

PUBLIC HEALTH PRACTICE

Quality Rated childcare programs and social determinants of health in rural and non-rural Georgia

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ABSTRACT

Background: Early childhood is linked to school readiness and early school achievement. Through its Quality Rated (QR) program, which was designed to improve the quality of care in early childhood programs, the state of Georgia has been a trailblazer in funding universal preschool and in improving the quality of childcare programs. We have assessed differences in the availability of QR childcare programs in Georgia to learn if, in rural versus non-rural counties, there is a relationship between QR childcare programs and health-related outcomes.

Methods: This cross-sectional study evaluated county-level data to evaluate the relationship between QR childcare programs and social determinants of health. County-level data for Georgia were extracted from the Georgia Department of Early Care and Learning, County Health Rankings and Roadmaps, and the Georgia Juvenile Justice Data Clearinghouse.

Results: Counties without QR childcare programs had child mortality rates 3.5 times higher than those for the state overall. Other differences in health-related outcomes included, but were not limited to, teen birth rates, low birth-weight babies, children in poverty, housing problems, and food insecurity.

Conclusions: It is now appropriate to address the prevalence of health disparities in rural areas of Georgia and focus on some of the disparities through the QR early childhood programs and other state agencies. Empowering rural communities to address health disparities may be the most favorable path toward diminishing these inequalities.

Keywords: quality childcare, health disparities, rural, non-rural

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INTRODUCTION

Early childhood is a critical time for children's development with many studies linking early childhood education to school readiness and early school achievement. Constructive outcomes associated with early education programs include social, emotional, cognitive and language development (Center for Public Education, n.d.). A study on outcomes associated with opportunities for early childhood education, the High/Scope Perry Preschool Project, found that children who were provided comprehensive preschool education were more likely to graduate from high school, had higher achievement test scores, were less likely to require special education services, were less likely to be arrested for violent or drug offenses, and had fewer arrests overall in comparison to the control group which received no early childhood education (Schweinhart & Weikert, 1997). A study involving pre-kindergarten (pre-k) programs found that those who participated in the Georgia universal pre-k program had scores 82% higher on measures of third-grade readiness compared to those who did not participate (Henry et al., 2011). Others have looked at the relationship between achievement and socioeconomic (SES) status. For example,

after attending preschool, children from extremely poor families had the strongest gains in pre-reading and math (Loeb et al., 2005). There were also significant differences between the highest and lowest SES groups; children in the highest SES group had, on average, cognitive scores 60% higher than those for the lowest SES group (Lee & Burkham, 2002).

Early Childhood Programs are Good Investments

According to the Center for Public Education, funding for pre-k programs is a growing investment (<http://www.centerforpubliceducation.org>). Upon reviewing the early childhood education literature, a Nobel laureate in economics, James Heckman, found that investment in early childhood education programs had an economic impact of more than \$8 for every dollar spent (Heckman, 2000). Heckman suggests that children's social skills and motivation are attributes most easily altered in early childhood programs. He also posits that students who have positive social skills and are motivated are more likely to seek higher levels of education.

Georgia's Programs

The state of Georgia has been a trailblazer in funding universal pre-k programs and is known as the first state in the U.S. to offer free pre-k to all children (Temple, 2009). In school year 2009 - 2010, Georgia, with funds from the Georgia Lottery, became the first state in the nation to serve more than one million pre-k children (<http://www.dec.state.ga.us/Prek/AboutPrek.aspx>). Georgia has also been a leader in improving the quality of care for all children. Launched in 2012, Georgia's Quality Rated (QR) program was spearheaded by then Commissioner of the Department of Early Care and Learning (DECAL), Mr. Bobby Cagle (<http://www.dec.state.ga.us/Prek/20YearAnniversary.aspx>).

The program was designed to improve the quality of care in early childhood programs. To date, 938 early childhood programs throughout the state have been rated for quality. These include licensed childcare centers, programs administered by the Department of Defense, Georgia Head Start/Georgia Early Head Start, and family childcare learning homes. The goal is to have all early childhood programs rated for quality by 2017. Accordingly, Georgia remains committed to high quality early childhood education programs for all children.

