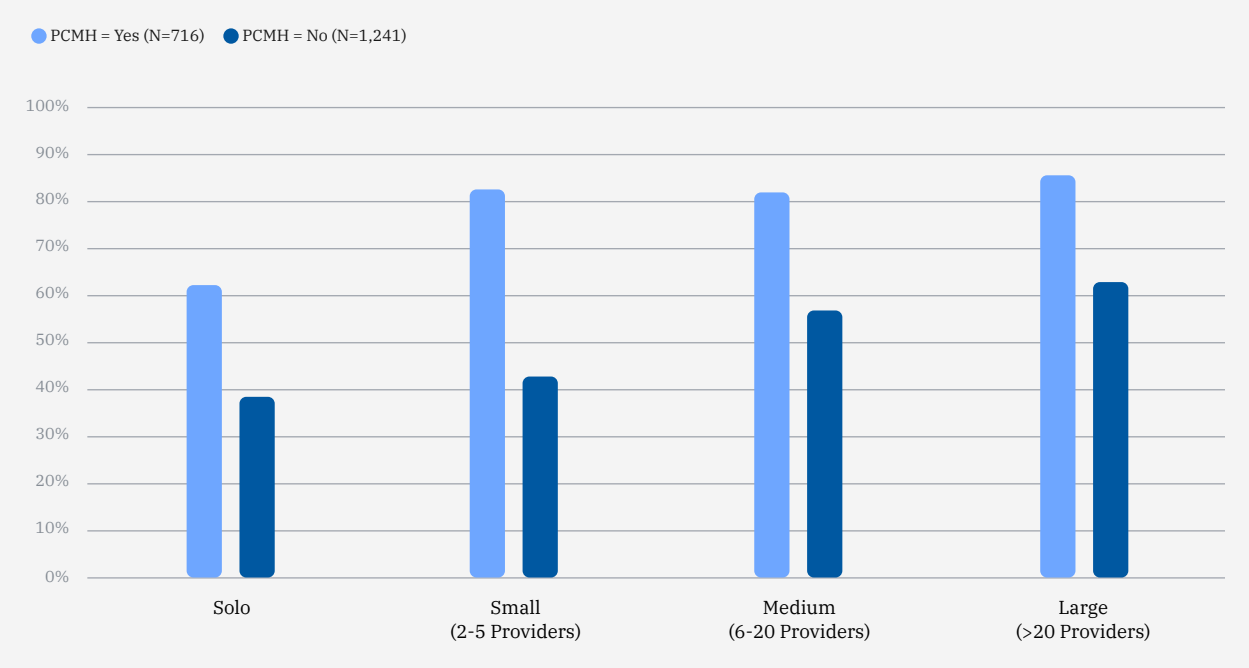
Source: American Board of Family Medicine (ABFM) Demographic Survey, 2013-2018.
FP: family physician. Sample restricted to FPs in direct patient care
*In 2017 and 2018, ABFM Diplomates were asked whether they provided "adult inpatient care" instead of "inpatient care" in the previous years.

V. Coordination

How Does Care Coordination Function in Primary Care

According to the Institute of Medicine, "primary care is 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."[56] A model encompassing this type of care is known as the Patient Centered Medical Home (PCMH), originally introduced by the American Academy of Pediatrics in 1967 and re-energized through accreditation programs in 2008. PCMH has since focused on activities of care coordination, enhanced access and payment reform.[57] Several primary care practices in the United States have adopted the PCMH model and in so doing have been able to increase their coordination capabilities (Figure 11).[58]

Figure 11. Percentage of Family Physicians Reporting Having a Care Coordinator at Their Primary Practice, by Practice Size and Patient-Centered Medical Home (PCMH) Status



Source: American Board of Family Medicine (ABFM) Recertification Examination Application Survey, 2016

Primary care, more than any other specialty, is uniquely suited to coordinate care in a way that meets the needs of the people it serves. Indeed, there are various health care providers whose roles in primary care clinics improve the overall health and welfare of patients through meeting multifaceted needs, including but not limited to the realm of social work, behavioral health, physical therapy, and clinical pharmacy. Furthermore, collaboration between family physicians and other health care providers appears to be on the rise (Table 8).[59]

Table 8. Percent Family Physicians Working Alongside Other Health Care Providers by Year

Provider	2014 (N=10,836)	2015 (N=9,198)	2016 (N=9,780)	2017 (N=8,161)	2018 (N=8,026)
Nurse Practitioner*	54.0	55.9	59.9	53.7	55.9
Registered Nurse*	47.0	48.7	49.8	53.5	53.8
Physician Assistant*	41.3	42.8	44.3	41.6	42.5
Licensed Practical Nurse*	34.5	35.1	37.1	49.7	49.3
Clinical pharmacist*	21.7	22.9	24.8	24.9	25.8
Behavior Specialist*	21.2	22.7	24.2	24.5	26.3
Social Worker*	20.9	22.0	24.6	24.0	26.3
PT/OT	14.8	16.4	17.5	14.5	14.4
Psychiatrist	12.1	12.5	14.2	13.1	13.1
Midwife	4.6	4.0	4.3	4.6	5.0

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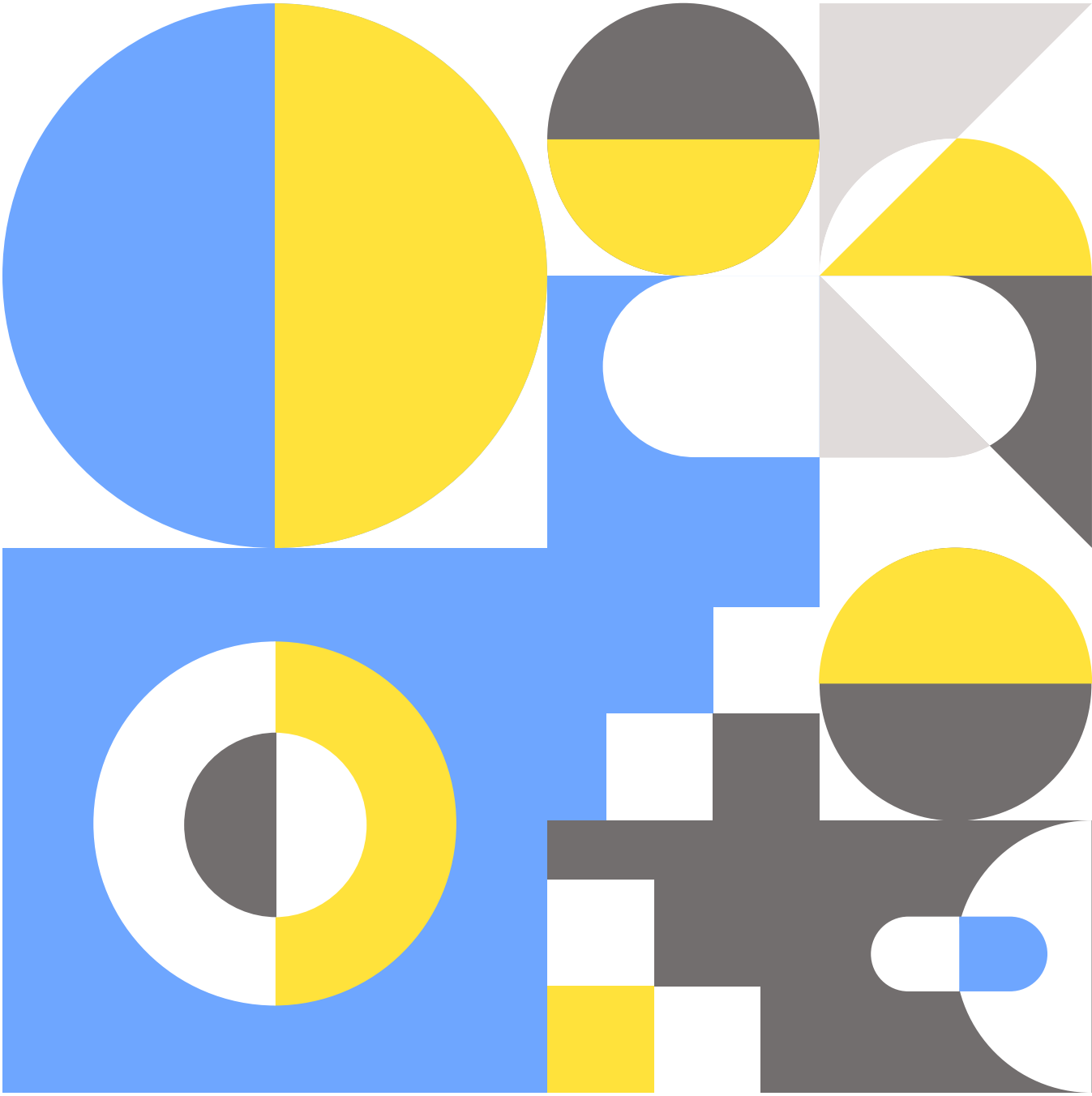
Source: 2014, 2015, 2016, 2017, and 2018 ABFM Recertification Examination Application Surveys.

