# PUBLIC HEALTH SUPPORT NEEDS FOR RURAL COLLEGE-EDUCATED WOMEN IN NORTH CAROLINA TO DECREASE "BRAIN-DRAIN".


## ABSTRACT

Brain drain describes an emigration trend of a flow of educated people who migrate from one region to another, leaving the area of emigration 'drained' of its educated and skilled workers and community members[1,2]. In many cases, this emigration occurs from rural regions to urban regions, which hold more economic prospects than their rural counterparts. Brain drain hinders rural communities' ability to achieve healthy and comfortable standards of living. With the increase of globalization in modern times creating urban centers as economic hubs, rural communities are increasingly faced with brain drain, as individuals are more attracted to these larger and more densely populated regions. In North Carolina, non-profit and public scholarships, such as those from Lead for America[3] and the National Health Service Corps[4], have targeted these concerns by incentivizing college graduates to seek employment in rural areas. This essay examines the potential limitations of current incentives in relation to the safety and health of women in rural North Carolina and suggests that policy should prioritize these health needs in order to effectively address the issue of brain drain.

Without public health support in rural communities, there is no basis for women's health and there is little appeal for educated women to return to or migrate to a rural region. Especially in the tradition of neglecting women's health in public policy, educated young women, who have obtained a bachelor's degree or higher, may feel unmotivated to make rural regions their homes without transparent public support. Gender diversity in the United Kingdom, Canada, Latin America, and the U.S. increased financial returns by 15%, surpassing the national median[5]. Without public health support for women, brain drain makes it harder to achieve diversity in the workplace. This paper analyzes current public health strategies and suggests health policies for women living in Robeson County, Moore County, Avery County, Dare County, and Gaston County. By examining these policies, I create policy suggestions for addressing the public health needs of women in rural North Carolina as an initial priority to economic incentives.


## INTRODUCTION

### Background on women's health as a broad scope

In western health tradition, women's sociocultural status has meant that feminized bodies and female sex organs have not been prioritized in medical research and care. This is why the

WHO recognizes the status of women as having an effect on the healthcare they receive, creating a policy strategy addressing necessary global changes[6]. The inadequate access that women receive in healthcare is further exacerbated in rural regions where several factors, including public policy measures such as reproductive rights, are taken into account and is especially so for women of color in rural regions of the United States[7,8].

Educated women often travel further to receive specialized healthcare, indicating an appeal to higher standards of healthcare in rural areas for educated women[9]. To improve health outcomes, increasing the presence of local and specialized services is crucial. The lack of public health support in rural communities, along with the tradition of neglecting women's health in public policy, makes it less appealing for educated women to live in these areas, and analyzing current public health strategies health policies for women in Robeson, Moore, Avery, Dare, and Gaston counties in North Carolina can help address this issue and improve the public health needs of women in rural North Carolina.

### Defining women's health public policy

Women have less power in determining their health outcomes in communities that undervalue their sociocultural status. Without access to choose in health care procedures and without financial liberties to seek healthcare, women have presented gaps in global mortality and morbidity between men who are diagnosed with the same disease[10,11]. These disparities in global morbidity and mortality rates pertains directly to disadvantages in women's healthcare access and availability, a matter that is further strained in rural regions. In the United States, state policy on medical leave, gun restrictions for domestic violence, and abortion access contributed to the barriers that women of color in that state received[7]. This paper will analyze publicly available resources for women including public health department resources, clinics providing abortion services, and health insurance rates in each county.

### Creating case studies in rural North Carolina

A county-level examination of Robeson County, Moore County, Avery County, Dare County, and Gaston County was analyzed for some of these implications on women's health and looking at the connections between the levels of higher-educated women in those counties. Within these regions, counties were selected at random, excluding Robeson County which was selected for its cultural diversity. Two rural counties were chosen within the Piedmont region, which is N.C.'s most populous region. Educational attainment levels are provided by the American Community Survey (ACS) 5-year estimates and public health policy knowledge.

## Defining Public Health Policies that Focus on Women's Health

Pinpointing which health policies may have the most impact on women and their health creates a foundation for addressing brain drain. Improving the health status of women has been

shown to improve the health of children in communities in Sub-Saharan Africa, suggesting that women's health can be a determinant for community health as a whole[12]. Defining how to achieve a better and achievable standard of healthcare for women will have outreaching effects in their community and creates a baseline incentive for educated women to live in rural regions. Utilizing 14 peer-reviewed publications on public health and rural health in North Carolina, this paper has found policies centered on deregulating and ensuring health access, public health insurance, domestic abuse prevention and support, and medical leave could have a substantial impact on the improvement of health for women.

On the matter of population health, autonomy is highly valued and acts to establish a standard of health through human rights, and the loss of autonomy can result in inadvertent health consequences[13]. Restricting access to any safe healthcare intervention impedes on the autonomy of the patient, which occurs in the case of state's regulation on procedures including the highly controversial abortion procedure[14]. However controversial, this health intervention has been deemed as essential to the health of women and to children by the World Health Organization (WHO) and the United Nations (UN)[15,6]. While careful consideration is required to evaluate all aspects of an invasive procedure such as this one, it is essential for an autonomous adult to independently receive abortion care without prior approval or external dependency. Consultation should be sought between the patient and the licensed medical practice, without intervention of the state. Deregulating abortion is likely the most cost-effective health policy that rural communities could adopt.

In the U.S., health insurance is fundamental to receiving healthcare. Public measures have been put in place in order to ensure access to health insurance regardless of economic standing. However, between Robeson County, Moore County, Avery County, Dare County, and Gaston County the ACS survey indicated 11.3% of residents did not have health insurance[16]. In North Carolina, 85.5% of women aged 18-64 years had health insurance in 2019[17]. Insurance rates obtained by the ACS did not include health insurance by gender, however women in these counties could be particularly at risk of not having health insurance and could greatly benefit from public outreach and health insurance program expansions.

Other policies that are indicators of women's health in rural regions include domestic abuse policies and medical leave[7]. Medical leave has an economic influence and could directly be seen as contributing to the draw of educated individuals. When medical leave targets necessary breaks for conditions such as surgeries and pregnancies that particularly affect women, more educated women may be incentivized to choose an employer in a rural region with these medical safety nets.

