4-2014

The Effects of Welfare Sanctions on Infant Mortality in Louisiana Parishes

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By

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A thesis submitted in partial fulfillment of the requirements for graduation with
UPPER DIVISION HONORS
from the department of
POLITICAL SCIENCE

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APRIL 2014

Introduction

Infant mortality, defined as the death of a child before the age of one, is a significant social indicator of well being and development, and is often used in methodologies that compare the quality of life between nations. According to the CIA 2013 World Factbook, the United States ranked 173rd of 224 countries in terms of its national infant mortality rate, which they estimate at 5.9 deaths per 1000 live births; the Kaiser Foundation measures average US infant mortality rates between 2007 and 2009 as being 6.6 deaths per 1000 live births.

Both the 5.9 and 6.6 infant mortality rates (IMR) put the United States behind most other developed nations and many developing nations as far as preventing infant death is concerned and seem to reveal an overlooked and understudied public health crisis. That being said, under closer examination it becomes clear that both the 5.9 and 6.6 IMRs are misleadingly optimistic numbers, as infant mortality rates vary dramatically from state to state, and furthermore, from county to county (or, in the case of this examination, parish to parish) and so on.

Among the fifty states, the average IMRs between 2007 and 2009 ranged from 10.0 in Mississippi to 4.8 in New Hampshire, with twenty-six states having two-year average IMRs higher than the US 6.6 IMR, and twenty-four states falling below that average (Kaiser Foundation). Consequently, it becomes clear that, as with many forms of disparity in the United States, the national average obscures the full extent of infant mortality.

However, since the New Deal, infant mortality has declined precipitously in the United States. From the late 1930s forward, federal and state programs aimed at ending poverty and disparities have been created with the goal of crafting a “social safety net,” and have directly or indirectly led to the decline of infant mortality to its current levels (the lowest in American history, even if they are not the lowest in the developed world). And so, there is a strong correlation between not just poverty and the infant mortality rate, but also between poverty alleviation and the reduction of infant mortality in the course of American history. Of course, the patches woven together in the social safety net, in the form of poverty alleviation programs, have been added and replaced over

time—from the New Deal's social security to the Great Society's Medicare, Medicaid, and AFDC (welfare in its pre-1990's form) to TANF—and the additions and reforms of these programs have had consequences for not only impoverished Americans, but the American standard of living and, for the purposes of this paper, infant mortality.

The primary focus of this paper will be to examine infant mortality in state of Louisiana and its parishes and their relationship to the social safety net, in particular, TANF (welfare) and SNAP (food stamps), as well as TANF sanctions imposed by the state, and prenatal care. The reasons for choosing Louisiana as the subject of this paper are many, but the most important reason is that Louisiana is a state in the Deep South (also including Alabama, Arkansas, Georgia, Florida, Mississippi, North Carolina, South Carolina, Tennessee, and Texas for the purposes of this examination) where issues of poverty, racial and gender inequality, and other issues that negatively affect well-being are highly prevalent, including infant mortality.

Table 1

State	**Infant Mortality Rate**
Mississippi	10.0
Alabama	9.2
Louisiana	*9.0*
North Carolina	8.2
Tennessee	8.2
Deep South States	**8.1**
South Carolina	7.9
Georgia	7.8
Arkansas	7.6
Florida	7.1
United States	**6.6**
Texas	6.2

The reasons for choosing TANF, SNAP, TANF sanctions, and prenatal care as potential variables affecting infant mortality are varied. TANF allows states a great deal of flexibility in determining rules and regulations regarding inclusion, benefits, and

sanctioning policies. For example, Louisiana requires TANF recipients to not only to meet federal guidelines, but also be American citizens and have at least one child to be eligible for assistance. Meanwhile, SNAP is another form of public assistance but is not subject to state regulation. Access to prenatal care suggests access to healthcare generally, and is considered important in preventing infant mortality. Seeing how actual pieces of the social safety net work within Louisiana, and how that may correlate to infant mortality across the state, could reveal what effect government and its programs have on the likelihood that a child will live or die.

As a consequence of the political culture that has prevailed historically in the Southern region of the United States, Louisiana shares many of the same policies and disparities that have developed and persisted in this region, and in fact, is quite dramatically affected by the problems that distinguish this region. As a consequence of these shared characteristics, a comprehensive examination of Louisiana may allow social scientists and policy makers to more adequately address infant mortality as an issue of public health and policy in the Deep South.

Literature Review

The literature concerning infant mortality from the perspective of social science is somewhat limited, but the social ramifications of infant mortality cannot be understated. What connections between public policy and infant mortality that have been studied are quite revealing, and create the framework from which infant mortality can be more thoroughly studied as being affected by human society and behavior, particularly political behavior.

Previous research has established important links between poverty and infant mortality (Gortmaker) as well as finding alarming racial disparities, with African Americans being nearly twice as likely as white Americans to experience infant mortality (MacDorman and Mathews). And more directly relating to the issue of how welfare affects infant mortality, it has been found that the implementation of New Deal policies (Fishback, Haines, and Kantor) and the rise of the welfare state (Conley and Springer)

have lead to the dramatic decline in American infant mortality rates over the course of the twentieth century.

Furthermore, poverty, race, and state government policies have been found to affect the health of children and infant mortality (Currie and Grogger, McCloskey, et al., Bartholomew). Most critically, literature also includes findings that children whose families are sanctioned from participating in welfare are more likely to be food insecure, hospitalized since birth, and admitted into emergency care on the same day as an appointment (meaning, the children are more likely to have serious injuries or illnesses) (Cook, et al). Additionally, in recent years, several states, including Illinois, Maryland, Michigan, and Minnesota, have published infant mortality reduction plans or initiatives, which seek to better understand the conditions of their states and develop strategies to reduce infant mortality rates—though none of these plans mention how the policies of those states may influence the rates as they already exist.

What the literature and these state-based plans are lacking, however, is how the policies used by states in regard to their welfare programs and the sanctions imposed on its participants may affect the disparities found in infant mortality rates. This is an important factor to be considered because use of sanctions vary in strictness at both a state and county (or parish) level—and so too do rates of poverty, racial composition, and infant mortality. Furthermore, states in the Deep South, including Louisiana, have large populations living in poverty and large nonwhite populations, many of whom are dependent upon different forms of government assistance, meaning that large portions of the populations in these states are affected by the sanctions imposed upon participants who do not meet the requirements of their programs. And it is also these populations that are most vulnerable to infant mortality, making the exploration of any relationships that may exist between infant mortality and state welfare policy, especially sanctioning policies, all the more important.

To best understand infant mortality as it relates to welfare sanctions in a state, consideration of factors at these more localized levels may be helpful in creating a fuller picture of what conditions and circumstances are related to higher or lower incidences of infant mortality. And in conducting such an investigation, this research aims to provide information to social scientists and policy makers working to improve the well

being of the people of Louisiana and states with similar political and socioeconomic conditions.

