Equity Mapping of Lactation Resources in Washington State

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Background

Breastfeeding supports the health of mothers and infants, while providing far reaching benefits for families, communities, and health systems.[1] Human milk is uniquely suited to meet the nutritional, immunological, and emotional needs of infants.[2] Breastfed infants are protected from infection and experience lower rates of chronic disease as adults.[3] Investments in lactation promotion contribute to broader public health goals by supporting childhood development, reducing healthcare costs, and improving food security.[4–7]

Washington boasts the second highest breastfeeding initiation rate overall, at around 94% in 2022,[8] but initiation rates vary widely from county to county with initiation rates below 90% in several counties, as of 2019.[9] The WHO, CDC, and AAP recommend exclusive nursing for the first 6 months of life and continued nursing for up to 2 years or beyond, alongside complementary foods.[2] However, only about 30% of infants in Washington are exclusively breastfed for at least 6 months and 47% breastfed at all by 12 months.[10] Despite slight increases in breastfeeding exclusivity and duration over the past years, rates still fall far below the Healthy People 2030 targets.[10]

The benefits of breastfeeding for both infants and breastfeeding parents are well established and increase with the duration of breastfeeding, but numerous barriers faced by parents contribute to suboptimal duration and exclusivity. Sixty percent of parents do not breastfeed for as long as they intend.[11] Reasons parents stop nursing include issues with lactation and latching, concerns about infant nutrition and weight, concerns about medications while lactating, unsupportive work and parental leave policies, cultural norms, lack of family support, and unsupportive hospital policies.[11] Many of these concerns could be resolved through continuous access to lactation support including lactation consultants, peer support, hospital-based support, and community resources.

However, lactation resources are not equitably distributed, and some communities face additional economic and structural barriers to accessing existing lactation support. This contributes to racial and ethnic disparities in breastfeeding rates observed in Washington State where Black, Hispanic, American Indian/ Alaska Native, and Native Hawaiian/ other Pacific Islander have lower rates of breastfeeding initiation.[12] Additionally, low-income parents are more likely to discontinue breastfeeding earlier.[13] This could be due to limited access to lactation resources as well as the need to return to work sooner. A recent study found that for Black women, living in a lower neighborhood socioeconomic status environment was associated with reduced breastfeeding initiation and duration compared with higher SES neighborhood environments, even after adjusting for individual SES factors.[14]

Studies demonstrate a strong positive correlation between the density of IBCLCs in an area and breastfeeding initiation, exclusivity, and duration.[15] IBCLCs are able to assess and manage the broadest scope of complex breastfeeding challenges due to their extensive training. However, other types of lactation support can be beneficial. WIC clinics play a critical role in improving

breastfeeding rates, especially in lower income communities where barriers to breastfeeding are more pronounced.[16,17] WIC Breastfeeding peer counselor (BFPC) programs employ local parents with breastfeeding experience to provide in-person, virtual and phone counseling to WIC participants to encourage and support breastfeeding. Evidence exists demonstrating the cost effectiveness of these programs and their ability to help parents meet their breastfeeding goals. BFPC programs are only available at select clinics due to insufficient funding, and a study in Minnesota found that counties with BFPCs had an increase in the proportion of participants breastfeeding for 3 months or longer and 6 months or longer. These effects were strongest in rural and low-income communities where lactation resources are often more sparse,[18] and where breastfeeding rates are lower compared to urban, higher income areas.[17,19,20]

The idea that your zip code is a greater determinant of your health than your genetic code has been widely propelled, and differences in breastfeeding rates by zip code could be one contributing factor. The National Association of County and City Health Officials (NACCHO) and the US Breastfeeding Committee (USBC) released a “Continuity of Care in Breastfeeding Support: A Blueprint for Communities” in 2021, and one of the first steps identified was to conduct a breastfeeding community needs/assets assessment to understand the local lactation support landscape.[21] The Washington State Lactation Collaborative (WLC) collaborated with the University of Washington School of Public Health in 2024 to conduct a qualitative needs assessment informed by a survey completed by lactation support providers across Washington State.[22] The majority of lactation support providers in the state believed that there were certain services that their communities were lacking.[22] To better visualize and identify what lactation services are lacking and in which geographic areas of the state, the Washington State Lactation Collaborative (WLC) and University of Washington collaborated on a Washington State equity mapping analysis from June to July of 2025. The results of the mapping analysis will be used to inform the WLC and local lactation coalitions across the state where to focus resources to improve equitable access to lactation support.

Methods

Identification of Types of Lactation Supports and Regions

Upon the inception of this project, members of the board of the Washington State Lactation Collaborative (WLC) put together a list of relevant lactation support resources to potentially include in this mapping project. Data sources for each resource type were identified, and resources were excluded from the map if there was insufficient data available or an inability to attach resources to a location. For example, breast pumps were identified as an important resource that providers reported as a limited resource in the 2024 Survey. However, pumps were not included in the mapping analysis as their ability to be shipped from a central location to anywhere in the state made this resource unamenable to mapping. Bodywork providers and tongue-tie release specialists were omitted due to a lack of centralized data.

Types of Lactation Supports (13) included are:

- Birthing Hospitals
- WIC Agencies
- WIC Breastfeeding Peer Counselor (BFPC) Programs
- Birthing Centers
- Lactation Classes
- Community Health Clinics (CHC) and education centers
- Doulas
- Midwives
- Lactation Support groups
- Local lactation coalitions
- Lactation Support Providers
    a. Designated Breastfeeding Experts (DBEs)
    b. IBCLCs
- Family Services
    c. Nurse Family Partnership
    d. MSS/ICM
    e. Family Spirit
- Outpatient Lactation Care

Lactation support resources were mapped onto zip codes and data were consolidated to the county level. Data was then further aggregated onto Apple Health managed care regions (**Fig 1.)**. Availability of lactation support was stratified by lactation support type, county, and Apple Health managed care region.

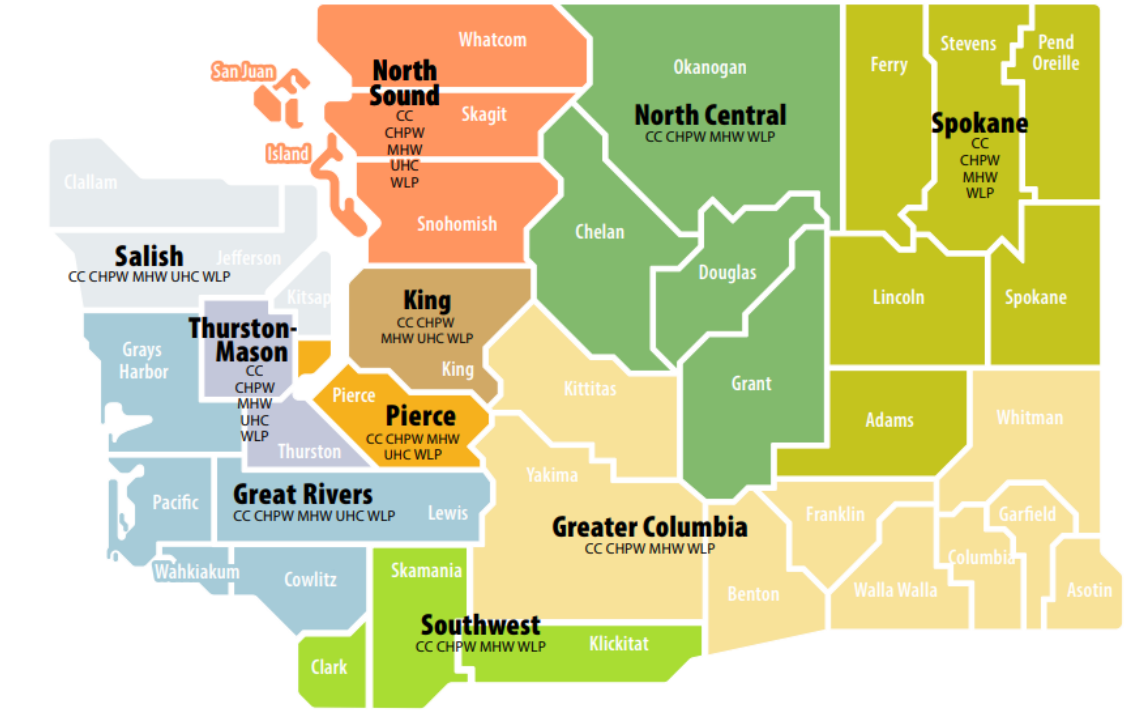


Fig 1. Apple Health managed care regions in Washington State

Outreach & Data Compilation

Birthing Hospitals included only hospitals with a staffed OB/GYN unit as of 2025. A list of birthing hospitals and associated data was obtained from the Washington Department of Health (WA DOH). WIC agency locations were obtained from the WA DOH WIC Clinic Locator tool.[23] The WA DOH also provided a list of WIC clinics with a Breastfeeding Peer Counselor (BFPC) program. Lastly, WA DOH provided estimates on how many WIC-designated breastfeeding experts and IBCLCs are available at each WIC clinic.

Midwives and Doulas and the area in which they are based were populated from the Midwives' Association of Washington State (MAWS) and DoulaMatch listings, respectively.[24,25] These public listings provide referral visibility in Washington, but birth workers have to pay a fee to be a member of the organization and be included in the listing.

Families Services programs, including Maternal Support Services/ Infant Case Management (MSS/ICM) programs, were sourced from the Washington State Health Care Authority First Steps MSS/ICM provider directory by county.[26] Nurse-family partnership (NFP) and Parents-As-Teachers Programs (PAT) were sourced from a list maintained by the Washington State Department of Children, Youth, and Families (DCYF) and Start Early.[27]

Birthing Centers, Lactation Classes, Community Health Clinics (CHC) and Education centers, Outpatient Lactation care and Lactation Support groups were sourced from a variety of resources. One primary source was HelpMeGrow Washington.[28] Peer Counselors through La Leche League (LLL) were identified using the LLL's locator.[29]

Lactation Support Providers include IBCLCs, CLCs, ANLCs, LECs, Certified Lactation Specialists, and more. There is no complete, publicly available directory available for any lactation provider type with locations listed. There are 24 IBCLCs listed on the United States Lactation Consultant Association (USLCA) website,[30] but this list is far from complete given that there are an estimated 662 IBCLCs across the state,[31] a smaller number of which likely provide direct patient care. The Academy of Lactation Policy and Practice (ALPP) provide a list of 183 CLCs in Washington via their CLC finder, but many of CLCs are not practicing and the ALPP do not include information on the areas CLCs serve.[32]

Local coalitions were included on the map as they provide support by advocating for breastfeeding and lactation-friendly policies in their communities and helping families to locate lactation support resources.[33] Available coalition resource guides were used to compile additional local lactation resources available to community members.

