

2006

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### Recommended Citation

Kulcsár, László J. and Bolender, Ben (2006) "Home on the Range: Aging in Place in Rural Kansas," *Online Journal of Rural Research & Policy*. Vol. 1: Iss. 3. <https://doi.org/10.4148/ojrrp.v1i3.31>

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## Home on the Range: Aging in Place in Rural Kansas<sup>1</sup>

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*Recommended Citation Style (MLA):*

Kulcsár, László J., and Benjamin Bolender. "Home on the Range: Aging in Place in Rural Kansas." The Online Journal of Rural Research and Policy 3 (2006): 1-26.

*Keywords:* Social demography, aging in place, Population aging, increasing proportion of people age 65 and above, general demographic trend, socioeconomic implications, national and local levels, social organization, impact, demographic, change, elderly well-being and poverty, community development, and economic growth. In the United States, public discourse focuses on the soon retiring, Baby Boom, generation, challenges, social institutions, rural, research, academic, peer-reviewed, university, college, geography, sociology, political science, architecture, law, science, biology, chemistry, physics, leadership studies, community service, agriculture, communications, mass communications, new media, Internet, web..

### **1. The social demography of aging in place**

Population aging, defined as an increasing proportion of people age 65 and above, is a general demographic trend in many societies, including the United States. It has a number of socioeconomic implications both at the national and local levels of social organization, including its impact on further demographic change, elderly well-being and poverty, community development, and economic growth. In the United States, public discourse focuses on the soon retiring Baby Boom generation, which will present significant challenges for social institutions. Though this process is not quite as pronounced as some other more developed nations at this moment, the entrance of the Baby Boom cohort into old age brings with it the possibility of accelerated change in the age structure of the country. Since the United States has a relatively young age structure compared to most industrial societies, less public attention is given to certain regions, such as the rural Midwest, where aging is not a new phenomenon but has been the main demographic trend for decades.

This study is a product of research on aging in place in the rural<sup>2</sup> Midwest. Here we take the perspective of social demography to investigate long-term trends of aging in rural Kansas. Using county level historical statistics and in-depth analysis of the 2000 Census, we put these trends into the context of aging in the United States, and present a statistical analysis of aging and economic development. The data for this study come from various sources at the U.S. Census Bureau and the Economic Research Service (E.R.S.) division of the U.S.D.A. We also address the community development challenges posed by aging in place. This latter subject will be presented as an overview since our current research activity is conducting case studies addressing community development issues in greater depth.

As we will discuss later in greater details, aging is not evenly distributed across space. Not all regions are aging at the same rates. The South and West have experienced the greatest growth in the elderly population over the last ten years, at least partially due to retirement migration. The Midwest, though it is not the most extreme case, is proportionally older than the country as a whole. Further, much of the West North Central division<sup>3</sup> is rural. Because of migration and development patterns, aging in this area is more likely to be aging in place. Kansas closely resembles the typical situation of older people in the rural Midwest. As such, it makes a good case study both for its own merits and as a representation of the area.

What constitutes old is contingent upon cultural and societal norms as well as subjective individual perspectives<sup>4</sup>. The most common age indicating elderly status is 65, used by many international agencies and scholars. Demographers also use the “oldest old” term to define those over 85. This categorization acknowledges two different periods of elderly life: an early more active and a late less active period. Each shows significant differences regarding both the activities of the elderly and the challenges for social institutions.

As a demographic process, aging refers to the increasing number and increasing proportion of older people in a society. However, the increasing number of older people in itself does not necessarily reflect aging, as long as the number of those below 65 increases at a larger pace. Once the older population increases proportionally though, communities and the society as a whole must consider the causes and consequences of aging. While the changing size of the older population draws attention to market demand and retirement funds, the increasing proportion of elderly brings in more fundamental questions about the relation between older and younger generations as well as the balance between various societal level interests.

The demographic dynamics behind aging reflect a complex web of societal processes, albeit with relatively simple demographic root causes. Declining mortality and the related increase in longevity have extended the life period of humans over 65. Life expectancy at birth is over 75 years in developed countries, which means an increase of 25 years over the 20<sup>th</sup> century. Today in the U.S., more people survive to old age, and people live longer than ever before. These facts seem to be the main causes behind aging. However, it is declining fertility that makes the real difference in age composition. With fewer children born, the growth of the younger population cannot balance out the increase of the older population.

Besides mortality and fertility, the third determinant of any demographic change is migration. While there are spatial differences in fertility and mortality, migration is the most important contributor to differences in aging across geographic areas, which in turn is interlinked with other forms of spatial inequalities. Migration and aging are connected in retirement migration and in aging in place. In retirement migration, well-off retirees move into certain communities. Through aging in place, the out-migration of younger generations leaves the older people behind. The latter process has multiple impacts. For one thing, the flight of people in their twenties and

thirties itself modifies the age composition of the area. Further, the community also loses the generation whose fertility behavior is the key to future population replacement.

Research shows that both retirement migration and aging in place have an impact on non-metropolitan aging in the United States<sup>5</sup>. However, retirement destinations are not evenly distributed in rural America. Rather, they tend to be concentrated in high amenity regions<sup>6</sup>. Also, retirement migration often induces an increase in general migration because the demand from high-income retirees for particular services creates a magnet for employment-driven in-migration<sup>7</sup>.

Hence, while aging and its consequences have been a profound change in rural America, and especially in the rural Midwest<sup>8</sup>, the process of aging carries a great paradox of geographic heterogeneity: states with aging populations are not necessarily the same as those that serve as retirement destinations. In 2000, of the 1,055 counties in the Midwest, 869 (82%) exceeded the U.S. proportion of population 65 and above<sup>9</sup>. Perpetuated by age-selective out-migration from the region, this process poses a significant development challenge for rural communities in the Midwest.<sup>10</sup>

From a demographic perspective, two important characteristics of the rural older population should be noted. The first is that, due to gender differences in life expectancy, aging also means the feminization of population. The sex ratio becomes unbalanced in populations over the age 75. Paradoxically, in societies where women have a lower social status, the sex ratio is more even, since this low social status counterbalances female biological advantages in life expectancy. The feminization of the elderly is connected to important societal perspectives on gender equality and the status of women.

The second demographic characteristic is the ethnic composition of the older population. The most populous minorities, Hispanics and African Americans are underrepresented among the elderly, due to their lower average socioeconomic status throughout their life course. They are more likely to live in or close to poverty for at least a period of time. This not only results in less savings or lower income by the time of their retirement, but also often comes with accumulated health problems that contribute to their higher mortality as well. This phenomenon is called "multiple jeopardy".<sup>11</sup> The overrepresentation of the non-Hispanic White population among the elderly is even more profound in the rural Midwest where their proportion in the population exceeds the national average.

While aging is usually perceived as an individual biological change, it has important social aspects that influence community development. From a historical perspective, scholars note a status decline of the elderly that coincides with urbanization and modernization<sup>12</sup>. This is especially important in the countryside, where aging in place creates an unbalanced age structure in many rural communities. With improvements in Social Security over time, retirement does not

necessarily lead to poverty. However, older people in rural areas are still disadvantaged due to their lower income compared to urban elderly.<sup>13</sup>

What are some examples of social change and community development challenges regarding population aging? One of the most important challenges communities face is institutional care and the provision of related community services. Since the healthcare system in the United States is better suited to treat acute illness than chronic illness, community based services, such as home healthcare, are very important for keeping older people out of institutions. In addition, these services have social functions that exceed healthcare needs and maintain the social network of older people<sup>14</sup>. The integration of the elderly into community life is vital for long-term community development perspectives.

The most common form of institutional care is nursing homes. Approximately four percent of the older population lives in nursing homes, but almost every second American over the age of 65 is expected to spend some time in a nursing home at some point in their life.<sup>15</sup> Nursing homes, however, can be very expensive compared to the income of the elderly. This also helps signify the importance of alternative community care programs.

Communities differ in their capacity to address national trends in healthcare, retirement, and pension systems. Also, the transition to retirement is becoming a gradual process through part-time work and possibly a second career.<sup>16</sup> While Social Security provides a basic income for older people, it makes a significant difference in the status of the elderly whether they could accumulate personal savings or if they have the opportunity for part-time work. Urban and suburban communities have a better chance to provide these opportunities. Older people living in those communities that are able to provide such opportunities are better equipped to manage the financial aspects of their late life course. In this respect, rural older people have a disadvantage.

