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Future Population Shifts in the Great Plains and Their Implications

Richard Rathge*

INTRODUCTION

The dynamics of population change in the Great Plains are complex and largely hidden. From a regional or even state perspective, one is left with the impression that the area has enjoyed sustained population growth. All 12 states in the region (i.e., Montana, North Dakota, Minnesota, Wyoming, South Dakota, Iowa, Nebraska, Colorado, Kansas, New Mexico, Oklahoma, and Texas) increased their population from 1990 to 2000, and the region as a whole expanded by 6.7 million people or 17 percent (Rathge, 2005). In fact, the region's population has doubled since 1950. However, these aggregate statistics mask a very different reality. Population growth in the region has been largely a metropolitan phenomenon. From 1990 to 2000, 85 percent of the region's population growth occurred in metropolitan counties which account for only 14 percent of all counties in the region. In contrast, rural counties (i.e., those lacking a city of at least 2,500 people) comprise about one-third of all counties in the Great Plains and their population base has declined by one-fifth since 1950. Moreover, the redistribution of population in the region has been very age-selective. From 1990 to 2000, the young adult population (i.e., ages 20 to 34) has declined by 7 percent in the region's nonmetropolitan counties while their metropolitan counterparts grew by 4 percent. In contrast, the senior elderly population (i.e., ages 85 and older), ballooned in both metropolitan and

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nonmetropolitan counties at rates of 41 percent and 23 percent respectively. The purpose of this article is to explore future population change in the region and its policy implications, with a specific focus on age cohorts and county population size.

DEFINING THE GREAT PLAINS

The Great Plains is commonly viewed as the territory reaching from Montana to Minnesota and down to New Mexico and Texas. This regional designation is based largely on the agricultural commonalities found within the territory. The U.S. Department of Agriculture (USDA), using a county-based system, defines these shared traits as lower and more erratic rainfall, less timber, and less suitability for corn, cotton, or other crops without irrigation or periodic fallowing of land (see Bogue and Beale, 1961). The USDA isolated 870 contiguous counties within this region as having these traits. For the purposes of this research, I relax this strict definition and include all 1,009 counties within the 12 states in my definition of the Great Plains. I reason this slight modification is justified because my primary purpose is to provide context for policy making, including those at the federal level. Thus, the broader definition is more informative because it accurately encompasses the political boundaries rather than just the unique agricultural territory. The size of this region is noteworthy because it accounts for approximately 42 percent of all U.S. land area outside of Alaska and Hawaii.

RECENT POPULATION CHANGE

An analysis of population change in this enormous region is somewhat problematic. The ecological makeup of counties in the region can vary distinctly from the dominant regional pattern. For example, in the states of Colorado and New Mexico, a significant portion of the rural counties run counter to the larger regional trend for all nonmetropolitan counties. For example, in Colorado, the rural population grew by 45 percent relative to a 33 percent growth

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in the overall nonmetropolitan population from 1990 to 2000. A similar trend is seen in New Mexico; from 1990 to 2000, rural population grew by 31 percent relative to a 16 percent growth in the overall nonmetropolitan population (see Table 1).

Table 1 Change in population by state in the Great Plains by county type: 1990 to 2000

	Change	in	Percent Change in Population								
States in the Great Plains	Population for All Counties		D.d.a.t.m.a	Nonmetropolitan Counties							
	N	%	politan Counties	Total	Urban population 20,000 or more	Urban population 2,500 to 19,999	Rural population less than 2,500				
Colorado	1,006,867	30.6	30.0	33.2	24.8	31.6	44.7				
Iowa	149,569	5.4	10.5	1.5	1.7	1.9	-1.0				
Kansas	210,844	8.5	14.1	2.0	3.1	2.3	-1.1				
Minnesota	544,380	12.4	15.0	6.7	6.8	6.9	6.1				
Montana	103,130	12.9	9.7	13.9	21.7	7.6	7.9				
Nebraska	132,878	8.4	14.3	2.6	7.2	3.3	-4.3				
New Mexico	303,977	20.1	23.0	16.4	13.7	19.4	31.1				
North Dakota	3,400	0.5	10.3	-6.1	1.5	-5.0	-9.5				
Oklahoma	305,069	9.7	12.2	6.0	3.6	7.7	-4.8				
South Dakota	58,840	8.5	18.3	3.9	-0.3	7.2	0.7				
Texas	3,865,310	22.8	24.9	12.0	11.8	12.1	11.8				
Wyoming	40,194	8.9	10.2	8.3	0.0	10.6	10.9				
TOTAL	6,724,458	17.4	21.5	8.2	8.6	9.0	4.7				

