

Trends in Rural-Urban Births in Oklahoma

From 1980 to 2019, the Distance Traveled for Childbirth by Oklahoma's Rural Mothers Has Increased Significantly, Highlighting Growing Disparities in Maternity Care Access.

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INTRODUCTION

Recent studies highlight the worsening decline in access to maternal healthcare in rural areas, a trend with serious implications for maternal and infant health outcomes.¹ Oklahoma faces these same challenges, with many communities classified as maternity care deserts—areas where there are no hospitals providing obstetric care, no birth centers, and a shortage of maternal health providers.^{2,3} This lack of access increases pregnancy complications, preterm births, and poor health outcomes while also forcing longer travel times, delaying critical care, and heightening health risks.⁴

Additionally, many Oklahoma counties face persistent population decline, further straining rural healthcare. Between 2010 and 2020, 53 of the state's 77 counties saw a population decrease, with 38 counties experiencing a long-term decline from 1980 to 2020. Of these, 37 are classified as rural, and 23 contain either a Critical Access Hospital, a Rural Emergency Hospital, or a recently closed hospital.

METHODS

Our analysis examines county-level population data in relation to births, categorizing them by the mother's county of residence and the county where the birth occurred. Population data were sourced from the U.S. Census Bureau's decennial censuses for 1980, 1990, 2000, 2010, and 2020. Birth data were obtained from the Oklahoma State Department of Health's OK2SHARE data system, encompassing 1,965,305 births during the study period.

A crosstab analysis classified births based on the mother's county of residence and the county of occurrence. To enhance statistical reliability and minimize data suppression risks, births were aggregated into ten-year intervals corresponding to each decennial census (i.e., 1980–1989, 1990–1999, 2000–2009, and 2010–2019). Births to Oklahoma residents occurring out of state and births to non-residents occurring within Oklahoma were excluded.

Centroid-to-centroid distances between counties were calculated using ArcGIS Pro and applied to the birth data. Counties were also classified as urban or rural based on the Rural-Urban Continuum Codes (RUCC) defined by the U.S. Department of Agriculture. Counties with a RUCC of 1 to 3 were classified as urban, while those with a RUCC of 4 to 9 were classified as rural (Figure 1).

All statistical analyses were conducted using SPSS v29.