At the same time, rural old people are usually pictured as living in large and supportive family networks. The importance of this issue was demonstrated by earlier research<sup>17</sup> which described social breakdown syndrome, linking older people's social environment to their psychological distress. However, evidence is mixed at best about the role and existence of family networks in rural areas.<sup>18</sup>

The issue of the family network is closely related to the living arrangements of the elderly. Most older people prefer to live in an independent household as long as they can. The ability to run such a household, however, deteriorates rapidly once somebody is left alone. Being married has many advantages for the elderly, including a combined income, a better psychological adjustment to aging, and a better health situation. Independent living is a key for the life quality of many older people. Such independence is strongly contingent on supportive family and community networks, as well as transportation possibilities, physically accessible housing, and local social services. Research indicates that in housing and transportation rural older people have a traditional disadvantage.<sup>19</sup>

The perspective of social demography gives us an overview of the most important issues and challenges regarding aging in place at both national and community levels. In the following sections we present a statistical analysis of the aging trend in Kansas, and put it into the context of aging in the United States over the 20<sup>th</sup> century.

## 2. Overview of aging in the U.S. and Kansas

This section briefly covers the highlights of aging in the United States, the Midwest region, and Kansas in particular. Over the last century, the United States as a whole has experienced an overall decline in both fertility and mortality. This has led to a general increase in both the average age of the population and the percentage of people falling into the “older” age groups. The median age of the U.S. population has risen from 22.9 years in 1900 to 35.3 years in 2000. It should be kept in mind that this increase was not at a constant rate. Primarily due to the increase in births between the mid-1940s and the mid-1960s, the median age did dip for a while. The Baby Boomers were able to offset the general aging trend for while, but as they age, the median age is expected to continue to increase. The U.S. Census Bureau expects the population to continue progressively aging until the median age levels off around 39 in 2030.

Figure 1: United States: Young and Older Population

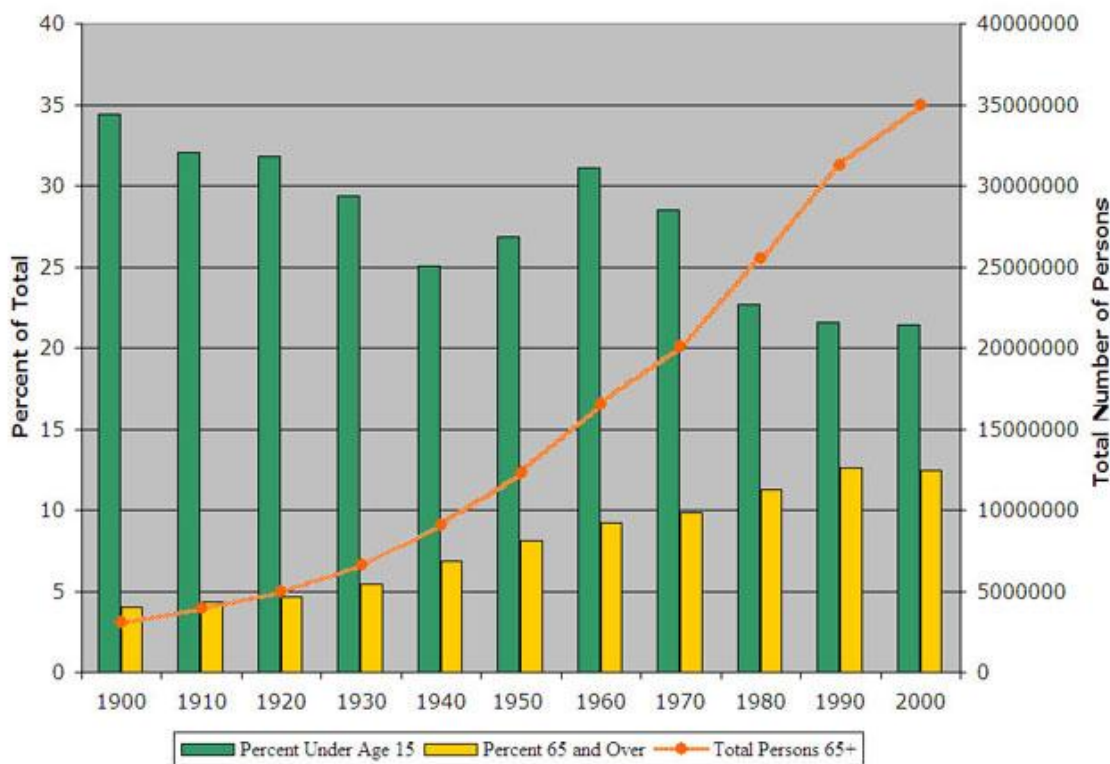


Figure 1 shows an increasing trend in the number and percentage of persons age 65 and above. Here it is compared to the similar, but not identical, reduction in the proportion of young people.

As is clear, even with an upward bump in fertility during the Baby Boom years, the proportion of the population falling under age 15 is gradually decreased while the proportion over age 65 has gradually increased.

The chart shows four approximate trends in the proportion of the population under the age of 15. The first trend shows a fairly steady decline from 1900, where over 34% of the population was young, to 1940, where the proportion dipped to about 25%. The second trend is a somewhat steep increase from 1940 to the 1960s when the young comprised a little over 31% of the population. Third, there is a fairly sharp decrease from 1960 to 1980. From about 1980 on, the proportion of the population under 15 has remained fairly steady around 22%.

During this same time, the proportion of the population 65 and above did not follow the same pattern. Instead, we here see a gradual overall increase with only three slight trends visible if any. In the first period, from 1900 to 1920, those 65 or above remained stable at around 4.5% of the population. The proportion of older people then began a fairly steady rise until it reached about 12.5% in 1990, and stayed at approximately this level until 2000.

This leveling off may lead some readers to believe that the United States has reached an aging peak and will remain around the same levels steadily into the future. However, that presumption would be in error. As we mentioned, aging trends depend not only on mortality but also on fertility rates during various periods and changes in the immigration rate over time. The flat spot in aging between 1990 and 2000 is at least partially the result of two phenomena.

First, the cohort born in the 1930s (those turning 65 now) was relatively smaller than the cohort before it and much smaller than the cohort after it. Because of this, there are fewer people currently entering the older age groups. Moving into the first 30 years of the 21<sup>st</sup> century, though, the United States will experience the onset of the Baby Boomers into retirement age. This will greatly swell the ranks of the 65 and older population. In fact, the U.S. Census Bureau projects that by 2010, 13% of the population will be age 65 or above. This number should then rise to 19.6% by the year 2030 and level off around 20% thereafter.

The second reason that the percentage of the population in the older category could be leveling off is the increase in immigration over the last 15 years. International immigrants comprise an ever-increasing percentage of population growth in the United States. Because of the age selectivity of immigration, most movers fall within the younger age categories, thus the immigrant population is generally composed of disproportionately younger people. Increased immigration rates could, therefore, offset domestic aging factors.

In any case, it is plain to see that the United States as a whole is aging and should continue to do so for some time. However, this process is not evenly distributed across space. Different regions and divisions have had both different aging rates and experiences. The Midwest region, though not experiencing the type of growth in the elderly population seen in the South and the West, still

ranks higher than the U.S. average in many usual measures of aging. The population of the West North Central division, within the Midwest, appears even older still.

