

FEBRUARY 2023

# REPRODUCTIVE HEALTH WORKFORCE DATA AND METHODS



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## Questions

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## Suggested Citation

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Strasser J, Schenk E, Luo E, Bodas M, Das K, Dewhurst E, and Chen C. Reproductive Health Workforce Data and Methods. Fitzhugh Mullan Institute for Health Workforce Equity. Washington, DC: George Washington University, 2023.

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## Data Sources

*IQVIA:* We used IQVIA datasets comprising two types of data: retail prescriptions (LRx) and medical claims (DxHx). IQVIA is a proprietary health information company that aggregates data from multiple sources for healthcare analysis and business solutions.

*LRx Dataset:* The LRx data includes retail prescription claims and derives from multiple sources, including pharmacy billing software and pharmaceutical clearinghouses. The dataset covers an estimated 92% and 93% of retail prescription claims nationally in 2019 - 2021, respectively. We obtained full year 2019 - 2021 provider month-level counts of new and refill prescriptions for contraceptive products (primarily: the pill, patch, and ring). LRx claims also identify pay types and includes provider National Provider Identifier (NPI), provider type, and provider mailing address. In addition, IQVIA provided a list of all providers with an NPI and provider type that appeared in the full LRx dataset in 2019 - 2021.

*DxHx Dataset:* The DxHx medical claims data is derived from billing software and claims clearinghouses. The dataset covers an estimated 84% and 94% of AMA registered physicians nationally in 2019 - 2021, respectively. However, the capture of annual claims varies by provider. IQVIA defines three tiers based on the proportion of claims available, with Tier 1 representing the highest level of claims comprehensiveness and Tier 3 representing the lowest. Tier 1 providers contain all or nearly all claims filed by that provider, Tier 2 providers are partial volume unstable providers, and Tier 3 providers are those with monthly number of visits outside of acceptable limits or with very unstable volumes. We requested full year 2019 - 2021 provider month-level counts of procedure (HCPCS and CPT) codes associated with abortion services, depot medroxyprogesterone acetate (DMPA), IUDs, the etonogestrel implant system, and sterilization services (vasectomy and tubal ligation). DxHx claims also identified one ICD-10 code associated with the medical claim and pay types, as well as provider NPI, provider type, and mailing address. In addition, IQVIA provided a list of all providers with NPI and provider type that appeared in the DxHx dataset in 2019 - 2021.

*National Plan and Provider Enumeration System (NPPES):* We used 2019 - 2021 NPPES data to identify provider type and location (state and county) of all active providers, including those not prescribing contraception and/or providing abortion and contraception services. NPPES is a national registry of healthcare providers required for any provider who conducts HIPAA-covered electronic transactions. It additionally provides information on mailing and practice address, healthcare provider credentials, provider type, and state license information.

*American Community Survey (ACS):* We used the 2019 American Community Survey (ACS) to determine the number of women of reproductive age (ages 15-44) at the county-level. The ACS is an annual survey conducted by the US Census Bureau. The five-year sample combines the most recent five years to provide more accurate estimates for smaller and less populated geographies.

*Transformed Medicaid Statistical Information System (T-MSIS) Claims:* We used the 2016 T-MSIS Other Service (OT) files to identify the number of Medicaid providers for the shot, IUD, and implant, by specialty. The T-MSIS Medicaid claims contain patient-level information, provider data, and medical and prescription claims. The OT files contain research-identifiable records for professional services, in addition to outpatient hospital institutional utilization, clinic services, home health, and premium payments.

*American Medical Association (AMA) MasterFile and Historical Residency File:* We used the 2019 AMA MasterFile to determine providers' years since graduation, gender, age, and MD/DO status. The AMA MasterFile is a current and historical database of physicians, residents, and medical students and is considered the gold standard of physician data. The Historical Residency File contains information on where a physician is/was in residency training (including the name of the residency program, city, and state), the specialty of the residency program, the date the physician began training, and the date the physician ended training.

