



## Dispersion of contraceptive access policies across the United States from 2006 to 2021

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### ABSTRACT

Person-centered contraceptive access benefits reproductive autonomy, sexual wellbeing, menstrual regulation, and other preventive health. However, contraceptive access varies by social and geographic position, with policies either perpetuating or alleviating health inequities. We describe geographic and time-trend variation in an index from fewer (less expansive) to greater (more expansive) aggregation of U.S. state-level contraceptive access policies across 50 states and Washington, D.C. (collectively, states) from 2006 to 2021. We collected data from primary and secondary sources on 23 policies regulating contraceptive education, insurance coverage, minor's rights, provider authority, and more. As of 2021, the most enacted policies expanded contraceptive access through: 1) prescribing authority for nurse practitioners, certified nurse-midwives (n = 50, 98 % of states), and clinical nurse specialists (n = 38, 75 %); 2) Medicaid expansion (n = 38, 75 %); 3) prescription method insurance coverage (n = 30, 59 %); and 4) dispensing authority for nurse practitioners and certified nurse-midwives (n = 29, 57 %). The average overall U.S. policy index value increased in expansiveness from 6.9 in 2006 to 8.6 in 2021. States in the West and Northeast regions had the most expansive contraceptive access landscapes (average index values of 9.0 and 8.2, respectively) and grew more expansive over time (increased by 4–5 policies). The Midwest and South had least expansive landscapes (average index values of 5.0 and 6.1, respectively). Regions with more expansive sexual and reproductive health policy environments further expanded access, whereas least expansive environments were maintained. More nuanced understanding of how contraceptive policy diffusion affects health outcomes and equity is needed to inform public health advocacy and law making.

### 1. Introduction

The ability to access and use contraceptive methods (e.g., implants, pills, rings, etc.) when desired is associated with sexual well-being (Higgins et al., 2021), reduced pregnancy-related morbidity and mortality, improved infant health, improved menstrual symptom and disorder treatment outcomes (Kavanaugh and Anderson, 2013), higher educational attainment, and increased labor force participation at the population level (Jones and Bernstein, 2019). However, consistent with other preventive care, access to contraceptive care varies by social position. Geographically, women in southern U.S. states are more likely than those in other regions to report limited access to contraceptive methods (Johnston et al., 2019). Rural-urban differences in

contraceptive care access measures (e.g., receipt of family planning services, flexible appointment options, contraceptive method availability) are also observed across U.S. regions (Martins et al., 2016; Yarger et al., 2017). Black and uninsured women, women with lower income and with less education are more likely to report lack of timely and convenient access to desired contraceptive care. Relatedly, uninsured and lower income women are more likely to report use of a contraceptive method that they do not prefer, largely due to systemic reasons (unaffordability, unavailability, provider recommendation, etc.) (Fredriksen et al., 2021a).

These social inequities may in part reflect patterns in the U.S. contraceptive access policy climate, or the aggregation of contraceptive policies – including state laws that restrict and expand contraceptive

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access. State-level contraceptive access policies enable the accessibility of family planning care, particularly for systemically marginalized and less socioeconomically advantaged groups, or conversely, may disproportionately disadvantage such communities. Evaluation of U.S. contraceptive policy changes designed to increase access, namely the Patient Protection and Affordable Care Act (ACA) Section 2713 (coverage of preventive care services without consumer cost sharing) and Medicaid expansion under the ACA (Internal Revenue Service, Department of the Treasury; Employee Benefits Security Administration, Department of Labor; Centers for Medicare & Medicaid Services, Department of Health and Human Services., 2013), report population health outcomes such as increased sales of some contraceptive methods (Bullinger and Simon, 2019), increase in the choice of a prescription contraceptive method (Carlin et al., 2016), and a decrease in uninsured contraceptive visits at safety net clinics (Darney et al., 2020). Gaps in insurance coverage and prescription contraceptive use between Black and White women, and in insurance coverage between Hispanic and White women narrowed following the ACA (Johnston and McMorro, 2020). Despite this, two independent assessments of reproductive health via policy indicators of family planning access, including contraceptive care, rated most U.S. states with low letter grades (Hess et al., 2015; Population Institute, 2021).

The U.S. has experienced an increase in state-level family planning legislation affecting (and predominantly restricting) access over the last 10 years (Nash et al., 2018; Power to Decide, 2019). Contraceptive research stakeholders call for investigation into effects of these policy changes given the unprecedented nature of the family planning policy landscape (CECA, 2021; Lantz, 2019; Thompson and Seymour, 2017). Yet, existing contraceptive policy evaluation studies largely document the effect of single policy changes (ex. pre-ACA state-level contraceptive coverage mandates, pre-ACA or ACA Medicaid family planning expansion, etc.) and less recent contraceptive policies (Alharbi et al., 2019; Canestaro et al., 2017; Johnston and Adams, 2017; Raissian and Lopoo, 2014; Redd and Hall, 2019; Wherry, 2013). Further, existing sexual and reproductive health policy tracking literature and resources largely provide a snapshot of policy status across states at a single point in time (Branscum and Fallik, 2021; Garg and Volerman, 2021; Guttmacher Institute, 2019a; Guttmacher Institute, 2019b, Guttmacher Institute, 2019c, Guttmacher Institute, 2019d, Guttmacher Institute, 2019e, Guttmacher Institute, 2019f, Guttmacher Institute, 2019g, Guttmacher Institute, 2019h Kaiser Family Foundation, 2012; National Conference of State Legislatures, 2012a; National Conference of State Legislatures, 2012b, National Conference of State Legislatures, 2020; National Health Law Program, 2019; Power to Decide, 2019; Guttmacher Institute, 2022; Kaiser Family Foundation, 2022).

