**Data Subset Flowcharts**

**Part D Data**

1. Provider-Drug (2013-2019)

2013: 23,645,873 observations; 807,938 unique NPIs

2014: 24,120,618 observations; 837,663 unique NPIs

2015: 24,524,894 observations; 866,552 unique NPIs

2016: 24,964,300 observations; 893,160 unique NPIs

2017: 25,209,130 observations; 918,009 unique NPIs

2018: 25,311,600 observations; 953,263 unique NPIs

2019: 25,401,870 observations; 985,533 unique NPIs

Combined 2013-2019: 1,311,926 unique NPIs

1. Provider (2013-2019)

2013: 1,049,299 unique NPIs

2014: 1,072,978 unique NPIs

2015: 1,102,253 unique NPIs

2016: 1,131,550 unique NPIs

2017: 1,162,898 unique NPIs

2018: 1,204,935 unique NPIs

2019: 1,240,595 unique NPIs

Combined 2013-2019: 8,968,449 NPI-group-year observations; 7,964,508 NPI-year observations; 1,577,043 unique NPIs.

1. After dropping US territories and keeping only US-residing docs: 8,885,653 NPI-group-year observations; 7,886,507 NPI-year observations; 1,563,062 NPIs.
2. After dropping non-primary care docs: 2,413,527 NPI-group-year observations; 2,080,745 NPI-years; 370,704 NPIs
3. After dropping observations that appear in Provider data but not Provider-Service data: 1,984,947 NPI-group-year observations; 1,688,851 NPI-years; 317,762 NPIs.
4. After dropping observations that do not appear in the DAC data: 1,508,149 NPI-group-years; 1,212,053 NPI-years; 265,287 NPIs
5. After dropping observations that do not appear in the HRR data: 1,507,510 NPI-group-years; 1,211,520 NPI-years; 265,180 NPIs.
6. After dropping observations where # male beneficiaries are censored out: 1,404,509 NPI-group-years; 1,122,480 NPI-years; 250,688 NPIs.
7. After dropping observations where # white beneficiaries are censored out: 1,363,934 NPI-group-years; 1,087,357 NPI-years; 243,988 NPIs.
8. After dropping observations where # dual eligible beneficiaries are censored out: 1,236,713 NPI-group-years; 975,684 NPI-years; 224,174 NPIs.
   1. After collapsing to the NPI-group level and dropping observations with 0 total claims for the drugs in the categories: 398,673 NPI-groups; 220,061 NPIs.
      1. If further drop 0 total claims for opioids + benzos together: NPI-groups; NPIs.
      2. If drop solo practices: NPI-groups; NPIs.

**Part B Data**

1. Provider-Service (2013-2019)

2013: 9,286,633 NPI-HCPCS observations; 909,560 unique NPIs

after restricting to E/M codes: 2,576,332 observations; 604,402 unique NPIs

2014: 9,316,209 observations; 938,141 unique NPIs

after restricting to E/M codes: 2,595,407 observations; 622,843 unique NPIs

2015: 9,496,848 observations; 968,333 unique NPIs

after restricting to E/M codes: 2,637,950 observations; 644,073 unique NPIs

2016: 9,714,896 observations; 1,000,924 unique NPIs

after restricting to E/M codes: 2,693,218 observations; 667,702 unique NPIs

2017: 9,847,443 observations; 1,032,911 unique NPIs

after restricting to E/M codes: 2,724,644 observations; 691,003 unique NPIs

2018: 9,961,865 observations; 1,061,278 unique NPIs

after restricting to E/M codes: 2,751,701 observations; 712,409 unique NPIs

2019: 10,140,228 observations; 1,093,367 unique NPIs

after restricting to E/M codes: 2,789,821 observations; 735,545 unique NPIs

Combined 2013-2019, restricted to E/M codes: 18,226,884 NPI-year-HCPCS; 4,677,977 NPI-years (collapse HCPCS codes into E/M categories); 944,317 unique NPIs

1. Provider (2013-2019)

After having restricted to NPIs with >0 E/M codes.

2013: 956,251 unique NPIs

2014: 986,657 unique NPIs

2015: 1,019,377 unique NPIs

2016: 1,053,958 unique NPIs

2017: 1,088,687 unique NPIs

2018: 1,121,462 unique NPIs

2019: 1,155,870 unique NPIs

Combined 2013-2019: 8,782,375 NPI-group-year observations; 7,382,262 NPI-year observations; 1,469,581 unique NPIs.