Some regions or counties across the state do not have a local coalition, and some coalitions do not have a publicly available lactation resource guide. Hence, outreach activities were conducted to gather more information about resources available in these areas. We contacted local coalition leaders for those without resource guides and contacted WIC, tribal leaders, and county public health departments for counties without a local coalition. Resources described by local leaders were then added to the list. Online searches were conducted to determine an address or zip code for supports without a listed location. If a support had an imprecise location, then a centrally located zip code within the county which the resource is based was used.

Mapping of Resources

The consolidated excel spreadsheet of lactation support resources included geographic information including State, County, Apple Health Region, and Zip Code to allow supports to be geocoded onto a map of Washington State. Other columns included lactation support type, subtype, facility name, and individual name/credentials if applicable.

The data was imported into the mapping software, called ArcGIS Pro. GIS (Geographic Information System) software is a tool used to capture, visualize, and analyze spatial data. This software allows the mapping of resources as well as the linking of spatial trends with sociodemographic trends to assess geographic disparities and the influence of social determinants of health.

First, a base map was created in ArcGIS using Washington State County Boundaries created by the WA Public Land survey.[34] Boundaries between counties were dissolved to create Apple

Health managed care regions (**Figure 1**). The lactation resource data were imported into ArcGIS and then geocoded. Symbols were applied to differentiate lactation resource types.

Zip code polygons were imported from a TIGER/Line shapefile and converted into Zip centroids. A separate layer was created for each lactation resource type. The near tool was used to calculate the total miles to the nearest lactation resource of each type from each Zip centroid, with a limited range of 50 miles versus an unlimited range. Each zip code was assigned a binary access indicator of 0 or 1, as having or not having access to each lactation resource within 50 miles.

Data Analysis

Sociodemographic data for Washington state were imported and joined with spatial lactation data. This included Sociodemographic Vulnerability Index data by zip code from the CDC. This dataset includes four theme-based composite scores (RPL themes): Socioeconomic Status (RPL Theme 1), Household Characteristics (RPL Theme 2), Racial & Ethnic Minority Status (RPL Theme 3), and Housing Type & Transportation (RPL Theme 4), as well as an overall Social Vulnerability Index (SVI) score based on all four themes. It also includes individual sociodemographic variables used in each theme, including estimated proportion of the population of each zip code that belongs to a particular minority group, is below 1.5x the federal poverty boundary, has access to internet, has access to a personal vehicle, etc.

County level population and birth data were imported from WADOH Birth Certificate data from 2023.[35] Rural-Urban Commuting Area (RUCA) codes were used to assess rurality. Data of RUCA code by zip were obtained from the WWAMI RUCA Rural Health Research Center.[36] RUCA codes range from 1 to 10 with higher scores representing more rural areas and lower scores representing more urban areas (**Table 1**). Generally, a RUCA code less than 4 is considered urban and a RUCA code equal to or greater than 4 is considered rural.

Table 1. RUCA Code Classification

RUCA codes	Description	Designation
1	Metropolitan area core: primary flow within an urbanized area (UA)	Urban
2	Metropolitan area high commuting: primary flow 30% or more to a UA	Urban
3	Metropolitan area low commuting: primary flow 10% to 30% to a UA	Urban
4	Micropolitan area core: primary flow within an urban cluster of 10,000 to 49,999 (large UC)	Rural
5	Micropolitan high commuting: primary flow 30% or more to a large UC	Rural
6	Micropolitan low commuting: primary flow 10% to 30% to a large UC	Rural
7	Small town core: primary flow within an urban cluster of 2,500 to 9,999 (small UC)	Rural
8	Small town high commuting: primary flow 30% or more to a small UC	Rural
9	Small town low commuting: primary flow 10% to 30% to a small UC	Rural
10	Rural areas: primary flow to a tract outside a UA or UC	Rural
Other	.1, .2, .3 = secondary flow to large/small UA or UC (people are likely to travel from this area to a nearby area with more resources)	

Joined data from ArcGIS Pro were imported into JMP Pro v18 for further analysis. Then, a mean of the access or no access indicator (0 and 1) for all zip codes within each county/region was calculated to determine what proportion, between 0.00 and 1.00, of zip codes within each county/region have access to each lactation resource type. Mean values for total distance to the nearest lactation resource of each type were calculated for each county/region to estimate how far residents of each county would have to travel to get to the nearest lactation support.

Access and travel burden data were then stratified by Rural (RUCA <4) versus Urban (RUCA ≥ 4). Multivariate modelling was completed in JMP to assess associations between sociodemographic factors and access or distance to lactation support resources.

Finally, a composite score was developed to assess overall distribution of all thirteen types of lactation resources, labeled the Resource Distribution Score (RDS). The RDS was calculated for each zip code as the total number of lactation resource types accessible within 50 miles, for a score between 0.0 and 13.0. The mean RDS for all zip codes in each county or region was calculated, divided by 13, and then multiplied by number of births to account for potential need for lactation support in a weight RDS. This was scaled down by dividing by 100.

$$Weighted\ RDS = \frac{Sum\ of\ binary\ access\ indicators}{13} * total\ births \div 100$$

Results

Lactation Resources Identified

Table 2 lists the thirteen resource types included on the map and the total number of resources identified by resource type. Only Birthing Hospitals, WIC clinics, and WIC BFPC programs are complete lists while other resource types are suspected to be incomplete.

Table 2.

Type of Resource	N (%) identified
Birthing Hospital	55 (4.8%)
WIC	194 (16.8%)
WIC BFPC Programs	109 (9.5%)
Birthing Centers	6 (0.5%)
Lactation Classes	22 (1.91%)
CHC/ Education Centers	7 (0.61%)
Doulas	255 (22.1%)
Midwives	108 (9.4%)
Lactation Support Groups	30 (2.6%)
Local Lactation Coalitions	16 (1.4%)
Lactation Support Providers (LSP)	108 (9.4%)
Family Services	156 (13.5%)
Outpatient lactation care	33 (2.9%)

The total number of resources identified for each county are listed in **Table 3** along with county birth counts from 2023, mean RUCA scores, and presence of a local coalition. More than half of the resources identified were in King, Pierce, Snohomish, and Spokane counties.

Table 3.

County	N (%) Resources identified	Births (2023)	Mean RUCA Score	Coalition (Yes/No)
King	343 (29.8%)	22408	1.3	Yes
Pierce	100 (8.7%)	10443	1.3	Yes
Snohomish	96 (8.3%)	5696	1.7	Yes
Spokane	58 (5.0%)	5696	2.9	Yes
Thurston	43 (3.7%)	2837	1.5	Yes
Kitsap	42 (3.7%)	2691	1.4	Yes
Whatcom	42 (3.7%)	1935	3.3	No
Yakima	41 (3.6%)	3128	2.9	Yes
Clark	36 (3.1%)	5479	1.4	Yes
Skagit	33 (2.9%)	1352	7.6	Yes
Jefferson	31 (2.7%)	133	7.9	No
Chelan	25 (2.2%)	780	5.6	Yes
Okanogan	23 (2.0%)	412	9.1	Yes
Benton	20 (1.7%)	2460	2.2	Yes
Grant	19 (1.7%)	1382	6.7	Yes
Clallam	18 (1.6%)	518	8.2	No
Lewis	18 (1.6%)	910	5.0	Yes
Grays Harbor	17 (1.5%)	654	7.9	No
Cowlitz	14 (1.2%)	1201	2.8	No
San Juan	13 (1.1%)	89	9.4	No
Whitman	13 (1.1%)	378	6.7	No
Adams	10 (0.9%)	371	9.5	No
Franklin	10 (0.9%)	1439	1.8	Yes
Island	10 (0.9%)	712	3.9	Yes
Walla Walla	10 (0.9%)	557	3.6	No
Kittitas	9 (0.8%)	376	7.6	Yes
Mason	9 (0.8%)	668	6.2	No
Stevens	9 (0.8%)	475	9.0	No
Douglas	7 (0.6%)	468	7.6	No
Pacific	7 (0.6%)	148	10	No
Klickitat	5 (0.4%)	203	9.4	No
Ferry	4 (0.4%)	65	10.0	No
Pend Oreille	4 (0.4%)	114	10.0	No
Columbia	2 (0.2%)	34	10.5	No
Wahkiakum	2 (0.2%)	27	10.4	No
Asotin	1 (0.1%)	200	8.1	No
Garfield	1 (0.1%)	16	10.0	No
Lincoln	1 (0.1%)	125	10.3	No
Skamania	1 (0.1%)	88	8.3	Yes

General Trends in Lactation Resource Distribution

Table 3 lists the RDS and weighted RDS by Apple Health managed care region. Regions are listed in descending order by weighted RDS. Regional RDS ranged from 0 to 5.1, indicating that regions had gaps in access to between 0 and 5 lactation resources, on average. Regional weighted RDS ranged from 0 to slightly above 27 (**Table 3)**. King, Pierce, and Thurston-Mason regions had no identified lactation support gaps. Greater Columbia, Spokane, and Southwest were the three regions with the highest weighted RDS (all >20) suggesting that the largest number of births are affected by gaps in lactation support access within these three regions.

Table 3.

Apple Health Region	RDS	Regional Births	Weighted RDS
Greater Columbia	4.2	8,588	27.4
Spokane	4.6	6,846	24.0
Southwest	5.1	5,770	22.6
North Sound	0.9	9,784	6.9
Great Rivers	3.0	2,940	6.8
North Central	2.9	3,042	6.7
Salish	1.8	3,342	4.7
King	0.0	22,408	0.0
Pierce	0.0	10,443	0.0
Thurston-Mason	0.0	3,505	0.0

Table 4 lists the RDS and weighted RDS by county. Counties are listed in descending order by weighted RDS. County RDS range from 0 to 9.0 out of 13. There was at least one resource gap in 33 of the 39 counties in Washington. Generally, smaller counties with lower birth counts had gaps in a greater number of resources. The largest counties, King and Pierce County, had no measurable gap in resource availability. Once accounting for differences in birth count, Clark, Spokane, Benton, Yakima, and Franklin received the highest weighted RDS, suggesting that the impact of lactation resource gaps is the highest in these counties.