Figure 2. Percent Age 65+ and 85+, 2000

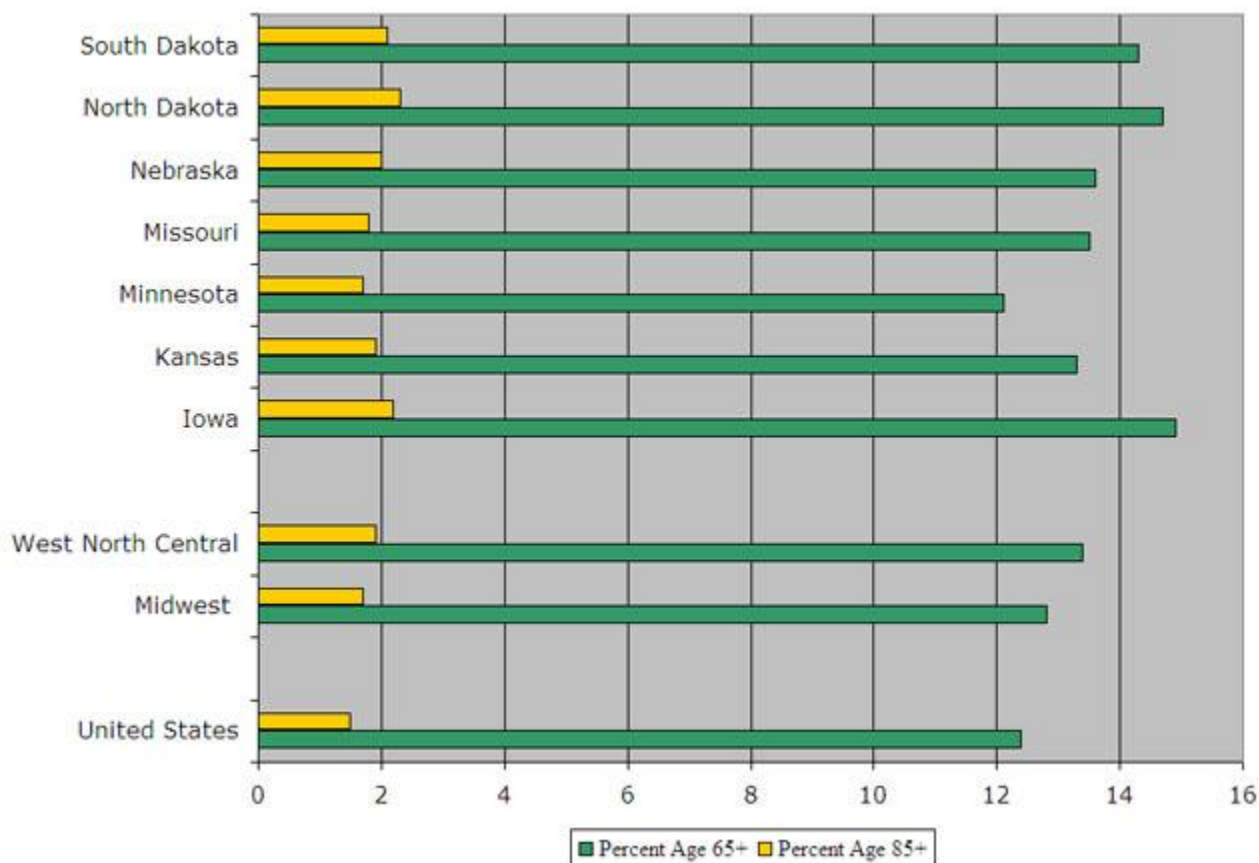


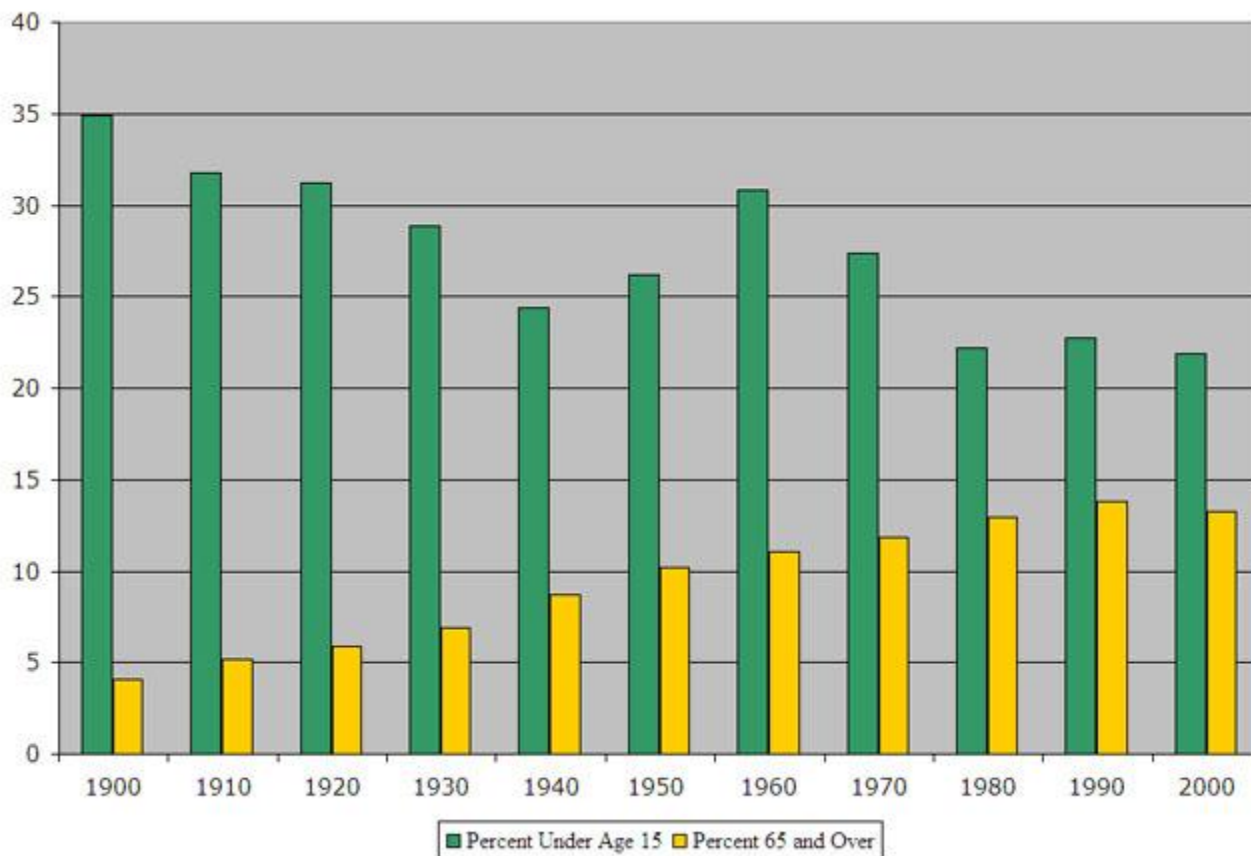
Figure 2 shows the percentage of the population in each area that is 65 or older and 85 or older. The Midwest region is slightly more aged than the national average, and the West North Central division is even slightly older than that. Their proportions on the usual aging statistics are still fairly close. The Midwest proportion of those 65 and over is about half a percentage point higher than the United States while the West North Central division is about one percentage point higher. Their proportions age 85 and over were within a half percent of each other with the Midwest and West North Central division being higher respectively. Further, the median age for the United States is 35.3 years. The West North Central division is about a half year higher, and the Midwest region falls halfway between the two.

Unlike some of the more extreme cases, Iowa for instance, Kansas is much like the West North Central average in terms of aging. It does not have quite as extreme a situation as many of the states in the Midwest region. Still, 13.3% of Kansans are 65 or older, 1.9% of them are 85 or



older, and the median age is 35.2. Kansas also has one of the highest rates of nursing home usage among the aged in the country at 6.61%.