This descriptive study aimed to examine patterns in the number of and change in a spectrum of U.S. state-level policies regulating access to contraceptive services over a 16-year period (2006–2021). Specifically, we sought to understand which policies were most enacted during the study period, the degree to which policy dispersion reflected expansion of contraceptive access, and how such trends differed across states and regions. Understanding the complex U.S. contraceptive policy landscape in nuanced ways could be foundational to policy development and implementation in several ways. Policy dispersion data is of direct use in analyses examining the potential for policies to act as intervention levers in population health outcomes and equity. The information gleaned from analyses of policy trends and their role in health outcomes, in this case, trends in increasing or diminishing access and for whom, may be of use to advocates, the public, practitioners, and researchers in efforts to inform voting behavior, in legislative advocacy, to drive policy decisions, to create innovative service delivery models, etc. The present analysis is particularly timely, considering that contraceptive access is an ongoing and prominent topic of U.S. policy discussion in courts of law and public opinion, with federal rulings and litigation over employer exemptions to the ACA contraceptive mandate and around changes to Title X family planning program grantee guidelines foremost in these

dialogues (Frederiksen et al., 2021b; Keith, 2020).

## 2. Methods

### 2.1. Scope and data sources

We collected data on 23 U.S. state-level policies that expand and restrict access to contraceptive care in all 50 states and Washington, D.C. (collectively, states) from 2006 to 2021 (Table 1), including insurance coverage of contraceptives, Medicaid expansions, minor consent and confidentiality, contraceptive education, access to pharmacist-administered contraceptives, bans on family planning funding, contraceptive service refusal clauses, and prescriptive and dispensing authority of Advanced Practice Registered Nurses (APRNs), which include nurse practitioners (NPs), certified nurse-midwives (CNMs) and clinical nurse specialists (CNS). We selected policies – specifically, state statutes or regulations – based on the availability of multiple sources of secondary state-level policy surveillance information (listed in Table 1). Additionally, we used Nexis Uni (LexisNexis Academic), an academic search engine of legal sources including federal and state statutes, regulations, and legislation, to collect full-text versions of codified statutes and regulations when there were not at least two consistent secondary sources available. We categorize policies as “expansive” and “restrictive” according to whether they act to increase or decrease opportunity for access to contraceptive services, respectively. Policies may expand or restrict access at the patient level, where patients experience fewer or more barriers to accessing contraception due to policy (e.g., degree of access to contraceptive education, presence of requirements for parental consent and notification, etc.), at the provider or clinic level, where providers or clinics experience fewer or more barriers (e.g., scope of practice and provider type expansion or restriction), among other levels (e.g., community).

### 2.2. Data collection and validation

To compile a state-year policy dataset, we gathered data on the presence or absence of each policy and the year of policy enactment, initially through review of secondary data sources. At least two secondary data sources informed our coding for every policy. The Guttmacher Institute provided high-level data on a wide range of contraceptive access policies. Other sources – including NARAL Pro-Choice America, the National Conference of State Legislatures, and the National Health Law Program – provided more detail regarding select contraceptive access policies. When only one secondary data source was available for a policy (e.g., nurse dispensing authority) or secondary data sources conflicted, we conducted primary legal data collection using Nexis Uni, reviewed, and extracted information from full-text versions of pertinent statutes or regulations.

All data collection and validation activities were conducted independently by two members of the research team. Subsequently, the coders compared data. We reviewed and discussed each discrepancy, revisited the primary and secondary data sources, and resolved each discrepancy, consulting other team members as needed. Where discrepancies existed, the primary source took precedence.

### 2.3. Analyses

The state-year dataset contains dichotomous indicators for each policy, and count indicators representing the sum of the number of expansive and restrictive policies by each state and year over the 16-year study period (see Appendix A). Additionally, the dataset contains a contraceptive access policy index – our primary unit of analysis – that combines the expansive and restrictive policy count indicators to approximate the expansiveness of a state’s contraceptive access landscape. The index was calculated by subtracting the number of enacted restrictive policies (thus giving a score of –1 per restrictive policy) from

**Table 1**  
Contraceptive Access Policies: Definitions and Data Sources.

Policy	Definition	Data Sources
1. Prescription Method Insurance Coverage*	Requires insurers that cover prescription drugs to provide coverage of FDA-approved prescription contraceptive drugs and devices	Guttmacher, <sup>1</sup> NARAL, <sup>2</sup> NCSL, <sup>3</sup> NHLP, <sup>4</sup> primary legal data collection
2. Over-the-counter Method Insurance Coverage*	Insurance coverage required for over-the-counter contraceptive methods	Guttmacher, NARAL, NHLP, primary legal data collection
3. Extended Supply*	Requires insurers to cover an extended supply of contraceptives at one time	Guttmacher, NARAL, NHLP, primary legal data collection
4. Sterilization Insurance Coverage*	Insurance coverage required for male sterilization, female sterilization, or both	Guttmacher, NHLP, primary legal data collection
5. Insurance Cost-Sharing Prohibition*	Prohibits consumer cost-sharing for contraceptive method utilization by insurers	Guttmacher, NARAL, NHLP, primary legal data collection
6. Prohibition of Coverage Restriction or Delay*	Prohibits the use of restrictions and delays by insurers, or the use of medical management techniques or other circumstances that restrict or delay access to contraceptive methods	Guttmacher, NHLP, primary legal data collection
7. Medicaid Expansion*	Expands Medicaid eligibility to include a greater proportion of low-income adults	Kaiser Family Foundation <sup>5</sup>
8. Medicaid Family Planning Expansion*	Expands eligibility for Medicaid family planning services via Section 1115 waiver or State Plan Amendment (SPA)	Guttmacher, primary legal data collection
9. Minor Consent*	Allows all minors to consent to contraceptive services without parental consent	Guttmacher, primary legal data collection
10. Confidentiality for Insured Dependents*	Protects the confidentiality of individuals insured as dependents	Guttmacher, primary legal data collection
11. Contraceptive Education*	Requires the inclusion of information on contraceptive methods in sex education	Guttmacher, NCSL, primary legal data collection
12. Prescriptive authority for clinical nurse specialists (CNS)*	Grants prescriptive authority to CNS	Guttmacher, primary legal data collection
13. Prescriptive authority for nurse practitioners (NPs)*	Grants prescriptive authority to NPs	Guttmacher, primary legal data collection
14. Prescriptive authority for certified nurse-midwives (CNMs)*	Grants prescriptive authority to CNMs	Guttmacher, primary legal data collection
15. Dispensing authority for registered nurses (RNs)*	Grants dispensing authority of contraceptives to RNs in specific settings	Guttmacher, primary legal data collection
16. Dispensing authority for CNS*	Grants dispensing authority to CNS	Guttmacher, primary legal data collection
17. Dispensing authority for NPs*	Grants dispensing authority to NPs	Guttmacher, primary legal data collection
18. Dispensing authority for CNMs*	Grants dispensing authority to CNMs	Guttmacher, primary legal data collection
19. Emergency Room (ER) Emergency Contraception*	Requires hospital ERs to provide information about or dispense emergency contraception to sexual assault victims or survivors	Guttmacher, NARAL, NCSL, primary legal data collection
20. Pharmacist Administered Contraceptives*	Pharmacists may dispense emergency or other contraception without prescription	Guttmacher, NCSL, primary legal data collection

