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Research Brief

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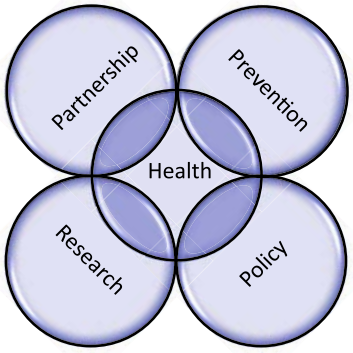

Community Determinants of Infant Mortality Rates in Fort Worth: An Ecologic Study

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The Center for Community Health is a joint project of the J. McDonald Williams Institute and the University of North Texas Health Science Center.

COMMUNITY DETERMINANTS OF INFANT MORTALITY RATES IN FORT WORTH

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ABSTRACT

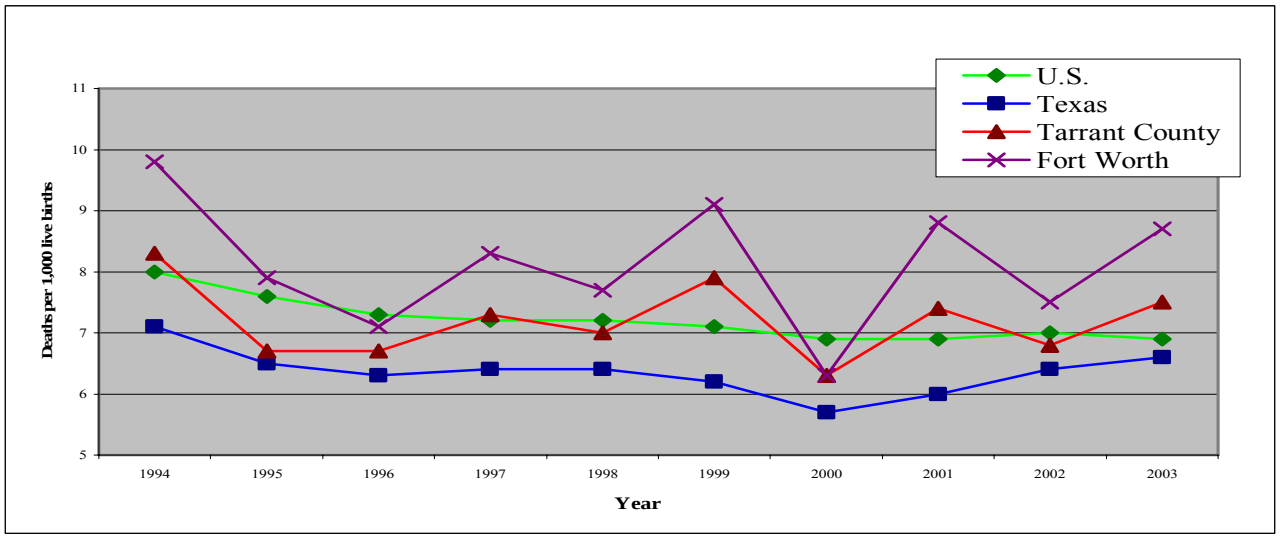
Infant mortality rates (IMRs) are robust indicators of population health status[1]. Fort Worth's IMR was 8.7 deaths per 1,000 live births in 2003 – almost 32% higher than Texas's IMR and 26% higher than the national IMR[1]. This number varies, however, in different areas within the city, with IMRs ranging from 0 to as high as 17.9 deaths per 1,000 live births[1]. In this study, two demographically similar Fort Worth communities with disparate infant mortality rates were studied in order to identify possible community-level factors that contribute to these citywide IMR differences. Specifically, factors related to socioeconomic position, neighborhood characteristics, general health status, healthcare utilization, and health literacy were considered. Community-level data were taken from the City of Fort Worth's 2003 Community Needs Assessment Summary Report. Community characteristics were compared using chi-square tests and odds ratios for categorical variables and Mann Whitney tests for continuous variables. The community with the higher IMR was associated with a larger proportion of respondents reporting poor housing conditions, no working telephone, difficulty purchasing groceries, no health insurance, and no employment. Along with other data recently collected by the Fort Worth Public Health Department, these results indicate that targeting fundamental determinants of population health are likely to impact local IMRs.