PT, physical therapist; OT, occupational therapist.

* Significant to the P < .001.

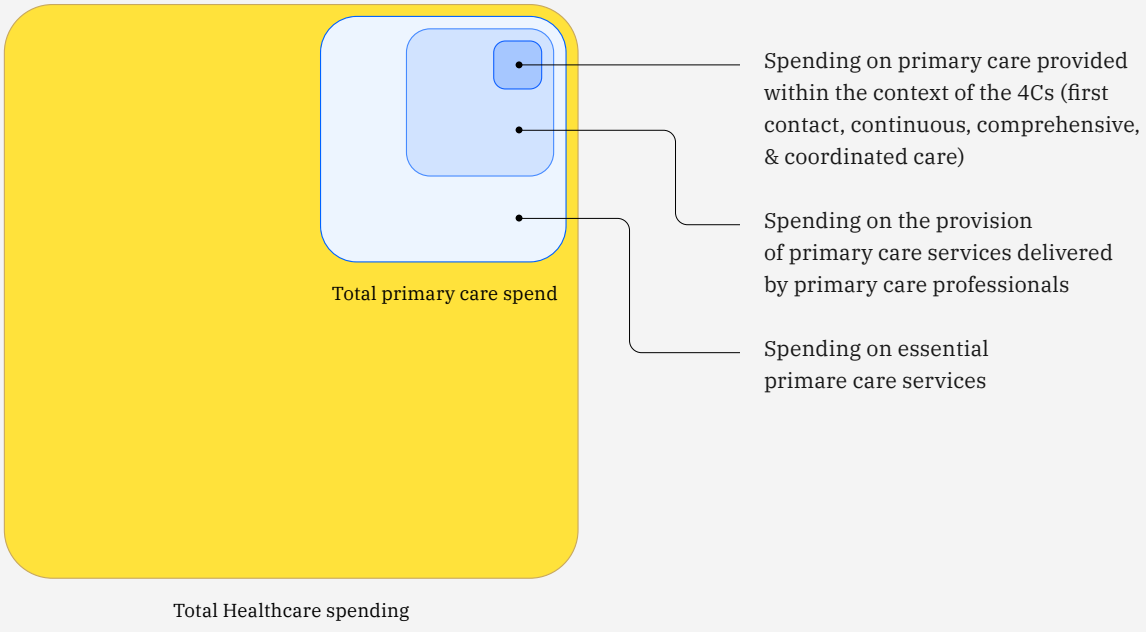
VI. Cost



How Much Do We Spend on Primary Care?

According to the Centers for Medicare & Medicaid Services (CMS), total health care spending in the United States reached $3.6 trillion in 2018.[60] Despite being the largest specialty in the U.S. health system, primary care accounts for a mere 5-7% of total health care spending.[61] This investment pales in comparison to other developed nations who average 14% of their total health care spending on primary care.[62] As the United States evaluates its primary care investment, the Primary Care Spend model (Figure 12) may be a useful tool – a framework appraising primary care resource allocation and prioritization in the context of a system's overall health budget, while simultaneously acknowledging the complex multifaceted components of primary care.[63]

Figure 12. The Constituent Components of the Primary Care Spend Model



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Expenditures for Primary Care

According to the Medical Expenditure Panel Survey (MEPS), which captures household expense data for non-institutionalized populations in the United States, office-based primary care accounted for only five percent of total health expenditures in 2017 (Table 9). Furthermore, Americans spent three times more on office-based specialist services than primary care services.

Table 9. Expenditures on Health Care by Service Type

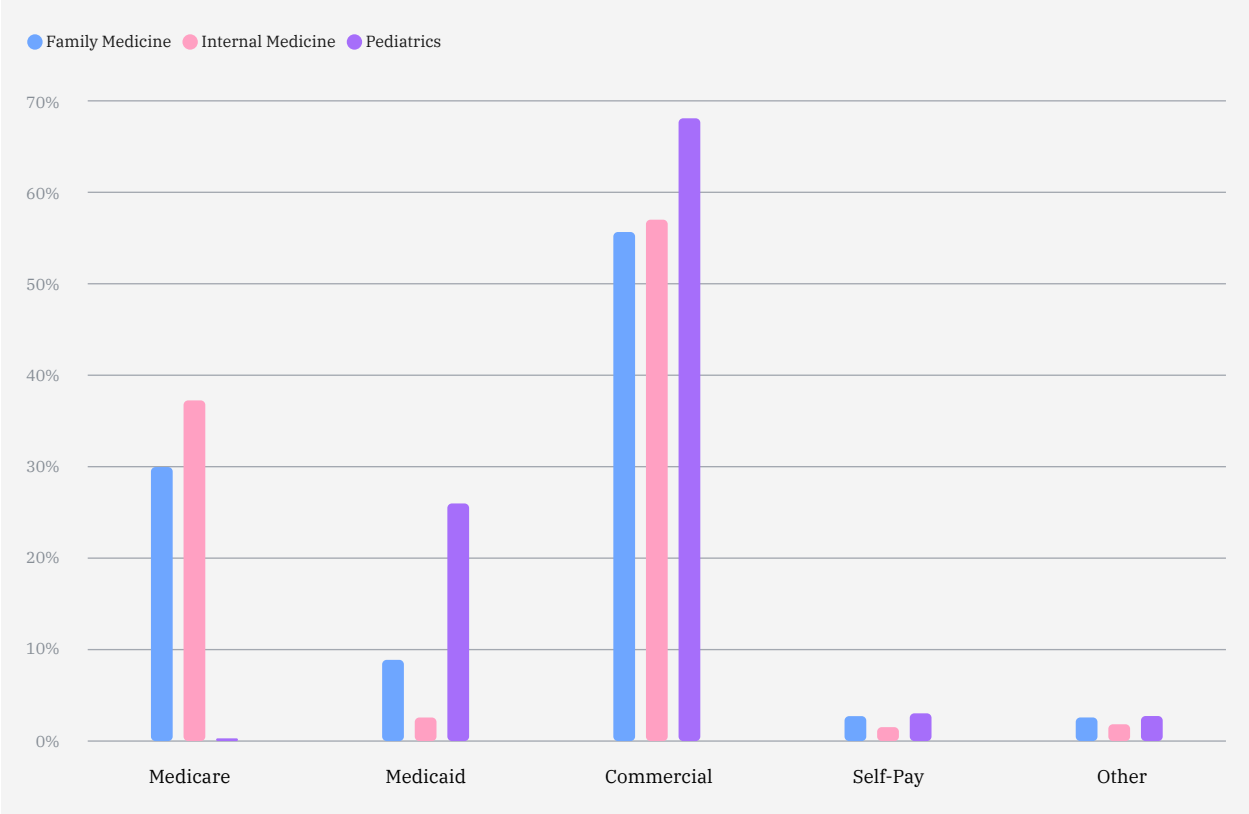
Services	Total Expenses (In Millions)	Percent of Total
Primary care, office-based	$91,663	5.3%
Specialist, office-based	$273,565	15.9%
Non-physician, office-based	$211,999	12.3%
Emergency room	$64,153	3.7%
Prescriptions	$409,409	23.8%
Home Health	$96,959	5.6%
Dental	$106,156	6.2%
Inpatient	$422,364	24.5%
Vision	$17,943	1.0%
Other	$28,918	1.7%
Total	$1,723,130	100.0%

Source: Medical Expenditure Panel Survey (MEPS), 2017.
Note: Office-based and outpatient expenditures consist of facility and physician expenses for all office-based and outpatient visits.
'Other' includes expenditures on medical equipment and services.

