



Are we serving the most vulnerable communities? Examining the reach of one SC home visiting program

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Background

- **Maternal, Infant, and Early Childhood Home Visiting (MIECHV)** program provides **evidence-based home visiting programs** for at-risk mothers and families.¹
- **Identifying not only individuals, but communities at risk** is important to the successful program delivery.^{2,3}
- County-level assessments may **mask within-county communities at risk**.
- Comparing **actual reach of the program** to the **intended reach** is important.



- **Study purpose:** To identify SC ZIP Code Tabulation Areas (ZCTAs) at high risk for poor maternal and child health outcomes and to identify the distribution of households enrolled in the SC MIECHV program across those high-risk ZCTAs.

Methods

Design

- Retrospective, cross-sectional study.

Data

- *SC Maternal, Infant, and Early Childhood Home Visiting (MIECHV)* program data, 2013-2016.
- *SC Community Assessment Network (SCAN)* maternal-child health data.
- Addresses geocoded with *ArcGIS Network Analyst*.
- ZIP Code Tabulation Areas (ZCTAs) identified using 2010 *U.S. Census Bureau TIGER/Line* boundary files.

Variable construction for ZCTAs

- **Volume:** identified number of live births; collapsed into quartiles.
- **Risk:** Out of 10 risk measures, number of MCH outcomes worse than state average.
- **Risk/Volume categories** created for each ZCTA.

Analyses

- Descriptive



Results

Characteristics

SC MIECHV participants

(2013-2016, n=3090)

- 11% teen parents
- 70% minority race
- 62% ≤ high school diploma
- 62% were unemployed
- 74% income <\$20,000/year

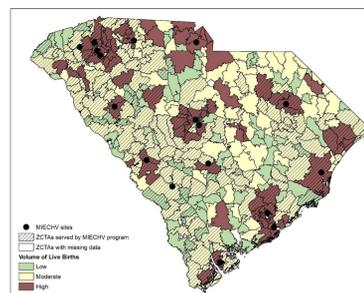


Figure 1. Map of South Carolina showing ZCTAs by volume of births and MIECHV service, 2013-2016

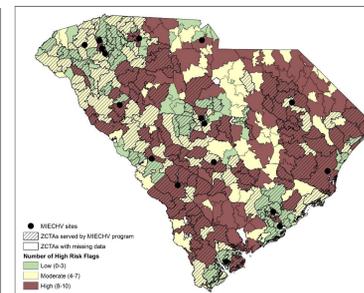


Figure 2. Map of South Carolina showing ZCTAs by risk level and MIECHV service, 2013-2016

Risk/Volume categories	Number of ZCTAs n (%)	ZCTAs with at least one MIECHV-enrolled household n (% of total)	Number of MIECHV-enrolled households
High risk (8-10 flags)			
High volume	33 (21.7)	26 (78.8)	961
Moderate volume	84 (55.3)	55 (65.5)	503
Low volume	35 (23.0)	14 (40.0)	30
High risk totals	152	95 (62.5)	1494
Moderate risk (4-7 flags)			
High volume	14 (10.9)	12 (85.7)	295
Moderate volume	71 (55.5)	50 (70.4)	406
Low volume	43 (33.6)	8 (18.6)	19
Moderate risk totals	128	70 (54.7)	720
Low risk (0-3 flags)			
High volume	48 (48.5)	41 (85.4)	759
Moderate volume	35 (35.4)	24 (68.6)	113
Low volume	16 (16.2)	2 (12.5)	4
Low risk totals	99	67 (67.7)	876

¹ SC: South Carolina; ZCTA, zip code tabulation area; MIECHV, Maternal, Infant, and Early Childhood Home Visiting.
² Of the 424 SC ZCTAs, 45 had no data from South Carolina Community Assessment Network (SCAN) and were excluded from analyses (all were categorized as a PO Box or a unique/single, high volume address).
³ Risk flags indicate higher than state average on any of 10 risk-related measures (mothers who are unmarried, Medicaid deliveries, African-American, teens, less than high school education, used tobacco during pregnancy, had inadequate prenatal care, received WIC during pregnancy or delivered infant who was preterm or low birthweight).
⁴ Low volume of live births defined as the first quartile (< 26 births/year). High volume of live births defined as upper quartile (> 228 births/year).

