

Place-Based Poverty in Iowa 1969-2009



The first decade of the 21st century has been fraught with economic challenges. The decade of the 2000s has seen two recessions that has stagnated growth in jobs, income and overall net wealth. In turn, this has impacted government budgets and spending, limiting their ability to stimulate the economy. One indicator of economic well-being is the share of people living in poverty. Since the end of the Second World War, poverty rates had been generally declining across the nation. However, over the last 10 years poor economic conditions have reversed this trend, causing an increase in poverty rates. There is a need to understand how these trends have impacted Iowa communities. Thus, the purpose of this report is to document the trends in poverty across Iowa counties over the past 40 years, and to identify some key socioeconomic correlates of poverty in Iowa.

Previous research has clearly identified key demographic and economic correlates of local poverty in the United States (Lobao 2004; Lobao and Hooks 2007; Peters 2009; Weber, Jensen, Miller, Mosley, and Fisher 2005). This body of work has demonstrated that poverty can be explained by

differences in economic structures, individuals, natural resources, geography, and past history. In terms of geography, poor counties are spatially clustered where neighboring poverty impacts local poverty; and poverty tends to be higher in non-metropolitan and core urban areas. Poverty is path dependent over time, meaning that high poverty in previous decades results in high poverty today. In terms of demographics, single-headed families and minorities are associated with higher level of local poverty; and higher levels of education decrease poverty. In economic terms, poor places have lower labor force participation and higher unemployment rates. Employment in agriculture, natural resources, lower skill services, trade, and government are all associated with higher rates of poverty. Non-poor places tend to have more jobs in higher skilled producer services. Manufacturing and transportation tends to reduce poverty rates overall, but not in non-metropolitan areas.

Data and Methods

In order to better understand Iowa poverty rates over time, this analysis uses a unique set of spatial data from the 1970, 1980, 1990 and 2000 Decennial Census,

Iowa's poverty rate was 11.4% in 2009, lower than the U.S. rate of 13.5%.

Since 1969 Iowa's poverty rate has remained unchanged.

and the 2005-09 American Communities Survey (ACS). Data for all Iowa counties is presented in the appendix.

To determine whether a household is in poverty, the U.S. Census uses a set income thresholds that vary by household size. Income thresholds are set by the federal government and are adjusted for inflation each year. However, the thresholds do not account for cost of living differences across locations. If a household's total income is less than the threshold, then that household and all individuals within it are in poverty.

In 2009, for example, an individual earning less than \$10,956 per year would be in poverty. A two-person household in poverty would earn less than \$13,991, a three-person household less than \$17,098, and a four-person household in poverty would earn less than \$21,954. Although poverty threshold are calculated to reflect basic food needs, they are intended to be used as a statistical yardstick to measure economic well-being, and not as a complete description of what households need to live.

Trends in Poverty 1969-2009

Over the past 40 years poverty rates in Iowa have been lower than those nationally. In 1969, Iowa's rate was 11.3 percent compared to the U.S. rate of 13.7 percent. More recently, Iowa's poverty rate in 2009 is 11.4 percent compared to 13.5 percent nationally. Although rates are lower, poverty in both Iowa and the United States has essentially remained unchanged over the past 40 years.

Between 1969 and 2009 poverty rates declined by only -0.2 percent nationally, and in Iowa they slightly increased by 0.1 percent. Refer to figure 1.

However, over the last 10 years poverty has increased faster in Iowa compared to the rest of the nation. The booming economy of the 1990s resulted in large reductions in poverty in both Iowa and the U.S., but the recessionary decade of the 2000s reversed these trends. Between 1999 and 2009 Iowa saw poverty rates increase by 2.2 percent, where they only increased by 1.1% nationally.

Within Iowa there are some key differences in poverty rates (see figure 2). In general, poverty is lower in rural areas of the state compared to those found in more urbanized areas. The rural poverty for Iowa rate in 2009 is 10.6 percent, which is lower than the rate for metropolitan (11.7%) and micropolitan (11.6%) areas. However, Iowa rural areas did not always have low poverty. Over the past 40 years rural poverty dropped by -3.6 percent, falling from 14.1 percent in 1969 to 10.6 percent in 2009. In fact, Iowa rural poverty rates in the 1970s and 1980s were at the national rate, being much higher than the rates in metro and micro Iowa. By contrast, metropolitan area poverty in Iowa rose by 2.1 percent, rising from 9.6 percent in 1969 to 11.7 percent in 2009. Micropolitan areas in the state saw slower increases in poverty, rising by 1.1% over this period.

However, all regions of Iowa saw increasing rates of poverty over the last decade, although rural areas experienced smaller rates of growth. Metro poverty grew

