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Do Children in Rural Areas Still Have Different Access to Health Care? Results from a Statewide Survey of Oregon's Food Stamp Population

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Abstract

Purpose—To determine if rural residence is independently associated with different access to health care services for children eligible for public health insurance.

Methods—We conducted a mail-return survey of 10,175 families randomly selected from Oregon's food stamp population (46% rural and 54% urban). With a response rate of 31%, we used a raking ratio estimation process to weight results back to the overall food stamp population. We examined associations between rural residence and access to health care (adjusting for child's age, child's race/ethnicity, household income, parental employment, and parental and child's insurance type). A second logistic regression model controlled for child's special health care needs.

Findings—Compared with urban children (reference = 1.00), rural children were more likely to have unmet medical care needs (odds ratio [OR] 1.48, 95% confidence interval [CI] 1.07–2.04), problems getting dental care (OR 1.36, 95% CI 1.03–1.79), and at least one emergency department visit in the past year (OR 1.42, 95% CI 1.10–1.81). After adjusting for special health care needs (more prevalent among rural children), there was no rural-urban difference in unmet medical needs, but physician visits were more likely among rural children. There were no statistically significant differences in unmet prescription needs, delayed urgent care, or having a usual source of care.

Conclusions—These findings suggest that access disparities between rural and urban low-income children persist, even after adjusting for health insurance. Coupled with continued expansions in children's health insurance coverage, targeted policy interventions are needed to ensure the availability of health care services for children in rural areas, especially those with special needs.

Geographic comparisons in the 1990s found rural-urban differences in children's unmet health care needs. Disparate rates of health insurance coverage were hypothesized as an explanation for such disparities, so strategies were developed to increase public insurance enrollment among rural residents and other populations with lower rates of coverage. In

addition, public coverage for all low-income children was expanded through the State Children's Health Insurance Program (SCHIP). These efforts have been successful in decreasing the overall number of uninsured children, expanding children's access to health care and closing the insurance gap between urban and rural children.¹⁷ Although insurance expansions improve children's access to health care, other factors—such as the availability of primary care providers, the location of safety net clinics, and travel distance—may remain as significant barriers to obtaining health care services for low-income rural children.¹⁸

Although prior studies of children's access to health care have had mixed results, most have described some rural disadvantage. Rural children have consistently had higher rates of unmet dental needs, but reports of most other services have varied.¹⁹ Newacheck et al found no rural-urban differences between unmet medication and vision needs. Kuhlthau et al found no difference in the use of specialty care between rural and urban children. Among adolescents, rural residence was a predictor of fewer preventive visits, but was not associated with different rates of overall health care visits. Among all ages, rural residents were more likely to have a usual source of care but fewer health care visits, when compared with urban dwellers.

Most studies have controlled for insurance coverage as a significant covariate; however, some have not. Regardless, the children's health insurance landscape has changed significantly since most previous studies were conducted. It is unclear whether closing the rural-urban children's insurance coverage gap has changed or eliminated previously reported access disparities, especially among populations of children who are eligible for Medicaid and SCHIP.²⁰ To address some of this uncertainty, we conducted a study among a group of low-income children eligible for public insurance in a state with a large rural population. Our major objective was to further investigate whether rural-urban differences in children's access to health care services persist, adjusting for insurance type and several other covariates that may affect the associations between rural residence and unmet children's health care needs.

Methods

Data Collection—Survey of Parents

We designed a self-report, mail-return survey with 63 items—most adapted from national surveys—to ask parents about their children's access to health care services during the previous year.²¹ We conducted preliminary surveys (cognitive interviews) among low-income parents to ensure maximum comprehension among our study population. The surveys were translated into Spanish and Russian (the 2 most common non-English languages among this population), and then independently back-translated to ensure fidelity of translation. A 4-wave methodology was employed (2 surveys and 2 reminder postcards). Survey participants were entered into a drawing to receive a \$100 grocery store voucher. Because of budgetary constraints, telephone follow-up was not possible. All aspects of the study were approved by the Oregon Health and Science University institutional review board (OHSU eIRB# 1717).

