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ANALYSIS OF WOMEN'S REPRODUCTIVE HEALTH CARE AND PRENATAL CARE IN RURAL VIRGINIA

A COMMUNITY BASED RESEARCH PROJECT

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Introduction

Throughout my undergraduate career I have strived to understand the intersection between poverty and health care. As a pre-medical student, I have sought to comprehend what it means to be a physician and how it requires a deeper understanding of the societal structures that impact people's health and contribute to healthcare inequalities. My sophomore year, one of my reading assignments in Poverty 101 was Janet Currie's *"Inequality at Birth: Some Causes and Consequences."* The study investigated the impacts of prenatal exposure to pollution in 2 cohorts, white college educated women and black high school dropouts, and subsequent incidence of low birth weight (LBW) and the future economic outcomes of their children. Currie found that incidence of LBW is more than three times higher in children of black high school dropout mothers than white mothers with a college degree [1]. LBW children have worse schooling attainment, test scores, use of disability programs, residence in high income areas, and wages.

The piece illustrated powerfully what it means to be born into poverty. The idea that your socioeconomic status can be predetermined by the health of your mother was mind-blowing to me and emphasized the importance of both structural and environmental impacts of poverty and of women's health. Women's health has always been a passion of mine and a possible specialty for my future career. Throughout my time at Washington and Lee, my poverty courses and community engagement have made clear the bubble that W&L's campus is. Thus, for my Poverty and Human Capabilities Studies Capstone I knew I wanted to engage

[1] Janet Currie, "Inequality at Birth: Some Causes and Consequences," Working Paper, Working Paper Series (National Bureau of Economic Research, February 2011), https://doi.org/10.3386/w16798.

with the community and specifically focus on an analysis of prenatal care in Rockbridge and surrounding rural counties. This paper delves into the importance of addressing disparities in prenatal care for women of low-income, an analysis of the health status of Rockbridge and surrounding rural counties specifically regarding women's health and prenatal care, and finally my recommendations for improvements.

The Issues Surrounding Women's Health

There is a longstanding history of differential treatment within health care of all women relative to men and specifically women of low socioeconomic status (SES) and minority women. In Cornell philosopher Kate Manne's manuscript "*Entitled*," her chapter "Incompetent – On the Entitlement to Medical Care" begins by recounting the experience of sociologist and writer Tressie McMillan Cottom's pregnancy as a black woman[2]. Her heartbreaking story describes how doctors and nurses failed to believe her unwavering 72-hour labor pains resulting in the loss of her premature daughter. Despite her attempts to self-advocate, Cottom was sent home twice. When she finally received an ultrasound, they found 2 tumors larger than the size of her baby. After being denied pain medication repeatedly, her story ends with the powerful recount:

> *"McMillan Cottom held her daughter and consulted with the nurse about how to handle her remains. The nurse then turned to her and said: "Just so you know, there was nothing we could have done because you did not tell us you were in labor."*

[2] Kate Manne, *Entitled* (Crown, 2020).

Manne goes on to review multiple studies on women and girl's denial of pain medication and decreased rates of receiving pain treatment compared to men, despite studies showing that women experience more pain than men given the same stimuli. She also recounts a promising study in the UK by Susan Wray which had the potential to reduce rates of unnecessary and dangerous C-sections by simply administering doses of baking soda. However, Manne warns against optimism as funding for the research was denied as it was deemed "not a high enough priority." She concludes the chapter by saying, "council members might as well have just come out and say it: the health of women – especially nonwhite and poor women – matters very little." Multiple facets of women's health are undermined and underserved due to existing societal and healthcare structures and norms.

The United States had a maternal death rate of 17 per every 100,000 live births in 2018, which is more than double other high-income countries[3]. The same report analyzing data from the CDC identifies differences in maternal care workforces, postpartum care access and paid maternity leave policies. These differences are attributed to an overall shortage of maternity care providers and an underrepresentation of midwifery, whereas in other countries, midwives greatly outnumber Obstetrician-gynecologists. The World Health Organization recommends utilizing midwives to reduce mortality through their ability to build relationships to understand and address social needs. Midwifery-led care creates a "more efficient use of health system resources including lower use of unnecessary and potentially harmful interventions like C-sections for low-risk deliveries, epidurals, and instrument-assisted births" and improved

[3] "Maternal Mortality Maternity Care US Compared 10 Other Countries | Commonwealth Fund," accessed February 14, 2023, https://www.commonwealthfund.org/publications/issue-briefs/2020/nov/maternal-mortality-maternity-care-us-compared-10-countries#1.

psychosocial and psychological outcomes. Despite their successful use in other countries, barriers to midwifery in the U.S. include a lack of uniform insurance coverage despite ACA requirements and low reimbursement rates for midwives. Although 52% of maternal deaths occur postpartum, the U.S. is the only country that does not guarantee access to additional care during this period.

Poor women suffer unequally regarding mortality and sterilization. 11% of Medicaid beneficiaries with ectopic pregnancies experience complications and are significantly more likely to experience complications than women with private insurance[4]. Factors related to the incidence of ectopic pregnancy include poor access to care, lack of follow up care, and decreased quality of care. Women receiving Medicaid also have a 4.7 times greater chance of being sterilized than those with private insurance.

Rural Health Care

Cost associated barriers are not the only preventor of receiving reproductive care. Women's healthcare and prenatal care in rural areas pose their own set of challenges. Since 2010, 126 rural hospitals have closed with one third vulnerable to closure in the future creating *health desserts* across rural U.S.[5] In addition to lack of resources, rural women cite decreased insurance coverage, lack of health insurance and difficulty locating a health center that accepts medical assistance. Rural women are more likely than women living in non-rural areas to travel

[4] D.B. Stulberg et al., "Ectopic Pregnancy Morbidity and Mortality in Low-Income Women, 2004–2008," *Human Reproduction* 31, no. 3 (March 1, 2016): 666–71, https://doi.org/10.1093/humrep/dev332.
[5] Michele Statz and Kaylie Evers, "Spatial Barriers as Moral Failings: What Rural Distance Can Teach Us about Women's Health and Medical Mistrust," *Health & Place* 64 (July 1, 2020): 102396, https://doi.org/10.1016/j.healthplace.2020.102396.