Figure 1. Oklahoma Counties by RUCC Classification

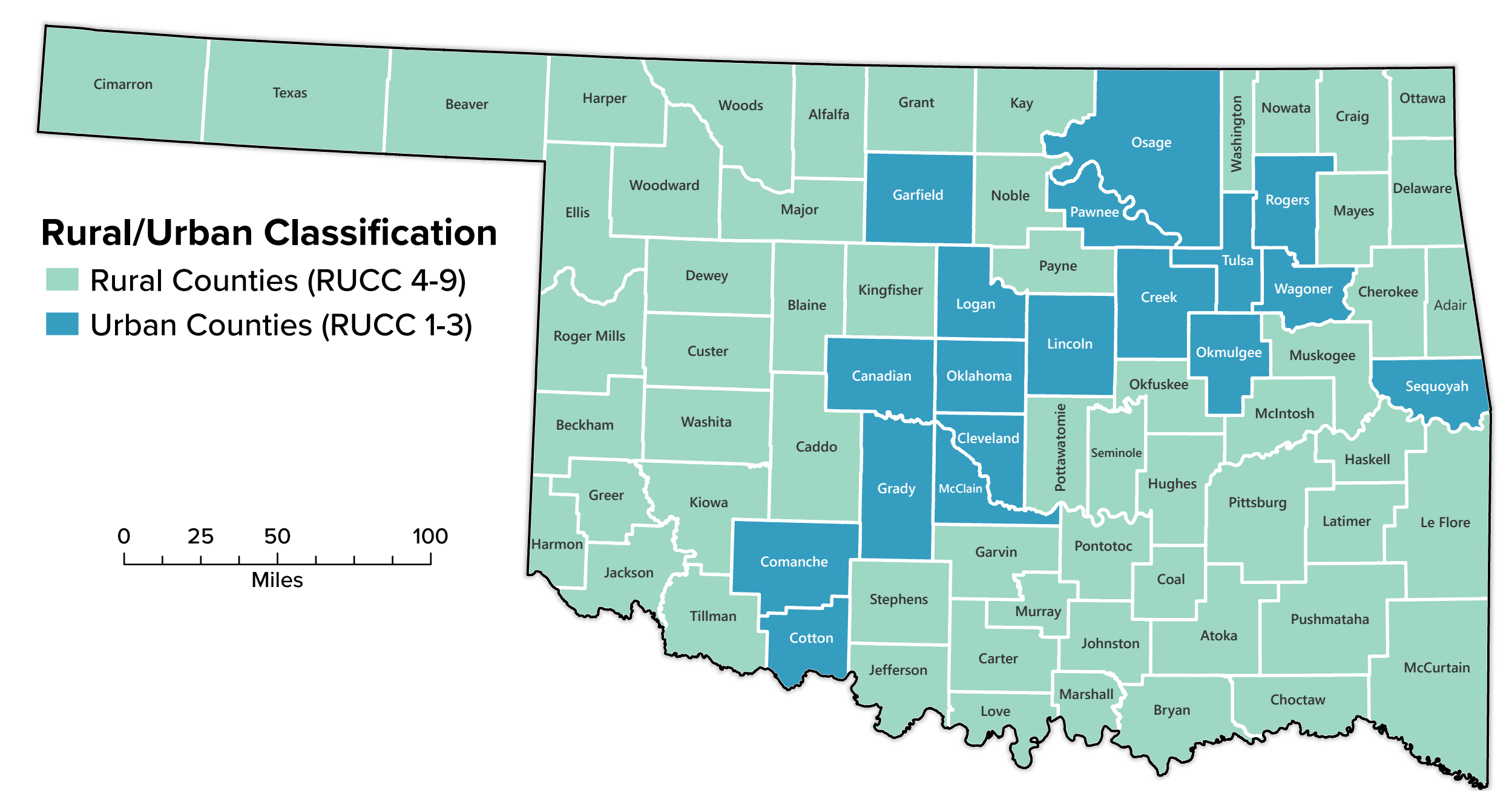


Figure 2. Population Change by County, 1980 - 2020

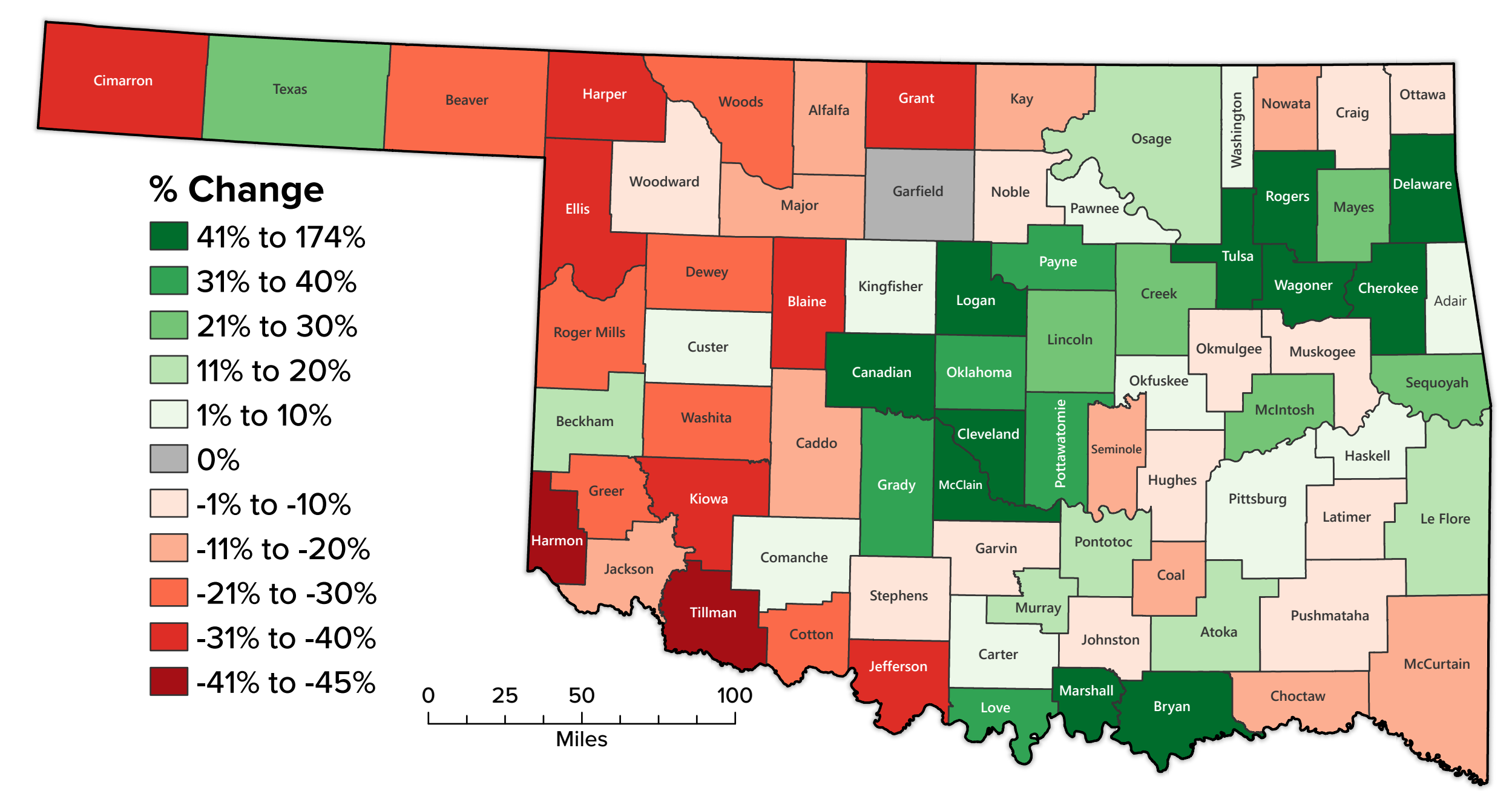


Table 1. Descriptive Statistics Travel Distance (miles) to Give Birth, All Counties | N = 77

Decade	Range	Min	Max	Mean	SD
1980-89	85.46	2.75	88.22	46.37	23.76
1990-99	111.17	2.40	113.57	57.39	29.65
2000-09	159.90	2.33	162.24	67.30	35.56
2010-19	176.47	2.24	178.70	78.40	39.20

Table 2. Descriptive Statistics Travel Distance (miles) to Give Birth, Rural Counties | N = 59

Decade	Range	Min	Max	Mean	SD
1980-89	74.82	9.63	84.45	46.76	22.75
1990-99	104.27	9.30	113.57	58.92	28.98
2000-09	152.95	9.28	162.24	70.84	35.78
2010-19	160.82	17.89	178.70	84.12	38.75

Table 3. Descriptive Statistics Travel Distance (miles) to Give Birth, Urban Counties | N = 18

Decade	Range	Min	Max	Mean	SD
1980-89	85.46	2.75	88.22	45.09	27.50
1990-99	96.25	2.40	98.65	52.35	32.09
2000-09	101.28	2.33	103.62	55.71	33.22
2010-19	104.01	2.24	106.25	59.67	35.51