The Rural Challenge

A challenge that Georgia faces in providing all young children with developmentally appropriate early care and learning programs involves its size and configuration of counties. Georgia is the ninth most populous state. It has 159 counties, and 108 of these (68.6%) are considered rural. Families living in rural areas often perform worse on various measures than families residing in non-rural areas. For example, children living in rural areas fall behind their peers in urban and suburban areas in reading and math skills (Dervarics, 2005). Further, rural children, in comparison to those in suburban and urban areas, are more likely to have fewer adequately trained teachers, a greater proportion of poorly funded schools, greater rural isolation and fewer educational resources (Dervarics, 2005). The author concludes that “. . . rural environments often aren't giving their children a good chance to succeed” (Dervarics, 2005, p.1). Others posit that parents in rural areas are frequently more poorly educated and may not place a high priority on children's education (Rivers, 2005). Further, children from rural areas and from low-income families are less likely to take part in early-education programs (Temple, 2009). Rural children entering kindergarten are at a disadvantage in comparison to non-rural children; for example, a longitudinal study has shown that rural children, in comparison to non-rural children: 1) are less likely to have parents with at least a bachelor's degree; 2) are more likely to be placed in special education in kindergarten; and 3) are at higher risk of mental health problems (Grace, et al., 2006). Further, a larger percentage of rural children reside in poverty and the percentage of children living in poverty is highest in southern rural areas (National Center for Education Statistics, 2013). Temple (2009) suggests that researchers need to focus on rural children's access to state-funded preschool programs.

Our Questions

We were interested in investigating the relationship between the prevalence of QR childcare programs and social determinants of health in rural and non-rural Georgia counties. Non-rural areas include one or more counties containing a core urban area of 50,000 or more people, together with any adjacent counties that have a high degree of social and economic integration (as measured by commuting to work) with the urban core. Rural areas are those with at least 2,500 but no more than 50,000 people (http://www.ers.usda.gov/datafiles/Rural_Definitions/StateLevel_Maps/GA.pdf).

Since Georgia continues to provide exemplary early care and learning programs, we sought to determine: 1) Is there a difference in the availability of quality childcare services between rural and non-rural areas? 2) Is there a relationship between the quality of early-care programs, health outcomes, and the two geographic regions (i.e., rural vs. non-rural)?

METHODS

This cross-sectional study evaluated county-level data to assess the relationship between QR and non-QR childcare programs and social determinants of health in regard to rural and non-rural geographic locations. To investigate differences in the availability of QR programs between rural and non-rural counties in Georgia, we reviewed data from the DECAL website (www.qualityrated.ga.gov) to identify QR programs by county.

The goal of this study was to identify health-related factors associated with QR childcare programs and to begin an assessment of the potential different needs between communities (i.e., rural and non-rural). The primary objectives were to compare health-related factors for rural and non-rural counties that have QR childcare programs, to determine differences between rural and non-rural counties, and to identify health-related factors that correlate with the availability of QR childcare centers.

Data Collection

County-level data were extracted from three sources: Georgia DECAL (www.qualityrated.ga.gov), County Health Rankings & Roadmaps (<http://www.countyhealthrankings.org/>) and the Georgia Juvenile Justice Data Clearinghouse (<http://juveniledata.georgia.gov/Default.aspx>). Data from DECAL included the number of QR childcare programs per county and the county's designation as either rural or non-rural; data represented 2016 ratings. DECAL distinguishes four types of childcare program: Child Care Learning Centers (CCLC), Family Child Care Learning Home (FCCLH), Georgia Head Start (GAHS)/Georgia Early Head Start (GAEHS), and Department of Defense (DOD). The programs were further designated as rural or non-rural. Health-related factors at the county-level came from County Health Rankings and Roadmaps for the years indicated (Table 1). County referrals to the Georgia Department of Juvenile Justice were extracted from the Georgia Juvenile

Justice Data Clearinghouse; these data are from 2014, the most current year available.

174 QR programs in rural Georgia and 764 in non-rural Georgia. The number of licensed centers by far exceeds the other combined categories of care in both rural and non-rural counties.

