New Mexico Epidemiology

June 10, 2016 Volume 2016, Number 6

Concentrated Disadvantage and Birth Outcomes in New Mexico

Glenda Hubbard, MPH & Kelly Gallagher, PhD
Public Health Division
New Mexico Department of Health

Neighborhood-level, socioeconomic effects on health outcomes are increasingly recognized as important determinants of health disparities. Empirical research has established that a number of socioeconomic indicators are highly correlated with each other and tend to cluster geographically at the neighborhood level[1], including the concentration of multiple indicators of economic disadvantage[2].

Poverty or socioeconomic status – indicators that may include income, education, and employment – alone may not encompass the synergistic effects of social and economic factors that aggregate geographically and create truly disadvantaged neighborhoods[2]. Used together, though, a quantifiable, composite measure of social and economic factors can be potentially very powerful. Therefore, "concentrated disadvantage" may be the most significant and useful indicator for a neighborhood and impactful to the life course of an individual.

Multiple indicators of economic disadvantage, or "concentrated disadvantage" (CD), refers to the relative poverty of neighborhoods. Concentrated disadvantage is an indicator that captures the kinds of compounded disadvantages that may expose neighborhood residents to negative social conditions, isolate a community from resources, and limit access to local networks. Further, CD has been associated with educational outcomes[3], health outcomes[4], arrest rates[5], and homicide[6]. CD contributes to teen pregnancy and communities with CD are more likely to experience adverse health outcomes relating to childbearing such as infant mortality, low birth weight and child maltreatment[1, 7].

The unfortunate results of relatively high CD are that communities have less mutual trust and willingness among community members to intervene for the common good (sometimes referred to as collective efficacy or social capital[8]).

In this report, concentrated disadvantage at the census tract level for New Mexico was calculated. Subsequently, possible associations between CD and New Mexico maternal and child health data were examined.

Methods

Concentrated disadvantage (CD) in New Mexico's communities was calculated using six census-tract level variables from the U.S. Census Bureau's 2010-2014 American Community Survey. Percentages by census tract of: 1) families below the poverty line; 2) individuals on public assistance (e.g. Supplemental Nutrition Assistance Program); 3) female-headed households; 4) those unemployed, 5) those younger than age 18 years of age; 6) households with individuals younger than 18 years of age were calculated. Subsequently, the percentages of each individual indicator were Z-score transformed. A Z-score transformation is achieved by subtracting the mean of the distribution from the variable value and dividing the difference by the standard deviation of the distribution. Finally, the Z-scores for the five variables were averaged, resulting in one Z-score per New Mexico census tract. This final Z-score represents an overall index of concentrated disadvantage or deprivation[1,9]. After Z-scores were calculated for all New Mexico census tracts, the Z-scores were divided into quartiles to determine qualitatively which census tracts should be considered to have "high concentrated disadvantage". Areas of "high concentrated disadvantage" were defined as those census tracts whose averaged Z-scores fell within the 75th percentile of values.

Birth data from the NM Bureau of Vital Records and Health Statistics on teen births, prenatal care, pre-term births (<37 weeks) and low birth weight (<2500 grams) for the years 2011-2013 were utilized. Five

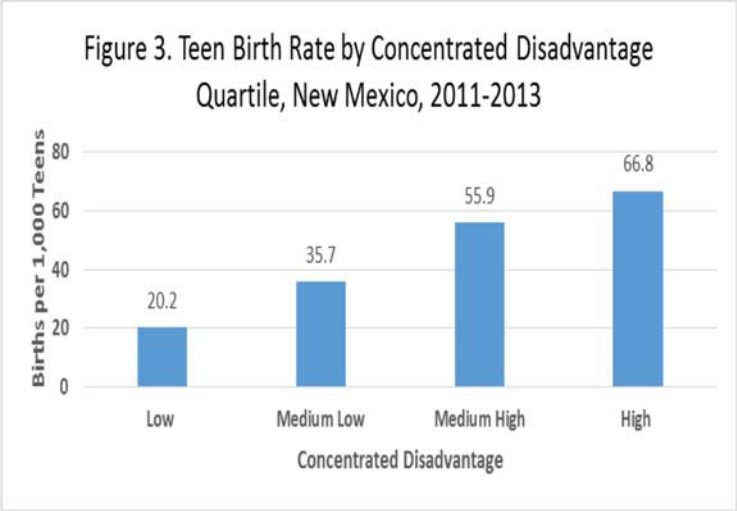
years of infant mortality data from the NM Bureau of Vital Records and Health Statistics were utilized due to the low number of infant deaths. Teen birth rate, infant mortality rate, percent receiving prenatal care, preterm birth and low birth weight were calculated by quartile of concentrated disadvantage.

