Mental Health Risk Factors, Unmet Needs, and Provider Availability for Rural Children

South Carolina
Rural Health
Research Center

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Executive Summary

Rural children are not protected from biological and environmental factors that can cause mental health problems. However, few studies report specifically on mental health needs and the receipt of services by rural children. The study reported here uses the 2001 National Health Interview Survey, a nationally representative survey of the US population, to assess the prevalence of sub-clinical mental health problems among children, the degree to which children with potential problems use mental health and general providers for these problems, and the degree of unmet need. Possible mental health problems are identified based on the Strengths and Difficulties Questionnaire (SDQ), rather than reports of diagnosed problems, to control for potential differences in use of services and thus receipt of a clinical diagnosis. "Rural" is defined as living in a county outside a metropolitan statistical area. Because the proportion of children with potential mental health problems is small, leading to small sample sizes in the NHIS data set, mental health issues could not be studied across levels of rurality.

Key Findings

Prevalence of mental health difficulties and mental health care utilization
- Nearly 1 of every 4 rural children has a potential mental health problem as derived from the Strengths and Difficulties Questionnaire. 36% of rural African-American children were found to have at least one potential mental health problem.

- Rural African-American children had the highest prevalence of conduct problems (22.7%) and hyperactive behavior (15.5%) among rural children. No other race/ethnicity differences were detected based on scores for the total SDQ, emotional symptoms, peer relationship problems, or social behavior.

- Three percent of rural children, significantly more than urban children, had a parent who reported limitations in activities due to depression, anxiety or emotional problems.

- Age, sex, family income, parental education, living situation, health insurance status, and previously diagnosed developmental disorders were all associated with subclinical mental health problems in children.

- Less than 1 out of 5 parents of rural or urban children with sub-clinical mental health problems had seen or talked to a mental health professional about the child in the past 12 months.

- Characteristics associated with mental health care utilization were race/ethnicity, insurance status, level of education in the child's family, living situation, and previous diagnosis of a developmental disorder.

Availability of services

- Among roughly 2.9 million rural children with a potential mental health problem as defined by the SDQ score, two thirds (68.1%) are living in a HPSA-mental health designated area. This translates to over 1.9 million children with mental health problems living in areas where very minimal to no resources are available for their care.

- Four of every five (80%) rural children with potential mental health problems live in counties that do not have community mental health centers. However, in bivariate analysis, children living in counties with a community mental health center did not have significantly higher mental health care utilization than other children.

- The presence of mental health resources affects utilization. The proportion of rural children with a potential mental health problem who report a mental health visit in the past year is significantly higher in counties that have a psychiatrist (29.9%) than in counties that do not (17%; p = 0.0039). Similarly, children with potential mental health problems who live in counties with a hospital that has an alcohol and substance abuse treatment unit are more likely to report a visit in the past year than those that do not (41.1% v 21.5%, p=0107), as are children in counties with a hospital that has child psychiatry services (37.1% with versus 21.5% in counties with no unit; p = 0.0149).

Policy Recommendations

- Support for Practitioner Education and Training:
  - To enhance the number of mental health practitioners, states should consider including non-physician mental health specialists in efforts, such as loan repayment programs, that direct practitioners to underserved areas. Such specialists could include psychologists, clinical social workers, and mid-level providers.
  - To ensure that all potential practitioners are able to contribute effectively to mental health care in rural areas, states should examine licensing laws to ascertain whether these create unique barriers to rural practice. Requirements for supervision, for example, may need to be more creatively addressed for rural mid-level practitioners.
  - To improve the ability of general medical providers to assess and treat children with MH difficulties, Area Health Education Centers serving rural communities should incorporate behavioral health into training and continuing education opportunities provided for medical and nursing professionals.

- Improving Access to Care:
  - Community Mental Health Centers, in cooperation with schools, primary care systems, and other community-based organizations, should assess the degree to which their services effectively screen, assess and treat children. Where gaps are identified, collaborative means of pooling local resources to ensure that all children are reached should be designed and tested.
  - Parent education is needed to raise awareness of the long-term implications of children's mental health problems and to reduce perceived stigma associated with treatment for children. As recommended by the Subcommittee on Rural Issues to

the President's New Freedom Commission on Mental Health, the Substance Abuse and Mental Health Services Administration, working with other relevant entities within the US Department of Health and Human Services, is encouraged to form a public education collaborative that can inform rural parents of the importance of early intervention for children with potential mental health problems.