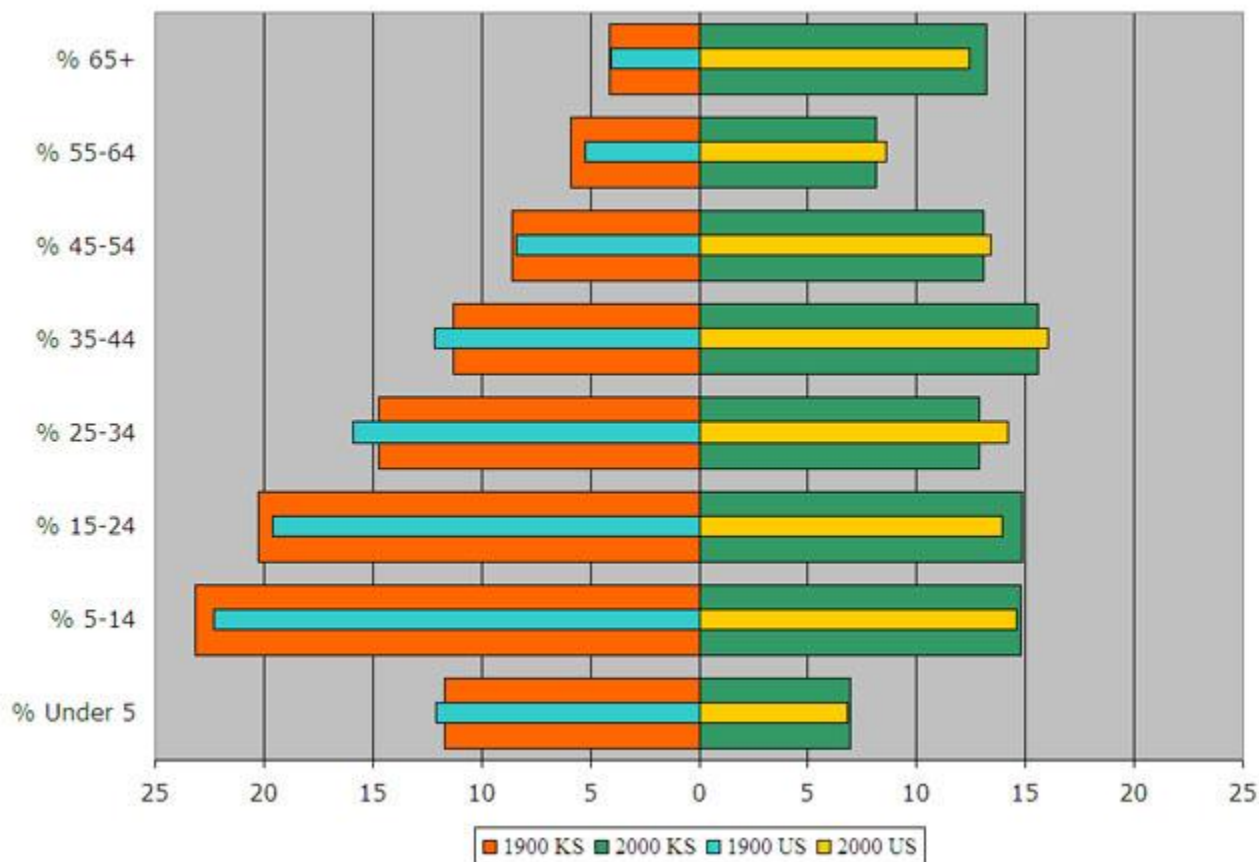
Figure 3. Young and Older Population in Kansas, 2000



The general history of aging in Kansas can be easily seen in Figure 3. Just like the rest of the United States, Kansas has experienced an overall proportional decline in the younger population (other than the Baby Boom) while seeing a fairly steady proportional increase in the older population. Though the proportion 65 and above seems to level off or even drop between 1990 and 2000, we should not take this as an indication that aging has reached stability. As was previously stated, this could be the result of many factors including relative cohort size and immigration rates.

One question of interest is how the process of aging in Kansas has compared to the general American trend over the last century. As far as the younger population goes, Kansas and the United States have been very similar. For every decennial census year since 1900, the proportions under the age of 15 in both areas have been within one percentage point of each other. In regards to those 65 and over, Kansas has also mirrored the national historic trajectory. However, Kansas has had a consistently higher older proportion for the entire 20<sup>th</sup> century.

Figure 4. Age Composition in 1900 and 2000



We should also examine the overall similarity between the age composition of Kansas and the United States as a whole. By taking 1900 and 2000 as reference years, it is possible to get a visual picture of how the age compositions have changed over time (Figure 4). The 1900 half of the chart expresses the classic pyramid shape of a population experiencing rapid growth. Children far outnumber those in the working and older ages. Almost over 30% of the population is age 15 or younger. In 2000, however, the population age composition has a definite rectangular shape. The movement from a pyramid to a rectangle shaped age distribution shows the progressive aging of the population.

Figure 5. Percent 65+ and Median Age in Kansas by Sex

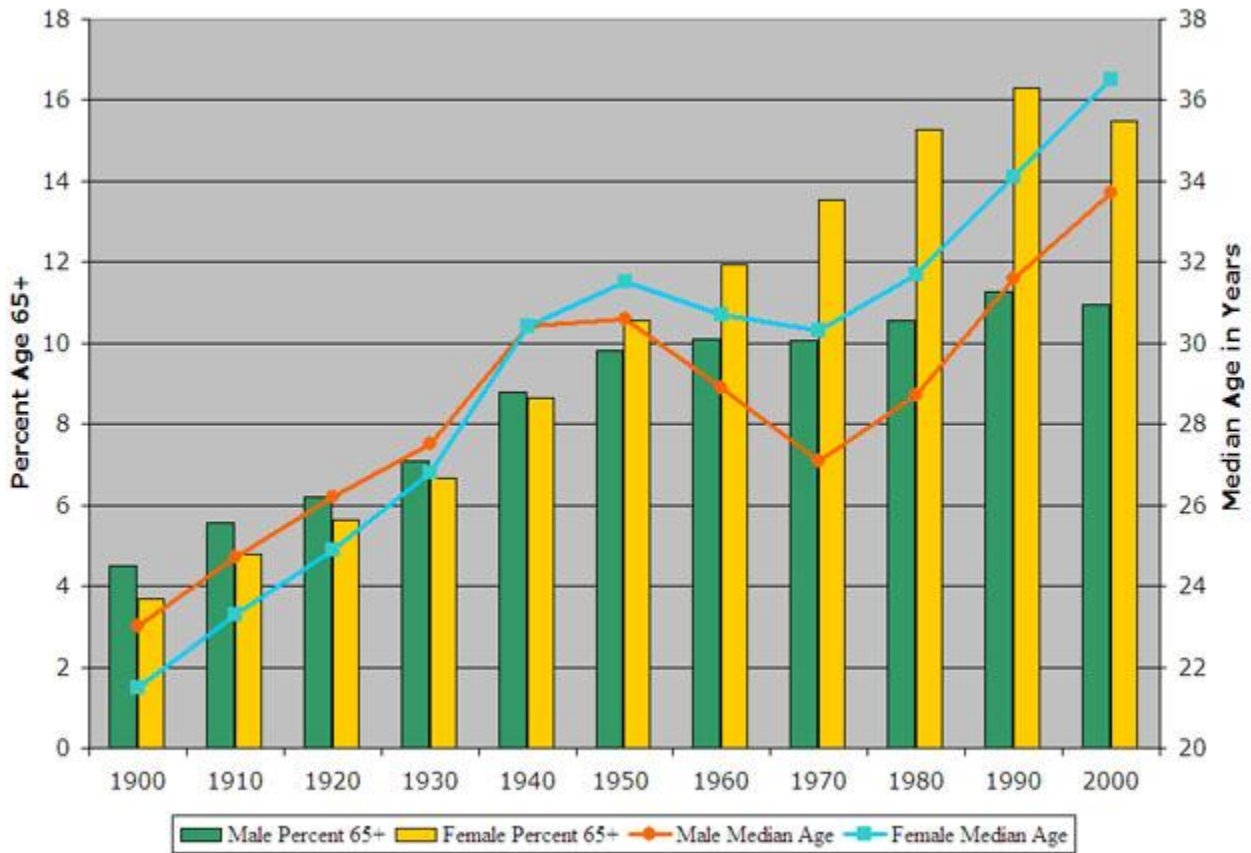


Figure 5 shows the difference in aging experiences for the male and female populations of Kansas. Both follow approximately the same pattern from 1900 to around 1940, however, the aging of the female population is slightly more pronounced. After 1950, the proportion of men 65 and above seems to stabilize while women's proportion 65 and above continues to rapidly increase. A possible reason for this could be that improvements in medical technology and thus in longevity had a more profound impact for women resulting in a more pronounced increase in female life expectancy. The chart also shows the change in median age over time, indicating the gender difference as well as the impact of the Baby Boom between 1950 and 1970. This impact was greater for men, since the general sex ratio at birth is about 105 men for 100 women.

