

10-1-2010

Access to Mental Health Services and Family Impact of Rural Children with Mental Health Problems

Jennifer D. Lenardson MHS

University of Southern Maine, Maine Rural Health Research Center

Erika C. Ziller PhD

University of Southern Maine, Muskie School of Public Service, Maine Rural Health Research Center

David Lambert PhD

University of Southern Maine, Muskie School of Public Service, Maine Rural Health Research Center

Melanie M. Race MS

University of Southern Maine, Muskie School of Public Service, Maine Rural Health Research Center

Anush Yousefian Hansen MS, MA

*University of Southern Maine*Follow this and additional works at: https://digitalcommons.usm.maine.edu/behavioral_healthPart of the [Health Services Research Commons](#), and the [Mental and Social Health Commons](#)

Recommended Citation

Lenardson, J. D., Ziller, E. C., Lambert, D., Race, M. M., & Yousefian, A. (2010). Access to mental health services and family impact of rural children with mental health problems. (Working Paper #45). Portland, ME: University of Southern Maine, Muskie School of Public Service, Maine Rural Health Research Center.

This Report is brought to you for free and open access by the Maine Rural Health Research Center (MRHRC) at USM Digital Commons. It has been accepted for inclusion in Mental Health / Substance Use Disorders by an authorized administrator of USM Digital Commons. For more information, please contact jessica.c.hovey@maine.edu.

Maine Rural Health Research Center
Working Paper #45

Access to Mental Health Services and Family Impact of Rural Children with Mental Health Problems

October 2010

Authors

Jennifer D. Lenardson, M.H.S.

Erika C. Ziller, M.S.

David Lambert, Ph.D.

Melanie M. Race, B.A.

Anush Yousefian, M.S.

Cutler Institute for Health and Social Policy

Muskie School of Public Service

University of Southern Maine

UNIVERSITY OF SOUTHERN MAINE

Muskie School of Public Service



**Rural Health Research
& Policy Centers**

Funded by the Federal Office of Rural Health Policy

www.ruralhealthresearch.org

Access to Mental Health Services and Family Impact of Rural Children with Mental Health Problems

October 2010

Maine Rural Health Research Center

Working Paper #45

Jennifer D. Lenardson, M.H.S.
Erika C. Ziller, M.S.
David Lambert, Ph.D.
Melanie M. Race, B.A.
Anush Yousefian, M.S.

Cutler Institute for Health and Social Policy
Muskie School of Public Service
University of Southern Maine



**Rural Health Research
& Policy Centers**

Funded by the Federal Office of Rural Health Policy
www.ruralhealthresearch.org

This study was funded under a Cooperative Agreement with the federal Office of Rural Health Policy, Health Resources and Services Administration, DHHS (CA#U1CRH03716). The conclusions and opinions expressed in the paper are the authors' and no endorsement by the University of Southern Maine or the sponsor is intended or should be inferred.

TABLE OF CONTENTS

| | |
|--|----|
| EXECUTIVE SUMMARY | i |
| INTRODUCTION | 1 |
| BACKGROUND | 2 |
| Prevalence, Need, and Service Use..... | 2 |
| Site of Service..... | 2 |
| Impact of Income and Insurance Status | 2 |
| Family Impact | 3 |
| METHODS | 4 |
| Data..... | 4 |
| Dependent and Independent Variables | 5 |
| Statistical Analysis..... | 5 |
| FINDINGS..... | 6 |
| Rates and Characteristics of Children with Mental Health Problems..... | 6 |
| Access to Mental Health Services and Problem Severity | 7 |
| Family Impact..... | 7 |
| Factors Associated with Use of Mental Health Services | 7 |
| LIMITATIONS..... | 8 |
| DISCUSSION AND POLICY IMPLICATIONS..... | 9 |
| REFERENCES | 11 |
| APPENDIX..... | 1 |

Acknowledgements

The authors would like to thank Stephanie Robinson of the National Center for Health Statistics' Research Data Center for her invaluable assistance. They also wish to thank Kim Bird and Karen Pearson of the Maine Rural Health Research Center for their design and production guidance.

The findings and conclusions in this paper are those of the authors and do not necessarily represent the views of the Research Data Center, the National Center for Health Statistics, or the Centers for Disease Control and Prevention.

EXECUTIVE SUMMARY

Introduction

The majority of children with mental health problems go untreated, and the gap between need and service use is assumed to be wider in rural than in urban areas. It is also assumed that rural families of children with mental health problems experience a greater financial and emotional impact than urban families. These assumptions reflect the lower availability of mental health specialty care and support services in rural areas. Lower income and more limited economic opportunities may further hamper the ability of rural families to care for children with more severe mental health problems. The current research literature does not describe how well the needs of children with mental health problems are being met in rural areas, or the impact of these needs on rural families' financial and emotional well-being. Although there are reasons to believe the burden these problems place on families is higher in rural areas, evidence is limited.

Methods

Using data from the 2005-06 National Survey of Children with Special Health Care Needs (NS-CSHCN) and the 2006 Area Resource File, we compared prevalence, access, problem severity, and family impact for rural and urban children with mental health problems. Because the NS-CSHCN has a complex sampling strategy, we used sampling weights and statistical procedures that adjust for clustering in SAS.

Findings

Children in rural areas have a small, but significantly higher prevalence of mental health problems compared to children in urban areas (5.8 percent versus 5.3 percent). A greater proportion of rural children with mental health problems have a behavioral difficulty compared to urban children (59.1 percent versus 53.7 percent). Access to *any* mental health care does not differ significantly between rural and urban areas. However, the probability of receiving *all* needed mental health care is lower among children with mental health problems living in rural areas than urban (OR: 0.81, CI: 0.71-0.92). Uninsured children with mental health problems are more likely than privately insured children to receive *any* mental health care, but less likely to receive *all* (OR: 0.4, CI: 0.30-0.53). Among families of children with mental health problems, a greater proportion of rural families spend six or more hours each week coordinating their child's care (12.1 percent) than do urban families (8.5 percent).

Discussion and Policy Implications

Mental health problems have considerable impact on children and their families and some of these impacts are higher in rural than urban areas. Rural children are slightly but significantly more likely to have a mental health problem than urban children, are more likely to have a behavioral difficulty, and are more likely to be usually or always affected by their condition. Compared to urban children, rural children are more likely to go without access to all parent-reported needed mental health services and their families spend more time coordinating their care. To improve access to care for children with

mental health needs and their families, policymakers and providers should consider models that have been effective for children with other special health care needs, including a medical home with care coordination, adequate insurance coverage, and organized community-based services. Promoting access to public coverage and outreach regarding care coordination benefits are important for ensuring access to mental health care for children in rural areas.