Research Recommendations

- <u>Methods for identifying rural children in need of mental health services</u>. Too little is known about how best to conduct screening and diagnosis in the rural setting. Universal screening approaches, implemented through schools, can minimize differences in access to clinical services associated with lack of insurance, low parental education, or cultural barriers. Research into the reliability, validity and acceptability of youth screening instruments is needed.

- <u>Methods for providing services with restricted practitioner availability</u>. Effective means of providing high quality, integrated mental health interventions using primary care practitioners, school based personnel, and other sources of care must be identified.

- <u>Methods for insuring quality of care and effective outcomes</u>. Both process and outcome measures appropriate to children's mental health care in rural settings must be developed.

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Chapter One – Introduction

Need for Research into Rural Children's Mental Health

Few studies conducted in the last ten years have explored national data on child mental health issues. Kataoka and associates, (2002), used three national datasets (the 1998 National Health Interview Survey, the 1997 National Survey of American Families, and the 1996-1997 Community Tracking Survey) to explore the mental health needs of American children. This study found a startling lack of mental health services for children and even greater lack of care for both Latino and uninsured children. It did not, however, explore rural-urban differences in mental health needs or access to care. Newacheck and co-authors (2000), using 1994-1995 data, found that insured children were less likely than uninsured children to report unmet needs for mental health care. The authors controlled for location of residence (rural/urban) but did not report the associations between unmet need and location residence.

A single-state study found that rural children are more protected than urban children from the risk factors associated with mental health disorders (Zahner, Jacobs, Freeman, and Trainor; 1993). This notion of protection may be outdated. Most of the studies on child mental health have focused primarily on diagnosable psychopathology and learning disabilities, while sub-clinical developmental problems that contribute to mental health problems have received little attention. A bias toward clinical diagnosis may misrepresent the prevalence of mental health problems in rural children, since rural children have reduced access to clinicians trained in mental health diagnosis. Other factors, such as limited personal privacy and lack of transportation may confound the shortage of behavioral care providers and further reduce accuracy of mental health diagnosis reporting.

The present study adds to the current knowledge regarding unmet mental health need among rural children in two ways: updating prior research with new data, and using a pre-validated measure of sub-clinical mental health needs. Halfon and Newacheck (1999) state that the National Health Interview Survey (NHIS) provides a useful and "untapped" resource for assessing disabling mental health conditions. In 2001, the NHIS measured the prevalence of sub-clinical mental health problems among children ages 4 to 17 using the Strengths and Difficulties Questionnaire (SDQ; NCHS, 2002; Goodman, 1997; Goodman, 1999; Goodman,

Scott, 1999). The SDQ records parental reports of child behavior across five psychological attributes or dimensions: emotional symptoms, conduct problems, hyperactive behavior, peer relationships, and abnormal social behavior. While the SDQ is not a clinical diagnostic tool, it is suggestive of potential problems that could benefit from professional assessment. In a sample of over 10,000 British 5-15 year olds, the SDQ showed satisfactory reliability through internal consistency (mean Cronbach $\alpha=0.05$), cross informant correlation (mean: 0.34) and retest stability after 4 to 6 months (mean: 0.62) (Goodman, 2001). Use of a screening tool is an improvement over recording diagnosed conditions, as children with limited access to mental health practitioners may not receive a diagnosis. In addition, cognitive disorders such as ADD/ADHD or learning disabilities are mainly detected in school environments (See Appendix E on the prevalence of cognitive disorders and mental health care utilization among US children). The SDQ assesses problems that may be detected at school but would be best addressed and managed by community mental health providers.

Study Objectives

Objective 1: To examine the prevalence of sub-clinical mental health problems in rural children, including emotional problems, conduct problems, hyperactive behavior, peer relationship difficulties, and lack of pro-social behavior.

Objective 2: To explore potential risk factors associated with mental health problems in American rural children, including age, race, gender, family income, insurance status, parental history of mental health problems, and parental education, and presence of developmental disorder.

Objective 3: To assess the influence of local mental health provider availability on healthcare provider contact, and to estimate the number of rural children needing mental health care who live in provider shortage areas.