Source U.S. Census Bureau, Decennial Censuses

This was largely due to the scenic amenities (e.g., mountains, lakes, streams) which are attracting people. Similar natural amenity growth is occurring in the lake counties of Minnesota and the mountain vistas of western Montana and Wyoming. This is in stark contrast to the prolonged population decline typical of most agricultural-based rural counties in the region. PROJECTED FUTURE POPULATION REDISTRIBUTION IN THE GREAT PLAINS

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To gain a perspective of the future population change within the Great Plains, I contacted the demographic units from each of the 12 states and requested their latest county-specific population projections by age. This was necessary because no one entity produces county-level age-specific population projections for all states. Obviously, this raises some methodological concerns with regard to standardization of assumptions or uniformity of modeling. These issues will be briefly discussed. *Population Projections Methodology*

The common technique used by the 12 states in producing their population projections was a cohort survival model. This approach bases the projections on historical trends in fertility, mortality, and migration. Historical trend lines used by the analysts varied among states. However, most used a recent three-year average of births to calculate age-specific fertility rates for women ages 15 to 44. In the modeling process, these rates were applied to successive cohorts of women in this age group to determine the number of births that would occur for that projection period. A similar process took place for deaths. Typically, a three-year average of age-specific deaths was calculated using the most recent data from respective state Departments of Health. Age-specific survival rates were calculated based on these data and applied within the projection model to determine the deaths that would occur in each age cohort. A three-year trend line is a standard approach that compensates for any unusual fluctuation in a specific year (Shryock et al., 1976). The trend lines used for migration varied the most among the 12 states. Most states adopted either a ten or five-year trend line based on recent Census data. Data on age-specific migration patterns for counties are relatively difficult to find, thus greatly limiting the analyst's options. These historical trends in fertility, mortality, and migration were then assumed to hold for the future of the projection period. Since it is difficult to forecast how well historical trends will fit the future, analysts sometimes develop different scenarios based on adaptations of the trend lines in fertility, mortality, and migration. They release different versions of

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projections and allow the users to decide which series might best reflect changes in the future. However, only a few of the states had alternative population projection scenarios, thus, only one series is analyzed in this paper. If a state did release multiple scenarios, I selected the middle or conservative projection. Finally, the longest projection period reported for each state was the year 2020, thus I used 2000 to 2020 as my projection horizon. My confidence in these projections is very high because the analysts producing them are the most knowledgeable about their own state's population dynamics.

Table 2 is a compilation of the population projections for the 12 states in the Great Plains. It is organized to offer both a macro and micro perspective of the region's projected population dynamics. First, total population change for the region by age group is presented along with corresponding change by county type. This reflects a broad overview of predicted age shifts within the region. However, in order to explore contextual variations that may be masked by aggregate statistics, as noted earlier, I also present data on the number and proportion of counties that are forecast to grow or decline by county type.

The forecast shows four notable trends. First, the region as a whole is expected to grow and, in the aggregate, this growth includes all county types. Overall, the region is expected to gain 12 million people from 2000 through 2020, with 85 percent of that growth occurring in metropolitan areas. Rural counties (i.e., lacking a city of at least 2,500 people) are predicted to gain 165,372 people. However, closer inspection of the data reveals that these aggregate predictions are somewhat misleading. Nearly 60 percent of these rural counties are projected to decline and 40 percent of all nonmetropolitan counties are in the loss column. Moreover, most of these declines are predicted to be in the northern plains as noted in Figure 1.

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Table 2Number of counties by population gain or loss in the Great Plains by metropolitan and
nonmetropolitan status from Census 2000 to 2020 projections