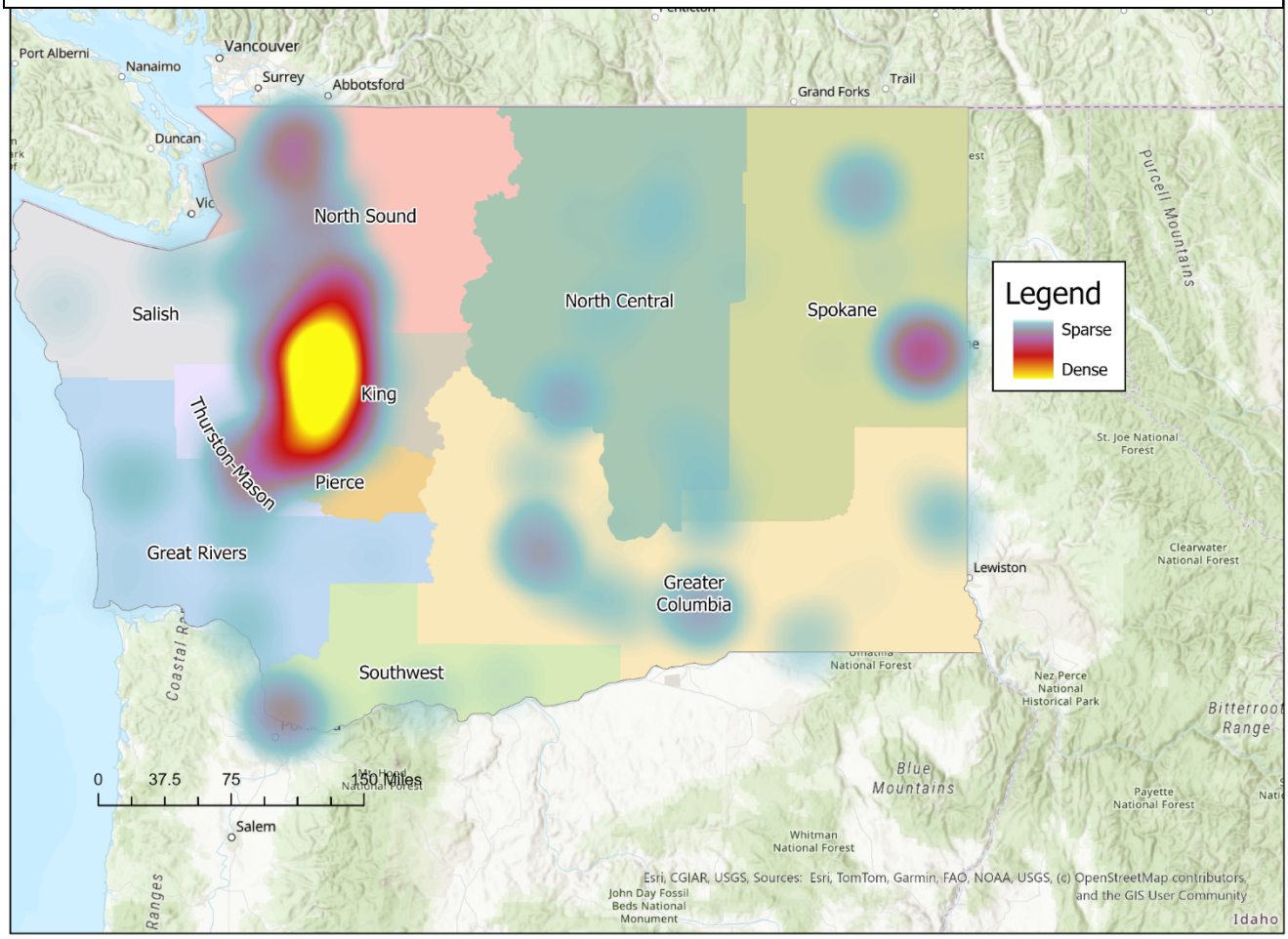
Of note, Clark County* received the highest weighted RDS, however, resources in Oregon were not included in the mapping analysis. All zip codes in Clark County are within 50 miles of Portland, Oregon where there are a significant number of lactation supports available to residents of Clark County.

Table 4.

County	Apple Health Region	RDS	County Births	Weighted RDS
Clark*	Southwest	3.6	5479	15.31
Spokane	Spokane	3.0	5696	13.15
Benton	Greater Columbia	5.0	2460	9.46
Yakima	Greater Columbia	2.8	3128	6.74
Franklin	Greater Columbia	5.0	1439	5.53
Whatcom	North Sound	2.5	1935	3.72
Grant	North Central	2.6	1382	2.81
Clallam	Salish	7.0	518	2.79
Cowlitz	Great Rivers	2.8	1201	2.59
Walla Walla	Greater Columbia	5.0	557	2.14
Stevens	Spokane	5.0	475	1.83
Grays Harbor	Great Rivers	3.6	654	1.79
Adams	Spokane	6.2	371	1.77
Whitman	Greater Columbia	5.5	378	1.60
Okanogan	North Central	4.7	412	1.47
Asotin	Greater Columbia	9.0	200	1.38
Klickitat	Southwest	7.6	203	1.18
Skagit	North Sound	0.8	1352	0.80
Chelan	North Central	1.2	780	0.74
Lewis	Great Rivers	0.9	910	0.63
Pend Oreille	Spokane	6.8	114	0.60
Pacific	Great Rivers	5.2	148	0.60
Douglas	North Central	1.5	468	0.54
Lincoln	Spokane	4.7	125	0.55
Ferry	Spokane	8.1	65	0.41
Snohomish	North Sound	0.1	5696	0.32
Skamania	Southwest	3.8	88	0.36
Columbia	Greater Columbia	6.0	34	0.16
Jefferson	Salish	1.1	133	0.12
San Juan	North Sound	1.7	89	0.11
Wahkiakum	Great Rivers	4.7	27	0.10
Garfield	Greater Columbia	6.0	16	0.07
Kittitas	Greater Columbia	0.1	376	0.03
Island	North Sound	0.0	712	0.00
King	King	0.0	22408	0.00
Kitsap	Salish	0.0	2691	0.00
Mason	Thurston-Mason	0.0	668	0.00
Pierce	Pierce	0.0	10443	0.00
Thurston	Thurston-Mason	0.0	2837	0.00

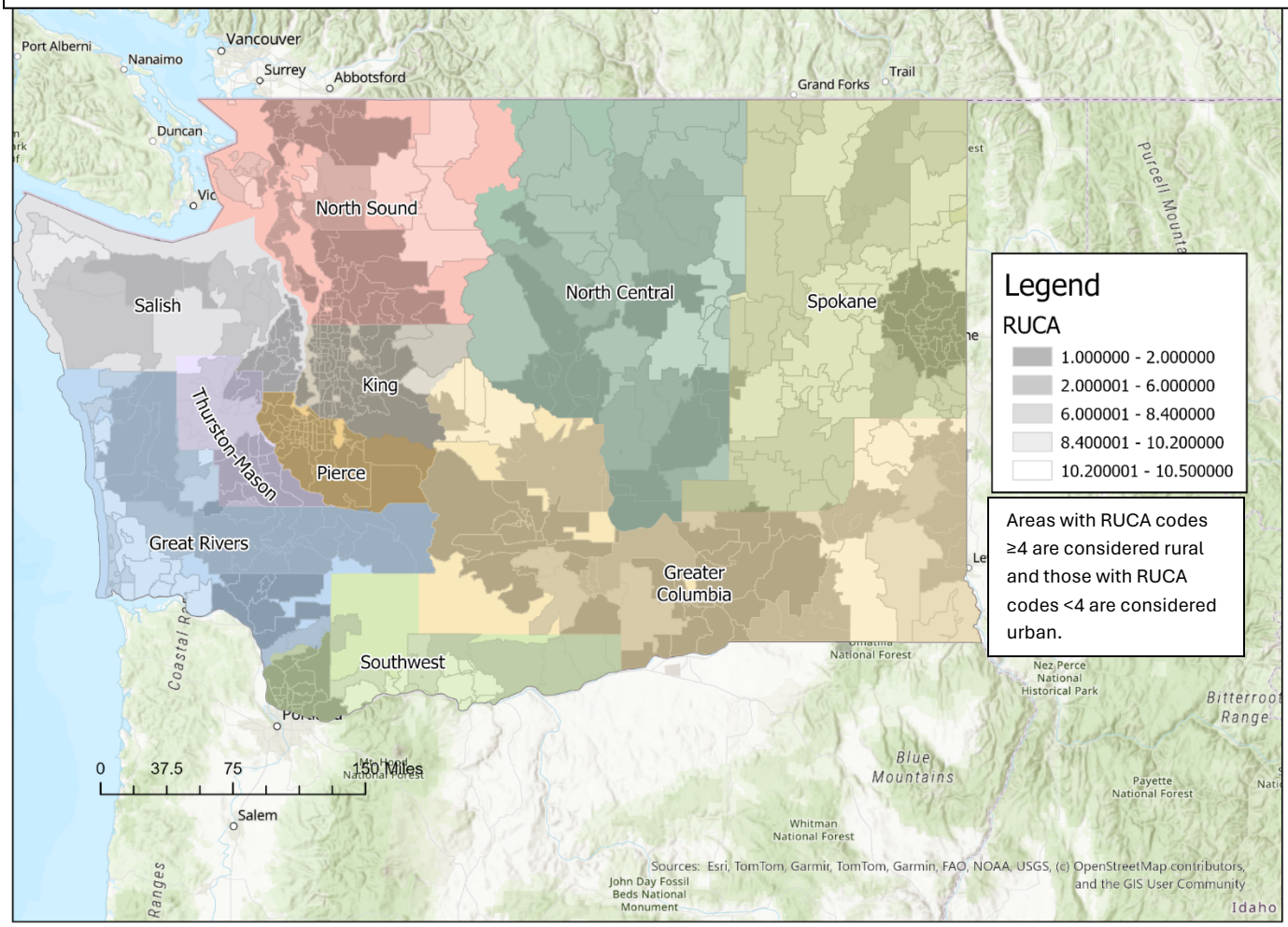
Map 1. is a heat map of lactation resource density in Washington State. Lactation resources are significantly more densely concentrated in the King County area compared to any other part of the state. Pierce, Snohomish, Thurston-Mason, and Spokane counties are also densely concentrated with lactation supports. Otherwise, lactation support resources appear to be scattered across the state. Most Apple Health managed care regions are noted with areas where lactation resources are concentrated, surrounded by areas where resources are sparse.