Chapter Two: Results

Demographics: Life settings for rural children

Rural children compared to urban children

Rural children (ages 4-17) were more likely than their urban counterparts to be white (78.6% vs 60.5%). Rural children generally experience more economic disadvantage compared to urban children. They were more likely to live in families with incomes below $20,000 (20.5% vs 16.1%) and have public insurance or no health insurance (34.4% vs 29.0%). On the other hand, rural children were slightly more likely live in households with both parents (74.4% versus 70.5%; See Tables 1A and 1B).

Among rural children, minorities are more disadvantaged

Among rural children, white children were less likely than minority children to live in families with incomes less than $20,000 and with an adult with less than high school education (Table 1A). Between 37% and 47% of Hispanic and African American rural children surveyed by the NHIS lived in families with incomes less than $20,000, significantly higher than their urban counterparts. About 38% of Hispanic children lived in homes where the highest education of an adult was less than high school. Also, rural white children were more likely to have private health insurance and live in a household with both parents compared to children of minority race/ethnicity. Most rural minority children reside in the South or the West. The percentage of Hispanic children living in a single parent home was similar to that of white children (22.2% vs 19.1%, respectively), but African American children were over twice as likely to live in a single parent home (52.3%) and over three times as likely to live in a home without at least one parent (9.3%).

Objective 1: Prevalence of Mental Health Difficulties

Mental health problems were equally present among rural and urban children. Based on the SDQ scores, about 8% of children had emotional symptoms, over 10% abnormal conduct problems, about 9% hyperactive behavior, approximately 10% peer relationship problems, and 23-24% had at least one mental health problem (Figure 1). Small differences in prevalence between rural and urban children were not statistically significant.

> The Strengths and Difficulties Questionnaire looks at child behaviors across five dimensions. The total score summarizes across the five categories of activity examined. Each category has a cut-point indicating potential problems. A child can have problems in one area without having a high overall score.

Figure 1. Prevalence of mental health problems in rural and urban children (ages 4-17) as measured by the Strengths and Difficulties Questionnaire.
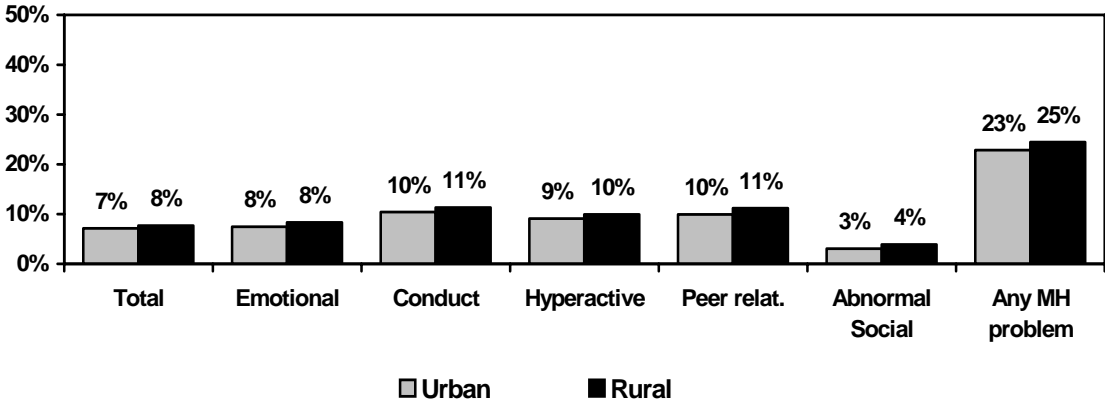
Three percent (3%) of rural children had a parent who reported limitations in activities due to depression, anxiety or emotional problems. This was significantly higher than the percentage among urban children (1.9%, p=0.0209; Tables 2A and 2B).

Minority Rural Children

Among rural children, the prevalence of abnormal total SDQ scores did not differ significantly by race/ethnicity (Tables 2A & 3A). Similarly, there were no significant race/ethnicity differences in abnormal emotional symptoms, peer relationships, or abnormal social behavior. Black children had the highest prevalence of parentally reported conduct

problems and hyperactive behavior compared to the other three groups (Figure 2, p=0.0069 and p=0.0447, respectively).

