Place Really Does Matter:
Using Area-Based Measures to Investigate Associations between
Poverty and Low Birth Weight in Arizona (CSTE Health Disparities Pilot Project)

Rebecca Ascher, M.S. & Rayna Edwards, M.P.H.
Arizona Health Disparities Center, Arizona Department of Health Services

Background: Life course elements (e.g. socioeconomic status, environmental exposures, stress) are associated with gestational growth and birth weight.1 Low birth weight (LBW) is closely related to premature birth and they share many of the same poor health outcomes, including respiratory difficulties, cerebral palsy, hearing and vision loss, feeding and digestive issues, and intellectual disabilities.2 These health consequences, in addition to disparities experienced by racial and ethnic minorities, make LBW an important health outcome to understand. For this project, associations between having a LBW child and living in areas of high poverty in Arizona, living in U.S.-Mexico border regions of Arizona, and being a racial or ethnic minority were assessed.

Methods: Birth records from 2000 and 2010 that were not automatically geocoded to the address level were geocoded by hand whenever possible. All geocoded records were assigned to the appropriate census tract and merged with census tract poverty level3, giving each record a census tract poverty level. Census tract level border status4 was determined for each record using ArcGIS. Rates of LBW and prematurity by census tract poverty level, census tract border status, and race/ethnicity were evaluated.

Results: After exclusions (non-geocoded, non-Arizona resident, no/improbable birth weight, multiple birth, maternal age < 15 or > 55 years), there were 80,126 birth records from 2000 and 82,651 from 2010. Overall, the rate of LBW was 5.50 and 5.58 per 100 live births in 2000 and 2010, respectively. High poverty areas had higher rates of LBW than low poverty areas. This trend was statistically significant in 2000 and 2010 (Cochran-Armitage Z2000 = 8.93, p < 0.0001; Z2010 = 8.40, p < 0.0001). In 2000, LBW rates were 19% higher in the border area than in non-border areas (RR2000=1.19), but no meaningful difference was found in 2010 (RR2010=1.03). LBW rates also differed by race: Blacks, Asians/Pacific Islanders, and Hispanics (American Indian/Alaska Natives in 2010 only) had higher than average rates. Similar results were observed when prematurity was evaluated.

Conclusions: Arizona women residing in census tracts with high poverty may be more likely to have a low birth weight child, compared to those residing in low poverty census tracts. This trend may not hold true for all races/ethnicities, or for residing in the border region, depending on the year. These results can be used to inform state policies and outreach for improving birth outcomes for those groups with disproportionate low birth weight and prematurity rates in Arizona.

3 American FactFinder, U.S. Census Bureau [Accessed December 1, 2012]