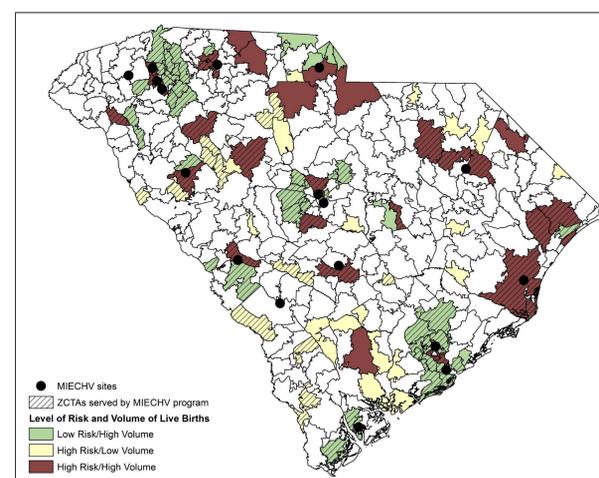


Figure 3. Map of SC showing ZCTAs with highest risk/volume combinations and MIECHV service, 2013-2016

KEY FINDINGS

- Of 379 ZCTAs with reported data, 152 had 8 or more risk flags.
- Of the 152 highest-risk ZCTAs, 33 also had high birth volumes.
- Fifty-seven of the 152 highest-risk ZCTAs had no MIECHV-enrollees.
- Seven of the 33 highest-risk/highest-volume ZCTAs had no MIECHV-enrollees.

ZCTA	Total SC births (2013-2016)	Risk Factors ¹										Total # of Flags
		Unmarried Mothers	Medicaid Deliveries	African American Mothers	Teen Mothers	< High School Education Mothers	Tobacco Use During Pregnancy	Inadequate Kotelchuck Index	WIC During Pregnancy	Low Birthweight	Preterm Births	
SC (n=379) ²	229,846	46.5%	50.8%	31.2%	7.4%	15.4%	10.2%	18.9%	46.7%	9.6%	11.0%	-
29340	997	61.3%	69.9%	29.7%	13.5%	24.5%	24.5%	21.2%	65.8%	10.8%	11.5%	9
29341	943	56.1%	60.0%	32.4%	11.9%	21.1%	13.5%	23.0%	58.4%	11.7%	12.2%	10
29488	1,099	63.1%	74.1%	47.0%	11.1%	22.8%	15.6%	18.3%	72.1%	10.3%	12.1%	9
29536	986	71.9%	81.3%	60.4%	13.6%	32.2%	15.4%	18.3%	74.0%	12.7%	12.9%	9
29706	915	69.4%	69.2%	52.9%	9.7%	17.7%	15.4%	26.9%	69.1%	11.7%	11.8%	10
29720	2,249	59.2%	54.1%	34.8%	10.7%	17.6%	12.8%	15.7%	62.4%	11.8%	12.5%	9
29730	3,008	57.2%	64.4%	45.8%	9.3%	15.8%	11.5%	25.6%	46.8%	9.8%	11.4%	10

¹ Risk factors are flagged if ZCTA average exceeds state average. The state averages for each of the 10-risk related measures were obtained from SCAN

² A total of 379 out of the 424 ZCTAs had SCAN data; the 45 with no SCAN data were excluded from analyses.

Discussion

- This study describes a unique use of geographic information system (GIS) methods to determine whether or not the SC MIECHV program was reaching the most at-risk communities within its state for service delivery
- We were able to identify gaps in MIECHV services - specific communities smaller than county-level that had no MIECHV enrollees despite having a high volume of births and multiple ZCTA-level risk factors at levels above state averages.
- Identifying the *actual* as compared to the *projected or intended* reach of a program is important for determining if those potential clients who are most at-risk are receiving needed services.

Public Health Implications

- Knowledge of actual areas served can be used by local implementing sites to guide precision outreach into underserved communities.
- Knowledge of both most at-risk communities and actual areas served can be used by local implementing sites to inform program expansion.
- Building a collaborative home visiting system of care (including a collective effort to identify service areas, the creation of a single point of entry, and development of a system of appropriate referrals across programs) could be advantageous to home visiting statewide and to improved health and well-being outcomes of residents most in need.

References: ¹Health Resources and Services Administration. (2017). Home visiting. <https://mchb.hrsa.gov/maternal-child-health-initiatives/home-visiting-overview>. Accessed September 13, 2018. ²Sallis, J. F., & Owen, N. (2002). Ecological models of health behavior. In: K. Glanz, B. K. Rimer, & F. M. Lewis (Eds.), *Health behavior and health education: Theory, research, and practice*, Vol 3. (pp. 462-484). San Francisco, CA: Jossey-Bass. ³Jilcott Pitts, S. B., Keyserling, T. C., Johnston, L. F., et al. (2015). Associations between neighborhood-level factors related to a healthful lifestyle and dietary intake, physical activity, and support for obesity prevention policies among rural adults. *Journal of Community Health, 40*(2), 276-284.

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