Figure 2. Percentage of rural children with potential problems, as determined by the Strengths and Difficulties Questionnaire, by race/ethnicity.
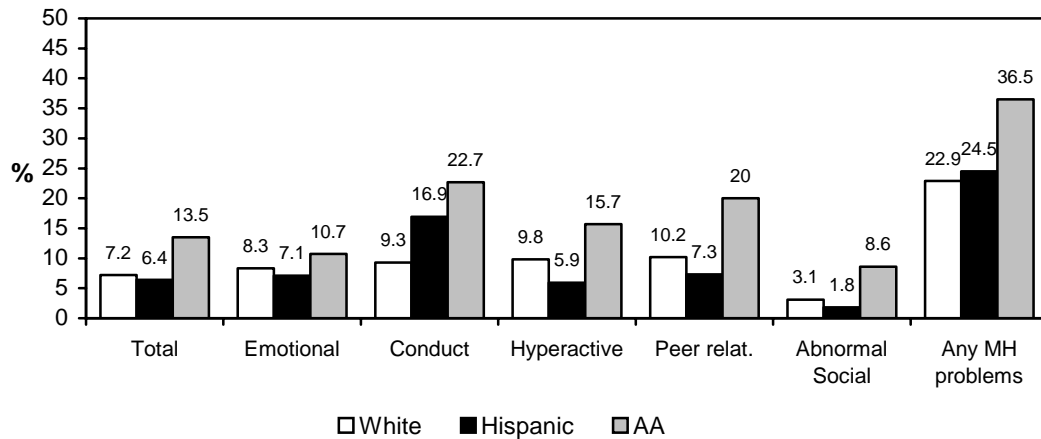
Note: Significant race/ethnicity differences for conduct problems (p=0.0069) and for hyperactive behavior (p=0.0447).

The proportion of non-Hispanic African American children with mental health problems was consistently higher across the domains of problems, although not all differences reached significance. Findings for rural Hispanic and rural non-Hispanic children of some other race (not shown in figure) must be interpreted cautiously, as most percentages lack statistical reliability due to small sample sizes.

Objective 2: Factors Associated with Mental Health Difficulties

Among Rural Children

Parents reported more general problems and hyperactive behavior among *younger children* (ages 4 – 14) than older children (15-17). *Male* children showed more problem behaviors than female children across all domains except emotional symptoms. Children living in *low income* families (below $20,000) had higher prevalence of problems across all categories, except abnormal social behavior, than children living in homes with incomes above $20,000. (See Table 3A for details.)

Figure 3. Percentage of rural children with SDQ problems, by family income
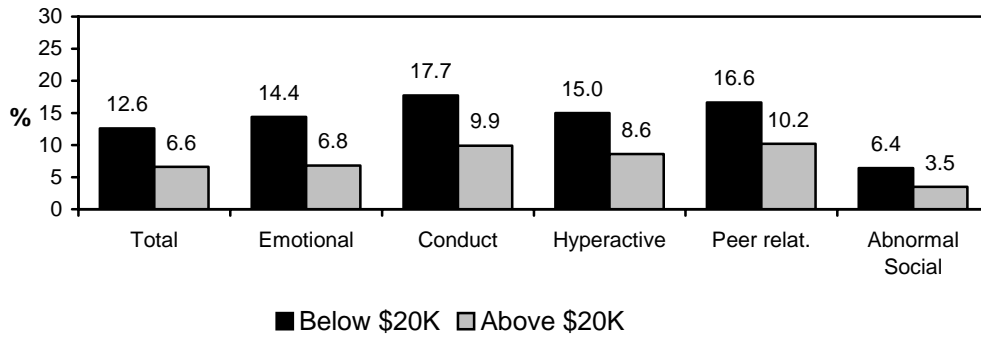
A higher proportion of children in families with *lower parental education* had emotional, conduct and peer relationship problems than children in families with education of high school or more. *Family structure*, defined by the number of parents in the home, was associated with all of the symptoms/behaviors and problems except abnormal social behavior. Children living with both parents in the home showed fewer symptoms and problems than children living in single parent homes or homes where neither parent was present.