Additionally, policy measures could be defined as targeting the health needs of women overall. This includes maternal health, but is not limited to this population as not all women are mothers, but many women do experience sexism in healthcare[18,19]. Sexism in healthcare particularly targets women of color and women in the LGBTQIA+ community[7,18]. By creating policies that target sexism and women's discrimination, these communities will see the most

improvements. In rural public health policies, community health could be measured through improving policies that deregulate women's healthcare access, expand health insurance coverage, domestic abuse policies creating safe communities, and medical leave for women.

## Design and Methodology

This academic literature review was conducted using databases in PubMed, Summon, and Web of Science. The following search results were used to create a thorough search on the literature for public policy recommendations and rural health knowledge (Figure 1). Search results included the phrases: "("Women's health") AND ((education) OR (rural)) AND (US) AND ((United States) OR (North Carolina))", "(public health) AND (north carolina) AND ((women) OR (robeson county) OR (moore county) OR (avery county) OR (dare county) OR (gaston county))", "(public health) AND (women) AND (north carolina)", "(Women's health) AND (disparities) AND (rural north carolina)", "((women) OR (health access)) AND (mortality) AND ((US) OR (United States))", and "(sexism) AND (health) AND ((US) OR (United States))". Out of these search terms, 14 papers were deemed relevant to the women's health and sexism.

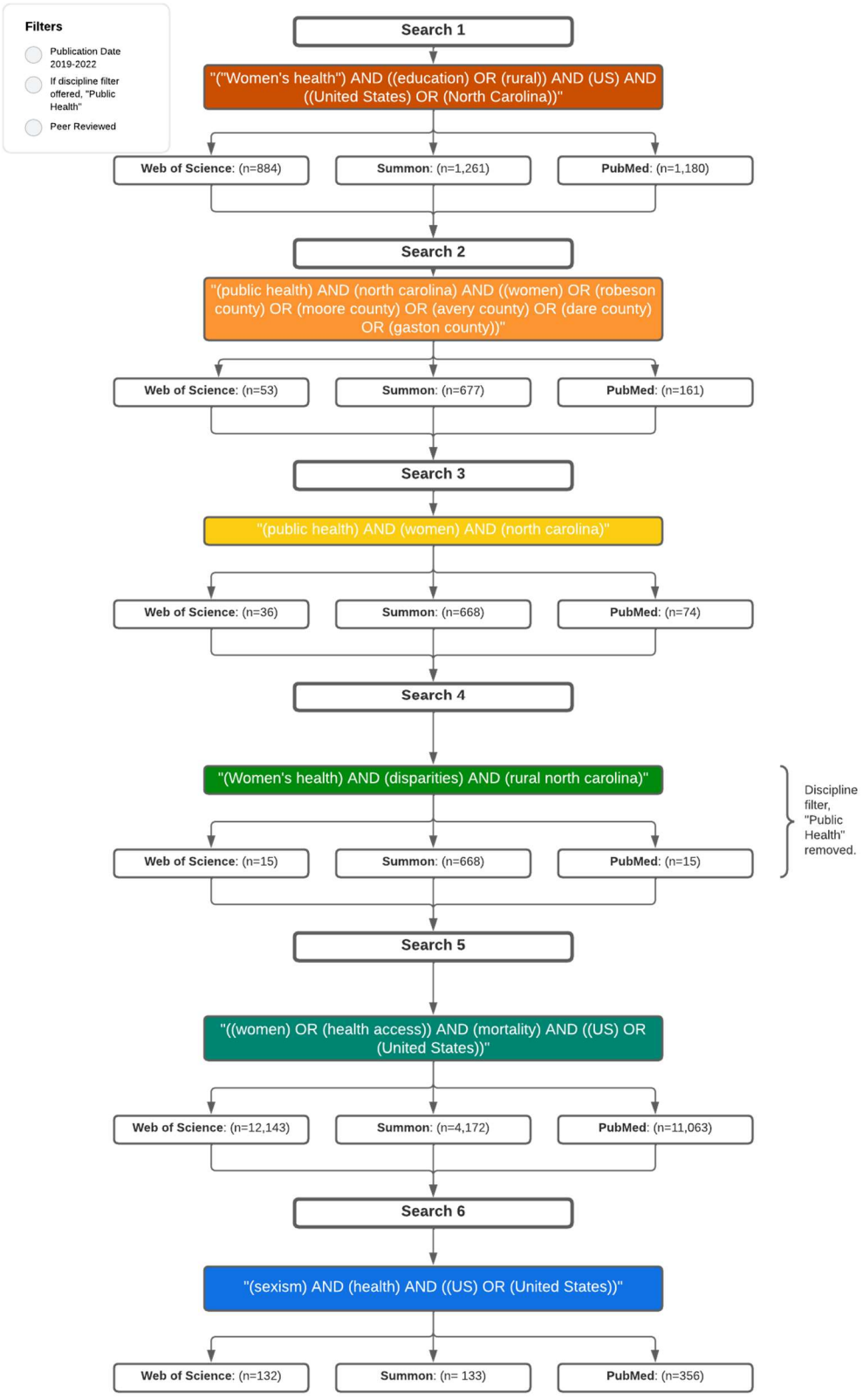
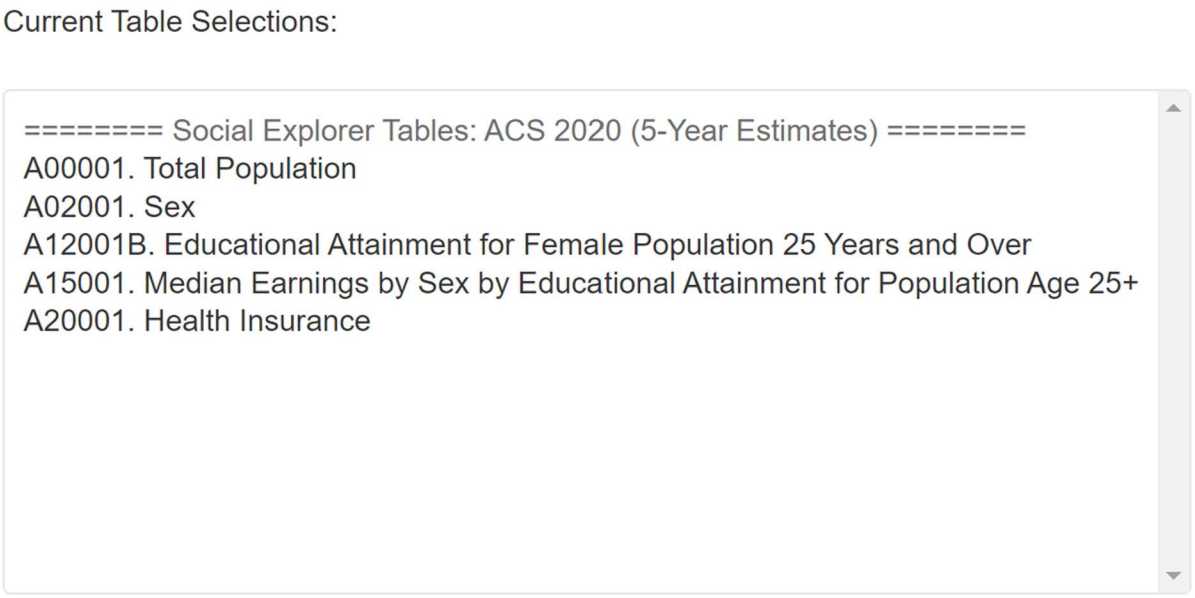