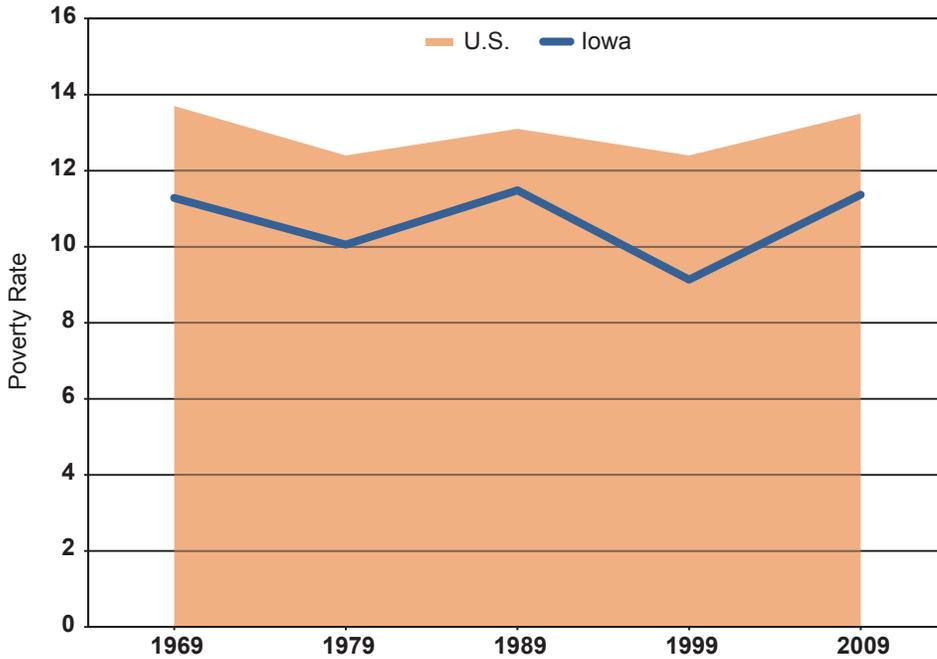


Figure 1. Poverty rates in Iowa and the U.S., 1969-2009

by 2.5 percent, going from 9.1 in 1999 to 11.7 percent by 2009. Micropolitan poverty grew by 2.3 percent. Rural poverty grew more slowly at 1.6 percent, going from 9.0 to 10.6 percent.

Looking specifically at Iowa's metropolitan areas (urban areas of 50,000 or more), poverty rates over the past 40 years grew fastest

in Ames (10.3%), Iowa City (6.9%) and Waterloo–Cedar Falls (5.1%); and declined or grew slowly in Dubuque (-2.1%), Des Moines (-0.2%) and Council Bluffs (0.5%). However, between 1999 and 2009 all metro areas experienced rising poverty rates. Metros with the fastest growth over the last decade are Ames (6.0%), Iowa City (4.4%),

Iowa's poverty rate jumped by 2.2% over the last 10 years.

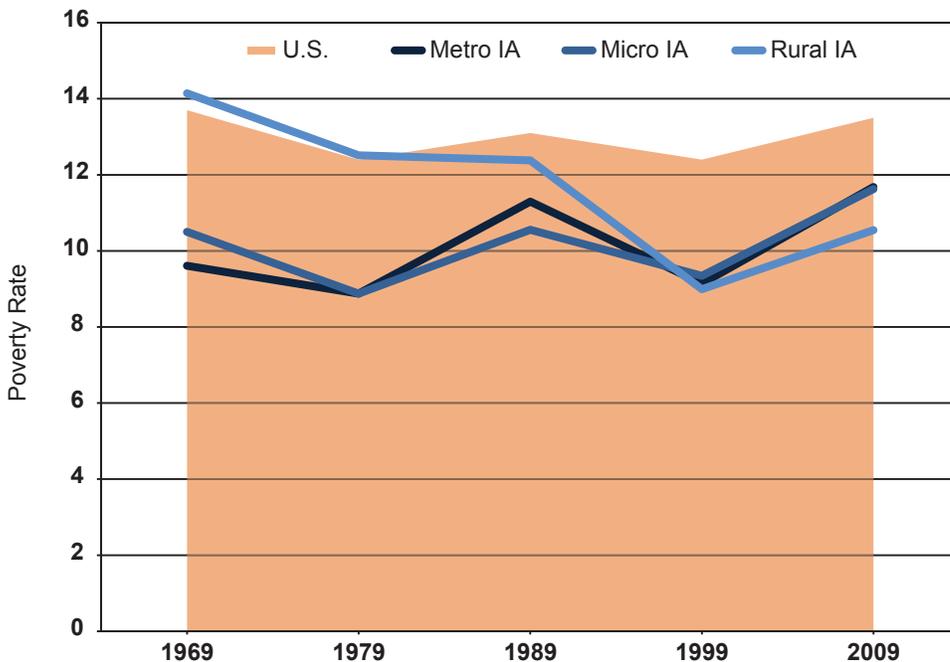


Figure 2. Poverty rates in Iowa metropolitan, micropolitan, and rural areas, 1969-2009

Rural poverty stood at 10.6%, a drop of -3.6% since 1969.

Sioux City (4.2%), Cedar Rapids (3.3%) and Council Bluffs (3.1%). Dubuque is the only metro that saw slow growth in poverty over the past 10 years (0.5%).

For the state's micropolitan areas (urban areas of 10,000 to 50,000), poverty grew the fastest since 1969 in the micropolitan areas of Burlington (4.1%), Marshalltown (3.9%) and Fort Dodge (3.2%). By contrast, sizeable declines occurred in Oskaloosa (-5.6%), Pella

(-4.7%), Spirit Lake (-4.6%) and Spencer (-3.1%). As was the case for metro areas, most micropolitan areas saw growth in poverty since 1999. Micros with the fastest growth over the last 10 years are Newton (4.8%), Boone (4.3%), Fort Dodge (3.7%), Keokuk-Fort Madison (3.5%) and Muscatine (3.1%). Only a handful of micros saw near-zero growth, including Spencer (-0.2%), Pella (0.1%) and Clinton (0.4%). Refer to table 1.

Table 1. Poverty rates in Iowa metropolitan and micropolitan areas, 1969-2009.

