

Midwifery on the periphery: Are outcomes different for rural clients?

Elizabeth Nethery, MSc, MSM (candidate)¹, Marit Bobvbjerg, PhD², Melissa Cheyney, PhD, CPM², Wendy Gordon, MPH, CPM¹
¹Bastyr University, Department of Midwifery; ²Oregon State University

Objectives

- Compare low-risk rural women to non-rural women who planned community births with midwives
- Compare outcomes for rural mothers and newborns compared to non-rural women

Background

Over 20% of American women live in rural areas (1). Rural women may need to travel very far to access prenatal care or to their birth location and have limited choice in their care providers (2). Despite the challenges of rural maternity care, many midwives currently serve rural women and families. This is the first study of community midwifery and planned home or birth center births in rural America.

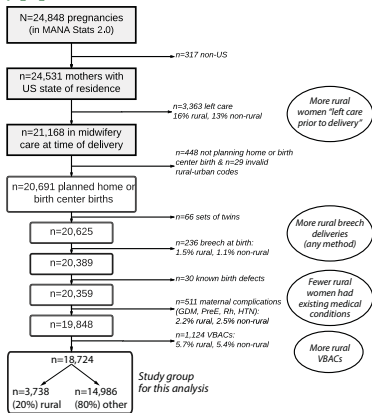
Methods

This study uses the MANA Statistics dataset 2.0 (2004-2009). Rural residences were identified using previously developed Rural-Urban Commuting Area (RUCA) codes with an adjustment for health care service delivery areas. The study group was limited to cephalic, singleton and low-risk women who planned home or birth center birth at the initiation of labor.

Outcomes considered: For mothers, a "maternal composite"=any of cesarean section, 3rd/4th degree laceration, forceps/vacuum, blood transfusion, severe events, intrapartum or postpartum transfer and for newborns: NICU admissions, any hospital or NICU in 1st 48hrs, a "newborn composite"=any of hospital/NICU (1st 48hrs), APGAR<4, intrapartum or neonatal death.

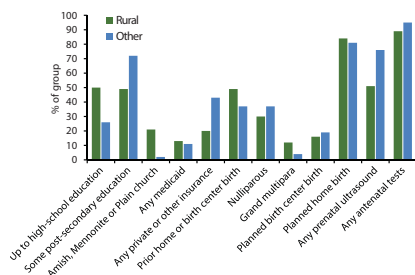
Statistical analysis using ANOVA and chi-squared tests, multivariable logistic regression controlling for risk factors.

Study population and exclusions



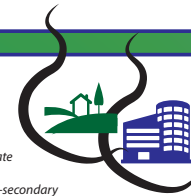
Results

Were rural women different from non-rural women?



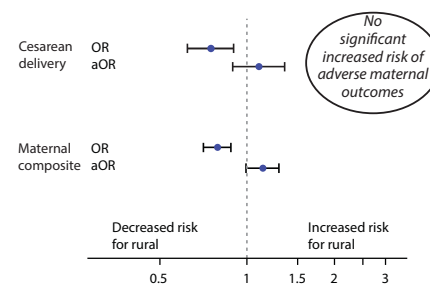
Rural women: *
 • younger
 • more nulliparas and grand multiparas
 • higher BMI
 • Amish, Mennonite or Plain church
 • fewer prenatal visits
 • later to initiate prenatal care
 • more self-pay and Medicaid
 • fewer years of education
 • more planned home births

Non-rural women:
 • older
 • more private insurance
 • more post-secondary education
 • more prenatal tests & ultrasound
 • more planned birth center births

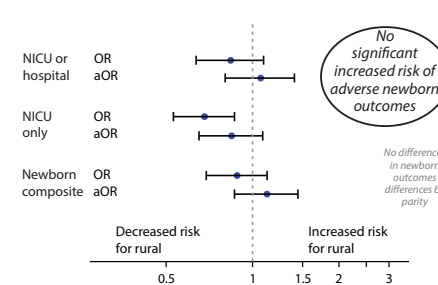


* Significant differences for all characteristics by chi-squared tests or ANOVA at p<0.0001

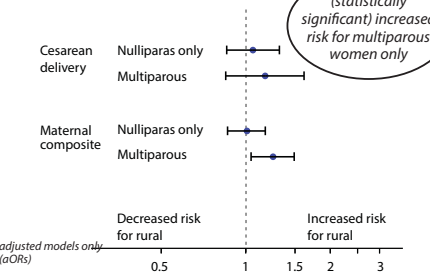
Were there differences in outcomes for rural mothers? *



Were there differences in outcomes for rural babies? *



What about parity? *



* adjusted Odds Ratios: Models adjusted for maternal age, BMI, weight gain, parity (nullip, multip, grand multip), Amish, any induction or augmentation of labor, and rural residence