	Number of Counties in the Great Plains by County Type											
					Nonmetropolitan Counti							
Change in Population by Age	A Cou Tyj	ll Inty pes	Metro- politan Counties		Total		Urban population 20,000 or more		Urban population 2,500 to 19,999		Rural population less than 2,500	
Cohort	Ν	%	Ν	%	Ν	%	Ν	%	Ν	%	Ν	%
All Ages	1,00	100.	142	100.	867	100.	66	100.0	443	100.0	358	100.0
	659	65.3	140	98.6	519	59.9	50	75.8	324	73.1	145	40.5
	350	34.7	2	1.4	348	40.1	16	24.2	119	26.9	213	59.5
Population Change (Persons)	12,162,414		10,314,465		1,847,949		463,501		1,219,076		165,372	
Ages 0 to 4	1	1										
	657	65.1	122	85.9	535	61.7	41	62.1	311	70.2	183	51.1
	352	34.9	20	14.1	332	38.3	25	37.9	132	29.8	175	48.9
Population Change (Persons)	626,827		511,059		115,768		30,792		74,151		10,825	
Ages 5 to 19												
	356	35.3	106	74.6	250	28.8	29	43.9	164	37.0	57	15.9
	653	64.7	36	25.4	617	71.2	37	56.1	279	63.0	301	84.1
Population Change (Persons)	1,440	440.938 1.441.786		1,786	-848		21,750		15,003		-37,601	
Ages 20 to 3	34											
_	675	66.9	120	84.5	555	64.0	42	63.6	314	70.9	199	55.6
	334	33.1	22	15.5	312	36.0	24	36.4	129	29.1	159	44.4
Population Change (Persons)	1,962,247 1,536,90		6,907	425,340		89,960		285,712		49,668		
Ages 35 to 54												
	293	29.0	97	68.3	196	22.6	21	31.8	129	29.1	46	12.8
	716	71.0	45	31.7	671	77.4	45	68.2	314	70.9	312	87.2
Population Change (Persons)	1,540	,540,684 1,662,597		-121,913		1,566		-63,305		-60,174		
Ages 55 to 6	54											

	Number of Counties in the Great Plains by County Type												
	952	94.4	142	100.	810	93.4	66	100.0	435	98.2	309	86.3	
	57	5.6	0	0.0	57	6.6	0	0.0	8	1.8	49	13.7	
Population Change (Persons)	3,283	,283,204 2,597,506		685,698		158,107		432,116		95,475			
Ages 65 and	l Older												
	889	88.1	142	100.	747	86.2	62	93.9	405	91.4	280	78.2	
	120	11.9	0	0.0	120	13.8	4	6.1	38	8.6	78	21.8	
Population Change (Persons)	3,308,466 2,564		1,662	743,804		161,	,321	475,	295	107,	188		

Sources U.S. Census Bureau, Decennial Censuses; Individual state agencies provided population projections

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Figure 1 Projected percent change in total population in the Great Plains states by county: 2000 to 2020





counties participating in this growth. Nearly two-thirds of the nonmetropolitan counties in the region are expected to increase their pre-school population between 2000 and 2020, representing an estimated net growth of 115,768 children. The growth of pre-school children in metropolitan counties is four times the growth in their nonmetropolitan counterparts, with an anticipated net expansion of 511,059 children. Approximately 86 percent of all metropolitan counties are expecting growth in the number of pre-school children from 2000 to 2020. This anticipated growth among children is due to the corresponding net expansion of young adults

ages 20 to 34, which encompasses all geographic categories in the region. This projected net increase also runs counter to historical trends. From 1990 to 2000, the nonmetropolitan counties in the region lost 7 percent of their young adults; losses in the rural counties were twice that level (Rathge, 2005).

A third noteworthy trend is the sizeable loss of population in the prime workforce age group. Demographers are predicting a net loss of 121,913 people ages 35 to 54 in nonmetropolitan areas of the Great Plains from 2000 through 2020 (see Table 2). Half of this loss will occur in rural counties of the region, with 87 percent of these rural counties having a net loss in prime-age workers. In contrast, slightly less than one-third of the 142 metropolitan counties in the region are predicted to suffer a net loss of residents ages 35 to 54. Much of the loss in this age group will be a function of baby boomers aging into the next age cohort. Nonetheless, this transition may represent a significant burden on employers as the available labor pool shrinks.

As noted in Figure 2, the greatest concentration of loss among the prime working-age population will be in the northern Plains states. In fact, only a handful of counties in the Dakotas, Montana, and Wyoming are expected to expand their prime working age population from 2000 to 2020. In addition, the net growth of this age group in Minnesota is largely concentrated in a group of counties that extends northwest of Minneapolis/St. Paul and is known for its scenic lakes. This amenity growth is similar to that occurring in Colorado, New Mexico, and parts of Texas.