Primary Care Payment Sources

The proportion of care provided for patients using public health insurance (Medicare and Medicaid) varies among the three major primary care specialties: family medicine, internal medicine, and pediatrics (Figure 13). This is largely reflective of the age ranges of the patients that different primary care specialists treat. For all three specialties, more than half of their patients have commercial insurance. Internists care for a large number of elderly patients, which is reflected in the high percentage of patients who participate in Medicare. General pediatricians see a larger percentage of children, which is reflected in the high percentage of patients who participate in Medicaid.[64]

Figure 13. Primary Care Payment Sources, 2014

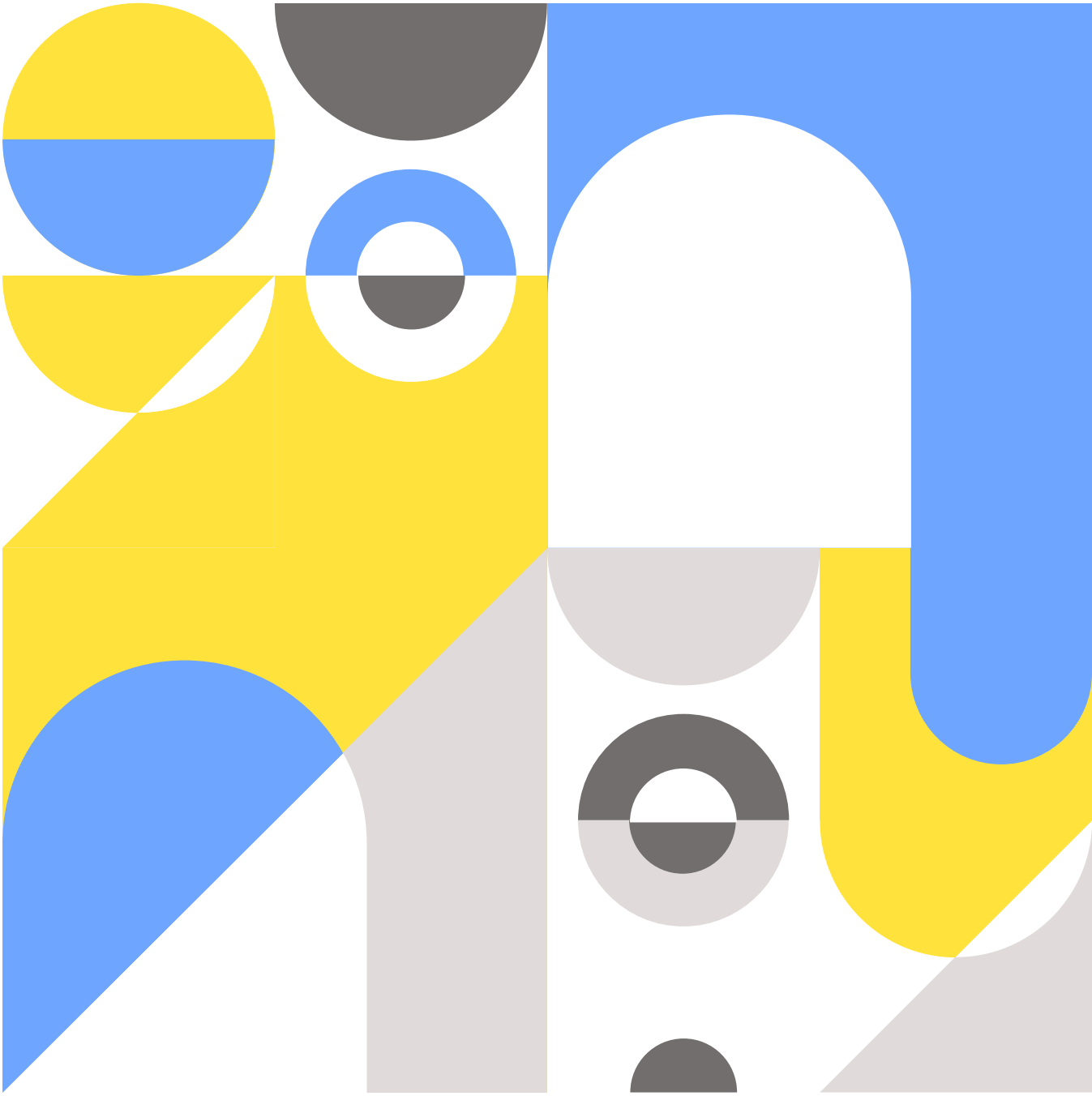


Source: Medical Group Management Association (MGMA), Cost and Revenue Survey, 2015

Trends in Compensation for Primary Care Providers

While physician compensation has steadily increased in recent years, primary care physicians continue to earn much less than their specialist counterparts.[65] The 2020 Provider Compensation and Production Report from the Medical Group Management Association (MGMA) revealed that primary care physicians earned a median total compensation of $273,437 in 2019, compared to $448,353 for specialist physicians.[66] Notably, however, was the rise in median primary care physician compensation (10.46%) outpacing that of specialist physicians (7.78%) between 2014 and 2018.[67] Perhaps more striking was a 12% rise in family medicine physician median compensation, despite little change to 'work relative value units' (wRVU) – a measure of clinical productivity – over the same period. This incongruent relationship between productivity and compensation exposes the potential for two broader trends: (1) a growing recognition of the primary care workforce shortage that has made primary care physicians a valuable commodity in a competitive market, and (2) the rise in value-based incentives that has shifted the calculus for physician compensation from volume (fee-for service) to quality that primary care provides.[68] Additional factors that influence compensation include specialty, practice setting (academic vs. private practice), and geographic location.

VII. Preventive Care Visits



Why Preventive Care Visits?