Hypotheses

The purpose of this research is to more closely examine what relationship, if any, exists between the social safety net and infant mortality across Louisiana parishes. As programs such as TANF and SNAP are intended to help the poor, policymakers would hope that these programs help to alleviate problems such as infant mortality. It is expected that in some cases that this will be true—parts of the social safety net will provide enough security and assistance to prevent or reduce infant mortality. In other cases, however, it seems likely that the pressures and circumstances that cause populations to be dependent on public assistance, and the populations that are then denied that public assistance through sanctions, will fail to prevent infant mortality. Also important is access to prenatal care, and so this study also examines the relationship between access to prenatal care in the first trimester and infant mortality. In considering all of these factors, the following hypotheses are being tested:

Hypothesis 1: As the percentage of women participating in TANF increases in a parish, the infant mortality rate will increase in that parish.

Hypothesis 2: As the percentage of women with TANF sanctions in a parish increases, the rate of infant mortality will also increase in that parish.

Hypothesis 3: As the percentage of women participating in SNAP in a parish increases, the rate of infant mortality will decrease in that parish.

Hypothesis 4: As the percentage of women receiving first trimester prenatal care in a parish increases, the infant mortality rate of that parish will decrease.

The rational for Hypothesis 1 is grounded in the fact that poverty greatly increases the likelihood of infant mortality, and impoverished populations that rely on these forms of public assistance (in this case, women) are consequently more at risk for infant mortality. To better explain this, it helps to understand the history of the TANF program and its provisions. Temporary Assistance to Needy Families, or TANF, is the program that replaced Aid to Families with Dependent Children (AFDC), which was the primary form of welfare for Americans living in poverty from 1935 (as a part of the Social Security Act) to 1996 (when welfare "reform" was passed through the Personal Responsibility and Work Opportunity Reconciliation Act). TANF was quite different from AFDC in several important ways. First, unlike AFDC, which was available to all Americans who were eligible whenever they were eligible, TANF allows state governments to create restrictions and punishments for its participants. Secondly, AFDC was available to all eligible Americans with dependent children throughout their lives, without restriction; TANF, however, is limited to 60 months or 5 years of public assistance (at most—with states being free to offer fewer months of assistance). And finally, TANF provides less assistance than AFDC, with benefits that adjust to the income of the family receiving aid. The motivation for these reforms was based on popular opinions that people in poverty were lazy, disincentivized from working because of what was perceived as generous public assistance, and because welfare was perceived to do very little in encouraging its recipients to find work and receive education. Consequently, TANF was crafted with the purpose of requiring welfare participants to be actively looking for work or participating in educational programs, and also limiting the amount of assistance available to incentivize positive behaviors.

The reason TANF is expected to differ from food stamps (Hypothesis 3) in this hypothesis is that the benefits provided by TANF are not adequate for a stable, healthy lifestyle and are also subject to state regulation, which SNAP is not. The average size of a TANF cash grant in Louisiana is $200 and the average family consists of a mother and two children (Louisiana Department of Social Services). According to the Center on Budgets and Policy Priorities, the Louisiana TANF cash grant is so low that the amount places families' incomes below 20% of the poverty line. While all states' benefits are so low that benefits are below 50% of poverty, Louisiana is one of only 15 states that fall

below the 20% mark (Floyd and Schott 2011). Research suggests that the paucity of Louisiana's benefit is likely to influence infant mortality. For example, an examination of infant mortality in the state of Washington found that of the 6.5 deaths per 1000 in 2008-2010, 50% of the mothers were TANF participants with an income of less than 50% of the poverty rate (demonstrating the impact TANF may have on infant mortality). A recent study examining the impact of the Earned Income Tax Credit on birth weight, found that the amount of cash assistance offered under TANF is crucial in regards to impact. Strully, Rehkopf, and Xuan (2010) conclude that "living in a state with AFDC/TANF benefits in the top quartile, rather than the bottom, increases birth weights by approximately 8gm."

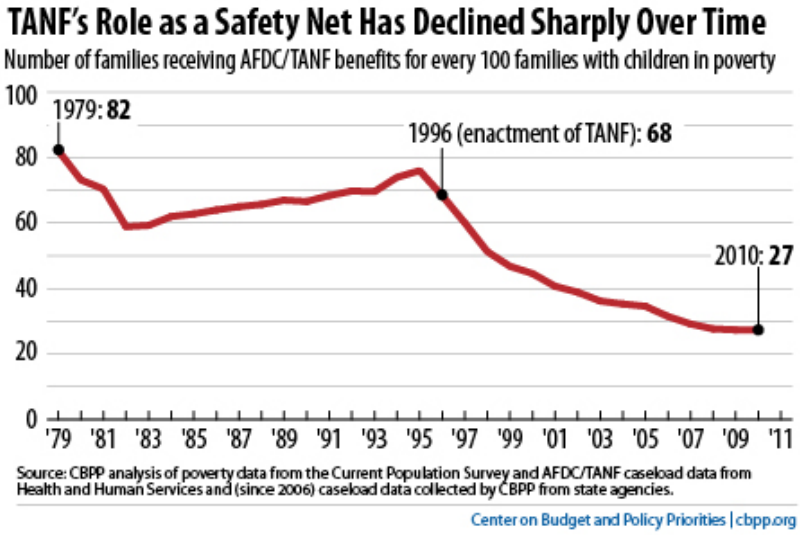

Figure 1

Additionally, dramatic changes to the U.S. cash assistance program have made the program unresponsive to actual need. For example, Figure 1 illustrates a sharp decline in the number of children in poverty receiving services. In 1979, 82 of every 100 children in poverty received cash assistance under AFDC. By 2010, that number had dropped to 27 out of 100 under TANF. One reason for the dramatic decline is that TANF has lifetime limits for assistance; in Louisiana, that limit is set at 60 months (5 years) over the lifetime of a recipient. Consequently, TANF no longer tracks with traditional indicators of need (according to the American Community Survey in 2009, only 10% of Louisianans eligible for TANF were participating in the program, putting it in

the bottom 10 states for TANF participations despite also being in the top 5 states for percentage of residents living in poverty). Additionally, increased unemployment during the last recession corresponded with increases in SNAP participation (Rosenbaum), but not with TANF usage (see Figure 2), likely because the state TANF policies discourage use (Zedlewski, Loprest, and Huber).