INTRODUCTION

While infant mortality has declined in the United States over the past two centuries, urban areas continue to exhibit higher rates than the rest of the country[2], and disparities by racial and ethnic status have widened.[3] Because infant mortality is an indicator of community health status[1], numerous investigations have explored the causes of infant mortality, both at the individual and community levels. Studies have found that individual risk factors, including low socioeconomic position, poor nutrition, inadequate housing[4], single marital status[4-6], and maternal substance abuse[4, 7], increase the likelihood of early infant death. At the community level, infant mortality is associated with health services, socioeconomic factors, and life expectancy.[8] Other community-level risk factors include living in unsanitary housing (specifically concerning toilet facilities and fresh drinking water), high consumption of fat calories, low literacy rates[9], and the concentration of healthcare facilities within an area.[10]

The infant mortality rate (IMR) for the City of Fort Worth was 8.7 deaths per 1,000 live births in 2003—almost 32% higher than the state's rate of 6.6 deaths per 1,000 live births and 26% higher than the national rate of 6.9 deaths per 1,000 live births.[1] However, the IMR in Fort Worth ranges from 0 to as high as 17.9 deaths per 1,000 live births, depending on the area.[1] These rates are higher than those of Tarrant County, the state of Texas, and the United States, and the rates have been rising (see Figure 1).

FIGURE 1. INFANT MORTALITY RATES RISING SINCE 2000

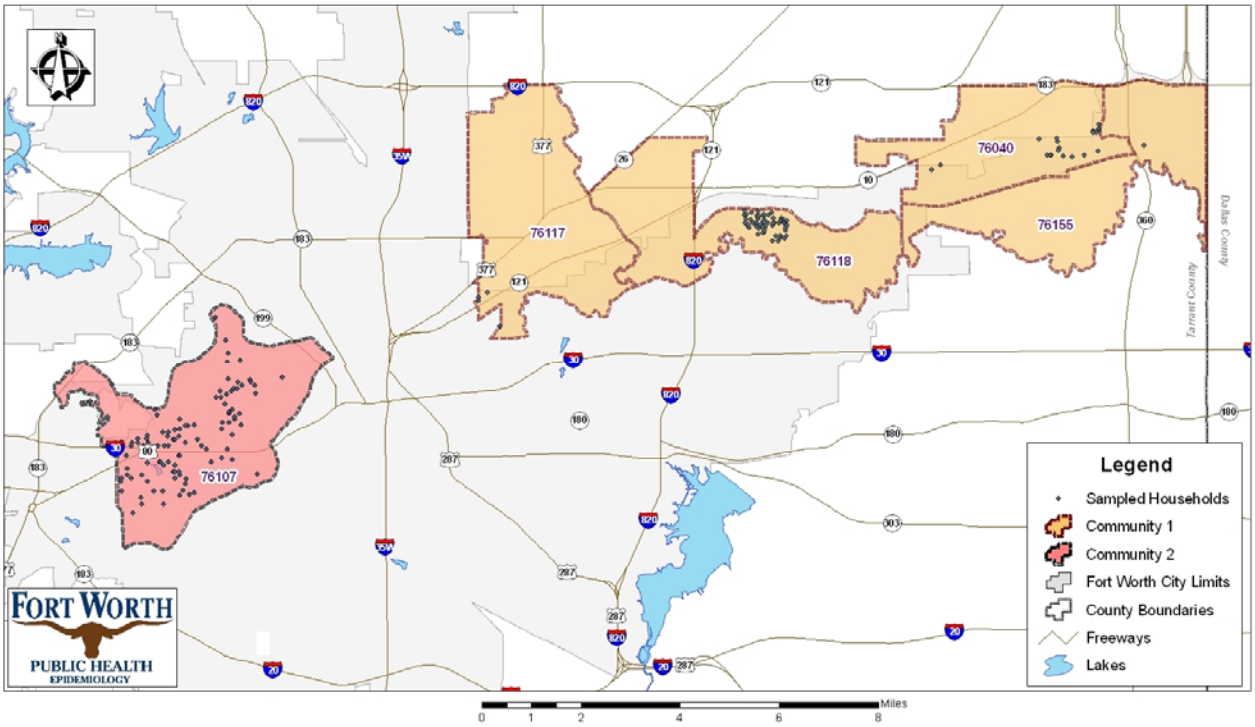


To better understand the causes of this citywide variation, two demographically similar communities with disparate IMRs were studied in order to identify community-level factors, specifically in the areas of socioeconomic position, neighborhood characteristics, healthcare utilization, and health literacy, that may be associated with these IMR differences. While numerous ecologic studies have studied infant mortality in the U.S. population, none have studied characteristics at the community level associated with increased infant mortality in two similar urban communities.