Filters
Publication Date 2019-2022
If discipline filter offered, "Public Health"
Peer Reviewed
Search 1
"("Women's health") AND ((education) OR (rural)) AND (US) AND ((United States) OR (North Carolina))"
Web of Science: (n=884)
Summon: (n=1,261)
PubMed: (n=1,180)
Search 2
"(public health) AND (north carolina) AND ((women) OR (robeson county) OR (moore county) OR (avery county) OR (dare county) OR (gaston county))"
Web of Science: (n=53)
Summon: (n=677)
PubMed: (n=161)
Search 3
"(public health) AND (women) AND (north carolina)"
Web of Science: (n=36)
Summon: (n=668)
PubMed: (n=74)
Search 4
"(Women's health) AND (disparities) AND (rural north carolina)"
Web of Science: (n=15)
Summon: (n=668)
PubMed: (n=15)
Discipline filter, "Public Health" removed.
Search 5
"((women) OR (health access)) AND (mortality) AND ((US) OR (United States))"
Web of Science: (n=12,143)
Summon: (n=4,172)
PubMed: (n=11,063)
Search 6
"(sexism) AND (health) AND ((US) OR (United States))"
Web of Science: (n=132)
Summon: (n= 133)
PubMed: (n=356)

**FIGURE 1**

Using the tables in the Social Explorer tool, data weregathered from the ACS 2016-2020 5-year estimates survey. This was the most recent ACS survey at the time of writing. A report was generated with North Carolina county filters including Robeson, Moore, Avery, Dare, and Gaston. Additional relevant filters that were added were, "Total Population" (A00001), "Sex" (A02001), "Educational Attainment for Female Population 25 Years and Over" (A12001B), "Median Earnings by Sex by Educational Attainment for Population Age 25+" (A15001), and "Health Insurance" (A20001). After using the ACS and the relevant literature, each county health website was consulted and searched for services that addressed women's health needs in adult health and maternal health and was scored according to the number of services that were explicitly pertinent to women's health. This score included maternal health services and breastfeeding services, though it is important to note that women's health expands beyond these needs. All services included are outlined before reporting the score and include unique services to each county. The score included the total number of services offered and is not indicative of quality of health. The tool, abortionfinder.org, was used to determine abortion access for each county.




## RESULTS

Women in all of five counties of Robeson, Moore, Avery, Dare, and Gaston, were less likely to have obtained a bachelor's degree or higher than women in other counties[16]. They were also making less in median wages than men in their counties who had the same educational attainment. The analyses below observe the conditions in each county drawn from the ACS.

### ROBESON COUNTY

Robeson County in North Carolina is one of the "most racially diverse county" and includes the native American Lumbee tribe[20]. The ACS estimates that 16% of those who responded as Female 25 years and older had a bachelor's degree and beyond[16]. Robeson County reported one of the highest levels of poverty compared to other counties in North Carolina[17]. Robeson County is located in the southern border of North Carolina and 51.8% of the population is recorded as female[16].

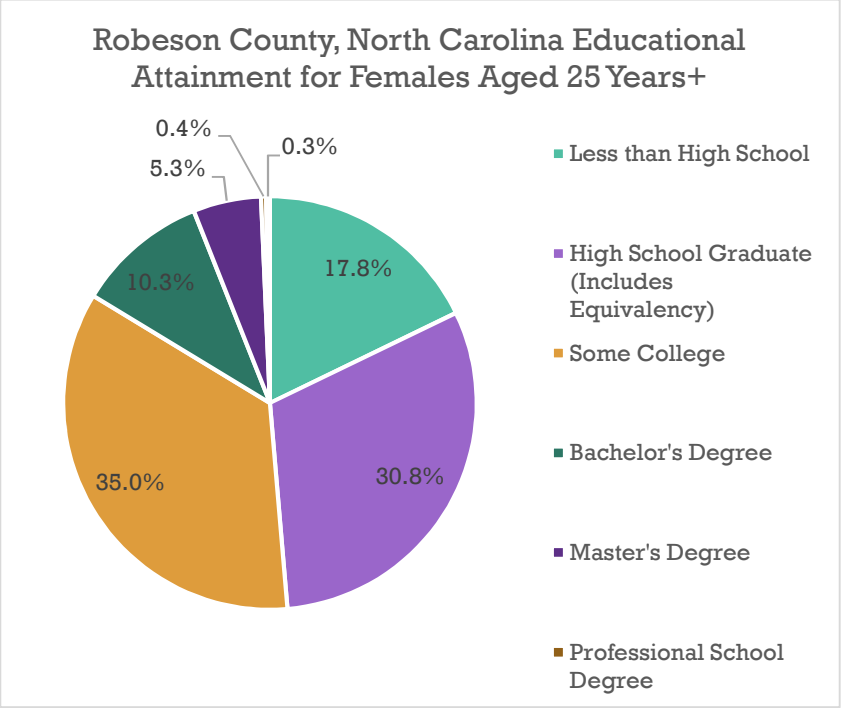



**FIGURE 2**

While the percentage of women with health insurance was not obtainable by the ACS, the total population with health insurance data showed that 14.2% of the population in Robeson County did not have health insurance, which was the highest uninsured percent between all five counties. 47.9% of the population with health insurance in Robeson County had public insurance[16]. According to the same ACS estimate, N.C. reported a total of 34.7% of residents who were covered by public insurance in the state. In the U.S., this figure was slightly higher at 35.4%. The higher rate at which Robeson County received public insurance should be considered when assessing public health concerns.