Results

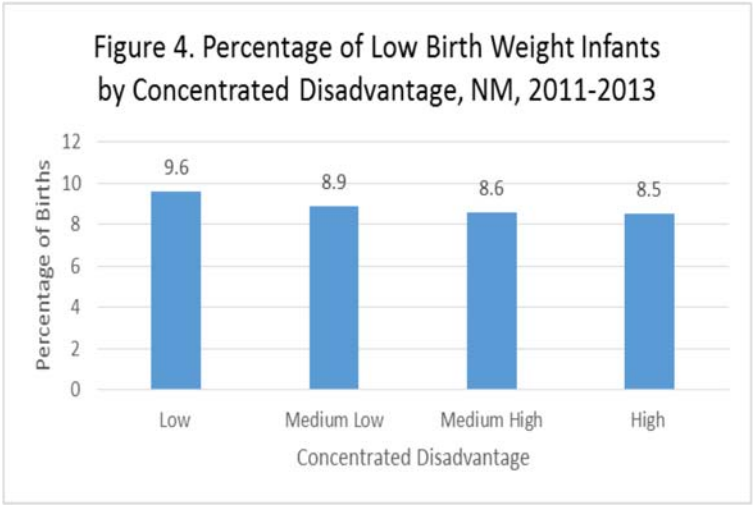
Generally, high CD is prevalent in the northwest and southern regions of New Mexico (Figure 1, page 4). Of New Mexico's 499 census tracts, 15.8% (79) of them fell within the "high" CD category, and 36.9% (184) and 39.3% (196) fell within the "medium high" and "medium low" CD categories, respectively. Only 8% (40) of New Mexico's 499 census tracts were categorized as "low" CD.

Bernalillo County had the highest percentage of census tracts (26.6%) in NM in the highest CD category, followed by Dona Ana (17.6%), and McKinley (11.4%) counties. Santa Fe County had the highest percentage of census tracts (47.5%) in NM in the lowest quartile CD category, followed by Bernalillo County (40.0%).

The New Mexico census tract with the highest CD occurred in Sandoval County, and the census tract with the lowest CD also occurred in Sandoval County; these fine-scale geographic differences (Figure 2. page 4) may provide information regarding disparities of social determinants of health within political boundaries. The five lowest CD census tracts occurred in Santa Fe County; and among the 15 census tracts with the lowest CDs, 13 census tracts were in Santa Fe County.

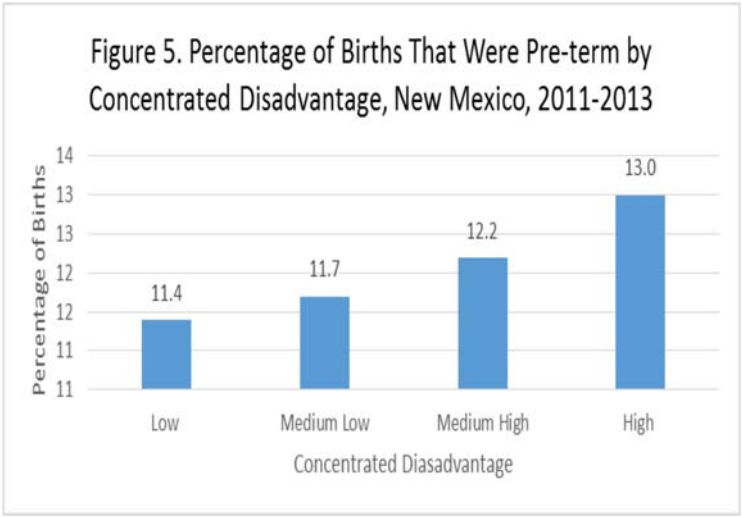


Teen Pregnancy. The birth rate among teen girls aged 15 to 19 years living in high CD neighborhoods was 3.3 times higher than the rate among teens living in low CD neighborhoods during 2011-2013 (Figure 3). The teen birth rate among NM residents was 21.4 births/1,000 teens.