METHODS

IMR data were compiled by the Epidemiology and Assessment Division of the City of Fort Worth Public Health Department and included natality and mortality from January 2003 to December 2003.[1] Community-level characteristic data were derived from the City of Fort Worth's 2003 Community Needs Assessment (CNA) Summary Report. The purpose of the CNA is to assess the needs of Fort Worth communities in order to best allocate city resources to serve people. The CNA is an 81-question survey compiled by organizations including the Fort Worth Independent School District, Texas Department of State Health Services, Centers for Disease Control and Prevention, Tarrant Country Public Health, and Dallas-Fort Worth Hospital Council, among others. One survey was administered for each household chosen from a stratified random sample, and the survey respondent (at least 18 years old and living in the household) served as the representative for that household. A total of 3,361 face-to-face surveys were completed in Fort Worth during 2003.[11]

FIGURE 2. LOCATIONS OF COMMUNITIES 1 AND 2 WITHIN THE CITY OF FORT WORTH



* Source: Epidemiology and Assessment Division, City of Fort Worth Public Health Department. Dorian Villegas, DrPHc, MPH.

Based on the participants' responses to the CNA, two demographically similar communities were identified by zip code using SPSS software. The communities were comparable in terms of the distributions of gender, marital status, race, language spoken at home, as well as in average age, household size, and number of years of education completed. Community 1 included contiguous zip codes 76040, 76053, 76117, 76118, and 76155, and Community 2 covered zip code 76107 (see Figure 2). Community 1 (n = 100 CNA respondents) had an IMR of 0 infant deaths per 1,000 live births, while Community 2 (n = 229 CNA respondents) had an IMR of 11.4

infant deaths per 1,000 live births in 2003.[1] Site visits were made in both communities to ensure the communities were consistent with the CNA dataset.

Characteristics of the two communities were compared using chi-square tests and logistic regression for the categorical variables and Mann-Whitney tests for the continuous variables. For logistic regression analyses, odd ratios and 95% confidence intervals were computed for categorical variables, using Community 1 (with the lower IMR) as the referent community. Statistical significance was set at the α=0.05 level. Community attributes were divided into five categories: socioeconomic position, neighborhood characteristics, general health, healthcare utilization, and health literacy.

RESULTS

DEMOGRAPHIC CHARACTERISTICS. Communities 1 and 2 were similar in terms of the distributions of participants based on gender, race, and language spoken at home, as well as in participants' average age and average years of education completed. They differed, however, in the distribution of participants by marital status and in the participants' mean household size. More participants from Community 2 were single ($p < 0.001$), and Community 2 had a smaller average household size ($p<0.001$) (see Table 1).

SOCIOECONOMIC POSITION (SEP). Householders in Community 2 had increased odds of not owning their current residence (OR = 22.78, 95% CI: 12.57-52.89), not having a working telephone within the household (OR = 9.68, 95% CI: 1.28-73.01), reporting needed repairs to the home (OR = 2.81, 95% CI: 1.59-4.95), and having problems buying enough groceries within the past 12 months (OR = 2.35, 95% CI: 1.24-4.43) compared to householders in Community 1 (see Table 3).