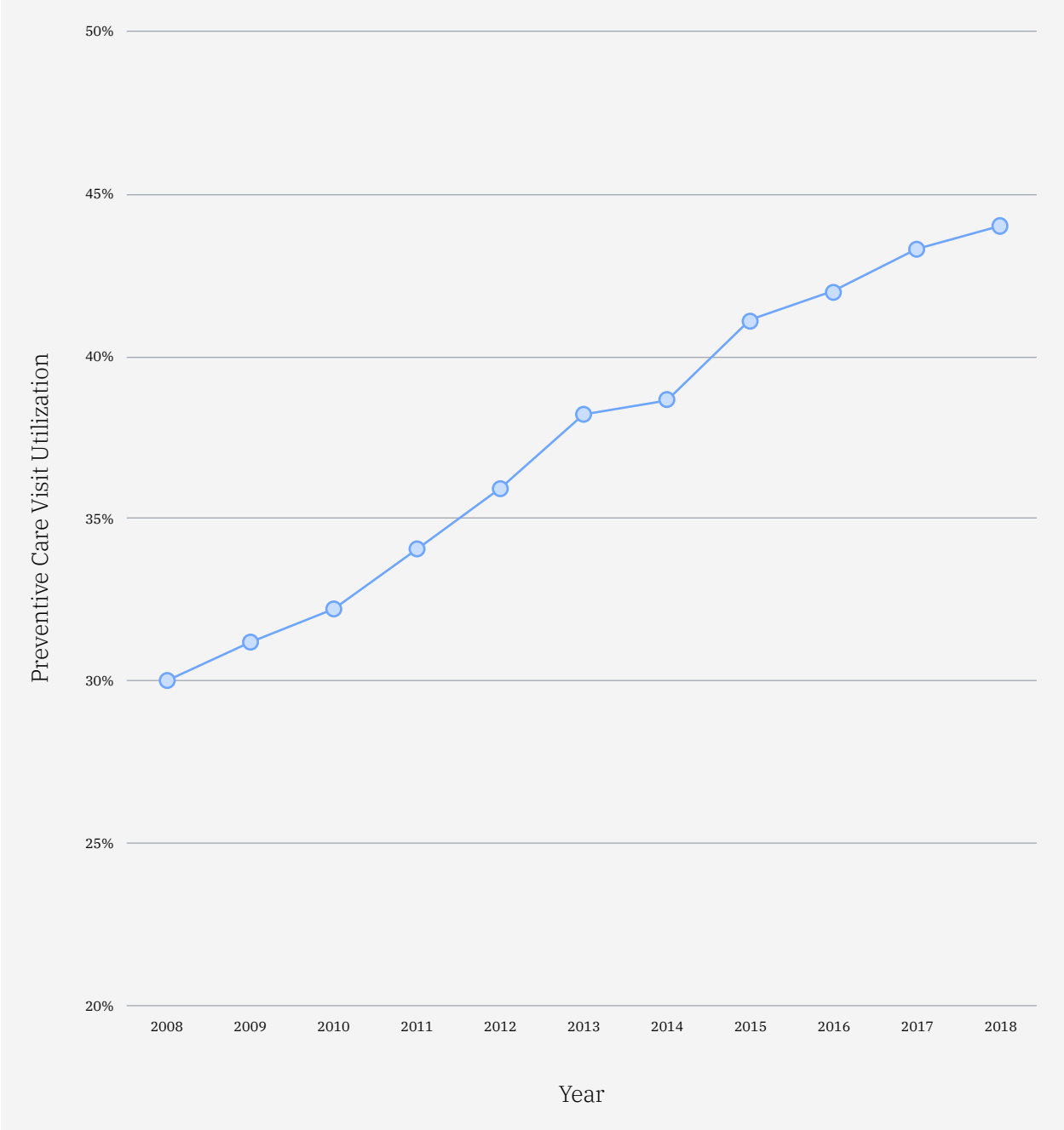
A cornerstone of primary care practice is the delivery of preventive care where the consistent delivery of preventive care services contributes to the fundamental medical practice components of the quadruple aim. In particular, major contributions include improving the health of people and population, and reducing health care cost.[69,70,71] To promote utilization, the 2010 Affordable Care Act (ACA) enacted into law the provision for preventive care services to be covered by insurances at no cost to patients.[72] However, recently, the U.S. has failed to reach the 4 goals for clinical preventive care set out by Health People 2020 (which, for 2019, included colorectal screening, blood pressure and blood glucose control, and childhood immunizations).[73] Even in commercially insured individuals, which is 55% of the U.S. population[74] and the largest source of revenue for primary care practices,[75] recommended preventive care is not received by all.[76,77]

The relationship that a patient has with their primary care provider and primary care organization has a great impact on mitigating their individual health risks and is associated with greater adherence to preventive care services.[78,79] These services are typically addressed with patients during physician office encounters, and for both children, and adults, these visits are expected to be billed as preventive medicine encounters according to CPT® terminology.[80,81] This report defines the set of preventive medicine encounters as Preventive Care Visits (PCV) and describes the utilization of PCVs using the IBM® MarketScan® Commercial Research Database, which is a large sample of a commercially insured population and their dependents in the U.S.[82] This report focuses primarily on PCV utilization, which is defined as the proportion of individuals who had at least one PCV within a given year, as well as the trend of utilization from 2008 to 2018. In particular, for the year of 2018, PCV utilization is stratified by individual patient factors that may influence the consumption of or access to medical care and include age, sex, U.S. region of residence, and insurance plan type.[83,84,85]

Trend of Preventive Care Visit Utilization

From 2008 to 2018, the number of outpatient encounters billed as preventive care visits steadily increased from 30% in 2008 to 44% in 2018, through the transition stages of the ACA legislation.

Figure 14. Trend of Preventive Care Visit Utilization, 2008–2018



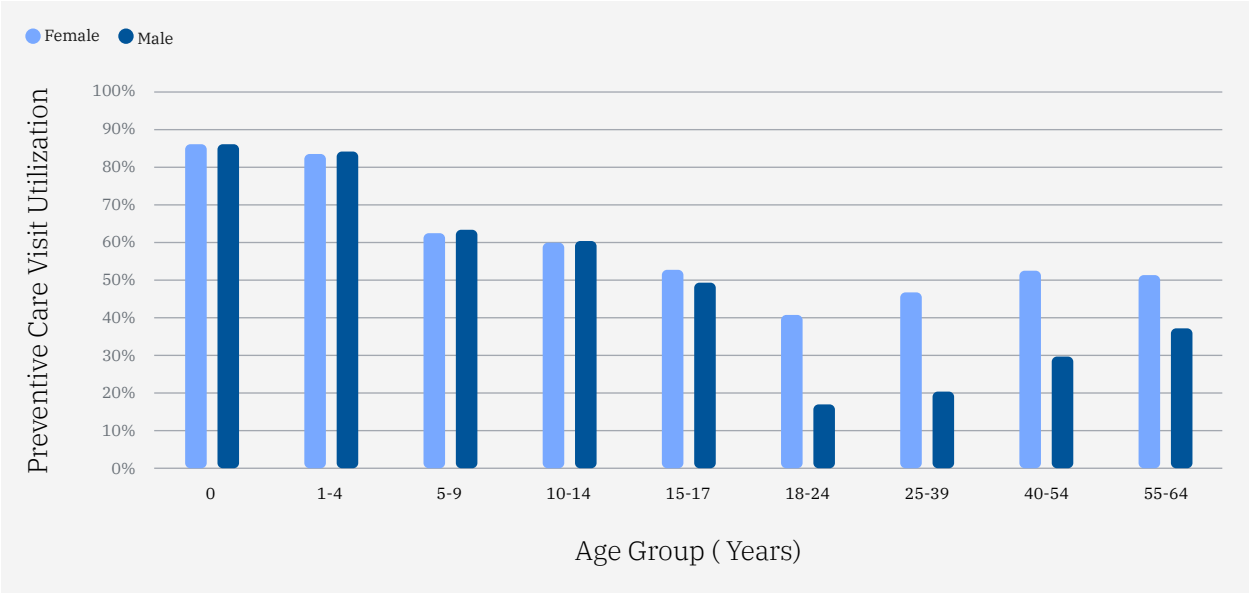
Source: IBM Marketscan, 2008-2018

Preventive Care Visit Utilization, Stratified by Age and Sex

In 2018, females have a higher proportion of preventive care visits when compared against males, by 53% vs 36%, respectively. From age 15 to 64 years, women have consistently higher PCV utilization when compared against men. In particular, the preventive care visit utilization for females aged 18-24 (41%), 25-39 (47%), 40-54 (53%) and 55-64 (52%) years were higher than for males in those age groups (18%, 21%, 30%, 37%, respectively). With regard to age, PCV utilization were higher with children than adults. Proportions were particularly high (above 80%), in the first year of life and in years 1-4.