Map 1. Heat Map of Lactation Resource Density in Washington State



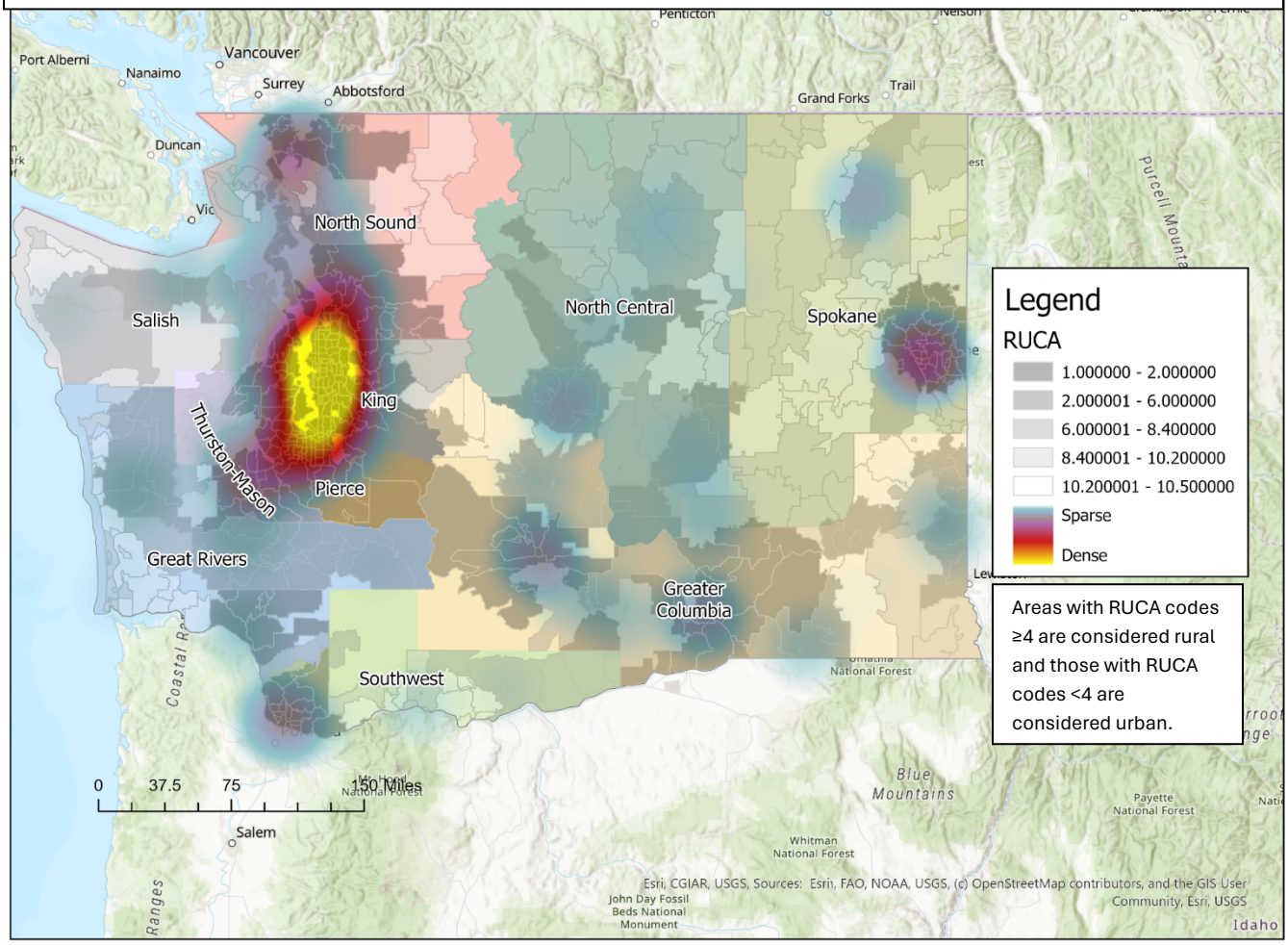
Map 2 is a visual depiction of RUCA codes by zip code within Apple Health managed care regions. Zip code areas with lower RUCA scores are shaded darker and rural areas with higher RUCA scores are shaded lighter. The Spokane and Southwest Region are both noted with a densely populated metropolitan core surrounded by a vast rural area. The Salish and Great Rivers regions are largely rural, with higher levels of rurality near the coast. Pierce and King regions are almost entirely urban. Finally, North Central, Greater Columbia, and North Sound regions feature areas of higher and lower rurality.

Map 2. Rural-Urban Commuting Area (RUCA) Codes within Apple Health Managed Care



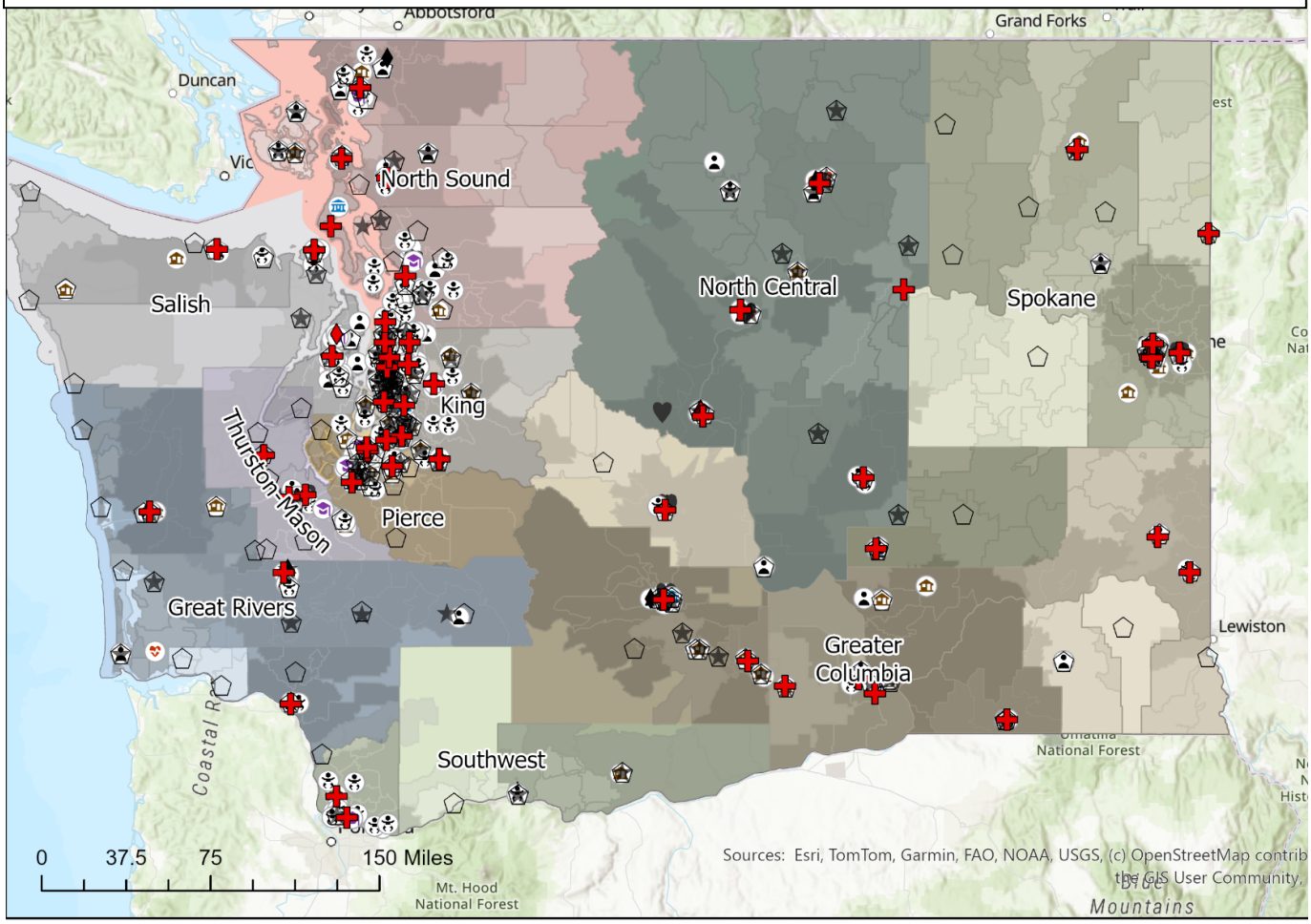
When the heatmap of lactation resource density is layered on top of the RUCA code map of Washington State (**Map 3)** the areas on the heatmap with the highest lactation resource density overlap closely with the areas that have the lowest RUCA codes.

Map 3. Rural versus Urban Lactation Resource Density in Washington State



Map 4 displays each lactation resource identified in Washington State by approximate location. Symbols are used to represent each type of Lactation Support (*see legend*). WIC clinics and Birthing Hospitals appear to be distributed more evenly across the state while other resources appear more concentrated in urban areas.

Map 4. Location of Lactation Resources in Washington State by Type



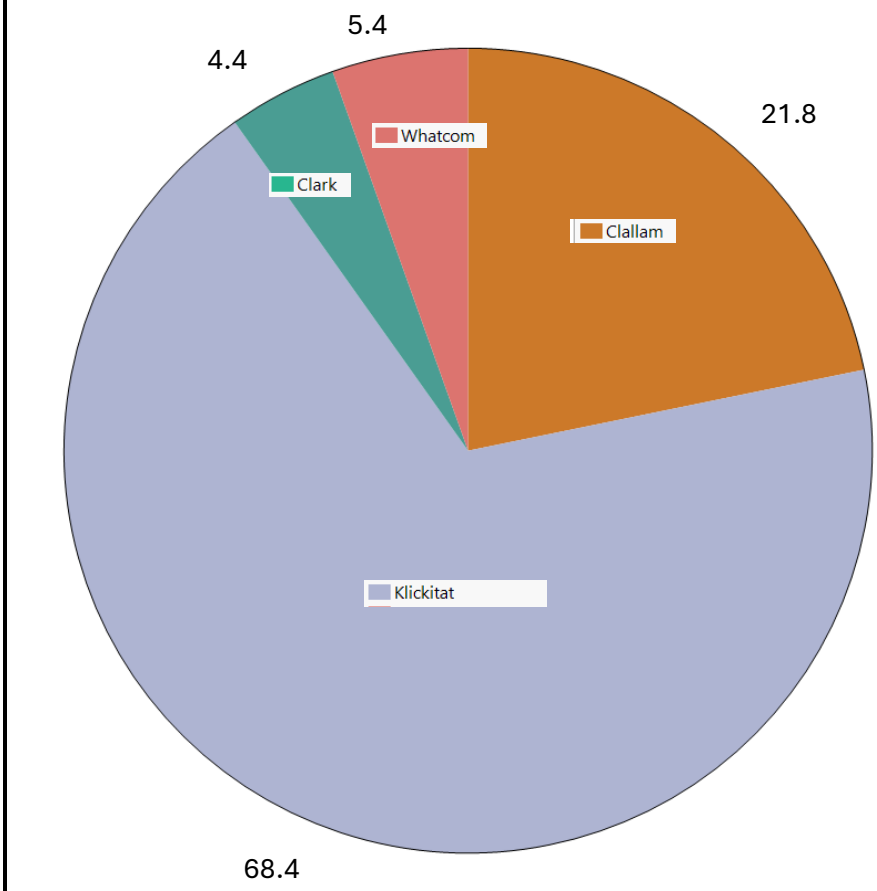
Legend

- Birthing Hospital
- WIC
- BFPC program
- Birthing Center
- Classes
- Community health clinic and community education centers
- Doulas
- Midwives
- Lactation support groups
- Local lactatation coalition
- Lactation Support Provider (LSP)
- Family Services
- Outpatient Lacation Care

Gaps in Lactation Resources

There are gaps in access to a Birthing Hospital within 50 miles in a portion of zip codes in the state (**Figure 2)**. These zip codes are in the Southwest, Salish, and North Sound regions. Within those regions, rural counties furthest from the most urban county must travel the furthest to get to a Birthing Hospital. Some zip codes in Klickitat, Whatcom, and Clallam counties must travel more than 50 miles.