50-100 miles to get the care and coverage they need. Moreover, these women report feeling stigmatized and recipients of "poor treatment" due to their reliance on medical assistance. Women report lack of services as "shameful" and has influenced their willingness to seek primary health care. As *maternity desserts*[6] increase, rural women bear the costs – in time, finances, and emotionally – especially minority women.

The impact of labor and delivery unit (LDU) closures is highlighted in a study done in rural Georgia from 2012 to 2016. Georgia had the 6th highest rate of infant mortality rates and the 2nd highest maternal mortality rate in the nation in 2018 and 2019, and LDUs that closed had higher numbers of patients with Medicaid and black women[7]. The study states that low birth volume, provider shortages and inadequate Medicaid reimbursement impacted closures. LDU closures pose significant risks to black women who are 3.2 times more likely to die from pregnancy complications and 2 times more likely to experience fetal death compared to white women. Closures are associated with poorer health outcomes through increased preterm birth, infant mortality, lack of adequate prenatal care and unplanned out-of-hospital births. Similarly, rural counties in Alabama that lost obstetric services in 2005 consequently doubled their rates of infant mortality within 8 years compared to contains without closures.

Community Based Research

Ethnographic and Community Engagement

[6] "Maternity Care Desert," March of Dimes | PeriStats, accessed March 27, 2023, https://www.marchofdimes.org/peristats/data?top=23.

[7] Anna E. Carson Daymude, Joshua J. Daymude, and Roger Rochat, "Labor and Delivery Unit Closures in Rural Georgia from 2012 to 2016 and the Impact on Black Women: A Mixed-Methods Investigation," *Maternal and Child Health Journal* 26, no. 4 (April 1, 2022): 796–805, https://doi.org/10.1007/s10995-022-03380-y.

The implications of limited rural prenatal care, low birthweight, and hospital closures are not removed from Lexington, Rockbridge County or surrounding rural regions. In fact, these issues plague our community and have for decades. Towards the end of my research for this project, I stumbled upon two past Washington and Lee Capstone papers regarding this topic. In 2011, Kara Karcher conducted her women's and gender studies capstone on *"Access to Prenatal Care in Rockbridge County: A Community-Based Research Project."*[8] In 2012, Kelli Jarrell conducted her poverty and human capabilities studies program capstone on *"Women's Reproductive Health in Rockbridge County,"* which also followed a community-based research model[9]. The decade between their research and my own highlights many important considerations, primarily, the continuity of the problem. Secondly, it has been interesting to read these pieces and consider how the community has changed within the past 10 years and how their recommendations compare to my own.

Under the Virginia Department of Health (VDH), Rockbridge County is part of the Central Shenandoah Health district along with Augusta, Bath, Highland, and Rockingham. Within this district the health department serves around 285,000 residents.[10] In April of 2010, the closure of Stonewell Jackson Hospital (now Carillion Hospital) eliminated Rockbridge's only labor and delivery unit. Consequently, the next closest LDU is Augusta Hospital in Fishersville (~40 miles away), Roanoke Carillion in Roanoke (~60 miles away), or UVA in Charlottesville (~65 miles away). Rockbridge county is thus a "high outflow community," meaning that women must leave

[8] Kara Karcher, "Access to Prenatal Care in Rockbridge County: A Community-Based Research Project" (Washington and Lee University, 2011).
[9] Kelli Jarrell, "Women's Reproductive Health in Rockbridge County" (Washington and Lee University, 2012).
[10] Jarrell.

to deliver.[11] Women from high-outflow communities receive poorer prenatal outcomes, premature often difficult births, and longer post-partum hospital stays.[12] Much of Karcher and Jarrell's work in 2011 and 2012 centered around the then recent closure of Stonewell Jackson and its implications. Those implications are still felt today.

My initial investigation into the status of prenatal healthcare in the surrounding Lexington community started with an interview with Kimary Schatten, a Certified Nurse Midwife (CNM) at Rockbridge Area Health Center (RAHC). She spoke with me about the multiple rural barriers to care that low-income women face. These barriers include: the lack of birthing center or labor and delivery unit, lack of public transportation, and a lack of continuity of care. Before moving to Lexington, she described her experience working in Atlanta, Georgia. While she worked with vulnerable populations, she noted differences between care in Atlanta and Lexington. In Atlanta, urban neighborhood clinics were well known and utilized, and her practice used group models where expecting mothers of similar demographics and ethnicities engaged in educational and support groups, creating tighter social networks. She explained that the limitation with implementing such a social structure in Lexington is that the smaller population leaves less women pregnant at the same time and the population being less diverse.

Interestingly, Jarrell in 2012 reported that prenatal support groups and classes were offered at Stonewall Jackson with success. To my knowledge, those classes and group models no longer exist in its replacement, Carillion Hospital. Kimary reported that she used to offer prenatal education classes before the pandemic but has not picked them back up. She

[11] Karcher, "Access to Prenatal Care in Rockbridge County: A Community-Based Research Project."
[12] Thomas Nesbitt et al., "Access to Obstetric Care in Rural Areas: Effect on Birth Outcomes.," 1990, https://doi.org/10.2105/AJPH.80.7.814.

seconded that no other entity offers classes in Rockbridge and that people must go to Carillion Hospital in Roanoke or Augusta Health in Fishersville for such classes.

RAHC is a Federally Qualified Health Center (FQHC), so primary care ranging from pediatrics to prenatal visits are covered by Medicaid. It was exciting to see one of Jarell's recommendations in her 2012 analysis was for RAHC (which was at the time Rockbridge Area Free Clinic) to transition to a FQHC. As the only FQHC in the county, this was an important and successful recommendation. However, Kimary still claims that one of the largest barriers the clinic faces is lack of utilization. Before she got to Lexington, she noted that there was very limited to no prenatal care and most frequently still, women forgo prenatal care all together. Despite comprehensive local advertising, she notes that she could fit twice as many patients into her daily schedule, and when women do come to her prenatally, instead of going straight to the closest labor and delivery unit, they come late in their pregnancy. To circumvent the issue of utilization, the clinic is actively implementing a mobile unit to increase community outreach and go directly into communities to offer services which is an extremely important step in the right direction for increasing accessibility.