The proportion for children with age ranges 5-9 years and 10-14 years were around 60% across the board for males and females. The lowest PCV utilization was in males and females at ages 18-24, with results for females still over twice as high as males, 41% vs 18%, respectively. The PCV utilization begins to uptick after the age group of 18-24 years, reaching the highest post-adolescent rates of 53% for females at 40-54 years and 37% for males at 55-64 years.

Figure 15. Preventive Care Visit Utilization, Stratified by Age and Sex, 2018



Source: IBM Marketscan, 2018

Table 10. Preventive Care Visit Utilization, Stratified by Age and Sex

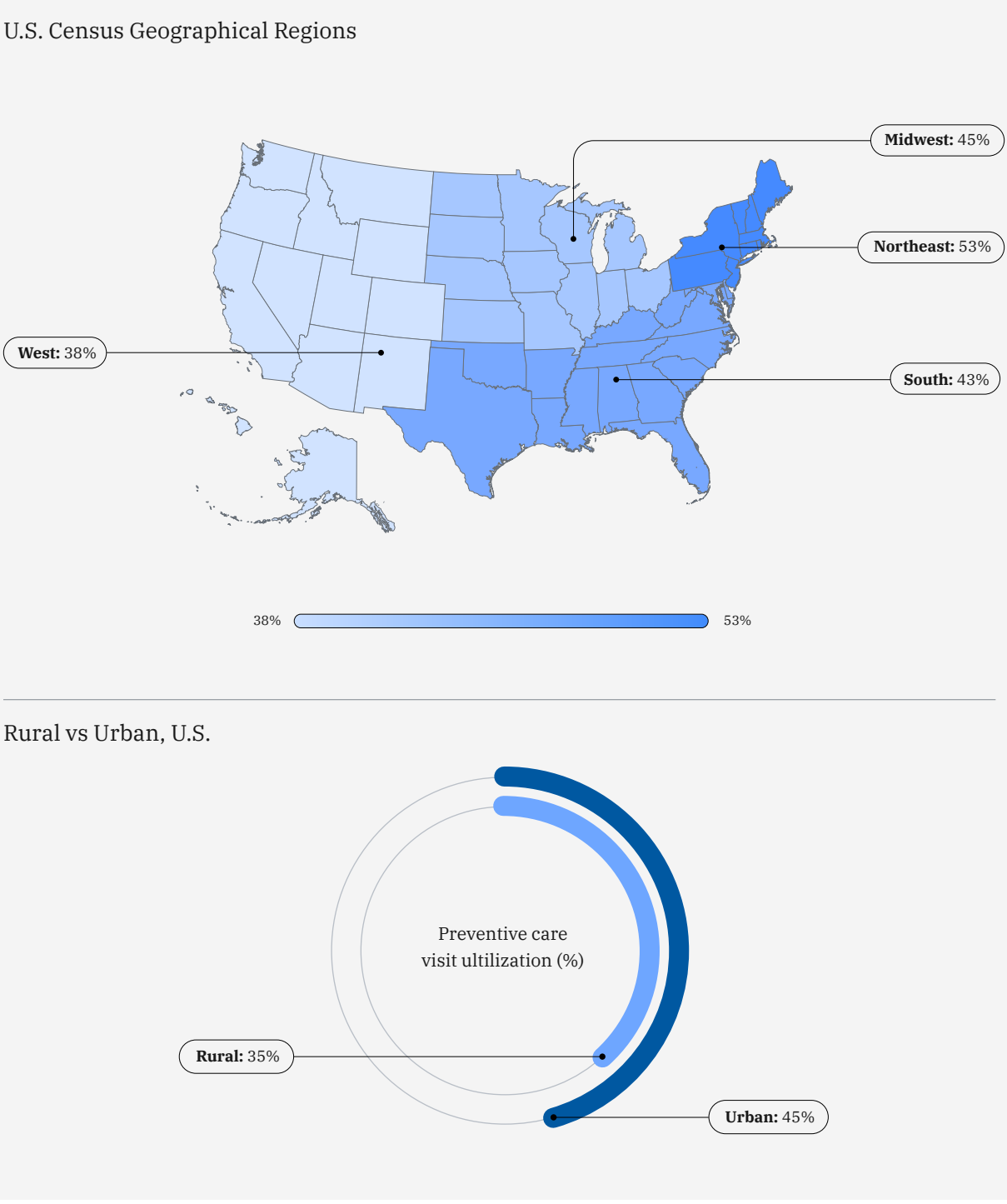
Age Group (in years)	Overall	Female	Male
0	86.34%	86.38%	86.29%
1-4	84.06%	83.81%	84.31%
5-9	63.43%	62.98%	63.86%
10-14	60.49%	60.39%	60.59%
15-17	51.30%	53.13%	49.58%
18-24	28.88%	41.16%	17.51%
25-39	34.01%	47.14%	20.80%
40-54	41.54%	52.72%	29.93%
55-64	44.84%	51.74%	37.47%

Source: IBM Marketscan, 2018

Preventive Care Visit Utilization, Regional Distribution

In 2018, the PCV utilization by U.S. geographical regions were 43% for the South, 38% for the West, 45% for the Midwest, and 53% for the Northeast. Also, the rates were higher for urban (45%) regions than for rural (35%) regions.

Figure 16. Preventive Care Visit Utilization, by U.S. Region, 2018



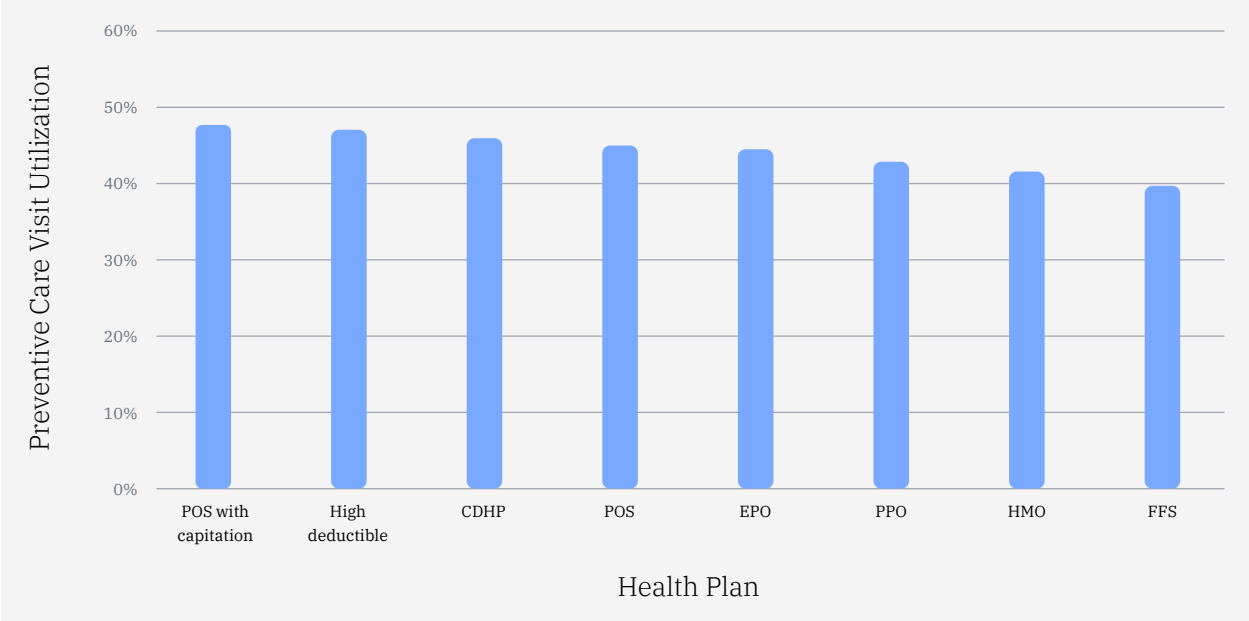
Source: IBM Marketscan, 2018

Preventive Care Visit Utilization, by Health Plan

The health plans types that are billing for PCVs within this database include point of service (POS) plan with capitation, high deductible plans, consumer-driven health plan (CDHP), POS, exclusive provider organization (EPO), preferred provider organization (PPO), health maintenance organization (HMO), and fee-for-service (FFS).

