APPENDIX B

The Health of US Primary Care: A Baseline Scorecard

Tracking Support for High-Quality Primary Care

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CONTENTS

OVERVIEW

The first section of this appendix briefly summarizes the data sources used to create the proposed scorecard measures and discusses how we identify medically underserved areas (MUAs) and rural areas. The second section presents a detailed discussion of how each of the measures and possible variants were operationalized. The third section includes supplemental tables.

DATA SOURCES

Survey Data

The Medical Expenditure Panel Survey (MEPS) is overseen by the Agency for Healthcare Research and Quality (AHRQ). It was used for primary care spending (Measures 1.1-1.3), capitation (Measure 1.4), and usual source of care (Measures 2.1 and 2.2). MEPS is a set of population-level longitudinal surveys of non-military and non-institutionalized individuals and families across the United States.[1,2] These data are collected through respondents' reports for themselves and their family members. The data are enriched with follow-up verification with physician offices for expenditures, diagnoses, and events. Data were used from 2010 to 2019, with samples sizes ranging from 28,512 (in 2019) to 35,427 (in 2015). The response rates varied from 39.5% to 53.5% in 2010-2019, with a much lower response rate of 27.6% in 2020. While MEPS is invaluable for national studies, it does not have sufficient sample sizes to produce state-level estimates nationwide. For reasons of confidentiality, state-level estimates can only be produced for 29 larger states, through AHRQ's research data center. Even for these states, small sample sizes are a problem when the dataset is further stratified by age (adults and children) and by payer type (private, Medicare, and Medicaid).

The National Health Interview Survey (NHIS 2010—2021), administered by the National Center for Health Statistics, part of the Centers for Disease Control and Prevention (CDC), was used as an alternative measure of the usual source of care for adults and children (Measures 2.1 and 2.2). NHIS is a large, nationally representative cross-sectional survey of the civilian, non-institutionalized population. The data are collected from individuals and their families continuously throughout the year. NHIS provides national estimates of health status, health care access, health behaviors, conditions, and disability. Data from the sample adult and sample child components (2010—2021) were used to estimate the proportion of adults and children with and without a usual source of care. NHIS underwent a major redesign in 2019 to improve the measurement of covered health topics and harmonize common content in other federal health surveys. The sample sizes ranged from 27,157 adults in 2010 to 29,482 adults in 2021, and from 11,277 children in 2010 to 8,261 children in 2021.

The Behavioral Risk Factor Surveillance System (BRFSS, 2010—2021) was used to calculate an alternative measure of the percentage of the adult population in the U.S. without a usual source of care (Measure 2.1). BRFSS is a joint project between all the states and U.S. territories and the CDC. States administer ongoing health-related telephone surveys with support and technical assistance from the CDC. Annually, nearly 500,000 non-institutionalized civilian adults (>18 years) residing in the United States are surveyed. The sample sizes ranged from 401,958 to 504,467 respondents from 2010 through 2021. BRFSS provides national and state-level estimates of health-related risk behaviors, chronic health conditions, health care access, and use of preventive services.

The National Survey of Children's Health (NSCH, 2016—2021) was used to create an alternative measure of usual source of care for children (Measure 2.2). NSCH is administered by the Health Resources and Services Administration (HRSA) Maternal and Child Health Bureau.[3] The survey collects data on the physical and mental health of children (0—17 years) and factors that play a role in the well-being of children. These factors include access to care, quality of health care provided, parents' health, neighborhood characteristics, schools, and after-school experiences. Data are collected from the parents or guardians who know about the child's health. NSCH provides national and state-level estimates of key measures of child health and well-being. Begun in 2016, the previous NSCH and National Survey of Children with Special Health Care Needs (NS_CSHCN) were integrated into NSCH. A revised version of the survey was conducted as a mail and web-based survey by the Census Bureau from 2016 to 2021. From 2016 to 2021, annually about 21,599 to 50,892 surveys were completed.

The National Ambulatory Medical Care Survey (NAMCS), from the National Center for Health Statistics at the CDC, was recommended as a possible data source. For this report, we used it to create an alternative measure of primary care revenue from capitation (Measure 1.4). The NAMCS is a population survey of non-federal medical offices. Either office staff or NAMCS personnel collected medical visit data for a sampled physician, relying on chart abstraction through 2017 and electronic health records from 2017 onward. Currently the 2017 data are still being processed and unavailable publicly, but the 2018 dataset is available. A major limitation of the NAMCS data is that with the revamping of the survey methodology, the number of physicians and primary care physicians participating in NAMCS declined sharply. In 2014 there were 2,179 physicians, but just 496 participated in 2018; over the same period, the number of participating primary care physicians dropped from 946 to 144.

The American Community Survey (ACS) is a population-level survey that contains updated U.S. Census estimates of the U.S. population at an annual level. County-level year-to-year population growth rates were applied to blocks to obtain block-level populations from 2012 to 2020.

The Occupational Employment and Wage Statistics (OEWS) survey is conducted by the U.S. Bureau of Labor Statistics and used to produce employment and wage estimates for approximately 830 occupations based on a survey of business establishments (employers). Importantly, the OEWS survey is restricted to wage and salary workers in nonfarm establishments and excludes self-employed individuals and owners and partners in unincorporated firms. OEWS is used as an alternative data source to calculate the percentage of physicians in primary care across states. Data are available from 2010 to 2020.

Workforce Data

The American Medical Association Physician Masterfile (AMA Masterfile) was used for Measures 2.3 and 2.4 (primary care physicians in medically underserved areas), Measure 3.2 (percentage of physicians in primary care), and Measure 3.3 (percentage of new physician workforce entering primary care each year). The AMA Masterfile is a proprietary dataset maintained by the American Medical Association (AMA) that includes a nearly complete listing of all physicians in the U.S. The AMA Masterfile includes detailed information about each physician, including their age, gender, specialty, practice address, type of medical degree (Doctor of Medicine [MD] or Doctor of Osteopathic Medicine [DO]), practice type, specialty, and home address. The Robert Graham Center holds AMA Masterfile data for each year

between 2000 and 2022 with the exception of 2003. The Robert Graham Center geo-codes the addresses in the file (98% match rate) and can readily match the addresses with other geographic data. The Masterfile also includes a crosswalk between its physician identifier (MENUM, for medical education number) and the National Provider Identifier (NPI).

Provider Enrollment, Chain, and Ownership System (PECOS) data were used to estimate the number of nurse practitioners (NPs) and physician assistants (PAs) in primary care (Measure 3.2). This dataset was also used to create an alternative measure of physicians in primary care (3.2) and primary care physicians in MUAs or not in MUAs (Measures 2.3 and 2.4). PECOS is a list of all providers enrolled in Medicare, including physicians, NPs, and PAs. Importantly, it allows linking of individual providers to the organizations to which they reassigned their billing rights. The PECOS dataset also allows for multiple enrollments at any given point in time. Providers and organizations are required to validate their information in PECOS every five years.

The most recent release of PECOS data through Q3 of 2022 includes 1,893,441 different individual providers and 432,512 different organizations, of which 246,361 are clinic/group practices. About 25% of organizations (as identified with an organization NPI) are part of a larger organizational entity identified by their provider associate level variable (PAC ID). This dataset has been publicly available since 2016 and released on a quarterly basis at no cost. Comparing the composition of PECOS data to that of other sources, it does appear that providers of types that would have few, if any, Medicare patients, such as pediatricians, nevertheless are enrolled in Medicare. Finally, as noted above, the PECOS system captures simultaneous enrollments in multiple positions, making it difficult to determine the allocation of effort across different settings.

The National Plan and Provider Enumeration System (NPPES) was used, along with other data sources, for Measure 3.2 to identify NPs and PAs in primary care practice. Available since 2006, the NPPES is an administrative dataset that captures all individuals and organizations with a National Provider Identifier (NPI). Included are basic attributes of the provider, such as gender, provider type, specialty, location of practice (street, city, state, and zip code). One of the strengths of the NPPES dataset is that it includes information on all providers required to have an NPI, including NPs and PAs. Another feature of the NPPES is that it includes training type for NPs (including family health, adult health, and mental health). While tempting, this information should not be used to identify NPs and PAs practicing in primary care, since many NPs with generalist training often work in specialist offices.[4,5] A new publicly available dataset is currently available for download every month. Recent data are available at **https://download.cms.gov/nppes/NPI_Files.html**. NBER has also maintained an archive of these files, from 2008 through 2019, at **http://data.nber.org/data/nppes**.

A major limitation of NPPES data is the lack of an effective mechanism for validating activity status or updating critical information such as specialty and addresses. Year over year, only about 0.5% of physician NPIs are deactivated. These low rates are cumulative, so over time the quality of NPPES data has deteriorated.

Centers for Medicare & Medicaid Services Physician and Other Practitioners Public Use File (CMS PUF) data were used to identify primary care physicians working as hospitalists and those billing mainly from emergency departments for Measures 2.3, 2.4, and 3.3. It was also used for Measure 3.2 to identify NPs and PAs billing from non-office settings. The data include information on use, payments, and submitted charges organized by National Provider Identifier (NPI), Healthcare Common Procedure Coding System (HCPCS) code, and place of service. The data are available annually from CMS at **https://data.cms.gov/provider-summary-by-type-of-service/medicare-physician-other-practitioners/medicare-physician-other-practitioners-by-provider-and-service/data**. The datasets are available from 2012 to 2020.