	Poverty Rates				
	1969	1979	1989	1999	2009
Major Areas					
United States	13.70	12.40	13.10	12.40	13.50
Iowa	11.28	10.05	11.48	9.13	11.37
Metropolitan Iowa	9.61	8.88	11.29	9.14	11.68
Micropolitan Iowa	10.50	8.88	10.56	9.34	11.62
Rural Iowa	14.14	12.51	12.38	8.99	10.55
Metropolitan Areas					
Ames	9.75	12.19	16.55	14.06	20.02
Cedar Rapids	8.43	7.36	9.18	6.63	9.90
Davenport	8.73	6.55	12.10	10.50	11.97
Des Moines-West Des Moines	9.01	8.48	8.94	7.47	8.78
Dubuque	10.34	8.34	10.27	7.76	8.28
Iowa City	11.27	12.29	15.70	13.77	18.12
Council Bluffs	10.80	10.47	10.89	8.22	11.29
Sioux City	11.79	11.42	13.41	10.30	14.48
Waterloo-Cedar Falls	9.60	8.34	13.88	11.34	14.71
Micropolitan Areas					
Boone	9.71	9.18	8.82	7.58	11.86
Burlington	8.81	8.43	11.33	10.67	12.95
Clinton	8.82	7.68	10.80	10.18	10.54
Fort Dodge	10.49	8.86	11.83	9.99	13.69
Keokuk-Fort Madison	10.28	8.07	12.86	9.70	13.15
Marshalltown	8.69	8.07	8.67	10.24	12.61
Mason City	10.84	8.42	9.07	8.52	10.22
Muscatine	9.34	9.61	10.45	8.98	12.08
Newton	9.64	8.09	6.97	6.47	11.29
Oskaloosa	16.99	12.19	13.05	9.84	11.38
Ottumwa	12.90	9.93	15.26	13.22	14.87
Pella	12.44	9.58	10.01	7.63	7.76
Spencer	11.14	10.28	9.95	8.22	8.03
Spirit Lake	13.26	8.55	9.16	5.98	8.70
Storm Lake	10.73	8.87	8.74	10.50	11.75

SOURCE: 1970-2000 Census and 2005-09 ACS, U.S. Census Bureau.

Micropolitan poverty grew by 1.1% to 11.6%.

Poverty in 2009

High rates of poverty in Iowa tend to be concentrated in two main areas of the state. First, high poverty is found in the state's smaller metropolitan areas, such as Ames, Iowa City, Sioux City, and Waterloo–Cedar Falls. Second, high poverty is also clustered in the southern and southeastern tier of counties. These areas contain the micropolitan areas of Burlington, Keokuk–Fort Madison, Muscatine, and Ottumwa. By contrast, low rates of poverty in 2009 tend to be found in the northern half of the state and in the Des Moines metro area. Refer to figure 3.

To better describe the key socioeconomic conditions of high and above average poverty places, mean differences are compared and presented in table 2. The analysis finds that *high poverty places* (rates over 14%) in 2009 have larger shares of families headed by single parents (19.8% vs. 15.9%), higher rates of unemployment (6.0% vs. 4.2%), lower

rates of labor force participation (65.7% vs. 67.7%), and lower per capita incomes (\$21,503 vs. \$24,042). In terms of employment structure, poor places have more jobs in leisure and other services (11.3% vs. 10.3%), but also have fewer jobs in agriculture (5.7% vs. 7.4%) and construction (5.7% vs. 7.0%). All of these findings are consistent with what has been found in the poverty literature.

However, one set of counter-intuitive findings is that the presence of large colleges and universities is associated with high poverty in Iowa. For example, high poverty places tend to have larger numbers of college students (9.2% vs. 4.7%), higher numbers of people with a bachelor's or graduate degree (21.7% vs. 18.5%), and larger employment in education, health and social services (25.7% vs. 22.1%) and professional services (5.7% vs. 4.8%). These findings indicate that college student populations increase local poverty, since students living off-campus are officially counted in the pov-

Metropolitan poverty jumped by 2.1% to 11.7%.

Metro poverty grew the fastest in Ames, Iowa City and Waterloo – Cedar Falls due to colleges students in temporary poverty.

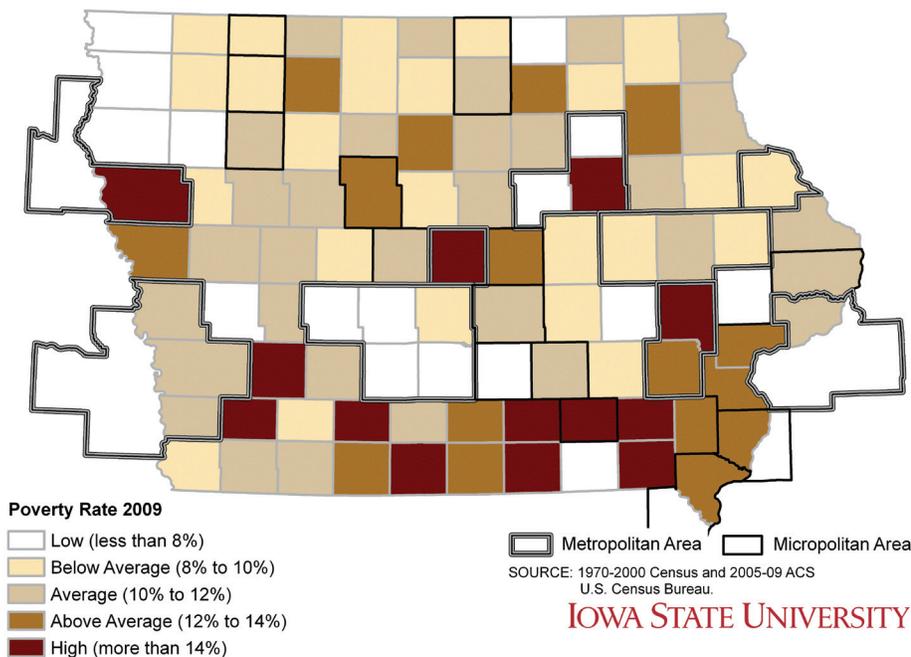


Figure 3. Poverty rates in Iowa, 2009

Micro poverty grew the fastest in Burlington, Fort Dodge and Marshalltown.

erty population as they have little income while completing their studies. However, this type of poverty is unique and temporary as students are financially supported mostly by loans, scholarships and family (support that is not officially included as income by the Census) until they complete their academic programs.