In 2018, preventive care visit utilization by health insurance plan ranged from 40% to 48%. PCV rates were higher for the POS with capitation plan (48%) and lowest for the fee for service plan (40%) when compared to other health plans.

Figure 17. Preventive Care Visit Utilization, by Health Plan, 2018



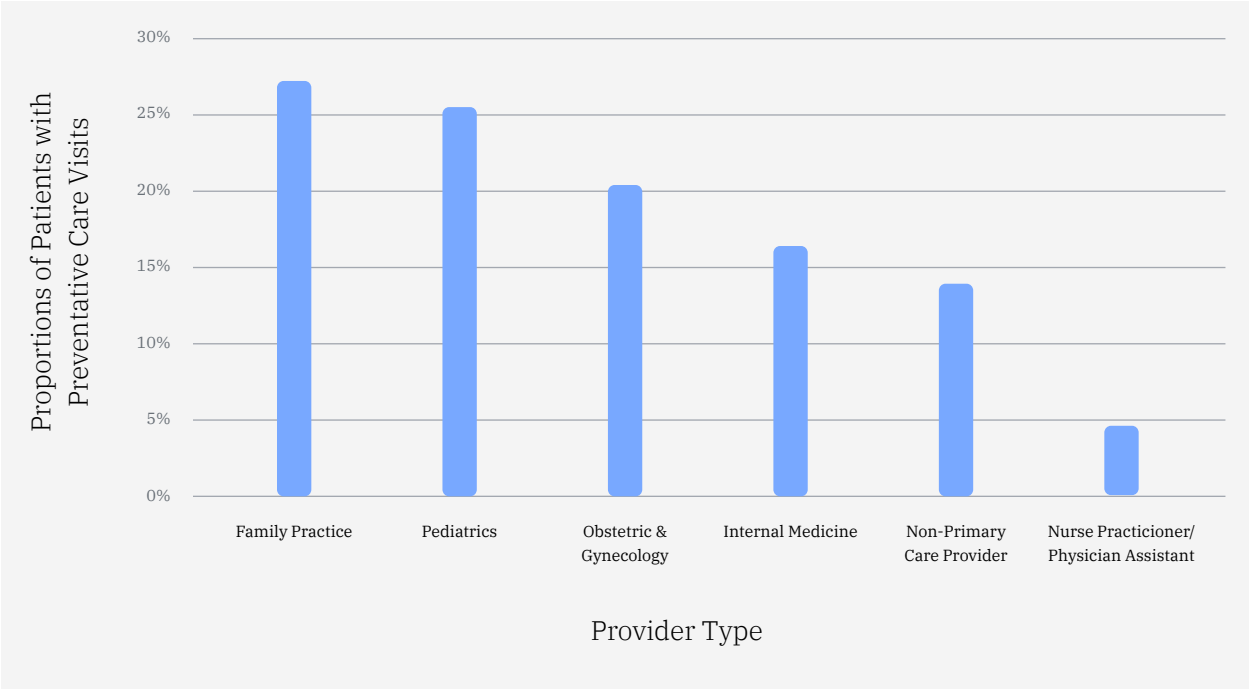
Source: IBM Marketscan, 2018

Patients with Preventive Care Visits, Primary Care and Non-Primary Care Providers

Primary care providers billing for PCV encounters encompass physicians in family practice, internal medicine, pediatrics, and obstetrics and gynecology, as well as nurse practitioners (NP) and physician assistants (PA) in primary care. Non-primary care providers were also included (e.g., endocrinologist, cardiologist) if they billed for preventive care visits. We included geriatricians to be complete, but as our cohort does not include patients 65 years and older, there were not many PCVs billed by geriatricians (about 0.05%) in this report. Provider types/specialties were derived from the claims-based classifications of the provider who billed the service.

A total of 71,558,728 patients had preventive care visits in 2018. Family practice and pediatricians saw the largest number of patients for preventive care visits, accounting for 27% and 26% of the total number of all patients who had preventive care visits, respectively. With regard to non-physician providers, NP had 3% and PA had 1% of all patients who had preventive care visits. Family practice, internal medicine, pediatrician, geriatric medicine, nurse practitioner, physician assistant, obstetrics and gynecology accounted for approximately 95% of all patients who had preventive care visits. Non-preventive care provider or other type of practitioner accounted for 14% of the total number of patients who had preventive care visits. (Provider type % sum can be greater than 100% because beneficiaries can have more than one preventive care visit per year.)

Figure 18. Distribution of Patients with Preventative Care Visits Across Provider Types, 2018



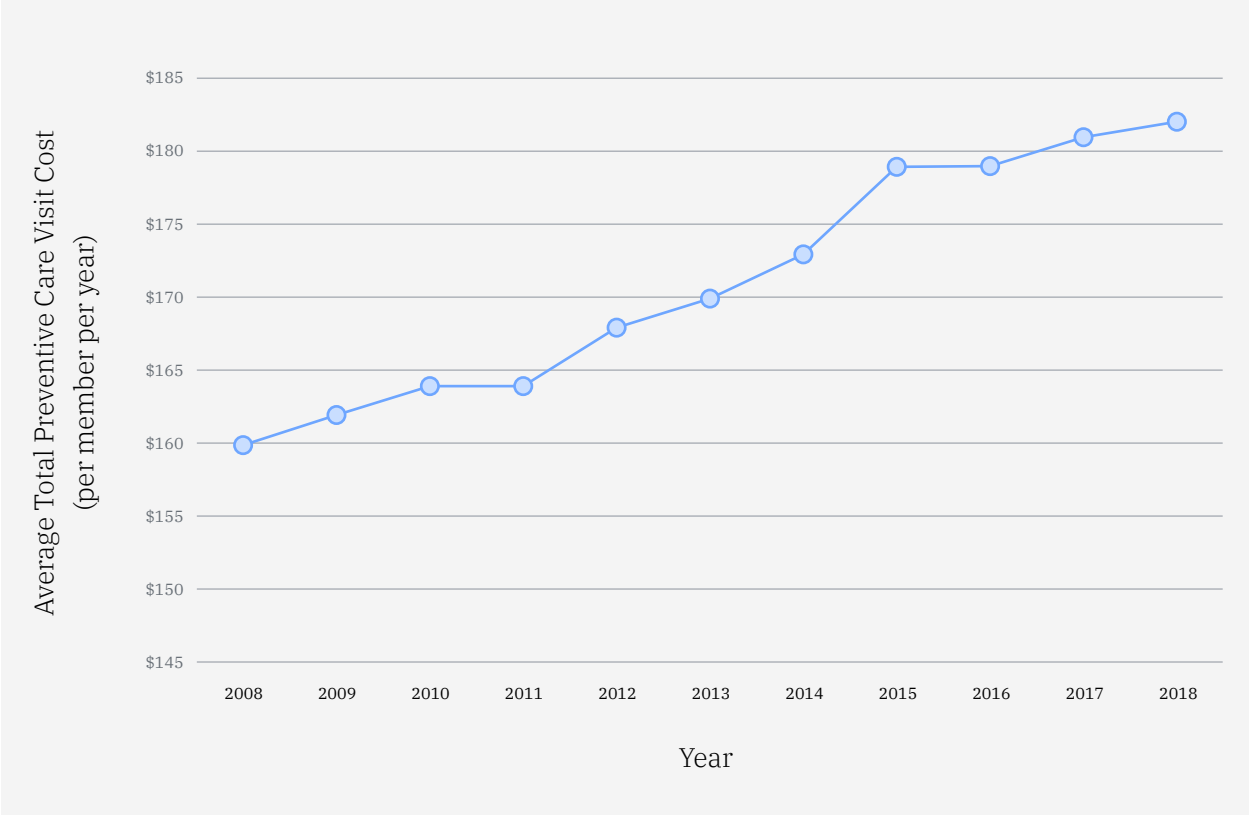
Source: IBM Marketscan, 2018

Trend of Average Total Cost of Preventive Care Visit Utilization

The PCV costs reflect the total payments made by the health plan and the patient, including out-of-pocket costs, after any contractual discounts. The average total cost for PCVs per member per year (PMPY) for 2018 was $182. When compared to the average total cost for PCV PMPY in 2008 of $160, there was an increase of 14% over the timespan.