INTRODUCTION

Children's mental health problems are estimated to range from 2.1 percent of U.S. children with a disabling mental health condition,¹ to 5 percent of U.S. children with an emotional or behavioral health problem,² up to an estimated 13 percent of U.S. children with some type of mental health problem.³ Our previous estimates indicate 7.5 percent of children had a behavioral or mental health problem.⁴ Despite this range, use of services consistently lags behind the numbers of children who need mental health services. The majority of children do not receive care for their problem; roughly two-thirds of children who need mental health care do not receive it.⁵⁻⁷ This gap between need and service use is assumed to be wider in rural than in urban areas, particularly for children with more serious needs.⁸

In addition to unmet needs, families of children with mental health problems are likely to experience negative financial and emotional impacts resulting from their child's condition.⁹⁻¹¹ Research to date on rural family impact has included children with all types of special health care needs, yet families living in rural areas may be especially vulnerable to the financial and emotional impacts of caring for a child with mental health problems because rural families often live in communities with few mental health providers¹² and mental health service use among rural children is lower.^{4,13} Moreover, rural families of children with special health care needs spend more time caring for their children at home and experience more financial difficulties related to the child's medical needs than urban families.¹⁴

The current research literature does not describe how well the needs of children with mental health problems are being met in rural areas. Although there are reasons to believe the burden these problems place on families is higher in rural areas, evidence to support this assumption is limited. Our key study questions include:

1. What proportion of rural and urban children have a mental health problem, and what is the severity of that problem?
2. How well are the mental health problems of these children being met across rural and urban residence?
3. Are there rural-urban differences in the financial and logistical impact of these needs on families?

This paper examines variation in the proportion of children with mental health problems, access to services, problem severity, and family impact of these needs across rural and urban counties. The needs of rural children with mental health problems and the impact of these needs on their families are intertwined and may place rural children and their families at risk of having their mental health and other needs go unmet. This paper aims to provide rural policy makers with critical information to better understand these needs and how best to support rural families.

BACKGROUND

Prevalence, Need, and Service Use

Estimates indicate that anywhere from 2 percent to 13 percent of U.S. children have some type of mental health disorder.^{1,2,15,16} Other estimates indicate that five to nine percent of children with mental illness experience symptoms severe enough to result in impaired functioning.^{17,18} Untreated mental health disorders can lead to school failure, family conflicts, drug abuse, violence, and suicide.¹⁹ Despite high prevalence and the possibility of poor outcomes, only a proportion of children who need services actually receive them. Nearly two-thirds (64.7 percent) of children who needed mental health care did not receive it in 1997 and 1999.²⁰ Nearly 40 percent of children with an emotional or behavioral problem used mental health services in 2002.²¹ Children with severe emotional disturbances use ten times as many services as youth with less severe mental health problems.²²

Rates of childhood mental health problems do not differ greatly between rural and urban settings,^{23,16} but problems with access to children's mental health services appear to be more pronounced in rural areas. In 1997, 1999, and 2002, children with mental health problems in rural areas were significantly less likely to have had a mental health visit compared to children with mental health problems in urban areas.²³ Controlling for other characteristics that affect access to care, rural children are 20 percent less likely to have a mental health visit than urban children.¹⁶ Stigma toward the use of the mental health system may limit acceptance of mental health treatment by parents in rural settings.²⁴

Site of Service

Schools provide the majority of children's mental health services, with specialty mental health services and general medical care contributing a smaller proportion of care. The Great Smoky Mountain Study found that 70-80 percent of children who received services did so within their schools, with schools often serving children without psychiatric diagnoses. The specialty mental health sector provided care to 20 percent of children who received any mental health service and the general medical sector provided care to 11-13 percent. Very few children received care through the child welfare or juvenile justice systems, but when they did these children often had significant mental health impairment.²⁵ For the majority of children receiving services, the educational system was their sole source of care and the most frequent entry point for first receiving mental health services.^{25,26}

Impact of Income and Insurance Status

Prevalence of children's mental health problems is associated with low family income. Among children ages 6-17, 12 percent of children with family income below the federal poverty level (FPL) had a mental health problem, compared to 9 percent of those between 100-200 percent of the FPL, and 6 percent of children above 200 percent of the FPL.²¹ Low household income is associated with high levels of depression and antisocial

behavior in children and subsequent improvements in household income reduce children's mental health problems.^{27,28}

Prevalence of mental health problems and service use also differs with insurance status. Among children ages 6-17, 12 percent of children with Medicaid or SCHIP had identified mental health problems compared to 9 percent of the uninsured and 6 percent with other coverage. Even among non-poor children, those covered by Medicaid or SCHIP had higher rates of mental health problems than non-poor children covered by other types of insurance. Children may be Medicaid-eligible as a result of severe mental health problems, which may partially explain the high rates of public coverage among children with mental health problems.²¹ Children who were uninsured or had public coverage had higher rates of serious emotional disorder than those children with private insurance.²⁹

Correspondingly, mental health service use is highest among children with public coverage. Medicaid coverage significantly increased the likelihood of mental health service use over private coverage and being uninsured.^{22, 30-33} Children with either public or private coverage were equally likely to use mental health services and three times as likely as children without coverage.²¹ This finding likely reflects a higher need for mental health services among Medicaid children as well as Medicaid's more generous coverage compared to private insurance plans.^{21, 31-34} Since rural children rely heavily on Medicaid and SCHIP for health insurance,¹⁶ it is possible that rural children may actually have better access to mental health care than their urban counterparts.

Family Impact

Children's mental health problems,³⁵ serious emotional disturbances,³⁶ mental disorders,³⁷ specific behavioral problems,^{38,39} and medical conditions with a mental health component⁴⁰ have been shown to negatively affect the emotional and financial well-being of families. When children's mental health problems are severe, parents experience high stress levels.^{41,42}

Caring for children with mental health problems affects financial well-being more so than caring for children with other special health care needs. Among the privately insured, families of children with mental health problems had higher out-of-pocket costs and were more likely to reduce their labor market participation than families of children with other special health needs.⁴³ Additionally, families of children with mental health problems were more likely than other families to cut work hours, to quit work, and to spend more time arranging their child's care.³⁵ Compared to families of children with physical conditions, families of children with behavioral disorders accrued greater total costs for office-based visits and prescription medications, the services least likely to be fully covered by private health insurance.⁴⁴

Since they often live in communities with few mental health providers,⁴⁵ families living in rural areas may be especially vulnerable to the emotional and financial impact of caring for a child with mental health problems. Moreover, rural families of children with any special health care need spend more time caring for their children at home and

experience more financial difficulties related to the child's medical needs than urban families.⁴⁶

METHODS

The purpose of this study is to close the knowledge gap about the use of mental health services by rural children with mental health problems and the impact that caring for these children has upon their family. Specifically, we seek to identify any rural-urban differences in whether children with an apparent need for mental health care receive services; the extent to which the amount of care received meets their needs (based on parent perception); and, the specific challenges or impacts families face in providing or coordinating care for their children. To address these questions we analyzed a nationally representative survey of parents of children with special health care needs.