When I asked Kimary her opinion on addressing infant and child mortality, she asserted that addressing concerns at childbirth – and late onset prenatal care – is too late. Her largest emphasis was on addressing prenatal care as upstream as sufficient reproductive education in schools. I was shocked when she told me Rockbridge public schools still teach abstinence. Interestingly, according to Jarrell in 2012, the local health department offered a weekly "teen clinic" at Rockbridge County High School where a nurse from the health department educated teens on "family planning, STIs, and cervical cancer screenings and general information about

sex [and] pregnancy."[13] Today, Kimary reports that "no one from health care goes into public schools at all. They have school nurses and a family health course, but it does not involve any sex education." Consequently, Kimary notes that often when pregnant women come to her, they convey sentiments like "I didn't think this would happen to me." My correspondence and conversations with Kimary have solidified the complexities of addressing disparities in prenatal care. Additionally, it is extremely interesting that services that existed in 2011 and 2012 no longer exist in 2023. Despite attempts to contact Carillion hospital and the local health department, this remains a mystery to me, and questions remain about when and why the programs ended and why their re-establishment hasn't been prioritized.

The next interview I conducted was with Laura Lee Wight, population health manager of the Central Shenandoah District at the Virginia Department of Health. I contacted her to obtain raw data surrounding prenatal care in the Rockbridge area as well as ask her more public health policy-based questions. She initially noted limitations of most recent data available being from and before 2020 and the rural county data being incomplete due to inherent limitations in rural reporting. When questioned about Virginia's approach to sex education, she informed me that there is no state mandated program, so is it up to the discretion of individual school boards to prioritize reproductive education. The school boards of Waynesboro and Stanton in collaboration with the office on youth have implemented sex education programs.

Laura briefly explained the politics of where VDH funding comes from in certain regions, and that since individual districts are partially funded by localities, they must first provide the mandated initiatives prioritized by those localities. When asked about state policies

[13] Jarrell, "Women's Reproductive Health in Rockbridge County."

surrounding prenatal care, she mentioned "BabyCare," an unmandated home visitation program implemented by the VDH, covered by Medicaid. However, she mentioned that, to her knowledge, the program stopped in 2020 when all VDH efforts were shifted towards the pandemic.[14] I also asked her about the recent Virginia Medicaid Doula Program, and she confirmed that there is movement at the state level about increasing access to doulas. However, she also noted that they do not run pilot programs for these services in her region and it is not a program that her district has adopted.[15]

Local Health Data, Assessments, and Reports

"The services here are abysmal."

The second half of my investigation includes an analysis of more recent health data of both Rockbridge County and surrounding rural counties. The Rockbridge Area Community Health Assessment (RACHA) in 2018 analyzed survey reported health-related issues facing the community. The assessment included 26 surveys and one focus group. The number of respondents averaged around 20 people per question. The report found that top health concerns among residents were poverty, lack of health literacy, and access to care[16]. The report cites needs among the community as increased access to healthcare, transportation, social care, education, and care coordination. Obstetric and gynecological services were listed first in specific healthcare needs, and teen pregnancy was cited as a concern among health officials.

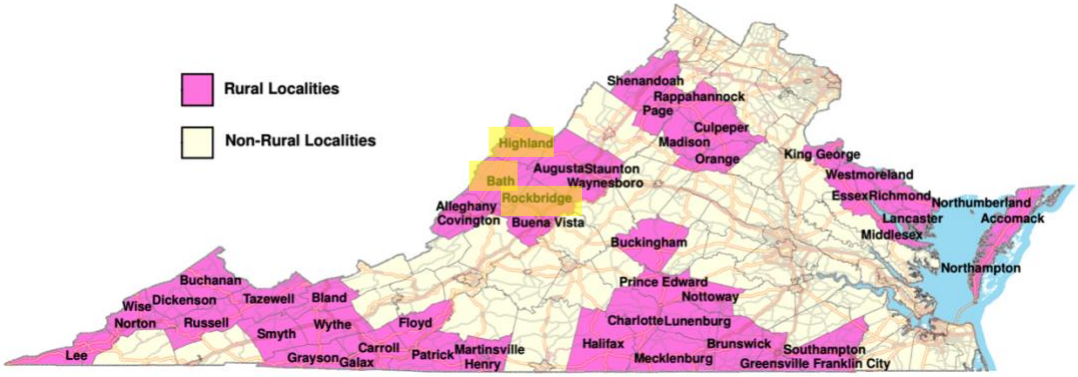
[14] Since learning about the program, I have called the contact number listed on the VDH website but have not heard back.
[15] Since our conversation, I have reconnected to obtain a contact in the state department to ask follow-up questions regarding these two programs, obtain a better understanding about the trickle-down process of policy implementation in rural districts, and the process of mandating programs at a local level.
[16] Carilion Clinic, "Rockbridge Area Community Health Assessment," August 31, 2018.

Rural areas were identified as an area with the greatest unmet need and women as the population with the greatest unmet needs. Health education was listed as a change to reduce barriers to health.

More than 60% of respondents reported a shortage of care including primary care, OB/prenatal care, and full-time physicians. 50% said the current medical care system is confusing making it hard to find doctors and get appointments specifically regarding women's health services and family planning. Barriers to obtaining care were identified as cost, lack of health insurance, lack of knowledge about available services and provider mistrust. In 2014, late or no prenatal care rates were higher in Rockbridge County than for the state *(see supplementary data Table 1).* The report confirms a consensus for improving healthcare in Rockbridge County, specifically regarding women's healthcare and education.

For the remaining regional analysis, rural counties were identified using the USDA Economic Research Service with the U.S. Department of Agriculture[17]. Rural counties are classified on a 9-point scale using the 2013 Rural-Urban Continuum Codes data set which was updated most recently in 2020. Codes 1-3 describe metro counties and 4-9 represent nonmetro counties. Counties with higher codes are increasingly rural with a score of 9 being the most rural. Surrounding Rockbridge County with a code of 6, Bath County and Highland County both score an 8 and were therefore included in my analysis to create a model for "rural counties surrounding Rockbridge."

[17] "USDA ERS - Rural-Urban Continuum Codes," accessed March 19, 2023, https://www.ers.usda.gov/data-products/rural-urban-continuum-codes/.