The average annual PCV cost increase is approximately 1% over those 10 years and after adjusting for the 2018 consumer price index for medical care. By U.S. Census region, the average total costs of PCV PMPY for 2018 are $181 for the Midwest, $198 for the Northeast, $162 for the South and $202 for the West.

Figure 19. Trend of Average Total Cost of Preventive Care Visits, 2008–2018



Source: IBM Marketscan, 2018

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Methods Appendix

Estimating the numbers of primary care physicians

The methods used for estimating the number of primary care physicians are based on the 2019 American Medical Association (AMA) Physician Masterfile and described in literature.[1] The following section describes similar methods used to update those estimates based on the 2019 AMA Physician Masterfile. Primary care physicians were identified by selecting physicians in direct patient care with a primary, self-designated specialty of family medicine, general practice, general internal medicine, general pediatrics, or geriatrics. Note that it is assumed that physicians reporting these specialties have not further specialized. In the AMA Masterfile, physicians who first trained in internal medicine and then obtained further training are not still classified in internal medicine.

Retirement: Undercounting and Correction

Due to the difficulty in determining when a physician retires, the AMA Physician Masterfile undercounts retirees. There are various ways to correct this problem. Workforce estimates from the Association of American Medical Colleges (AAMC)[2] or Health Resources and Services Administration (HRSA)[3] adjust AMA counts downward using results from a study of physicians over the age of 50, which includes a question about retirement intentions. The approach used in this chartbook adjusted AMA counts based on a comparison of the age distribution of physicians in the AMA Physician Masterfile with the subset of these physicians who could be matched in the National Plan and Provider Enumeration System (NPPES) database.

Physician counts were decreased by 3% for those 55 to 59 years, 8.7% for those 60 to 64 years, 20.1% for those 65 to 69 years, 26.2% for those 70 to 74 years, 38.4% for those 75 to 79 years, 54.3% for those 80 to 84 years, 70.6% for those 85 to 89 years, 81.4% for those 90 to 98 years, and 100% for those 99 years and older.

Hospitalists

A second correction made to the data is the exclusion of physicians with a primary care specialty working as hospitalists and those in non-primary care settings. We used an estimate, based on work by Kuo and colleagues, that about 20% of general internists worked as hospitalists.[4] We used data from the American Board of Family Medicine (ABFM) about time allocated to different activities by board certified family physicians to determine what percentage of those devoted 80% or more of their time to emergency or urgent care.[5] Based on this analysis, we assumed that about 5% of family physicians, pediatricians, and geriatricians worked in non-primary care settings. After these modifications, our estimate of the size of the workforce was reduced by about 27,000 (from 256,281 to 228,936). In its estimate of the size of the primary care workforce, HRSA relied on figures from the Society of Hospital Medicine, which estimated that there were 28,000 hospitalists in practice in 2010.[3] HRSA made no correction for primary-care trained physicians working in urgent or emergency care.

Estimating the Number of Nurse Practitioners and Physician Assistants in Primary Care

Data from the April 2020 Provider Enrollment, Chain and Ownership System (PECOS) were used to estimate the number of nurse practitioners (NP) and physician assistants (PA) in primary care.[6] This data were linked with 2017 CMS Physician and Other Supplier Public Use File data that include information about services provided by providers.[7] PECOS data include information about practices (identified by the organization's National Provider Identifiers), so it is possible, based on the physicians' specialty, to identify both single- and multi-specialty practices. We identified primary care practices as those composed of family physicians, general practitioners, general internists, pediatricians, and geriatricians. Physicians working mainly as hospitalists (as identified

in the Physician and Other Supplier file) were reclassified as non-primary care. All NPs/PAs practicing in a primary care practice were assumed to be primary care. For multi-specialty practices, it was assumed that share of NPs/PAs in primary care mirrored the share of its physicians in primary care.

NPs/PAs working mainly with behavioral health providers (social workers and psychologists) were classified as non-primary care. Based on organization type in the PECOS data, we classified NPs/PAs working in FQHC and rural health clinics as primary care, and those working in skilled nursing facilities and critical access hospitals as non-primary care. We also used the organization's name to identify retail clinics and reclassified their providers as non-primary care. Finally, we used Physician and Other Supplier to identify practices that were overwhelmingly billing services in hospitals, emergency departments, home health, assisted living and nursing facilities. NPs/PAs employed by these practices were reclassified as non-primary care. NPs/PAs that worked in practices with no physicians or behavioral health providers and who were not reclassified based on available data were assumed to be practicing in primary care.

Methods for Preventive Care Visit Utilization in the United States

The study included data from individuals with employer-sponsored insurance coverage from the IBM MarketScan Commercial Research Database, which includes more than 25% of all ESI beneficiaries in the United States, with over 253 million unique patients.

This cross-sectional retrospective descriptive study examined administrative claims data for members enrolled for 12 continuous months (excluding individuals using hospice services), aged 0-64 years in the individual years 2008-2018, whose preventive care is managed by family practice, internal medicine, pediatrician, geriatric medicine, obstetrics and gynecology, nurse practitioners and physician assistants or non-primary care providers. Preventive care visits (PCV) were defined by outpatient visits with Current Procedural Terminology (CPT) codes between 99381-99386 and between 99391-99397. We described primary care visit utilization overall and stratified by several factors of interest including year, age, sex, U.S. Census region, rural versus urban, primary care provider and health plan type. PCV utilization is defined as the proportion of PCV encounters. When stratified by a variable, the proportion is calculated within each factor (e.g., proportion of all women who have had a PCV encounter, proportion of all adolescents in the age group 15-17 years who have had a PCV encounter). We also examined the average total cost for preventive care visit per member per year overall and by U.S. Census region. The PCV costs reflect the total payments made by the health plan and the patient after any contractual discounts.

Commercial insurance weights were applied to the study population data to reflect the national population of individuals with employer-sponsored insurance. The weights were constructed using the Public Use Microdata Sample of the American Community Survey conducted by the United States Census Bureau. Consumer Price Index (CPI) adjustment was applied for cost estimates to account for rate of inflation.

American Board of Family Medicine Recertification Survey

The American Board of Family Medicine (ABFM) requires completion of a practice demographic questionnaire when Diplomates apply for a recertification exam. The questionnaire collects data on "practice content and scope of practice, practice organization and structure, presence of other health care professionals, and use of electronic health records."[8] Family physicians must recertify at regular intervals (recently changed to every 10 years), and as such the demographic questionnaire surveys a representative and reliable sample of recertifying family physicians annually.

American Medical Association Physician Masterfile

The AMA Physician Masterfile is a proprietary data set maintained by the American Medical Association (AMA) that includes a near complete listing of all physicians in the U.S. More than 1.4 million physicians, residents, and medical students in the U.S. have current and historical data in the AMA Physician Masterfile. The AMA Physician Masterfile includes detailed information about each individual, including their age, gender, self-reported specialty, practice address, type of medical degree (MD or Doctor of Osteopathic Medicine, DO), practice type, specialty, and home address.[9] The Robert Graham Center holds AMA Physician Masterfile data for each year between 2000 and 2019 with the exception of 2003. The Robert Graham Center geo-codes the addresses in the file (98 percent match rate) and can readily match the addresses with other geographic data.

