Primary Care Service Areas Project V2.1
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National Physician Inventory (NPI) Update 2007

The purpose of NPI update is to provide 2007 primary care physician supply by PCSAs and counties based on 2007 American Medical Association Physician Masterfile (AMA MF) and 20% Centers for Medicare and Medicaid Services (CMS) Medicare Part B and Outpatient claim data.

Because physician residents usually do not have their own UPIN, and CMS claims contain services to the elderly only, both lower and upper bounds of primary care supply were provided.

Two dbf format files are:

1. PCSA-level: **hrsa_npi0510_pcsa.dbf**; 6,542 PCSAs with 14 variables

2. County-level: **hrsa_npi0510_cnty.dbf**; 3141 Counties with 12 variables

For detail information, please refer to data dictionary:

HRSA National Physician Inventory Data Dictionary 0510.pdf

Data process steps:

1. AMA definition – same as the New Access Point (NAP) project

Primary care physician counted from the 2007 AMA. Only clinically active, non-federal, primary care physicians were included in the calculations.

Determination of "Active" Status

For physicians considered active—and thereby included in the count of primary care providers—they were non-federal (as defined by "present employment" variable not = 081-086) and flagged as clinically active (i.e., have ClinActive = 1 (true))

ClinActive is defined as follows:

a. Clinically Active Indicator (variable name: ClinActive)

    - Initialize ClinActive to 1 (true).

- Set ClinActive to 0 (false) if Type of Practice [TOP] is NOT equal to:

  '012' = Resident
  '020' = Direct Patient Care
  '072' = Semi-retired
  '100' = No Classification

- Set ClinActive to 0 (false) if AMA's Major Professional Activity [MPA] (as derived from "type of practice" and "present employment" variables) is equal to:

  'ADM' = Administration
  'INA' = Inactive
  'LOC' = Locum Tenens
  'MTC' = Medical Teaching
  'RES' = Research
  'OTH' = Other
  'TFG' = Temporally Foreign Physician
  'UNA' =Address Unknown

- Set ClinActive to 0 (false) if age is greater than 80.

Determination of "Primary Care"

For physicians to be considered primary care providers, they are first flagged as either general primary care (PrimCare = 1) **or** OB/GYN primary care (ObgPCare = 1). The definitions of the ASAPS primary care indicators are as follows:

a. Primary Care Indicator (variable name: PrimCare)

   - Initialize PrimCare to 0 (false).

   - Set PrimCare to 1 (true) if primary specialty (Spec1) *is equal to*:

     'ADL' = Adolescent Medicine (Pediatrics)
     'AMI' = Adolescent Medicine (Internal Medicine)
     'FP' = Family Practice
     'FM' = Family Medicine
     'FPG' = Geriatric Medicine (Family Practice)
     'FPP' = Psychiatry/Family Practice
     'GP' = General Practice
     'IFP' = Internal Medicine/Family Practice
     'IM' = Internal Medicine
     'MPD' = Internal Medicine/Pediatrics
     'PD' = Pediatrics

b. OB/GYN Primary Care Indicator (variable name: ObgPCare)

- Initialize ObgPCare to 0 (false).
- Set ObgPCare to 1 (true) if primary specialty (Spec1) *is equal to*:

  'GYN', 'OBG', 'OBS'

Determination of FTEs

Current residents (Resident = 1 (true)) and physicians who are listed as semi-retired (SemiRet = 1 (true)) are counted as active but assigned base FTEs of only 0.1 and 0.5, respectively, while physicians greater than 70 years of age also are counted as active, but receive gradually discounted FTE (i.e. 0.9 for age 71, 0.8 for age 72, 0.7 for age 73, 0.6 for age 74, 0.5 for age 75, 0.4 for age 76, 0.3 for age 77, 0.2 for age 78, 0.1 for age 79). Physicians ≥ age 80 are not counted. All other clinically active, non-federal physicians are given a base FTE value of 1.0.

SemiRet and Resident are defined as follows:

a. Semi-retired Status Indicator (variable name: SemiRet)

- Set SemiRet to 1 (true) if type of practice (TOP) = '072'; else set SemiRet to 0 (false).

b. Current Resident Indicator (variable name: Resident)

Set Resident to 1 (true) if MPA is equal to "HPR: Resident" OR type of practice (TOP) is '012 Resident'; else set to 0 (false).

Location of Physicians

Office ZIP Codes are first used to assign practice location. If office ZIP Code is missing, preferred mailing ZIP Code is used. ZIP Codes are assigned to ZCTAs based on ZIP to ZCTA 2007 crosswalk file. ZCTAs are then assigned to PCSAs based on the standard ZCTA to PCSA crosswalk file. Physicians are excluded if they practiced outside the 50 states and Washington DC.