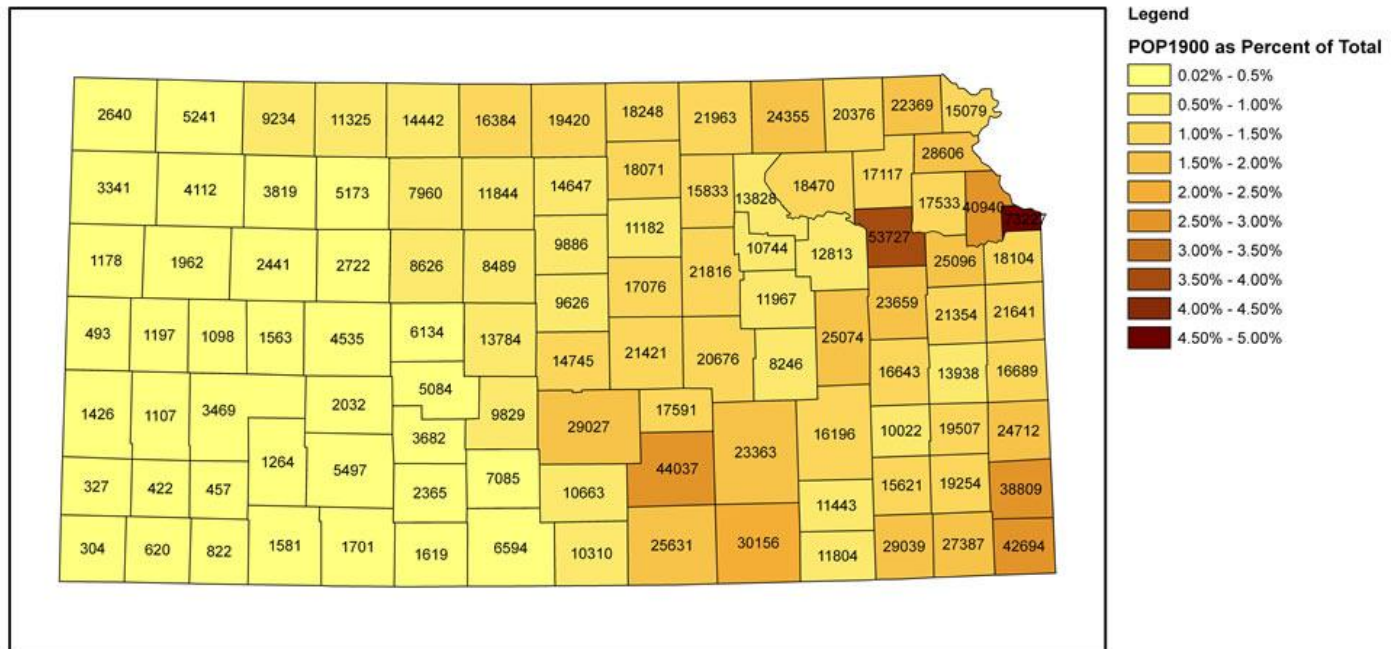
### 3. Population change, urbanization, and migration in Kansas

As has been discussed, aging is unevenly distributed across space. In this section, we focus on the historic patterns of population dynamics in Kansas, urbanization and migration in particular, to discuss the spatially uneven occurrence of aging. In the 20<sup>th</sup> century, the population of Kansas increased from 1.5 to about 2.7 million people, growing approximately 8% per decade. In the decade before the last decennial census (1990 to 2000), Kansas grew at 8.5%, compared to the national average of 13.2%. This was not a new phenomenon. Historically, when comparing two

decennial censuses, Kansas has experienced 5-10% less growth than the nation. In the 1990s, only 9 of 105 Kansas counties experienced growth equal to or greater than the national average growth rate.

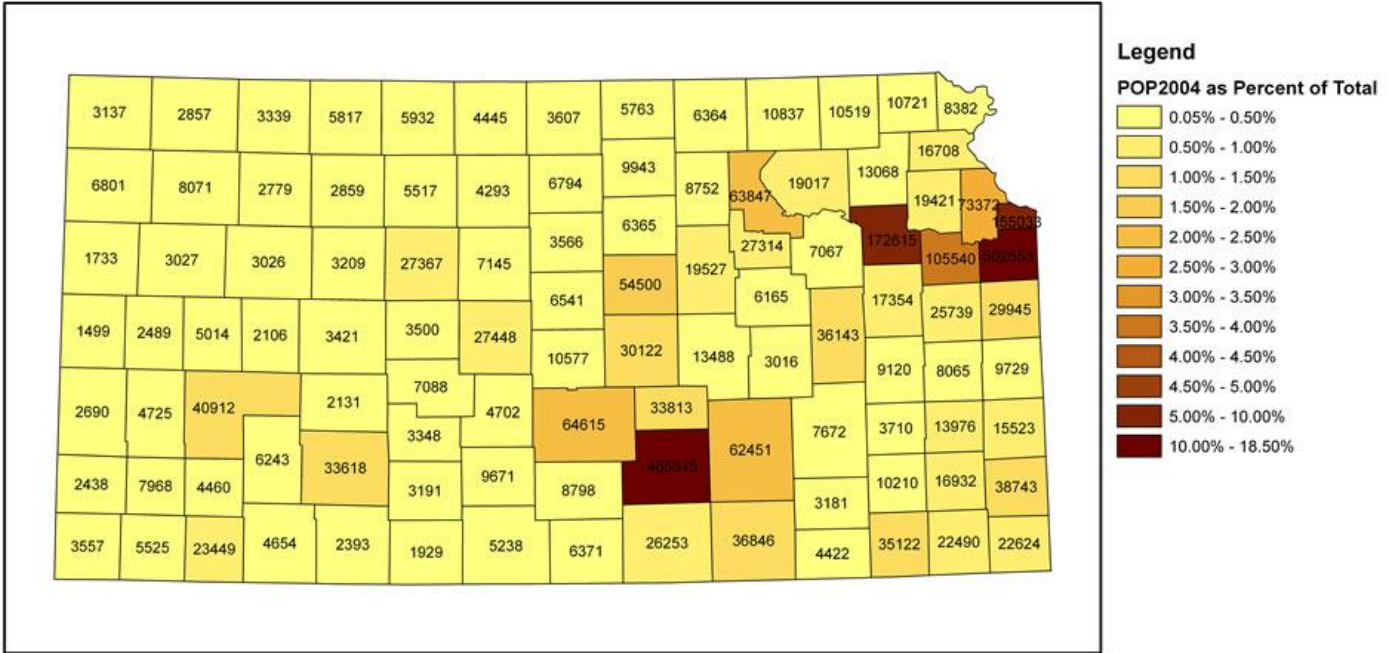
Even this slow growth occurs unevenly in space. Due to this uneven distribution of growth, the population of Kansas is much more concentrated today than in the beginning of the 20<sup>th</sup> century. Figure 6 indicates this change. In 1900, Wyandotte and Shawnee counties (where Kansas City and Topeka are located) accounted for a large proportion of the state's population. Other than that, Kansans were relatively evenly distributed across the state with eastern Kansas being more populous. In 2004, the population is concentrated in the Kansas City, Topeka, and Wichita metropolitan areas and some smaller towns like Manhattan, Dodge City, and Garden City, while rural areas are generally sparsely populated. On average, most rural counties account for less than only 0.5% of the state's population.

Figure 6a. This map was created by Eric Bernard for the following paper: Eric Bernard, László J. Kulcsár and Danny Rogers (2006) "Where did all the irrigators go? Trends in irrigation and emographics in Kansas". Used with authors' permission.



Kansas Population 1900.

Figure 6b. This map was created by Eric Bernard for the following paper: Eric Bernard, László J. Kulcsár and Danny Rogers (2006) "Where did all the irrigators go? Trends in irrigation and demographics in Kansas". Used with authors' permission.



Kansas Population 2004.

Neither the slow population growth nor the population concentration in metropolitan areas should be surprising. States in the Great Plains had very similar population dynamics over the 20<sup>th</sup> century<sup>20</sup>, and 67 of the 105 Kansas counties reached their peak total population by 1930. The Depression and the Dust Bowl made many people leave rural areas. The mechanization of agriculture, farm consolidation, and the postwar industrial boom are also responsible for population concentration in the mid-20<sup>th</sup> century. The 1960s was an especially hard time, as the state lost more than 130,000 people (about 6% of its population) due to out-migration. At this time, however, high fertility and natural increase could counterbalance migration loss. At the same time, the "non-metropolitan turnaround", the remarkable demographic phenomenon of rural population boom of the 1970s<sup>21</sup>, had only a modest impact in rural Kansas. The level of out-migration declined allowing natural increase to drive population growth, although the rate of natural increase itself steadily declined since 1950 corresponding with the national trend. It was only in the 1990s that Kansas had a positive net migration, a point to which we will return later in our discussion.