Figure 2. Zip Codes without Access to a Birthing Hospital within 50



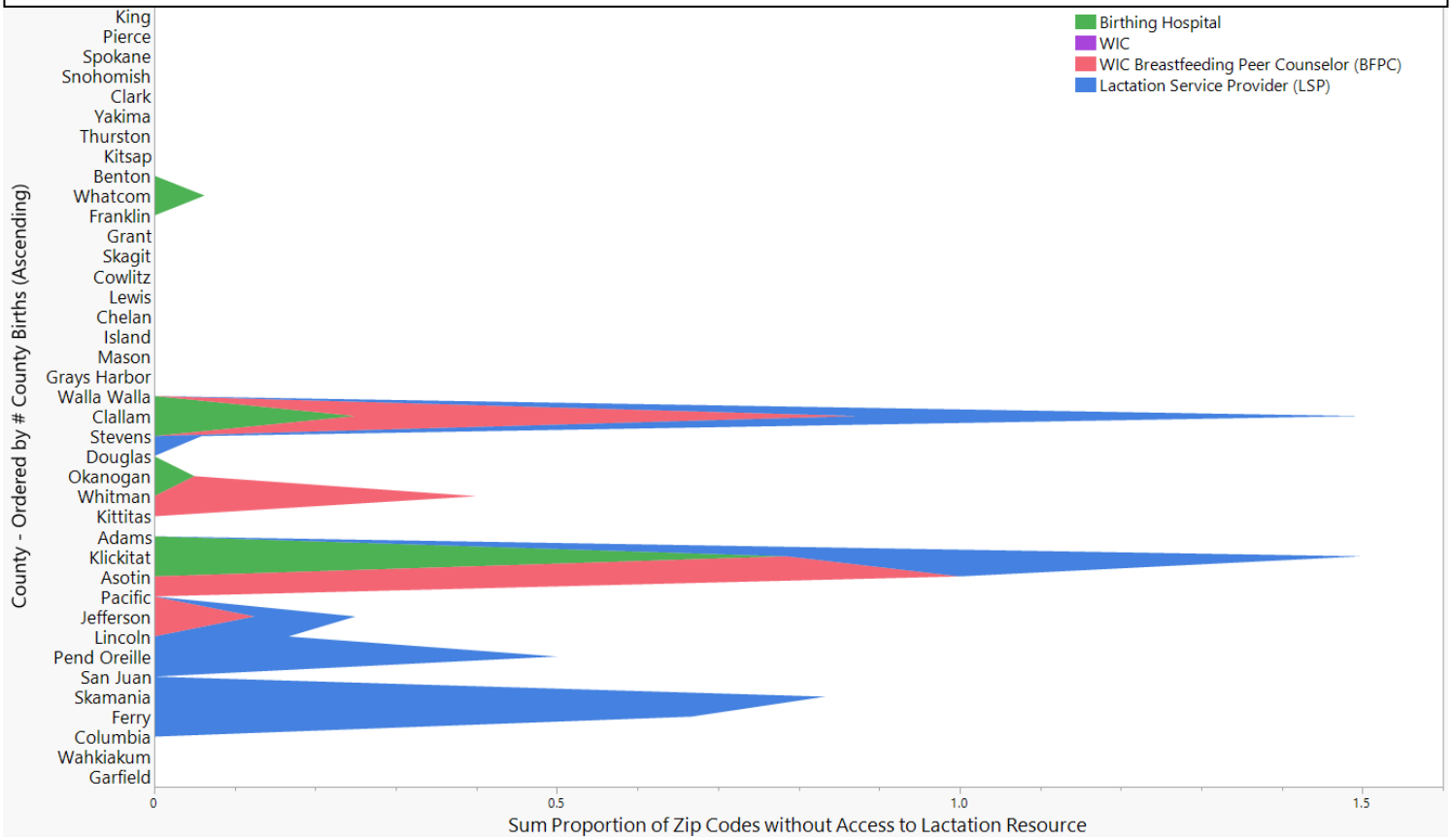
In the Southwest region, Clark County is noted with a small percentage of zip codes without access to a Birthing Hospital within 50 miles. However, residents of Clark County can access several large birthing hospitals in Portland, Oregon within 50 miles. In Klickitat County, however, these Birthing Hospitals are well beyond 50 miles away. Klickitat County makes up the majority of zip codes without access to a birthing hospital (68.4%). There is a small critical access Birthing Hospital across the border from Klickitat in Hood River, Oregon. However, this hospital is more than 50 miles from most zip codes in Klickitat County. There is a local hospital in Klickitat County, however they do not deliver babies. Hence, Klickitat County is identified as a rural maternity care desert.

In the Salish region, Clallam County makes up the next largest portion of zip codes without access to a Birthing Hospital within 50 miles (21.8%). Clallam County has access to one Birthing Hospital in Port Angeles. However, for residents on the west end of the county, this is beyond 50 miles by road or over an hour drive. There is a community hospital on the east end of the county, but it does not offer inpatient childbirth services.

In the North Sound region, a small percentage of zip codes on the far eastern side of the northernmost county, Whatcom, are beyond 50 miles of the only Birthing Hospital in the county, in Bellingham. Some zip codes within the North Sound region are within 50 miles of a Birthing Hospital, but would require taking a ferry, adding additional delays and uncertainty.

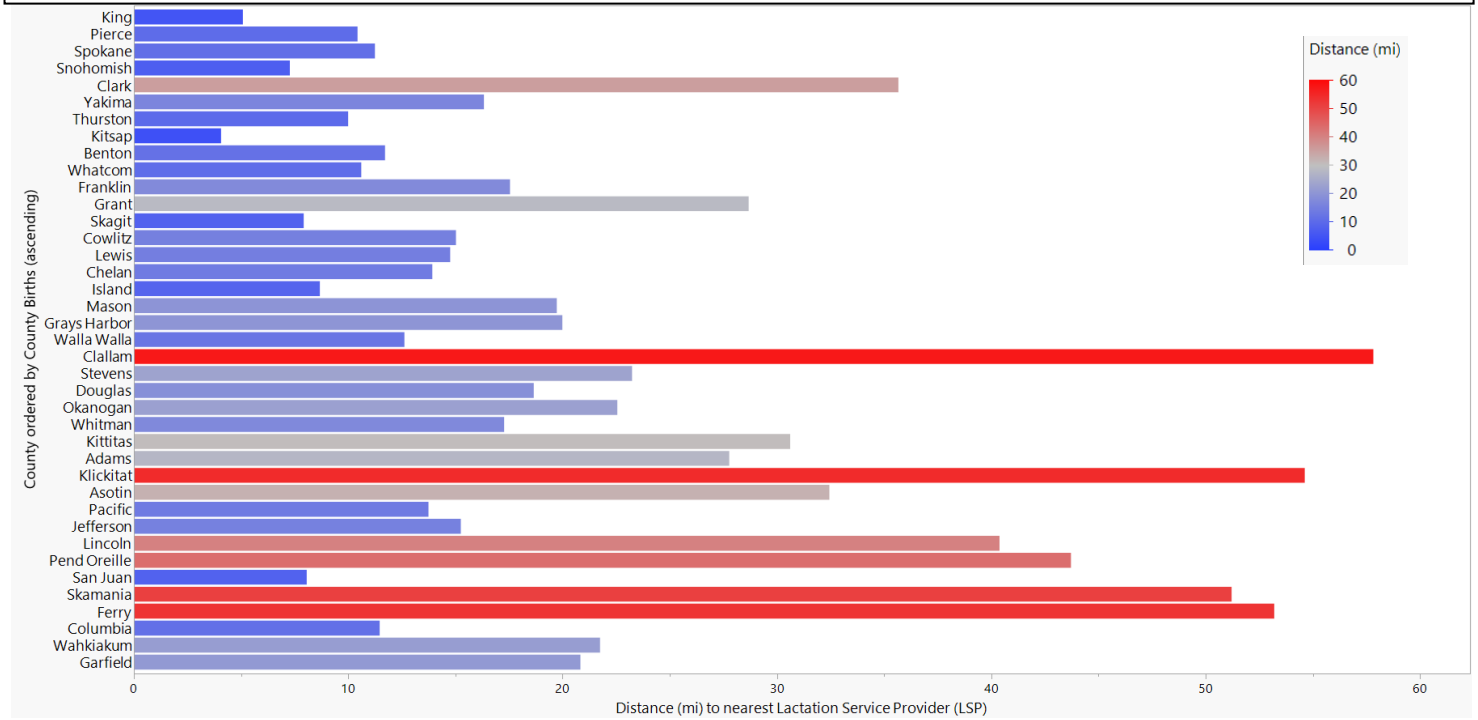
Figure 3. displays the proportion of zip codes in each county (ordered from largest to smallest volume of births from top to bottom) with gaps in access (within 50 mi) to four core lactation resources including Birthing Hospitals, WIC, WIC Breastfeeding Peer Counselors (BFPC) and Lactation Service Providers (LSPs), which include designated breastfeeding experts (DBEs) and IBCLCs. For Birthing Hospitals, this includes Klickitat, Clallam, and Whatcom County, as depicted in **Figure 2**, which are moderately sized rural counties. There were no gaps in access to WIC clinics identified across Washington state. However, there were gaps in access to WIC BFPCs in large portions of Clallam and Whitman County, all zip codes in Asotin County, and a small portion of Jefferson County (**Figure 3**). Finally, there were gaps in access to any LSP within 50 miles in the majority of zip codes in Skamania, Klickitat, Pend Oreille, Ferry, and Clallam counties, as well as a portion of zip codes in Stevens and Lincoln counties.