For physician county location, please see "**Special Note for county-level count and rate based on AMA specialty and location" on Page 5.**

2. CMS physician definition:

Only CMS physicians identified in the claims files and who link to the AMA Masterfile by UPIN are included. The following criteria only apply to AMA non-Pediatrics.

Physicians are assigned to a primary specialty and practice location based on the plurality of their work relative value units (wRVUs) from two sources. The first is the 20% 2006/2007 Part B Physician/Supplier Claim File. Location of service and physician specialty are listed on each claim. wRVU are assigned to each HCPCS code. The second file is the 2006/2007 20% Outpatient File that includes claims for physician services at rural health clinics and community health centers. Outpatient File does not contain physician specialty code. Researchers at Dartmouth have developed a method to create an annual UPIN-specialty crosswalk file. Using a plurality rule, we assigned a unique specialty to each physician based on each physician's wRVUs and number of claims from the Part B files (rules: assign specialty with the highest wRVUs; if more than one specialties with the same amount of wRVUs then assign specialty with the highest number of claims; we also included residual physicians from the 2006 CMS Physician Identification Master Record (PIMR) file and their specialty was the one on the record with the latest change on physician information. Note: 2006 is the last available PIMR file). HCPCS codes are not required for payment of RHC claims and in almost half of these claims the HCPCS code field was unfilled. In 2006, the HCPCS field was filled in 78% of the CHC claims, but mostly with HCPCS code 99212, a low level established office visit with a wRVU of 0.45. In contrast the average wRVU of RHC claims that had a HCPCS was 0.75. The average wRVU as found in Part B claims was 0.70 for general internists and 0.57 for family practice. This suggests that physician effort would be grossly underestimated because of incomplete HCPCS fields in RHC and arbitrarily assigned low-level HCPCS code in CHCs. To correct for this, we impute a wRVU of 0.67 for all 2006 CHC claims and for RHC claims. The 2007 Physician Fee Schedule Final Rule included the impact of the Five Year Review of physician wRVUs and resulted in application of 10.1 percent adjustment to all wRVUs (MedcrePhysFeeSchedfctsht.pdf). The imputed wRVU for 2007 CHC and RHC claims was therefore adjusted accordingly to 0.92. The final CMS specialty is Primary Care if the plurality of wRVUs specialty is primary care (TDI Specialty = FAMP, INTM, OBGN, PEDI). The final CMS location is the PCSA or the PCSA primary county with the plurality of wRVUs.

Determination CMS FTEs:

Each physician is assumed to have a FTE in accordance with AMA criteria. PCSA and county FTEs will be rounded to 0.1 FTE.

3. Population estimates:

The U.S. Census 2007 civilian population estimates are used for county tabulations. The 2007 PCSA project PCSA civilian population estimates are used for PCSA tabulations.

4. Physician rates (unadjusted):

Three types of primary care physician (PCP) supply were calculated:

1). PCP count with AMA specialty and location
2). PCP count with AMA specialty and location for residents and pediatricians, and AMA FTEs with CMS specialty and location for AMA-CMS linked MDs.
3). PCP count with AMA specialty and location for residents and pediatricians, AMA FTEs with CMA specialty and location for AMA-CMS linked MDs, and AMA FTEs, specialty and location for unlinked AMA MDs.

Three corresponding rates (MD to civilian population ratios) were calculated using 2007 civilian population.

Special Note for county-level count and rate based on AMA specialty and location:

Background:

To identify AMA physician practicing location, the general approach is to use office location, if it's available, otherwise the preferred mailing address. This approach has been used for the National Physician Inventory (NPI) data work to create both PCSA and County level primary care supply. While preparing 2007 NPI data, we found a very low correlation between 2006 and 2007 county level rates based on AMA location (Pearson correlation coefficient 0.251).

Potential errors:

After investigating Zip Codes and County variables in both 2006 and 2007 AMA files, we discovered potential coding errors on AMA 2007 office county variable. When office Zip Code is the same as the preferred mailing Zip Code, we would expect that the office county is the same as the preferred mailing county. However, we found that in 2007 file, among those primary care physicians whose office Zip Code was the same as their preferred mailing Zip Code (N=151,193), 11% of them (N=16,103) did not have a match of office county and preferred mailing county. Applying a different method, we used Zip Code to County crosswalk file developed at Dartmouth and found that, for those 151,193 with a matched Zip Code, 99% of County from Zip-County crosswalk matched to the preferred mailing county and 89% to the office county. Among the 16,103 with mismatched counties, 97% of county from the Zip Code to County crosswalk matched to the preferred mailing county.

Solution:

For NPI 2007 county rates, we applied the Zip-County crosswalk file to obtain the final AMA county assignment. The Pearson correlation coefficient between 2006 and the new 2007 county rates is 0.861 (Note: 2006 AMA only has the preferred mailing county).