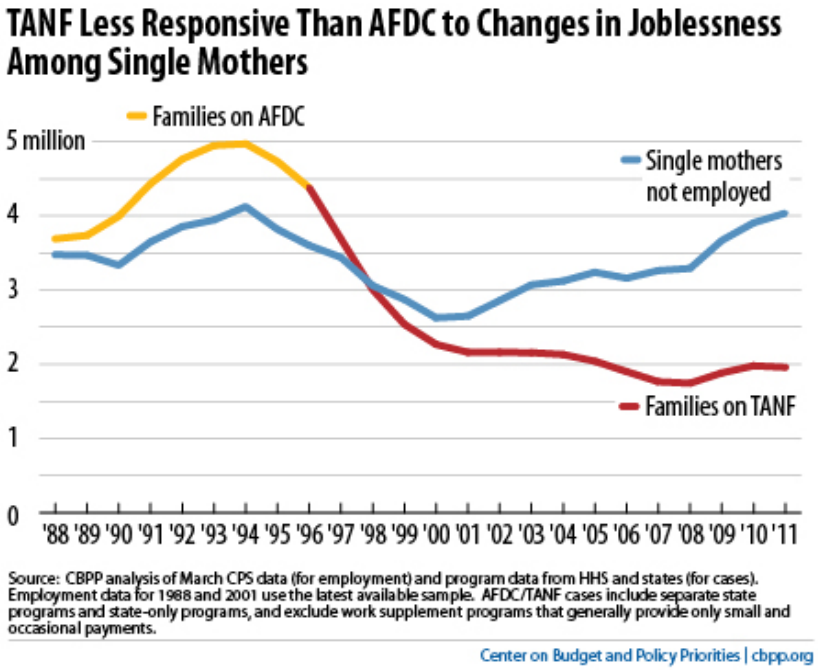

Figure 2

For Hypothesis 2, this paper predicts that higher rates of welfare sanctioning for women will also result in higher rates of infant mortality because this term more accurately reflects the number of normally welfare-eligible women in each parish who are not receiving assistance. Sanctions are one of the primary ways that states penalize welfare participants for violating state or federal regulations. These sanctions can come in the form of punitive restrictions on benefits that a family may receive, or could result in temporary removal from the program, and therefore, preventing the collection of benefits. Sanctions, however, are administered at the county, or in the case of Louisiana, parish level, meaning that it is a punitive measure that is subject to a great deal of discretion on the part of welfare caseworkers. Louisiana, and many states in the

South, have fairly rigorous restrictions on TANF participation, and consequently, have fairly high sanctioning rates and also very low TANF participation relative to its impoverished and low-income populations. Sanctions, therefore, are an important policy tool for the state in regard to how it treats Americans on public assistance. The sanctions are also important because these previously eligible, and still impoverished, women are now denied the assistance they may have received in coordination with other forms of public assistance (however meager), amplifying the difficulties of living in poverty that affect Hypothesis 1.

In a 2002 survey of parents who either participated in TANF or were sanctioned from participation, it was found that children from families who were sanctioned (having their welfare either terminated or reduced) were more likely to experience food insecurity, to have been hospitalized since birth, and to be admitted the day of an emergency department visit than children in families whose benefits were not reduced (Cook, et al.). The study shows that there are significant healthcare consequences for children on welfare—and especially for children in families that have been sanctioned. Because TANF eligibility in Louisiana requires its participants to have at least one child, this means that sanctioned participants also have children who have lost access to public assistance, making the results of the study all the more relevant to the issue of sanctions and infant mortality. In a state level study of infant health, Bartholomew examines how state TANF policy decisions influence infant health. She concludes that TANF policy decisions regarding sanctions play a crucial role in increasing total infant mortality rates. Unfortunately, she does not have a measure of TANF participation and relies on education level as a proxy for TANF participation which is quite suspect.

In Louisiana, TANF policy, including sanctions, is set by the Department of Social Services in Baton Rouge, but it is implemented in parish offices (Davis, Livermore, and Lim). Centralized administration with local implementation of sanctioning policies has resulted in a well established body of literature chronicling the uneven implementation of the policy (Schram et al.; Keiser et al.; Pavetti et al). This uneven application of the policy across the state means that if sanctioning rates influence infant mortality, increases in the parish office's preference for sanctions as a policy tool is likely to infant mortality rates.

Hypothesis 3 predicts that increasing the percentage of SNAP participants in each parish will decrease the infant mortality rate, as food stamp participation by a woman means that she is theoretically able to provide food for herself and her family. The Supplemental Nutrition Assistance Program (SNAP), better known as food stamps, is a Great Society program that provides assistance to low-income people and families to pay for food. It is one of the most successful public assistance programs, especially in terms of limiting misuse and stimulating economic activity, and also one of the most widely used. Food stamp use increased in the wake of the most recent recession, but with rising food prices, and cuts in funding from Congress, SNAP's ability to meet the needs of the poor is increasingly challenging. It is also worth noting that while TANF participants are also eligible for food stamps, SNAP eligibility extends to some who are not eligible for TANF based upon income and other factors (meaning that food stamps are accessible to those with greater income than those also receiving TANF). This may allow food stamp participants to more adequately provide for themselves and their families. Almond, Hoynes, and Schanzenback (2008) find positive associations between Food Stamps and birth weight, a predictor of infant mortality, in their study of food stamp variation across American counties in the 1960s and 1970s.

The size of the SNAP amount available to families leads me to hypothesize that its effect is protective in nature. The SNAP benefit in Louisiana when combined with the TANF cash allotment means that the average family in poverty in the state is at 50% of the poverty line. The SNAP program accounts for 35% of that amount while the TANF cash allotment is just 15% (Floyd and Schott). Floyd and Schott conclude that SNAP has provided a strong safety net for families, with an average benefit of $428 a month, but note that the amount when combined with cash assistance, means that benefits are below 75% of the poverty line in 45 states and below the official poverty line in all states. Figure 3 illustrates that unlike the TANF program, SNAP participation rates increase with poverty rates.