Urbanization has been one of the most profound changes in Kansas over the 20<sup>th</sup> century. Table 1 summarizes these dynamics between 1950 and 2000. As we can see, the urban population of Kansas increased over the whole period, reaching 71% in 2000 from 52% in 1950. The rural population had only two periods of increase. The first was the aforementioned non-metropolitan

turnaround in the 1970s. However, this increase was a function of high birth rates and not net in-migration. The second period of rural growth occurred in the 1990s. This was more driven by in-migration, more specifically by international immigrants who came to work in the meat industry in Southwestern Kansas. We have to note though that in both periods the growth of urban population was larger than that of rural population, hence urbanization continued throughout the whole 20<sup>th</sup> century.

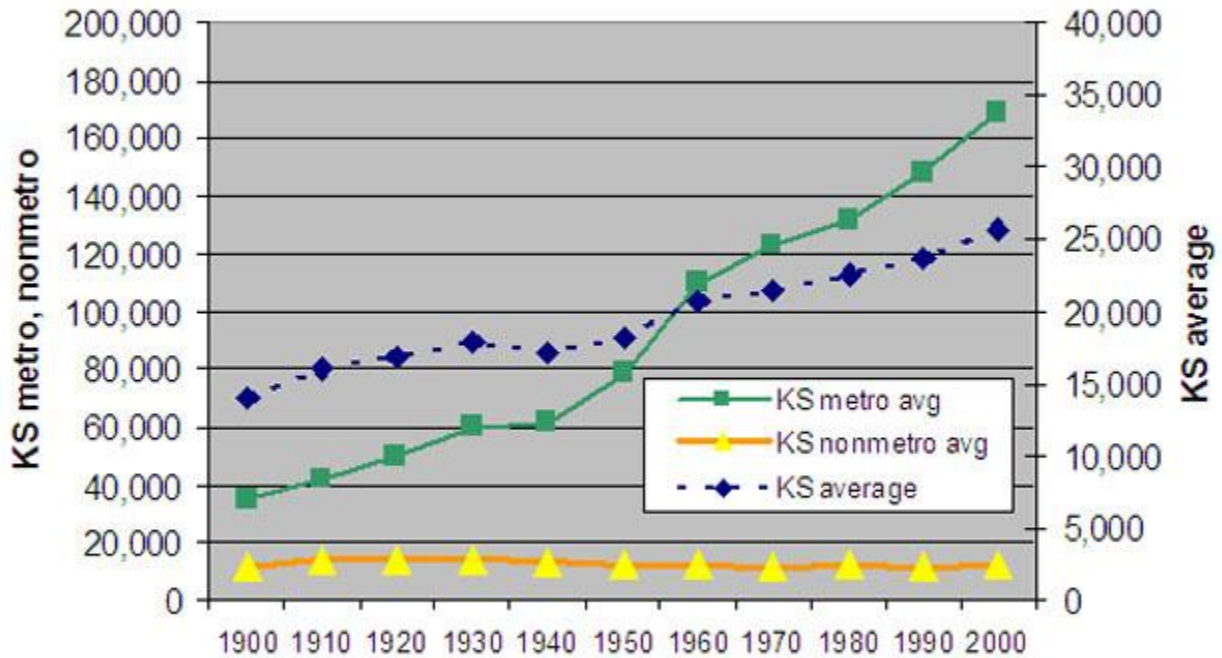
Table 1. Dynamics of Urbanization in Kansas, 1950-2000<sup>22</sup>

Year	Rural population	Urban population	Percent urban population	Number of metropolitan counties
<b>1950</b>	912,079	993,220	52.2	-
<b>1960</b>	849,870	1,328,741	60.9	4
<b>1970</b>	761,708	1,484,870	66.0	5
<b>1980</b>	787,780	1,575,971	66.7	8
<b>1990</b>	765,010	1,712,564	69.1	9
<b>2000</b>	767,180	1,920,081	71.4	9

Urbanization is, by definition, an unequal process in space. The population change of Kansas counties mirrors this phenomenon. Most of the population increase occurred in and around those counties that host the three large urban centers: Kansas City, Topeka, and Wichita. The four metropolitan counties in 1960 (when this classification was first applied) were Johnson, Wyandotte, Shawnee, and Sedgwick counties. The metropolitan expansion occurred in five adjacent counties.<sup>23</sup> Applying the 1990 and 2000 metropolitan status definition, we found that the nine metropolitan counties gained more than 130,000 people on average over the 20<sup>th</sup> century. At the same time, the average population growth in the 96 non-metropolitan counties was only 152 people. Examining the trends after 1950, when the large population redistribution trends caused by the Depression and WWII were over, rural Kansas counties lost 347 people on average. The average county population increased from 15,000 to 25,000 over the 20<sup>th</sup> century, but this increase meant exclusively the population boom of the existing or would-be metropolitan areas (Figure 7). The average population of a rural Kansas county remained around 12,000

people over the course of 20<sup>th</sup> century. There are six counties in Kansas that lost population in each decade since 1900, and 37 that had a negative net migration rate in each decade since 1950.

Figure 7. Average population of Kansas counties, 1900-2000



The most remarkable of contemporary migration trends in non-metropolitan Kansas was the influx of workers into the meat industry. As a result, three Southwestern Kansas counties that were primary meat processing areas experienced changing population trends. These were Finney County (Garden City) in the 1980s, and Ford County (Dodge City) and Seward County (Liberal) in the 1990s. Since migration is age-selective, the new immigrants helped slow the aging process.<sup>24</sup> All three counties have a much lower median age than the state average.

This is one aspect of the relationship between the discussed population trends and aging. With a general fertility decline experienced over the 20<sup>th</sup> century across the United States, the process of migration became the main contributor to aging in place. Clearly, those places that experience long-term population decline and persistent out-migration cannot avoid population aging.

Population projections indicate a 29% increase in the US population by 2030. The population of Kansas, corresponding with the historic trend, will increase at a more modest pace, only by about nine percent. At the same time, the 65+ population of the US will increase by 104%, while the corresponding Kansas figure will be 66%. While it looks like Kansas is in better shape with respect to aging, it really means that of the predicted 252,000 person increase between 2000 and 2030, approximately 237,000 of them will be in the 65+ age category. Since Kansas is not a

typical retirement destination state (having only Nemaha County which qualifies as a retirement destination county in 2000) this increase will be aging in place. In other words, it will be the progress of the population currently between 30 and 55 to retirement age.

#### **4. Statistical Analysis of Aging and Selected Economic Factors**

This section presents a statistical analysis of the effects of population change on economic factors in Kansas counties, using the median household income in 1999 and the employment rate in 2000 as dependent variables. We do not intend for this to be an all-encompassing explanation. Instead, we simply hope to show that population aging can have adverse effects on economic and community development. What follows is a short description of the variables used in the analysis, a brief discussion of univariate statistics, and a presentation of the results of regression models showing the influence of population change on median household income and the employment rate at the county level.

Many of the variables used in this analysis are fairly self-explanatory. Median household income, total population in 1950, and the percent of the population age 65 or older in 1950 fall into this category. However, others might require some clarification. The percent of the population that was urban in 1950, for example, is based on the Census Bureau's 1950 classification scheme whereby a person was defined urban if they lived within an incorporated place of 2,500 persons or more.

The percent change statistics were calculated according to the following procedures. The change in the percent urban and the change in the percent 65 and older were both figured by subtracting their value in 2000 from their value in 1950. The percent change from migration and natural increase, on the other hand, were calculated as absolute change over the 50 years divided by the total population in 1950. This means that they represent proportional change based on the starting 1950 population count.

The metro-nonmetro variable, using the 2000 classification, is a binary classification scheme with 1 being metro and 0 being nonmetro. The farm dependency variable is based on the U.S.D.A. E.R.S. typology of non-metropolitan counties. A county is classified as farming dependent if 15% or more of its average annual labor and proprietor's earnings were derived from farming in 1998-2000. In this case, 1 means farming dependent and 0 means other.

The percent married/spouse present refers to the percentage of people who are both married and living with their spouse. The college completion rate is the percent age 25 and above who have completed at least some college. Finally, the employment rate refers to the percent of the population age 16 or older that are considered employed.