Looking next at *above average poverty places* (rates of 12-14%), we find they tend to have larger minority populations (8.0% vs. 5.2%), larger numbers of single-headed families (19.2% vs. 15.9%), higher numbers of poorly education people (12.9% vs. 11.1%), higher unemployment rates (6.0% vs. 4.2%), lower labor force participation (65.3% vs. 67.7%), lower

incomes (\$22,118 vs. \$24,042), and lower employment in finance, insurance, and real estate services (4.1% vs. 5.7%). In general, high and above average poverty places tend to have similar demographic characteristics, except that high poverty places are dominated by institutions of higher education.

Growth in Poverty Since 1969

Over the past 40 years, most places in Iowa have experienced declining rates of poverty, especially in rural areas of the state. However, there are some clusters of growing poverty. First, poverty rates have grown in the smaller metropolitan areas of Ames, Iowa City, and Waterloo–Cedar Falls;

Table 2. Demographic and economic characteristics of poverty counties in Iowa, 2009.

Percent of Population	Other Counties	Poverty Counties 2009	
		Above Avg (12-14%)	High (>14%)
Minority population	5.22	7.95 *	7.03
Single-headed families	15.94	19.23 *	19.78 *
College population	4.69	4.50	9.17 *
No high school degree	11.06	12.92 *	11.95
College degree or higher	18.45	16.73	21.66 *
Labor force participation	67.66	65.27 *	65.66 *
Unemployment	4.20	5.95 *	6.04 *
Per capita income (nom\$)	\$24,042	\$22,118 *	\$21,503 *
Percent of Employed Population			
Agriculture & natural resources	7.74	6.70	5.67 *
Construction	7.03	6.57	5.69 *
Manufacturing	17.41	19.84	16.33
Trade	14.73	15.29	15.32
Transportation & utilities	5.28	5.45	4.79
Information services	1.81	1.67	1.90
Finance, insurance, real estate, rental services	5.65	4.08 *	4.75
Professional, management, admin services	4.76	4.88	5.65 *
Education, health, social services	22.12	22.21	25.65 *
Leisure & other services	10.31	10.16	11.31 *

NOTE: Mean differences between poverty counties and other counties tested using Scheffe's test controlling for population. *significant at $p < 0.05$. Leisure industry includes art, entertainment, recreation, accommodation, & food services.

SOURCE: 2005-09 ACS, U.S. Census Bureau.

and to a lesser extent in Cedar Rapids, Davenport, and Sioux City. Second, growth in poverty is also clustered in the southeastern corner of the state, centered around Burlington, Fairfield, and Keokuk–Fort Madison. Lastly, poverty has also grown in central Iowa in the micropolitan areas of Boone, Marshalltown, and Fort Dodge. Refer to figure 4.

As was the case for poverty rates in 2009, it appears that *fast growing poverty places* (growth of more than 5%) tend to be dominated by institutions of higher education. These places experienced very sizable population gains since 1969, growing by nearly 15 percent on average while other counties experienced declines. This growing population also became more divided along educational attainment, with fast growth in college educated persons (16.1% vs. 11.3%) occurring alongside slower declines in persons without a high school degree (-25.2% vs. -33.0%). One anomalous find-

ings is that the share of college students declined much more sharply than in other counties (-18.0% vs. -1.2%). However, this is due to overall population growing much faster than the college student population. In terms of employment, fast growing poverty places experienced slower declines in agriculture (-8.8% vs. -16.1%) yet slower growth in professional, education, health and social services (3.4% vs. 8.2%). This is likely due to low base numbers for agriculture and high base numbers for professional services. What these findings suggest is that these college dominated places began to attract new residents other than students over the past four decades.

By contrast, *growing poverty places* (growth of 2-5%) show much poorer socioeconomic outcomes over the past 40 years. These areas saw much faster growth in single-headed families (12.1% vs. 8.6%) and minority populations (3.9% vs. 1.0%) compared to other places; and slower declines in the share of poorly educated persons (-30.0%

Poverty clusters in Iowa's smaller metro areas and in the southern and southeastern counties.

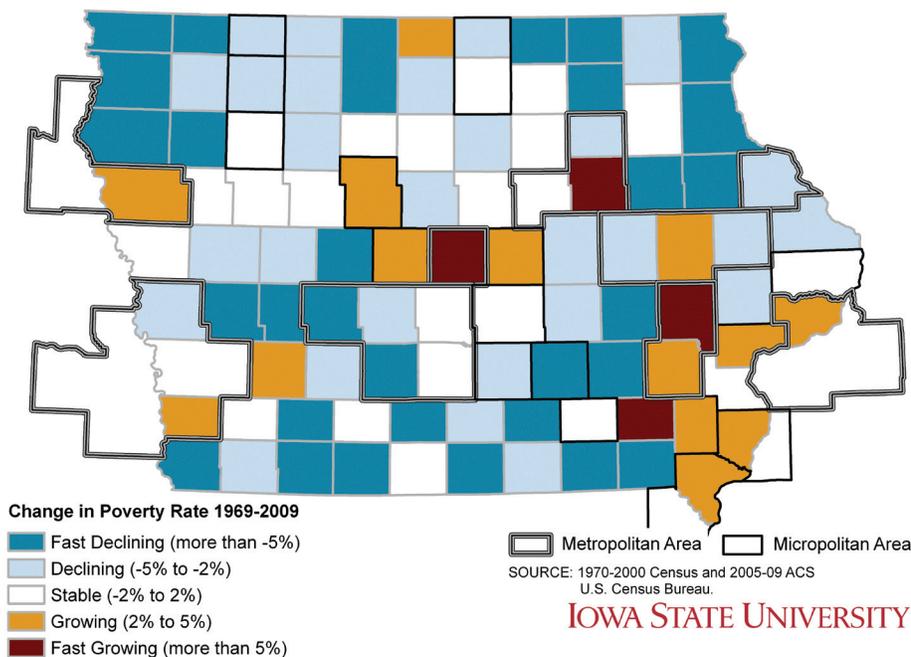


Figure 4. Poverty rates in Iowa, 2009

Poor places are dominated by college students who live in temporary poverty while they finish their studies.