NEIGHBORHOOD CHARACTERISTICS. Respondents from Communities 1 and 2 were equally likely to be happy with their neighborhoods (OR = 1.03, 95% CI: 0.45-2.34) and with their neighborhood schools (OR = 0.95, 95% CI: 0.21-4.18). The respondents from each community were also comparable in the average number of years lived in their respective neighborhoods ($p = 0.57$) and the number of retired persons living within their households ($p = 0.76$). The most commonly identified service need in both communities was street repairs (9.1% in Community 1 and 10.5% in Community 2). Communities 1 and 2 differed, however, in a number of ways. Community 2 reported fewer instances of being unsatisfied with the available public transportation (OR = 0.36, 95% CI: 0.17-0.74). This can be seen in the modes of transportation used by each community. In Community 1, 94% of respondents used a car, while 2% were dependent on someone else for transportation. In Community 2, 80% used a car, 9% used public transportation, and 7% were dependent on someone else. Respondents in Community 2 were also 2.05 times more likely to be a victim of crime in Fort Worth when compared to respondents from Community 1 (95% CI: 1.15-3.68); but crime victims in Community 2 had reduced odds of the crime occurring within their neighborhood (OR = 0.37, 95% CI: 0.12-1.16). Respondents from Community 2 were also slightly more likely to report feeling unsafe in their neighborhood compared to respondents from Community 1 (OR = 2.29, 95% CI: 0.92-5.72).

TABLE 1. CHARACTERISTICS OF CNA RESPONDENTS FROM COMMUNITY 1 AND COMMUNITY 2: FORT WORTH, TEXAS, 2003*

Categorical Variables	Community 1 Proportion	Community 2 Proportion	p-value
Gender			0.22
Female	61.5%	54.1%	
Marital status			< 0.001
Single	29.0%	65.8%	
Primary language spoken in home			0.19
English	91.9%	86.4%	
Race			0.50
White	63.0%	56.0%	
Black	18.0%	20.9%	
Other	19.0%	23.1%	
Continuous Variables	**Mean (Range)**		**p-value**
Demographics			
Age of respondent (years)	42.41 (18-86)	44.33 (18-92)	0.62
No. of people living household	2.72 (1-6)	2.01 (1-8)	<0 .001
No. of years of education completed	13.84 (2-20)	13.20 (2-22)	0.06
Socioeconomic Position			
No. of people employed in household	1.45 (0-4)	1.10 (0-6)	< 0.001
General Health			
No. of alcoholic drinks respondent consumes on days that he/she drinks	2.05 (1-6)	3.00 (1-24)	0.02
No. of days per week the respondent has at least 1 alcoholic beverage	2.00 (1-4)	3.15 (1-7)	0.04

* Community 1 includes the Fort Worth zip codes 76040, 76053, 76117, 76118, and 76155. Community 2 includes zip code 76107. Data source: 2003 City of Fort Worth Community Needs Assessment Survey.

GENERAL HEALTH. Participants from Community 2 had higher odds of reporting poor health status (OR = 1.44, 95% CI: 0.82-2.54), but these results were not statistically significant. Community 2 householders were significantly more likely to have arthritis (OR = 2.26, 95% CI: 1.09-4.69), depression (OR = 5.39, 95% CI: 1.88-15.48), anxiety (OR = 4.69, 95% CI: 1.39-15.77), mental health problems (OR = 5.97, 95% CI: 1.39-25.72), and smoking (OR = 2.39, 95% CI: 1.34-4.26), compared to Community 1 householders. Residents in Community 2 were also more likely to drink alcoholic beverages during the week and have more drinks on each occasion (see Table 1).

HEALTHCARE UTILIZATION. Significant differences between the two communities included the percentage of respondents and their children covered by health insurance, the percentage of respondents who had a dental checkup within 12 months of the survey (see Table 2), and where respondents go when sick (p = 0.003). In Community 1, 87% of respondents reported going to the doctor when ill, while 5% and 3% reported going to a clinic and the ER, respectively, and 3% reported going nowhere. In Community 2, 65% reported going to a doctor, 11% to a clinic, 8% to the ER and 9% would not seek treatment. Householders in Community 2 were also 3.47 times more likely to lack health insurance compared to Community 1 householders (95% CI: 1.65-7.33). Only 82% of Community 2 respondents reported having health insurance for all children, while 100% of Community 1 reported having all of their

children covered (p = 0.041). Those in Community 2 also had increased odds of not having anyone in the household visit the dentist for a checkup in the past year (OR = 4.06, 95% CI: 2.17-7.60).

HEALTH LITERACY. Householders within Community 2 were 2.67 times more likely to have trouble speaking English (95% CI: 0.78-9.14) and 2.86 times more likely to have trouble writing English (95% CI: 0.97-8.45) compared to those in Community 1. These differences, however, were not statistically significant (p = 0.10).