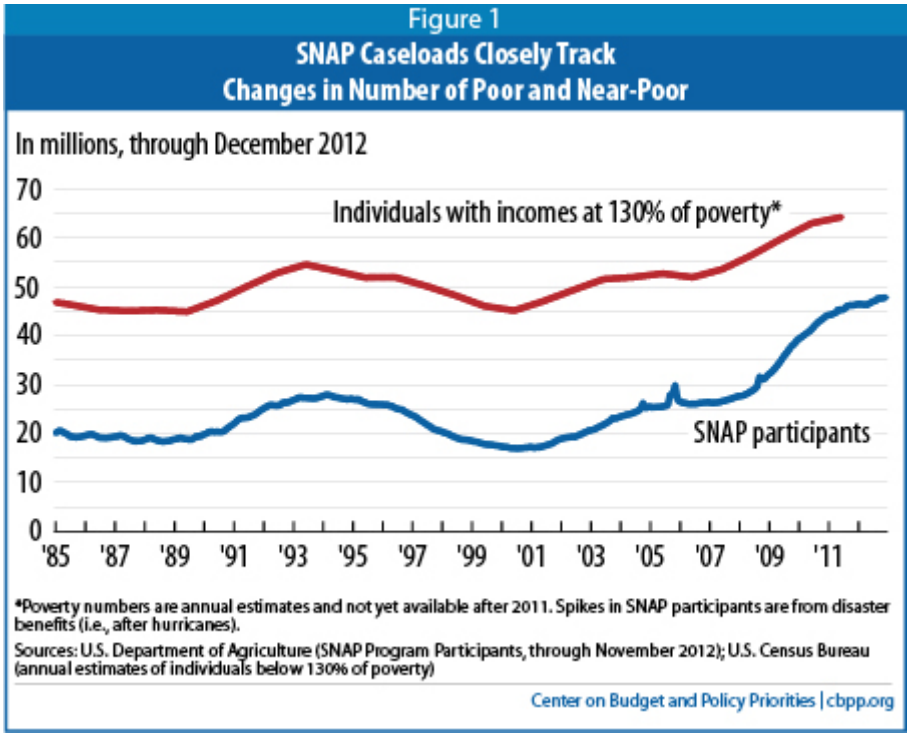

Figure 3

TANF, TANF sanctions, and SNAP are important variables for the purpose of this research because Louisiana has a large number of TANF and SNAP eligible people, and these people tend to be most at risk for incidences of infant mortality. The amended Table 2 below outlines the rates of TANF and SNAP participation by parish, as well as rates of welfare sanctions, and shows these variables for the three parishes with the highest and three parishes with the lowest infant mortality rates. The full table can be found in the appendix following the discussion section of this paper. As can be seen from the data, there are very few women in Louisiana participating in TANF—but much larger percentages of women sanctioned from participating or use food stamps to aid in meeting their needs. This is significant because it shows that, though many women are or were eligible for aid, many of them are not receiving, or are unable to receive, that aid through what is intended to be one of the primary forms of public assistance in the American social safety net. This paper seeks to understand whether or not this has consequences for the state's infant mortality rate.

Table 2: Percentages of Women on TANF, Women sanctioned, and Women on SNAP by Parish

LOUISIANA	IMR	% Covered by TANF	% Sanctioned from TANF	% on SNAP
Cameron, LA	2.4	12.3913	13.04348	5.77549
La Salle, LA	5.1	9.846939	57.14286	13.63182
St. James, LA	5.1	1.213206	48.68735	17.72863
West Baton Rouge, LA	16.6	3.276368	56.60881	14.97638
Claiborne, LA	18.1	1.092545	51.1054	20.63919
East Carroll, LA	21.3	0	59.90099	41.7515

And finally, Hypothesis 4 relies on the idea that access to prenatal care in the first trimester is likely linked to access to healthcare generally, and therefore represents the ability of women to seek out preventive treatments that reduce the likelihood of infant mortality occurring. Prenatal care can reduce infant mortality by "identifying and treating maternal conditions and behaviors that affect birth outcomes" (Cunningham, Leveno, Bloom, Rouse, Spong 2010).

With these hypotheses in mind, this research seeks to understand whether or not government policies have significant affects on infant mortality rates—and whether those policies aimed at alleviating poverty (TANF, SNAP) or restricting access to assistance (sanctions), as well as how access to prenatal care affects infant mortality rates in Louisiana.

Measuring Infant Mortality in Louisiana

The IMR, as a standard measurement, is measured as *(x number of deaths before the age of 1 year) per 100,000 live births*. So, for example, Louisiana's average IMR between 2005-2009 was 9.4, or 9.4 deaths per 100,000 live births between 2005-2009. All postpartum infant deaths before the age of 1 are counted towards the infant mortality rate, whether death was caused by Sudden Infant Death Syndrome, accidental suffocation, abuse or malnutrition, or homicide.

Consequently, IMR is not a narrow measurement of specific causes of death, but simply a measurement of all infants who have died. In this amended Table 2, we can analyze Louisiana's IMR from 2005-2009, broken down by race and parish, and shows these variables for the three parishes with the highest and three parishes with the lowest infant mortality rates. The full table can be found in the appendix following the discussion section of this paper. Highlighted units indicate higher than average infant mortality rates; colors are used to distinguish between total average (yellow), white average (red), black average (blue), Hispanic average (green), and "other" (purple).

Table 3: Infant Mortality Rates, State of Louisiana, by Race, by Parish, 2005-2009

	2005-2009 Total IMR	2005-2009 White IMR	2005-2009 Black IMR	2005-2009 Hispanic IMR	2005-2009 Other IMR
LOUISIANA	9.4	6.5	14	4.8	4.1
Cameron, LA	**2.4**	**2.6**	**0**	**0**	
La Salle, LA	**5.1**	**3.6**	**17.9**		**0**
St. James, LA	**5.1**	**3**	**6.7**	**0**	
West Baton Rouge, LA	**16.6**	**15.3**	**18.8**	**60.6**	**0**
Claiborne, LA	**18.1**	**5.5**	**24.4**	**58.8**	
East Carroll, LA	**21.3**	**16**	**22.6**		

(Statistics provided by the Office on Women's Health Quick Health Data Online database)

The numbers in Table 2 illustrate how the measuring the average IMR at the state and national level can obscure the true effects of infant mortality. Whether one chooses the parish averages—or averages in each parish by race, there are substantial variations in how infant mortality affects parts of the population. The data in Table 2 also demonstrate how significantly race is tied to infant mortality, and although race is not the focus of this study, such a disparity should not be ignored, especially not when considering the connections between poverty and race in the United States and especially the American South.

Data

Table 4 is the dataset used to calculate all results of this paper. It includes the parish IMR, percentage of women covered by TANF in each parish, percentage of women sanctioned from TANF coverage in each parish, percentage of SNAP participation in each parish, and percentage of women who received first trimester prenatal care in each parish.

Table 4: Infant Mortality Rate per 100,000 live births, TANF %, Sanction %, SNAP %, and Prenatal Care % by Parish, 2005-2009

LOUISIANA	IMR (mortality)	% of Women on TANF (pctcov)	% of Women sanctioned (pctsanction)	SNAP (foodstamp)	% of Women receiving Prenatal Care (firsttricare)
Cameron, LA	2.4	12.3913	13.04348	5.77549	97.02283
La Salle, LA	5.1	9.846939	57.14286	13.63182	94.31677
St. James, LA	5.1	1.213206	48.68735	17.72863	87.66211
West Baton Rouge, LA	16.6	3.276368	56.60881	14.97638	87.36216
Claiborne, LA	18.1	1.092545	51.1054	20.63919	86.65455
East Carroll, LA	21.3	0	59.90099	41.7515	78.87892

Results

Hypotheses were tested using bivariate regressions to correlate the independent variable of infant mortality with the dependent variables (percentage of women on TANF, percentage of women sanctioned, percentage of women on SNAP, and percentage of women who received first trimester prenatal care). Significant results are marked (**). P > 0.05.