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Figure 2 Projected percent change in persons ages 35 to 54 in the Great Plains states by county: 2000 to 2020



Sources U.S. Census Bureau, Census 2000; Individual state agencies provided population projections

The final trend of interest centers on the tremendous elderly expansion that will transform much of the region. Approximately half of the aggregate net increase in the region's population from 2000 to 2020 will be comprised of those ages 55 and older. The net expansion of 6.6 million people in this age group will be evenly split between pre-retirees (i.e., ages 55 to 64) and those traditionally viewed as retirees (i.e., ages 65 and older). What is most revealing is that this expansion will be almost universally felt throughout the region. About 94 percent of all the counties in the Great Plains will experience pre-retirement aged growth and 88 percent will gain residents ages 65 and older (see Table 2 and Figure 3).

Figure 3 Projected percent change in persons ages 65 and older in the Great Plains states by county: 2000 to 2020



Sources U.S. Census Bureau, Census 2000; Individual state agencies provided population projections

The magnitude of this expected redistribution will be dramatic. As noted in Table 3, the region's rural counties experienced an overall net loss of elderly (i.e., ages 65 and older) from 1990 through 2000. However, the projections forecast an 8 percent increase in elderly for these rural counties from 2000 to 2010 or 26,762 seniors, and an additional 22 percent or 80,426 seniors from 2010 to 2020. If these sparsely populated rural counties are not positioned for such a dramatic change, they could be easily overwhelmed. Similar dramatic increases are expected for the region's nonmetropolitan counties overall with a predicted expansion of 34

percent from 2000 to 2020, or nearly three-quarters of a million seniors. The greatest change will occur in the region's 142 metropolitan counties. A staggering 66 percent increase in the number of elderly is forecast for these counties, representing an overall influx of 2.5 million seniors from 2000 through 2020. This means that elderly will account for one-fourth of the expected growth in the region over this time period. Such dramatic change in the region's population distribution requires thoughtful debate regarding strategies that should be explored to maintain viable communities.

Table 3Change in elderly population (ages 65 plus) in the Great Plains by metropolitan
and nonmetropolitan status: Census 1980 to 2000 and projections 2010 and
2020

	Change in Great Plains Population by County Type											
	Nonmetropolitan Co											
Age Cohort and	All Counties		Metropolitan Counties		Total		Urban population 20,000 or more		Urban population 2,500 to 19,999		Rural population less than 2,500	
Year	Ν	%	Ν	%	Ν	%	Ν	%	N	%	Ν	%
All Ages												
1980 to	3,766,	10.	3,858,	16.	-	-0.8	61,26	2.1	-	-0.4	-	-6.6
1990 to	6,724,	17.	5,731,	21.	992,6	8.2	260,8	8.6	649,04	9.0	82,72	4.7
2000 to	5,899,	13.	5,042,	15.	856,1	6.6	222,3	6.7	572,43	7.3	61,37	3.3
2010 to	6,263,	12.	5,271,	14.	991,8	7.1	241,2	6.8	646,64	7.7	103,9	5.4
2000 to	12,162	23.	10,314	27.	1,847	13.	463,5	13.1	1,219,	14.4	165,3	8.6
Persons												
1980 to	736,26	19.	574,42	28.	161,8	9.2	53,36	15.4	95,618	8.7	12,85	4.0
1990 to	637,88	14.	556,58	21.	81,30	4.2	32,45	8.1	49,391	4.1	-547	-0.2
2000 to	899,67	17.	718,78	22.	180,8	9.0	35,27	8.2	118,84	9.6	26,76	8.0
2010 to	2,408,	39.	1,845,	47.	562,9	25.	126,0	27.0	356,45	26.2	80,42	22.2
2000 to	3,308,	54.	2,564,	66.	743,8	34.	161,3	34.5	475,29	35.0	107,1	29.6

Sources U.S. Census Bureau, Decennial Censuses; Individual state agencies providing population projections

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STRATEGIES FOR THE FUTURE

The future demographic challenges for the Great Plains will require bold and innovative action by policy makers and planners. Two of the fundamental issues to be addressed are underscored by this research. The first is the need to reexamine labor force changes and the consequences they hold especially for rural communities. Most rural communities are already at a disadvantage because of skills mismatch (Greengard 1998), chronic low-wages (Gibbs and Cromartie 2000), and decades of out-migration among the entry labor pool (Rathge 2005). The predicted labor shortfall among the prime working age population could devastate already fragile rural economic systems and facilitate the further demise of these communities, especially those in the northern Plains. One solution gaining acceptance argues that viability is found in community collaboration (Korsching et al. 1992; Shepard 1993). Small rural communities, regardless of their individual potential, need to become integrated into larger regional markets. Cooperative ventures need to be promoted to nurture collaboration among differing levels of governments (e.g. towns, townships, counties) in order to foster interdependence. Unfortunately, community identity is one of the greatest hurdles to community interdependence. Community pride developed through long histories of independence encourages jealousies that can easily undermine even the best cooperative strategies (Schafer 1992).