TABLE 2. ASSOCIATION BETWEEN COMMUNITY IMR LEVEL AND CATEGORICAL COMMUNITY-LEVEL VARIABLES – FORT WORTH, TEXAS, 2003*

Dependent Variable	Odds Ratio	95% CI	p-value (2-sided)
Socioeconomic Position			
No working phone in the household	9.68	1.28-73.01	0.01
Repairs needed in household	2.81	1.59-4.95	< 0.001
Problem buying enough groceries in past 12 months	2.35	1.24-4.43	0.01
Neighborhood Characteristics			
Ever been a victim of crime in Fort Worth	2.05	1.15-3.68	0.02
Availability of transportation is poor	0.36	0.17-0.74	0.01
General Health			
Arthritis in household	2.26	1.09-4.69	0.03
Depression in household	5.39	1.88-15.48	<0.001
Anxiety in household	4.69	1.39-15.77	0.01
Current mental problems in the household	5.97	1.39-25.72	0.01
Children under 17 in household	0.39	0.22-0.68	0.001
No one knows CPR in household	1.63	1.01-2.62	0.05
Smokers living in the household	2.39	1.34-4.26	0.003
Healthcare Utilization			
Does not have health insurance	3.47	1.65-7.33	0.001
Household has not visited a dentist for routine check-up in past 12 months	4.06	2.17-7.60	< 0.001
Health Literacy			
Writing English is a problem	2.86	0.97-8.45	0.05

* Community 1 (low IMR) is the referent group and Community 2 (high IMR) is the comparison group.
Data source: 2003 City of Fort Worth Community Needs Assessment Survey.

DISCUSSION

Disparities in infant mortality by community may be partially due to social inequalities that shape environmental and social exposures.[12, 13] Place-based stressors, or biologically relevant components of the human environment that can function independently of individual stressors to influence health, may impact infant mortality in three ways: 1) by affecting birth outcomes directly, 2) by increasing exposure to environmental hazards, and 3) by enhancing vulnerability to the toxic effects of contaminant exposures.[13] This study found that most of the significant differences between Communities 1 and 2 were related to socioeconomic position. Community 2

(with the higher IMR) displayed increased odds of smoking, lack of access to health care, and factors associated with poverty, including poor housing conditions, no working telephone, difficulty purchasing groceries, no health insurance, and low employment. Odds of depression, anxiety, and any mental health condition were also elevated in Community 2. These factors were significantly higher in Community 2, despite similarities in the mean levels of education (13.2 years versus 13.8, respectively) and the proportions of racial and ethnic minorities in the two communities.

Additional significant differences between the two communities included marital status, with a much smaller proportion of Community 2 residents being married, and difficulty writing English. The latter factor is likely related to poor health literacy, which has been shown to impede successful utilization of health care resources.[14] Community 2 had a lower proportion of respondents with health insurance, both for themselves and their children. It is interesting to note, however, that 100% of Community 2 respondents had children who were up-to-date with their immunizations, while in Community 1 91% were up-to-date (data not shown). A smaller percentage of respondents in Community 2 had visited a dentist within the past 12 months—an indicator that they are less engaged in preventive health care[15].

These findings are consistent with previous investigations of neighborhood-level characteristics and adverse pregnancy outcomes. Buka and colleagues[16] studied the effects of neighborhood support on the birthweight of African American and White infants. For African American mothers, mean birthweight decreased significantly as neighborhood economic disadvantage increased. Similar, though statistically insignificant, results were obtained for White mothers. Another recent study sought to characterize the social context of pregnancy and carefully detailed neighborhood attributes that might contribute to psychosocial stress, including physical incivility (condition of housing, yards, commercial and public spaces, vacant or burned property, litter, and graffiti), territoriality (fences, hedges, decorations, and signs), and social spaces (presence of people, non-resident visitors, parks, porches, and sidewalks).[17] Some have suggested that the very different segregation-driven residential environments in which African Americans and whites reside is the fundamental cause of racial disparities in health.[18]

LIMITATIONS

The main limitations of this study are those associated with all ecologic studies. Data were collected at the community level; therefore, it is not possible to infer individual-level risk from the results. Additionally, because community characteristic and infant mortality data were collected from the same year, causality cannot be inferred. That is, we have no way of knowing whether the neighborhood conditions "caused" the observed infant mortality rates using these data. Furthermore, only two communities were sampled, so we cannot know if the community-level associations found in this study are generalizable to other communities in Fort Worth.