Virginia Rural (Non-Metropolitan) Areas as Defined by the Office of Management and Budget (OMB)[18]

The Health Resourced and Services Administration (HRSA) Maternal and Infant Mapping Tool with data ranging from 2017 to 2019 was used to compare Rockbridge, Highland, and Bath counties' health indicators, health equity, and health resources[19]. Regarding health indicators of infant mortality, low birthweight, prenatal care in the first trimester, and preterm birth, Rockbridge County performs similarly to Highland and Bath counties *(see supplementary Table 2).* Bath and Rockbridge Counties report racial inequities in infant mortality with black babies having more than twice the mortality rate than white babies *(see supplementary Table 3).* Finally, the health resources indicator demonstrates an overall lack of providers and healthcare access across all three counties *(see supplementary Table 4).*

The Virginia's Plan for Wellbeing is an initiative launched in 2022 by the VDH in partnership with the University of Missouri Extension CARES[20]. The project contains the Virginia

[18] VDH, "Rural Virginia Defined," *Health Equity* (blog), accessed March 27, 2023, https://www.vdh.virginia.gov/health-equity/rural-virginia-defined/.
[19] Health Resources and Services Administration, "Maternal & Child Health | HRSA Data Warehouse," 2020, https://data.hrsa.gov/maps/mchb/.
[20] VDH, "Virginia Community Health Improvement Data Portal – Virginia's Plan For Well-Being," 2020, https://virginiawellbeing.com/virginia-community-health-improvement-data-portal/.

Community Health Improvement Data portal which provides a variety health indicator of data across years. Their plan features their public health priorities, priority number one being improvements in infant mortality. Bath and Highland reported higher rates of infant death, low birthweight, teen pregnancy, and late/no prenatal care compared to the state of Virginia. Rockbridge county scored lower comparatively in nearly every variable, except ranked similarly in late/no prenatal care at 11.21% of total live births compared to 4.07% for the state *(see supplementary Table 6).*

The Virginia Pregnancy Risk Assessment Monitoring System (PRAMS) is an ongoing population-based survey of women who have given birth in VA as an initiative by the CDC[21]. Data is collected yearly, but unfortunately only for Richmond City and Blue Ridge Health District only. In 2020, 944 mothers completed the survey with 279 coming from Blue Ridge Health District which includes Albemarle, Charlottesville, Fluvanna, Greene, Louisa, and Nelson counties. The study investigated disparities across race and prenatal care. Compared to white women, black and Hispanic women have higher percentages of inadequate prenatal care, and lower rates of received home visits (particularly for Hispanic women at 0.17% receiving a visit).[22] Black women were also found to have a higher percentage of receiving a cesarian section which has significant implications since increased rates C-section are associated with poorer health outcomes both for the mother and child *(see supplementary Table 7).* While there is no current PRAMS data for the Central Shenandoah Health District, the data can be

[21] VDH, "Virginia PRAMS Facts," 2020, https://www.vdh.virginia.gov/prams/resources/.
[22] The report did not cite the origins or program associated with home visits.

reasonably generalized – if not presumably worse – in the more rural Central Shenandoah Health District with larger rates of poverty.

Recommendations

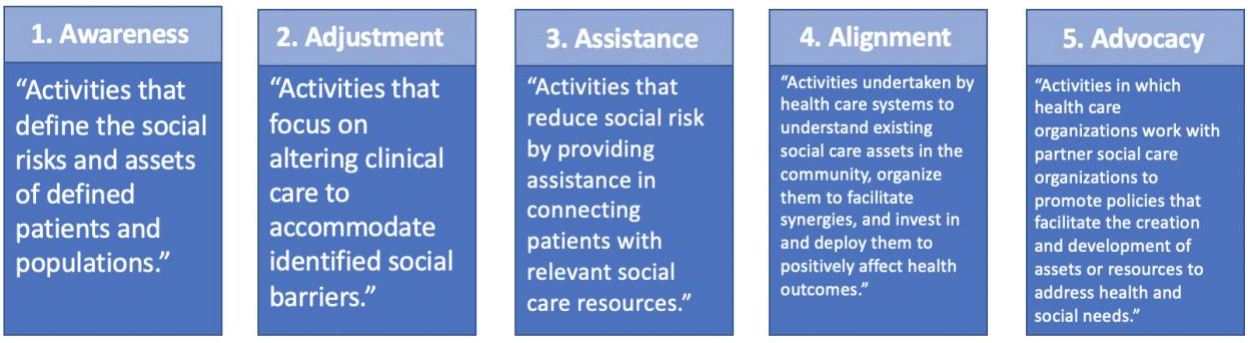
The complexity of addressing disparities in women's healthcare and additional barriers encountered in rural regions creates a large range of opportunities for intervention. I have considered many areas of improvement and their feasibility in Rockbridge and surrounding counties. Areas of intervention that were explored, but not expanded upon include: transportation, labor and delivery unit or birthing center, and reproductive education in schools.

The issue of transportation in rural communities is still paramount; however, the implementation of the mobile care unit by RAHC and the Rockbridge Area Transportation System (RATS) both serve as positive existing interventions in Rockbridge County aimed at combating this barrier. Regarding feasibility, improving the infrastructure of Rockbridge County and implementing an improved public transportation system remain lofty goals.

Kimary and I discussed the issue of LDU closures, and what implementation of a new LDU or birthing center in Rockbridge County would look like. She explained that doing so would require heavy recruitment of additional practitioners such as an anesthesiologist and a larger team to construct a successful center. Recruiting general practitioners and nurses to rural Rockbridge already poses a challenge and thus renders the feasibility of opening a new LDU improbable.

Regarding education, as discussed with Laura Wright, implementation of sexual education in public schools is up to the individual school board and community. I urge the school board and community to follow in Waynesboro and Stanton's footsteps in prioritizing this effort since appropriate sexual education has been a well-established preventative measure against teen pregnancy and promoting overall health which are forementioned community concerns within Rockbridge County.

The following recommendations are based on the larger goal to integrate social care into rural prenatal care. The National Academies of Sciences, Engineering, and Medicine released a 195-page extensive report in 2019 titled "*Integrating Social Care into the Delivery of Health Care: Moving Upstream to Improve the Nation's Health*."[23] The report defines social care as "activities that address health-related social risk factors and social needs" and emphasizes examining the social determinants of health to lead improvements in healthcare. They name five healthcare activities to better integrate social care as "awareness, adjustment, assistance, alignment, and advocacy."