The number of QR programs by center category and county type (Table 2) were classified as described above. There are

Table 1. County health rankings & roadmaps measures

Measure	Year
% Low birth weight	2013
% Teen birth rate	2013
Graduation rate (graduates/county population)	2013
% Some college	2014
% Unemployment	2014
% Children in poverty	2014
% Single parent households	2014
% Severe housing problem	2012
Child (<18) mortality rate (deaths/100,000)	2013
Infant (<1) mortality rate (deaths/100,000)	2012
% Food insecurity	2013
% Limited access to healthy foods	2010
% Uninsured children	2013
Annual income (U.S. dollars)	2014
% Free lunch	2013
% Population < 18	2014

Table 2. Number of Quality Rated programs by category of care and county type

Type of Care	Rural	Non-Rural
CCLC	115	518
FCCHL	36	219
GAHS/GAEHS	18	25
DOD	5	1
Total	174	763
Counties with no QR Programs	33	N/A

Statistical analyses

Statistical analyses were conducted with SAS® 9.4 (Statistical Analysis Software Institute, Cary, NC). Continuous data were summarized using means and standard deviations. Using a mean split, county-level data were also classified as above or below the state’s average. County-level proportions and differences (i.e., rural and non-rural) were evaluated using chi-square (χ^2) statistics and Wilcoxon two-sample tests. Associations among health measures were evaluated using Pearson’s correlation coefficients. The significance level was set at 0.05 for two-sided tests.

RESULTS

There are 159 counties in Georgia, of which 31.4% are classified as non-rural. All non-rural counties have at least one QR childcare program, and 33 rural counties have zero. On average, non-rural counties have better health-related measures compared to rural counties (Table 3). For health-related measures, rural counties perform better only in regard to the percent of population that has limited access to healthy foods and the percent of the population referred to the juvenile justice system. Further, rural counties have smaller populations who are 18 years old or less (Table 3).

Table 3. County-level health-related factors

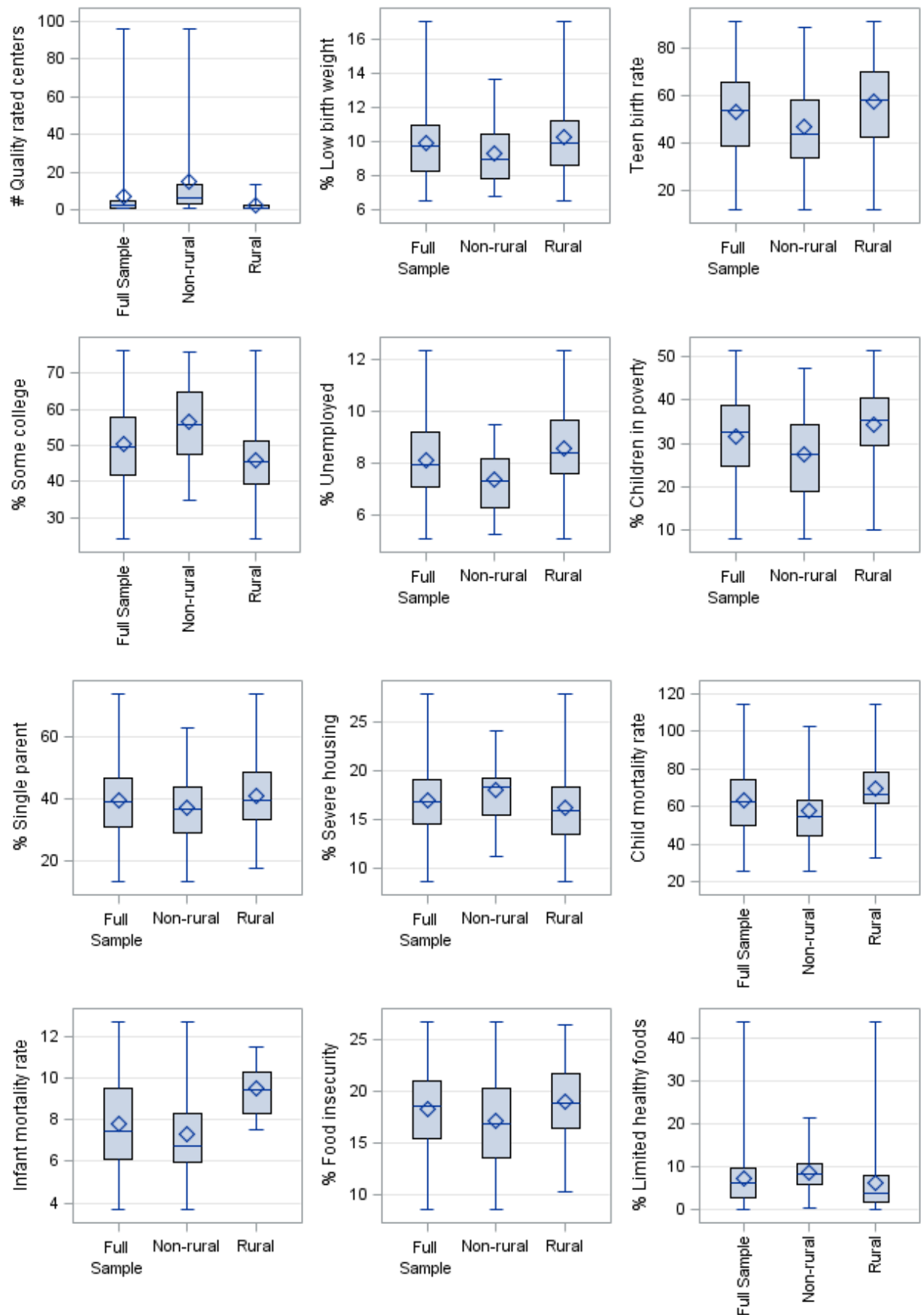
Measures	n	Min	Max	Mean	SD	95% Confidence Interval	
						Upper	Lower
Non-rural							
QR centers per county	50	1	96	15.32	20.39	9.53	21.11
% Low birth weight	50	6.85	13.72	9.36	1.68	8.88	9.83
% Teen birth rate	50	11.49	89.08	46.55	17.67	41.53	51.57
Graduation rate	50	56	90	74.31	7.66	72.13	76.49
% Some college	50	34.73	75.84	56.7	10.61	53.68	59.71