vs. -33.0%). Slower growth in per capita incomes (699% vs. 791%) and labor force participation rates (9.3% vs. 12.1%) also hindered reductions in poverty. In terms of economic structure, the most telling finding is that manufacturing employment declined by over three percent, while it grew by nearly three percent in other counties (-3.3% vs. 2.8%). Employment in agriculture also declined more slowly (-9.3% vs. -16.1%). Refer to table 3.

Growth in Poverty Since 1999

However, long-term trends mask some important changes than have

occurred in Iowa over the last decade. While poverty has generally declined over the last 40 years, we see that this has not been the case since the last decade. Keep in mind that 1999 was the height of the “dot-com bubble” of the 1990s, when booming economic conditions caused steep drops in unemployment and poverty. With two recessions occurring in the 2000s, the recent being the most severe, much of the gains of the 1990s have been lost.

Over the past 10 years, poverty rates have either remained stable or declined in Iowa (see figure 5). In fact, only a very small number of places actually saw improve-

Table 3. Demographic and economic characteristics of growing poverty in Iowa, 1969-2009.

Change in Population 1999-2009	Poverty Growth Counties 1999-2009		
	Other Counties	Growing (2-5%)	Fast Growing (>5%)
Population Δ (percent)	-2.44	-2.82	-2.53
Minority population Δ	1.70	1.76	2.18
Single-headed families Δ	9.52	11.61 *	10.94
College population Δ	0.79	0.67	0.70
No high school degree Δ	-4.12	-3.37 *	-4.07
College degree or higher Δ	2.64	1.84 *	1.66
Labor force participation Δ	1.32	1.10	0.52
Unemployment Δ	1.87	2.34	2.98 *
Per capita income Δ (percent, nom\$)	35.98	30.65 *	24.91 *
Change in Employed Population 1999-2009			
Agriculture & natural resources Δ	-0.71	-0.64	0.16
Construction Δ	0.35	0.16	-0.87 *
Manufacturing Δ	-1.23	-1.62	-2.25
Trade Δ	-0.64	0.40 *	-0.78
Transportation & utilities Δ	0.16	0.05	0.01
Information services Δ	-0.27	-0.26	-0.80
Finance, insurance, real estate, rental services Δ	0.56	0.09	1.21
Professional, management, admin services Δ	0.26	0.59	1.29 *
Education, health, social services Δ	1.44	1.11	1.71
Leisure & other services Δ	0.25	0.03	1.03

NOTE: Mean differences between poverty counties and other counties tested using Scheffe’s test controlling for population. *significant at p<0.05. Leisure industry includes art, entertainment, recreation, accommodation, & food services.

SOURCE: 2000 Census and 2005-09 ACS, U.S. Census Bureau.

ments in poverty rates. These rural places include Cherokee and Mitchell counties in the north, and Davis county in the south. In addition, most growing poverty places tend to be located in rural areas of the state.

The data do not present a clear picture of the characteristics hit hardest by the recessions of the 2000s. As one might expect, *fast growing poverty places* (growth over 5% since 1999) tended to have faster growth in unemployment rates (3.0% vs. 1.9%) and slower growth in per capita incomes (24.9% vs. 36.0%). In terms of economic change, employment in professional services grew much faster than average (1.3% vs. 0.3%), while construction employment declined (-0.9% vs. 0.4%). These two industries were some of the hardest hit during the last recession. Refer to table 4.

Similarly, *growing poverty places* also saw slower growth in incomes (30.7% vs. 36.0%). However, these places also experienced

growth in single-headed families (11.6% vs. 9.5%), slower declines in those without a high school education (-3.4% vs. -4.1%), and slower growth in those with a college degree (1.8% vs. 2.6%). In terms of employment, growing poverty places saw small growth in retail and wholesale trade jobs, while other places saw declines (0.4% vs. -0.6%).

Poverty Reduction Strategies

Given the spatial dimension of poverty, effective poverty reduction strategies need to address place-based barriers. At the state-level, previous research has shown that a rising tide does lift all boats, and poverty reduction should become an explicit goal of state macroeconomic policy (Partridge and Rickman 2006). Specifically, this means economic development efforts targeted at industries that are nationally growing, or those in which the state has a competitive advantage. Coupled

Poor places have more single-headed families and lower economic participation.