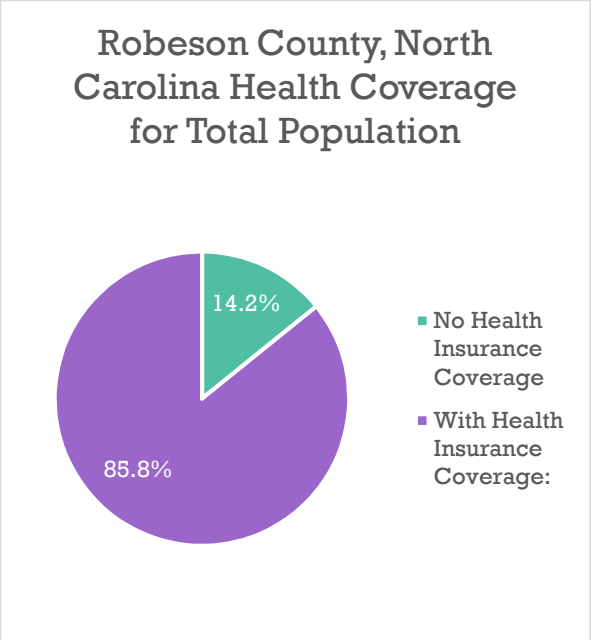



FIGURE 3

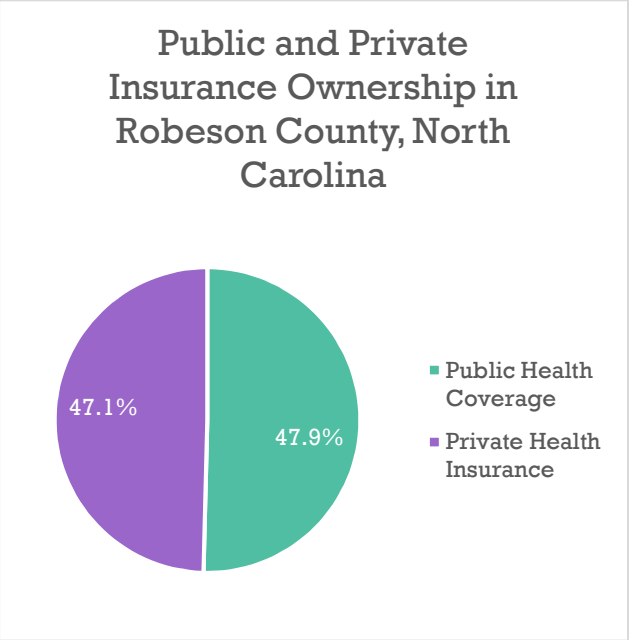



FIGURE 4

Robeson follows a similar economic trend to the rest of the nation where women make less in wages than the men in their same community (Figure 5). Men in Robeson County were more likely to not have attained a degree and made a median wage of $62,515 a year. While men make more money than women without obtaining a bachelor's degree or above, women continue to make less even when they do obtain a bachelor's degree and above compared to men with the same educational attainment (Figure 5).

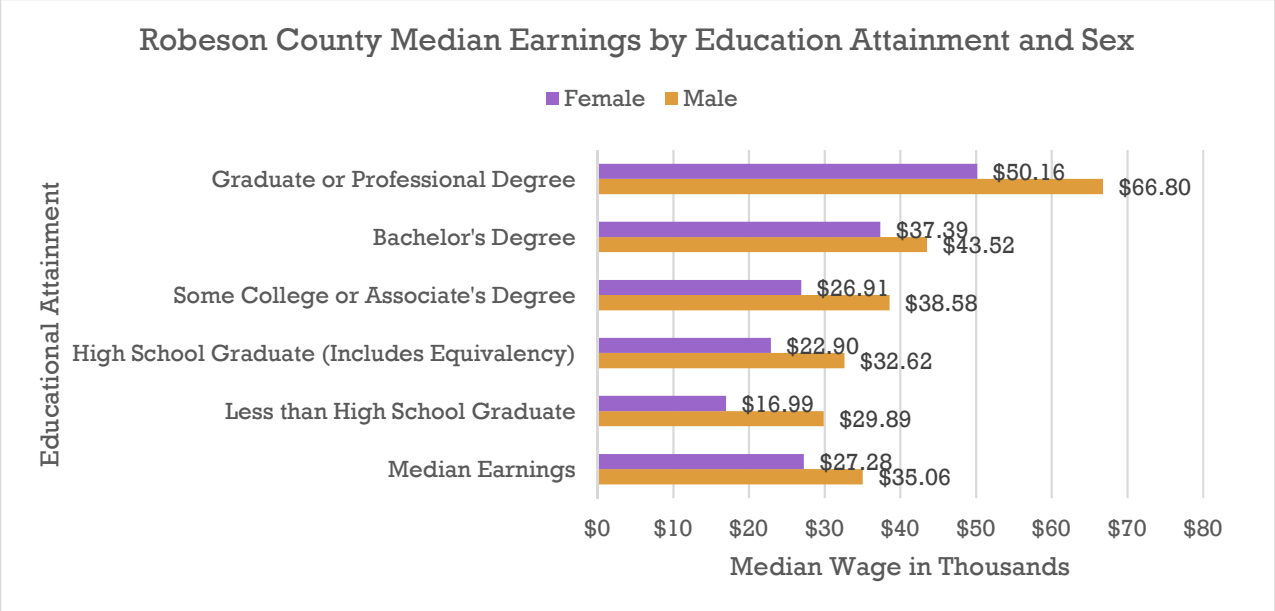



FIGURE 5

The closest clinics to access abortions in Robeson County reside in the next county over, in the city of Fayetteville, NC. Using the tool, abortionfinder.org, it was found that there are two abortion clinics operating in November of 2022, which both accept medicaid[21]. Robeson county health department did not include a women's health clinic but did include a maternal health clinic[22]. This clinic did not indicate any specialized services that could cater to the health of women, such as domestic abuse health and conditions that primarily target women (such as polycystic ovarian syndrome or PCOS). Robeson County, with services listed for breastfeeding and family planning, was given a score of two for the purposes of this paper. Health policies that directly addressed the health needs of women were not found in Robeson County literature or in county-level public health.