The Accreditation Council of Graduate Medical Education (ACGME) has several databases relevant to this report. First, as part of the AMA Masterfile held by the Robert Graham Center, the Historical Residency File provides detailed information regarding physicians' graduate medical education, including start and end dates of their residencies and fellowships. This information is used to construct Measure 3.3 (percentage of new physician workforce entering primary care each year). In addition, ACGME makes public information about sponsoring institutions, residency programs, and participating sites of residency programs (**https://apps.acgme.org/ads/Public/Request/PublicDataRequest**) for academic years 2012—2013 to 2020—2021. The residency program file includes the number of positions filled, thereby providing a count of residents nationwide and across states used for Measure 3.1 (percentage of physicians trained in rural areas and medically underserved areas) and Measure 3.4 (residents per 100,000 population by state). The residency participating site files includes the city, state, and zip code of participating sites of ACGME-accredited residency programs. These addresses were used to identify sites located in either rural or medically underserved areas (MUAs) for Measure 3.1. Because zip codes are not perfectly matched to MUAs or counties, this is a limitation of our current measures. *In the second year of this study, we secured permission from ACGME to access the restricted version of this dataset, with full street addresses that can be geocoded down to the Census block level to unambiguously determine whether a site is located in an MUA or rural county.*

The Healthcare Cost Report Information System (HCRIS) dataset was also used as an alternative source for Measure 3.4 (residents per 100,000 population by state) and is derived from administrative data provided by hospitals across the U.S. and its territories to CMS on an annual basis. A subset of these hospitals are teaching hospitals, which are required to provide information about their GME program, including the number of "interns and residents." The data used are from 2010 to 2020.

Other Data

The NIH RePORT (Research Portfolio Online Reporting Tools) was used for Measure 5.1 (investment in primary care research by the National Institutes of Health). The NIH RePORTER is a data tool that was used to query the publicly available database of all NIH-funded research projects. Data collected include grantee name and location (including state), department affiliation, type of grant, and dollar amounts. Data were available from 2017 to 2021.

Rural-Urban Continuum Codes (RUCC), developed and maintained by the United States Department of Agriculture (USDA) Economic Research Service, distinguish metropolitan counties by population size (50,000–249,999, 250,000–999,999, and 1,000,000 and up) and non-metropolitan counties by their size (0–2,499, 2,500–19,999, and 20,000–49,999) and adjacency to metropolitan counties. For Measure 3.1 (percentage of physicians trained in rural areas and medically underserved areas), we defined rural as non-metropolitan counties (RUCC 4 through RUCC 9).

National Uniform Claim Committee (NUCC) Taxonomy Code is a crosswalk between taxonomy codes used in NPPES data. It organizes taxonomy codes into groupings (e.g., "Allopathic & Osteopathic Physicians" or "Physician Assistants & Advanced Practice Nursing Providers"). Within groupings, the codes are further refined into classifications (e.g., "Family Medicine" or "Nurse Practitioner"), and, within classifications, taxonomies are differentiated by specialty (e.g., "Internal Medicine—Cardiology" or "Physician Assistant—Surgical"). This data file is updated frequently to reflect the addition and (rarely) the elimination of certain taxonomies. For this report, we used Version 5.0, accessed September 15, 2022, at **https://nucc.org/images/stories/CSV/nucc_taxonomy_221.csv**.

The Missouri Census Data Center, Geocorr 2018: Geographic Correspondence Engine is a useful tool to identify Census blocks in the different geographies used for some of measures (**https://mcdc.missouri.edu/applications/geocorr2018.html**). Specifically, for Measures 2.3, 2.4, and 3.1, we used it to identify all the blocks in MUAs. We also used it to identify blocks in ZIP Code Tabulation Areas (ZCTAs) to match ZCTAs with MUAs for Measure 3.1 (where publicly available residency site addresses are only at the zip code level). Finally, we used the engine to obtain 2010 Census population counts that were used to estimate block population counts from 2012 to 2020.

The HRSA Data Warehouse Medically Underserved Area data were used for Measures 2.3, 2.4, and 3.1. The data used for this analysis were obtained from the HRSA Data Warehouse in CSV format, accessed September 20, 2022, at **https://data.hrsa.gov//DataDownload/DD_Files/MUA_DET.csv**.

There are four major types of Medically Underserved Areas (MUAs) and Medically Underserved Populations (MUPs), according to the U.S. Department of Health and Human Services, Health Professional Shortage Areas (HPSAs) and Medically Underserved Areas/Populations (MUA/P) Shortage Designation Types 2019, accessed November 22, 2022, at **https://www.hhs.gov/guidance/document/hpsa-and-muap-shortage-designation-types**. In 2022, as shown in the table on the next page, approximately 78.9 million persons lived in 3,317 MUAs, 22.4 million persons lived in MUPs, and an additional 14.0 million lived in MUA/Ps designated through a governor's exemption (MUP_GE). In constructing this measure, we restricted our analysis to MUA designations, excluding MUA_GE, MUP, and MUP_GE designations. To construct trends, we used designation dates and withdrawal dates of MUAs to determine whether a particular area was designated as an MUA at a particular point in time from 2010 to 2020.

Characteristics of Medically Underserved Areas and Medically Underserved Populations

	MUA/P Type			
	MUA	**MUA_GE**	**MUP**	**MUP_GE**
Number	3,317	143	488	74
Population	78,883,056	8,153,676	22,405,890	5,817,882
Partial County	44.3	26.7	71.5	85.2
Full County	55.7	73.3	28.5	14.8
Socio-Demographic Characteristics				
Percent Rural (HRSA)	51.9	54.0	28.4	12.5
Percent Rural (RUCC)	30.4	19.4	19.0	8.8
Recent Poor	22.3	15.0	21.4	17.9
Percent Nonemployed	10.8	8.3	10.2	10.2
Percent Dropout	19.5	11.1	18.9	16.3
Percent Single Parent	21.8	17.3	22.7	21.9
Percent Black	18.1	6.5	15.0	19.9
Percent Hispanic	19.4	13.5	24.3	22.6
IMU Score	54.6	18.0	57.0	25.2

MUA: Medically Underserved Area, MUP: Medically Underserved Population, GE: Governor's Exemption, HRSA: Health Services Resource Administration, RUCC: Rural-Urban Continuum Codes, IMU: Index of Medical mUnderserviced
Source: HRSA Data Warehouse MUA File (2022), American Community Survey, 2013–2017.

OPERATIONALIZATION OF MEASURES

The measures described below are organized according to the five recommendations outlined in the NASEM report. The measures that were calculated and described below were pre-defined by the NASEM committee in Appendix E of their report and were operationalized by the scorecard research team. Because the NASEM committee did not define specific measures for Recommendation 4, that recommendation is not addressed in the methodology section.

Recommendation 1: Pay for Primary Care Teams to Care for People, Not Doctors to Deliver Services

Measure 1.1: Percentage of total spending going to primary care: commercial insurance

Measure 1.2: Percentage of total spending going to primary care: Medicare

Measure 1.3: Percentage of total spending going to primary care: Medicaid

These three measures were constructed using data from the 2010–2019 Medical Expenditure Panel Survey. We calculated the amount spent for primary care using the office-based and inpatient event files. For each visit reported in these files, there is detailed information about the provider of care and how the services were billed. Consistent with prior work, we use both a narrow definition and a broad definition of primary care. Narrowly, primary care includes physicians practicing in family medicine, general practice, geriatrics, internal medicine,

pediatrics, and osteopathy. The broader definition also includes mental health providers—psychiatrists, social workers, and psychologists—nurses/nurse practitioners, and physician assistants as well as obstetricians/gynecologists. In MEPS, primary care physicians were identified using DRSPLTY and non-physicians using MEDPTYPE.

With each definition and each payer type, we calculated our numerator—national or state total primary care spending by summing spending across all visits. We used OPDPVXXX, OPFPVXXX (outpatient), and OBPVXXX (office-based) to identify commercial insurance spending; OPDMRXXX, OPFMDXXX (outpatient), and OBMRXXX (office-based) for Medicare; and OPDMDXXX, OPFMDXXX (outpatient), and OBMDXXX (office-based) for Medicaid.

The denominator is the total spending for each payer type aggregated to either the state or national level. These measures were calculated by MEPS for each individual surveyed and are in the consolidated files: commercial spending is measured by TOTPRVXX, Medicare insurance by (TOTMCRXX), and Medicaid by TOTMCDXX.

All our analyses are weighted using the person weight (PERWT), and standard errors were adjusted for the complex survey design using VARPSU for primary sampling units and VARSTR for the stratum. To obtain state estimates using MEPS data requires access to a secure and restricted data center. Given concerns about confidentiality, such estimates can only be obtained for 29 states.

Components of the Broad Primary Care Spending Measure

There are multiple definitions of primary care spending and an ongoing debate on what physicians or clinicians should be included in calculating the broad primary care spending measure. Per recommendations from the scorecard advisory committee, we calculated the percentage of primary care spending separately for each clinician type included in the broad definition of primary care spending (see Supplemental Table 1). This would allow interested parties to frame their own definition of primary care and calculate the percentage of primary care spending accordingly.

Measure 1.4: Percentage of primary care patient care revenue from capitation

For this measure, we considered two possible data sources mentioned in the NASEM reports: MEPS, which has been used in previous research on capitation,[6] and the National Ambulatory Medical Care Survey (NAMCS). We prefer the MEPS data because of small sample sizes in NAMCS in recent years: down to 144 primary care physicians in 2018 (of which only 100 had a valid answer for the capitation question).