The sampling scheme for Community 1 is another limitation of the study. The zip codes within Community 1 are not wholly contained within the City of Fort Worth. Because community characteristic data came from the City of Fort Worth's Community Needs Assessment, however, these data are only representative of those parts of the zip codes that are in

Fort Worth. The infant mortality rate, however, is based on the entire community, including those parts that are outside the City of Fort Worth. Since there were no infant deaths in Community 1 in 2003, limiting the IMR to include only births to mothers who lived in Fort Worth would not have changed the rate. It may have decreased the overall number of births enough to make the rate unreliable.

In addition, when studies consider a large number of variables between two groups, as this study did with the community characteristics, it is likely that some pairings will yield statistically significant results by chance. Because of this, each association should be considered carefully. Finally, because the data were based on self-reported information, it is possible that respondents may have supplied inaccurate information, particularly with respect to diagnoses of health conditions.

Future research should use a multi-level approach, as advocated by many social epidemiologists[4, 19, 20], to incorporate these aggregate data into an individual-level investigation. A number of studies incorporating this multi-level approach have shown that neighborhood and community-level conditions are independently and significantly associated with risk of adverse birth outcomes after adjusting for individual-level characteristics.[21] Another improvement would be to perform a more thorough site visit of the studied communities to more objectively describe neighborhood conditions.

CONCLUSION

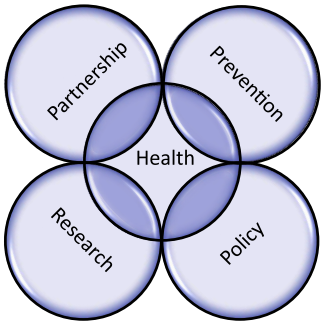
High infant mortality rates continue to pose a public health problem for most U.S. urban cities.[2] A recent comprehensive analysis conducted by the Institute of Medicine estimated that the annual societal economic burden associated with preterm birth in the United States in 2005 was at least $26 billion.[21] Recent research now suggests that the consideration of multiple dimensions of neighborhood environments account for a substantial part of racial differences in health[18] and, in particular, infant mortality[22]. Residential segregation facilitates differential exposures to the availability of alcohol[23]; environmental hazards[24]; lack of affordable, healthy food[25]; and a lack of available pharmacy services[26]. Our findings further the notion that accounting for race differences in exposure to social conditions reduces some health disparities and suggests that solutions to the disparities that target fundamental determinants of population health[27] may be effective.

Information from this study should be viewed as preliminary data to better identify candidate aggregate-level factors to be targeted in specific communities with high IMRs. These results can be used as a starting point for developing and piloting community interventions to address Fort Worth's racial/ethnic disparities in birth outcomes.