Figure 3. Change in Distance Traveled to Give Birth, 1980 - 2019

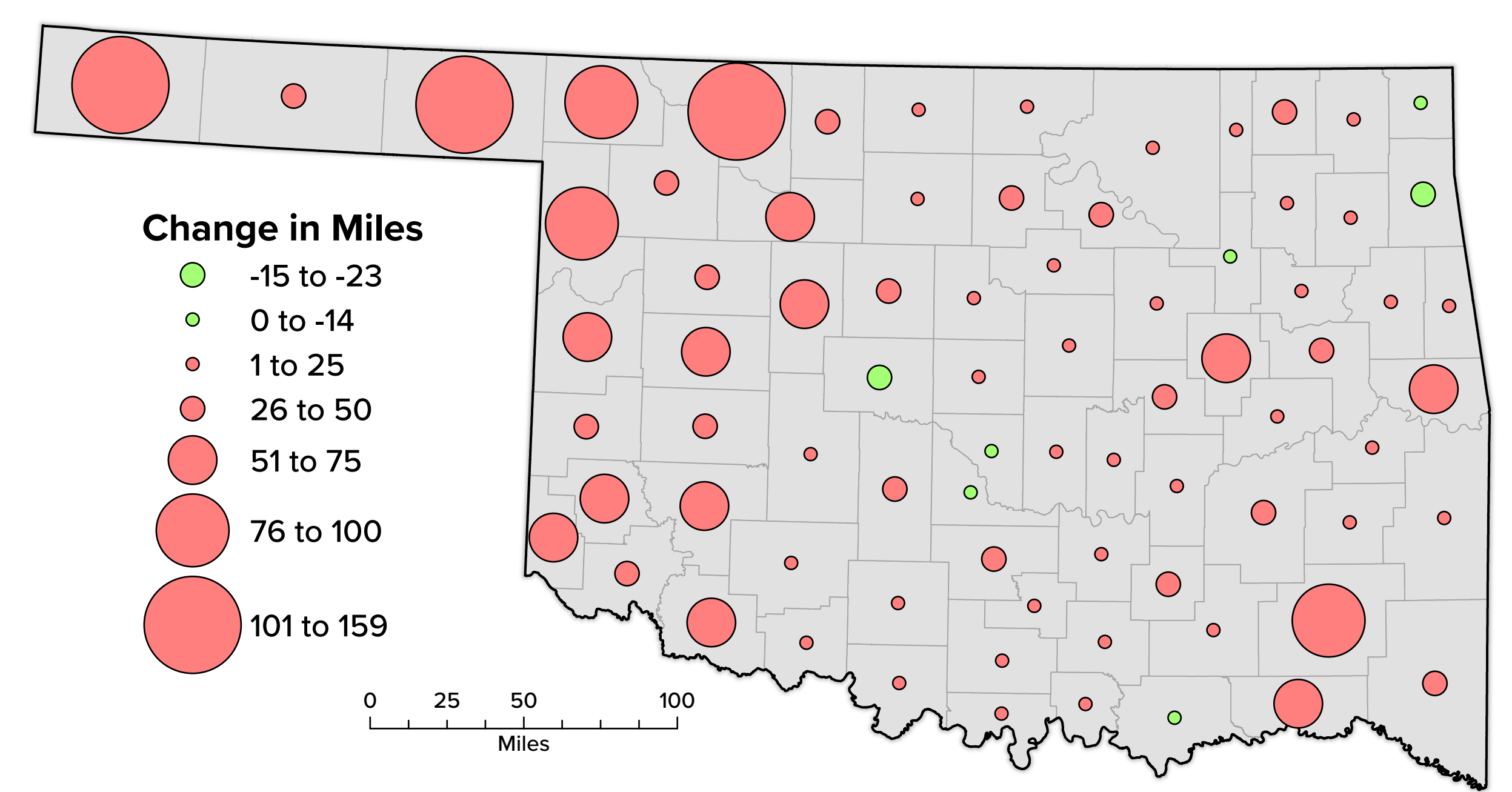


Figure 4. Births