Study Population—Sample of Parents

To identify a group eligible for public insurance, we included in our sampling frame all 84,087 families with children aged 1–18 enrolled in Oregon’s food stamp program at the end of January 2005. At that time, the eligibility criteria for food stamps in Oregon required a household income less than 185% of the federal poverty level (FPL) and US citizenship. These income and citizenship requirements were essentially the same for children’s Medicaid or SCHIP. Therefore, for the purposes of this study, Oregon children receiving food stamps were presumed eligible for publicly funded health insurance. Families with only children less than 1 year of age were excluded due to different public insurance eligibility requirements for this age group. We used oversampling techniques to select a stratified, random sample of 10,175 households. This process was aided by PASS software (NCSS, Kaysville, Utah) for adequate power calculations, and the survey selection procedure in SAS 9.1 (SAS Institute Inc., Cary, N.C.) to augment the sample in rural areas and among families not enrolled in public insurance. We then randomly selected a focal child from each household. A final sample of 8,636 households was deemed eligible to participate (excluding families who had moved out of state and those with no current address).

Consistent with other similar surveys of Medicaid-eligible populations, our response rate was 31%.⁷ Survey respondents had similar characteristics to the total population. Using administrative data, we weighted each response, depending on the probability of original selection, and further adjusted for non-response using a raking ratio estimation process.⁸ We report results that have been weighted back to the overall study population of 84,087 households.

Primary Measures

The primary predictor variable was the child’s residence in a rural or urban setting. Rural or urban status was defined using the criteria from Oregon’s Office of Rural Health, based on ZIP code. Self-reported ZIP codes were confirmed with administrative data, which were used to back-fill incomplete or inconsistent responses in less than 2% of entries. On the basis of significant associations in bivariate models, the covariates included the child’s age, child’s race/ethnicity, household income, parental employment, parent’s insurance type, child’s insurance type, and whether or not the child had a special health care need (assessed by the question: “Does your child have a physical, emotional, or mental health condition that seriously interferes with an ability to do things most children his or her age can do?”)

We selected 7 outcome variables: no usual source of care, unmet health care needs in the last 12 months (medical care not received, prescriptions not refilled due to cost, and big problems getting dental care), no ambulatory care visits in 12 months, at least 1 emergency department (ED) visit in 12 months, and delayed urgent care (rarely or never received immediate care as soon as it was needed).

Analysis

We used SPSS 14.0 (SPSS, Inc., Chicago, Ill.) with the complex samples module to account for the complex sampling design. We initially identified all demographic and family characteristics that were associated with at least 1 outcome measure through the chi-square

bivariate analyses and individual logistic regression models ($P < .05$) and then determined how these characteristics were represented among rural versus urban children. We used multivariable logistic regression models to assess how rural residence was independently associated with significant covariates. No significant interactions ($P < .15$) were noted between the main predictor variable and the covariates.

Results

Demographics Among Rural Versus Urban Children

Among children aged 1–18 in Oregon's food stamp population, approximately 46% lived in rural communities and 54% in urban centers. Significant rural-urban demographic differences were seen based on the child's age, child's race/ethnicity, household income, and whether or not the child had a special health care need ($P < .05$). Among both rural and urban children in this low-income population, approximately 11% were uninsured, and 32% had at least 1 uninsured parent (Table 1).

Predictors of Children's Unmet Health Care Needs

In the bivariate analyses, parental and child's health insurance types were most consistently associated with the measures of access. The widest differences were noted between the uninsured and those with coverage; those with public and private coverage were more similar. Racial/ethnic differences were significant in all measures except ED utilization and having a usual source of care. Having a special health care need was significantly associated with higher unmet medical, prescription, and dental needs as well as having at least 1 ED visit. Parental employment was associated with unmet medical and dental needs, whereas household income was only significantly associated with unmet prescription need. The rural children had higher rates of unmet medical needs, dental needs, and ED utilization (Table 2).

Rural Residence and Children's Access to Health Care

The 3 notable associations between rural residence and health care access remained significant in our first set of multivariable models. When compared with their urban counterparts, the rural children had significantly higher rates of unmet medical and dental need and at least 1 ED visit in the past year (adjusting for child's age, child's race/ethnicity, household income, parental employment, parent's insurance type, and child's insurance type) (Table 3, column 2).

The rural-urban difference in unmet medical need was perplexing when considering that the rural and urban children reported seeing a physician at the same rate and were equally likely to have delayed access to urgent care. We conducted a second series of logistic regression models to further investigate if the rural children, perhaps, had more underlying need. After adding a covariate to represent whether or not the child had a special health care need, the rural-urban difference in unmet medical need was no longer significant. Interestingly, this model did show that the rural children were less likely to go without seeing a doctor in the past year. The likelihood of at least 1 ED visit and unmet dental need remained significantly higher in the rural children (Table 3, column 3).

Discussion

This study confirms past reports of differences in access to health care services among rural children, compared with their urban counterparts. Despite recent expansions in health insurance coverage, rural children are still at some disadvantage. This study suggests that a higher percentage of special health care needs among some populations of rural children may explain, in part, previous reports of higher unmet need among this group.