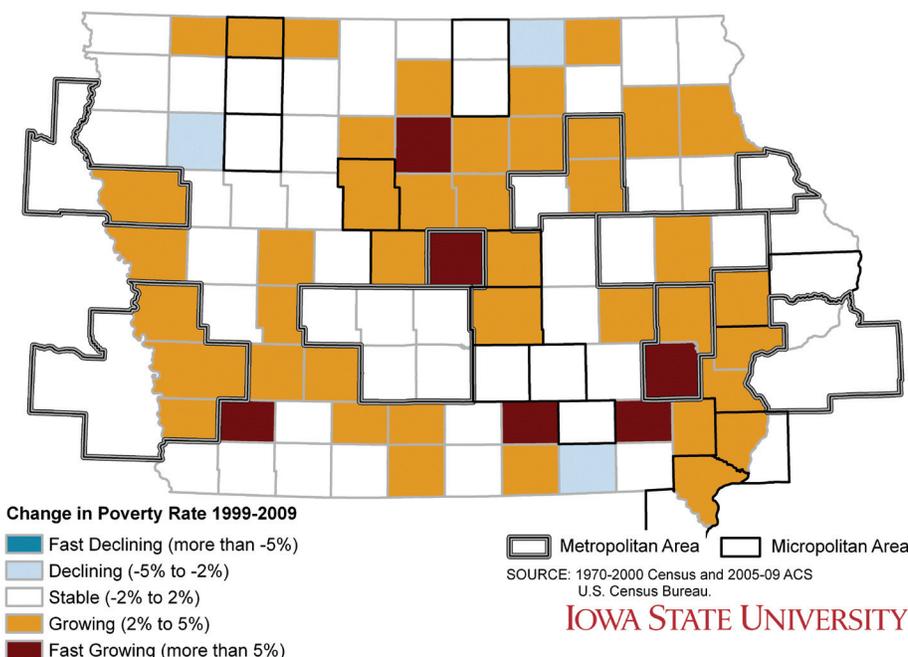


Figure 5. Change in poverty rates in Iowa, 1999-2009

Agriculture and manufacturing jobs help lower poverty rates.

with such development efforts, state tax policy should encourage work. The federal Earned Income Tax Credit (EITC) has been found to greatly increase labor force participation (Partridge and Rickman 2006). Iowa's version of the EITC should be maintained and possibly expanded to increase and reward engagement in the labor market. In short, job creation and labor force participation is the key to poverty reduction.

There are several place-based poverty reduction strategies that can be employed by communities. First, local economic development efforts should target industries that are growing faster than the

national average, or in industries that are nationally competitive. Second, cities and counties need to identify economically distressed areas and target incentives at new hires who reside within these zones. Exemptions for hires outside these zones should only be made to disadvantaged persons. Third, the best incentives are those tied to job creation. Many cities and states use "new jobs tax credits" that offer a 25 to 30 percent tax credit on wages for net new jobs that pay a livable wage with benefits, usually for five years. Fourth, customized training incentives can be used to support new job creation or to retain existing jobs in distressed

Leisure and personal services jobs help raise poverty rates.

Table 4. Demographic and economic characteristics of growing poverty counties in Iowa, 1969-2009.

Change in Population 1969-2009	Other Counties	Poverty Growth Counties 1969-2009	
		Growing (2-5%)	Fast Growing (>5%)
Population Δ (percent)	-7.25	-3.78	14.95 *
Minority population Δ	0.99	3.91 *	3.34
Single-headed families Δ	8.62	12.13 *	10.20
College population Δ	-1.22	-2.80	-18.01 *
No high school degree Δ	-33.02	-29.99 *	-25.20 *
College degree or higher Δ	11.31	10.56	16.01 *
Labor force participation Δ	12.07	9.26 *	12.08
Unemployment Δ	1.49	1.94	2.08
Per capita income Δ (percent, nom\$)	791.34	698.90 *	710.51
Change in Employed Population 1969-2009			
Agriculture & natural resources Δ	-16.08	-9.33 *	-8.78 *
Construction Δ	1.33	1.90	0.92
Manufacturing Δ	2.82	-3.26 *	-2.54
Trade Δ	-6.00	-6.23	-4.58
Transportation, communication, & utilities Δ	1.83	1.18	2.04
Finance, insurance, real estate services Δ	2.14	1.36	3.15
Professional, education, health, social services Δ	8.20	7.70	3.39 *
Leisure, admin, business, & other services Δ	6.00	6.51	6.46

NOTE: Mean differences between poverty counties and other counties tested using Scheffe's test controlling for population. *significant at p<0.05. Leisure industry includes art, entertainment, recreation, accommodation, & food services.

SOURCE: 1970 Census and 2005-09 ACS, U.S. Census Bureau.

zones. These credits subsidize wages as workers undergo training, which increases the skills of the workers as well as making the business more competitive. Fifth, there is further need for community-based job placement agencies, preferably provided by non-profits. These agencies first train and screen disadvantaged workers, and then place them in good employment matches. Non-profits typically have better community networks and may be more credible with businesses than government agencies.

For these programs to be effective in rural communities, the geographic scope needs to be broadened to encompass an economic region anchored by a regional employment center. These regional centers should have larger numbers of people, firms, and supporting education and social services agencies. The economic benefits of a growing regional center should spill over into less populated areas in the rest of the region. This approach suggests that programs and resources should not be targeted to isolated rural communities, since it is unlikely to produce tangible results. Rather, isolated rural places ought to be tied to regional centers based on commuting patterns, and local programs should focus on transportation and child care to facilitate work outside the community.

Summary

Over the past 40 years poverty rates in Iowa have been lower than those nationally. Poverty is lower in rural areas of the state compared to metropolitan and metropolitan areas. Although Iowa

has low poverty rates, they have essentially remained unchanged over the past 40 years. However, over the last 10 years poverty has increased faster in Iowa than the rest of the nation. While nearly all counties saw increasing poverty, rural areas experienced the smallest rates of growth.

High poverty places (rates over 14%) in Iowa tend to have more single-headed families, more college students, more educated persons, and more employment in services. However, these places also have lower incomes, less economic participation, and less employment in agriculture. One key finding is that high poverty places are dominated by institutions of higher education. Off-campus college students are officially included in the poverty count, and increase local poverty since they have little income while completing their studies. However, this type of poverty is temporary until students complete their academic programs.

Above average poverty places (rates of 12-14%) tend to have more minorities, more single-headed families, and more numbers of people without a high school education. These areas also have lower incomes, lower economic participation, and less employment in finance and insurance services. High and above average poverty places tend to have similar demographic characteristics, except that high poverty places are dominated by institutions of higher education and college student populations.