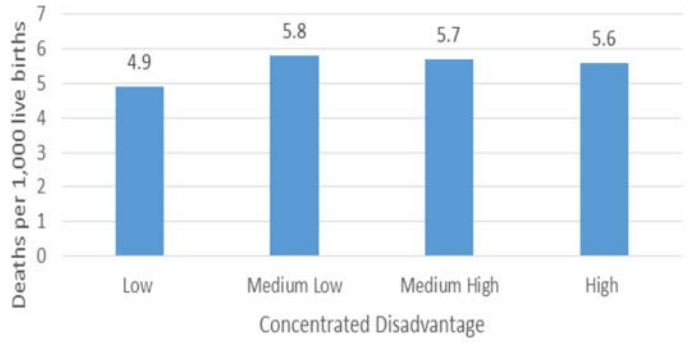
Low Birth Weight. Low CD neighborhoods had a higher percent of low birth weight births than high CD neighborhoods (9.6% and 8.5% respectively). (Figure 4.) The results varied by race/ethnicity. Among Hispanics and American Indians, the percent of births that were low birth weight was higher in the low CD neighborhoods, but among Whites the percent of births that were low birth weight was higher among the high CD neighborhoods.

Pre-term births. The percent of births that were preterm increased with increasing quartile of CD (Figure 5). Babies were 14% more likely to be born pre-term in high CD neighborhoods than in low CD neighborhoods.



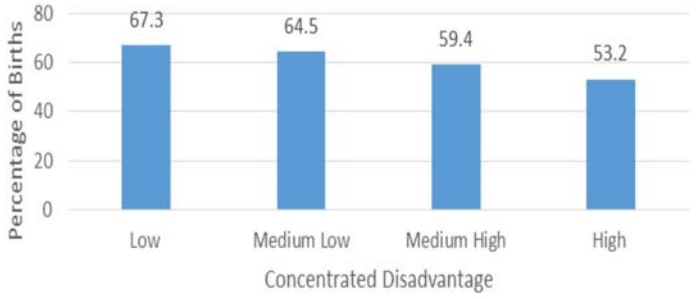
Infant Mortality. The infant mortality rate among the high CD neighborhoods was 10% higher than the rate among the low CD neighborhoods (Figure 6). The infant mortality rate among NM residents was 5.6/1000 live births.

Figure 6. Infant Mortality Rate by Concentrated Disadvantage, NM 2009-2013



Prenatal Care. Pregnant women living in low CD neighborhoods were 30% more likely to have prenatal care in the first trimester than pregnant women living in high CD neighborhoods (Figure 7).

Figure 7. Percentage with Prenatal Care in the First Trimester by Concentrated Disadvantage Quartile, NM, 2011-2013



Discussion

The teen birth rate and the pre-term birth rate increased with increasing levels of CD. The percentage of births that were low birth weight would be expected to increase with increasing levels of CD. The reverse was found for all races/ethnicities combined and for Hispanic and American Indian births in New Mexico. The percentage of births that were low birth weight decreased with increasing le levels of concentrated disadvantage. This finding requires additional analysis incorporating protective factors suspected of offsetting risks associated with disadvantage.

It is important to reduce teen pregnancy because teen childbearing brings substantial social and economic costs through immediate and long-term impacts on teen parents and their children. Abstinence from sexual intercourse is the most effective way to prevent unplanned pregnancies. In order to avoid unplanned pregnancies, it is essential for adolescents who are sexually active to use effective contraceptives every time they have sex.

Several resources in New Mexico to address improving birth outcomes in New Mexico include:

1. *Families First*—A case management program of the New Mexico Department of Health, Public Health Division It is funded by Medicaid to provide perinatal case management to Medicaid eligible pregnant women and children 0-3 years old.
2. *Children Youth and Families Department Home Visiting*—A program in which home visitors partner with families to promote child development and confident parenting by supporting the relationship among the family, home visitor and the community.
3. *Chi St. Joseph's Children Home Visiting Program*— A program that provides mothers, fathers, and primary care providers with education and support to encourage growth and development of happy, healthy babies in positive, nurturing families.
4. First Born® Program—A home visiting program that provides services for women pregnant for the first time, families parenting for the first time, and families adopting their first baby.