Occurring in Rural & Urban Counties by Decade

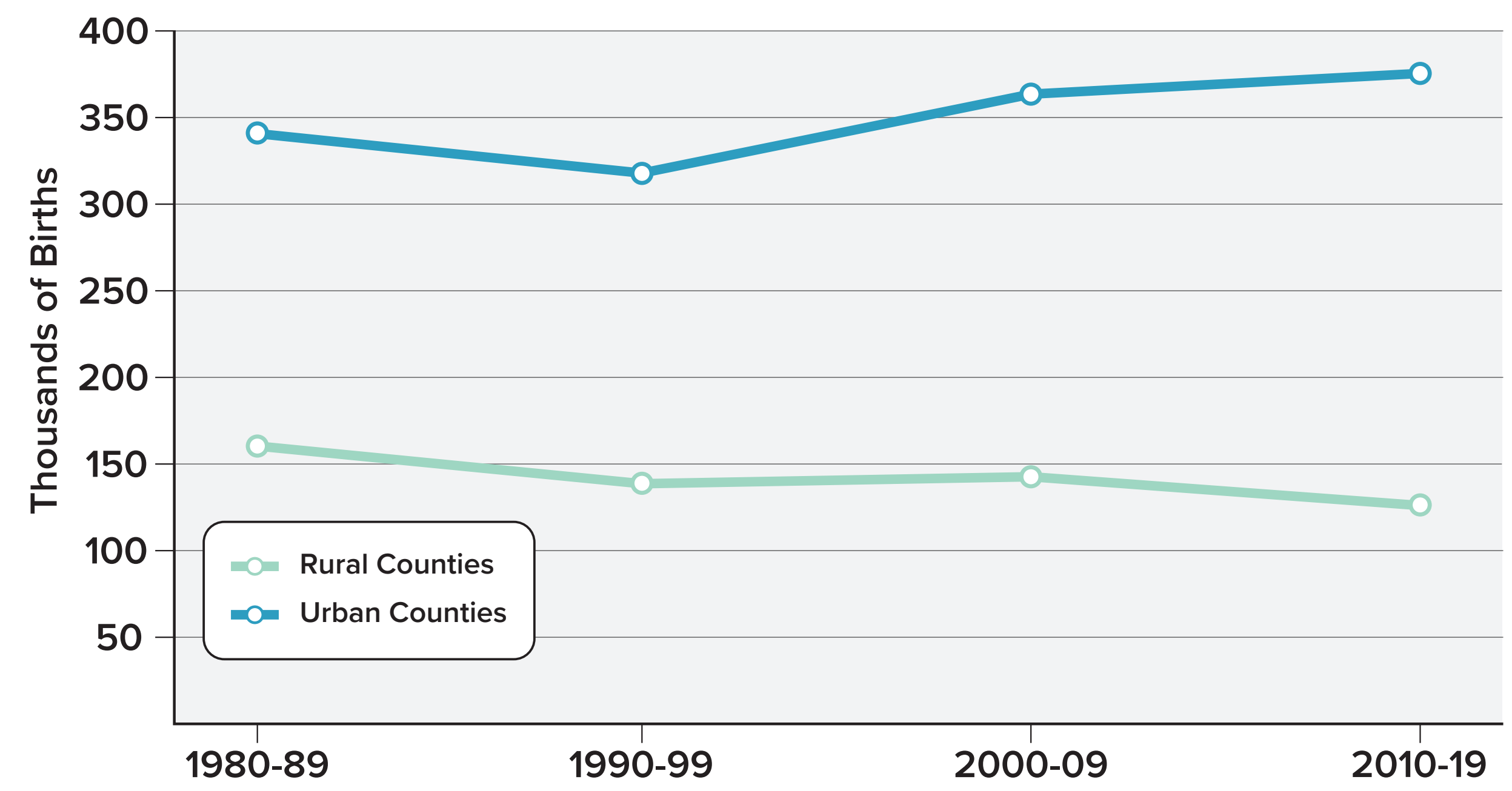
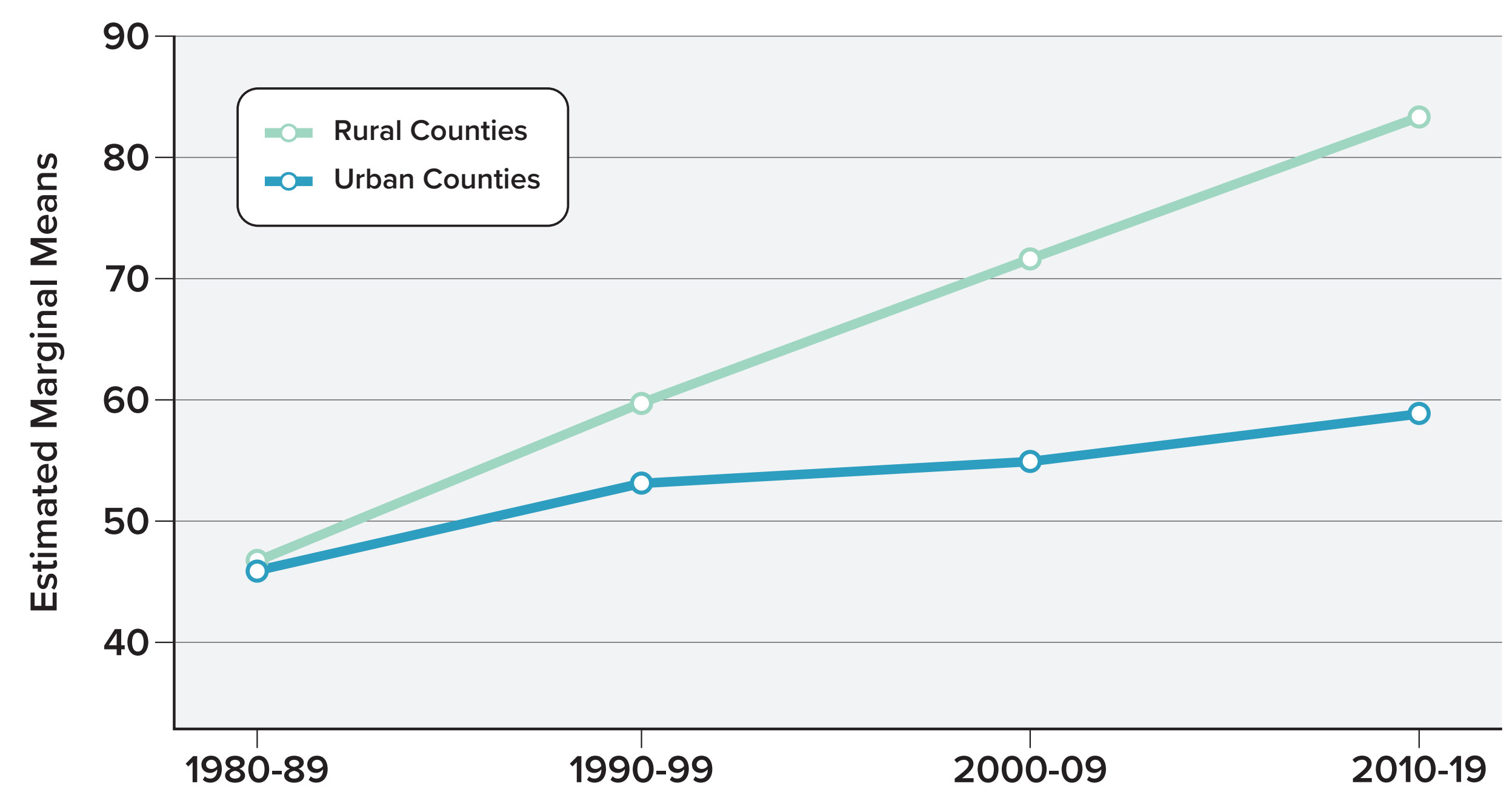