**Table 1 (continued)**

Policy	Definition	Data Sources
21. Bans on State Family Planning Funds <sup>†</sup>	Restricts state family planning funds from being used for abortion counseling or referral	Guttmacher, primary legal data collection
22. Exclusion of Providers from Family Planning Funds <sup>†</sup>	Restricts allocation of state or federal family planning funds to certain providers	Guttmacher, primary legal data collection
23. Refusal to Provide Contraceptives <sup>†</sup>	Permits individual providers, healthcare institutions, state employees, or pharmacists to refuse to provide services related to contraception	Guttmacher, NARAL

\* Indicates expansive contraceptive access policy; <sup>†</sup> Indicates restrictive contraceptive access policy.

<sup>1</sup> Guttmacher state policy briefs are cross-sectional policy tracking documents, updated monthly, depicting the dichotomous presence or absence of a given policy per state. States with a given policy are indicated by an “X”. Distinguishing elements of specific policies and litigation (i.e., temporary or permanent injunctions, constitutionality rulings) related to a given policy are included using punctuation footnote symbols.

<sup>2</sup> At the time of our data collection, NARAL Pro-Choice America’s State Government Law and Policy databases included qualitative data on state policies influencing access to abortion and family planning services. NARAL state databases contained the following data elements: a brief description of each policy, statutory citation, enactment year, and, if applicable, the year(s) in which the policies were enjoined or ruled unconstitutional.

<sup>3</sup> The National Conference of State Legislatures (NCSL) houses a handful of briefs examining policies related to contraceptive access. Each brief contains a table listing all states with a given policy in place, including the following elements: statutory citation, enactment year, a brief description of each policy, and a hyperlink to the legislative bill via which the policy was enacted. To our knowledge, this data was not updated following publication of each brief, so they only contained data on policies enacted as of their publishing date.

<sup>4</sup> The National Health Law Program’s (NHLP) State Contraceptive Equity Legislation & Statutes database includes a chart, updated periodically, of state legislation “relating to Medicaid and private insurance coverage of contraceptive care.” Each chart entry contains a state bill, the bill title, a description of the bill, its operative date, and statutory citation.

<sup>5</sup> Kaiser Family Foundation published an article on states expanding Medicaid prior to the 2014 Medicaid expansion, which included the effective date of each pre-ACA Medicaid expansion. Additionally, KFF maintains a database, updated periodically, documenting the status of each state’s decision regarding Medicaid expansion and, for states who expanded Medicaid, the effective date of each expansion.

the number of enacted expansive policies (thus giving a score of + 1 per expansive policy) in each state and year. With twenty expansive policies and three restrictive policies, the lowest possible value for the contraceptive index was -3 (zero expansive policies and three restrictive policies) and the highest possible value was 20 (twenty expansive policies and zero restrictive policies). Creating a combined measure allowed us to assess state contraceptive access landscapes on a spectrum of expansiveness, with the lowest values representing the least expansive landscapes and the highest values representing the most expansive landscapes. We calculated quartile values based on the distribution of contraceptive access policy index values across the sample and study period. As with the index values, the lowest quartile represented the least expansive landscapes while the highest quartile represented the most expansive landscapes.

We included categorical U.S. Census Region information for each state in the dataset to permit examination of regional trends. For each state, region, and year, we assessed numerically and visually the count and average number of each type of contraceptive access policy, and of the contraceptive access index. We tested the statistical significance of regional differences in average and annual contraceptive access index values using one-way ANOVA tests. We evaluated the absolute change

(i.e., exact numerical change) and percent change in the contraceptive access index over the entire study period (2006 to 2021). We also created maps visualizing the contraceptive access index values and quartiles of each state during three time points over the study period: 2006, 2014, and 2021. An Institutional Review Board deemed our study non-human subjects research and therefore exempt from review and approval.