References

1. Sampson RJ, Morenoff JD, Gannon-Rowley T. 2001. *Assessing "neighborhood effects": social processes and new directions in research*. Annu Rev Sociology 28: 443–478.
2. Wilson WJ. 2012. The truly disadvantaged: The inner city, the underclass, and public policy: University of Chicago Press.
3. Yun, JT and Moreno, JF. 2006. *College access, K-12 concentrated disadvantage, and the next 25 years of education research*. Educational Researcher 35: 12-19.
4. Wen, M, Browning, CR, and Cagney, KA. 2003. *Poverty, affluence, and income inequality: neighborhood economic structure and its implications for health*. Social Science and Medicine 57: 843-860.
5. Parker, KF, Stults, BJ, & Rice, SK. 2005. Racial threat, concentrated disadvantage and social control: considering the macro-level sources of variation in arrests. Criminology 43: 1111-1134.
6. MacDonald, JM, and Gover, AR. 2005. *Concentrated disadvantage and youth-on-youth homicide*. Homicide Studies 9: 30-54.
7. Brooksgunn J, Duncan GJ, Klebanov PK, Sealand N. Do Neighborhoods Influence Child and Adolescent Development. American Journal of Sociology 1993;99(2):353-395
8. Bourdieu, P. 1985. The forms of capital. *In* Handbook of theory and research for the sociology of education, ed. JG Richardson. Greenwood, New York. Pp. 241-58.
9. Messer LC, Laraia BA, Kaufman JS, Eyster J, Holzman C, Culhane J, *et al*. 2006. *The development of a standardized neighborhood deprivation index*. Journal of Urban Health 83(6): 1041-1062.

The New Mexico Epidemiology Report

Michael G. Landen, M.D., M.P.H.
State Epidemiologist & Editor

The New Mexico Epidemiology Report
(ISSN No. 87504642) is published monthly
by the
Epidemiology and Response Division
New Mexico Department of Health
1190 St. Francis Dr.
P.O. Box 26110, Santa Fe, NM 87502

24-Hour Emergency Number:
(505) 827-0006
www.health.state.nm.us

Figure 1. Concentrated disadvantage (dark shaded areas = higher CD) by census tract, New Mexico, 2010-2014

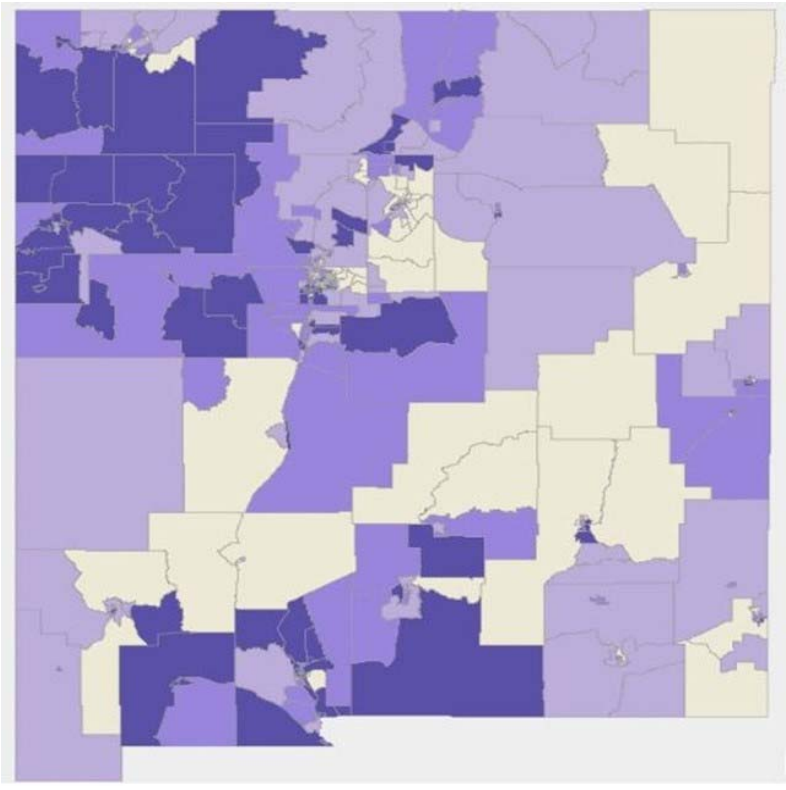


Figure 2. Concentrated disadvantage by census tract, Sandoval County, New Mexico, 2010-2014