To develop a MEPS measure, we reached out to Samuel Zuvekas, an author on the 2016 *Health Affairs* paper cited by NASEM.[7] His comprehensive reply was as follows:

> *The analyses in the 2016 Health Affairs article (as well as our earlier articles) are based on confidential data available only through one of the AHRQ data center options* **https://www.meps.ahrq.gov/mepsweb/data_stats/onsite_datacenter.jsp**.
>
> *However, an approximation to our basic indicator of fee for service vs. capitation can be obtained using the Public Use office-based event files* **https://www.meps.ahrq.gov/mepsweb/data_stats/download_data_files_detail.jsp?cboPufNumber=HC-213G**. *We looked at the subset of events in the office-based event files that were eligible for the MEPS MPC physician follow-back survey. You can get to the MPC [Medical Provider Component] eligible events we looked at by excluding visits where both SEEDOC_M18=2 and DOCATLOC=2.*
>
> *We then further subset to the set of events where there were matching MPC data available (not everyone signs permission forms, we subsample the set of physician offices where we do have permission forms, and not every physician office responds) AND the confidential FEEORCAP variable is non-missing. As described in the paper, we used a propensity-score model to reweight the set of events where we do have matching MPC data with the FEEORCAP variable available to represent the full set of events where SEEDOC_M18~=2 and DOCATLOC~=2.*
>
> *The approximation part comes in because there is neither an indicator for whether the event had matching MPC data nor the FEEORCAP on the PUF event file. BUT, there is a variable called IMPFLAG that describes the source of the expenditure data on the event file. In the cases where we have complete charge and payment data from the MPC we use it. IMPFLAG=2 are complete fee-for-service MPC cases and IMPFLAG=5 are complete capitated MPC cases. The ratio of IMPFLAG=2/(IMPFLAG=2+IMPFLAG=5) cases gives you the approximation to the indicator we used. It's an approximation because there is a small set of MPC events with partial payment/charge data but a valid FEEORCAP value that you cannot see in the PUFs directly but are distributed in the other IMPFLAG categories. These partial cases are more likely to be reported in the MPC as fee-for-service, so this approximation gives about a 10% higher estimate of capitation than the internal variable that we use. That is, where we calculated 5% using FEEORCAP, the approximation gives something like 5.5%.*
>
> *Some quick runs I did suggest that the picture hasn't changed much since 2013, at least in terms of full-capitation models. Of course, mixed payment models are likely more prevalent now but that is more difficult for the MEPS to pick up. Precision will be somewhat lower in 2019 and 2020 because of the disruptions the COVID-19 pandemic had on the field operations of the MEPS-HC and MEPS-MPC resulting in smaller sample sizes of events with MPC data.*

We used this approach with just two modifications. First, we combined information from both the outpatient and office-based event office-based files. Second, as above for the primary care spending measures, we used DRSPLTY in the event files to differentiate visits to primary care physicians and non-primary care physicians. Primary care includes family medicine, general practice, geriatrics, internal medicine, pediatrics, and osteopathy. The unit of analysis is a visit with a physician (SEEDOC_M18), seen at the location (DOCATLOC). In his paper Zuvekas calculated the percentage of visits that were fee-for-service; we calculated the percentage that are capitated. So, the numerator is the total number of visits where the imputation flag indicates that the visit was completely capitated (IMPFLAG=5) and the denominator is equal to the sum of fee-for-service visits and capitated visits.

In the second year of this project, we intend to fully replicate the measure developed in Zuvekas' paper using confidential data available through AHRQ's research data center. This will also allow us to calculate state-level data for this measure.

Still, measuring the percentage of capitated visits captures only a portion of non-FFS payment models, underscoring the need for a more holistic measure that would capture the mix of alternative payment models in primary care practices nationwide. Broad adoption of the **Health Care Payment Learning & Action Network (HCP-LAN)** classification of advanced payment models could lead to more refined measurement by categorizing payments received by primary care practices into four groups (Figure 2), representing progress toward models that could better support whole-person care, ranging from FFS only to population-based payment models that could better support high-quality primary care.[8]

Recommendation 2: Ensure That High-Quality Primary Care Is Available to Every Individual and Family in Every Community

Measure 2.1: Percentage of adults without a usual source of health care
Measure 2.2: Percentage of children without a usual source of health care

For these two measures, we used the Medical Expenditure Panel Survey from 2010 to 2019. The percentage of adults and children without a usual source of care is defined by report by the respondent who answered the question "Is there a particular doctor's office, clinic, health center or other place that {you/{PERSON}} usually {go/goes} if {you/he/she} {are/is} sick or {need/needs} advice about {your/his/her} health?" In addition, we categorized individuals as not having usual source of care if they first answered "yes" to the abovementioned question but on a subsequent question reported that such location was the emergency room. Note that respondents answered this question for themselves as well as for other family members. Adults were defined as 18 years or older, children as less than 18 years old.

Again, our analyses are weighted using the person weight (PERWT), and standard errors were adjusted for the complex survey design using VARPSU for primary sampling units and VARSTR for the stratum. State estimates were possible for 29 states with access to AHRQ's research data center. For reasons of confidentiality, AHRQ does not allow estimates to be calculated for smaller states. Stata was used for these measures.

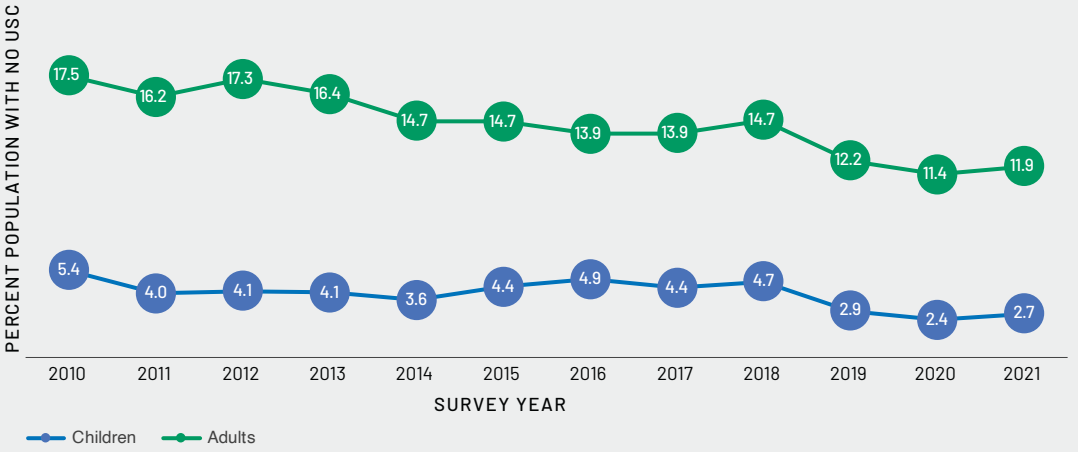
Alternative Data Sources for Usual Source of Care

There are alternative data sources that can be used to obtain better state coverage than MEPS data. We used the National Health Interview Survey (NHIS) sample adult and child survey data (2010–2021), the Behavioral Risk Factor Surveillance System (BRFSS) for adults with no usual source of care, and the National Survey of Children's Health (NSCH) (2016–2021) for children with no usual source of care in obtaining state-level estimates of people without a usual source of care (see Supplemental Tables 2 and 3). State-level estimates for the percentage of the population without a usual source of care can be calculated for all 50 states and the District of Columbia. These data sources are described above.

Response rates ranged from 58.9% to 61.1% for adults and 59.1% to 70.7% for children during 2010–2021. The upward trends observed from 2019 to 2021 in the percentages of both adults and children having a usual source of care may be attributed to the survey redesign and slight change in the wording of the usual source of care question. From 2010 to 2018 the question was "Is there a place that you USUALLY go to when you are sick or need advice about your health?" followed by "What kind of place is it – a clinic, doctor's office, emergency room, or some other place [Else if there is more than one place in response to previous question]? What kind of place do you go to most often – a clinic, doctor's office, emergency room, or some other place?" From 2019 to 2021 the question was "Is there a place that you USUALLY go to if you are sick and need health care?" followed by "What kind of place – a doctor's office or health center; an urgent care center, a clinic in a drug store or grocery store; a hospital emergency room; a VA Medical Center or VA outpatient clinic; or some other place?"

NHIS asks about the usual place, while MEPS asks about the usual provider and place.

Percent US population with No USC, NHIS (2010–2021)



Data Source: National Health Interview Survey (NHIS, 2010–2021).
Notes: The measure of no usual source of care was derived from the responses to two questions: "Is there a place that you USUALLY go to when you are sick or need advice about your health?" and "What kind of place is it – a clinic, doctor's office, emergency room, or some other place [Else if there is more than one place in response to previous question]? Until the year 2018. From 2019 to 2021 the question was "Is there a place that you USUALLY go to if you are sick and need health care?" followed by "What kind of place is it – a doctor's office or health center; an urgent care center, a clinic in a drug store or grocery store; a hospital emergency room; a VA Medical Center or VA outpatient clinic; or some other place?" Respondents who indicated "no" in response to the first question or answered hospital emergency department in response to the second question were combined to produce the estimates for the percentage of U.S. adults and children with no usual source of care.