## Moore County

There was no relevant literature found on Moore County and women's health on PubMed, Summon, or Web of Science. All results obtained for Moore County included results from the Moore County health department, the ACS, and abortionfinder.org. Moore county is located in central NC and 51.9% of the population is female[16].

Moore County measured the second highest rate of educational attainment for women 25 years and older who had a bachelor's degree or higher at 36.5% (Figure 6). Wages for women fell short of meeting the same wages for men per educational attainment in Moore County (Figure 7). Moore County was the most insured out of all five counties at 91.5% insured with 35.7% on public health coverage (Figure 8)[16].

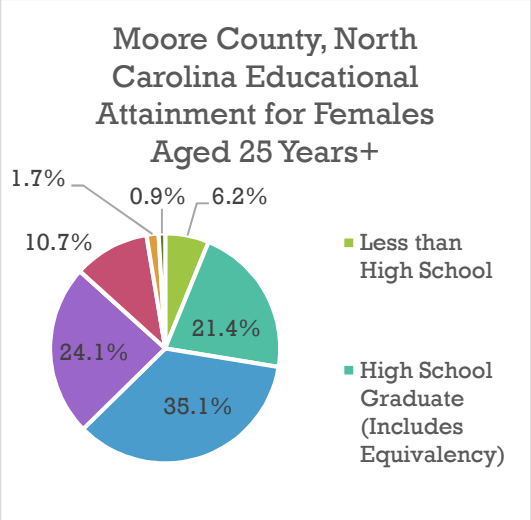



**Figure 6**

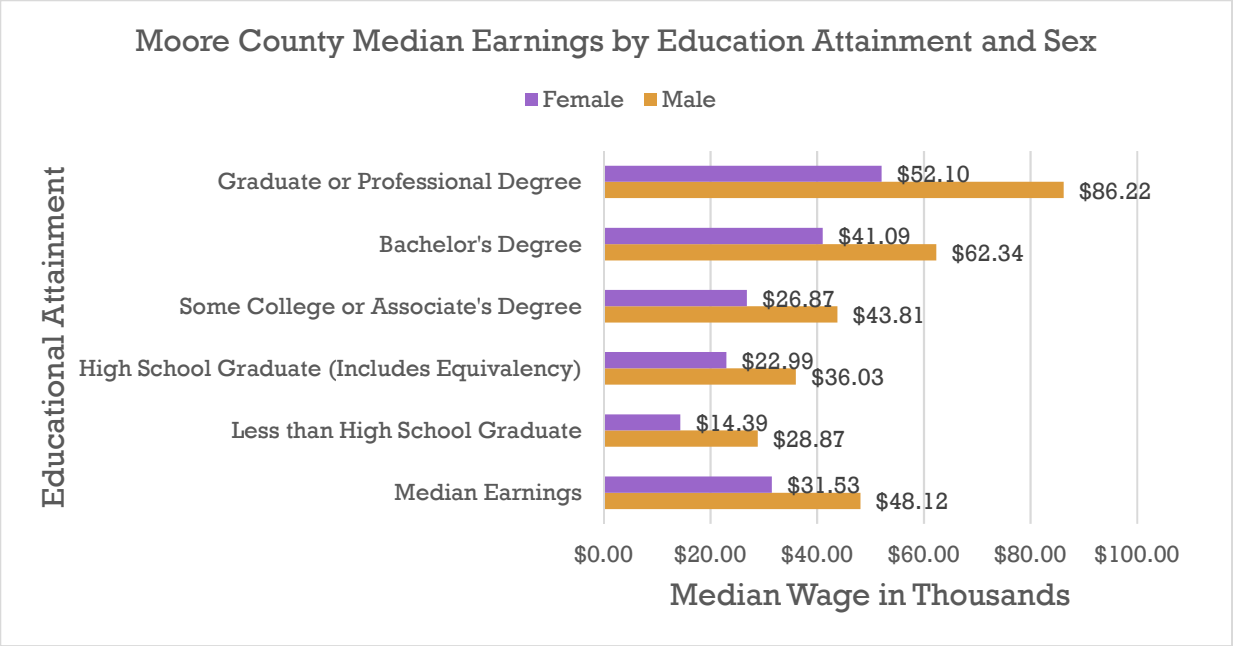



**FIGURE 7**

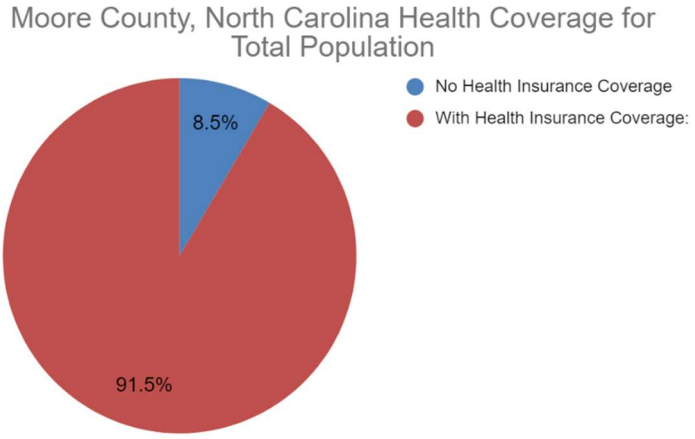



**FIGURE 8**

The Moore County Health Department listed reproductive (maternal health, STD, and family planning) health services and adult health services without mention of services pertaining to women's health beyond reproductive health[23]. With a list of three services that relate to women's health, the county was granted a score of three for the purposes of this paper. The abortionfinder.org tool recorded the same two clinics available to Robeson County as available to Moore County, suggesting an extended travel time in order to receive abortion care[21].

## AVERY COUNTY

Avery County is located in eastern North Carolina and includes 45% of female residents[16]. No literature in Avery County public health was found during the literature search, suggesting a

need for county-level examination. Out of the chosen counties, Avery County made the least in median wages[16]. Wages between male and female consistently showed a higher median for males over females, with growing gaps due to lower median wages (Figure 9). With the smallest population at 17,510, Avery County had a higher level of educational attainment for females aged 25+ with a bachelor's degree or higher than Robeson county (Figure 10). Avery County had a 85.3% percent who did have health insurance, with 38.7% of insured citizens having public health coverage[16].