The second fundamental change that will need to be addressed is the dramatic population shift toward a ballooning elderly population. In order to meet such a challenge, communities will need to embrace seniors as a source of economic development as opposed to a drain on community resources. Fortunately, the notion that retirees can be a viable source of economic development is gaining acceptance (Reeder 1998). In fact, Hass and Serow (2002) report that at least 10 states have implemented programs aimed at attracting seniors as part of an

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economic development program. In part, this is due to the realization that elderly can be economic assets to rural communities. They are consumers of goods and services, thus they stimulate local economies. Most elderly own property and therefore add to the local tax base. Seniors invest their capital in local communities and at times even continue to participate in the local labor market. In fact, the contribution of seniors to local and regional economies can be substantial. Sastry's (1992) economic impact analysis of in-migrating elderly to Florida found that a new job was created for every 2.5 retirees. The movement of more wealthy retirees to western North Carolina produced a new job for each retiree who relocated (Hass and Serow 1990). Similar findings were reported by Bennett (1993) who evaluated the economic contribution of elderly moving to various South Atlantic coast destinations. However, most of these studies focused on amenity growth areas, and, as Isserman (2000) reports, many rural areas that have persistently struggled will continue to be left out unless progressive policies are instituted.

One area of policy consideration that has received much attention has been tax burden. A flurry of economic analyses has been conducted to assess the consequence of state fiscal policies on elderly migration flows. Modeling of census migration flows demonstrates that elderly migration is influenced by fiscal policies (see Conway and Houtenville 1998; Duncombe et al. 2000). Indicators that have the largest influence are inheritance taxes, income taxes, and property taxes. These fiscal policies are also age-specific. For example, Woo (2003) has demonstrated that the young old (i.e., ages 60 to 75) are most influenced by income tax and property tax while the older seniors (i.e., ages 75 and older) are most influenced by inheritance taxes. The data also suggest that such broad fiscal incentives might be counterproductive because the corresponding revenue losses from such programs would outweigh the benefits. Thus, targeting fiscal policy to specific niche groups might be most effective. For example,

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many of the return elderly migrants to the Great Plains are in search of informal care giving. As seniors lose mobility, lose a significant other, or have a major health concern, they look to family or friends for assistance, commonly called informal care giving. Tax or fiscal incentives that assist caregivers should prove beneficial because they leverage the economic cost of caring for the senior between the state and informal caregivers. If the state, through incentives, can increase the amount of elderly care provided by informal caregivers, the state should see a corresponding reduction in elderly care expenses because institutionalized care is much more expensive.

The challenges to a retiree-attractive policy are numerous. An investment in seniors as an economic development strategy means that communities will need to address seniors' current and future residential needs in order to discourage them from seeking more suitable environments. These needs include housing, medical services, transportation, social services, and a host of others. In addition to the resource and infrastructural challenges, communities will face developmental or political issues such as how best to interface government with institutions or groups within the community to best serve seniors (Skelley 2004).

Herein lies both the challenge and opportunity. For rural communities, the main issue will be how to attract the needed labor and find the financial capital to serve the needs of its residents. In contrast, for larger urban communities, the issue will be how to balance a growing demand for elderly housing and service delivery systems while maintaining an appropriate perspective for other residential concerns. This point was illustrated in my own community when the city planning commission authorized the conversion of a long established neighborhood park into development property for elderly housing. As with most challenges that face communities, the desire to aggressively address these issues with foresight and open communication channels will likely determine success or failure.

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This research clearly demonstrates the dramatic population shifts that will accompany the aging of the baby boom within the next decade. The consequences for the Great Plains vary depending on location. Most of the small rural counties are expected to continue to decline in population while increasing in their proportion of elderly. In contrast, major urban areas of the region will gain rapidly as seniors relocate to the cities for services. The overarching concern, however, will be the sizeable loss of population in the prime workforce age groups. This article is intended to both alert researchers and decision makers to the issue and initiate a debate that will foster action.

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