Centers for Medicare and Medicaid Services National Plan and Provider Enumeration System

The Centers for Medicare & Medicaid Services (CMS) National Plan and Provider Enumeration System (NPPES) Downloadable File (2008-Present) is a freely available public data set that contains rich information on health care providers, including the National Provider Identifier (NPI), practice address, and practice arrangements.[10] The Health Insurance Portability and Accountability Act of 1996 (HIPAA) mandated that the required identifier for Medicare services, the unique provider identification number (UPIN), be replaced by the NPI. Other payers, including commercial health care insurers, also use the NPI. The NPI is a 10-position, intelligence-free numeric identifier (10-digit number). In October 2006, CMS began issuing NPIs. By May 23, 2007, all HIPAA covered entities, such as providers completing electronic transactions, health care clearinghouses, and large health plans, were required to use only the NPI to identify covered health care providers. One of the advantages of the NPPES data is that it is not restricted to physicians, permitting an analysis of nurse practitioners (NPs), physician assistants (PAs), and certified nurse midwives. The NPPES data also contain more precise physician address information than the AMA Physician Masterfile data. A drawback of the NPPES data is the lack of an indicator for currently active providers. Although the NPPES data identifies NPs and PAs, the data does not include a clear identifier of NPs and PAs who provide primary care. Address information can be used to create an identifier for nurse practitioners and physician assistants who are located with other primary care providers.

Medical Expenditure Panel Survey

The Medical Expenditure Panel Survey (MEPS) comprises surveys of households, health care and insurance providers, and nursing homes.[11] MEPS Household Component (MEPS-HC) is a set of large-scale surveys of families and individuals, their medical providers, and employers across the U.S. The MEPS-HC survey collects nationally representative data on demographic characteristics, health conditions, health status, use of medical care services, charges and payments, access to care, satisfaction with care, health insurance coverage, income, and employment. Interviews are conducted with one member of each family who reports on the health care experiences for the entire family. Starting in 1996, a new household MEPS sample has been drawn each year from the respondents to the National Health Interview Survey (NHIS) of the preceding year. After a preliminary contact, that sample, or "panel" is interviewed five times over the next two and a half years. Each panel represents a new sample and each round within a panel represents interviews during one of five, discrete, six-month time periods. Since new panels are formed in subsequent years, the panels overlap, increasing the effective sample size at a given time.[12]

MarketScan Commercial Database (ESI: Employer Sponsored "Health" Insurance)

The IBM® MarketScan® Commercial Database is a medical and pharmacy insurance claims database that includes information on over 40 million active employees, early retirees, and COBRA (Consolidated Omnibus Budget Reconciliation Act) continuers and their dependents insured by approximately 150 employer-sponsored plans. The database contains information on enrollment and demographic data in addition to outpatient and inpatient services, type of health plan, and cost of services.

Medical Group Management Association

The Medical Group Management Association (MGMA) is a for-profit agency that surveys medical professionals to create reports mostly relating to cost or compensation in the medical field.[13] The Physician Compensation and Productivity Report describes the salaries of physician and non-physician providers. The report includes information about specialty, geographic regions, practice settings, years in specialty, and method of compensation. The data has over 121,000 providers from 140 medical specialties.[14]

National Ambulatory Medical Care Survey

The National Ambulatory Medical Care Survey (NAMCS) measures physician-patient encounters to get reliable information about ambulatory care services in the U.S. and has been conducted annually since 1989. The survey collects physicians' diagnoses, patients' symptoms, and medications ordered or provided, as well as patient demographics and services provided.[15] The survey is administered by the U.S. Census Bureau for the Centers for Disease Control and Prevention (CDC).[16] The physicians who are interviewed must be non-federal office-based physicians that are primarily engaged in direct patient care. The survey samples 20-100% of the patient encounters a physician has during a one-week period, depending on the size of practice.[17]

Methods Appendix References

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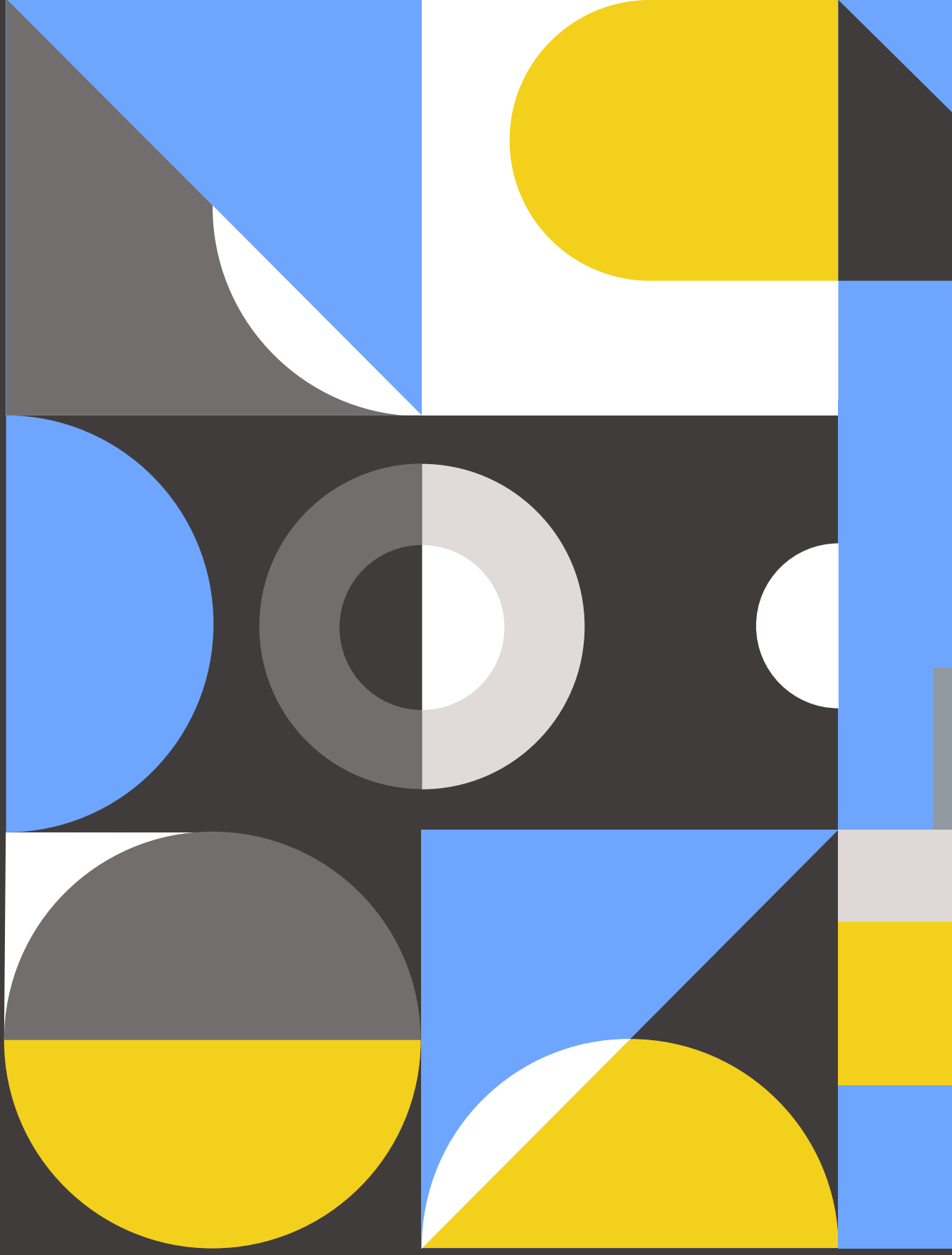

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