Figure 2. Proportion of Zip Codes with Gaps in Access to Lactation Support Resources by County



In these counties, Clallam, Klickitat, Lincoln, Pend Oreille, Skamania, and Ferry, the average distance residents must travel to access an LSP is much higher than the distance one must travel from other counties where LSPs are available within a 20-mile radius (**Figure 4**). This would require traveling over an hour by car to see an LSP in person, which may be unrealistic for rural, working families. In some counties, an LSP is available within a 50-mile radius. However, there may still be gaps in LSP access in some of these counties if the number of LSPs available is not adequate to meet the number of families needing care.

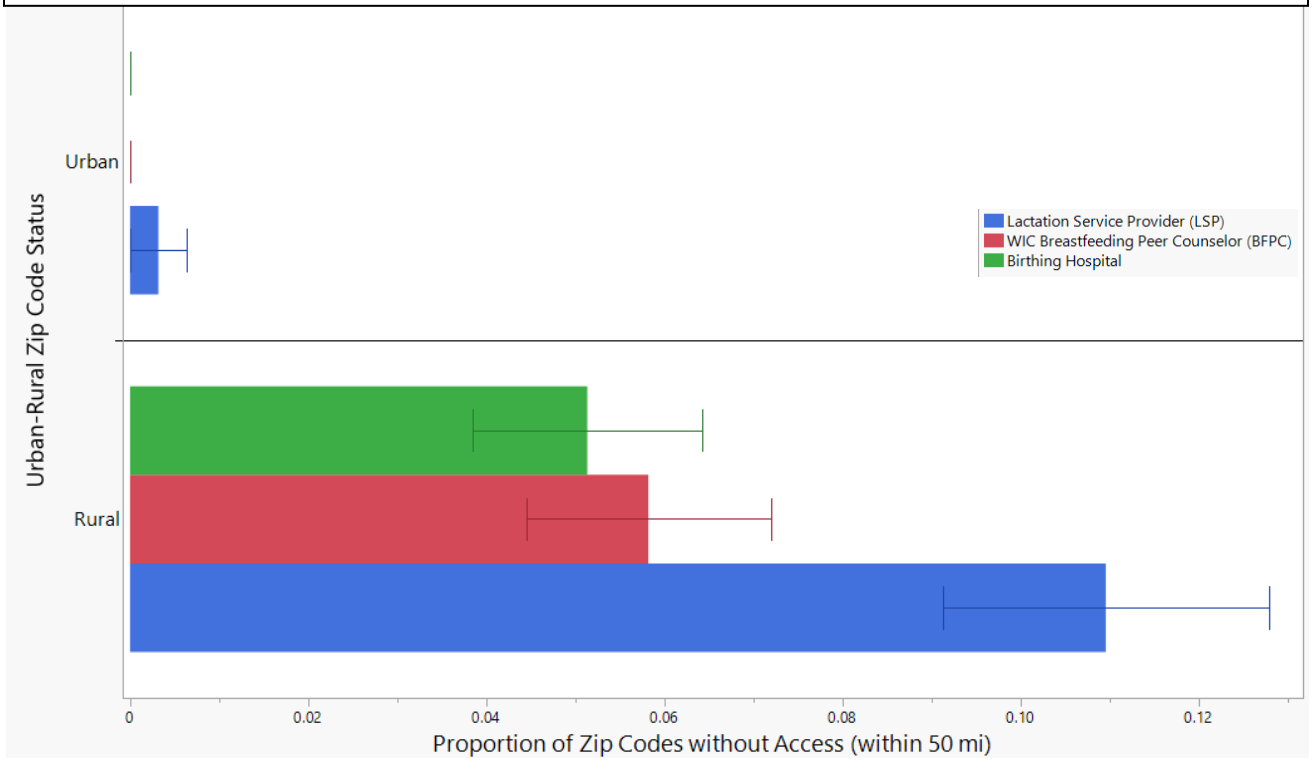
Fig 4. Mean Distance to Nearest Lactation Service Provider (LSP) by County



Rural versus Urban

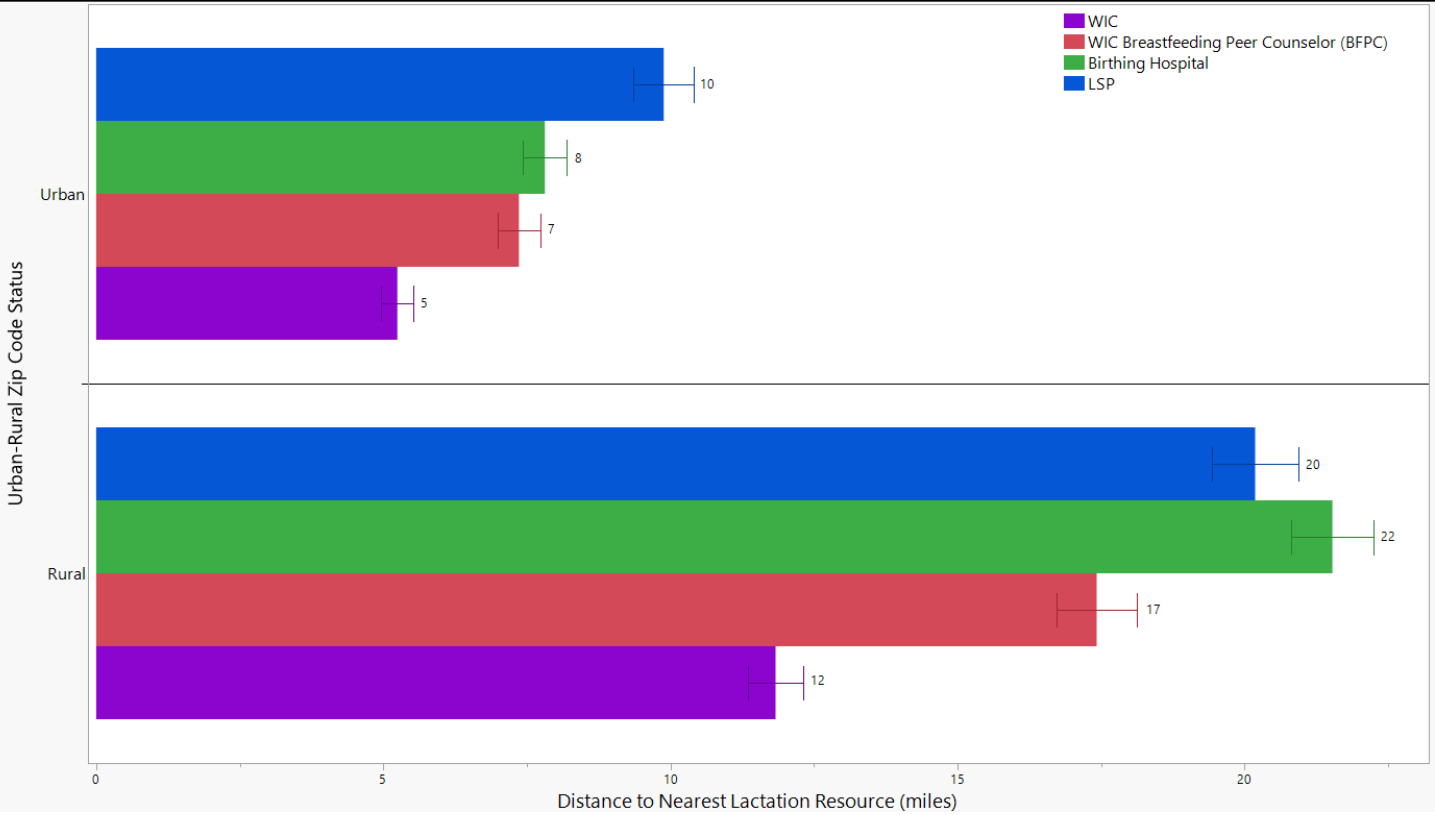
One of the most significant differences between counties with and without gaps in access to lactation support resources demonstrated by the mapping analysis was that they were largely rural. There is a stark contrast between access to lactation support in rural versus urban zip codes. Nearly all gaps in access to Birthing Hospitals, LSPs, and WIC BFPCs were in zip codes with RUCA codes >4 (**Figure 5**).

Fig 5. Gaps in Access to Lactation Support Resources in Rural versus Urban Zip Codes



Multivariate methods revealed that higher RUCA scores are *strongly* positively correlated with having to travel further to reach the nearest Birthing Hospital (r= 0.68), Midwife (r= 0.68), and Doula (r=0.62) *moderately* correlated with having to travel further to reach the nearest WIC Clinic (r=0.47), LSP (r=0.56), or WIC BFPC Program (r=0.48). Urban zip codes must travel an average of 5 to 10 miles to reach the nearest WIC, WIC BFPC, Birthing Hospital, or LSP, while rural zip codes must travel between 12 and 22 miles to reach these resources, although the distance is much greater for many rural zip codes (**Figure 6**).

Fig 6. Distance to Nearest Lactation Support Resource in Rural versus Urban Zip Codes