Here we present Table 2 showing basic univariate statistics for these variables in Kansas counties. As can be seen, the average median household income in 1999 was just below \$35,000 while a little over 61% of the 16 and older population was employed. As was previously



discussed, in 1950, the average county population in Kansas was a bit over 18,000 people while about 26.5% of people lived in urban settings. Further, around 10.5% of Kansans were age 65 and over in 1950.

Table 2. Univariate statistics

	<b>Mean</b>	<b>Standard Deviation</b>	<b>Minimum</b>	<b>Maximum</b>
<b>1999: Median Household Income</b>	34,838	5,147	25,335	61,455
<b>2000: Employment Rate</b>	61.23	3.84	49.60	72.10
<b>1950 Total Population</b>	18,145	28,822	2,010	222,290
<b>1950 Population Percent Urban</b>	26.55	28.15	0.00	87.29
<b>1950 Percent 65+</b>	10.57	3.23	2.80	15.60
<b>1950-2000: Percent Change from Natural Increase</b>	31.84	40.17	-14.81	216.39
<b>1950-2000: Percent Change from Migration</b>	-30.19	52.99	-164.54	402.09
<b>1950-2000: Change in Percent Urban</b>	5.76	13.52	-32.08	79.40
<b>1950-2000: Change in Percent 65+</b>	7.54	4.90	-2.29	19.34
<b>2000: Metro-Nonmetro Classification</b>	0.09	0.28	0.00	1.00
<b>2000: Farming Dependent County</b>	0.32	0.47	0.00	1.00
<b>2000 Percent Married Spouse Present</b>	46.82	3.88	32.81	53.15
<b>2000 25+: Percent Completed Some College</b>	49.26	6.45	36.88	77.37

The change statistics show an interesting picture. We can see that the average county level increase in the proportion of the 65+ population was quite high. The fact that this number was not as high for the state as a whole suggests a weighting effect of the few truly urban areas in Kansas. Since a few urban areas contain such large proportions of Kansans, places like Kansas City, Topeka, and Wichita can offset the state numbers. In fact, this finding supports that aging is more pronounced in rural Kansas than in the urban areas.

We can also see that the average proportional growth in the population through natural increase is almost outweighed by an equal and opposite force of negative net migration. This supports our argument that aging in Kansas is primarily aging in place, not retirement migration. The data also show a slight trend towards increasing urbanization. On average, almost 6% more people were living in cities or towns in 2000 compared to 1950.

The metro-nonmetro and farming dependent classifications are both used here as binary variables. As such, the mean represents the proportion falling into the 1 category. In other words, only about 9% of Kansas counties (actually 9 counties total) were classified as metropolitan at the time of the 2000 Census. About one-third of them, in contrast, were classified as farming dependent. Finally, the last two variables show that counties average a little less than half of their population as married with a spouse present and a half of those age 25 or older have completed some college.

Table 3 presents the results of regression analysis predicting 1999 median household income as a function of 1950 population distribution, population change, classification issues, and related social predictors. Model 1 looks at only the effects of 1950 population factors. The adjusted  $R^2$  is fairly small, but significant. It appears that in terms of independent effects, the percent age 65 and older is the only significant predictor. As expected, this shows that, the higher the proportion of the population that was elderly, the lower the median household income in the present.

Table 3.

	Model 1			Model 2			Model 3			Model 4		
	Slope	Beta	Sig	Slope	Beta	Sig	Slope	Beta	Sig	Slope	Beta	Sig
Intercept	36820.8		0.00	49873.1		0.00	47256.0		0.00	14002.8		0.00
1950 Total Population	0.0	0.153	0.18	0.0	0.075	0.30	0.0	-0.071	0.39	0.0	0.055	0.38
1950 Population Percent Urban	27.8	0.152	0.19	-38.4	-0.210	0.01	-33.2	-181.000	0.03	6.9	0.038	0.57
1950 Percent 65+	-304.4	-0.191	0.04	-786.3	-0.494	0.00	-632.5	-0.397	0.00	-1083.4	-0.680	0.00
1950-2000: Percent Change from Natural Increase				-9.3	-0.073	0.56	-3.7	-0.029	0.81	-23.0	-0.179	0.05
1950-2000: Percent Change from Migration				54.1	0.557	0.00	43.1	0.443	0.00	37.3	0.384	0.00
1950-2000: Change in Percent Urban				0.5	0.001	0.98	7.4	0.019	0.76	37.3	0.098	0.05
1950-2000: Change in Percent 65+				-533.0	-0.507	0.00	-517.2	-0.492	0.00	-834.5	-0.794	0.00
2000: Metro-Nonmetro Classification							4961.1	0.271	0.00	4317.1	0.236	0.00
2000: Farming Dependent County							705.0	0.064	0.43	-199.6	-0.018	0.78
2000 Percent Married Spouse Present										829.7	0.625	0.00
2000 25+: Percent Completed Some College										14.3	0.018	0.74
R <sup>2</sup>	0.12			0.67			0.71			0.85		
Adj. R <sup>2</sup>	0.09			0.65			0.68			0.83		
F value	4.60			28.67			25.74			46.27		

Model 2 adds the effects of population change. The adjusted  $R^2$  is fairly large at .65. The major predictors here are the percent urban in 1950, the percent 65 and older in 1950, the percent change from migration, and the change in the percent 65 and older. Further, these influences are in the expected directions. It seems advantageous, household income-wise, for counties to have higher in-migration rates while it is definitely a disadvantage to either start with a larger proportion of elderly or gain more over time.

The only factor that does not act as expected is the proportion of the population that is urban in 1950, which was not significant in Model 1. We should see an economic advantage in terms of greater urban development, but the relationship is negative. A number of speculations are possible to explain this counterintuitive finding. One could be the changes in agribusiness and farming over the last 50 years. The urban population in 1950 includes small towns with a couple of thousand people that experienced hardships during the farm consolidation of the 1960s. Another explanation is that the appearance of this relationship could be due to changes in the classifications of what is urban and rural over time. Our current work does not allow us to give a clear answer at this time, but it is definitely an interesting topic to consider for future research.

Model 3 adds the two binary variables for classification schemes. The metro-nonmetro distinction has a fairly strong influence on median income for obvious reasons. However, farming dependency does not have such an effect. The interesting thing about this model is that, due to the nature of the binary variables, the slopes for the rest of the model now represent the relationship in nonmetro, non-farming counties. Still, all the discussed relationships hold, and the adjusted  $R^2$  has risen to around .68.

Finally, to avoid possible spuriousness, we present Model 4 that controls for two variables that could be strongly related to household income. Of the two, the percent married with spouse present has, by far, the strongest effect. The percent completing some college is not significant. Also, now, the change in percent urban shows a positive, though weak, relationship; and the percent change through natural increase shows a barely significant negative relationship.

The adjusted  $R^2$  in this model jumps to almost .83. However, what should be noted here is that all the demographic relationships still hold in the presence of a loose proxy for family structure. In fact, the percent change in the 65 and older population now has the strongest effect out of all the variables in the model. This shows that aging, even in the presence of demographic change and important control variables, still has a strong, negative effect on economic conditions.

Table 4

	Model 1			Model 2			Model 3			Model 4		
	Slope	Beta	Sig	Slope	Beta	Sig	Slope	Beta	Sig	Slope	Beta	Sig
<b>Intercept</b>	63.28		0.00	73.28		0.00	71.14		0.00	50.34		0.00
<b>1950 Total Population</b>	0.00	-0.040	0.74	0.00	-0.103	0.31	0.00	-0.053	0.66	0.00	0.048	0.68
<b>1950 Population Percent Urban</b>	0.03	0.189	0.11	-0.01	-0.060	0.59	0.00	0.021	0.86	0.02	0.142	0.25
<b>1950 Percent 65+</b>	-0.25	-0.210	0.03	-0.67	-0.567	0.00	-0.55	-0.461	0.01	-0.78	-0.659	0.00
<b>1950-2000: Percent Change from Natural Increase</b>				-0.01	-0.148	0.40	-0.01	-0.138	0.43	-0.02	-0.253	0.13
<b>1950-2000: Percent Change from Migration</b>				0.03	0.395	0.00	0.03	0.424	0.00	0.02	0.342	0.00
<b>1950-2000: Change in Percent Urban</b>				-0.06	-0.218	0.02	-0.04	-0.156	0.10	-0.03	-0.118	0.19
<b>1950-2000: Change in Percent 65+</b>				-0.37	-0.472	0.00	-0.40	-0.514	0.00	-0.58	-0.746	0.00
<b>2000: Metro-Nonmetro Classification</b>							-0.86	-0.063	0.60	-1.42	-0.104	0.37
<b>2000: Farming Dependent County</b>							1.98	0.243	0.04	1.20	0.146	0.22
<b>2000 Percent Married Spouse Present</b>										0.45	0.451	0.00
<b>2000 25+: Percent Completed Some College</b>										0.07	0.118	0.23
R <sup>2</sup>	0.08			0.37			0.40			0.47		
Adj. R <sup>2</sup>	0.05			0.32			0.34			0.41		
F value	2.93			8.11			6.96			7.62		

Table 4 presents the result of the same regression analysis carried out on the employment rate in 2000. In Model 1, again, the only significant factor is the percent 65 and over in 1950. In Model 2, the percent 65 and over in 1950, the change from migration, the change in the percent urban, and the change in the percent 65 and over are all significant. However, they only explain about 32% of the variance in the employment rate. Again, all relationships are in the expected direction except the change in the percent urban.