Because our study population was fairly homogenous from a socioeconomic standpoint and we were able to control for rural-urban differences in some key demographics, the most likely explanation for persistent access disparities relates to factors influencing the availability of services. First, the higher rural rates of unmet medical need that did not remain significant after controlling for special health care needs may have been due to higher underlying needs in the rural population. Specialty care services are often broader in urban areas. It is unclear whether the prevalence of special health care needs actually varies based on rural-urban residence, or if the urban parents in our study were just less likely to report a special health care need because their child had access to all necessary treatments.

Although it is not possible to offer a wide array of specialized services in isolated areas, workforce shortages may still contribute to unmet medical and dental care needs among rural children. Recent workforce studies report ample numbers of children's health care providers but with problems of geographic maldistribution, suggesting that targeted policies to recruit and retain providers in rural areas may be more helpful than simply training more physicians and dentists.⁷ Further policy reforms need to facilitate enhanced training to support a broader scope of practice among rural providers. In addition, models to creatively deliver specialized services to rural areas, such as telemedicine, should be further explored.

Distance and isolation may also present barriers for primary care providers attempting to secure referrals to far-away urban centers, especially for uninsured patients or even those with public coverage. Although we controlled for insurance type, some of the unmet needs may represent uncovered services. This problem of underinsurance contributes to access problems, especially among low-income populations. For example, Oregon's public programs for children include dental coverage; however, parents struggle to access covered services. One parent reported: "Even though my children are eligible for dental coverage under OHP [Oregon's Medicaid and SCHIP Program], it is impossible to find a dentist that will take OHP. The only one I could find is 3 hours and at least 2 mountain passes away making getting there almost impossible, especially in the winter." Although "equally underinsured," urban children might be able to obtain uncovered services from charity clinics or safety net clinics that accept public insurance.

Noting persistent rural-urban disparities in low-income children's access to medical and dental care—despite SCHIP coverage—can inform policy initiatives to target rural areas in the expansion of safety net services and specialty pediatric care and increase reimbursement rates for providers in isolated geographic areas. A visit to the ED does not necessarily represent compromised access to care if emergency services are required. The higher utilization of the ED among rural families, however, may be a reflection of limited

ambulatory care hours requiring an ED visit for primary care-treatable conditions. In fact, a rural child who visits the ED in the evening may see the same provider that he or she would have seen earlier in the clinic. However, ED visits are much more costly (in both time and money), which puts rural families at a disadvantage.

Interpreting data presented here requires consideration of several important factors. The data from this study can only be generalized to Oregon's food stamp population. Because food stamp users are already connected to a system of public benefits, these findings likely underreport access disparities among the entire low-income population. Further study is needed among other socioeconomic cohorts and nationally representative groups with the use of consistent covariates for meaningful comparisons and wider generalizability.

Second, for budgetary reasons, the survey was not administered in all languages, and telephone follow-up was not possible. Although our response rate is comparable to other similar studies of Medicaid-eligible populations, response bias remains an important consideration. To the extent possible, the comprehensive food stamp administrative database facilitated raking ratio estimation adjustments for non-response, which helped address this anticipated bias in the weighting and analysis.

Finally, relying on self-reported data always creates the potential for report and recall bias. One recent study found that rural parents have a decreased perception of their children's health care needs, suggesting that our self-reported data may actually underestimate the true disparity of unmet need between urban and rural children. To minimize recall bias, validated questions were used from national surveys that ask respondents to recall occurrences only in the past 12 months. In determining the key predictor variable, the self-reported data were confirmed with administrative data.

Policy makers should pay close attention to the persistent association between rural residence and low-income children's unmet health care needs, despite expansions in children's public health insurance coverage. Targeted policy interventions should continue to improve incentives that bolster the rural health care workforce and ensure better access to health care services for all children.