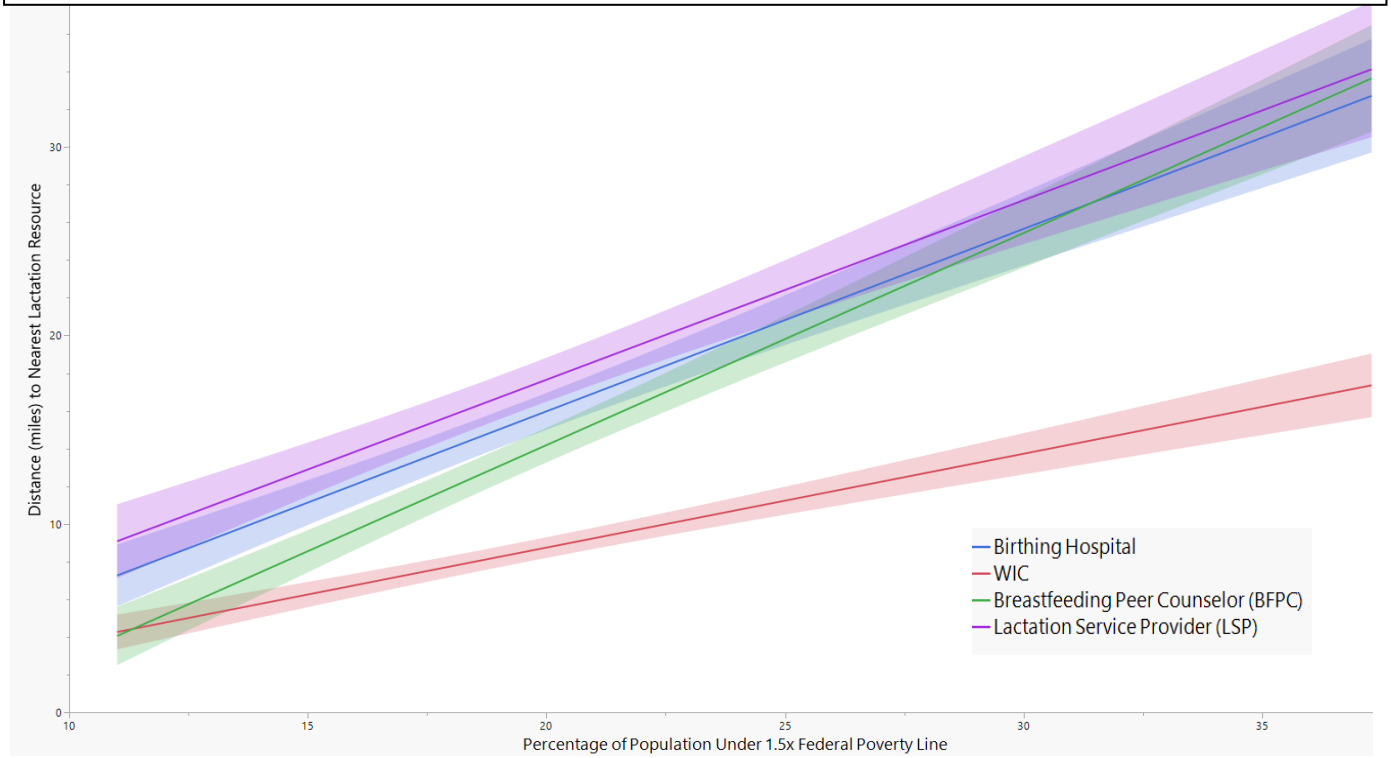


Socioeconomic Status

Another significant difference between counties with and without access to Lactation Support resources was socioeconomic (SES) status. Higher SES vulnerability (RPL theme 1) was *moderately* positively correlated with residing in a zip code without access within a 50 mi radius to birthing centers (r=0.41), lactation classes (r=0.52), CHCs (r=0.41), or doulas (r=0.48). Higher SES vulnerability was also *moderately* positively correlated with having to travel further to access a midwife (r=0.56).

Residing in a zip code with a higher percent of the population under 1.5x the federal poverty rate was *strongly* correlated with lack of access (within a 50 mi radius) to lactation classes (r=0.69) and *moderately* correlated with lack of access (within a 50 mi radius) to birthing centers (r=0.58), CHCs (r=0.53), and doulas (r=0.55). Residing in a zip code with a higher % population under 1.5x the federal poverty line was also *moderately* correlated with having to travel further to access the nearest Birthing Hospital (r=0.44), WIC clinic (r=0.40), WIC BFPC Program (r=0.52), Birthing Center (r=0.60), Midwife (r=0.55), Lactation Class (r=0.66), CHC (r=0.58), and Lactation support group (r=0.43) and *strongly* correlated with having to travel further to access the nearest doula (r=0.73). **Figure 7** depicts this trend, where as the percentage of the population under 1.5x the federal poverty line increases, the distance to the nearest Birthing Hospital, WIC, WIC BFPC, or LSP increases. This trend is less significant for WIC clinics, however, compared to other resource types.

Figure 7. Distance to Nearest Lactation Resource by % Population Under 1.5x Federal Poverty Line



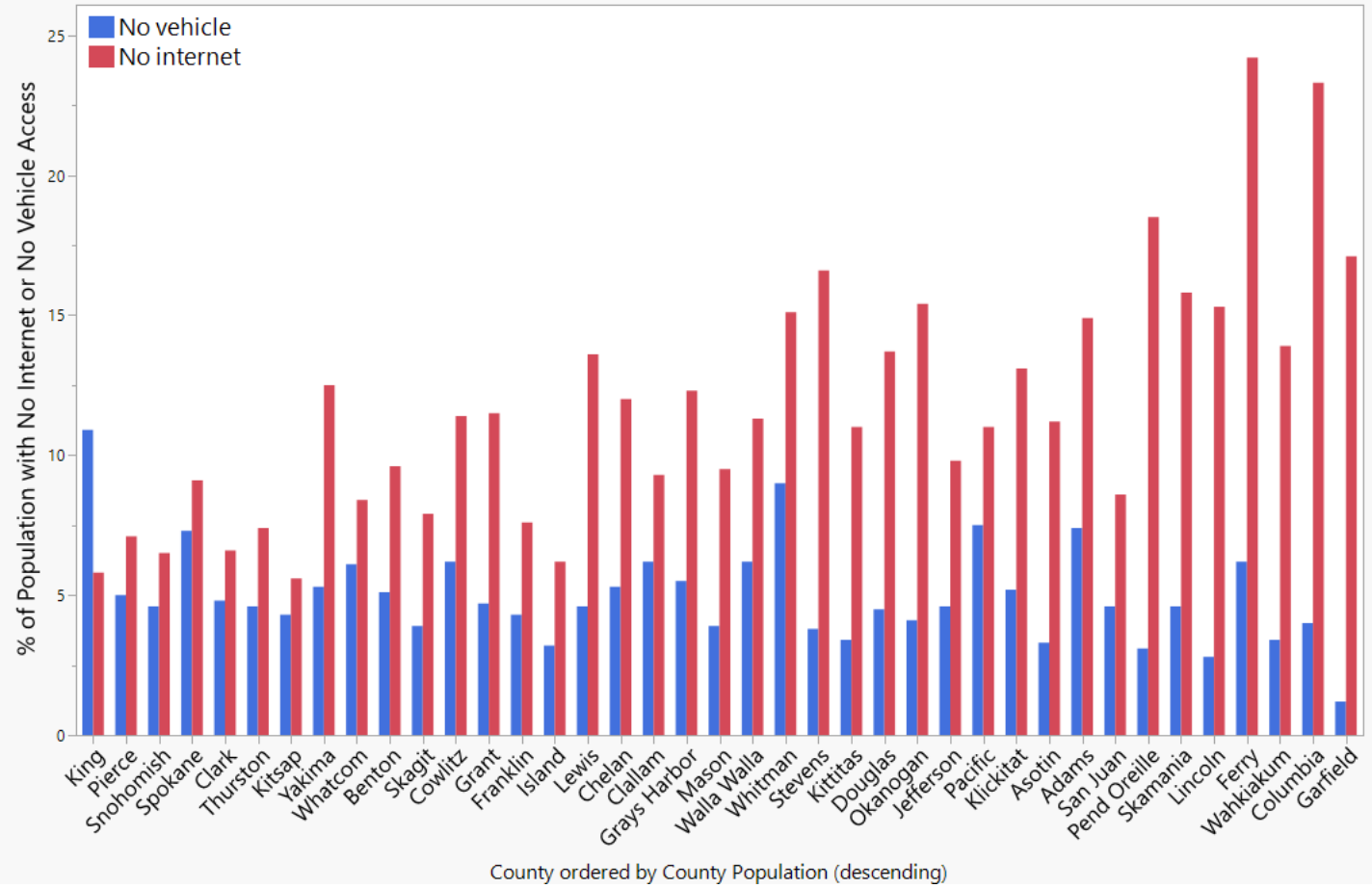
Notably, there was a *weak* positive association between Socioeconomic Vulnerability (RPL theme 1) and higher RUCA scores, and a *moderate* positive correlation between % population under 1.5x the federal poverty line and RUCA score. This may be partially explained by the fact that populations in rural zip codes tend to be older than those in urban zip codes, have lower household incomes, higher poverty rates, fewer high paying job opportunities, and lower educational attainment.[37] However, it is also possible that rurality and SES interact in a way that either compounds or reduces access to lactation services.

Access to Transportation and Internet

In addition to travel burden, rural areas experience additional barriers to accessing lactation care. Measuring the distance to the nearest lactation resource and comparing it across counties assumes that all communities have equal ability to travel that distance – but this is not the case. In some counties, a higher proportion of residents lack access to a personal vehicle (**Figure 7**). King County has the highest proportion of residents without a vehicle, but public transportation is often highly accessible in urban areas. Rural counties often have a lower proportion of residents without access to a personal vehicle, likely due to the necessity of having a vehicle to access most resources, but the effect is more significant if one does not have a vehicle. In parts of Spokane, Whitman, Pacific, Adams, Ferry, Cowlitz and other counties, not having a personal vehicle could contribute to the inability to access available lactation support resources, especially if they are beyond 50 miles.

While telehealth is often proposed as an alternative for rural communities without nearby resources available or without a personal vehicle to travel to access resources, rural counties may face additional inequities due to limited broadband infrastructure and poor internet access (**Figure 7**). Generally, as RUCA code internet access decreases (**See appendix**).

Figure 7. Percentage of Population Lacking Internet or Vehicle Access by County



Discussion

Specific Gaps in Lactation Resource Availability and Barriers to Accessing Lactation Resources based on Mapping Analysis

Several disparities in resource availability were identified through this mapping analysis. The most significant deficiencies were noted in the Southwest, Salish, and Spokane Apple Health managed care regions:

Southwest

Resources were unevenly distributed in the Southwest region where the majority of resources were concentrated in Clark County while inadequate resources were available in Klickitat and Skamania County. Skamania County is a mostly rural county with a mean RUCA code of about 8 ± 3.4. Its proximity to Clark County allows Skamania County residents to access most Lactation resources within 50 miles. However, 83% of zip codes in Skamania County do not have access to a lactation service provider (LSP) within 50 miles. Additionally, over 15% of zip codes in Skamania do not have internet access. Skamania County would benefit from the recruitment or training of a local LSP, although it is a small county with less than 100 births annually. Klickitat County is the most rural county in the Southwest region with a mean RUCA code of about 9. It is well beyond 50 miles from Clark County and more than 50 miles from any major city in Oregon. The population is >20,000 with around 200 births annually. Around 79% of zip codes in Klickitat do not have access to a Birthing Hospital (within 50 miles), 71% do not have access to an LSP, and 54% do not have access to a birth worker. Compounding this issue, about 5% of Klickitat lacks access to a personal vehicle to allow travel to access these distant resources. In addition, around 13% do not have access to the internet, making telehealth an inviable option. Klickitat County would benefit from the recruitment or training of local birth workers and LSPs. Mobile home-visiting services between Skamania and Klickitat could also alleviate gaps. Additionally, it is vital that the critical-access Birthing Hospital in Hood River remain available to residents of Klickitat County. The region would benefit from a Birthing Hospital on the east side of the Southwest region or, at minimum, a birthing center. Currently, birthing services appear to be limited to home-visiting birth worker services.