[23] *Read "Integrating Social Care into the Delivery of Health Care: Moving Upstream to Improve the Nation's Health" at NAP.Edu*, accessed February 27, 2023, https://doi.org/10.17226/25467.

The United States has a higher percentage of GDP spent on health care services (18%) compared to most countries, despite countries with higher ratios of social to health care showing better healthcare outcomes. The committee claims that the U.S. fee for service health care provider payment does not encourage social care integration. They argue for implementation of a workforce specializing in social care as well as organization level changes and discuss institutional barriers that limit the scope of practice of social care providers. They explain that barriers to financing social care stem from historical definitions of health care and medicine that have challenged integration of social care into the health care setting and variation of social care benefits due to levels of Medicaid coverage.

Integrating social care into health care is imperative not only reduce inequalities, but also to make the delivery of healthcare more upstream instead of approaching disparities when it's too late. This idea is best illustrated in a public health parable coined by Irving Zola:

> *"The story's protagonist is standing alongside a river that is slowly filling with Drowning people. The protagonist starts pulling each drowning person from the water but finds the pace of saving drowning people an impossible one to keep. More importantly, the immediacy of the need also prevents the protagonist from traveling upstream to determine how these people have come to be in the river at all."*[24]

[24] *Read "Integrating Social Care into the Delivery of Health Care*.

Home Visitation Programs

Pre and postnatal home visitation programs have been a successful intervention for improving women's healthcare globally for decades and are an example of successful integration of social care into healthcare and community outreach. Visitation programs are conducted most often by a registered nurse or practitioner in either the patient's home or in a neutral location. The sessions offer health education, social support, and referral information. Home visitation is not a new idea, but within the last few decades its emphasis and integration has been positively associated with increased birth weight and increased used of medical care and community services.[25] Home visitation programs show positive benefits for all women, but specific studies show that such programs are a successful means to serve low-income women at high risk for poor pregnancy outcomes[26]. Implementation of a home visitation program would aim to address the identified issues facing women in Rockbridge County including continuity of care, awareness, health education and literacy, utilization of services, community trust, cultivating social networks, and combating racial disparities. Additionally, such a program fits the definitions of adjustment, assistance, alignment, and advocacy healthcare activities.

In 1987, the Virginia Department of Medical Assistance Services (DMAS) launched the BabyCare home visitation program. The program offers three specific services: 1. Behavioral risk screening through DMAS criteria, 2. Case management and 3. Expanded Services. Case Management includes service planning and coordination, referral information, follow-up care,

[25] D. L. Olds et al., "Long-Term Effects of Home Visitation on Maternal Life Course and Child Abuse and Neglect. Fifteen-Year Follow-up of a Randomized Trial," *JAMA* 278, no. 8 (August 27, 1997): 637–43.
[26] Olds et al.

monitoring and education. Examples of the type of aid provided include scheduling appointments, assisting in completing forms, and coordinating with practitioners and social service organizations. The expanded services include nutritional services, home-help, substance abuse treatment services and educational classes which can include themes like breastfeeding, labor and delivery, and child safety. To use this service, women must be Medicaid eligible and pregnant or have an infant up to two years of age. BabyCare uses a fee-for-service model. There are a variety of providers that can offer BabyCare, including local health departments, FQHCs, community and rural health clinics, physicians, and practitioners. FQHCs, rural health clinics, local health departments, and physicians and practitioners can bill for BabyCare services and other providers must enroll first with DMAS to bill for services.

Despite being created in 1987, when questioned about BabyCare, my community contacts cited limited if no use of the program. My contact at the Virginia Department of Health cited that the program is not state mandated and was used with varying success until COVID hit. Since COVID, she does not believe that the program has been reimplemented. I asked Kimary Schatten, CNM, about the program as well, and she seconded that BabyCare has not been offered since COVID, and elaborated on her thoughts:

> *"The local health department has lost almost all its funding and staff and are unable to provide many of the services that they used to. Honestly, even before COVID, I think this program was very underutilized – I offered it to a few of my patients…and I don't know anyone that took the health department up on it. I think in general it is hard to make people comfortable inviting any unknown "government workers" (health department*

etc.). Many patients are very private and proud and either don't want to show their places to outsiders or don't want to "get in trouble." Many of my rural patients are used to authorities coming to their houses for various child protective services or drug/law enforcement reasons that they are afraid of. Ideally these programs would be facilitated by trusted local community members rather than outside officials."

I share many of Kimary's concerns regarding the feasibility and efficiency of the program as well as understanding the barriers to utilization. While advocating for BabyCare's reintegration into rural prenatal care, I also call for its revising. Kimary's words echo that the people conducting home visits should be members of the community. Community members conducting visits will play a vital role in cultivating trust while providing health care to low-income women[27]. Ethnographic studies report more trust with lay healthcare workers (LHW) and nurses than with physicians due to increased contact. Decreased trust increases disenrollment of care, poor compliance and thus decreased overall health. Thus, I believe the most successful demographic would be older, possibly retired, mothers ranging in diversity. They should be employed and trained by a responsible provider of BabyCare whether that be the local government health department or other clinics. Responsible meaning, they will take on the challenge of ensuring reimbursement for women employed by the program. Employing community members will be a more efficient resource for cultivating trust with patients.

[27] Vanessa B Sheppard, Ruth E Zambrana, and Ann S O'Malley, "Providing Health Care to Low-Income Women: A Matter of Trust," *Family Practice* 21, no. 5 (October 1, 2004): 484–91, https://doi.org/10.1093/fampra/cmh503.

Virginia's Medicaid Program and Department of Medical Assistance Services (DMAS) in January of 2022 implemented the community doula program in an effort to reduce racial inequities in maternal health outcomes[28]. State-certified doulas are trained nonmedical professionals that provide support throughout pregnancy with a commitment to connecting with community in which they serve. Virginia is the 4th state to implement a doula program covered by Medicaid. Women first must be recommended by a practitioner after which nine total 60-minute visits are covered. Doulas are reimbursed up to $859 and are incentivized monetarily to make referrals to ensure comprehensive care[29]. Doula programs are increasingly reviewed and found to have immense positive impacts on rates of cesarian sections and postpartum depression[30]. While the program is very new and the Virginia Department of Health reports movement at the state level, the Central Shenandoah Health District still reports that is has not "adopted the program." The Virginia Medicaid Doula Program therefore serves as another existing window of opportunity for integration into rural communities.