### 3. Results

#### 3.1. Variation in policy type

Policies varied substantially in terms of how many states had each policy in place each year (Table 2). For instance, in 2006, the most common contraceptive access policies included prescriptive authority laws for NPs (n = 45, 88 % of states), CNMs (n = 44, 86 %) and CNSs (n = 35, 69 %), prescription method insurance coverage (n = 26, 51 %), and dispensing authority laws for NPs (n = 25, 49 %) and CNMs (n = 24, 47 %). In contrast, the least common policies in 2006 included contraceptive coverage specifications, including over-the-counter method insurance coverage (n = 0, 0 %), extended supply coverage (n = 0, 0 %), sterilization insurance coverage (n = 1, 2 %), and policies prohibiting insurance coverage restrictions or delays for contraception (n = 1, 2 %). By 2021, the most common contraceptive access policies included prescriptive authority laws for NPs (n = 50, 98 %), CNMs (n = 50, 98 %), and CNSs (n = 38, 75 %), Medicaid expansion (n = 38, 75 %), prescription method insurance coverage (n = 30, 53 %), dispensing authority laws for NPs and CNMs (n = 29, 57 %), Medicaid family planning expansion programs (n = 27, 53 %), and policies allowing for individual providers, healthcare institutions, state employees, or pharmacists to refuse to provide contraceptives (n = 27, 53 %). The least common policies included bans on state family planning funds being used for abortion counseling or referral (n = 7, 14 %), policies permitting pharmacists to dispense emergency or other contraception without

prescriptions (n = 8, 16 %), and prohibition of coverage restrictions or delays (n = 9, 18 %).

Policies varied in terms of how frequently they were adopted by states over the study period (Table 2). Some policies experienced very little variation, with three or fewer states enacting these policies from 2006 to 2021. Policies with little variation included: prescriptive authority for CNS (Δ: 3 states), dispensing authority for RNs and CNS (Δ: 2 states), bans on state family planning funds being used for abortion counseling or referral (Δ: 2 states), minor consent to contraceptive services (Δ: 1 state), and pharmacist-administered contraceptives (Δ: -1 state). Alternatively, some policies experienced a large amount of variation and were adopted by 10 or more states from 2006 to 2021, including Medicaid expansions (Δ: 38 states), extended supply coverage (Δ: 21 states), sterilization insurance coverage (Δ: 14 states), and prohibition of coverage restrictions or delays (Δ: 14 states).

#### 3.2. Contraceptive access policy index

Over the study period, states had an average contraceptive access policy index value of 6.9 (Table 3). The average index value increased over time, from 5.5 policies in 2006 to 8.6 in 2021, indicating that the average state contraceptive access landscape grew marginally more expansive over the 16-year period. Individual states varied substantially in their contraceptive access policy index values, although states with the lowest and highest values remained similar over the study period (Table 4, Figs. 1 and 2). In 2006, states with the lowest index values – and thus, least expansive landscapes – included D.C., Florida, Michigan, Mississippi, and South Dakota, each with index values of one or less, falling in the lowest index quartile (Q1). States with the highest contraceptive access policy index values – and thus, most expansive landscapes – included California, Delaware, Iowa, and New Mexico, each with index values of 10 or greater, falling in the highest index quartile (Q4). By 2021, states with the least expansive landscapes included Kansas and Mississippi, with index values of 1 and 2 (Q1), respectively,

**Table 2**  
Number of States with Policies in Place by Year: 2006–2021\*.

Expansive Policies	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
1. Prescription Method Insurance Coverage	26	27	27	28	29	29	29	29	29	29	29	29	30	30	30	30
2. Over-the-counter Method Insurance Coverage	0	0	0	0	0	0	0	0	2	2	4	7	10	12	13	13
3. Extended Supply	0	1	1	1	1	1	1	1	1	3	7	14	18	20	21	21
4. Sterilization Insurance Coverage	1	1	1	1	1	1	1	1	2	2	4	8	12	14	15	15
5. Insurance Cost-Sharing Prohibition	2	2	2	2	2	2	2	2	2	3	4	8	12	14	16	16
6. Prohibition of Coverage Restriction or Delay	1	1	1	1	1	1	1	1	2	2	2	5	7	9	9	9
7. Medicaid Expansion	0	0	0	0	4	6	6	6	27	30	32	32	32	34	36	38
8. Medicaid Family Planning Expansion	16	17	17	19	20	23	26	26	26	26	27	26	25	25	27	27
9. Minor Consent to Contraceptive Services	22	22	22	22	22	22	22	22	22	22	22	22	22	23	23	23
10. Confidentiality for Insured Dependents	6	7	7	7	7	8	8	9	10	12	12	12	13	13	13	13
11. Contraceptive Education	12	13	13	15	16	16	16	16	17	17	17	17	17	17	17	17
12. Prescriptive authority for clinical nurse specialists (CNS)	35	34	35	35	35	35	35	36	36	36	37	37	37	37	38	38
13. Prescriptive authority for nurse practitioners (NPs)	45	45	46	48	48	48	48	48	48	48	50	50	50	50	50	50
14. Prescriptive authority for certified nurse-midwives (CNMs)	44	44	45	48	48	48	48	48	48	48	50	50	50	50	50	50
15. Dispensing authority for registered nurses (RNs)	13	13	13	13	13	13	14	14	14	15	15	15	15	15	15	15
16. Dispensing authority for CNS	21	20	20	21	21	21	21	22	22	22	22	22	22	23	23	23
17. Dispensing authority for NPs	25	25	25	26	26	26	26	27	27	27	28	29	29	29	29	29
18. Dispensing authority for CNMs	24	24	24	27	27	27	27	27	27	27	28	29	29	29	29	29
19. Emergency Room (ER) Emergency Contraception	11	16	18	20	20	20	20	21	21	21	21	21	21	21	22	23
20. Pharmacist Administered Contraceptives	9	9	9	9	9	9	9	9	9	9	8	8	8	8	8	8
<b>Restrictive Policies</b>																
21. Bans on State Family Planning Funds	5	4	5	5	5	5	5	5	5	6	6	6	7	7	7	7
22. Exclusion of Providers from Family Planning Funds	2	3	3	3	3	6	7	8	9	11	11	13	14	14	14	15
23. Refusal to Provide Contraceptives	22	22	23	24	25	25	26	27	27	27	27	27	27	27	27	27

\* Darker shading indicates higher number of states with policies in place across years.