Discussion

- Differences between rural and non-rural women in this study were similar to those identified in the literature
- Some differences have implications for rural midwifery practice and suggest further research:
 - Rural women were more likely to leave care of the midwife during pregnancy, started prenatal care later and had fewer visits.
 - More VBACs and breeches in the rural group: possibly due to limited options for care, differences in practice or client choice.
- Despite challenges of rural community birth (longer travel times in case of emergencies), no increased risk for babies or nulliparous women in this analysis.
- A small, but significant, increased risk for multiparous mothers
- Higher rates of hemorrhage, blood transfusions and postpartum transfers were noted in the rural group but further research is needed to understand this finding.
- We recommend increased access to emergency medications (anti-hemorrhagics) and advocate for inter-professional collaborations to facilitate smooth transfers as needed.

Key points

1. Rural and non-rural women were very different groups
2. At first glance, outcomes appear "better" for rural clients! But, when we account for the differences between the rural and non-rural groups, there was no increased risk for rural first-time mothers and babies.
3. There was a small increased risk for rural multiparous women only which needs further investigation.
4. This work supports community birth and midwifery care in rural America and calls for improvements in transfer protocols and inter-professional collaborations.

References

1. Agency for Healthcare Research and Quality. 2013 National Healthcare Disparities Report. Rockville, MD; 2014.
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Acknowledgments

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Contact

Questions or comments are welcome!

Please contact the author at: elizabeth.nethery@gmail.com



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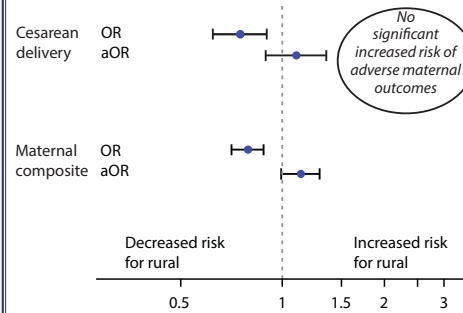
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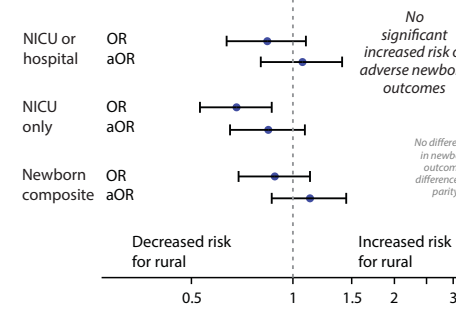


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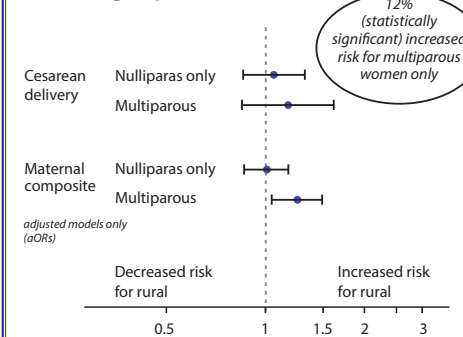
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Midwifery on the periphery: Are outcomes different for rural clients? Detailed Results

Table 1. Study population, antepartum care and demographics

Characteristics of the study population	Rural (n=3738) median [IQR] or No. (%)	All others (n=14986) median [IQR] or No. (%)
Any high school education **	1832 (49.0)	3868 (25.8)
At least 4 years of post-secondary**	417 (11.2)	3187 (21.3)
Amish, Mennonite or other Plain church**	777 (20.8)	258 (1.7)
Any Medicaid**	501 (13.4)	1638 (10.9)
Any other Insurance **	746 (19.9)	6417 (42.8)
Age**	29 (25-33)	30 (26-33)
BMI at beginning of pregnancy**	23 (21-26)	22 (21-26)
Mother's BMI is >= 35 (obese II or III) (y/n)?**	126 (3.4)	442 (2.9)
Nulliparous**	1190 (29.8)	5847 (36.5)
Grand multiparity (>4 prior vaginal deliveries)**	496 (12.4)	709 (4.4)
History of prior home or birth center birth**	1968 (49.2)	5906 (36.8)
Planned birth center birth#**	620 (16.6)	2910 (19.4)
Planned home birth**	3118 (83.4)	12076 (80.6)
Number of prenatal care visits with this midwife**	10 (7-12)	11 (9-12)
Weeks (from LMP) that any prenatal care began**	12 (9-16)	11 (8-13)
Any prenatal ultrasound**	1894 (50.7)	11344 (75.7)
Any antenatal tests (ultrasounds, GBS or GDM screening**)	3313 (88.6)	14184 (94.6)