REFERENCES

1. Beel, E., W. Migala, M. Kadza and D. Villegas, *Fort Worth Vital Statistics Report, 2003*. 2005, City of Fort Worth Public Health Department: Fort Worth, Texas.
2. Haynatzka, V., M. Peck, W. Sappenfield, S. Iyasu, H. Atrash, K. Schoendorf and S. Santibanez, *Racial and ethnic disparities in infant mortality rates - 60 largest U.S. cities, 1995-1998.* Morbidity and Mortality Weekly Report, 2002. **51**(15): p. 329-332, 343.
3. Martin, J., B. Hamilton, P. Sutton, S. Ventura, F. Menacker and S. Kirmeyer, *Births: final data for 2004.* National Vital Statistics Report, 2006. **55**: p. 1-101.
4. Matteson, D., J. Burr, and J. Marshall, *Infant mortality: A multi-level analysis of individual and community risk factors.* Social Science & Medicine, 1998. **47**(11): p. 1841-1854.
5. Powell-Griner, E., *Differences in infant mortality among Texas Anglos, Hispanics and blacks.* Social Science Quarterly, 1988. **69**(2): p. 15-28.
6. Sharma, R., *Causal pathways to infant mortality: Linking social variables to infant mortality through intermediate variables.* Journal of Health and Social Policy, 1998. **9**(3): p. 15-28.
7. Zopf, P., *Mortality Patterns and Trends in the United States*. 1992, Westport, CT: Greenwood Press.
8. Yoon, C. and J. Kim, *A study on health indicator and health affecting factors.* Ingu Pogon Nonjip, 1987. **7**(1): p. 89-107.
9. Hertz, E., J. Herbert, and J. Landon, *Social and environmental factors and life expectancy, infant mortality, and maternal mortality rates: Results of a cross-national comparison.* Social Science & Medicine, 1994. **39**(1): p. 105-114.
10. Anand, S. and T. Barnighausen, *Human resources and health outcomes: Cross-country econometric study.* Lancet, 2004. **364**(9445): p. 1603-1609.
11. Kadza, M., E. Beel, J. Martinez and W. Migala, *2003 Community Needs Assessment Summary Report*. 2004, City of Fort Worth Public Health Department: Fort Worth, TX.
12. Silbergeld, E.K. and T.E. Patrick, *Environmental exposures, toxicologic mechanisms, and adverse pregnancy outcomes.* American Journal of Obstetrics and Gynecology, 2005. **192**(5): p. S11-S21.
13. Morello-Frosch, R. and E. Shenassa, *The environmental "riskscape" and social inequality: implications for explaining maternal and child health disparities.* Environmental Health Perspectives, 2006. **114**(8): p. 1150-3.
14. Paasche-Orlow, M. and M. Wolf, *The Causal Pathways Linking Health Literacy to Health Outcomes.* American Journal of Health Behavior, 2007. **31**(Supp 1): p. S19-S26.
15. Satcher, D., *Oral health in America: A report of the surgeon general*. 2000, US Department of Health and Human Services: Rockville, MD.
16. Buka, S., R. Brennan, J. Rich-Edwards, S. Raudenbush and F. Earl, *Neighborhood support and the birth weight of urban infants.* American Journal of Epidemiology, 2003. **157**(1): p. 1-8.
17. Laraia, B., L. Messer, J. Kaufman, N. Dole, M. Caughy, P. O'Campo and D. Savitz, *Direct observation of neighborhood attributes in an urban area of the US south: characterizing the social context of pregnancy.* International Journal of Health Geographics, 2006. **5**(11): p. 1-11.

18. Williams, D. and C. Collins, *Racial residential segregation: a fundamental cause of racial disparities in health.* Public Health Reports, 2001. **116**(5): p. 404-416.
19. Blalock, H., *Contextual-effects models: Theoretical and methodological issues.* Annual Review of Sociology, 1984. **10**: p. 353-372.
20. Huber, J., *Macro-Micro Linkages in Sociology*. 1991, Newbury Park, CA: Sage.
21. Behrman, R.E. and A.S. Butler, *Preterm Birth: Causes, Consequences, and Prevention*. 2006, Washington, D.C.: Committee on Understanding Premature Birth and Assuring Healthy Outcomes, Institute of Medicine of the National Academies. The National Academies Press.
22. Papacek, E., J. Collins, Jr., N. Schulte, C. Goergen and A. Drolet, *Differing postneonatal mortality rates of African American and white infants in Chicago: an ecologic study.* Maternal and Child Health Journal, 2002. **6**(2): p. 99-105.
23. LaVeist, T. and J. Wallace, *Health risk and inequitable distribution of liquor stores in African American neighborhoods.* Social Science & Medicine, 2000. **51**(4): p. 613-617.
24. Bullard, R., *Solid waste sites and the black Houston community.* Sociological Inquiry, 1983. **53**(2-3): p. 273-288.
25. Morland, K., S. Wing, A. Diez Roux and C. Poole, *Neighborhood characteristics associated with the location of food stores and food service places.* American Journal of Preventive Medicine, 2002. **22**(1): p. 23-29.
26. Morrison, R., S. Wallenstein, D. Natale, R. Senzel and L. Huang, *"We don't carry that" - failure of pharmacies in predominantly nonwhite neighborhoods to stock opioid analgesics.* New England Journal of Medicine, 2000. **342**(14): p. 1023-1026.
27. Cardarelli, K., J. DeMoor, B. Low and M. Low, *Fundamental determinants of population health*, in *Reinventing Public Health: Policies and Practices for a Healthy Nation*, L. Aday, Editor. 2005, Jossey-Bass Publishers: San Francisco.



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Center for COMMUNITY HEALTH

at UNTHSC

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