Data

The 2005-06 National Survey of Children with Special Health Care Needs (NS-CSHCN) was conducted by the National Center for Health Statistics (NCHS) on behalf of the federal Maternal and Child Health Bureau between April 2005 - February 2007.⁴⁷ The NS-CSHCN was one module of the State and Local Area Integrated Telephone Survey of the Centers for Disease Control and Prevention, using the same sampling frame as the National Immunization Study. Through a random-digit dial sample, households across the 50 states and the District of Columbia were identified as having children under age 18. Then, households with children with special health care needs were identified using the CSHCN Screener. This Screener identified general health needs that could result from chronic health conditions. Follow-up questions were administered to determine if this general health need resulted from a medical, behavioral, or other health condition and whether the condition had lasted or was expected to last 12 months or more. A total of 40,840 special-needs interviews were conducted. The survey examined access to medical homes, adequate health insurance, and needed services as well as functional difficulties, care coordination, satisfaction with care, and transition services among children with special health care needs. The overall response rate for the special-needs interview was 56.1 percent. An additional screener file contains all responses to the CSCHN Screener, including 363,183 children identified with or without a special health need. We used this file to calculate the proportion of U.S. children with mental health problems.

Interviews were conducted with parents or guardians who knew about the child's health. The data file includes 40,723 children under age 18 with special health care needs (117 pre-Katrina hurricane interviews from Louisiana were excluded from the public release file). It contains 15,942 children with a mental health problem such as depression, anxiety, eating disorder, other emotional problem, attention deficit disorder (ADD), or attention deficit hyperactive disorder (ADHD). Approximately 18 percent of the sample resides in a non-metropolitan area.

The NS-CSHCN public use file contains a dichotomous measure of rural-urban that is suppressed in 16 states with either very small metropolitan or non-metropolitan populations. To gain access to the suppressed data, and increase flexibility in the way we defined “rural,” we applied for permission to conduct our final analyses through the remote-access procedure of the NCHS Research Data Center (RDC). Through the RDC, a linked file was created merging the NS-CSHCN with select variables from the Area Resource File including the Rural-Urban Continuum Codes (RUCC). Using the RUCC, we classified rural counties based their adjacency to a metropolitan area, enabling comparisons of populations living in urban counties, rural counties adjacent to urban counties, and rural counties not adjacent to urban counties (abutting only other rural counties).

Dependent and Independent Variables

To examine how well the mental health problems of children are met across rural and urban residence, our dependent variables included two measures of mental health access: whether the child had received *any* needed mental health care or counseling in the past year and whether he or she had received *all* needed mental health care or counseling in the past year. These variables are based on the responses of a parent or guardian who knew about the child’s health and health care, which is subject to that person’s recall and perception. Though we have no reason to suspect that any potential bias differs between rural and urban areas, this variable may not reliably indicate true need for mental health care limiting the usefulness of our findings. Respondents were asked if there was any time in the past 12 months that a child needed mental health care or counseling. If the response was yes, the respondent was then asked if the child received all the mental health care or counseling that he or she needed. If the respondent replied that the child did not receive all needed mental health care, the respondent was asked if the child received any mental health care or counseling.

In addition to access, our dependent variables include measures of family impact, such as out-of-pocket costs for medical care, financial problems resulting from health conditions, need for additional income to cover medical expenses, stopping work or cutting hours to care for the child, need and receipt of mental health care/counseling for the family regarding the child’s condition, need and receipt of respite care for the family, and hours spent by family in coordinating/arranging care for the child.

Our primary independent variable of interest is rural or urban location and adjacency to an urban location as described above. Other covariates include socioeconomic variables known to affect health care use such as age, gender, race/ethnicity, number of adults in the household, region of residence, and health insurance coverage. To assess the level of need a child might have for mental health services, we also included a measure of problem severity (i.e., minor, moderate, severe).

Statistical Analysis

Using bivariate and multivariate analyses, we addressed rural-urban differences in access to mental health services, problem severity, and the impact of mental health problems on

family well-being. At the bivariate level, we used chi-square tests to measure whether prevalence of a mental health problem, access to services, problem severity, and family impact differed by residence, and for individual and family socioeconomic characteristics within residence.

Our multivariate analyses included two logistic regressions to estimate 1) the odds that a child would receive any mental health or counseling services and 2) the odds that a child received all the mental health services the parent felt the child needed in the preceding 12 months. These models were limited to children whose parent reported that they had a mental health problem. Covariates included child's rural or urban residence, age, gender, race and ethnicity, condition severity, region, insurance status, and family income. Results are presented as odds ratios with 95 percent confidence intervals.

Throughout the text and tables, estimates presented are statistically weighted to represent the non-institutionalized U.S. population of children with special health care needs age 17 and under. The sampling weights are provided by the NCHS and are adjusted for number of CSHCN in the household and interview non-response. Because the NS-CSHCN employs a complex sampling strategy, the weights are assigned to each record based on the probability of selection and adjusted for key socio-demographic characteristics. We used these weights in our analyses to correct for sample design, using appropriate statistical procedures that adjust for clustering (e.g., *surveyfreq*, *surveymeans*, and *surveylogistic* in SAS version 9.2). These procedures have been tested and found to yield corrected standard errors that are comparable to SUDAAN and Stata.⁴⁸

FINDINGS

Rates and Characteristics of Children with Mental Health Problems

Among all U.S. children, 5.4 percent have a mental health problem such as depression, anxiety, eating disorder, other emotional problem, ADD, or ADHD, representing nearly four million children (Table 1). A slightly higher proportion of children living in rural areas (5.8 percent), particularly those in adjacent areas (5.9 percent), have a mental health problem compared to children living in urban areas (5.3 percent). This estimate is lower than our previous findings, where we found that 7.5 percent of children had a behavioral or mental health problem with data from National Survey of America's Families.⁴ The variation may be a factor of differing survey methods. The NS-CSHCN has been shown to produce lower estimates of children with special health care needs than other surveys using the same screening tool and to identify more children with complex health needs and consequences compared to other surveys.⁴⁹

Children with mental health problems living in a rural, not adjacent area are more likely to be under age 12 (53.1 percent) compared to children living in an urban area (46.2 percent) (Table 2). Children with mental health problems in all rural areas are more likely to be white and not Hispanic (76.1 percent) compared to children in urban areas (64.4 percent). Rural children with a mental health problem are more likely to have family income below 200 percent of poverty (63.8 percent) and to have a public source of

coverage (58 percent) compared to urban children with a mental health problem (45.2 percent and 40.8 percent respectively). There is no appreciable difference between children living in not adjacent and adjacent rural areas in the proportion of those living in poverty and having public coverage.

Access to Mental Health Services and Problem Severity

At the bivariate level, access to mental health care does not differ significantly between rural and urban areas (Table 3). Although point estimates suggest that rural children living in counties not adjacent to an urban area have better access to at least *some* services than their rural adjacent and urban counterparts, this finding was statistically inconclusive. We explore these relationships in greater detail in the logistic regressions described below.