Measure 2.3: Primary care physicians per 100,000 people in medically underserved areas

Measure 2.4: Primary care physicians per 100,000 people in areas that are not medically underserved

For these two measures, we combined data from the AMA Masterfile with CMS Physician and Other Practitioners data and HRSA MUA information. For each year from 2012 to 2020, we started with data from the AMA Masterfile to identify primary care physicians in direct patient care. Primary care includes physicians in family medicine (AMA specialty code FM), general practice (GP), geriatrics (IMG and FPG), internal medicine (IM), pediatrics (PD), and Med-Peds (MPD). In all cases, these specialty designations indicate no further specialization. Primary care physicians in direct primary care (AMA Practice Type 020) exclude residents as well as retirees. We also adjusted status based on age to adjust for the likelihood that physicians listed as being in direct contact with patients have actually retired.[9, 10]

As discussed earlier, a growing number of physicians listing a primary care specialty are working as hospitalists or in emergency departments. To identify these physicians, we use CMS Physician and Other Practitioners data from 2012 to 2020, which include the volume of services rendered by provider and service. These data were then linked to the AMA Masterfile using the MENUM-NPI crosswalk. Physicians identified as primary care in the AMA Masterfile were reclassifiedas non-primary care if they billed 90% or more their E&M services from either a hospital or an emergency department, rather than from an office setting.

We also used the CMS Physician and Other Practitioners data to identify physicians with unspecified specialty (AMA specialty code US) and unknown practice type (AMA Practice Type 100). Specifically, if the AMA specialty was unknown, we used specialty information listed in CMS Physician and Other Practitioners data. We also inferred that if a physician was billing Medicare, they were in direct patient care.

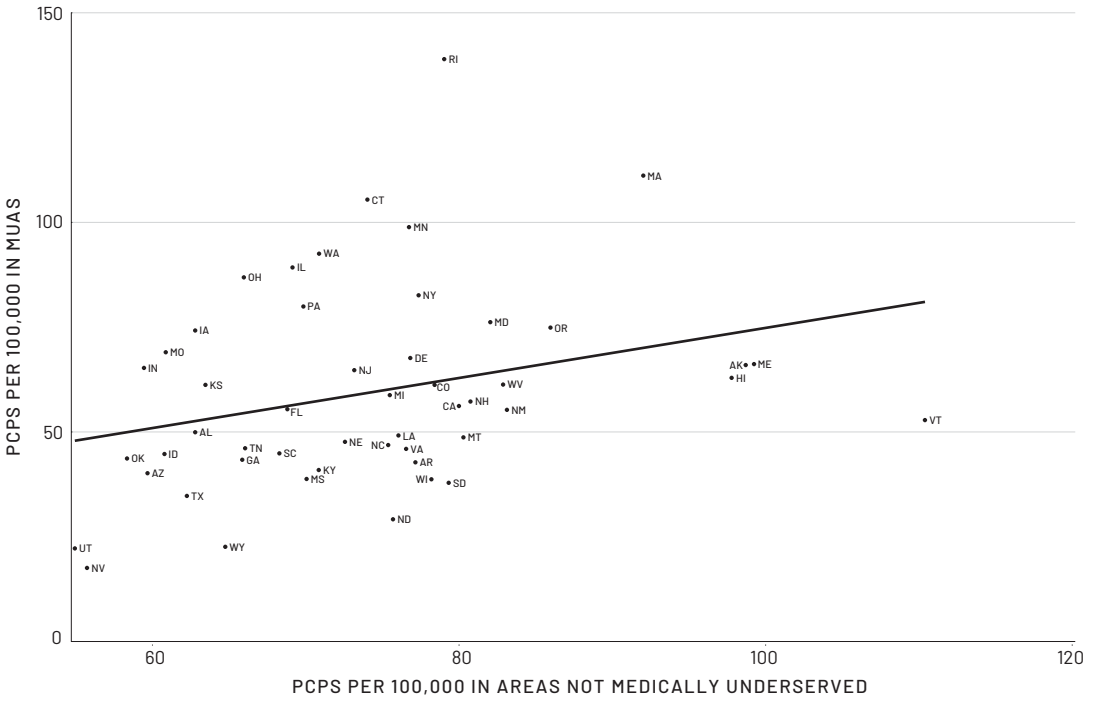
Finally, at the Census block level and for each year from 2012 to 2020, we linked HRSA data identifying MUAs and block population with geocoded AMA Masterfile data. For every state and the District of Columbia, we then determined the total population and the number of primary care physicians in both MUAs and areas not medically underserved. With these totals, we then calculated the number of primary care physicians per 100,000 population in MUAs (Measure 2.3) and in areas that are not medically underserved (Measure 2.4Nationwide, the rate of primary care physicians per 100,000 declined slightly from 56.3% in 2012 to 55.6% in 2020 and did not vary substantially in areas that are not medically underserved, with a rate per 100,000 of 72.4 in 2012 and 73.5 in 2020. The difference, therefore, increased slightly from 16.1 (72.4 – 56.3) in 2012 to 16.9 (72.5 – 55.6) in 2020. At the same time, there is considerable variation across states in the difference between the MUA and non-MUA rates. In the graph below, U.S. states above the line of best fit have a smaller gap than the nation as a whole, while those below the line have a larger gap. In a few states, the rate of primary care physicians per 100,000 people is greater in MUAs than in non-MUAs, notably Rhode Island, Massachusetts, Connecticut, and Minnesota.

Measures 2.3 and 2.4: Primary Care Physicians in Medically Underserved and Areas Not Medically Underserved

	Medically Underserved Areas			Areas Not Medically Underserved		
Year	**PCPs**	**Population**	**Rate per 100,000**	**PCPs**	**Population**	**Rate per 100,000**
2012	45,934	81,555,567	56.3	168,284	232,358,473	72.4
2013	46,445	82,221,043	56.5	169,588	233,907,798	72.5
2014	47,314	83,614,976	56.6	171,468	235,242,084	72.9
2015	47,504	84,512,345	56.2	172,554	236,906,477	72.8
2016	47,388	84,968,207	55.8	172,561	238,159,307	72.5
2017	47,188	85,559,321	55.2	172,397	240,159,860	71.8
2018	47,276	86,203,405	54.8	173,641	240,964,033	72.1
2019	47,425	85,882,593	55.2	174,923	242,356,935	72.2
2020	47,119	84,717,366	55.6	177,439	244,766,759	72.5

PCP: Primary Care Physicians
Data Sources: AMA Masterfile, 2012–2020; CMS Pysician and Other Practitioners, 2012–2020, HRSA-MUA File

PCPs per 100,000 in Medically Underserved Areas and Areas Not Medically Underserved in 2020



PCP: Primary Care Physician; MUA: Medically Underserved Area.
Source: AMA Masterfile 2020, MUA File, HRSA Data Warehouse
Note: PCP counts exclude hospitalists as identified in 2020 CMS Physician and Other Practitioners data.
Results for the District of Columbia is not shown.

Recommendation 3: Train Primary Care Teams Where People Live and Work

Measure 3.1: Percentage of physicians trained in rural areas and medically underserved areas

For this measure, we used site-level residency program data from academic years 2012-2013 to 2020-2021 publicly available from ACGME (**https://apps.acgme.org/ads/Public/Request/PublicDataRequest**). This file includes the city, state, and zip code of participating sites of ACGME-accredited residency programs. These addresses were used to identify sites located in either rural areas or medically underserved areas (MUAs). Because zip codes are not easily matched to MUAs, there is some imprecision in this measure. *In the second year of this study, we secured permission from ACGME to access the restricted version of this data, with full street addresses that can be geocoded down to the Census block level to unambiguously determine whether a site is located in an MUA, as we did for Measures 2.3 and 2.4, where we used geocoded addresses to determine whether primary care physicians are located in an MUA.*[11,12]

For this provisional measure, we first used a zip code–ZCTA crosswalk from Health Landscape (**https://udsmapper.org/zip-code-to-zcta-crosswalk**) to use Census Bureau geographies that can linked to our MUA file at the Census block level. We used the Geocorr engine at the Missouri Census Data Center to identify all blocks in ZCTAs. We classified a ZCTA as an MUA if more than 25% of its population was also in an MUA. We also used the same approach to determine whether a ZCTA was rural.

In the ACGME program-level data, we used the "number of positions filled" field to obtain a count of the number of residents from 2012—2013 to 2020—2021 in each program. The denominators of the measure are the total number of residents in an ACGME-accredited program for each year and each state. The numerators represent those residents in programs that included at least one site that was in a rural county and/or located in an MUA.

The total number of residents increased from 116,820 in 2012 to 148,205 in 2020—2021. Over the same period the number in programs with a rural site increased from 3,863 to 7,747, or 3.3% to 5.2%. The number in programs with an MUA site increased from 73,809 to 94,877, or 63.2% to 64.0%. The number in programs with either a rural site or an MUA site are not substantially different than the MUA figures, indicating that most rural sites are also MUA sites. It is noteworthy that these percentages are relatively high. This may reflect the fact that residency programs have multiple sites and the chances that at least one of them is in an MUA or a rural county are relatively high.