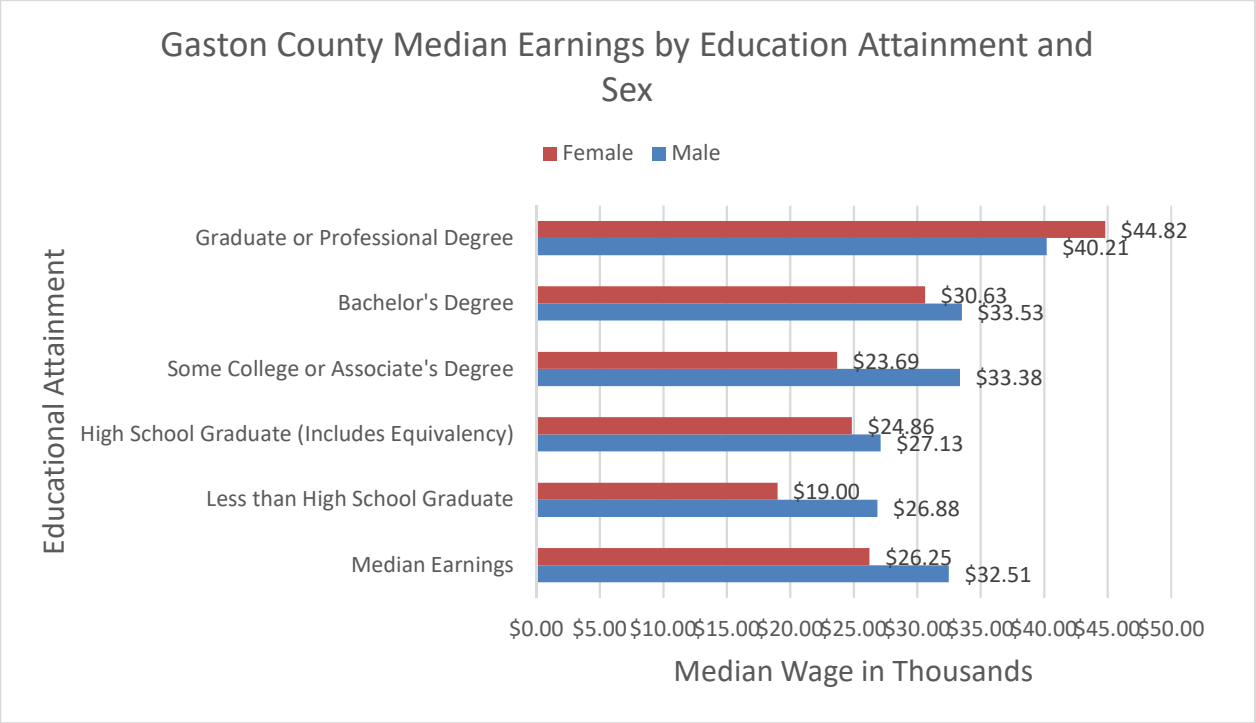



**FIGURE 9**

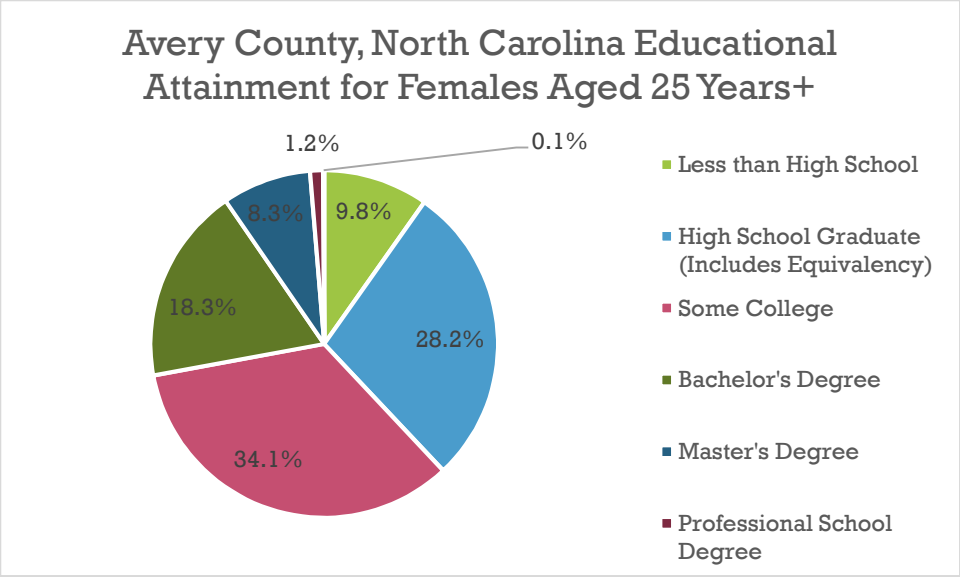



**FIGURE 10**

The abortionfinder.org tool found an abortion clinic 37.4 miles away from the Avery County border. The clinic was located in Virginia, whose laws include a ban at 26 weeks and 6 days and no waiting period[21]. The Avery County health department offered an overview of the services they regulate, which includes maternal health and family planning. The Avery County health department website listed adult health as a service but did not detail gendered adult health services that could appeal to women and so was not counted towards the score. Additionally, services were listed for breast and cervical cancer, family planning, breast & cervical cancer screening, pregnancy care management, and STD screening[24]. Avery County received a score of five for these services offered and 27.8% of females aged 25+ had received a bachelor's degree or higher.

## DARE COUNTY

Dare County is a mostly coastal community located on the easternmost side of North Carolina. According to the ACS, Dare county's female population was 49.9%, which was the second lowest population out of the five counties studied in this paper (Figure 11). Dare had the highest portion of females aged 25+ who had obtained a bachelor's degree or higher at 42% (Figure 12). Median wage earned per educational attainment followed the trend of lower wages earned by females to males. The county observed similar health insurance statistics with 12.6% of the population being uninsured and 30.3% of those insured being covered through public health plans[16].