Children with mental health problems in rural areas are somewhat less likely to report a health plan problem as a reason why they did not obtain needed care, compared to children in urban areas (16.6 percent versus 25.1 percent) (data not shown in Appendix). Rural children with mental health problems are just as likely as urban children to report that lack of transportation and limited availability of local services are barriers to care.

Children with mental health problems who live in rural areas are more frequently affected by their condition than those who live in urban areas (36.2 percent “usually or always” compared to 32.8 percent) (Table 3). Behavioral difficulties are most pronounced among not adjacent rural counties (60.8 percent versus 58.3 percent in rural adjacent and 53.7 percent in urban counties).

Family Impact

Urban families are most likely to cut their work hours to care for their child with a mental health problem (22.2 percent); however, rural, not adjacent families (21.3 percent) are more likely than those in adjacent areas to cut their work hours (18.9 percent) (Table 4). Rural families are more likely to provide health care at home for their children with mental health problems, especially those families living in rural, not adjacent areas (47.7 percent in not adjacent compared to 41.0 percent in urban areas). The amount of time spent providing care does not differ by residence. Although the direct provision of care is not more time consuming for rural families, there is a rural-urban difference in the amount of time spent coordinating services for children with mental health problems. Twelve percent of rural families spend 6 or more hours coordinating care for these children each week compared to less than 9 percent of urban families.

Factors Associated with Use of Mental Health Services

As noted earlier, we found no bivariate rural-urban differences in the percent of children with mental health problems that received any or all services their parents felt they needed. To further test this finding, we conducted a series of logistic regressions designed to test the odds of receiving any or all needed mental health services, controlling for sociodemographic characteristics known to affect need and access to

services (Tables 5 and 6). The first column of findings in each table displays the regression model with residence included as a dichotomous variable (rural-urban) and the second where rural residence was divided into adjacent and non-adjacent categories.

The first set of logit models supports the bivariate findings. The probability of receiving *any* needed mental health care among children with mental health problems does not differ by rural or urban residence, controlling for child and family characteristics (Table 5; OR: 0.84, CI: 0.65-1.09). This finding did not change when we separated rural residence into adjacent and non-adjacent categories. The characteristics associated with the likelihood of receiving any mental health care include being uninsured or having public coverage, being between 12 and 17 years old, and having either a moderate or severe condition.

In contrast, the probability of receiving *all* needed mental health care among children with mental health problems is lower among those living in rural areas (Table 6; OR: 0.81, CI: 0.71-0.92) and the uninsured (OR: 0.40, CI: 0.30-0.53). This may result from limited availability of specialty mental health providers in rural areas and reliance on schools for mental health services, an aspect of child development outside of schools' traditional purview. Compared to urban children with mental health problems, those in rural areas (both adjacent and non-adjacent) are 20 percent less likely to receive all needed services, controlling for child and family characteristics. The odds of receiving all needed services are 60 percent lower for uninsured children compared to those with private coverage. Having public coverage increased the likelihood of receiving all needed mental health care for children by 17 percent over private coverage. Additionally, boys, Hispanic persons, and those living in the South are less likely to receive all mental health care. As with receipt of any mental health care, being between 12 and 17 years old, and having either a moderate or severe condition increased the odds of receiving all mental health care. Children living in a household with one adult were 26 percent more likely to receive all services compared to children living with two adults, perhaps because of their greater receipt of other types of health and social services.

LIMITATIONS

There are several limitations to our study. The NS-CSHCN has a response rate of 56 percent of families whose child was identified as having a special health care need through a series of screening questions. We do not know how families choosing and not choosing to participate in this survey may differ on important study variables. Another limitation is that both children's need for and use of services are based on parental report, which is subject to recall and perception. Parents of children in rural areas may perceive fewer unmet needs for medical care. Researchers suggest that this may result from the historical lack of available providers creating different patterns of use and lower perceived need among rural residents.⁵⁰ To the extent that this is true for mental health services, it would suggest that rural-urban differences in unmet need may be

underreported. Additionally, recall and perception may vary by family income, location, severity of children's health, and other factors that figure prominently in our analysis.

We are also limited by a lack of information about where children receive their mental health services and the volume of care they receive. Thus, when rural families report that their child did not receive all needed services, it is unclear whether or not the issue was one of quantity or type. It is possible that rural children are receiving fewer visits than needed, are not receiving care from a provider the parents would prefer (e.g. a child psychologist or psychiatrist versus a primary care provider or other professional), or both.

DISCUSSION AND POLICY IMPLICATIONS

Children in rural areas have a small, but significantly higher rate of mental health problems compared to children in urban areas (5.8 percent versus 5.3 percent). As in other studies,^{21,29} we found that children with mental health problems are more likely to live in poverty and to have public health insurance.

According to parental report, children with mental health problems living in rural areas are more frequently affected by their condition and are more likely to have behavior difficulties. Poverty is associated with behavioral symptoms in children, such as conduct and oppositional disorder.⁵¹ Given the higher poverty rates we found among children with mental health problems in rural areas, poverty may be a factor in this rural-urban difference.

At the bivariate level, we find no rural-urban differences in access to mental health care services. This finding is confirmed at the multivariate level for initial receipt of services: rural children with mental health problems are as likely to receive *any* mental health care as their urban counterparts. However, rural children are 20 percent less likely than urban children to receive *all* mental health care that parents identified as necessary.

Children with mental health problems who are uninsured are more likely than those with private insurance to receive at least some mental health care; however, they are 60 percent less likely to receive *all* needed services. This may be because uninsured children receive limited mental health services through schools and child welfare agencies that are unable to provide the full range of needed services. When a child had public coverage, access to *any* mental health care increased by 37 percent and access to *all* mental health care increased by 17 percent over private coverage. Given the accessibility of mental health care through public coverage in rural areas, promoting and expanding children's access to Medicaid and the State Children's Health Insurance Program are important aspects of ensuring children's use of mental health services in rural areas, especially for low-income families.

Among families of children with mental health problems, a greater proportion of rural families spend six or more hours coordinating their child's care each week. It may be

that rural areas have fewer resources offering care coordination services. Urban schools, in particular, may be well-equipped to offer coordination activities as a result of having more concentrated numbers of children with mental health problems. Since rural children with mental health problems are often covered by Medicaid, and all states but Delaware cover targeted case management under their Medicaid programs,⁵² it may be that rural families need more information about resources provided through this benefit.