Measure 3.1: Percentage of Physicians Trained in Rural Counties and Medically Underserved Areas

		Residents			Percent		
Academic Year	Total	Rural	MUA	Both	Rural	MUA	Both
2012–2013	116,820	3,863	73,809	75,182	3.3	63.2	64.4
2013–2014	119,183	4,106	75,323	76,749	3.4	63.2	64.4
2014–2015	120,662	4,230	78,429	79,773	3.5	65.0	66.1
2015–2016	123,471	4,566	77,003	78,579	3.7	62.4	63.6
2016–2017	128,765	5,211	82,162	83,710	4.0	63.8	65.0
2017–2018	134,360	5,856	84,782	86,510	4.4	63.1	64.4
2018–2019	139,429	6,463	88,538	90,361	4.6	63.5	64.8
2019–2020	144,023	7,159	90,923	92,952	5.0	63.1	64.5
2020–2021	148,205	7,747	94,877	97,036	5.2	64.0	65.5

Data Sources: ACGME Site and Program Data; HRSA MUA File

Measure 3.2: Percentage of physicians, nurses, and physician assistants working in primary care

Since there is not a national workforce database comparable to the AMA Masterfile for other types of primary care clinicians, we used data from the Provider Enrollment, Chain and Ownership System (PECOS) in conjunction with the Medicare Physician and Other Practitioners Public Use File data (hereafter Medicare PUF) to identify PAs and NPs working in primary care. PECOS is a system of records detailing providers enrolled in Medicare.Both of these data sources are available from 2016 to 2020. It is relatively unique in that it is possible to link most individual providers to a particular organization to which they reassigned their billing rights. As discussed below, the characteristics of the physicians in a practice can be used to infer the likely specialty of the NPs and PAs in the same practice. The Medicare PUF provides information regarding services and procedures performed on Medicare beneficiaries, which allowed us to further elucidate the type of practice based on billing code information.

Measure 3.4: Main Billing Site for Nurse Practitioners and Physician Assistants, 2020

	Nurse Practitioners		Physician Assistants	
Site of Care	N	Percent	N	Percent
Total	111,523	100.0	60,037	100.0
Office	75,371	67.6	42,232	70.3
Hospital	15,460	13.9	6,785	11.3
Emergency Department	5,900	5.3	9,099	15.2
Assisted Living	1,794	1.6	298	0.5
Nursing Home	10,024	9.0	1,322	2.2
Home Health	2,423	0.5	246	0.1
Mental Health	551	0.5	55	0.1

Data Source:CMS Physician and Other Practitioners Public Use File, 2020
Note: The counts exclude nurse practitioners and physician assistants who bill Medicare but not using Evaluation and Management Codes. It also excludes those who bill fewer than 50 times.

The approach used in this analysis builds on our earlier attempts to identify NPs and PAs working in primary care.[11] The CMS Physician and Other Practitioners data was used to identify NPs/PAs primarily working in non-primary care settings, including hospitals, emergency departments, nursing homes, assisted living, home health, and mental health (see Supplementary Table 4 for the full listing of CPT codes used). In 2020 Physician and other Practitioners data, there were 111,523 NPs and 60,037 PAs using E&M codes. For both NPs and PAs, more than 66% mainly used office billing codes. About 13.9% of NPs and 11.3% of PAs billed from hospitals. NPs were more likely to mainly billed from Nursing homes (9.0%) than PAs (2.2%). By contrast, more PAs billed from Emergency Department (15.2%) than NPs (5.3%). Note that in our approach, NPs and PAs billing from a non-office setting are classified as non-primary care. However, we do not assume that those billing from an office setting are primary care.

The Physician and other Practitioners data also allowed us to reclassify PCPs primarily billing from a non-office setting as non-primary care. We assumed that NPs/PAs working alongside primary care physicians specialized in primary care and those in practices with no PCPs were not in primary care. For multi-specialty practices, we assumed that the relative share of primary care physicians in the practice was equal to the relative composition of NPs/PAs. NPs and PAs working in rural health clinics (RHCs) and federally qualified health centers (FQHCs) were classified as primary care. NPs and PAs working primarily with social workers and psychologists were reclassified to non-primary care. Furthermore, based on the "organization type" information in PECOS, we classified NPs/PAs working in retail clinics, critical access hospitals, and skilled nursing facilities as non-primary care.

In cases where NPs and PAs were not in a practice with physicians (due mainly because they did not reassign their billing rights if their Medicare enrollment status was "order and referring" only), we used the x-y coordinates of their NPPES address to determine whether they were collocated with physicians. Lastly, we assumed that NPs and PAs working in practices not composed of physicians or other healthcare providers work in primary care if there was insufficient data to reclassify them as non-primary care.

Measure 3.3: Percentage of new physician workforce entering primary care each year

For this measure, we used the 2022 AMA Historical Residency File, the 2022 AMA Masterfile, and the 2012—2020 CMS Physician and Other Practitioners data. The Historical Residency File allowed us to identify the end years of primary care physicians' training as a proxy for when they entered the workforce. We examined trends using end years from 2012 to 2020. Because we used the 2022 AMA data instead of 2020 data, we are relatively confident that nearly all had actually finished their training by 2020.[13,14] Primary care includes physicians in family medicine (AMA specialty code FM), general practice (GP), geriatrics (IMG and FPG), internal medicine (IM), pediatrics (PD), and Med-Peds (MPD). Annual Physician and Other Practitioners data were used to identify hospitalists with a primary care specialty and reclassify them as non-primary care.

In calculating the percentage of new physicians entering primary care, the denominator is the number of physicians who completed their training each year and the numerator is the number of non-hospitalist primary care physicians. Note that the AMA Masterfile includes "preferred" and "alternative" addresses. The preferred address was used when it was the physician's office address, and the alternative address was used when the preferred address was their home address.

The following table shows two sets of numbers. The first is the main measure, showing a slow decline in the percentage of new physicians working in primary care, with a decline from 21.9% in 2012 to 20.4% in 2020. The second set of numbers shows the rising number of physicians trained in primary care choosing to work as hospitalists. The "generalists" include both primary care physicians and hospitalists; the hospitalists count includes only hospitalists with primary care specialties in the AMA Masterfile. The percentage of hospitalists increased from 25.5% in 2012 to 30.5% in 2020. This implies that the decline in the percentage of the new workforce entering primary care is mainly attributable to the rising percentage choosing to become hospitalists. In 2012, about 29.4% of the new entrants were generalists (7,178/24,375), the same percentage as in 2020 (8,036/27,334 = 0.294).

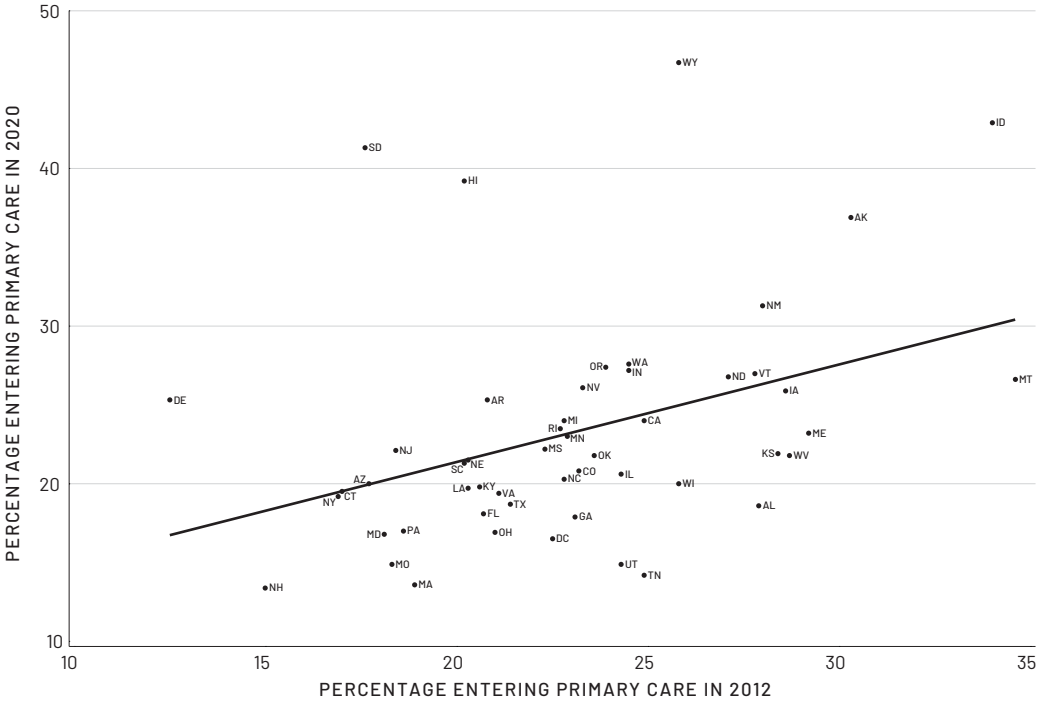
Measure 3.3: Percentage of New Physicians Entering Primary Care Each Year

	New Entrants in Primary Care			Working as Hospitalists		
Year	**All**	**PCP**	**Percent**	**Generalists**	**Hospitalists**	**Percent**
2012	24,375	5,346	21.9	7,178	1,832	25.5
2013	24,099	5,215	21.6	7,102	1,887	26.6
2014	24,742	5,258	21.3	7,284	2,026	27.8
2015	25,485	5,447	21.4	7,551	2,104	27.9
2016	25,454	5,510	21.6	7,589	2,079	27.4
2017	25,737	5,237	20.3	7,427	2,190	29.5
2018	26,046	5,309	20.4	7,668	2,359	30.8
2019	26,915	5,437	20.2	7,866	2,429	30.9
2020	27,334	5,585	20.4	8,036	2,451	30.5

PCP: Primary Care Physicians
Data Sources: 2022 AMA Masterfile; 2022 AMA Historical Residency; Physician and Other Practitioners, 2012-2020

For state-level estimates, we used the physicians' state address as of 2022. While this allows the AMA Masterfile time to update address fields, it does not allow for a standard amount of time across years. That is, physicians who entered the workforce in 2012 are more likely to have moved to a different state than those who entered in 2020. The scatterplot below suggests that this may be the case, with considerable deviations from the line of best fit in a comparison of 2012 and 2020 values of the measure. In the second year of this study, we will update this analysis to examine movement of physicians across states early in their careers.