**Table 3**  
Average Contraceptive Access Policy Index Values by Year and U.S. Census Region: 2006–2021.

Year	U.S.	Census Region			
		Midwest	Northeast	South	West
2006 – 2021***	6.93 ± 3.71	4.95 ± 3.56	8.19 ± 2.62	6.09 ± 3.10	8.97 ± 3.91
2006	5.54 ± 2.95	4.08 ± 3.12	6.00 ± 2.29	5.24 ± 2.88	7.00 ± 2.83
2007	5.73 ± 3.03	4.25 ± 3.33	6.11 ± 2.37	5.35 ± 2.96	7.31 ± 2.72
2008	5.78 ± 2.96	4.58 ± 3.20	6.22 ± 2.11	5.35 ± 2.96	7.15 ± 2.91
2009*	6.10 ± 2.80	4.67 ± 3.17	6.67 ± 1.32	5.59 ± 2.72	7.69 ± 2.63
2010*	6.22 ± 2.84	4.83 ± 3.30	6.78 ± 1.30	5.65 ± 2.64	7.85 ± 2.79
2011*	6.27 ± 2.93	4.75 ± 3.31	6.89 ± 1.45	5.65 ± 2.74	8.08 ± 2.78
2012*	6.31 ± 3.05	4.67 ± 3.37	7.00 ± 1.50	5.71 ± 2.76	8.15 ± 3.08
2013*	6.37 ± 3.19	4.58 ± 3.37	7.44 ± 1.51	5.59 ± 2.83	8.31 ± 3.28
2014*	6.88 ± 3.56	5.00 ± 3.72	8.00 ± 1.66	5.94 ± 3.13	9.08 ± 3.77
2015**	7.00 ± 3.61	5.00 ± 3.77	8.33 ± 1.58	6.00 ± 3.06	9.23 ± 3.85
2016*	7.35 ± 3.78	5.58 ± 4.34	8.33 ± 1.41	6.47 ± 3.26	9.46 ± 4.12
2017**	7.75 ± 4.05	5.58 ± 4.10	9.33 ± 1.87	6.47 ± 3.18	10.31 ± 4.59
2018**	8.06 ± 4.34	5.33 ± 4.12	10.22 ± 2.33	6.94 ± 3.60	10.54 ± 4.75
2019**	8.33 ± 4.54	5.33 ± 4.12	11.00 ± 2.45	7.00 ± 3.57	11.00 ± 4.98
2020***	8.55 ± 4.54	5.42 ± 4.08	11.44 ± 2.60	7.24 ± 3.61	11.15 ± 4.79
2021***	8.59 ± 4.50	5.50 ± 4.01	11.33 ± 2.54	7.29 ± 3.55	11.23 ± 4.83
Value (%)	3.05	1.42 (34.8 %)	5.33 (88.8 %)	2.05 (39.1 %)	4.23 (60.4 %)
Change, 2006 – 2021	(55.1 %)	%	%	(39.1 %)	(60.4 %)

Note: Results show the mean and standard deviation of contraceptive access policy index – defined as the number of expansive contraceptive access policies minus the number of restrictive contraceptive access policies – values in each year, among all 50 states and Washington, D.C. and stratified by U.S. Census Region. Also shown is the absolute change (i.e., exact numerical change) and percentage change in the contraceptive access policy index values over the 16-year study period. Statistical significance of one-way ANOVA tests assessing regional differences in contraceptive access index values: \*p <.05, \*\* p <.01, \*\*\* p <.001.

while states with the most expansive landscapes included Oregon and California, with index values of 18 and 19 (Q4), respectively.

Additionally, states varied in the change in contraceptive access policy index values over the study period (Table 4, Figs. 1 and 2). Index values in some states – including Alabama, Arkansas, Idaho, Kansas, Kentucky, and Texas – remained unchanged or decreased from 2006 to 2021, indicating that state contraceptive access landscapes remained stagnant or grew less expansive over the 16-year period. In other states – including California, Connecticut, D.C., Hawaii, Maryland, Massachusetts, Nevada, Oregon, and Rhode Island – index values increased by seven or more from 2006 to 2021, indicating that state contraceptive access landscapes grew substantially more expansive over the study period.

There were clear trends in the presence of expansive contraceptive access policies by U.S. Census Region (Table 3; Table 4; Figs. 1 and 2). Over the study period, the Midwest and South had the lowest average contraceptive access policy index values (5.0 and 6.1, respectively) while the Northeast and West had the highest index values (8.2 and 9.0, respectively), with substantial variation by year. In 2006, states in the

Midwest had an average index value of 4.1, followed by states in the South (5.2), the Northeast (6.0) and the West (7.0); these differences were not statistically significant, suggesting that regional contraceptive access landscapes were somewhat comparably expansive. However, by 2021, states in the Midwest and South had average index values of 5.5 and 7.3, suggesting their contraceptive access landscapes were markedly less expansive than those of states in the Northeast and West, which had average index values of 11.3 and 11.2; these regional differences were statistically significant. This finding is echoed when examining absolute changes in index values over the study period by region. Index values in the Midwest and South grew by two or fewer while index values in the Northeast and West grew by four or more, demonstrating that contraceptive access landscapes grew more expansive in the Northeast and Western regions over the 16-year period, as compared to the Midwest and South. These trends are visually reflected in the contraceptive access policy index value and quartile maps in Figs. 1 and 2.

#### 4. Discussion

The present analysis adds an important but understudied focus on contraception laws to other recent legal mapping research characterizing state-level trends in diffusion of sexual and reproductive health (namely abortion and HIV prevention) policies (Jones et al., 2018; Redd et al., 2022; Salvant Valentine et al., 2022; Tomlinson, 2021). Policy diffusion research has the potential to present temporal patterns in policy dimensions and enable longitudinal analyses of policy impacts. Our analysis of contraceptive policy dispersion across the U.S., from 2006 to 2021, gleaned key findings related to the relative expansiveness of contraceptive access landscapes, patterns in policy type, and regional variation in policy change over time.