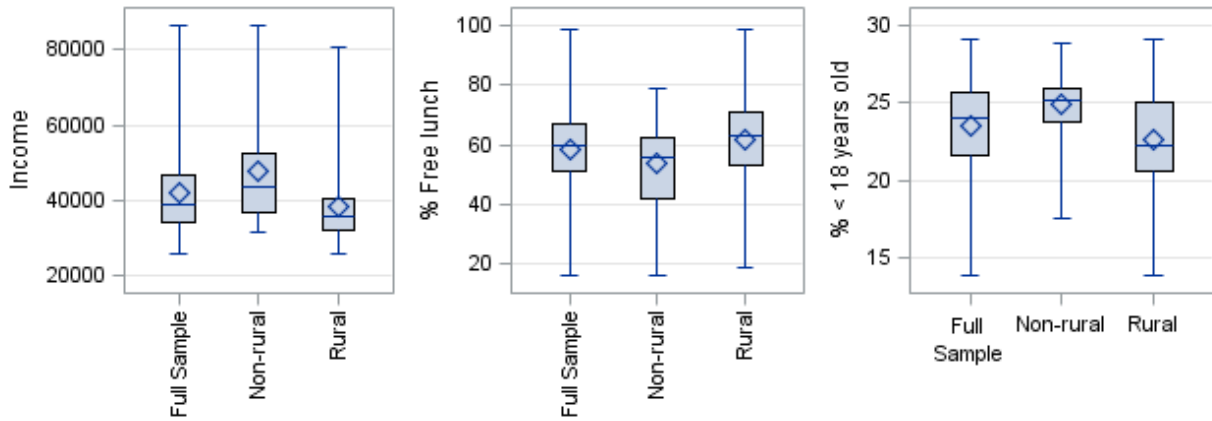
	95% Confidence Interval						
% Unemployment	50	5.3	9.51	7.41	1.11	7.1	7.73
% Children in poverty	50	8	47.4	27.43	9.41	24.76	30.1
% Single parent households	50	13.26	62.64	37.15	10.12	34.27	40.03
% Severe housing problem	50	11.21	24.14	17.98	2.97	17.13	18.82
Child mortality rate	50	25.42	102.58	57.63	17	52.8	62.46
Infant mortality rate	48	3.66	12.72	7.34	2.14	6.72	7.96
% Food insecurity	50	8.5	26.7	17.13	4.01	15.99	18.27
% Limited access to healthy foods	50	0.46	21.4	8.89	3.94	7.77	10.01
% Uninsured children	50	6.25	13.45	9.66	1.51	9.23	10.09
Income	50	31487	86413	47937	12496	44386	51489
% Free lunch	49	15.97	79.1	53.66	14.34	49.54	57.78
% Population < 18	50	17.62	28.85	24.93	2.14	24.33	25.54
% Population referred to juvenile justice	45	0.47	4.71	1.78	0.91	1.51	2.06
Rural							
QR centers per county	109	0	14	1.59	1.84	1.24	1.94
% Low birth weight	109	6.59	18.11	10.51	2.38	10.06	10.96
% Teen birth rate	109	11.33	91.61	56.32	17.92	52.92	59.72
Graduation rate	98	42.33	92.5	75.48	9.13	73.65	77.31
% Some college	109	21.94	76.27	44.75	10.35	42.79	46.72
% Unemployment	109	5.08	12.34	8.46	1.54	8.17	8.75
% Children in poverty	109	10.3	56.4	34.79	8.37	33.2	36.38
% Single parent households	109	17.5	73.64	41.39	10.68	39.37	43.42
% Severe housing problem	109	8.13	27.92	16.04	3.88	15.3	16.77
Child mortality rate	51	32.81	135.4	69.5	20.36	63.78	75.23
Infant mortality rate	13	7.54	11.5	9.49	1.27	8.72	10.26
% Food insecurity	109	10.2	27.6	19.1	3.69	18.4	19.8
% Limited access to healthy foods	109	0	43.93	6.45	8.28	4.88	8.02
% Uninsured children	109	6.06	17.49	10.17	1.98	9.8	10.55
Income	109	25807	80631	38125	8629	36486	39763
% Free lunch	104	18.79	99.1	63.21	14.25	60.44	65.98
% Population < 18	109	13.85	29.07	22.51	3.08	21.92	23.09
% Population referred to juvenile justice	107	0.12	4.93	1.5	0.81	1.35	1.66