Comparison of Percentage of New Physician Workforce Entering Primary Care in 2012 and 2020



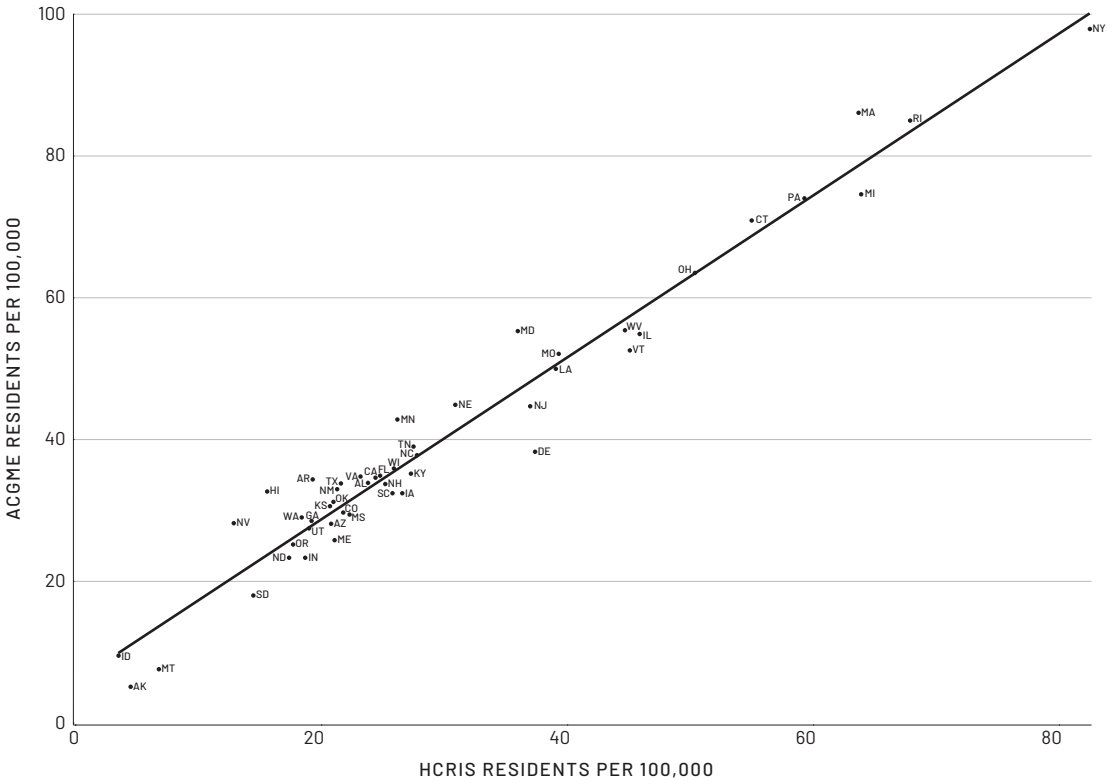
Data Source: AMA Masterfile 2012, 2020

Measure 3.4: Residents per 100,000 population by state

A version of this measure produced by ACGME already exists. The ACGME's Data Resource Book provides calculations of the number of active residents per 100,000 since 2007 (**https://www.acgme.org/about-us/publications-and-resources/graduate-medical-education-data-resource-book**; the most recent version, for the 2021-2022 academic year, can be found at **https://www.acgme.org/globalassets/pfassets/publicationsbooks/2021-2022_acgme__databook_document.pdf**, Table C.9). Our own measure uses basically the same data and the same method. Following the ACGME, we define active residents broadly to include those that are in specialty programs as well as subspecialty programs. We used publicly available ACGME program-level data. Residents per program are defined as the number of filled positions in an academic year. State counts were obtained by rolling up program counts to the state level. We used Census population estimates for 2010—2019 and actual Census counts for 2020.

In its discussion of this measure, the NASEM report cites a paper by Mullan et al. that uses Healthcare Cost Report Information System (HCRIS) data instead of ACGME data.[15] Historically, of course, the ACGME counts are restricted to counts of residents in ACGME accredited program, thus excluding residents in programs accredited by the American Osteopathic Association (AOA). The HCRIS dataset includes both osteopathic and allopathic physicians but is restricted to those in hospitals obtaining GME dollars from CMS. This excludes most pediatricians training in children's hospitals funded by HRSA and many psychiatrists and physicians trained in VA hospitals. Moreover, in HCRIS data, counts of residents are expressed as full-time equivalents (FTEs).

Comparison of HCRIS and ACGME Physician Resident Rates per 100,000 population



Data Sources: 2020 HCRIS and ACGME residency program information

In addition to the ACGME measure, we also created alternative state and national estimates using HCRIS data. We used HCRIS data available from NBER (**https://www.nber.org/research/data/healthcare-cost-report-information-system-hcris**). Specifically, we used the yearly "Rollup" files located at **https://www.nber.org/research/data/hcris-hosp**. The count of residents is the NBER variable e4_c3_8 (for the information contained in worksheet E4, line 8, column 3), which shows the total "weighted FTE count for physicians in an allopathic and osteopathic program for the current year" in form CMS-2552-10 completed by hospitals (see **https://www.cms.gov/Regulations-and-Guidance/Guidance/Transmittals/Downloads/R3P240f.pdf**). For this measure, we also used Census data for state populations from 2010 to 2020. The association between the two rates is shown below. As expected, there is a strong correlation between the two measures (r = .99 in 2020).

Recommendation 5: Ensure That High-Quality Primary Care Is Implemented in the United States

Measure 5.1: Investment in primary care research by the National Institutes of Health in dollars spent and percentage of total projects funded

In measuring investment in primary care research, our focus was to capture grant funding given to departments of family medicine at U.S. medical schools because these institutions have traditionally housed such researchers and their staff, thereby serving as the research infrastructure of primary care.

Moreover, family physicians have clinical practices that treat disparate populations, and their resultant community ties make them suited for not only providing quality primary care, but also translating research into practice. Hence, we treated NIH research grant funding for departments of family medicine as a proxy for primary care research.

We began by benchmarking results from the downloaded database to available statistics stated in a study by Lucan et al. that analyzed data on all grants to departments of family medicine in 2006.[16] The researchers found not only that NIH grants to family medicine accounted for 0.2% of all awards in the period of analysis, but also that family medicine was under-represented on NIH advisory committees, indicating under-representation in funding and in shaping NIH direction.[17] We found concordance in the funding for family medicine, as well as the share of overall NIH grant funding.

Secondary data from the NIH RePORTER tool were collected for use in this analysis. This online tool provides users access to reports and raw data of the entire set of grant-awarded projects for a given fiscal year, going back to 1985. Using the **ExPORTER** feature, we downloaded information from 2017 to 2021, where each observation is an NIH-funded proposal, with identifying detail. It was then possible to calculate total NIH funding (direct costs, indirect costs, sub-project costs) across all grant types, for all PI-affiliated academic departments of family medicine located in the U.S., and to calculate what proportion this accounts for across total NIH funding for each fiscal year. Note that these dollar figures are not adjusted for inflation.

One limitation is the risk of misclassification of research by errors of either omission or commission. Other entities or departments outside of family medicine may also have funded research that aligns with the tenets of primary care but was excluded from this measure. Another limitation is that the current measure does not capture research affiliated with national organizations for primary care or family medicine (such as the North American Primary Care Research Group) that also aim to build research capacity, especially as it relates to practice-based research.[18]

In future iterations of this scorecard, this metric may incorporate methods that can better identify projects relating to primary care that are housed outside departments of family medicine or funded by these national primary care organizations, which are becoming well established in the primary care research infrastructure.