Families are more likely to experience financial difficulties stemming from their child's condition if he or she has a mental health versus other special health care need (data not shown), confirming prior research.^{35,43} This study indicates that this pattern is true for families in both rural and urban areas. In order to improve access to care for children with mental health care needs, and reduce the impact on families, policymakers and providers should consider models that have been effective for children with special health care needs in general. These models include a medical home with care coordination, adequate insurance coverage, and organized community-based services.^{53,54}

REFERENCES

1. Halfon N, Newacheck PW. Prevalence and Impact of Parent-Reported Disabling Mental Health Conditions Among U.S. Children. *Journal of American Academy of Child and Adolescent Psychiatry*. 1999, May; 38:600-9.
2. Simpson GA, Bloom B, Cohen RA, Blumberg S, Bourdon KH. U.S. Children With Emotional and Behavioral Difficulties: Data From 2001,2002, and 2003 National Health Interview Surveys. *Advance Data From Vital and Health Statistics*. 2005, June 23;1-13.
3. Merikangas KR, He J-P, Brody D, et al. Prevalence and Treatment of Mental Disorders Among US Children in the 2001-2004 NHANES. *Pediatrics*. 2010, January; 125:75-81.
4. Lambert, D, Ziller, EC, Lenardson, JD. *Use of Mental Health Services by Rural Children*. (Working Paper #39). Portland, ME: University of Southern Maine, Maine Rural Health Research Center; July 2008.
5. Sturm R, Ringel JS, Andreyeva T . Geographic Disparities in Children's Mental Health Care. *Pediatrics*. 2003 Oct; 112:e308.
6. Armbruster P, Fallon T. Clinical, Sociodemographic, and Systems Risk Factors for Attrition in a Children's Mental Health Clinic. *American Journal of Orthopsychiatry*. 1994 Oct; 64:577-85.
7. Howell E. *Access to Children's Mental Health Services Under Medicaid and SCHIP*. (Series B, No B-60). Washington, DC: The Urban Institute; 2004.
8. President's New Freedom Commission on Mental Health. *Achieving the Promise: Transforming Mental Health Care in America. Final Report*. (DHHS Pub. No. SMA-03-3832). Rockville, MD: U.S. Department of Health and Human Services; 2003.
9. Busch SB, Barry CL. Mental Health Disorders in Childhood: Assessing the Burden on Families. *Health Affairs*. 2007; 26:1088-1095.
10. Sawyer MG, Whaites L, Rey JM, et al. Health-Related Quality of Life of Children and Adolescents With Mental Disorders. *Journal of the American Academy of Child and Adolescent Psychiatry*. 2002; 41:530-537.
11. Centers for Disease Control and Prevention. Mental Health in the United States: Health Care and Well Being of Children With Chronic Emotional, Behavioral, or Developmental Problems--United States, 2001. *Journal of the American Medical Association*. 2005; 294:2567-2569.
12. Moore, CG, Mink, M, Tompkins, M, Johnson, A, Hughley, S. *Mental Health Risk Factors, Unmet Needs, and Provider Availability for Rural Children*.

Columbia, SC: South Carolina Rural Health Research Center; 2005.

13. Adams, SJ, Xu, S, Dong, F. *Differences in Prescribing Patterns of Psychotropic Medication for Children and Adolescents Between Rural and Urban Prescribers*. Boulder, CO: Western Interstate Commission for Higher Education (WICHE); October 2009.
14. Skinner AC, Slifkin RT. Rural/Urban Differences in Barriers to and Burden of Care for Children With Special Health Care Needs. *The Journal of Rural Health*. 2007; 23:150-157.
15. Merikangas KR, Jian-Ping He, Brody D, et al. Prevalence and Treatment of Mental Disorders Among US Children in the 2001-2004 NHANES. *Pediatrics* . 2010, January; 125:75-81.
16. Lambert, D, Ziller, EC, Lenardson, JD. *Use of Mental Health Services by Rural Children*. (Working Paper #39). Portland, ME: University of Southern Maine, Maine Rural Health Research Center; July 2008.
17. Costello EJ, Mustillo S, Keeler G, Angold A. Prevalence of psychiatric disorders in childhood and adolescence. In: Levin BL, Petrila JHKD, Eds. *Mental Health Services: A Public Health Perspective*. Second ed. New York: Oxford University Press; 2004:111-128.
18. United States Public Health Service *Report of the Surgeon General's Conference on Children's Mental Health: A National Agenda*. Rockville, MD: Department of Health and Human Services; 2000.
19. National Mental Health Information Center. Child and Adolescent Mental Health Fact Sheet. US Department of Health and Human Services, Substance Abuse and Mental Health Administration.
20. Sturm R, Ringel JS, Andreyeva T. Geographic Disparities in Children's Mental Health Care. *Pediatrics*. 2003; 112.
21. Howell, E. *Access to Children's Mental Health Services Under Medicaid and SCHIP*. (Series B, No B-60). Washington, DC: The Urban Institute; 2004.
22. Burns BJ, Costello EJ, Erkanli A, et al. Insurance Coverage and Mental Health Service Use by Adolescents With Serious Emotional Disturbance. *Journal of Child and Family Studies*. 1997; 6:89-111.
23. Howell E, McFeeters J. Children's Mental Health Care: Differences by Race/Ethnicity in Urban/Rural Areas. *Journal of Health Care for the Poor and Underserved*. 2008, February; 19:237-247.
24. Starr S, Campbell LR, Herrick CA. Factors Affecting Use of the Mental Health System by Rural Children. *Issues of Mental Health Nursing*. 2002 April-

May; 23:291-304.

25. Burns BJ, Costello EJ, Angold A, et al. Children's Mental Health Service Use Across Service Sectors. *Health Affairs*. 1995, August; 14:147-159.
26. Farmer EMZ, Burns BJ, Phillips SD, Angold A, Costello EJ. Pathways into and Through Mental Health Services for Children and Adolescents. *Psychiatric Services*. 2003; 54:60-66.
27. Strohschein L. Household Income Histories and Child Mental Health Trajectories. *Journal of Health and Social Behavior*. 2005 Dec; 46:359-75.
28. Costello EJ, Compton SN, Keeler G, Angold A. Relationships Between Poverty and Psychopathology: a Natural Experiment. *Journal of the American Medical Association*. 2003 Oct 15; 290:2023-9.
29. Glied S, Howven CW, Moore RE, Garrett AB, Regier DA. Children's Access to Mental Health Care: Does Insurance Matter? *Health Affairs*. 1997; 16:167-174.
30. Cunningham PJ, Freiman MP. Determinants of Ambulatory Mental Health Services Use for School-Age Children and Adolescents. *HSR: Health Services Research*. 1996; 31.
31. Ringel JS, Sturm R. National Estimates of Mental Health Utilization and Expenditures for Children in 1998. *Journal of Behavioral Health Services and Research*. 2001; 28:319.
32. Becker S. Bringing excellence to rural and frontier America: Advocacy for substance abuse services in the 1990s. In: *Rural Issues in Alcohol, and Other Drug Abuse Treatment: Award for Excellence Papers*. CSAT Technical Assistance Publications Series, no. 10 ed. Rockville, MD: Center for Substance Abuse Treatment; 1994:1-6.
33. Eberhardt M, Ingram D, Makuc D. *Health, United States, 2001: Urban and Rural Chartbook*. Hyattsville, MD: National Center for Health Statistics; 2001.
34. Comer J, Mueller KJ. Correlates of Health Insurance Coverage: Evidence From the Midwest. *Journal of Health Care for the Poor and Underserved*. 1992; 3:305-320.
35. Busch SB, Barry CL. Mental Health Disorders in Childhood: Assessing the Burden on Families. *Health Affairs*. 2007; 26:1088-1095.
36. Centers for Disease Control and Prevention. Mental Health in the United States: Health Care and Well Being of Children With Chronic Emotional, Behavioral, or Developmental Problems--United States, 2001. *Journal of the American Medical Association*. 2005; 294:2567-2569.