Mental health problems determined by the SDQ were 3-4 times more prevalent among children with a *developmental disorder* (learning disability, Down's syndrome, autism, mental retardation, or ADD/ADHD) compared to those without. This finding could be anticipated, as some of the symptoms of developmental disorders overlap with the sub-clinical symptoms assessed by the SDQ.

Health insurance was associated with all domains of symptoms and problems among rural children. Across all domains, the proportion of children with problems and adverse behaviors was lower among those with private insurance than among children with public insurance. Children without health insurance coverage tended to fall somewhere between children with public health insurance and those with private health insurance coverage with regard to prevalence of mental health problems. The relationship between health insurance and mental health care utilization contains endogeneity, as public insurance is generally more generous for mental health care. It is likely that there is less endogeneity in the relationship between health insurance and the behavioral difficulties measured by the SDQ. Instead, health insurance may be related to behavioral problems because of the links between public insurance and low income. It is also possible that children with insurance receive more care to address their behavior problems, even before they become diagnosable illness.

Figure 4. Percentage of rural children with potential problems as determined by the Strengths and Difficulties Questionnaire, by highest education of parent/caretaker.
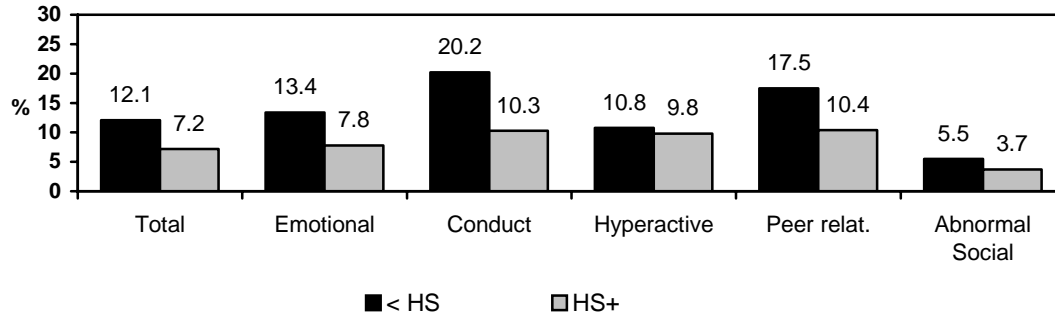
Among Urban Children

Patterns seen among demographic and socioeconomic factors and mental health problems in urban children were similar to those in rural children. In general, children of minority race/ethnicity were more likely to have mental health problems than non-Hispanic white children (general, emotional, conduct, and peer relationship). (See Table 3B for details.)

Objective 3: Mental Health Care Utilization and Provider Availability

Mental Health Care Utilization among Rural and Urban Children

Overall use of care for mental health issues by rural and urban children ages 4-17 is presented in Table 4. Across all children regardless of symptoms, 6 to 7% of parents have seen or talked to a mental health professional about the child in the past 12 months, and approximately 5% have spoken to a general doctor about the child's behavioral health. Utilization differed by race/ethnicity, with a lower proportion of urban minorities reporting care than urban whites. Higher proportions reported care among rural whites and African-Americans compared to Hispanics.   About 1 out of every 100 parents reported needing mental health care or counseling for their child but being unable to afford it.

Utilization and Unmet Need Among Children with Mental Health Difficulties

Figure 5, below, summarizes the proportion of parents of children with potential mental health problems who report that the child visited a mental health professional during the past

year. Among children with general mental health problems derived from the parent report SDQ, about one in three had visited a mental health professional in the past 12 months, with no rural / urban difference (Table 5).