SUPPLEMENTAL TABLES

Supplemental Table 1: Percentage of Primary Care Spending, Broad Definition, Breakdown by Physician or Clinician Type and Payer Type, MEPS (2010–2020)

Year	Percentage of Primary Care Spending, Broad Definition, by Payer Type			Percentage of Primary Care Spending, Narrow Definition, by Payer Type			Percentage of Spending for OBGYN Outpatient Visits by Payer Type			Percentage of Spending for Psychiatrist Outpatient Visits by Payer Type			Percentage of Spending for Behavioral Health Non-physician Outpatient Visits by Payer Type			Percentage of Spending for Nurse/NP or PA Outpatient Visits by Payer Type		
	Commercial	Medicare	Medicaid	Commercial	Medicare	Medicaid	Commercial	Medicare	Medicaid	Commercial	Medicare	Medicaid	Commercial	Medicare	Medicaid	Commercial	Medicare	Medicaid
2010	11.7	7.4	9.0	6.9	4.0	5.1	2.5	0.2	1.7	0.4	0.2	0.7	0.4	0.1	0.5	1.5	3.0	1.0
2011	11.4	6.2	9.4	6.5	4.4	5.0	2.6	0.2	1.3	0.5	0.2	0.9	0.4	0.1	0.8	1.5	1.2	1.4
2012	11.1	6.0	9.0	6.1	3.9	4.8	2.1	0.2	1.2	0.6	0.3	1.2	0.5	0.1	1.0	1.8	1.4	0.9
2013	13.8	7.0	9.7	8.0	4.2	5.1	2.4	0.2	1.4	0.4	0.3	0.9	0.6	0.2	0.8	2.5	2.0	1.6
2014	13.1	7.3	13.3	7.1	4.1	5.3	2.3	0.3	1.5	0.5	0.4	1.1	0.7	0.2	1.4	2.5	2.4	4.0
2015	11.0	6.4	12.4	5.7	3.8	5.2	2.3	0.2	1.7	0.3	0.2	1.0	0.6	0.2	1.4	2.1	2.0	3.1
2016	12.1	7.7	12.1	6.3	4.3	4.8	2.1	0.2	1.1	0.3	0.2	0.9	0.5	0.2	1.1	2.9	2.8	4.2
2017	12.2	8.0	11.7	6.1	4.1	4.9	2.2	0.2	1.2	0.4	0.4	1.1	0.7	0.3	1.6	2.8	3.1	2.9
2018	14.1	7.4	12.0	6.5	4.2	4.8	2.7	0.2	1.0	0.9	0.4	1.1	1.0	0.3	2.3	3.1	2.4	2.8
2019	13.3	8.0	12.7	6.0	4.6	4.8	2.1	0.3	1.0	0.6	0.3	1.0	1.3	0.3	3.2	3.2	2.5	2.6
2020	15.1	7.4	12.7	5.6	3.5	4.2	1.8	0.1	1.2	0.7	0.3	1.2	2.1	0.4	2.9	4.9	3.0	3.3

Data Source: Medical Expenditure Panel Survey (MEPS), 2010-2020. MEPS was redesigned in 2018. Data on ambulatory care expenditures are derived from the consolidated, office-based and outpatient event files. Details are described elsewhere in Appendix B.
Notes: The primary care broad definition includes both physicians and non-physicians. Primary care physicians (family medicine, general practice, internal medicine, pediatrics, geriatrics, and osteopaths), OBGYNs, and psychiatrists and non-physicians including nurses/nurse practitioners, physician assistants, clinical psychologists, social workers and mental health counselors, and marriage and family therapists. Mental health counselors and marriage and family therapists were added since 2018.

Supplemental Table 2: Percentage of the U.S. Adult Population with No Usual Source of Care (BRFSS 2011–2021)

State	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Alabama	19.7	19.7	22.1	23.4	20.9	21.3	20.6	21.8	22.6	21.5	16.4
Alaska	33.2	36.8	32.4	33.5	34.5	31.7	31.0	36.9	31.7	33.9	23.8
Arizona	26.7	25.7	31.6	27.8	27.2	26.5	26.8	26.2	28.7	28.5	22.4
Arkansas	22.9	22.5	22.7	22.1	16.4	19.5	19.2	18.6	20.9	23.5	15.6
California	26.9	27.2	28.7	25.3	23.2	23.9	24.2	25.2	25.1	24.2	17.9
Colorado	23.9	23.0	23.5	23.8	23.6	25.4	25.6	25.8	26.5	27.1	18.2
Connecticut	14.8	13.7	15.1	15.7	14.8	14.8	14.5	15.7	16.5	16.4	12.6
Delaware	11.8	13.0	14.0	14.0	15.1	16.7	18.0	18.2	17.6	16.9	15.1
District	19.2	21.1	23.7	24.9	19.7	24.4	25.5	21.8	23.3	23.0	14.5
Florida	24.7	24.4	26.6	23.9	21.9	27.9	27.4	26.0	27.8	28.5	NA
Georgia	26.8	25.2	28.0	28.4	28.3	27.2	27.0	28.0	26.1	25.1	18.8
Hawaii	17.2	15.3	14.9	15.3	15.2	15.2	16.8	14.9	16.4	14.5	9.9
Idaho	26.9	28.3	28.0	29.1	26.7	27.5	24.5	28.8	27.7	25.6	17.3
Illinois	18.6	17.2	20.0	19.1	17.4	17.8	18.0	17.9	20.2	20.4	16.4
Indiana	19.0	18.5	19.4	19.6	18.6	18.2	19.0	20.2	21.9	20.8	15.4
Iowa	18.7	17.2	19.4	19.4	18.9	16.5	17.3	17.4	17.1	17.9	14.5
Kansas	19.7	20.7	21.5	19.4	20.0	22.3	22.2	22.2	21.7	22.3	14.1
Kentucky	19.7	18.4	21.7	20.5	17.1	20.3	17.5	18.9	18.2	20.3	13.7
Louisiana	25.0	23.0	25.7	25.4	22.5	24.5	21.6	23.2	23.5	21.5	14.4
Maine	12.5	11.8	12.6	12.1	11.5	11.8	12.7	14.7	14.5	13.7	9.3
Maryland	16.9	16.6	20.5	17.3	14.7	15.2	16.6	16.3	15.1	16.2	12.7
Massachusetts	11.6	11.5	12.2	10.6	11.0	11.1	13.2	13.2	12.6	12.6	9.8
Michigan	15.4	15.7	16.9	16.0	14.7	14.6	15.0	14.8	14.4	14.3	10.9
Minnesota	22.7	24.1	26.9	24.1	23.1	27.2	24.8	24.1	25.0	23.3	17.8
Mississippi	25.7	25.2	22.7	26.6	21.9	22.6	23.4	26.0	26.3	23.8	16.6
Missouri	19.8	21.2	20.5	20.9	22.2	22.0	23.6	23.3	21.2	23.0	15.9
Montana	28.2	27.2	29.5	29.1	25.9	26.3	28.2	27.2	26.8	27.1	19.8
Nebraska	18.3	17.2	20.8	20.1	19.7	19.0	19.7	22.2	20.3	20.4	14.3
Nevada	36.6	33.2	34.9	34.7	32.9	30.7	32.9	30.3	33.6	33.0	25.4
New Hampshire	13.1	12.6	12.5	15.1	11.5	12.1	12.7	13.7	11.5	12.0	9.1
New Jersey	16.5	17.3	18.5	18.1	17.9	17.6	20.6	20.3	NA	18.8	15.3
New Mexico	29.5	29.4	31.1	30.6	29.2	29.7	28.2	31.0	30.1	29.1	25.9
New York	16.3	17.4	18.6	18.3	16.9	16.5	16.9	19.4	20.4	20.1	13.8
North Carolina	24.2	24.5	26.5	23.6	21.6	21.2	20.8	21.9	23.9	22.7	16.8
North Dakota	24.8	26.2	26.5	28.6	26.2	25.8	29.3	27.3	30.4	30.9	17.6
Ohio	18.3	18.8	19.2	19.7	17.9	17.3	18.6	20.2	20.3	20.6	13.9

State	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Oklahoma	24.2	24.1	26.0	24.7	25.2	24.6	24.7	24.1	24.4	24.4	20.4
Oregon	22.1	22.0	25.3	22.9	21.2	21.2	22.8	24.8	24.5	22.1	22.2
Pennsylvania	12.6	12.9	14.1	14.9	13.1	14.2	14.4	15.1	16.1	14.9	10.7
Rhode Island	14.1	13.3	15.6	13.6	11.9	12.8	12.1	13.9	14.5	13.4	9.9
South Carolina	21.8	22.3	23.8	23.2	21.7	21.5	22.2	23.8	24.6	22.6	16.1
South Dakota	24.1	23.7	23.8	24.5	20.9	23.9	24.0	25.2	24.1	22.0	16.7
Tennessee	21.9	21.1	22.6	24.2	22.3	21.8	22.2	23.5	25.7	22.7	17.2
Texas	31.4	32.7	32.9	32.7	33.0	30.9	31.5	31.7	31.6	32.9	25.6
Utah	27.1	26.0	28.3	28.8	26.0	27.2	28.3	27.2	27.0	26.1	20.0
Vermont	12.2	12.3	13.2	13.3	12.1	11.9	12.6	14.2	13.7	15.0	9.8
Virginia	22.5	22.4	23.4	23.9	21.3	22.0	22.9	20.3	21.6	23.6	16.0
Washington	25.2	23.7	27.4	25.1	22.8	24.2	23.8	23.8	24.4	24.5	16.1
West Virginia	23.9	23.9	23.3	22.7	21.0	19.5	19.4	18.5	18.2	18.3	12.6
Wisconsin	16.4	17.7	19.0	18.7	19.4	17.0	17.6	17.3	17.6	17.1	13.4
Wyoming	30.8	32.0	30.7	30.4	30.4	31.0	31.9	32.0	32.8	29.8	24.6
U.S.	22.0	22.1	22.1	22.7	21.4	21.8	22.2	22.7	23.2	22.9	16.7

Data Source: Analyses of Behavioral Risk Factor Surveillance System (2016–2021). No usual source of care is derived from the questions "Do you have one person you think of as your personal doctor or health care provider?" and, if the answer is no, ask "Is there more than one or is there no person who you think of as your personal doctor or health care provider?" (PERSDOC).