Table 2. Intrapartum care and maternal outcomes by rural residence and risk estimates

Intrapartum and Maternal Outcomes	Rural residence (n=3738) median [IQR] or No. (%)	All others (n=14986) median [IQR] or No. (%)	unadjusted OR [95% CI]	adjusted OR [95% CI] +
Birth location (actual) **				
freestanding birth center	519 (13.9)	2392 (16.0)		
home	2882 (77.1)	10819 (72.2)		
hospital	328 (8.8)	1754 (11.7)		
other	9 (0.2)	21 (0.1)		
Waterbirth **	1021 (27.3)	4926 (32.9)		
Induction or Augmentation of labor: Any method **	738 (19.7)	3860 (25.8)		
Normal spontaneous vaginal delivery ***	3565 (95.4)	14080 (94.0)		
Adverse Maternal Outcomes				
Instrumental delivery only (forceps or vacuum)	33 (0.9)	162 (1.1)	0.81 (0.55, 1.2)	1.0 (0.68, 1.5)
Cesarean delivery **	140 (3.7)	738 (4.9)	0.75 (0.62, 0.90)	1.1 (0.90, 1.4)
Severe events (abruption, embolism, ruptured uterus, cord prolapse, seizure)	20 (0.5)	76 (0.5)	1.1 (0.63, 1.7)	1.1 (0.61, 1.8)
Blood transfusion (as reported by midwife)	15 (0.4)	51 (0.3)	1.2 (0.64, 2.0)	1.4 (0.73, 2.4)
Third or Fourth degree perineal tear	36 (1.0)	197 (1.3)	0.73 (0.50, 1.0)	0.98 (0.67, 1.4)
Intrapartum transfer to higher level of care **	325 (8.7)	1724 (11.5)	0.73 (0.65, 0.83)	1.1 (0.92, 1.2)
Postpartum transfer to higher level of care	59 (1.6)	213 (1.4)	1.1 (0.82, 1.5)	1.2 (0.90, 1.7)
Maternal composite outcome ** (any of 7 above)	433 (11.6)	2130 (14.2)	0.79 (0.71, 0.88)	1.1 (0.99, 1.3)

Table 3. Newborn outcomes by rural residence and risk estimates

Neonatal outcomes	Rural residence (n=3738) median [IQR] or No. (%)	All others (n=14986) median [IQR] or No. (%)	unadjusted OR [95% CI]	adjusted OR [95% CI] ^
Gestational age	281 (275-287)	281 (275-287)		
Preterm (<37 completed weeks)	79 (2.1)	280 (1.9)		
Postterm (>42 completed weeks) **	332 (8.9)	1039 (6.9)		
Small for gestational age (SGA)**	177 (4.7)	524 (3.5)		
Large for gestational age (LGA)	658 (17.6)	2818 (18.8)		
Low Birthweight (<2500g)	35 (0.9)	101 (0.7)		
Macrosomic (>4000g)	804 (21.5)	3266 (21.8)		
Macrosomic (>4500g)	162 (4.3)	663 (4.4)		
Neonatal adverse outcomes				
5-minute APGAR <7	54 (1.4)	193 (1.3)	1.1 (0.82, 1.5)	1.3 (0.96, 1.8)
5-minute APGAR <4	20 (0.5)	67 (0.4)	1.2 (0.71, 1.9)	1.4 (0.83, 2.4)
Assisted ventilation longer > 10 mins	20 (0.5)	84 (0.6)	0.95 (0.57, 1.5)	1.1 (0.66, 1.9)
Birth defect	64 (1.7)	236 (1.6)	1.1 (0.82, 1.4)	1.0 (0.76, 1.4)
Any NICU in the first 6 weeks	77 (2.1)	450 (3.0)	0.68 (0.53, 0.86)	0.84 (0.65, 1.1)
Hospital or NICU in the 1 st 48hrs for >24hrs	66 (1.8)	314 (2.1)	0.84 (0.64, 1.1)	1.1 (0.80, 1.4)
Neonatal composite outcome +	80 (2.1)	361 (2.4)	0.89 (0.69, 1.1)	1.1 (0.87, 1.4)

* p <=0.01; same methods

** p <= 0.001. Categorical variables: chi-square tests; continuous variables: Kruskal-Wallis test

+ All multivariate models adjusted for: rural status AND

maternal age (categorical)

BMI at booking (continuous)

pregnancy weight gain w/in IOM recommended for BMI (y/n)

parity (no prior births vs. <5 births vs. >=5 births)

mother belongs to Amish, Mennonite or other Plain church (y/n)

any induction or augmentation of labor (y/n)

gestational age at delivery (Newborn models only)

Contact

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