Unlike the overwhelmingly restrictive (and conversely less expansive) state-level policies that regulate access to abortion services (Jones et al., 2018; Redd et al., 2022; Tomlinson, 2021), in comparison, our study revealed contraceptive policies enacted over the 16-year study period largely expanded rather than restricted access. The most common types of contraceptive policies enacted during the 2006–2021 study period included expansion of prescribing authority for NPs, CNMs, and CNSs, and dispensing authority for NPs and CNMs. Practice laws that limit the types of providers permitted to provide sexual and reproductive health care act as barriers to the provision of high quality sexual and reproductive health services at multiple levels (Auerbach et al., 2012; McLemore and Levi, 2017). Nursing trainees and training programs may prioritize areas with greater exposure and availability of practice opportunity. Limits to APRN scope of practice may have implications for the comprehensiveness of nursing curricula, for educational exposure among nurses, and for decision-making by the potential APRN workforce about area of care provision. More accessible, interprofessional care may also improve patient experience and increase care utilization (Marshall et al., 2012). A California-based investigation found that provision of legal authority to registered nurses to dispense self-administered hormonal contraceptives and administer hormonal contraceptive injections resulted in a 10 % increase in access to birth control dispensing and administrative visits in the 18 months following policy implementation (Parker et al., 2017).

Medicaid expansion was another common type of contraceptive policy changed during the study period. Medicaid expansion before and under the ACA is credited with improvements to contraceptive and other preventive health service use (Alharbi et al., 2019; Johnston and McMorro, 2020; Redd and Hall, 2019; Wherry, 2013). Another popular policy during the study period, prescription contraceptive method insurance coverage has had reported benefits such as decreased out-of-pocket cost for prescription contraceptives and increased total use of any contraceptive method, among privately insured women (Becker, 2018). However, our study found that policy adoption was not evenly experienced across the U.S., and thus, any benefits of such policy distribution may be disparately experienced.

**Table 4**  
Contraceptive Policy Index Values by State and Year: 2006–2021\*.

Region	State	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	
Midwest	Illinois	9	9	9	9	9	9	9	9	11	11	15	15	15	15	15	15	
	Indiana	3	3	3	3	3	3	4	4	3	4	4	4	4	4	4	4	
	Iowa	10	10	10	10	10	10	10	10	11	11	11	10	9	9	9	9	
	Kansas	3	3	3	3	3	3	2	2	2	1	1	1	1	1	1	1	
	Michigan	1	1	1	1	1	1	1	1	2	2	5	4	4	4	4	4	
	Minnesota	7	9	9	9	10	10	10	10	10	10	10	10	10	10	10	10	10
	Missouri	2	2	5	5	5	5	5	4	4	4	4	4	2	2	2	3	
	Nebraska	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4	4	4
	North Dakota	6	6	6	6	6	6	6	6	7	7	7	7	7	7	7	7	7
	Ohio	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3
	South Dakota	1	1	1	1	1	1	1	1	1	1	1	3	3	3	3	3	3
Wisconsin	2	2	3	4	5	4	3	3	3	3	3	3	3	3	3	3	3	
Northeast	Connecticut	5	6	6	6	7	7	8	8	8	8	8	8	12	12	12	12	
	Maine	7	7	7	7	7	7	7	7	7	7	8	11	11	13	13	13	
	Massachusetts	6	6	6	6	6	6	6	6	7	7	7	12	13	13	13	13	
	New Hampshire	9	9	9	9	9	9	9	10	11	11	11	11	13	13	13	12	
	New Jersey	8	8	8	8	8	9	9	9	9	9	9	10	10	10	14	14	
	New York	7	7	7	7	7	7	7	7	8	8	8	8	8	13	13	13	
	Pennsylvania	2	1	2	5	5	5	5	5	5	6	6	6	6	6	6	6	
	Rhode Island	3	4	4	5	5	5	5	8	9	9	9	9	10	10	10	10	
	Vermont	7	7	7	7	7	7	7	7	8	10	9	9	9	9	9	9	
South	Alabama	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	
	Arkansas	8	9	9	9	9	9	9	9	9	7	7	7	7	7	7	7	
	Delaware	10	10	10	10	10	10	10	10	11	11	11	11	15	15	15	15	
	District of Columbia	1	1	1	2	3	3	3	3	3	4	4	4	8	8	8	8	
	Florida	1	1	1	1	1	1	1	1	1	1	5	5	5	5	5	5	
	Georgia	8	8	8	8	8	9	9	9	9	9	9	9	9	9	9	9	
	Kentucky	8	8	8	8	8	8	8	8	9	9	9	8	8	8	8	8	
	Louisiana	6	6	6	6	6	6	6	6	7	7	8	8	8	8	8	8	
	Maryland	8	8	8	8	8	9	9	9	11	12	15	15	15	15	16	16	
	Mississippi	0	0	0	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	North Carolina	7	7	7	8	8	7	7	7	7	7	7	7	7	7	7	7	7
	Oklahoma	4	4	4	4	4	4	4	4	3	3	3	3	3	3	3	3	4
	South Carolina	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	Tennessee	6	6	6	6	6	6	7	7	7	7	7	7	7	7	7	7	7
	Texas	5	6	6	6	6	5	5	4	4	4	4	4	4	4	5	5	5
Virginia	3	3	3	3	3	3	3	3	3	4	4	4	5	5	6	7	7	
West Virginia	3	3	3	3	3	3	3	3	4	4	4	4	4	4	5	5	5	
West	Alaska	8	8	8	8	8	8	8	8	8	9	9	9	9	9	9	9	
	Arizona	6	4	4	5	5	5	4	4	5	5	5	5	5	6	7	7	
	California	12	11	11	11	13	13	14	15	18	18	19	19	19	19	19	19	
	Colorado	2	5	3	3	4	5	5	5	7	7	7	8	7	7	7	7	
	Hawaii	4	5	5	9	9	9	9	10	11	11	12	12	12	12	12	12	
	Idaho	7	7	7	7	6	6	6	6	6	6	6	6	6	6	6	6	
	Montana	9	9	9	9	9	9	10	10	10	10	11	11	11	11	11	11	
	Nevada	7	7	7	7	7	7	7	7	8	8	8	13	13	13	13	14	
	New Mexico	10	10	10	10	10	11	11	11	12	12	12	12	12	17	17	17	
	Oregon	9	12	12	12	12	12	12	12	13	14	14	18	18	18	18	18	
	Utah	3	3	3	4	4	4	4	4	4	4	4	4	4	4	5	5	
	Washington	8	8	8	8	8	9	9	9	9	9	9	10	14	14	14	14	
	Wyoming	6	6	6	7	7	7	7	7	7	7	7	7	7	7	7	7	

\* Darker shading indicates higher number of policies in place for states and regions across years.