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Table 1

Demographic Characteristics of Children in Oregon's Food Stamp Population by Rural or Urban Residence, Based on Oregon Office of Rural Health ZIP Code Designations

Demographic and Other Characteristics	Percentage of Total Study Population (Weighted %)	Percentage of Rural Population (46% of Total) (Weighted %)	Percentage of Urban Population (54% of Total) (Weighted %)
Child's age in 2005 [*] (N = 84,087) [†]			
1–4 years	29.0	25.2	32.3
5–9 years	30.0	30.7	29.4
10–14 years	25.5	26.3	24.8
15–18 years	15.5	17.7	13.5
Race/ethnicity categories [*] (N = 84,087) [†] [combined variable from administrative data]			
White, not Hispanic	69.2	75.8	63.5
Hispanic, any race	19.9	18.9	20.8
Non-white, non-Hispanic	10.9	5.4	15.6
Parent's employment status [§] (N = 77,305)			
Not employed	57.3	55.9	58.4
Employed/self-employed	42.7	44.1	42.7
Parent's insurance (N = 78,052)			
Parent private insurance	14.6	14.4	14.8
Parent public insurance	52.8	52.8	52.8
Parent uninsured	32.6	32.7	32.5
Child's insurance (N = 83,032)			
Child private insurance	16.1	15.3	16.8
Child public insurance	73.0	73.8	72.4
Child uninsured	10.9	10.9	10.9
Household income as a percentage of federal poverty level (FPL) [*] (N = 81,722)			
Zero income	13.3	12.2	14.3
1–50% FPL	36.5	37.4	35.7
51–100% FPL	30.0	32.5	27.9
101–133% FPL	13.6	10.5	16.2
>133% FPL	6.6	7.4	6.0
Child has physical, emotional, or mental health condition that seriously interferes with an ability to do things most children his or her age can do. (special health care need) [*] (N = 79,243)			
Yes, special health care need	13.1	15.4	11.1
No special health care need	86.9	84.6	88.9

^{*} $P < .05$ in the chi-square analyses for overall differences between the demographic subgroups.

[†] Characteristic known from administrative data (Note: Population number varies for each characteristic because respondents did not always report on each item. The demographic information gathered from administrative data was more complete than the self-reported data.)

[‡] Because Oregon's predominant minority population is Hispanic, and a large number of Hispanics in the sample reported "other" as their race, we created a combination race/ethnicity covariate based on administrative data.

[§] Employment status of the parent who completed the survey.

// Insurance type of the parent who completed the survey.

Note: Column percentage = 100% (may not be exact due to rounding to nearest 10th).

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Table 2
 Characteristics Associated with Children's Unmet Health Care Needs and Access Problems

Variable	No Usual Source of Care	Unmet Medical Need	Unmet Prescription Need	Big Problem Getting Dental Care	No Doctor Visits in Past Year	At Least 1 ED Visit in Past Year	Rarely or Never Got Immediate Care
Total	9.5	16.1	22.0	26.0	13.8	39.2	21.7
Age							
1–4 years	9.0	12.1	19.1	15.5	7.9	49.4	20.8
5–9 years	8.2	15.8	20.5	26.9	13.4	35.3	21.6
10–14 years	10.8	20.2	23.9	34.2	17.0	33.7	22.3
15–18 years	11.7	17.5	27.4	29.9	20.7	36.5	22.8
Race/ethnicity							
White, not Hispanic	8.8	14.8	24.0	28.1	10.5	40.0	16.4
Hispanic, any race	12.1	17.2	19.3	25.2	26.8	34.4	44.3
Non-white, non-Hispanic	10.7	22.4	14.6	14.4	11.6	43.0	21.3
Parental employment [†]							
Employed/self-employed	10.5	18.4	24.2	28.7	14.6	37.2	23.3
Not currently employed	8.9	14.3	20.5	23.7	13.1	40.4	20.1
Household income							
>133% FPL	9.6	19.9	32.9	29.8	12.3	32.8	21.1
101%–133% FPL	9.7	20.9	29.0	30.6	16.2	35.1	21.7
51%–100% FPL	7.7	12.5	21.1	26.1	11.2	41.6	17.8
1%–50% FPL	11.2	16.6	20.8	24.0	14.8	41.1	24.4
Zero income	9.6	17.1	16.0	22.0	14.8	38.2	21.1
Child's insurance							
Child private insurance	5.3	13.6	26.8	24.9	9.9	33.4	14.7
Child public insurance	7.2	13.5	18.6	21.4	11.1	42.1	19.3
Child uninsured	31.8	37.6	38.7	60.0	38.5	28.6	51.8
Parent's insurance [‡]							
Parent private insurance	6.8	17.8	30.5	26.3	11.4	33.5	18.6
Parent public insurance	7.5	12.4	18.7	21.6	10.0	43.9	17.9

Variable	No Usual Source of Care	Unmet Medical Need	Unmet Prescription Need	Big Problem Getting Dental Care	No Doctor Visits in Past Year	At Least 1 ED Visit in Past Year	Rarely or Never Got Immediate Care
Parent uninsured	15.1	22.4	23.8	32.0	20.3	33.7	29.9
Place of residence							
Urban	9.4	14.2	20.1	22.5	14.9	36.2	21.6
Rural	9.9	18.3	24.3	30.3	12.6	42.8	21.8
Child has special health care need							
Yes, special need(s)	9.3	29.7	34.9	41.0	7.7	46.8	21.8
No special need	9.7	13.7	19.2	23.5	14.3	38.0	20.9

* ED = emergency department; FPL = federal poverty level.