Table 5: Results

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
Infant Mortality	64	9.565625	3.345417	2.4	21.3
Percent Covered	64	3.572932	3.79972	0	24.04545
Percent Sanction	64	48.41387	12.07431	13.04348	75.08974
Food Stamp %	64	18.62007	6.685863	5.77549	41.7515
FirstTriCare %	64	4.546725	4.546725	74.47273	97.02283

The average percent of women covered by TANF across all Louisiana parishes is about 3%. While there is not as much deviation in the percentage of women receiving welfare coverage relative to other variables considered in this model, there are some dramatic outliers and some substantial range between parishes. The lowest coverage percentage is 0, in East Carroll, Madison, and Morehouse parishes, and the highest coverage percentage is 24%, in West Feliciana Parish, with most parishes falling closer to 1-4% and a few parishes falling between 6-9%. The bivariate regression in table 5 found that there is no statistically significant correlation between the percentage of women with welfare coverage and infant mortality, meaning that Hypothesis 1 can be neither accepted nor rejected.

Table 6: Bivariate Regression Assessing the Relationship between TANF Coverage and Infant Mortality

Mortality	**Coefficient**	**Standard Error**	**t score**	**P > |t|**	**[95% Confidence Interval]**
Percent Covered	-0.0723749	0.1114373	-0.65	0.518	-0.2951349 – 0.150385
Constants	9.8242116	0.5788105	16.97	0.000	8.66719 – 10.98124

Relative to the percentage of women using TANF, women sanctioned from standard public assistance are far more common in Louisiana. The average rate for women issued welfare sanctions across all Louisiana parishes is around 48%. However, there is substantial variation in sanctioning across all parishes. Cameron Parish has the lowest rate of sanctioning for women at 13%, while Bienville Parish has the highest rate of sanctioning, at 75%. Most parishes fall above sanctioning rates of 40% for women. In a bivariate regression, there is no statistically significant relationship between the percentage of women sanctioned and infant mortality. This means that Hypothesis 2 can be neither accepted nor rejected.

Table 7: Bivariate Regression Assessing the Relationship between TANF Sanctions and Infant Mortality.

Mortality	**Coefficient**	**Standard Error**	**t score**	**P > |t|**	**[95% Confidence Interval]**
Percent Sanction	0.0481732	0.0346519	-1.39	0.169	-0.210949 – 0.1174413
Constants	7.233373	1.728226	4.19	0.000	3.778698 – 10.68805

SNAP participation by women across Louisiana parishes is approximately 18%, and just as with the other variables, participation differs substantially in each parish. This ranges from about 5% of women receiving food stamps in Cameron Parish to 41% of women in East Carroll Parish. Table 7 shows that the bivariate regression uncovered a statistically significant relationship between food stamp participation and infant mortality. The relationship is positive, contrary to what was hypothesized, leading to a rejection of Hypothesis 3. As food stamp participation increases, infant mortality also increases. For every one-percentage point increase in food stamp participation, infant mortality increases by .20 deaths per 100,000 live births.

Table 8: Bivariate Regression Assessing the Relationship between SNAP Coverage and Infant Mortality

Mortality	**Coefficient**	**Standard Error**	**t score**	**P > |t|**	**[95% Confidence Interval]**
Food Stamp %	0.2036413	0.0580464	3.51	0.001**	0.0876081 – 0.3196744
Constants	5.77381	1.147367	5.03	0.000	3.778698 – 10.68805

And finally, the rate of women receiving prenatal care in their first trimester across all Louisiana parishes is nearly 86%, with Tensas Parish having care provided to 74% of pregnant women, while in Cameron Parish, having the highest percentage of first trimester care for women, at 97%. In the bivariate regression shown in Table 8, a statistically significant relationship between prenatal care in the first trimester and infant mortality. The relationship is negative as hypothesized (Hypothesis 4), meaning that infant mortality declines as prenatal care in the first trimester rises. For every one-percentage point increase in prenatal care, infant mortality declines by .22 deaths per 100,000 live births.

Table 9: Bivariate Regression Assessing the Relationship between First Trimester Prenatal Care and Infant Mortality

Mortality	**Coefficient**	**Standard Error**	**t score**	**P > |t|**	**[95% Confidence Interval]**
FirstTriCare %	-0.2267349	0.0888976	-2.55	0.013**	-0.4044387 – -0.0490312
Constants	29.27668	7.738654	3.78	0.000	13.80733 – 44.74603

Discussion

In the matter of whether or not the social safety net—or its intentional holes, in the form of sanctions—affects infant mortality, the research conducted for this study is inconclusive. The results from the bivariate regressions for women participating in TANF and women sanctioned while participating in TANF had no statistically significant relationship with infant mortality, and contrary to what was expected, the correlation between percentage of women participating in SNAP correlated positively with infant mortality. The only hypothesis that was confirmed was that as the percentage of women with access to first trimester prenatal care increased, infant mortality rates decreased. As for why the results of this research were inconclusive on the matter of infant mortality and its relationship with the social safety net, there are at least two important limitations that must be addressed.

First, there were not enough observations to complete a multivariable regression, and consequently, the results are based on bivariate regressions. This is not the ideal methodology for this kind of study, and using more observations and personal-level infant mortality data would allow for a more precise understanding of the effects of the social safety net on infant mortality. Future research should consider pooling the data across time, which would allow us to assess the relationships between variables across time and allow for multiple regression estimation.

And secondly, the methodology employed here is at parish and state level data—meaning, broader, generalized data—rather than individual level data. Consequently, the results of this study do not considering whether or not the same women who experience infant mortality are also receiving prenatal care, are participants in TANF or food stamps programs, or are sanctioned from receiving welfare benefits by the parish. Consequently, just as acquiring more observations are critical to better understanding what relationships may exist between infant mortality and the social safety net (or its intentional holes), the kinds of observations must also be adapted in any future study of this subject. Individual level data of infant mortality would be most useful in this regard, by providing a picture of the women affected by infant mortality, and resolving some of the problems with this study.

Keeping those limitations in mind, there is still value in analyzing and understanding the results that were significant in this study. First, the significant result that as the percentage of women using food stamps in a parish increased, infant mortality also increased. While the result was unexpected, participation in SNAP is an indicator of one's low-income, near-poverty or in-poverty status. As food stamp participation increased in a parish, this also meant more at-risk women lived in that parish, making infant mortality more likely despite the program providing opportunities to purchase food. A possible explanation for why food stamps do not have a negative correlation to infant mortality is that food stamps do not provide enough compensation to pay for the food needed to support healthy lifestyles for women or their families. Another explanation may be that many women participating in SNAP are not well educated on what kinds of foods are nutritious and beneficial to not only their livelihoods, but also the health of their children. In either case, it seems that providing minimal access to food, as intended, does not necessarily raise the standard of living for women in poverty enough to overcome problems such as infant mortality.