In addition to the descriptive findings, there were differences between rural and non-rural counties. Non-rural counties performed significantly better in regard to the number of QR programs ($p < 0.01$), low birth weight ($p < 0.01$), teen birth ($p < 0.01$), college attendance ($p < 0.01$), employment ($p < 0.01$), children not in poverty ($p < 0.01$),

single parent households ($p = 0.02$), child ($p < 0.01$) and infant mortality ($p < 0.01$), food insecurity ($p < 0.01$), income ($p < 0.01$) and children on free lunch ($p < 0.01$). Rural counties performed significantly better on the limited access to healthy food measure ($p < 0.01$) and housing problems ($p < 0.01$), as shown in Figure 1.

Figure 1. Rural & non-rural health-related measures





Chi-square statistics indicated that there were significant proportional differences between rural and non-rural counties in regard to exceeding state averages on health-related measures; however, there were fewer statistical differences between the two geographic locations when counties with QR childcare programs were compared than when all rural counties were compared to all non-rural counties (Table 4). Non-rural counties performed better on 6 of 9 measures, and rural counties were healthier on 3 measures. The top 5 measures where non-rural

outperformed rural counties include income (7.7 times more likely to be above the state mean), college attendance (6.6 times greater), children in poverty (4.2 times less likely), unemployment (3.5 times less likely) and teen birth rate (2.1 times less likely). Conversely, rural counties were 2.9 times less likely to be below the state average in severe housing problems, 3.5 times more likely to have high infant mortality and 3.3 times less likely to have limited access to healthy foods compared to non-rural locations.

Table 4. Non-rural and rural counties for those with QR programs in comparisons to State means

Measures	Non-rural n=50	Rural n=76	χ^2	<i>p</i>
	n (% or rate)	n (% or rate)		
% Low birth weight	25 (50.0)	55 (72.4)	6.5	.01
% Teen birth rate	30 (60.0)	58 (76.3)	3.8	.05
% Some college	18 (36.0)	6 (7.9)	15.4	< .01
% Unemployment	29 (58.0)	63 (82.9)	9.5	< .01
% Children in poverty	28 (56.0)	64 (84.2)	12.2	< .01
% Severe housing problem	27 (54.0)	22 (29.0)	8.0	< .01
Child mortality rate	28 (56.0)	64 (84.2)	12.2	< .01
Infant mortality rate	21 (42.0)	13 (17.1)	9.5	< .01
% Limited access to healthy foods	28 (56.0)	21 (27.6)	10.2	< .01
Income	22 (44.0)	7 (9.2)	20.6	< .01

In addition to county comparisons (i.e., rural and non-rural), health-related measures were related to one another. The number of QR childcare programs in a county was associated significantly with college attendance (n = 126, r = 0.43, p < 0.01), and non-rural counties on average had a greater number of QR childcare programs than rural locations. Further, college attendance was associated with income (n = 126, r = 0.72, p < 0.01) and inversely with unemployment (n = 126, r = -0.52, p < 0.01), child poverty (n = 126, r = -0.61, p < 0.01), and free lunch for children (n = 120, r = -0.64, p < 0.01). Only teen birth rate was associated with referrals to the juvenile justice system (n = 120, r = 0.41, p < 0.01).