Over the last 40 years, places with fast growing poverty (over 5%) tend to be home to higher educa-



tion institutions. In addition, they have experienced fast population growth and have seen growing divides in educational attainment. Places with growing poverty (2-

5% growth) are characterized by poorer demographic outcomes, slower growing incomes and economic participation, and sizable declines in manufacturing.

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Appendix – Statistical Methods

Although the ACS has replaced the Decennial Census long-form data, there are some important differences between the two that should be noted. First, ACS data represent average values for each year between 2005-09, rather than point-in-time estimates. Second, income and employment status are for the previous 12 month period, rather than for the previous calendar year. Third, standard errors for the ACS tend to be higher for smaller geographies than was the case in previous census periods. However, analysis of the standard errors finds no estimate whose coefficient of variation exceeds 25 percent, indicating adequate data quality.

Household income includes wage and self-employment earnings, retirement and Social Security, dividends and interest, unemployment and workers' compensation, child support, and Supplemental Security Income and public assistance. It does not include non-cash benefits like food stamps, housing assistance, or state-funded health care. Not counted in the poverty rate are people who are institutionalized, armed forces personnel in group quarters, and college students in dormitories.

To identify significant differences between counties across key demographic and economic characteristics, analysis of covariance (ANCOVA) and multiple comparison tests are used. ANCOVA is used to control for population differences and Scheffe's multiple comparison test is used to test for mean least square differences.

The matrix form ANCOVA model is presented in equation 1, where y is the vector of socioeconomic variables, X is the matrix of poverty categories, z is the covariate vector (in this case population), e is the vector of residuals, and b and g are coefficient vectors. Scheffe's test is presented in equation 2, where \bar{x}_i are the means, s^2 is the mean of squared errors, n is the number of cases, k is the number of comparisons, and F is the critical value at a given alpha level and degrees of freedom.

$$(1) \quad y = X\beta + z\gamma + \varepsilon$$

$$(2) \quad S = \frac{\bar{x}_i - \bar{x}_j}{\sqrt{s^2 \left(\frac{1}{n_i} + \frac{1}{n_j} \right)}} \geq \sqrt{(k-1)F_{(\alpha; k-1, n-k)}}$$

Appendix – Poverty Rates by County, 1969-2009

County	Urban	Poverty Rates					Change	
		1969	1979	1989	1999	2009	1969 2009	1999 2009
Adair		13.58	16.93	13.42	7.65	11.25	-2.32	3.61
Adams		18.40	14.44	16.75	9.29	8.83	-9.57	-0.46
Allamakee		20.84	14.53	13.24	9.57	11.03	-9.81	1.46
Appanoose		20.52	16.23	20.38	14.54	16.83	-3.69	2.29
Audubon		16.58	13.02	12.09	7.73	11.14	-5.44	3.41
Benton	Metro	10.34	11.37	11.39	6.11	8.01	-2.33	1.90
Black Hawk	Metro	9.64	8.58	15.30	13.12	16.78	7.14	3.66
Boone	Micro	9.71	9.18	8.82	7.58	11.86	2.15	4.28
Bremer	Metro	10.58	8.31	9.19	5.09	7.90	-2.69	2.81
Buchanan		15.90	11.72	16.72	9.41	10.86	-5.04	1.45
Buena Vista	Micro	10.73	8.87	8.74	10.50	11.75	1.02	1.25
Butler		12.65	9.66	10.69	8.01	10.82	-1.83	2.81
Calhoun		12.98	10.46	11.92	10.07	11.44	-1.54	1.37
Carroll		12.91	10.76	10.56	6.46	10.12	-2.78	3.66
Cass		12.14	11.66	11.52	11.05	15.48	3.34	4.43
Cedar		9.73	9.48	10.23	5.54	7.69	-2.03	2.16
Cerro Gordo	Micro	10.77	8.39	8.92	8.55	10.47	-0.30	1.92
Cherokee		10.01	10.75	11.20	7.27	4.80	-5.21	-2.47
Chickasaw		15.32	11.37	10.70	8.27	9.63	-5.69	1.36
Clarke		16.61	18.31	13.74	8.54	10.69	-5.92	2.15
Clay	Micro	11.14	10.28	9.95	8.22	8.03	-3.10	-0.19
Clayton		17.27	13.88	14.41	8.60	11.32	-5.96	2.72
Clinton	Micro	8.82	7.68	10.80	10.18	10.54	1.73	0.36
Crawford		13.55	12.30	15.86	11.10	11.28	-2.27	0.18
Dallas	Metro	9.88	7.14	7.60	5.61	6.50	-3.38	0.89
Davis		17.02	24.89	17.78	11.87	7.40	-9.62	-4.47
Decatur		20.81	20.67	21.01	15.51	19.21	-1.60	3.70
Delaware		19.61	13.62	12.79	7.94	8.75	-10.86	0.81
Des Moines	Micro	8.81	8.43	11.33	10.67	12.95	4.14	2.27
Dickinson	Micro	13.26	8.55	9.16	5.98	8.70	-4.56	2.73
Dubuque	Metro	10.34	8.34	10.27	7.76	8.28	-2.06	0.52
Emmet		14.14	12.67	13.04	8.22	10.64	-3.50	2.42
Fayette		14.44	10.60	14.24	10.78	13.02	-1.43	2.23
Floyd		11.89	9.06	13.31	9.32	13.60	1.71	4.28
Franklin		12.90	12.85	11.29	7.98	10.44	-2.46	2.46
Fremont		15.31	17.70	12.16	9.49	9.78	-5.53	0.29
Greene		13.94	14.57	12.22	8.08	8.11	-5.83	0.04
Grundy	Metro	7.63	6.32	8.29	4.64	6.48	-1.14	1.85