Figure 5. Estimated Marginal Means of Travel Distance (miles)



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RESULTS

Women living in the 18 metro counties traveled 32% farther to give birth during the 2010–2019 decade compared to 1980–1989, with the average distance increasing from 45.09 miles to 59.67 miles. Thirteen of the 14 metro counties experienced population growth between 1980 and 2020, with four counties surpassing a 100% increase in population (Figures 2-4 & Table 3).

Women living in the 59 rural counties traveled 80% farther during 2010–2019 compared to 1980–1989, with the average distance increasing from 46.76 miles to over 84.12 miles. Among these counties, 15 experienced population declines between 1980 and 2020 (Figure 2-4 & Table 2).

A mixed-model ANOVA with one repeated measure (Decade) and one between factor (Rural-Urban) revealed a significant interaction effect between time and rurality, $F(1,3) = 5.856, p < .001, \eta^2 = .072$. Following a significant interaction, follow-up analyses explored the urban and rural data separately. Both groups showed a significant effect for distance traveled over time:

Urban: $F(3) = 6.155, p = .001, \eta^2 = .27$

Rural: $F(3) = 55.481, p < .001, \eta^2 = .49$

These results indicate that although the average distance traveled to give birth increased significantly by decade overall, the increase was substantially greater for women in rural counties (Figure 5). Post-hoc analyses exploring pairwise differences in average distance traveled by decade indicate that the average distances for rural counties were significantly longer each decade when compared to the previous decade ($p < .001$ for each comparison). The findings are more nuanced for urban counties, with a significant increase between the 1980s and 1990s ($p = .01$), a slight but non-significant increase between the 1990s and 2000s ($p = .18$), and a modestly significant increase between the 2000s and 2010s ($p = .04$).

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