37. Sawyer MG, Whaites L, Rey JM, et al. Health-Related Quality of Life of Children and Adolescents With Mental Disorders. *Journal of the American Academy of Child and Adolescent Psychiatry*. 2002; 41:530-537.
38. Klassen AF, Miller A, Fine S. Health-Related Quality of Life in Children and Adolescents Who Have a Diagnosis of Attention-Deficit/Hyperactivity Disorder. *Pediatrics*. 2004; 114:e541-e547.
39. Sukhodolsky DG, do Rosario-Campos MC, Scahill L, et al. Adaptive, Emotional, and Family Functioning of Children With Obsessive-Compulsive Disorder and Comorbid Attention Deficit Hyperactivity Disorder. *American Journal of Psychiatry*. 2005; 162:1125-1132.
40. Raina P, O'Donnell M, Rosenbaum P, et al. The Health and Well-Being of Caregivers of Children With Cerebral Palsy. *Pediatrics*. 2005, June; 115:e626-636.
41. Kim HHK, Viner-Brown SI, Garcia J. Children's Mental Health and Family Functioning in Rhode Island. *Pediatrics* . 2007, February; 119:S22-28.
42. Brannan AM, Heflinger CA. Caregiver, Child, Family, and Service System Contributors to Caregiver Strain in Two Child Mental Health Service Systems. *Journal of Behavioral Health Services and Research*. 2006; 33:408-422.
43. Busch SH, Barry CL. Does Private Insurance Adequately Protect Families of Children With Mental Health Disorders? *Pediatrics*. 2009; 124:S399-406.
44. Guevara JP, Mandell DS, Rostain AL, Zhao H, Hadley TR. National Estimates of Health Services Expenditures for Children With Behavioral Disorders: an Analysis of the Medical Expenditure Panel Survey. *Pediatrics*. 2003, December; 112:e440.
45. Moore, CG, Mink, M, Tompkins, M, Johnson, A, Hughley, S. *Mental Health Risk Factors, Unmet Needs, and Provider Availability for Rural Children*. Columbia, SC: South Carolina Rural Health Research Center; 2005.
46. Skinner AC, Slifkin RT. Rural/Urban Differences in Barriers to and Burden of Care for Children With Special Health Care Needs. *Journal of Rural Health*. 2007 Spring; 23:150-7.
47. Blumberg, SJ, Welch, EM, Chowdhury, SR, et al. *Design and Operation of the National Survey of Children With Special Health Care Needs, 2005-2006*. (Vital and Health Statistics 1(45)).: National Center for Health Statistics; 2008.
48. Bell-Ellison BA, Kromrey JD. *Alternatives for Analysis of Complex Sample Surveys: A Comparison of SAS, SUDAAN, and AM Software*. Paper 133-

2007. Poster session presented at the SAS Global Forum 2007; April 16-19, 2007; Orlando, FL. <http://www2.sas.com/proceedings/forum2007/133-2007.pdf>

49. Bethell CD, Read D, Blumberg SJ, Newacheck PW. What Is the Prevalence of Children With Special Health Care Needs? Toward an Understanding of Variations in Findings and Methods Across Three National Surveys. *Maternal and Child Health Journal*. 2008; 12:1-14.
50. Skinner AC, Slifkin RT, Mayer ML. The Effect of Rural Residence on Dental Unmet Need for Children With Special Health Care Needs. *Journal of Rural Health*. 2006 Winter; 22:36-42.
51. Costello EJ, Compton SN, Keeler G, Angold A. Relationships Between Poverty and Psychopathology: a Natural Experiment. *JAMA*. 2003 Oct 15; 290:2023-9.
52. Medicaid Benefits Database. Benefits by Service: Targeted Case Management. Kaiser Family Foundation; 2008.
53. Hill K, Freeman L, Yucel R, Kuhlthau K. Unmet Need Among Children With Special Health Care Needs in Massachusetts. *Maternal & Child Health Journal*. 2008; 12:650-661.
54. Kuhlthau K, Hill KS, Yucel R, Perrin JM. Financial Burden for Families of Children With Special Health Care Needs. *Maternal and Child Health Journal*. 2005; 9:207-218.

APPENDIX

Table 1:
**POPULATION ESTIMATES OF U.S. CHILDREN
 BY MENTAL HEALTH STATUS AND RESIDENCE**

| Residence | U.S. Children, Ages 0-17 | |
|---------------------|--|---|
| | Children with mental health problems, % | Children without mental health problems, % |
| Rural, Not Adjacent | 5.6 (n=229,405) | 94.4 (n=3,867,491) |
| Rural, Adjacent | 5.9 (n=470,692) | 94.1 (n=7,562,825) |
| Rural, Total | 5.8 (n=700,097) | 94.2 (n=11,430,316) |
| Urban | 5.3 (n=3,272,761) | 94.7 (n=58,116,963) |
| US, Total | 5.4 (n=3,972,858) | 94.6 (n=69,547,279) |

Rural-urban differences significant at $p \leq .01$.

Note: Due to rounding, totals may not equal 100 percent; n's are weighted.