County	Urban	Poverty Rates					Change	
		1969	1979	1989	1999	2009	1969 2009	1999 2009
Guthrie	Metro	13.39	14.86	11.23	8.03	7.97	-5.42	-0.07
Hamilton		11.02	9.50	8.21	6.25	8.88	-2.14	2.63
Hancock		11.53	8.23	8.87	6.03	8.78	-2.75	2.75
Hardin		11.47	11.26	10.80	7.96	11.75	0.28	3.79
Harrison	Metro	14.32	15.62	13.75	7.14	11.29	-3.03	4.15
Henry		9.26	8.26	10.07	8.76	13.34	4.08	4.58
Howard		19.00	14.85	13.85	9.32	11.43	-7.57	2.11
Humboldt		12.37	9.32	8.81	8.28	11.74	-0.63	3.46
Ida		10.53	14.35	11.60	8.80	9.13	-1.40	0.33
Iowa		13.54	8.00	8.19	4.98	7.98	-5.56	3.00
Jackson		16.07	13.14	14.31	10.27	11.30	-4.76	1.03
Jasper	Micro	9.64	8.09	6.97	6.47	11.29	1.65	4.83
Jefferson		11.65	13.03	13.85	10.92	16.68	5.02	5.76
Johnson	Metro	11.85	12.10	17.06	14.98	18.97	7.12	3.99
Jones	Metro	12.19	11.27	11.47	8.59	9.84	-2.35	1.25
Keokuk		17.71	12.73	13.08	10.08	9.72	-7.99	-0.36
Kossuth		13.79	12.87	10.97	10.16	8.66	-5.13	-1.51
Lee	Micro	10.28	8.07	12.86	9.70	13.15	2.87	3.45
Linn	Metro	7.71	6.32	8.64	6.50	10.15	2.44	3.65
Louisa	Micro	10.34	11.32	11.66	9.34	12.31	1.96	2.97
Lucas		18.24	17.62	13.06	13.68	13.75	-4.49	0.07
Lyon		13.56	12.83	13.31	7.04	5.75	-7.81	-1.29
Madison	Metro	14.70	11.96	11.13	6.74	7.25	-7.45	0.50
Mahaska	Micro	16.99	12.19	13.05	9.84	11.38	-5.61	1.54
Marion	Micro	12.44	9.58	10.01	7.63	7.76	-4.67	0.13
Marshall	Micro	8.69	8.07	8.67	10.24	12.61	3.92	2.36
Mills	Metro	8.95	9.34	10.20	8.25	11.00	2.05	2.75
Mitchell		13.80	12.77	10.31	10.71	7.15	-6.65	-3.55
Monona		14.50	16.07	14.76	9.41	12.68	-1.82	3.27
Monroe		19.48	13.95	15.61	9.03	14.06	-5.42	5.04
Montgomery		12.75	9.42	10.13	9.07	14.07	1.32	5.00
Muscatine	Micro	9.05	9.10	10.10	8.87	12.02	2.98	3.15
O'Brien		11.72	10.41	12.11	7.26	8.70	-3.02	1.43
Osceola		15.73	11.01	9.79	7.03	9.35	-6.39	2.32
Page		14.03	11.13	13.79	12.49	11.38	-2.64	-1.10
Palo Alto		15.80	12.07	15.29	10.55	12.09	-3.70	1.54
Plymouth		13.20	11.92	9.03	5.99	5.03	-8.17	-0.97
Pocahontas		12.04	12.57	10.43	9.10	8.92	-3.12	-0.17

County	Urban	Poverty Rates					Change	
		1969	1979	1989	1999	2009	1969 2009	1999 2009
Polk	Metro	8.64	8.40	9.20	7.94	9.41	0.76	1.47
Pottawattamie	Metro	10.39	9.66	10.49	8.40	11.33	0.95	2.93
Poweshiek		11.63	13.32	10.40	9.83	9.50	-2.12	-0.33
Ringgold		19.10	28.39	17.18	14.26	12.28	-6.82	-1.99
Sac		11.33	10.71	11.78	9.92	11.19	-0.14	1.27
Scott	Metro	8.73	6.55	12.10	10.50	11.97	3.24	1.47
Shelby		12.77	14.79	9.38	6.01	7.59	-5.18	1.58
Sioux		14.31	10.36	8.07	6.44	6.38	-7.94	-0.06
Story	Metro	9.75	12.19	16.55	14.06	20.02	10.27	5.96
Tama		12.04	10.80	10.56	10.53	9.92	-2.11	-0.61
Taylor		21.55	17.85	18.31	12.10	11.35	-10.19	-0.75
Union		16.03	14.77	15.45	11.40	15.53	-0.50	4.13
Van Buren		21.20	19.64	16.76	12.68	14.64	-6.55	1.96
Wapello	Micro	12.90	9.93	15.26	13.22	14.87	1.97	1.65
Warren	Metro	7.68	6.93	6.28	5.07	6.58	-1.09	1.52
Washington	Metro	9.06	13.04	9.46	7.57	13.34	4.28	5.76
Wayne		21.80	18.82	19.10	13.98	12.94	-8.86	-1.05
Webster	Micro	10.49	8.86	11.83	9.99	13.69	3.21	3.71
Winnebago		7.74	7.18	11.71	8.38	10.33	2.58	1.95
Winneshiek		12.75	13.53	13.21	7.97	8.00	-4.75	0.03
Woodbury	Metro	11.79	11.42	13.41	10.30	14.48	2.69	4.18
Worth	Micro	11.22	8.53	9.92	8.34	8.83	-2.38	0.49
Wright		11.53	10.29	9.71	7.05	13.25	1.72	6.21

SOURCE: 1970-2000 Census and 2005-09 ACS, U.S. Census Bureau.

For More Information

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