University Outreach Program

Employing members of the community within larger health care programs is also not a new idea. Rush University Medical Center in Chicago, Illinois adopted a framework for prioritizing "health equity as a system strategy." This strategy aligns with the Center for

[28] NASHP Staff, "Virginia Invests in Doulas to Improve Maternal Health Outcomes," *NASHP* (blog), February 28, 2022, https://nashp.org/virginia-invests-in-doulas-to-improve-maternal-health-outcomes/.
[29] Meghan McIntyre, Virginia Mercury October 10, and 2022, "Doula Services Now Covered under Virginia Medicaid Expansion," *Virginia Mercury* (blog), October 10, 2022, https://www.virginiamercury.com/2022/10/10/doula-services-now-covered-under-virginia-medicaid-expansion/.
[30] April M. Falconi et al., "Doula Care across the Maternity Care Continuum and Impact on Maternal Health: Evaluation of Doula Programs across Three States Using Propensity Score Matching," *EClinicalMedicine* 50 (August 1, 2022), https://doi.org/10.1016/j.eclinm.2022.101531.

Medicaid Service's 2019 recommendations to improve access to maternal health care in rural communities. Health Equity as a System Strategy: The Rush University Medical Center Framework aligns with the Center for Medicaid services in 2019 recommendations to improve access to maternal health care in rural communities[31]. Rush is a Chicago based academic health system which in 2017 launched their Anchor Mission to "hire, purchase, invest, and volunteer locally"[32]. Their Anchor institutions are nonprofit or "public based entities" such as hospitals and universities. Among their five pillars of supporting health equity, number four stands to "eliminate health care inequities." To do so, they started two home visitation programs, one for postpartum mothers.

Larger collaborative institutions like Rush University Medical Center can implement the cohesive, collaborative, structural change needed to promote health equity. Many studies have found that when such structural changes are made in the way services are offered, low-income families experience increased rates of use.[33] A common pattern has been found that while costs and attitudes can be barriers, they are not the only barriers association with lack of service utilization. In fact, they only tell part of the story and structural barriers to adequate delivery must be examined.[34]

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[31] Center for Medicare and Medicaid Services, "Improving Access to Maternal Health Care in Rural Communities" (CMS, September 3, 2019).
[32] David A. Ansell et al., "Health Equity as a System Strategy: The Rush University Medical Center Framework," *NEJM Catalyst* 2, no. 5, accessed March 16, 2023, https://doi.org/10.1056/CAT.20.0674.
[33] W. Sword, "A Socio-Ecological Approach to Understanding Barriers to Prenatal Care for Women of Low Income," *Journal of Advanced Nursing* 29, no. 5 (May 1999): 1170–77, https://doi.org/10.1046/j.1365-2648.1999.00986.x.
[34] Diana B. Dutton, "Explaining the Low Use of Health Services by the Poor: Costs, Attitudes, or Delivery Systems?," *American Sociological Review* 43, no. 3 (1978): 348–68, https://doi.org/10.2307/2094495.

Many medical schools and universities are beginning to implement the structural changes to rural prenatal care. The University of Arkansas Antenatal and Neonatal Guidelines, Education and Learning System (ANGELS) program began in 2002[35]. The program was implemented in response to Arkansas Medicaid only covering 55% of births and the state having many medically underserved regions. In comparison, Virginia Medicaid only covers 32% of births.[36] The program collaborated across federal entities, nonprofits and physicians providing guidelines for providers in rural areas for high-risk cases, providing a 24-hour consultative service for both practitioners and women. They conduct telemedicine conferences with specialists, virtual ultrasound readings and additional OBGYN training. The program won the Harvard Kennedy School Innovations in American Government award in 2007. Since the program's implementation, Medicaid beneficiaries are 42% more likely to deliver in tertiary care centers to ensure fewer complications and increase survival rates. Consequently, the program has saved Arkansas Medicaid millions from complications due to lack of care. The return on investment is estimated at $1.30 to $1.50 per every dollar spent. Their virtual consultation calls have skyrocketed, and increased patient satisfaction to 4.79 out of 5.

In addition to Arkansas' program, the University of Wisconsin School of Medicine in their department of Obstetrics and Gynecology has implemented their rural residency program, and Tulane School of Medicine started their rural outreach initiative where they provide

[35] Harvard Kennedy School, ASH Center, "Award: Antenatal and Neonatal Guidelines, Education and Learning System (ANGELS)," 2021, https://ash.harvard.edu/news/antenatal-and-neonatal-guidelines-education-and-learning-system-angels.

[36] "Medicaid Coverage of Births: Virginia, 2016-2020," March of Dimes | PeriStats, accessed March 26, 2023, https://www.marchofdimes.org/peristats/data?reg=99&top=11&stop=154&lev=1&slev=4&obj=1&sreg=51.

scholarships for medical students wanting to practice in rural Louisiana[37]. While implementation of a university rural prenatal care initiative may be out of the scope of Washington and Lee's capabilities, I also call for the consideration of such a program from the University of Virginia and Virginia Tech.

Ethical Obligations

Maternal and infant healthcare is vital, not only to protect the lives of mothers and children, but also in downstream effects of health indicators like low birthweight on the future success of children. With low income and rural women suffering unequally from disparities in prenatal care, there is an opportunity to address poverty alleviating inequalities through improved prenatal healthcare. Given that multiple other countries, states, universities, and local governments have historically and presently conducted efforts to improve prenatal care for low-income women both generally and specific to rural areas, there is therefore an ethical obligation for the state of Virginia and local entities to increase and prioritize prenatal health investments in rural regions, specifically in and around Rockbridge County.

This follows John Rawls's Theory of Justice and contractarian framework of ethics asserting that every individual has an equal right to basic liberties and should have the right to opportunities and equal chance given to other individuals of similar ability. Every woman, regardless of socioeconomic status, race, or zip code should be afforded the same opportunities for adequate prenatal care. This argument reaches further when considering that

[37] "Residency - Rural Residency Program - Ob-Gyn UW-Madison," accessed March 17, 2023, https://www.obgyn.wisc.edu/residency/rural; "Rural Outreach Initiative," Medicine, accessed March 17, 2023, https://medicine.tulane.edu/family-community-medicine/rural-outreach.

the state of Virginia already has programs like BabyCare and the Doula program that do not reach to rural communities and therefore women are actively not reaping the benefits of such opportunities that exist. We ought primarily to strive harder to understand the structural barriers that impact utilization of such benefits.