Model 3 again adds the classification variables. However, their addition, while slightly altering the existing relationships in the table, does not significantly increase  $R^2$ . Strangely, the only significant relationships in this model come from aging, migration, and farm dependency, when the other factors are controlled. It makes sense that the importance of agriculture in the local economy could have a strong influence on employment rates. It appears here that farming counties enjoy a slight advantage in terms of employment when compared with other non-metropolitan counties.

We could speculate on a number of possible reasons for this. One explanation is that it may have something to do with the method for assigning farm dependency status. The major economic dependence categories are mutually exclusive, and farming dependence has priority over the others. Therefore, it is possible that farming dependent counties could also fit into other categories such as manufacturing, services, or mining. However, this information is lost by the measure. Another related explanation is that places in the rural Midwest may benefit from having a stronger agricultural base around which to build economic development compared to other farm dependent counties elsewhere. Farming communities in Kansas might even have an advantage over other rural places when it comes to attracting businesses and economic development.

Finally, Model 4 adds the social-cultural control variables to avoid spuriousness. The adjusted  $R^2$  goes up to .41, but only the percent married/spouse present, migration, and aging are significant. This gives us strong evidence that aging (both in terms of a place's historical trajectory and current situation) can have a strong impact on employment independent of other types of demographic, classification, and social changes.

## 5. Conclusions

Population aging is a contemporary demographic process with which a society has to cope at various levels. Aging in Kansas, similarly to other Midwest states, is more progressed than in the United States as a whole. This aging, however, is very different from what one can see in popular retirement destinations, such as Florida or Arizona. Aging in Kansas is, first of all, aging in place. This is an important point considering the historical trends. The Baby Boom cohort, which had a mitigating impact on aging in the mid-20<sup>th</sup> century, will have an accelerating impact on aging very soon. In Kansas, this will mean that community challenges with respect to aging will

intensify in the form of a spatially less mobile and socially and economically more disadvantaged elderly population.

Immigration, which has influenced aging at the national level since the 1980s because of its age-selectivity, will have a generally moderate impact on aging in Kansas (but a more substantive impact on general social change in the state). However, in some counties we can find a profound effect of immigration. This might even help to curb population aging, but, on the other hand, such an influx may also create certain social challenges in those communities. Furthermore, how the impact of immigration is distributed across Kansas also exhibits spatial differences at the county and community level.

Population growth in Kansas has always been below the national average. The analysis of historical trends indicates that rural Kansas has been experiencing population decline since the Great Depression. Further, all the population growth is occurring in urban areas or in their metropolitan hinterland. Even during periods of non-metropolitan revivals, such as the 1970s and the 1990s, rural places grew less than urban places. More importantly, even this rural population growth was simply a function of high birth rates and not positive net migration until the 1990s when the meat industry arrived. Our analysis indicated that only a few urban areas experienced population growth and aging decline. Average natural increase is greatly offset by average out-migration, thus it cannot be a buffer against population aging, especially not in rural Kansas.

The population concentration in Kansas has important implications for policy-making and interest representation in state legislation. Since population dynamics in Kansas are driven by urban population processes, rural places are disadvantaged because urban population dynamics can mask rural problems. This means that sparsely populated rural areas might have difficulties receiving statewide attention.

One result of these population distribution trends is accelerated aging in place in rural Kansas. While the population of Kansas is projected to grow in the following decades, much of this growth will occur in the 65+ age category as the Baby Boom cohort reaches retirement. Hence, we looked for the economic impact of aging over time, using both historical statistics and county-level data from the 2000 Census.

When examining the impact of aging on household income and employment, we found that the percent change in the 65+ age group had the strongest effect out of all the predictors (based on beta weight comparisons), while the percent of people age 65+ in 1950 had the second strongest effect. This means that aging is very important for non-metropolitan Kansas counties even when controlling for all the other socioeconomic variables. In other words, it means both that aging has a strong negative impact on income, and that there is a certain path-dependency, since the aging situation in 1950 is a relatively good predictor of income in 1999. Furthermore, the process of aging is very difficult to change. The fact that it can be a persistent problem in certain counties

for 50 years indicates that in many cases, local communities are either ill-prepared or too vulnerable to address development challenges that arise from population aging.

Generally we can say that aging is a very important process in rural Kansas and disadvantageous for economic well-being. There are areas of rapid aging in place, especially along the Nebraska border. The historic and contemporary population trends of Kansas indicate future difficulties for many rural places. We have no reason to believe that these trends will change, except in a few communities. However, such change might result in different development challenges, similar to what occurred in the meatpacking centers of Southwestern Kansas.

While urbanization and population concentration seem to have a direct impact on aging and economic development, the complex interaction between agricultural change and urban expansion in their influence on population aging and community development should be studied in greater detail. Our results indicate a fluctuating impact of agriculture on economic development contingent on various demographic factors. Thus, this topic is offered as a potential future subject for investigation. Another direction suggested by this work is the in-depth analysis of the impact of aging on community organization and development. We have already selected case study sites along the Nebraska border, and are conducting statistical analysis and qualitative fieldwork to gain deeper insights into how rural communities address the long-term problems of aging.

### **Special Acknowledgements**

This paper represents the product of work by a variety of people and funding sources. Funding was provided by the Kansas Population Center, the Center on Aging Competitive Faculty Development Awards, and the Kansas State University Small Research Grant program.



**End Notes:** László J. Kulcsár and Benjamin C. Bolender. "Home on the Range: Aging in Place in Rural Kansas," [Online Journal of Rural Research & Policy](#) (2006.3).

1. This research was supported by the Fall 2005 Kansas State University Small Research Grant program. We'd like to acknowledge the help of the Kansas Population Center in hosting this research project. [\[back\]](#)
2. It has to be noted that there are two parallel urban-rural classification systems in the US. The Census Bureau uses a place-based system, differentiating between urban and rural places. The Office of Management and Budget uses a county-based system, differentiating between metropolitan and non-metropolitan counties. This latter scheme is used by most researchers, however in many publications researchers use the term "rural" as a synonym for non-metropolitan. In this study, the terms rural and non-metropolitan are used interchangeably. [\[back\]](#)
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18. Glasgow, 2003, *Ibid.* [\[back\]](#)
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20. Kenneth Johnson and Richard Lathge, "Agricultural dependence and changing population in the Great Plains." Pages 197-218 In *Population Change and Rural Society*, by William A. Kandel and David L. Brown (eds.). Dodrecht: Springer, 2006. [\[back\]](#)
21. See Calvin L. Beale, *The revival of population growth in nonmetropolitan America* (Washington DC: U.S. Department of Agriculture, Economic Research Service, 1975). [\[back\]](#)
22. In this table, the rural and urban terms refer to the Census Bureau definition. [\[back\]](#)
23. By 2006, due to changes in the classification system, the number of metropolitan counties increased to 17. [\[back\]](#)
24. This is only one aspect of this complex change. Employment in the meat processing industry is increasingly based on minority labor, mostly Hispanics (see William Kandel and Emilio Parrado. "Restructuring of the US Meat-processing Industry and New Hispanic Migrant Destinations." *Population and Development Review* 31 (2005): 447-471.). This has important implications in community development in these places. [\[back\]](#)

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