[†] Employment status of the parent completing the survey.

[‡] Insurance type of the parent completing the survey.

Note: Bold denotes P -values $< .05$ in the chi-square analyses for overall differences between the subgroups.

Table 3

Multivariate Associations Between Rural Residence and Health Care Access Measures Among Children in Oregon's Food Stamp Population

Access Measure	Percent Reporting Children's Health Care Access Difficulties Weighted %	Column 1 Unadjusted Odds Ratio	Column 2 (Multivariate Analysis 1) Adjusted Odds Ratio [†]	Column 3 (Multivariate Analysis 2: Added Adjustment for Special Health Care Needs) Adjusted Odds Ratio [‡]
No usual source of care	(Total 10%)			
Urban	9.4%	1.00	1.00	1.00
Rural	9.9%	1.06 (0.74–1.52)	1.27 (0.85–1.90)	1.27 (0.83–1.94)
(MV 1: Unweighted N = 2,290; Weighted N = 71,802)				
(MV 2: Unweighted N = 2,175; Weighted N = 68,282)				
Unmet medical need [*]	(Total 16%)			
Urban	14%	1.00	1.00	1.00
Rural	18%	1.35 (1.12–1.80)	1.48 (1.07–2.04)	1.32 (0.94–1.85)
(MV 1: Unweighted N = 2,357; Weighted N = 73,799)				
(MV 2: Unweighted N = 2,241; Weighted N = 70,326)				
Unmet prescription need	(Total 22%)			
Urban	20%	1.00	1.00	1.00
Rural	24%	1.28 (0.99–1.64)	1.22 (0.93–1.60)	1.24 (0.93–1.65)
(MV 1: Unweighted N = 2,335; Weighted N = 73,130)				
(MV 2: Unweighted N = 2,221; Weighted N = 69,615)				
Big problem getting dental care [*]	(Total 25%)			
Urban	23%	1.00	1.00	1.00
Rural	30%	1.50 (1.19–1.89)	1.45 (1.11–1.90)	1.36 (1.03–1.79)
(MV1: Unweighted N = 2,327; Weighted N = 72,693)				
(MV 2: Unweighted N = 2,211; Weighted N = 69,262)				
No doctor visits	(Total 14%)			
Urban	15%	1.00	1.00	1.00
Rural	13%	0.82 (0.61–1.12)	0.76 (0.54–1.06)	0.70 (0.50–0.99)
(MV1: Unweighted N = 2,383; Weighted N = 74,629)				
(MV 2: Unweighted N = 2,266; Weighted N = 71,119)				
At least 1 ED visit [*]	(Total 40%)			
Urban	36%	1.00	1.00	1.00
Rural	43%	1.32 (1.06–1.64)	1.41 (1.11–1.79)	1.42 (1.10–1.81)

Access Measure	Percent Reporting Children's Health Care Access Difficulties Weighted %	Column 1 Unadjusted Odds Ratio	Column 2 (Multivariate Analysis 1) Adjusted Odds Ratio [†]	Column 3 (Multivariate Analysis 2: Added Adjustment for Special Health Care Needs) Adjusted Odds Ratio [‡]
(MV 1: Unweighted N = 2,383; Weighted N = 74,712)				
(MV 2: Unweighted N = 2,264; Weighted N = 71,165)				
Rarely or never got immediate care [§]	(Total 22%)			
Urban	22%	1.00	1.00	1.00
Rural	22%	1.02 (0.75–1.39)	1.11 (0.77–1.61)	1.10 (0.76–1.62)
(MV1: Unweighted N = 1,608; Weighted N = 50,829)				
(MV2: Unweighted N = 1,532; Weighted N = 48,684)				

* $P < .05$ in the chi-square analyses for comparisons between rural and urban children.

[†] Multivariable analysis 1 (MV1) odds ratio adjusted for child's age, child's race/ethnicity, household income, parental employment, parent's insurance status/type, and child's insurance status/type.

[‡] Multivariable analysis 2 (MV2) odds ratio adjusted for child's age, child's race/ethnicity, household income, parental employment, parent's insurance status/type, child's insurance status/type, and whether or not child has a special health care need.

[§] Only among children who needed immediate care in the previous 12 months.