If the reason for this negative relationship is the result of insufficient support, another variable worthy of including in future research would be participation rates in the Women, Infants, and Children program, or WIC. WIC is a program that provides assistance to pregnant women, recent mothers (within six months of the birth), and breastfeeding women as well as infants up to their first birthday and children up to their fifth birthday. The program can be used to supplement SNAP, pay for baby formula, or cover healthcare treatments such as prenatal care, immunizations, child clinics, and addiction treatment. WIC also provides free health and nutrition educational opportunities for participants, and breastfeeding support for mothers unfamiliar with breastfeeding. However, data at the parish level for WIC participation during the time period under study is currently unavailable, though there is some evidence suggesting that WIC participation results in fewer low birth weight babies in comparison to low income women who do not participate (Bittler and Currie 2005).

The second significant result, finding that the percentage of women receiving first trimester prenatal care is negatively correlated with infant mortality (meaning that infant mortality declines as the percentage of women receiving first trimester prenatal care

increases) was predicted in Hypothesis 4 on the basis that access to prenatal care demonstrates access to healthcare generally, and should improve health outcomes of both the women and child. The results of the bivariate regression seem to confirm that access to prenatal care in the first trimester does improve the likelihood that a child will survive past its first year. That being said, the relationship could also be influenced by the fact that parishes where a greater percentage of women receive prenatal care are also the same parishes that have fewer women living in poverty (based on the percent of women participating in TANF, SNAP, or sanctioned), and therefore, many are less at risk than in parishes with greater levels of poverty.

Recognizing that access to healthcare is important to preventing infant mortality, the option before states to expand their Medicaid programs through the Affordable Care Act in order to provide more coverage for more people would be particularly beneficial for Louisianans. With coverage through Medicaid, families living in low-income and impoverished conditions would be able to access healthcare when wanted or needed rather than when unavoidably necessary. This would allow more women to seek out prenatal care, and in turn, could lead to reductions in infant mortality. However, the current Governor and his administration have held strong in refusing aid for Louisiana's low-income and poor, despite the fact that the expansion would be completely paid for by the federal government in the first few years, and then predominantly covered by the federal government from then on.

As for the results that were inconclusive—the bivariate regressions dealing with the relationship between infant mortality and TANF participation rates for women and the TANF sanctioning rates for women—there remains more possibility for work to be done. The limitations of this study, particularly the limited number of observations and the broad nature of the data gathered, as opposed to individual level infant mortality data, prevent this research from effectively understanding what relationship, if any, does exist between TANF, TANF sanctions, and the infant mortality rate of Louisiana and its parishes.

What can be summarized from the results of this study is that poverty has a powerful affect on infant mortality—so much so that not even programs such as SNAP, which are intended to help feed the poor, reduce infant mortality. And access to prenatal

care is essential in decreasing infant mortality as well; but as can be seen in the data section of this paper, such access does not extend to all women in the state of Louisiana. Whether or not other parts of the social safety net (particularly TANF) and its holes (TANF sanctions) reduce infant mortality, or merely predict which populations are most vulnerable to it, cannot be deduced from the results of this research. And so, future research must overcome the limitations that prevented results from conclusively establishing whether or not the policies intended to alleviate poverty also effect infant mortality. This may be accomplished by increasing the number of observations collected in order to complete multivariable regressions, rather than bivariate regressions used in this paper, and also by collecting individual level data for infant mortality in the state of Louisiana.

Appendix of Tables

Table 1: Infant Mortality Rates in the Deep South

Kaiser Foundation, US Infant Mortality Rates (Deaths per 1000 Live Births), 2007-2009

State	Infant Mortality Rate
Mississippi	10.0
Alabama	9.2
Louisiana	*9.0*
North Carolina	8.2
Tennessee	8.2
Deep South States	**8.1**
South Carolina	7.9
Georgia	7.8
Arkansas	7.6
Florida	7.1
United States	**6.6**
Texas	6.2

Table 2: Percentages of Women on TANF, Women sanctioned, and Women on SNAP by Parish

LOUISIANA	IMR	% Covered by TANF	% Sanctioned from TANF	% on SNAP
Cameron, LA	2.4	12.3913	13.04348	5.77549
La Salle, LA	5.1	9.846939	57.14286	13.63182
St. James, LA	5.1	1.213206	48.68735	17.72863
Catahoula, LA	5.2	1.987104	57.44432	22.90271
Livingston, LA	5.2	6.667219	46.96468	11.52827
St. Mary, LA	5.4	3.258984	42.85156	22.50981
Caldwell, LA	6	0.6413223	41.73553	19.76094
St. Tammany, LA	6.2	4.680119	32.58232	7.353223
Allen, LA	6.3	6.48423	48.79406	15.81309
Plaquemines, LA	6.3	8.647541	30.7377	12.84508
Beauregard, LA	6.6	4.432099	46.79012	11.80231
Morehouse, LA	7	0	54.69291	29.4883
Natchitoches, LA	7.2	1.266121	56.94526	24.37377
Lafourche, LA	7.3	7.607975	38.83436	13.07404
St. Bernard, LA	7.3	2.320772	44.22986	12.35983
St. Charles, LA	7.3	3.814623	47.93205	10.87985
Sabine, LA	7.5	1.617092	48.55716	16.74388
Bossier, LA	7.6	1.593031	41.34146	11.72458
Vernon, LA	7.7	9.771552	32.75862	11.14108
Avoyelles, LA	7.8	0.8651577	63.86148	24.22525
Jackson, LA	7.8	1.607656	61.48325	17.21188
Vermilion, LA	7.8	3.353753	43.70147	14.56785
Winn, LA	8.1	1.416831	65.08875	20.64824
Iberia, LA	8.3	2.423454	51.51722	20.06215
Terrebonne, LA	8.3	8.529195	44.92373	14.70654
Jefferson, LA	8.5	4.847617	50.19612	9.668986
Iberville, LA	8.8	1.898721	48.40085	21.9008
Union, LA	8.8	1.715397	72.48471	16.78259
Ascension, LA	8.9	4.124138	44.63054	9.423644
Rapides, LA	9	1.411789	51.89061	17.72664
Franklin, LA	9.1	3.4768	24.16	27.01557
St. Landry, LA	9.1	4.069919	49.07799	22.58018
West Carroll, LA	9.2	0.1063508	45.41331	21.26274
Richland, LA	9.3	0.5702479	64.57551	25.15097
Assumption, LA	9.4	3.212766	46.16096	18.94872
St. John the Baptist, LA	9.4	2.428498	47.54776	17.20251
Tangipahoa, LA	9.4	3.589687	41.16119	20.934
Calcasieu, LA	9.6	3.371241	33.9708	13.75263