1. After dropping US territories and keeping only US-residing docs: 8,734,447 NPI-group-year observations; 7,339,666 NPI-year observations; 1,461,468 NPIs.
2. After dropping non-primary care docs: 1,848,060 NPI-group-year observations; 1,514,801 NPIs-years; 278,486 NPIs.
3. After dropping observations that appear in Provider data but not Provider-Service data: 1,701,547 NPI-group-year observations; 1,385,968 NPI-years; 259,600 NPIs.
4. After dropping observations that do not appear in the DAC data: 1,472,666 NPI-group-years; 1,157,087 NPI-years; 248,565 NPIs
5. After dropping observations that do not appear in the HRR data: 1,472,077

NPI-group-years; 1,156,613 NPI-years; 248,461 NPIs.

1. After dropping observations where # male beneficiaries are censored out: 1,427,894 NPI-group-years; 1,117,579 NPI-years; 242,488 NPIs.
2. After dropping observations where # white beneficiaries are censored out: 1,122,274 NPI-group-years; 861,291 NPI-years; 204,326 NPIs.
3. After dropping observations where # dual eligible beneficiaries are censored out: 1,024,589 NPI-group-years; 773,844 NPI-years; 189,761 NPIs.
   1. After collapsing to the NPI-group level and dropping observations with 0 office visits: 241,094NPI-groups; 145,078 NPIs.

**DAC data**

2014: 192,451 groups; 960,863 unique NPIs.

2015: 188,151 groups; 975;894 unique NPIs.

2016: 189,236 groups; 1,018,373 unique NPIs.

2017: 188,058 groups; 1,118,304 unique NPIs

2018: 79,690 groups; 1,132,222 unique NPIs

2019: 81,879 groups; 1,197,248 unique NPIs

2020: 79,892 groups; 1,220,071 unique NPIs

Combined 2014-2020: 241,540 unique groups; 1,606,216 unique NPIs;

If replace grouppracticepacid = npi if grouppracticepacid == “” (to deal with the sharp discontinuity in # groups between 2017 and 2018):

2014: 283,040 groups; 960,863 unique NPIs; 1,182,370 unique NPI-groups.

2015: 274,088 groups; 975;894 unique NPIs; 1,190,213 unique NPI-groups.

2016: 270,073 groups; 1,018,373 unique NPIs; 1,265,994 unique NPI-groups.

2017: 267,159 groups; 1,118,304 unique NPIs; 1,384,043 unique NPI-groups.

2018: 259,848 groups; 1,132,222 unique NPIs; 1,369,806 NPI-groups.

2019: 256,911 groups; 1,197,248 unique NPIs; 1,462,268 unique NPI-groups.

2020: 246,132 groups; 1,220,071 unique NPIs; 1,456,767 unique NPI-groups.

Combined 2014-2020: 9,311,461 observations; 490,076 unique groups; 1,606,216 unique NPIs; 2,878,313 unique NPI-groups.

After dropping non-PCP: 1,789,063 observations; 107,392 unique groups; 295,249 unique NPIs; 552,519 unique NPI-groups.

2014: 63,847 groups; 207,420 unique NPIs

2015: 61,115 groups; 207,899 unique NPIs

2016: 59,563 groups; 212,743 unique NPIs

2017: 58,038 groups; 213,967 unique NPIs

2018: 55,266 groups; 203,144 unique NPIs

2019: 54,044 groups; 203,769 unique NPIs

2020: 50,805 groups; 201,090 unique NPIs

**Health IT data**:

2011: 34,372 unique NPIs.

2012: 107,985 unique NPIs.

2013: 139,469 unique NPIs

2014: 241,219 unique NPIs

2015: 158,689 unique NPIs

2016: 233,095 unique NPIs

2017: 231,841 unique NPIs

2018: 294 unique NPIs.

Combined total: 1,934,819 observations (some NPIs attested multiple times); 361,763 unique NPIs.

**MIPS data**

2019: 954,654 observations (same NPI could have group + apm + individual scores); 719,244 unique NPIs

2020: 933,504 observations; 704,331 unique NPIs.

Combined 2019-2020: 1,888,158 observations; 830,333 unique NPIs.

**CAHPS data**

2019: 791 total observations (CAHPS could survey different groups for the same org); 113 unique groups

2020: 665 total observations; 95 unique groups.

Combined 2019-2020: 1456 observations; 133 unique groups.

**Merged Data**