Given that the proposed recommendations will help rural, low-income, pregnant mothers, it must also respect the dignity of this population. My recommendation of employing lay community members to engage in home visits is proposed to accomplish the goal or respecting dignity and cultivating trust within the community and encourage utilization of prenatal services.

Limitations

I have considered many limitations throughout my conduction of this project. Primarily, my lack of knowledge surrounding public health policy limits my credibility in speaking to the feasibility of revising and implementing the forementioned programs and their ability to reach rural communities as well as the ability of local entities to implement or support such initiatives. Not only is understanding barriers to prenatal care and utilization extremely complex, but also is the process of researching, analyzing, and implementing successful public health policy and thus the complexity of the issue overall. There are also limitations in the policies themselves. For example, BabyCare is a fee-for-service program which may provide its own barriers to provider reimbursement. More specific limitations regarding available data are the lack of and outdated data and reporting in rural communities, which limits some validity.

According to community contacts there is presently a lack of local health department funding which poses the most obvious barrier to program implementation.

Finally, an opportunity to engage further with pregnant women and mothers in the community is what I believe is most lacking from my assessment of rural community health. While I have dug deep and reviewed literature with empathy, there is no better way for me to have learned about the most important considerations than by speaking directly to a population of women in need of prenatal services. I believe that my proxies of information through providers, local officials, community reports and literature has provided a comprehensive understanding of the issues at hand, although I would've greatly appreciated more direct insight from community members.

Conclusion

Global, national, and statewide efforts to address disparities in women's reproductive health care are rising. The current effort lies in maintaining attention to these problems and addressing them locally, especially in rural areas where women fall especially vulnerable to inequalities. Community insight from both a local practitioner and from a public health entity, helped me analyze the current barriers experienced by the community, the services that are currently available, and the data that points to disparities faced by women. The proposed recommendations represent a greater goal of integrating social care into the delivery of health care. This is accomplished through programs like home visitation, doulas, and community

outreach that promote community trust, stronger social networks, and increasingly upstream medical intervention.

I urge community members, local departments, the Virginia Department of Health, and local partitioners to not only consider the implementation of the existing programs mentioned, but also bear the responsibility of utilizing them and referring them to patients. The implications of prioritizing women's health will be felt through future generations and their success.

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Supplementary Data

Geography	Families living in poverty	Late to no prenatal care rate per 1,000 live births (2014)	Low birthweight (2015)
Virginia	8.1%	28.0	7.9%
Rockbridge County	8.6%	34.0	6.0%
Buena Vista City	25.8%	21.7	4.8%
Lexington City	6.2%	22.0	7.0%

Table 1: Rockbridge Area Community Health Assessment (2018) Demographics

County	Infant Mortality (/100,000)	LBW (%)	PNC 1st Tri (%)	PTB (%)
Highland	4.6	7.3	78.7	9
Bath	4.5	7.9	79.5	8.1
Rockbridge	5.5	7.5	79.8	8.3

Table 2: HRSA Maternal Infant Mapping Tool (2017-2019) Health Indicators

County	Infant Mortality Rate - Black (/100,000)	Infant Mortality Rate - White (/100,000)	Infant Mortality Rate - Black/White Diff (/100,000)	Black/White Infant Mortality Rate Ratio
Highland	-	5.5	-	-
Bath	12.3	5.8	6.4	2.1
Rockbridge	11.8	5.1	6.5	2.3

Table 3: HRSA Maternal and Infant Mapping Tool (2017-2019) Infant Health Equity

County	Family Medicine Provider Rate (/100,000)	General Practice Provider Rate (/100,000)	Health Center Service Delivery Sites	Hospitals with Obstetric Care	NHSC and Nurse Corps Sites	OBGYN Provider rate (/100,000)	Rural Health Clinics
Highland	91.3	0	2	0	1	0	0
Bath	24.1	0	0	0	0	0	0
Rockbridge	39.9	0	3	0	1	4.4	3

Table 4: HRSA Maternal and Infant Mapping Tool (2017-2019) Health Resources

County	PTB (%)	LBW (%)	Late/No Prenatal Care (%)
Highland	22.2	16.7	16.7
Bath	7.4	7.4	3.7
Rockbridge	6.3	7.9	3.1

Table 5: Virginia Department of Health: Maternal and Child Health (2017) Health Indicators

Report Area	Infant death rate (per 1,000 Total Live Births)	LBW (%)	Teen pregnancy (per 1,000 females ages 15-19)	PTB (%)	Late/no prenatal care (% of Total Live Births)
Bath County	7.63	11.90%	37.50	14.29%	7.14%
Highland County	21.28	11.76%	0	11.76%	11.76%
Rockbridge County	0.00	6.90%	10.94	9.48%	11.21%
Central Shenandoah Health District	6.23	6.94%	13.18	8.83%	6.04%

Virginia	5.75	8.29%	17.27	9.60%	4.07%

Table 6: Virginia's Plan for Wellbeing (2020): Virginia Community Health Improvement Data Portal Health Indicators

Race	**Inadequate prenatal care (Kotelchuck index)**	**Cesarian Sections (%)**	**Received Home Visit (%)**
White	9.28%	12.13%	5.89%
Black	14.49%	15.26%	5.35%
Hispanic	21.63%	11.38%	0.17%

Table 7: Virginia Pregnancy Risk Assessment Monitoring System (PRAMS) (2020) Health Indicators by Race

References

Ansell, David A., -Hightower Darlene Oliver, Larry J. Goodman, Omar B. Lateef, and Tricia J. Johnson. “Health Equity as a System Strategy: The Rush University Medical Center Framework.” *NEJM Catalyst* 2, no. 5. Accessed March 16, 2023. https://doi.org/10.1056/CAT.20.0674.

Carilion Clinic. “Rockbridge Area Community Health Assessment,” August 31, 2018.