Lafayette, LA	9.6	3.443728	37.19931	12.19601
Acadia, LA	9.7	7.516892	42.5	18.49272
Orleans, LA	9.7	0.2941576	51.92746	19.28597
Washington, LA	10.1	3.183972	47.8484	24.60274
Evangeline, LA	10.4	2.252567	60	23.9839
Jefferson Davis, LA	10.5	2.265791	48.1551	14.80466
East Baton Rouge, LA	10.7	3.376312	64.67201	15.43115
Tensas, LA	10.8	0.816245	31.55792	33.83944
Lincoln, LA	10.9	1.445983	59.82751	16.43955
Concordia, LA	11	0.270406	69.61072	26.76205
East Feliciana, LA	11	6.061433	32.76451	14.9582
De Soto, LA	11.1	8.186777	53.22314	18.98766
Madison, LA	11.3	0	65.05206	35.52006
Pointe Coupee, LA	11.8	2.730681	51.87452	18.87439
Red River, LA	12.3	2.146843	54.33186	23.00293
Grant, LA	12.5	0.6363106	53.70694	20.02965
Ouachita, LA	12.5	0.7077463	55.81107	20.65061
St. Martin, LA	12.5	1.144582	38.97532	17.38842
Bienville, LA	13	1.58794	75.08974	21.70503
Webster, LA	13.4	4.331202	40.40921	18.32689
Caddo, LA	13.6	1.193875	58.59948	18.12934
West Feliciana, LA	16	24.04545	29.54545	7.935371
St. Helena, LA	16.5	5.399361	25.87859	27.7622
West Baton Rouge, LA	16.6	3.276368	56.60881	14.97638
Claiborne, LA	18.1	1.092545	51.1054	20.63919
East Carroll, LA	21.3	0	59.90099	41.7515

Table 3: Infant Mortality Rates, State of Louisiana, by Race, by Parish, 2005-2009

	2005-2009 Total IMF	2005-2009 White IMF	2005-2009 Black IMF	2005-2009 Hispanic IMF	2005-2009 Other IMF
LOUISIANA	9.4	6.5	14	4.8	4.1
Acadia, LA	**9.7**	**8**	**15.7**	**0**	**0**
Allen, LA	**6.3**	**5.3**	**11.1**	**0**	**0**
Ascension, LA	**8.9**	**7.4**	**13.7**	**4.5**	**0**
Assumption, LA	**9.4**	**6.4**	**13.6**	**0**	**0**
Avoyelles, LA	**7.8**	**7**	**9.7**	**0**	**0**
Beauregard, LA	**6.6**	**5.7**	**13.9**	**14.5**	**0**
Bienville, LA	**13**	**6.3**	**20.5**	**0**	
Bossier, LA	**7.6**	**6.2**	**12.6**	**9.1**	**0**
Caddo, LA	**13.6**	**8.2**	**17.8**	**7.4**	**0**
Calcasieu, LA	**9.6**	**7.7**	**14**	**6.1**	**8.5**
Caldwell, LA	**6**	**3.7**	**16.4**	**0**	
Cameron, LA	**2.4**	**2.6**	**0**	**0**	
Catahoula, LA	**5.2**	**5.7**	**4.2**		
Claiborne, LA	**18.1**	**5.5**	**24.4**	**58.8**	
Concordia, LA	**11**	**5.3**	**17.3**		**0**
De Soto, LA	**11.1**	**6.1**	**16.6**	**30.3**	**0**
East Baton Rouge, LA	**10.7**	**4.6**	**15.2**	**4.6**	**3.1**
East Carroll, LA	**21.3**	**16**	**22.6**		
East Feliciana, LA	**11**	**6.1**	**16.2**		
Evangeline, LA	**10.4**	**8.6**	**13.8**	**43.5**	**0**
Franklin, LA	**9.1**	**5.6**	**13.9**	**0**	
Grant, LA	**12.5**	**11.1**	**22.9**	**0**	**0**
Iberia, LA	**8.3**	**6.4**	**10.5**	**0**	**11.6**
Iberville, LA	**8.8**	**7.4**	**10**	**0**	**0**
Jackson, LA	**7.8**	**7.2**	**9.3**	**0**	
Jefferson, LA	**8.5**	**6.7**	**11.9**	**2.8**	**4.8**
Jefferson Davis, LA	**10.5**	**7.9**	**22.9**	**0**	**0**
Lafayette, LA	**9.6**	**6.1**	**16.9**	**1.9**	**0**
Lafourche, LA	**7.3**	**5.5**	**14.9**	**0**	**3.7**
La Salle, LA	**5.1**	**3.6**	**17.9**		**0**
Lincoln, LA	**10.9**	**10.8**	**11.5**	**8.8**	**0**
Livingston, LA	**5.2**	**4.8**	**12.8**	**7.4**	**0**

Madison, LA	11.3	8	12.5	83.3	
Morehouse, LA	7	4.2	9.5	0	
Natchitoches, LA	7.2	3	11.1	0	0
Orleans, LA	9.7	5.7	11.1	6.6	11.4
Ouachita, LA	12.5	8.5	16.9	18.2	6
Plaquemines, LA	6.3	4.4	10.7	0	14.5
Pointe Coupee, LA	11.8	5.2	18.6	0	
Rapides, LA	9	6.5	13.2	3.3	0
Red River, LA	12.3	8.4	16.2		
Richland, LA	9.3	6.3	11.4		
Sabine, LA	7.5	6.7	13.6	0	0
St. Bernard, LA	7.3	5.7	16.1	0	0
St. Charles, LA	7.3	6.6	8.2	17.3	16.9
St. Helena, LA	16.5	4.4	23.7		
St. James, LA	5.1	3	6.7	0	
St. John the Baptist, LA	9.4	6.3	11.6	0	0
St. Landry, LA	9.1	4.1	14.3	0	0
St. Martin, LA	12.5	9.3	17	0	22.7
St. Mary, LA	5.4	4.2	7.7	0	0
St. Tammany, LA	6.2	5.2	12.6	4.1	3.3
Tangipahoa, LA	9.4	6.7	13.6	6.2	0
Tensas, LA	10.8	8.4	12		0
Terrebonne, LA	8.3	6.5	16.1	12.9	2.6
Union, LA	8.8	8.5	9.5	6.5	
Vermilion, LA	7.8	6.3	12.9	0	10.2
Vernon, LA	7.7	6.3	16.4	2.6	0
Washington, LA	10.1	10	10.5	0	0
Webster, LA	13.4	13.6	13.4	0	0
West Baton Rouge, LA	16.6	15.3	18.8	60.6	0
West Carroll, LA	9.2	6.6	19.1	0	
West Feliciana, LA	16	9.2	26.5		
Winn, LA	8.1	3.1	18	0	

Table 4: Infant Mortality Rate per 100,000 live births, TANF %, Sanction %, SNAP %, and Prenatal Care % by Parish, 2005-2009