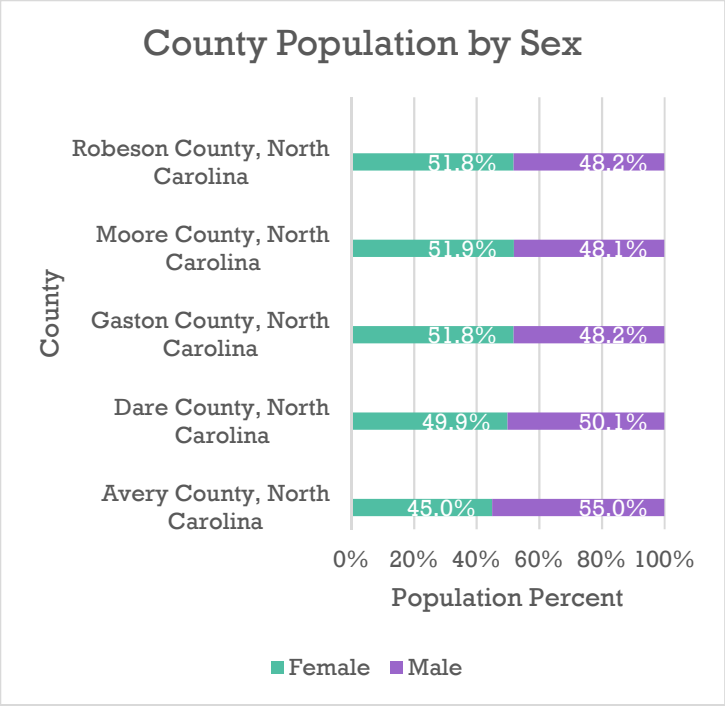



**FIGURE 11**

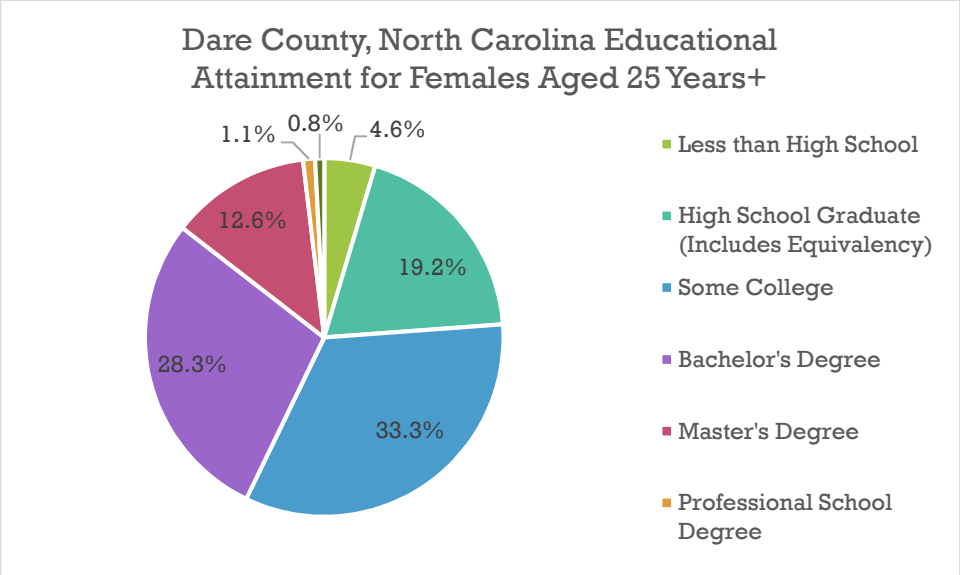



**FIGURE 12**

The closest clinic providing abortions to Dare County was 88.7 miles away and located in Virginia. There were 4 health clinics located around this distance and operated under Virginia state law[21]. Dare County Health and Human Services offered the most women-specific care services under the "adult health" section found on their website including women's health and family planning, breast & cervical screening, maternal health, pregnancy care management, STD screening, and "Women of Worth" totaling a score of six for the purpose of this paper[25]. While the

total population for females was lower in Dare County compared to the five other counties, they observed a higher rate of education for women. Further research could examine the relationship between this county-level focus on women's health and the highest portion of educational attainment in women between these five counties.

## Gaston County

Gaston County is located in the southern border of North Carolina and is further west than Robeson. 51.8% of the population in Gaston were female. Gaston County showed similar trends in healthcare insurance to other counties, with more public health coverage ownership than in urban counties of North Carolina.

Gaston County had the second lowest educational attainment for women aged 25+ with only 35.6% of that group having a bachelor's degree or higher. Median earnings per educational attainment remained lower for females than it did for males in Gaston[16].

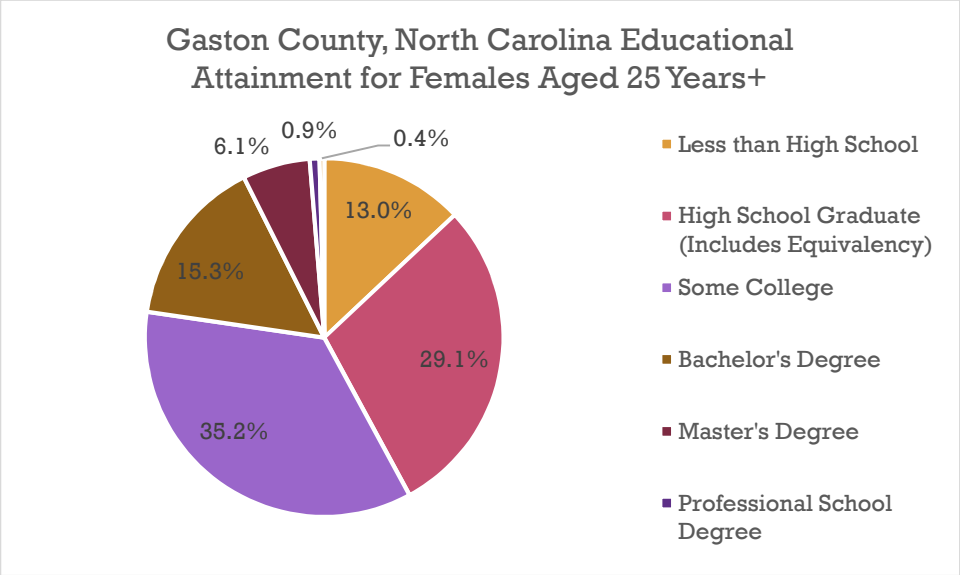



**Figure 13**

Three health clinics in Charlotte were located by the abortionfinder.org tool, each providing access to abortions. The closest clinic was 21.8 miles away from the Gaston County border[21]. The Gaston department of health and human services released a report for 2018 which cited the life expectancy for women was higher than for men[26]. Their county website did not explicitly outline any services, but a search for "adult health" rendered a list of services that included maternity services, STI services listed as adult health, and family planning. No other services were found on the public website and Gaston scored three for its services.