Figure 5. Percentage of children with parents reporting the child has seen or talked to mental health professional in the past 12 months.
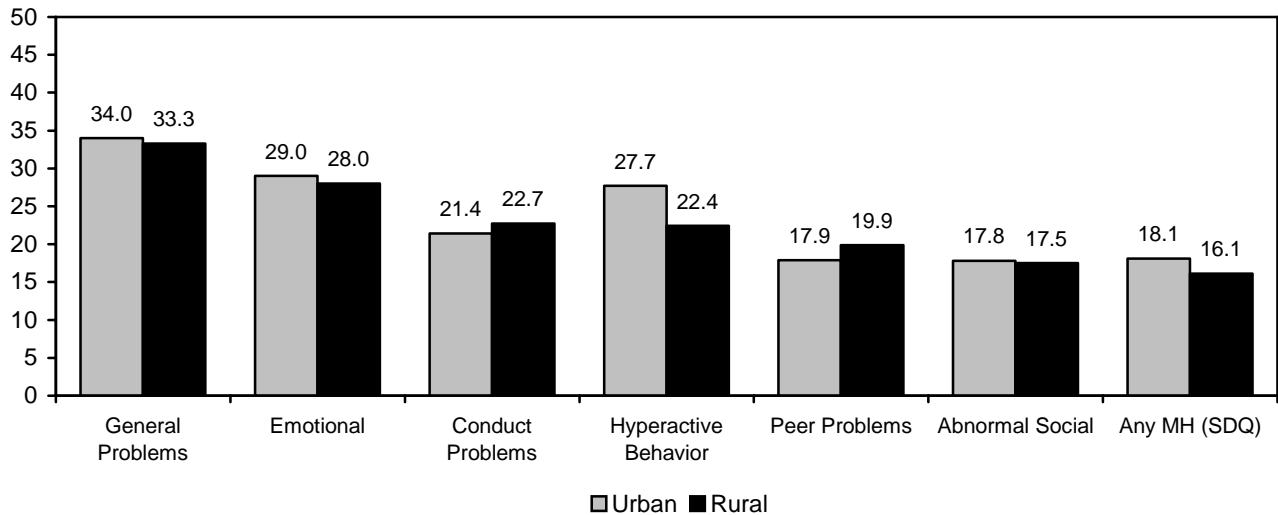
Between 2% and 9% of parents of children with potential mental health problems reported needing mental health care or counseling for the child but being unable to afford it (Table 5). The proportion of parents reporting that they could not afford care did not differ across rural and urban residence.

We used multivariable logistic regression to examine family factors affecting any utilization for mental health care among those children with a mental health problem as indicated by the SDQ. "Any" utilization for mental health care was defined as the parent reporting in the past 12 months having talked to a mental health professional or to a general physician about emotional or behavioral problems the child was having. Rural residence was not associated with differences in mental health utilization between rural and urban children (OR 1.06, CI 0.78-1.43; Table 6).

Among children with a potential mental health problem detected via the SDQ, significant predictors of utilization included race/ethnicity, health insurance coverage, level of education in family, living situation, and developmental disorder. African American (OR 0.64, CI1.45 – 0.91) children were less likely to utilize mental health services in the past 12 months than were white children. Uninsured children were less likely to report utilization (OR 0.58, CI 0.37 –

0.89) than were insured children, and those living in families where the highest level of education was less than high school were less likely to have received care (OR 0.52, CI 1.32 – 0.83) than those whose parents were better educated. Living situation also affected receipt of care, with children from single parent households (OR 1.52, CI 1.11 – 2.10) being more likely to report care than those from two parent households. Children with previously detected developmental disorders (OR 10.51, CI 8.02 – 13.78) were more likely to report mental health care utilization in the past 12 months than other children.

Provider Availability

On average, rural children live in counties with fewer general physicians and mental health care professionals per 100,000 people than do urban children (Table 7, Figure 6). Rural children were less likely to live in a county with a hospital or a community mental health center, but, as expected, more likely to live in a county with a rural health clinic compared to urban children.

Figure 6. Provider availability, general and mental health, in county of residence per 100,000 persons, rural and urban.
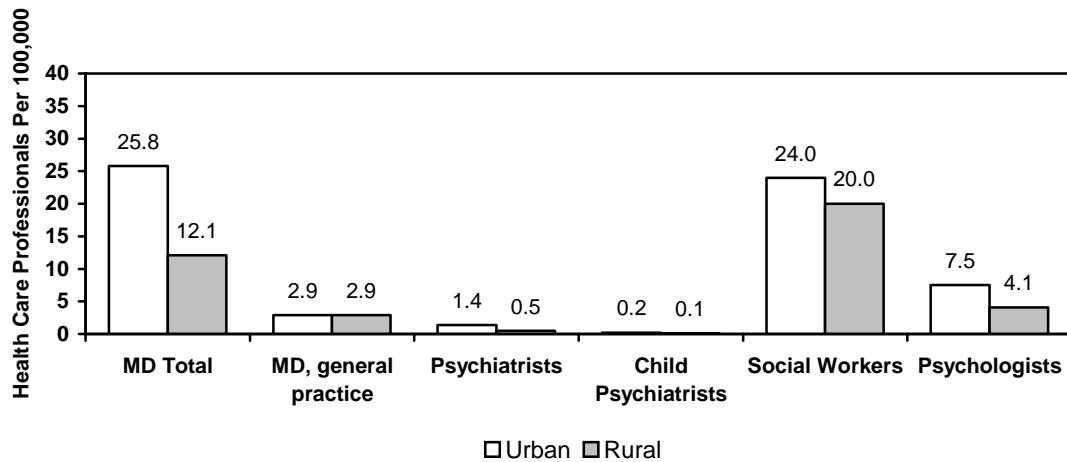
Rural children were more likely to live in counties designated as HPSA mental health areas than were urban children (67.8% and 39.1%, respectively).