DISCUSSIONS

These results show that non-rural counties perform significantly better compared to rural counties on most health-related measures, which is consistent with the

broader literature regarding the effects of geographic location and outcomes (Dervarics 2005; Grace et al., 2006). Further, the numbers of QR programs available in non-rural counties are significantly greater than those in rural counties. Disparities in resources (e.g., financial, educational and human) between rural and non-rural counties can explain, in part, the relationship between health outcomes and availability of QR childcare programs. Non-rural counties typically have more assets to address health and health-related issues than rural localities. In addition to differences in resources, rural counties are more likely to have a small percent of their population comprised of adolescents and children (< 18 year old), which may result in some programs weighing the benefit of pursuing and maintaining a QR childcare program.

Rural counties did not perform poorly on all measures. There were two factors that did not appear to be issues in rural locations: lack of access to healthy foods and housing

problems. Access to healthy foods (e.g., fresh fruits/vegetables) is essential for nutrition and education, and rural counties have an advantage in regard to this factor. Populations in rural counties also do not appear to have housing problems that are found in non-rural counties, which is likely attributable to the lower population density. We propose that housing problems can be disruptive for attaining a quality education, including preschool, and can be a challenge for achieving and maintaining health and health-related outcomes, especially if continuity of care and keeping appointments are issues. Thus, there are positive factors in regard to rural localities, but many more disparities compared to non-rural counties.

Although efforts to eliminate health disparities over the past several years have mostly focused on health care and illness, there are other factors that create disparities, such as high-quality education, safe housing and the physical environment (Healthy People, 2020). As reported here, there were significant differences between rural and non-rural counties in health disparities, with rural counties performing poorly in regard to state averages for number of low birth-weight infants, the rates of teen pregnancy, child mortality rates, lower rates of college attendance, unemployment, single parent households, children in poverty, child and infant mortality (see above), food insecurity, income and children who qualify for the free-lunch program. Residents of non-rural communities were almost seven times more likely to be above the state average for attending college and in this regard, more than two times less likely to be above the state average for teen pregnancies and births than those in rural counties. These findings, along with the result that the number of QR programs was related to college attendance, with the non-rural counties having a greater number of QR programs than rural, is significant. There is a large economic impact when children attend high-quality early care and learning environments and go on to higher education programs (Heckman 2000; Henry et al, 2001; Schweinhart & Weikert, 1997). Thus, identifying opportunities for greater collaboration between various agencies, including early care and learning interventions in rural areas, should be explored.

It was disturbing to find that rural counties were 3.5 times more likely to have child mortality rates above the state average compared to non-rural localities. The 33 counties with no QR programs represent 20.8% of the counties in Georgia. This finding may be a call for those involved in educational venues to have greater outreach in rural areas. Although these results are correlational not causal, it behooves those who are concerned about these findings to continue research efforts to determine the causal link.

Finally, when the 33 rural counties that have no QR programs were removed from the analysis, since these areas may have skewed the data, disparities between geographic regions persisted. Further investigation and analysis are needed to determine if this is the case.

Although the aims for this report are not causal, the results suggest that disparities in health and health-related

outcomes are affected by various factors that are aligned with differences between rural and non-rural counties. However, many of the disparities identified here are not immutable, but will necessitate policy changes. QR childcare programs, which must meet rigorous DECAL standards related to nutrition and physical activities, health information and the provision of family resources, are ideal to address and help close gaps (e.g., disparities related to education and healthy foods) between rural and non-rural counties.

CONCLUSIONS

Our research has added to the literature on the connection between preventable health disparities and residing in the rural south. It is appropriate now to address the prevalence of health disparities in rural areas and for Georgia to deal with some of the disparities through its high-quality early childhood programs and other state agencies. Empowering rural communities to address the health disparities described here may be the best path toward diminishing these disparities. We are pleased with the work Georgia is doing on behalf of its children, families and child care services. We trust that these efforts will continue and progress.

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