Center for Medicare and Medicaid Services. “Improving Access to Maternal Health Care in Rural Communities.” CMS, September 3, 2019.

Currie, Janet. “Inequality at Birth: Some Causes and Consequences.” Working Paper. Working Paper Series. National Bureau of Economic Research, February 2011. https://doi.org/10.3386/w16798.

Daymude, Anna E. Carson, Joshua J. Daymude, and Roger Rochat. “Labor and Delivery Unit Closures in Rural Georgia from 2012 to 2016 and the Impact on Black Women: A Mixed-Methods Investigation.” *Maternal and Child Health Journal* 26, no. 4 (April 1, 2022): 796–805. https://doi.org/10.1007/s10995-022-03380-y.

Dutton, Diana B. “Explaining the Low Use of Health Services by the Poor: Costs, Attitudes, or Delivery Systems?” *American Sociological Review* 43, no. 3 (1978): 348–68. https://doi.org/10.2307/2094495.

Falconi, April M., Samantha G. Bromfield, Trúc Tang, Demetria Malloy, Denae Blanco, RN Susan Disciglio, and RN Winnie Chi. “Doula Care across the Maternity Care Continuum and Impact on Maternal Health: Evaluation of Doula Programs across Three States Using

Propensity Score Matching." *EClinicalMedicine* 50 (August 1, 2022). https://doi.org/10.1016/j.eclinm.2022.101531.

Harvard Kennedy School, ASH Center. "Award: Antenatal and Neonatal Guidelines, Education and Learning System (ANGELS)," 2021. https://ash.harvard.edu/news/antenatal-and-neonatal-guidelines-education-and-learning-system-angels.

Health Resources and Services Administration. "Maternal & Child Health | HRSA Data Warehouse," 2020. https://data.hrsa.gov/maps/mchb/.

Jarrell, Kelli. "Women's Reproductive Health in Rockbridge County." Washington and Lee University, 2012.

Karcher, Kara. "Access to Prenatal Care in Rockbridge County: A Community-Based Research Project." Washington and Lee University, 2011.

Manne, Kate. *Entitled*. Crown, 2020.

March of Dimes | PeriStats. "Maternity Care Desert." Accessed March 27, 2023. https://www.marchofdimes.org/peristats/data?top=23.

March of Dimes | PeriStats. "Medicaid Coverage of Births: Virginia, 2016-2020." Accessed March 26, 2023. https://www.marchofdimes.org/peristats/data?reg=99&top=11&stop=154&lev=1&slev=4&obj=1&sreg=51.

"Maternal Mortality Maternity Care US Compared 10 Other Countries | Commonwealth Fund." Accessed February 14, 2023. https://www.commonwealthfund.org/publications/issue-briefs/2020/nov/maternal-mortality-maternity-care-us-compared-10-countries#1.

McIntyre, Meghan, Virginia Mercury October 10, and 2022. “Doula Services Now Covered under Virginia Medicaid Expansion.” *Virginia Mercury* (blog), October 10, 2022. https://www.virginiamercury.com/2022/10/10/doula-services-now-covered-under-virginia-medicaid-expansion/.

Medicine. “Rural Outreach Initiative.” Accessed March 17, 2023. https://medicine.tulane.edu/family-community-medicine/rural-outreach.

Nesbitt, Thomas, Frederick Connell, Gary Hart, and Rodger Rosenblatt. “Access to Obstetric Care in Rural Areas: Effect on Birth Outcomes.,” 1990. https://doi.org/10.2105/AJPH.80.7.814.

Olds, D. L., J. Eckenrode, C. R. Henderson, H. Kitzman, J. Powers, R. Cole, K. Sidora, P. Morris, L. M. Pettitt, and D. Luckey. “Long-Term Effects of Home Visitation on Maternal Life Course and Child Abuse and Neglect. Fifteen-Year Follow-up of a Randomized Trial.” *JAMA* 278, no. 8 (August 27, 1997): 637–43.

Read “Integrating Social Care into the Delivery of Health Care: Moving Upstream to Improve the Nation’s Health” at NAP.Edu. Accessed February 27, 2023. https://doi.org/10.17226/25467.

“Residency - Rural Residency Program - Ob-Gyn UW-Madison.” Accessed March 17, 2023. https://www.obgyn.wisc.edu/residency/rural.

Sheppard, Vanessa B, Ruth E Zambrana, and Ann S O’Malley. “Providing Health Care to Low-Income Women: A Matter of Trust.” *Family Practice* 21, no. 5 (October 1, 2004): 484–91. https://doi.org/10.1093/fampra/cmh503.

Staff, NASHP. “Virginia Invests in Doulas to Improve Maternal Health Outcomes.” *NASHP* (blog), February 28, 2022. https://nashp.org/virginia-invests-in-doulas-to-improve-maternal-health-outcomes/.

Statz, Michele, and Kaylie Evers. “Spatial Barriers as Moral Failings: What Rural Distance Can Teach Us about Women’s Health and Medical Mistrust.” *Health & Place* 64 (July 1, 2020): 102396. https://doi.org/10.1016/j.healthplace.2020.102396.

Stulberg, D.B., L. Cain, I.H. Dahlquist, and D.S. Lauderdale. “Ectopic Pregnancy Morbidity and Mortality in Low-Income Women, 2004–2008.” *Human Reproduction* 31, no. 3 (March 1, 2016): 666–71. https://doi.org/10.1093/humrep/dev332.

Sword, W. “A Socio-Ecological Approach to Understanding Barriers to Prenatal Care for Women of Low Income.” *Journal of Advanced Nursing* 29, no. 5 (May 1999): 1170–77. https://doi.org/10.1046/j.1365-2648.1999.00986.x.

“USDA ERS - Rural-Urban Continuum Codes.” Accessed March 19, 2023. https://www.ers.usda.gov/data-products/rural-urban-continuum-codes/.

VDH. “Rural Virginia Defined.” *Health Equity* (blog). Accessed March 27, 2023. https://www.vdh.virginia.gov/health-equity/rural-virginia-defined/.

———. “Virginia Community Health Improvement Data Portal – Virginia’s Plan For Well-Being,” 2020. https://virginiawellbeing.com/virginia-community-health-improvement-data-portal/.

———. “Virginia PRAMS Facts,” 2020. https://www.vdh.virginia.gov/prams/resources/.