Provider Availability among Rural Children with mental health Problems

Mental health care resources for children with mental health problems are shown in Tables 8 and 9. No statistical tests were conducted across groups because any one child could be classified into multiple categories. Of note, among roughly 2.9 million rural children with mental health problem as defined by the SDQ score, 68% are living in a HPSA mental health designated area. This translates to over 1.9 million children with mental health problems who live in areas where very minimal to no resources are available for their care (Table 9).

Figure 7. Mental health care resource availability among rural children with any mental health problem as determined by the SDQ.
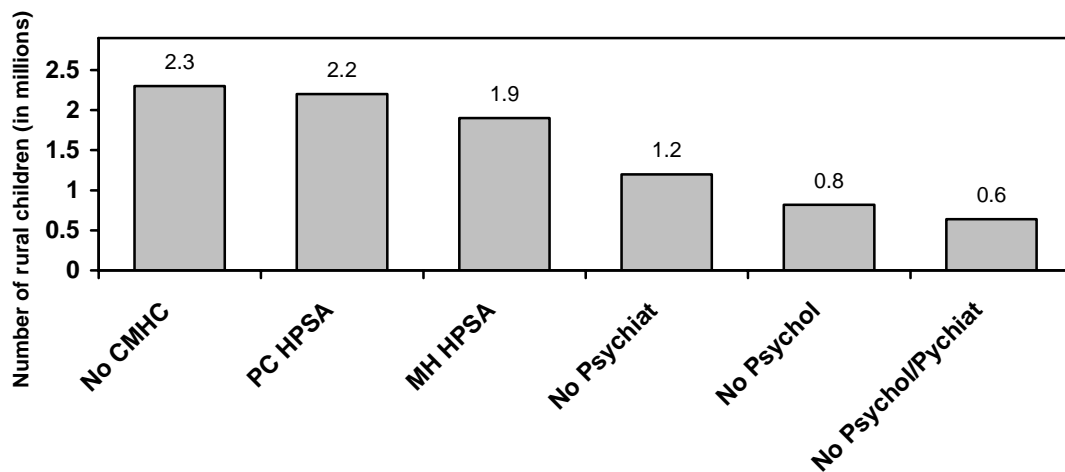
Mental Health Problems, Provider Availability, and Utilization

To answer objective 3, determining the degree to which provider availability is associated with provider contact, we grouped the child's county of residence into provider availability categories and looked for differences in mental health care utilization among the children with mental health problems. From this analysis, three mental health provider availability measures were significant and two were marginally significant at the 0.05 level. As physicians providing patient care increased in a county, the proportion of children with mental health problems reporting utilization in the past 12 months increased. For example, 33.9% of children living in areas with the highest quartile of physicians per population reported mental health care utilization compared to only 21.2% in the lowest quartile. Children in areas with psychiatrists (including child psychiatrists) were similarly more likely to report utilization (29.9% vs 17.4%). Also, children living in areas where hospitals provided alcohol and drug abuse outpatient

services or child/adolescent psychiatric services were more likely to report mental health care utilization than children living in areas where these services were not available.

Chapter Three: Conclusions and Policy Implications

Summary

Approximately 1 of every 5 rural children ages 4-17 years old had at least one potential mental health problem as determined by the Strengths and Difficulties questionnaire. Prevalence was similar across rural and urban children (25% and 23%), suggesting the absence of any protective effect for rural residence. Based on equal prevalence, rural children deserve equal access and comparable mental health resources (Walrath, et al., 2003).