States in the West and Northeast had the highest average (9.0 and 8.2, respectively) and increase in (4.2 and 5.3) contraceptive access policy index values, indicating that states in these regions had the most expansive contraceptive access landscapes. States in the Midwest and South had the lowest average (5.0 and 6.1) and increase in (1.4 and 2.0) contraceptive access policy index values, suggesting that states in these regions have less expansive contraceptive access landscapes. Notably, consistent regional patterns have been observed in the surveillance of other family planning policies. For instance, other studies have similarly

found fewer restrictive abortion policies enacted in Northeastern and Western states, and more restrictive policies to be concentrated in the Midwestern and, for some policy types, Southern states (Redd et al., 2022; Tomlinson, 2021). States with more restrictive abortion policies also tend to have fewer policies supporting women, children and families' health and well-being (e.g., expanded family leave beyond FMLA, paid sick leave, workplace lactation rights beyond federal requirements, etc.) and vice-versa (Ibis Reproductive Health and Center for Reproductive Rights, 2020).

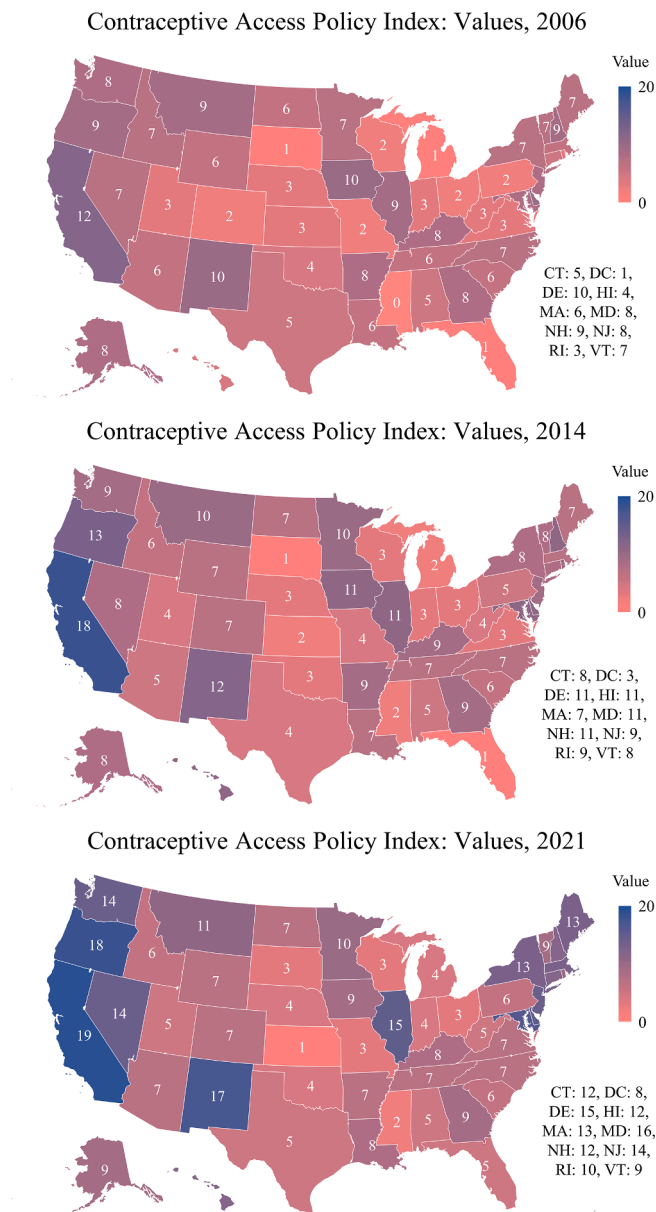


Fig. 1. Contraceptive Access Policy Index Values: 2006, 2014, and 2021.

4.1. Limitations

A general limitation of legal mapping and policy surveillance techniques involves the challenging nature of reducing complex and highly varied legal text into quantitative data, which may result in oversimplification. Second, and relatedly, although multiple study team members independently collected policy data from multiple secondary sources to validate policy data across sources, the secondary sources occasionally contained conflicting information. We addressed these discrepancies through validation with primary legal coding, though subject to human interpretation. Third, although we collected policy data on a wide range of policies related to contraceptive access, there are other relevant laws and legal decisions that are less directly related to contraceptive access (e.g., increased Medicaid reimbursement of primary care services through the ACA) or regulated by other levels of government (e.g., federal and local levels), that we did not capture in our analysis. For instance, at the federal level, the 2016–2020 U.S. executive governmental branch’s tenure included repeated legal challenges to the ACA contraceptive coverage mandate and implementation