Table 2:
SAMPLE CHARACTERISTICS OF
CHILDREN WITH MENTAL HEALTH PROBLEMS BY RESIDENCE

| Characteristics | Rural, Not Adjacent, % (n=2,009) | Rural, Adjacent, % (n=2,064) | Rural, Total, % (n=4,073) | Urban, Total, % (n=11,869) |
|--------------------------------------|---|---|--------------------------------------|---|
| Age of Child * | | | | |
| 5 or under | 8.8 | 6.9 | 7.5 | 6.6 |
| 6-11 | 44.3 | 41.6 | 42.5 | 39.6 |
| 12-17 | 46.9 | 51.5 | 50.0 | 53.8 |
| Gender* | | | | |
| Male | 64.6 | 61.2 | 62.3 | 65.6 |
| Female | 35.4 | 38.8 | 37.7 | 34.4 |
| Race/Ethnicity *** | | | | |
| White, Not Hispanic | 76.2 | 76.1 | 76.1 | 64.4 |
| Not White, Not Hispanic | 16.1 | 17.3 | 16.9 | 23.3 |
| Hispanic | 7.7 | 6.5 | 6.9 | 12.3 |
| Family Income *** | | | | |
| < 100% | 32.3 | 34.4 | 33.7 | 21.6 |
| 100-199% | 32.4 | 28.9 | 30.1 | 23.6 |
| 200% or more | 35.3 | 36.6 | 36.2 | 54.9 |
| Condition Severity | | | | |
| Mild | 33.2 | 33.2 | 33.2 | 34.9 |
| Moderate | 49.9 | 53.1 | 52.0 | 50.9 |
| Severe | 16.9 | 13.7 | 14.8 | 14.2 |
| Health Insurance Coverage *** | | | | |
| Uninsured | 4.4 | 4.0 | 4.1 | 4.2 |
| Private Coverage | 37.1 | 38.2 | 37.8 | 55.0 |
| Public Coverage | 58.5 | 57.8 | 58.0 | 40.8 |
| Region *** | | | | |
| Northeast | 6.1 | 12.1 | 10.2 | 18.7 |
| Midwest | 33.2 | 26.8 | 28.9 | 23.0 |
| South | 43.5 | 49.5 | 47.6 | 38.0 |
| West | 17.2 | 11.6 | 13.4 | 20.3 |
| Number of Adults in Household | | | | |
| One adult | 21.6 | 20.2 | 20.7 | 20.5 |
| Two or more adults | 78.4 | 79.8 | 79.3 | 79.5 |

Rural-urban differences significant at $p \leq .05$, * $p \leq .01$, ** $p \leq .001$.***

Note: Due to rounding, some characteristics may not total 100 percent.

Table 3:
PROBLEM SEVERITY AMONG
CHILDREN WITH MENTAL HEALTH PROBLEMS BY RESIDENCE

| Access to Care and Problem Severity | Rural, Not Adjacent, % (n=2,009) | Rural, Adjacent, % (n=2,064) | Rural, Total, % (n=4,073) | Urban, Total, % (n=11,869) |
|--|---|---|--------------------------------------|---------------------------------------|
| Receipt of MH care | | | | |
| Received any MH care | 74.2 | 60.9 | 65.4 | 68.0 |
| Received all needed MH care | 83.5 | 84.0 | 83.8 | 84.4 |
| Amount of time child affected by condition over past year * | | | | |
| Never / Sometimes | 64.5 | 63.5 | 63.8 | 67.2 |
| Usually / Always | 35.5 | 36.5 | 36.2 | 32.8 |
| How severely has condition affected child's ability to do things | | | | |
| A great deal | 24.5 | 25.4 | 25.1 | 25.9 |
| Some / very little | 75.5 | 74.6 | 74.9 | 74.1 |
| Stability of child's health care needs | | | | |
| Needs change all the time | 10.1 | 10.3 | 10.3 | 8.7 |
| Needs change infrequently or never | 89.9 | 89.7 | 89.7 | 91.3 |
| Difficulty with feeling anxious or depressed | 62.3 | 63.1 | 62.8 | 60.3 |
| Difficulty with behavior problems *** | 60.8 | 58.3 | 59.1 | 53.7 |
| Difficulty making and keeping friends | 40.3 | 40.0 | 40.1 | 38.5 |
| Severity of child's condition/problem | | | | |
| Minor | 33.2 | 33.2 | 33.2 | 34.9 |
| Moderate | 49.9 | 53.1 | 52.0 | 50.8 |
| Severe | 16.9 | 13.7 | 14.8 | 14.2 |

Rural-urban differences significant at $p \leq .05$, * $p \leq .01$, ** $p \leq .001$.***

Table 4:
IMPACT AMONG FAMILIES OF
CHILDREN WITH MENTAL HEALTH PROBLEMS BY RESIDENCE

| Family Impact | Rural, Not Adjacent, % (n=2,009) | Rural, Adjacent, % (n=2,064) | Rural, Total, % (n=4,073) | Urban, Total, % (n=11,869) |
|--|--|------------------------------------|---------------------------------|----------------------------------|
| Out-of-pocket costs | | | | |
| \$1,000 or more | 65.5 | 60.2 | 62.0 | 63.6 |
| Less than \$1,000 | 34.5 | 39.8 | 38.0 | 36.4 |
| Financial problems resulting from health condition | 26.5 | 22.1 | 23.5 | 24.8 |
| Need additional income to cover medical expenses | 24.2 | 20.4 | 21.6 | 21.9 |
| Stopped work to care for the child | 16.5 | 16.9 | 16.8 | 17.2 |
| Cut work hours to care for child * | 21.3 | 18.9 | 19.7 | 22.2 |
| Family provides health care at home for child *** | 47.7 | 46.9 | 47.2 | 41.0 |
| Hours per week spent by family providing care at home *** | | | | |
| Less than one hour | 30.0 | 29.8 | 29.9 | 31.9 |
| 1 – 5 Hours | 41.4 | 43.0 | 42.5 | 40.8 |
| 6 – 10 Hours | 10.2 | 8.7 | 9.2 | 9.4 |
| More than 10 Hours | 18.4 | 18.5 | 18.5 | 18.0 |
| Hours per week spent by family in coordinating care for child *** | | | | |
| Less than one hour | 38.8 | 42.8 | 41.4 | 44.6 |
| 1 – 5 Hours | 49.4 | 44.9 | 46.4 | 46.9 |
| 6 – 10 Hours | 6.7 | 6.7 | 6.7 | 4.4 |
| More than 10 Hours | 5.1 | 5.6 | 5.4 | 4.1 |
| Receipt of family mental health care regarding the child's condition | 76.0 | 81.3 | 79.2 | 80.0 |
| Receipt of family respite care | 51.8 | 47.6 | 49.3 | 44.7 |

Rural-urban differences significant at $p \leq .05$, * $p \leq .01$, ** $p \leq .001$.***

Table 5:
LOGISTIC REGRESSION PREDICTING PROBABILITY OF RECEIVING
ANY MENTAL HEALTH CARE FOR CHILDREN WITH MENTAL HEALTH PROBLEMS

| Control Variable | Simple Urban-Rural Model O.R. 95% C.I. | Urban, Rural Adjacent and Rural Non-Adjacent Model O.R. 95% C.I. |
|---------------------------|---|---|
| <u>Residence</u> | | |
| Urban | 1.0 | 1.0 |
| Rural | 0.84 (0.65, 1.09) | -- |
| Adjacent | -- | 0.77 (0.55, 1.07) |
| Non-Adjacent | -- | 0.99 (0.73, 1.34) |
| <u>Health Insurance</u> | | |
| Private | 1.0 | 1.0 |
| None | 2.34 (1.54, 3.57) | 2.35 (1.54, 3.58) |
| Public | 1.37 (1.03, 1.81) | 1.37 (1.04, 1.81) |
| <u>Age</u> | | |
| 0-12 | 1.0 | 1.0 |
| 13-17 | 1.34 (1.06, 1.70) | 1.34 (1.06, 1.70) |
| <u>Gender</u> | | |
| Female | 1.0 | 1.0 |
| Male | 0.83 (0.66, 1.05) | 0.83 (0.66, 1.05) |
| <u>Race / Ethnicity</u> | | |
| White | 1.0 | 1.0 |
| African American | 0.87 (0.64, 1.19) | 0.87 (0.64, 1.19) |
| Hispanic | 0.80 (0.54, 1.20) | 0.80 (0.54, 1.20) |
| <u>Condition Severity</u> | | |
| Mild | 1.0 | 1.0 |
| Moderate | 3.05 (2.29, 4.06) | 3.05 (2.30, 4.06) |
| Severe | 5.20 (3.67, 7.38) | 5.20 (3.66, 7.36) |
| <u>Region</u> | | |
| Northeast | 1.0 | 1.0 |
| Midwest | 0.92 (0.63, 1.35) | 0.92 (0.63, 1.34) |
| South | 0.97 (0.67, 1.41) | 0.97 (0.67, 1.40) |
| West | 1.27 (0.84, 1.91) | 1.26 (0.84, 1.90) |
| <u>Family Composition</u> | | |
| Two adults in household | 1.0 | 1.0 |
| One adult in household | 1.13 (0.87, 1.46) | 1.13 (0.87, 1.46) |