LOUISIANA	IMR (mortality)	% of Women on TANF (pctcov)	% of Women sanctioned (pctsanction)	SNAP (foodstamp)	% of Women receiving Prenatal Care (firsttricare)
Cameron, LA	2.4	12.3913	13.04348	5.77549	97.02283
La Salle, LA	5.1	9.846939	57.14286	13.63182	94.31677
St. James, LA	5.1	1.213206	48.68735	17.72863	87.66211
Catahoula, LA	5.2	1.987104	57.44432	22.90271	87.50009
Livingston, LA	5.2	6.667219	46.96468	11.52827	92.08058
St. Mary, LA	5.4	3.258984	42.85156	22.50981	84.05227
Caldwell, LA	6	0.6413223	41.73553	19.76094	90.47634
St. Tammany, LA	6.2	4.680119	32.58232	7.353223	91.01148
Allen, LA	6.3	6.48423	48.79406	15.81309	88.83618
Plaquemines, LA	6.3	8.647541	30.7377	12.84508	88.58939
Beauregard, LA	6.6	4.432099	46.79012	11.80231	83.38256
Morehouse, LA	7	0	54.69291	29.4883	89.13279
Natchitoches, LA	7.2	1.266121	56.94526	24.37377	79.4071
Lafourche, LA	7.3	7.607975	38.83436	13.07404	88.20771
St. Bernard, LA	7.3	2.320772	44.22986	12.35983	88.1549
St. Charles, LA	7.3	3.814623	47.93205	10.87985	89.41321
Sabine, LA	7.5	1.617092	48.55716	16.74388	85.82511
Bossier, LA	7.6	1.593031	41.34146	11.72458	87.34338
Vernon, LA	7.7	9.771552	32.75862	11.14108	90.89502
Avoyelles, LA	7.8	0.8651577	63.86148	24.22525	87.36552
Jackson, LA	7.8	1.607656	61.48325	17.21188	91.44084
Vermilion, LA	7.8	3.353753	43.70147	14.56785	93.09469
Winn, LA	8.1	1.416831	65.08875	20.64824	86.24759
Iberia, LA	8.3	2.423454	51.51722	20.06215	81.04689
Terrebonne, LA	8.3	8.529195	44.92373	14.70654	89.74984
Jefferson, LA	8.5	4.847617	50.19612	9.668986	87.35223
Iberville, LA	8.8	1.898721	48.40085	21.9008	83.66367
Union, LA	8.8	1.715397	72.48471	16.78259	89.88692

Ascension, LA	8.9	4.124138	44.63054	9.423644	89.79821
Rapides, LA	9	1.411789	51.89061	17.72664	89.7626
Franklin, LA	9.1	3.4768	24.16	27.01557	81.70065
St. Landry, LA	9.1	4.069919	49.07799	22.58018	78.17596
West Carroll, LA	9.2	0.1063508	45.41331	21.26274	91.40602
Richland, LA	9.3	0.5702479	64.57551	25.15097	89.24127
Assumption, LA	9.4	3.212766	46.16096	18.94872	86.44713
St. John the Baptist, LA	9.4	2.428498	47.54776	17.20251	86.13687
Tangipahoa, LA	9.4	3.589687	41.16119	20.934	87.42521
Calcasieu, LA	9.6	3.371241	33.9708	13.75263	90.9389
Lafayette, LA	9.6	3.443728	37.19931	12.19601	94.80318
Acadia, LA	9.7	7.516892	42.5	18.49272	82.87371
Orleans, LA	9.7	0.2941576	51.92746	19.28597	82.37263
Washington, LA	10.1	3.183972	47.8484	24.60274	88.17553
Evangeline, LA	10.4	2.252567	60	23.9839	86.38694
Jefferson Davis, LA	10.5	2.265791	48.1551	14.80466	85.59353
East Baton Rouge, LA	10.7	3.376312	64.67201	15.43115	84.78553
Tensas, LA	10.8	0.816245	31.55792	33.83944	74.47273
Lincoln, LA	10.9	1.445983	59.82751	16.43955	90.34798
Concordia, LA	11	0.270406	69.61072	26.76205	75.42524
East Feliciana, LA	11	6.061433	32.76451	14.9582	84.58671
De Soto, LA	11.1	8.186777	53.22314	18.98766	81.11016
Madison, LA	11.3	0	65.05206	35.52006	81.47177
Pointe Coupee, LA	11.8	2.730681	51.87452	18.87439	85.41433
Red River, LA	12.3	2.146843	54.33186	23.00293	81.44484
Grant, LA	12.5	0.6363106	53.70694	20.02965	91.54602
Ouachita, LA	12.5	0.7077463	55.81107	20.65061	86.73556
St. Martin, LA	12.5	1.144582	38.97532	17.38842	91.93319
Bienville, LA	13	1.58794	75.08974	21.70503	89.98256
Webster, LA	13.4	4.331202	40.40921	18.32689	89.24006
Caddo, LA	13.6	1.193875	58.59948	18.12934	82.39231

West Feliciana, LA	16	24.04545	29.54545	7.935371	91.92137
St. Helena, LA	16.5	5.399361	25.87859	27.7622	83.69762
West Baton Rouge, LA	16.6	3.276368	56.60881	14.97638	87.36216
Claiborne, LA	18.1	1.092545	51.1054	20.63919	86.65455
East Carroll, LA	21.3	0	59.90099	41.7515	78.87892

Table 5: Results

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
Infant Mortality	64	9.565625	3.345417	2.4	21.3
Percent Covered	64	3.572932	3.79972	0	24.04545
Percent Sanction	64	48.41387	12.07431	13.04348	75.08974
Food Stamp %	64	18.62007	6.685863	5.77549	41.7515
FirstTriCare %	64	4.546725	4.546725	74.47273	97.02283

Table 6: Bivariate Regression Assessing the Relationship between TANF Coverage and Infant Mortality

Mortality	Coefficient	Standard Error	t score	P > |t|	[95% Confidence Interval]
Percent Covered	-0.0723749	0.1114373	-0.65	0.518	-0.2951349 – 0.150385
Constants	9.8242116	0.5788105	16.97	0.000	8.66719 – 10.98124

Table 7: Bivariate Regression Assessing the Relationship between TANF Sanctions and Infant Mortality.

Mortality	Coefficient	Standard Error	t score	P > |t|	[95% Confidence Interval]
Percent Sanction	0.0481732	0.0346519	-1.39	0.169	-0.210949 – 0.1174413
Constants	7.233373	1.728226	4.19	0.000	3.778698 – 10.68805

Table 8: Bivariate Regression Assessing the Relationship between SNAP Coverage and Infant Mortality

Mortality	Coefficient	Standard Error	t score	P > |t|	[95% Confidence Interval]
Food Stamp %	0.2036413	0.0580464	3.51	0.001**	0.0876081 – 0.3196744
Constants	5.77381	1.147367	5.03	0.000	3.778698 – 10.68805

Table 9: Bivariate Regression Assessing the Relationship between First Trimester Prenatal Care and Infant Mortality

Mortality	Coefficient	Standard Error	t score	P > |t|	[95% Confidence Interval]
FirstTriCare %	-0.2267349	0.0888976	-2.55	0.013**	-0.4044387 – -0.0490312
Constants	29.27668	7.738654	3.78	0.000	13.80733 – 44.74603

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