## **Analysis**

*Provider Specialties:* IQVIA classifies providers by 285 different specialties. We collapsed these specialties into 10 key categories of interest for this project: OBGYN, family medicine, internal medicine, pediatrics, other physicians, nurse midwife, advanced practice nurses (APRNs), physician assistants, and other health professions. We included all specialties, however remote the possibility of providing contraception services (e.g., dentist), with the single exception of veterinarians, which we dropped from the dataset. We used the primary provider type listed for the provider included in the IQVIA LRx and DxHx data.

We previously had access to another IQVIA dataset, OneKey, which is a data product from IQVIA that collects information on healthcare providers and their organizations; our access expired on October 15, 2021. It contains information on healthcare provider name, practice address, provider type, and specialty. Using NPIs, we reclassified nurse practitioners in IQVIA LRx and DxHx as nurse midwives if their primary provider type indicated that they were a nurse practitioner and their second provider type indicated nurse midwife in OneKey.

*Prescription Contraception Workforce:* We used the IQVIA LRx dataset to identify providers who prescribed the birth control pill, patch, and ring in 2019 - 2021. We included both new and refill prescriptions and limited our analysis to providers who prescribed 10 or more contraception prescriptions (of either the pill, patch, and/or ring) during 2019 - 2021. This minimum of 10 prescriptions was used to exclude providers who were rare contraception prescription providers, possibly providing contraception prescriptions outside of the scope of their normal practice. We aggregated and analyzed these providers by provider type, focusing on the women's health and general primary care specialties, including OBGYNs, nurse midwives, family medicine, internal medicine, pediatrics, advanced practice nurses (APRNs), and physician assistants (PAs), and calculated the percent of the total workforce providing prescription contraception services. We used NPPES data to determine which providers were in the 50

states plus Washington, DC and US territories; we excluded providers in US territories. The denominator for these calculations was the total number of providers by provider type in the total IQVIA 2019 - 2021 LRx dataset.

We used provider address information in the IQVIA LRx dataset to locate providers in states and counties and calculated state- and county-level prescription contraception provider-to-female population of reproductive age (age 15-44) ratios from ACS data. We used Tableau software to develop interactive state- and county-level maps of prescription contraception providers. Maps categorize states and counties by quartile of provider to population ratios. Quartiles are determined across all states at the state level and all counties in the US at the county level, excluding US territories. The analysis and maps can be disaggregated by provider type.

Using the IQVIA LRx data, we further identified those contraception providers who did and did not have associated Medicaid contraception prescription claims and calculated the percent of each state's contraception providers who serve Medicaid patients. Medicaid patients include those who utilize fee-for-service Medicaid, managed Medicaid, managed Medicaid/Medicare supplement/Medigap/state assistance, and the Children's Health Insurance Program.

*In-Person, Non-Permanent Contraception Workforce:* We defined in-person contraception as shot, IUD, and implant and used the IQVIA DxHx dataset to identify providers who submitted claims for these services. We used CPT and HCPCS codes for the device itself, including multiple types if applicable (e.g., Mirena, Paragard, etc., for IUD), and for general insertion, placement, or injection codes as applicable to the method. We did not include the removal of IUDs or implants in this analysis; we analyzed removal separately. We did not apply a minimum number of services for inclusion in the workforce analysis for in-person contraception services as these services are much less likely than prescriptions to be provided out of scope.

For some analyses, we focused on a subset of Tier 1 and Tier 2 in-person contraception providers in the IQVIA DxHx dataset. Tier 1 indicates those providers with full volume medical claims, ensuring if there was no claim for a service, the provider did not bill for it and was unlikely to have provided the service. Tier 2 providers have a partial volume of claims, and these analyses may be an undercount. However, as a face validity test, we compared proportions of Tier 1 and Tier 2 providers that bill for the shot, IUD, implant, and ICD-10 code Z30.X (contraception management) and found very similar proportions across the tiers.

We used the 2016 T-MSIS OT file to identify the number of Medicaid providers and their service volume of in-person contraception. The same CPT codes as the IQVIA data were used to identify these medical claims. The denominator used in these calculations is the number of providers by specialty in NPPES.