Bold indicates significance at $p \leq .05$.

Table 6:
LOGISTIC REGRESSION PREDICTING PROBABILITY OF RECEIVING
ALL NEEDED MENTAL HEALTH CARE FOR CHILDREN WITH MENTAL HEALTH PROBLEMS

| Control Variable | Simple Urban-Rural Model O.R. 95% C.I. | Urban, Rural Adjacent and Rural Non-Adjacent Model O.R. 95% C.I. |
|---------------------------|---|---|
| <u>Residence</u> | | |
| Urban | 1.0 | 1.0 |
| Rural | 0.81 (0.71, 0.92) | -- |
| Adjacent | -- | 0.80 (0.69, 0.93) |
| Non-Adjacent | -- | 0.82 (0.69, 0.97) |
| <u>Health Insurance</u> | | |
| Private | 1.0 | 1.0 |
| None | 0.40 (0.30, 0.53) | 0.40 (0.30, 0.53) |
| Public | 1.17 (1.04, 1.32) | 1.17 (1.04, 1.32) |
| <u>Age</u> | | |
| 0-12 | 1.0 | 1.0 |
| 13-17 | 1.23 (1.10, 1.38) | 1.23 (1.11, 1.38) |
| <u>Gender</u> | | |
| Female | 1.0 | 1.0 |
| Male | 0.87 (0.78, 0.97) | 0.87 (0.78, 0.97) |
| <u>Race / Ethnicity</u> | | |
| White | 1.0 | 1.0 |
| African American | 0.94 (0.81, 1.09) | 0.94 (0.81, 1.09) |
| Hispanic | 0.79 (0.64, 0.98) | 0.79 (0.64, 0.98) |
| <u>Condition Severity</u> | | |
| Mild | 1.0 | 1.0 |
| Moderate | 1.92 (1.70, 2.16) | 1.92 (1.70, 2.16) |
| Severe | 2.23 (1.86, 2.67) | 2.23 (1.86, 2.67) |
| <u>Region</u> | | |
| Northeast | 1.0 | 1.0 |
| Midwest | 0.87 (0.74, 1.02) | 0.87 (0.74, 1.02) |
| South | 0.71 (0.61, 0.83) | 0.71 (0.61, 0.83) |
| West | 0.88 (0.72, 1.07) | 0.88 (0.72, 1.07) |
| <u>Family Composition</u> | | |
| Two adults in household | 1.0 | 1.0 |
| One adult in household | 1.26 (1.10, 1.46) | 1.26 (1.10, 1.46) |

Bold indicates significance at $p \leq .05$.

Maine Rural Health Research Center Recent Working Papers

- WP44. Hartley, D., Gale, J., Leighton, A., & Bratesman, S. (2010). *Safety net activities of independent Rural Health Clinics*
- WP43. Gale, J., Shaw, B., Hartley, D., & Loux, S. (2010). *The provision of mental health services by Rural Health Clinics*
- WP42. Race, M., Yousefian, A., Lambert, D., & Hartley, D. (2009, September). *Mental health services in rural jails.*
- WP41. Lenardson, J., Race, M., & Gale, J.A. (2009, December). *Availability, characteristics, and role of detoxification services in rural areas.*
- WP40. Ziller, E., Anderson, N.J., Coburn, A.F., & Swartz, J. (2008, November). *Access to rural mental health services: Service use and out-of-pocket costs.*
- WP39. Lambert, D., Ziller, E., Lenardson, J. (2008). *Use of mental health services by rural children.*
- WP38. Morris, L., Loux, S.L., Ziller, E., Hartley, D. *Rural-urban differences in work patterns among adults with depressive symptoms.*
- WP37. Yousefian, A. Ziller, E., Swartz, J., & Hartley, D. (2008, January). *Active living for rural youth.*
- WP36. Loux, S. L., Hartley, D., Gale, J., & Yousefian, A. E. (2007, August). *Inpatient Psychiatric Units in small rural hospitals: A national survey.*
- WP35. Lenardson, J. D., & Gale, J. A. (2007, August). *Distribution of substance abuse treatment facilities across the rural-urban continuum.*
- WP34. Ziller, E.C, Coburn, A.F., Anderson, N., Loux, S. (2006). *Uninsured rural families.*
- WP33. Ziller E, Coburn, Yousefian AE. (2005). *Out-of-pocket health care spending and the rural underinsured.*
- WP32. Hartley D, Ziller E, Loux S, Gale J, Lambert D, Yousefian AE. (2005). *Mental health encounters in CAH ERs: A national survey.*
- WP31. Hartley D, Hart, V, Hanrahan N, Loux, S. (2004). *Are advanced practice psychiatric nurses a solution to rural mental health workforce shortages?*

Established in 1992, the Maine Rural Health Research Center draws on the multidisciplinary faculty, research resources and capacity of the Cutler Institute for Health and Social Policy within the Edmund S. Muskie School of Public Service, University of Southern Maine. Rural health is one of the primary areas of research and policy analysis within the Institute, and builds on the Institute's strong record of research, policy analysis, and policy development.

The mission of the Maine Rural Health Research Center is to inform health care policymaking and the delivery of rural health services through high quality, policy relevant research, policy analysis and technical assistance on rural health issues of regional and national significance. The Center is committed to enhancing policymaking and improving the delivery and financing of rural health services by effectively linking its research to the policy development process through appropriate dissemination strategies. The Center's portfolio of rural health services research addresses critical, policy relevant issues in health care access and financing, rural hospitals, primary care and behavioral health. The Center's core funding from the federal Office of Rural Health Policy is targeted to behavioral health.

Maine Rural Health Research Center
Muskie School of Public Service
University of Southern Maine
PO Box 9300
Portland, ME 04104-9300
207-780-4430
207-228-8138 (fax)
<http://muskie.usm.maine.edu/ihp/ruralhealth/>