Supplemental Table 3: Percentage of U.S. Children with No Usual Source of Care

State	2016	2017	2018	2019	2020	2021
Alabama	17.2	24.9	26.7	21.7	24.8	25.0
Alaska	23.9	22.9	25.1	19.9	24.0	20.5
Arizona	21.7	28.1	26.7	28.2	34.1	24.9
Arkansas	21.8	31.1	22.3	22.9	28.9	24.2
California	26.9	25.4	31.3	29.3	31.6	34.1
Colorado	15.9	17.9	21.0	15.9	18.1	18.1
Connecticut	19.0	16.9	22.5	23.1	24.3	27.2
Delaware	18.1	21.9	27.6	23.7	25.3	30.0
District	23.2	17.1	28.2	29.3	26.1	29.2
Florida	20.3	26.2	32.0	29.5	26.7	30.9
Georgia	17.7	20.0	24.7	25.9	26.9	25.2
Hawaii	19.6	24.9	29.8	25.0	28.5	27.9
Idaho	17.8	20.0	18.9	16.7	17.6	24.5
Illinois	22.0	20.7	26.2	23.3	19.8	26.6
Indiana	20.5	17.5	22.1	23.4	25.4	25.0

State	2016	2017	2018	2019	2020	2021
Iowa	15.2	15.7	16.2	14.0	24.9	17.4
Kansas	20.5	21.3	18.9	21.0	19.9	19.4
Kentucky	18.3	23.4	22.9	22.9	22.3	20.2
Louisiana	21.4	21.8	24.7	28.1	30.8	31.8
Maine	17.3	18.1	15.8	16.6	17.0	16.4
Maryland	12.2	17.9	30.7	24.6	26.0	27.1
Massachusetts	16.6	17.4	23.4	20.0	24.5	23.8
Michigan	22.8	28.0	27.2	24.4	22.5	24.9
Minnesota	17.4	18.1	21.1	15.3	18.8	20.2
Mississippi	16.5	24.1	26.0	23.9	24.7	28.9
Missouri	21.6	18.7	23.8	22.7	26.2	23.6
Montana	18.5	23.9	19.0	16.0	18.8	17.1
Nebraska	20.1	17.5	20.9	25.0	23.3	19.8
Nevada	29.4	34.8	28.3	33.1	33.4	38.2
New Hamp	15.5	12.8	17.5	15.4	20.3	21.4
New Jersey	19.0	17.2	25.6	26.2	25.1	29.2
New Mexico	21.5	25.9	24.7	25.7	31.4	29.2
New York	24.7	25.4	29.8	26.1	24.6	30.6
North Ca	19.1	17.2	21.9	19.8	22.2	23.7
North Da	18.2	21.1	18.9	22.5	21.9	17.9
Ohio	22.1	22.0	23.1	21.8	23.6	22.0
Oklahoma	20.4	20.1	24.3	21.1	24.2	23.3
Oregon	17.1	18.1	23.6	20.4	19.8	19.4
Pennsylvania	17.6	21.9	20.5	21.2	20.0	23.6
Rhode Island	19.3	18.7	23.2	24.0	22.9	24.3
South Carolina	18.0	24.7	22.7	23.5	24.9	25.2
South Dakota	18.7	19.0	18.4	20.6	22.7	21.7
Tennessee	21.2	22.9	22.1	25.3	23.5	23.1
Texas	22.7	26.5	24.9	31.7	33.3	29.4
Utah	15.1	19.9	17.3	15.8	19.2	17.8
Vermont	14.6	17.0	15.5	13.1	14.8	17.4
Virginia	19.4	17.0	15.3	16.3	22.3	22.7
Washington	19.8	15.9	23.0	18.4	21.8	20.7
West Virginia	17.0	20.8	27.0	24.4	20.4	19.9
Wisconsin	17.6	27.6	22.4	24.8	20.9	22.4
Wyoming	17.7	17.7	16.8	17.6	21.4	23.1
U.S.	20.9	22.6	25.2	24.7	25.8	26.5

Data Source: National Survey of Children's Health (2016–2021). Here, the measure of no usual source of care includes children with no usual source of care and those who had the emergency department or hospital as their usual source of care (see text).

Supplemental Table 4: Healthcare Common Procedure Coding System (HCPCS) Codes

Code	Description
Office	
99201	New patient office or other outpatient visit, typically 10 minutes
99202	New patient office or other outpatient visit, typically 20 minutes
99203	New patient office or other outpatient visit, typically 30 minutes
99204	New patient office or other outpatient visit, typically 45 minutes
99205	New patient office or other outpatient visit, typically 60 minutes
99211	Established patient office or other outpatient visit, typically 5 minutes
99212	Established patient office or other outpatient visit, typically 10 minutes
99213	Established patient office or other outpatient visit, typically 15 minutes
99214	Established patient office or other outpatient, visit typically 25 minutes
99215	Established patient office or other outpatient, visit typically 40 minutes
G0439	Annual wellness visit, includes a personalized prevention plan of service (pps), subsequent visit
Hospital	
99217	Hospital observation care on day of discharge
99218	Hospital observation care, typically 30 minutes
99219	Hospital observation care, typically 50 minutes
99220	Hospital observation care, typically 70 minutes
99221	Initial hospital inpatient care, typically 30 minutes per day
99222	Initial hospital inpatient care, typically 50 minutes per day
99223	Initial hospital inpatient care, typically 70 minutes per day
99224	Subsequent observation care, typically 15 minutes per day
99225	Subsequent observation care, typically 25 minutes per day
99226	Subsequent observation care, typically 35 minutes per day
99231	Subsequent hospital inpatient care, typically 15 minutes per day
99232	Subsequent hospital inpatient care, typically 25 minutes per day
99233	Subsequent hospital inpatient care, typically 35 minutes per day
99234	Hospital observation or inpatient care low severity, 40 minutes per day
99235	Hospital observation or inpatient care moderate severity, 50 minutes per day
99236	Hospital observation or inpatient care high severity, 55 minutes per day
99238	Hospital discharge day management, 30 minutes or less
99239	Hospital discharge day management, more than 30 minutes
Emergency Department	
99281	Emergency department visit, self-limited or minor problem
99282	Emergency department visit, low to moderately severe problem
99283	Emergency department visit, moderately severe problem
99284	Emergency department visit, problem of high severity

Code	Description
99285	Emergency department visit, problem with significant threat to life or function
99291	Critical care delivery critically ill or injured patient, first 30-74 minutes
99292	Critical care delivery critically ill or injured patient
Assisted Living	
99324	New patient assisted living visit, typically 20 minutes
99325	New patient assisted living visit, typically 30 minutes
99326	New patient assisted living visit, typically 45 minutes
99327	New patient assisted living visit, typically 60 minutes
99328	New patient assisted living visit, typically 75 minutes
99334	Established patient assisted living visit, typically 15 minutes
99335	Established patient assisted living visit, typically 25 minutes
99336	Established patient assisted living visit, typically 40 minutes
99337	Established patient assisted living visit, typically 60 minutes
Nursing Facility	
99304	Initial nursing facility visit, typically 25 minutes per day
99305	Initial nursing facility visit, typically 35 minutes per day
99306	Initial nursing facility visit, typically 45 minutes per day
99307	Subsequent nursing facility visit, typically 10 minutes per day
99308	Subsequent nursing facility visit, typically 15 minutes per day
99309	Subsequent nursing facility visit, typically 25 minutes per day
99310	Subsequent nursing facility visit, typically 35 minutes per day
99315	Nursing facility discharge day management, 30 minutes or less
99316	Nursing facility discharge management, more than 30 minutes
99318	Nursing facility annual assessment, typically 30 minutes
Home Health	
99341	New patient home visit, typically 20 minutes
99342	New patient home visit, typically 30 minutes
99343	New patient home visit, typically 45 minutes
99344	New patient home visit, typically 60 minutes
99345	New patient home visit, typically 75 minutes
99347	Established patient home visit, typically 15 minutes
99348	Established patient home visit, typically 25 minutes
99349	Established patient home visit, typically 40 minutes
99350	Established patient home visit, typically 60 minutes

Code	Description
Mental Health	
90791	Psychiatric diagnostic evaluation
90792	Psychiatric diagnostic evaluation with medical services
90832	Psychotherapy, 30 minutes
90833	Psychotherapy, 30 minutes
90834	Psychotherapy, 45 minutes
90836	Psychotherapy, 45 minutes
90837	Psychotherapy, 60 minutes
90838	Psychotherapy, 60 minutes
90839	Psychotherapy for crisis, first 60 minutes
90849	Multiple-family group psychotherapy
90853	Group psychotherapy
96127	Brief emotional or behavioral assessment
96130	Psychological testing evaluation by qualified health care professional, first 60 minutes
96131	Psychological testing evaluation by qualified health care professional, additional 60 minutes
96132	Neuropsychological testing evaluation by qualified health care professional, first 60 minutes
96133	Neuropsychological testing evaluation by qualified health care professional, additional 60 minutes
96136	Psychological or neuropsychological test administration and scoring by qualified health care professional, first 30 minutes
96137	Psychological or neuropsychological test administration and scoring by qualified health care professional, additional 30 minutes
96138	Psychological or neuropsychological test administration and scoring by technician, first 30 minutes
96139	Psychological or neuropsychological test administration and scoring by technician, additional 30 minutes
96146	Psychological or neuropsychological test administration and scoring by single standardized instrument via electronic platform with automated result

NOTES

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