## Discussion and Conclusion

Each county showed a consistent economic gap between men and women based on educational attainment. This can make it difficult for women who do not have health insurance to

afford insurance and healthcare access, which diminishes their already limited autonomy in healthcare. Every county also reported high public health insurance usage. In North Carolina, abortions require a 72-hour waiting period and cannot be performed after 20 weeks, which applies to every county in this paper, except for those with clinics out of the state. Public insurance in North Carolina covers abortions under state policy[27].

| | **Robeson** | **Moore** | **Avery** | **Dare** | **Gaston** |
|---|---|---|---|---|---|
| *Score* | 2 | 3 | 5 | **6** | 3 |
| *Educational Attainment* | 16% | 36.5% | 27.8% | **42%** | 35.6% |

**FIGURE 14**

Women's health services scores and the educational attainment of women aged 25+ did not indicate a correlational relationship with the current sample. However, Dare County offered a unique service for women that extended beyond the services that other counties offered for women in their regions and had the highest percent of educational attainment for women. Exploring the causes of this relationship could provide insight into the benefits of explicit attention to the health needs of women in public health. Further studies should explore the benefits of providing a baseline of healthcare directly pertinent to women's health on educational attainment. Currently, the standards of healthcare cannot sustain the portion of educated women and excludes this population from supporting and habituating in rural regions. Rural regions have higher rates of publicly insured people than urban regions and indicate a probable benefit from increasing healthcare received by the county. This is particularly relevant to Robeson County, which population is nearly half insured through public health coverage.

Further research on county-level health could be conducted to determine a variable specific correlation to women's healthcare and women's educational attainment. The current literature and data is limited to the quantity of services offered by the county and does not include the quality and the experiences of rural women from those counties. Understanding how the quality of healthcare can impact the population's educational attainment rate is fundamental to addressing the needs of rural communities. In the case of Dare County, the highest educational attainment for women out of all five counties, the county health department offered the most services that targeted women's health needs. Dare also reported a median wage of $34,904 which was similar to the median wages of other counties (Figure 14).

| | **AVERY COUNTY, NORTH CAROLINA** | **DARE COUNTY, NORTH CAROLINA** | **GASTON COUNTY, NORTH CAROLINA** | **MOORE COUNTY, NORTH CAROLINA** | **ROBESON COUNTY, NORTH CAROLINA** |
|---|---|---|---|---|---|
| **MEDIAN EARNINGS:** | $29,429 | $34,904 | $37,354 | $39,941 | $31,081 |

**FIGURE 15**

Before beginning to address economic incentives to reduce brain drain, the health needs of the population must be met in its entirety. Women's health disparities are most notable by race and

create ripple impacts on the community at large[7]. Further research should fully explore the capacity that rural regions receive these disparities and attempt to address them through public policies.

## POLICY RECOMMENDATIONS

1.) *Develop robust women's health programs that cater to the specific needs of the rural region and make this information accessible via public platforms online and through traditional paper campaigns.*
    a. To address the health needs of women in rural communities, it is crucial to develop robust women's health programs that cater to specific needs in abortion access, health insurance, and the public health department resources of the region. These programs should be designed to address the unique challenges faced by women in rural areas, such as limited access to healthcare facilities and providers. Additionally, to ensure that these programs are accessible to all women in the rural community, it is important to make the information available through a variety of channels, including online platforms and traditional paper campaigns. This can be accomplished through targeted outreach efforts, such as community meetings, informational brochures, and social media campaigns. Furthermore, local government should invest in improving the infrastructure of the health care services available in rural areas and to increase the number of healthcare providers specifically trained in women's health, including primary care physicians. These efforts will not only improve the health outcomes of rural women, but also reduce the incidence of brain drain by providing more opportunities for women to live and work in their home communities.
2.) *Incentivize clinics providing specialized care for women (such as abortion care) to locate themselves within the most populous center of a rural community.*
    a. To improve access to specialized healthcare for women in rural communities, it is essential to incentivize clinics providing these services to locate themselves in the most populous centers of a rural region. This can be achieved through a variety of mechanisms, such as tax incentives, grants, and loan programs. By providing financial incentives to clinics and healthcare providers, local governments can encourage them to establish their practices in the rural areas where they are needed most.
    b. Additionally, the government may be capable of investing in building necessary infrastructures for clinics to provide specialized care for women. This can include providing funding for building and equipment construction, as well as for training and education for healthcare providers to ensure they are equipped to provide the specialized care needed by rural women. Furthermore, the government should provide subsidies to support low-income women to access these specialized care centers, this would make healthcare more accessible for everyone regardless of their financial situation. By creating a more equitable distribution of specialized

healthcare providers and services, rural women will have improved access to the care they need and will be less likely to have to travel long distances to receive it.

3.) *Outline health codes and regulations that equip women with access to personal and independent health insurance.*

a. To ensure that women in rural communities have access to personal health insurance, it is essential to outline clear health codes and regulations that guarantee this right. This can be accomplished by implementing policies that promote individual ownership when selecting health insurance. For example, the government can make it mandatory for all insurance providers to offer individual policies and provide detailed information about their coverage options. Additionally, local governments can provide subsidies for low-income women to help them afford health insurance. Local governments may also create a local public health insurance option for women who don't have access to private insurance.

   By providing women with access to personal and independent health insurance, women in rural communities will have access to the fundamental right of human health. This will empower women to take control of their own health and will also contribute to reducing brain drain in rural communities by providing more opportunities for women to live and work in their home communities.

There are significant gaps in the literature on women's health needs in rural areas, especially pertaining to women aside from their status as mother's. To assure that all women, and noting the greater disparities attributed to race and socioeconomic status, receive equitable access to healthcare for their health needs, public policy may consider targeting abortion access, public health insurance, and domestic violence restrictions. This paper encourages further examination on the relationship of educational attainment and women's health needs and suggests public policy be developed to protect the safety and autonomy of women.

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