Salish

Overall, the Salish region appears to be fairly well resourced on the east side of the region. However, on the west side of the Salish region, in Clallam County, there are gaps in access to Birthing Hospitals, LSPs, and WIC BFPC. Clallam county is largely rural with an average RUCA score of about 8. The population is >75,000, however, with over 500 births annually. About 25% of zip codes in Clallam County must travel over 50 miles to Port Angeles to reach the nearest Birthing Hospital. As of 2024, Clallam County has in-county doula services and a small, midwife-run Birth Center for low-risk births.[38] However, all residents in coastal towns and some residents in Forks must travel more than 50 miles to the nearest Birthing Hospital for high-

risk births. Additionally, 63% of zip codes in Clallam do not have access to a WIC BFPC program (within 50 mi) and 63% do not have access to an LSP. The WA DOH awarded an American Indian and Alaska Native Maternal Health grant to the Makah Birthing House in 2025, which serves the Makah reservation and Neah Bay community.[39] This grant supports expanded culturally grounded in-home lactation services and will alleviate the gap in access to lactation care for tribal members in this region through community-driven intervention.[39]

Spokane

In the Spokane Apple Health managed care region, there were significant gaps in access to lactation support resources in Stevens, Lincoln, Pend Oreille, and Ferry counties. Overall, 13.5% of zip codes in the Spokane region do not have access to an LSP (within 50 miles). The largest county outside of Spokane County in the region is Stevens County, with a population nearing 50,000 with close to 500 births annually. Stevens County is highly rural with an average RUCA code of 9. The main gap identified in Stevens County was in access to birth workers. Around 41% of zip codes do not have access to a Midwife (within 50 mi) and 35% do not have access to a doula.

Lincoln County has a population of >10,000 and over 100 births annually, and a mean RUCA score of 10. This county also experiences a similar gap in birth workers with a mean of 29% of zip codes lacking access to a birth worker within 50 miles. Around 50% of zip codes do not have access to a midwife, and a smaller portion of zip codes (8%) lack access to a doula. There are no lactation services or lactation providers in Lincoln County outside from WIC. Although resources exist in Spokane County, representatives report that transportation to Spokane presents a major challenge for families in this area.

Pend Oreille County is equally rural (mean RUCA of 10) and of a similar size to Lincoln County with a population ~14,000 and around 100 births annually. However, Pend Oreille has a higher SES Vulnerability Score (RPL theme 1) compared to Lincoln County, 0.447 vs. 0.149, respectively. Additionally, Pend Oreille has a higher Housing Type & Transportation vulnerability score (RPL Theme 4) at 0.428 compared to 0.213 in Lincoln County. Specifically, this means that a higher proportion of households do not have a personal vehicle or live in mobile homes or group quarters. Around 18.5% of households also do not have access to internet. In Pend Oreille, around 50% of zip codes do not have access to an LSP (within 50 miles, 66% do not have access to a Midwife, and 66% do not have access to a doula. Both counties have significant gaps in birth worker availability and gaps in LSP access. Internet access and travel burden are significant barriers to accessing any available lactation support resources.

Ferry County is the smallest county in the Spokane region with an average RUCA score of 10 and a population <10,000 with <100 births annually. It has a higher composite Social Vulnerability Index (SVI) compared to other counties in the Spokane region with higher SES vulnerability (RPL Theme 1), Racial and Ethnic Minority Status (RPL Theme 3), and Housing Type and Transportation (RPL Theme 4) vulnerability scores. Similarly to Pend Oreille County,

66% of zip codes in this county do not have access to an LSP within 50 miles. This lack of local LSP availability likely has a significant impact on residents of the county given that this county has the highest proportion of households without access to internet in the state at 24.2%. Hence, telehealth appointments with LSPs may not be a solution for many residents of Ferry County. Ferry County would benefit from recruitment or training of local LSPs. Another solution could include utilizing spaces that provide free wireless internet and computer access in the area. For example, local libraries in Ferry County could designate a dedicated telehealth room with access to HIPAA compliant video apps where residents can privately meet with IBCLCs in other counties or other healthcare providers.

Greater Columbia

Counties in Greater Columbia and in other regions were noted to have access to doulas, but no access to midwives. Other counties had access to midwives, but minimal access to doula care. Differences in availability of doulas versus midwives could be related to the reimbursement structure for birth workers.[40] Midwifery services are reimbursed by Medicaid in Washington whether provided by CNMs or CPMs, but there are barriers to licensure in low-income communities. Historically, the exclusion of doulas from Medicaid reimbursement has harmed BIPOC communities, contributing to disparities in maternal health outcomes.[41] As of 2023, doula services are reimbursable by Medicaid in Washington state.[42] However, for doula services to be sustainable in low-income areas, Medicaid reimbursement must be adequate to provide economic incentives for doulas to work in these areas where there may not be a market for private doulas and where doulas must often travel longer distances to provide services at birthing centers or homes.[40] Thanks to years of advocacy work, as of 2024 Washington State doulas now receive the highest Medicaid reimbursement rate per birth of any state in the nation.[41] This is important, given that more than 45% of births in the state, and more than 70% of births in rural areas of Washington, are covered by Medicaid.[43]

Other Potential Resource Gaps and Challenges to Determining Resource Availability

Other counties/regions had significant gaps in other lactation resources outside of LSPs, Birth workers, Birthing Hospitals, WIC clinics, and WIC BFPCs as described above, including lactation support groups, classes, community health clinics, and outpatient lactation care. For example, about 39% of zip codes in Washington appear to lack access to breastfeeding classes within 50 miles and 30% of zip codes in the state lack access to lactation support groups. It is hard to determine whether this is due to a physical gap in these services or difficulty with data collection for these types of lactation services. However, it is highly possible that lactation support groups and classes are in fact widely lacking in areas across the state. Qualitative data collected by UW and WLC via a survey in 2024 revealed that group classes and/or support groups were the most frequently cited service that providers wished to offer with only 33.3% and 26.2% of respondents reporting that they provided group classes or support groups.[22]

Reliable data on WIC clinic locations, Birthing Hospitals, and WIC BFPC program data were obtained from WA DOH. However, data on the locations of IBCLCs across the state was much harder to obtain and less reliable given that there is no centralized listing for IBCLCs in Washington State. USLCA provides a short list of 24 IBCLCs in Washington State, but most practicing IBCLCs are not listed on their website, likely because USLCA charges a fee for IBCLCs to be a member of their organization and to be listed on their website.[30,44] This may be an additional barrier to identifying local IBCLCs in low-income communities where this fee may be prohibitive for joining the organization. Moreover, the cost of IBCLC training is a barrier to expanding IBCLC availability in rural and low-income communities where funding for training is less available. The lack of training opportunities and high cost of IBCLC training was described by multiple responders during the outreach process as a significant barrier to expanding access to lactation care in their community. Discrimination is an additional barrier faced by BIPOC communities during the IBCLC certification process.[45]

Limitations of Mapping Analysis & Uncaptured Barriers to Lactation Resource Access

GIS Mapping Software is a powerful tool which allows for geographic landscaping of healthcare resources. To our knowledge, this is the first mapping analysis of lactation resources in Washington state. The results of this analysis will be valuable in assessing which regions of Washington state are underserved and would benefit the most from community driven interventions and expansion of lactation support resources.

At the same time, GIS mapping analysis has a limited scope and several limitations. Firstly, it depends on the reliable gathering of data to be entered into the software. Data collection was completed to the best of our ability, but some resources, such as IBCLCs, Lactation Support Groups, Lactation Classes, etc. are harder to gather due to there being no consolidated online source, a lack of online visibility, and a short project timeline. More lactation resources were identified in counties with local coalitions. This could be due to the availability of resource guides and contacts to validate available resources. It could also be because these regions were more urban, as areas with higher RUCA codes were less likely to have a local coalition. Alternatively, this could be a result of local coalition work.

GIS software also excels in identifying how zip code and environment inform access to lactation support resources. It is also possible to link this with sociodemographic data to assess how social determinants of health affect the environment and present additional barriers. However, some barriers to lactation support cannot be depicted through mapping software. BIPOC communities face additional barriers to accessing lactation support services that are not depicted on the map we created. These barriers are rooted in structural racism, historical trauma, and systemic inequities.[46] Few lactation professionals share the cultural background or lived experiences of BIPOC clients. Culturally concordant care can alleviate some of these barriers.[47–49] In addition, traditional knowledge around breastfeeding may be devalued in Western models of medical and lactation care.[50] Several BIPOC led lactation organizations like Open Arms Perinatal Services,

BLKBRY, the Native American Breastfeeding Coalition of Washington, the Mahogany Moms Coalition, and Hummingbird Indigenous Family Services advocate for and provide culturally appropriate care to their communities.

Recommendations & Future Directions:

The following are equity-focused recommendations for the WLC:

Access to and Visibility of Lactation Support Providers in Underserved Communities

1. Partner with training programs to mentor and fund Rural and BIPOC LSP trainees.
2. Support the creation of a statewide, centralized, free, and public-facing lactation provider directory – including IBCLCs, CLCs, LECs, Peer Counselors, and other LSPs.
3. Collaborate with USLCA and/or ILCA to propose a membership fee waiver for IBCLCs serving underserved communities.

Deepening Understanding of Lactation Support Barriers in Underserved Communities

4. Organize Rural and BIPOC-focused listening sessions to better understand the unique challenges faced by these communities including resource availability, internet access, travel burden, and other barriers to accessing lactation resources.
5. Collaborate with the DOH or HCA in establishing routine statewide assessments of lactation access and disparities and advocate for additional funding to be allocated to address specific lactation resource disparities in Birthing Hospitals, WIC BFPCs, etc.

Supporting community-driven solutions

6. Identify rural clinics, WIC agencies, or libraries that could host lactation telehealth hubs.
7. Develop a lesson plan for a series of lactation classes that could be easily implemented in lactation deserts through partnerships between organizations like WIC and local community hubs like libraries or family service centers.
8. Support efforts to pilot mobile lactation support vans by coordinating routes to areas identified as having LSP gaps.

Future reports on the landscape of lactation support in Washington state should aim to understand how intersectionality impacts lactation outcomes for individuals holding multiple marginalized identities or for BIPOC individuals living in rural, low-income communities. This report presents the results of a quantitative GIS mapping analysis, but it does not paint the entire picture. A qualitative analysis focused on the perspectives of families and perceived barriers to accessing lactation care in underserved communities rural versus in urban areas would be a valuable addition to better understand barriers to lactation support through the lived experiences of families. Lastly, this analysis focused on whether or not populations in zip codes across the state have access to different types or resources, but it did not assess differences in the quality of resources accessible to communities in different parts of the state. Future analyses could build on the present mapping analysis by incorporating data on the quality or level of care provided to families based on their location.

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Appendix

Supplementary Figure. Percentage of Population Lacking Internet or Vehicle Access by County