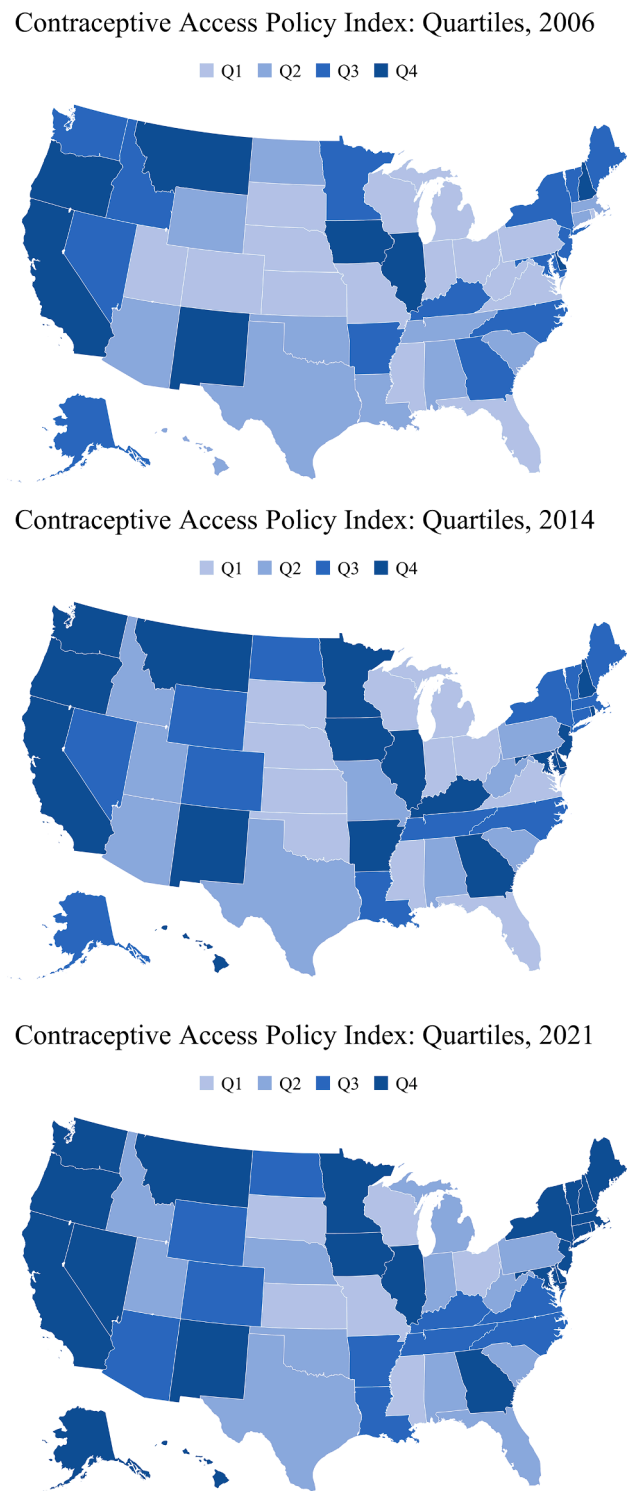


Fig. 2. Contraceptive Access Policy Index Quartiles: 2006, 2014, and 2021.

of the Title X family planning program “domestic gag rule” (Sadeghi and Wen, 2019), regulations that effectively reduced the Title X service network capacity by 46 % (Dawson, 2020). Additionally, our review of these policies does not reflect implementation and enforcement of these policies, which may differ in practice from how policies are written.

4.2. Future research

The highly dynamic nature of family planning policy change in the U.

S. warrants continued investigation. Prior research suggests that contraceptive access policy change in particular may impact contraceptive method sales, selection, and cost, and use of other preventive health services (e.g., pap tests, and pelvic and breast exams) (Carlin et al., 2016; Darney et al., 2020; Johnston and McMorro, 2020; Raissian and Loo, 2014; Wherry, 2013). Other outcomes of potential focus in future research could include contraceptive satisfaction, other contraceptive care access and quality measures, and reproductive autonomy. Investigation into the health and social impact that contraceptive access policy variation has at the local, state, or federal level, and particularly into the potential that such variation acts as a lever in alleviating or exacerbating inequities in health and wellbeing, can inform the degree of future investment in policy change as a form of public health and social justice intervention. Effective intervention to facilitate contraceptive access at the policy level will require knowledge about the key drivers of such policy implementation and diffusion, which – at the state level – are likely to encompass a multidimensional constellation of determinants including state resources, social ideology, political pressures (Mallinson, 2020), perceived constituent wants and need (Dodson et al., 2013), and information dissemination (Dodson et al., 2015). Additionally, research into the actual practice or lived experiences of patients and providers navigating various contraceptive care policy landscapes, especially the marginalized populations benefitting less from expansive family planning policies compared to others, may be particularly useful in catalyzing state legislative decision-making (Woodruff and Roberts, 2020).

## 5. Conclusions

This analysis of state-level contraceptive access policy diffusion across states, from 2006 to 2021, largely reflected a growth in expansiveness of state contraceptive access landscapes – namely via policies granting prescribing and dispensing authority to APRNs and Medicaid expansion. U.S. regions with most expansive sexual and reproductive health policy environments further expanded access, whereas least expansive environments were maintained. Uses of this more nuanced contraceptive policy mapping information include application in future research to understand how contraceptive access climates affect health outcomes and equity. Characterization of policy diffusion patterns, and evaluation of their health and social effects are needed to inform public health advocacy and law making.

## CRedit authorship contribution statement

**Whitney S. Rice:** Conceptualization, Funding acquisition, Investigation, Methodology, Project administration, Resources, Supervision, Writing – original draft, Writing – review & editing. **Sara K. Redd:** Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Supervision, Software, Validation, Visualization, Writing – original draft, Writing – review & editing. **Alina A. Luke:** Data curation, Formal analysis, Investigation, Software, Validation, Visualization, Writing – original draft, Writing – review & editing. **Kelli Komro:** Conceptualization, Funding acquisition, Writing – review & editing. **Kimberly Jacob Arriola:** Conceptualization, Funding acquisition, Writing – review & editing. **Kelli Stidham Hall:** Conceptualization, Funding acquisition, Writing – review & editing.

## Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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## Appendix A. Supplementary data

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