*Permanent Contraception (Sterilization) Workforce:* We identified permanent contraception as tubal ligation and vasectomy and used the IQVIA DxHx dataset to identify providers who submitted claims for these services. We used CPT/HCPCS codes for the visit itself. Tubal ligation

visits included visits that had both a CPT code for tubal ligation *and* ICD-10 code Z30.2 (encounter for sterilization). Vasectomy visits included visits with CPT codes 55250 and 55450. For permanent contraception services, we did not apply a minimum number of services for inclusion in the workforce analyses as these services are much less likely than prescriptions to be provided out of scope.

*Abortion Workforce:* We also used HCPCS and CPT codes for abortion services, including medication codes (e.g., mifepristone and misoprostol) and procedure codes (e.g., dilation and curettage, dilation and evacuation, etc.) to identify abortion providers. We defined procedural abortion (in-clinic abortion services) to include manual vacuum aspiration and D&C procedures; this term includes abortions that have also been called surgical abortion.

We further sorted claims by ICD-10 codes for indication. We defined “induced abortions” to include pregnancy terminations associated with the ICD-10 codes: encounter for elective termination of pregnancy (Z33.2) and problems related to unwanted pregnancy (Z64.0). We defined “medical management of pregnancy loss” to include: missed abortion (O02.1), incomplete spontaneous abortion without complication (O03.4), and maternal care for fetal abnormality and damage (O35.9XX0). One limitation of this approach is the dataset included only the first ICD-10 code listed on a medical claim.

## **Limitations**

There are some ongoing limitations in the development of this national abortion and contraception workforce database. While the IQVIA LRx and DxHx datasets are some of the most extensive datasets that provide identified provider information, all have limitations in completeness.

*IQVIA LRx Dataset:* From IQVIA’s analysis, the LRx dataset had an average of 93% coverage of retail pharmacies in calendar year 2021, with state-level coverage ranging from 74% to over 93%. In examining the prescription contraception workforce, we limited our analysis to providers present in the overall LRx dataset. However, we compared the total number of IQVIA providers by type to NPPES counts of providers and found similar numbers of providers by type. In some cases, it appears the IQVIA dataset may identify more providers in a provider type than the NPPES. This may be due to known limitations in the NPPES or variation in provider type designations. The LRx data particularly appear to identify fewer advanced practice clinicians than the NPPES. The underlying causes for this difference may be a combination of the 92% coverage of the dataset, as well as the fact that the LRx will only identify providers who are actively prescribing. In addition, the LRx dataset does not include prescriptions dispensed by insurers who operate their own medical centers and pharmacies (e.g., Kaiser). For states with a large market share of HMO pharmacies, we may be undercounting the number of providers.

*IQVIA DxHx Dataset:* From the IQVIA analysis, the DxHx dataset had 94% coverage of AMA providers in calendar year 2020, with state-level coverage ranging from 85% to over 95%. Further, the comprehensiveness of each provider’s medical claims varied. IQVIA identifies

providers in three tiers: Tier 1 providers are full volume stable providers, Tier 2 providers are partial volume unstable providers, and Tier 3 providers are those with monthly number of visits outside of acceptable limits or with very unstable volumes. As a result, we have confidence that providers who *do* appear in the data as billing for various services actually *do* provide those services; however, we do not have the same degree of confidence that providers who *do not* have claims for a service *do not* provide that service. This is a particular challenge when healthcare providers may be providing low volumes of a type of service. Abortion services are further limited by payment policies that limit billing and reduce the likelihood of submitting claims.

*NPPES*: While the NPPES dataset is one of the most comprehensive lists of both physicians and non-physicians, the information is not updated systematically and is self-reported. Therefore, it includes providers who may have retired or who no longer work in active practice (e.g., in pharmaceutical or policy settings). However, it contains provider NPI number, which allows for provider address, gender, and specialty to be linked to other datasets. A further limitation of the NPPES data is the more limited inclusion of non-physician healthcare workers. This is of particular relevance for healthcare providers who are less likely to submit medical claims, such as nurses, social workers, and counselors.

*T-MSIS*: Data quality in the T-MSIS files varies across states. CMS provides analysis of T-MSIS data quality through the T-MSIS Data Quality Atlas (DQ Atlas) website. Variation in data quality is related to two factors, either or both of which may present an issue: claims volume completeness and the prescribing provider NPI.