The overall rate for the presence of any mental health problem was the same or greater for minority as for white children. For two types of problems, conduct disorder and hyperactivity, rates were higher among rural African American children than among rural white children. Earlier work looking at diagnosed mental disorder had found lower prevalence among minority youth (Richardson, DiGiuseppe, Garrison, Christakis, 2003); the present study, however, was based on a screening instrument. The prevalence of potential mental health problems was higher among children in lower income families, children without health insurance coverage, children with publicly funded health insurance coverage, and children not living with two parents in the household.

Among parents of rural children with a mental health problem, fewer than one in five had seen or talked to a mental health professional or a general practitioner in the past 12 months about the child's emotional health. Some of these children may be accessing mental health care from school-based services or child-welfare services which would not be detected in our analysis (Glied and Cuellar, 2004). The factors influencing utilization among US children with mental health problems in 2001 included race/ethnicity, health insurance coverage, family education, living situation, and diagnosis of some other developmental delay. Children without health

insurance were less likely to access any mental health care in the last year. This finding is consistent with previous research in health care utilization among children with special health care needs (Weller, Minkovitz, Anderson, 2003; Newacheck, McManus, Fox, Hung, Halfon, 2000).

Rural children have fewer mental health care services available per child than do children living in urban areas. Among rural children, utilization of mental health care services was positively associated with resource availability (psychiatrists, hospitals with alcohol & drug abuse outpatient services, hospitals with psychiatric services). We estimate that over 1.9 million rural children with mental health problems live in areas where very minimal to no resources are available for their care.

Shortages of mental health services may affect rural children indirectly, as well as with regard to their own problems. Rural children were significantly more likely to have a parent who had limitations in activities due to depression, anxiety or emotional problems than were urban children. While beyond the scope of the present study, the relative availability of mental health services for adults may affect the home environment of rural children, regardless of the child's mental health status.

Policy Recommendations

The President's New Freedom Commission on Mental Health explicitly called for programs that address children (New Freedom Commission, 2003). In rural communities, lack of insurance, lack of practitioners, and insufficient public awareness of existing programs may all contribute to a prevalence of potential under-treatment for mental health problems among rural children. Further, rural children are more likely to have parents who report disability due to

mental health problems, calling attention to a need for increased availability of adult as well as child mental health services if future disability among children is to be prevented.

<u>Support for Practitioner Education and Training</u>:

There is a severe shortage of child and adolescent psychiatrists, particularly in rural and poor, urban areas. The outlook on this shortage is not hopeful, although suggestions have been made to offset this lack of availability with other child mental health specialty providers such as psychologists and social workers (Glied, Cuellar, 2004; Kim, 2004). The American Academy of Child and Adolescent Psychiatry Task Force on Work Force Needs notes that training programs for this discipline have difficulty recruiting both residents and faculty. In rural areas, where mental health practitioners are limited, a broader range of providers may need to be tapped to ensure the availability of services. Primary care can be a very important setting for identifying and treating behavioral and emotional problems in children, which implies that rural physicians will need training or continuing medical education in mental / behavioral health (Horwitz, Kelleher, et al, 2002). The President's New Freedom Commission on Mental Health specifically noted the lack of practitioners in rural areas, as well as the need for collaborative efforts to address mental health problems.

Recommendations:

- To enhance the number of mental health practitioners, states should consider including non-physician mental health specialists in efforts, such as loan repayment programs, that direct practitioners to underserved areas. Such specialists could include psychologists, clinical social workers, and mid-level providers.

- To ensure that all potential practitioners are able to contribute effectively to mental health care in rural areas, states should examine licensing laws to ascertain whether these create unique barriers to rural practice. Requirements for supervision, for example, may need to be more creatively addressed for rural mid-level practitioners.

- To improve the ability of general medical providers to assess and treat children with MH difficulties, Area Health Education Centers serving rural communities should incorporate behavioral health into training and continuing education opportunities provided for medical and nursing professionals.

Improving Access to Care:

Improving access to quality care across rural communities is a key goal of the President's New Freedom Commission on Mental Health (*President's Commission*, 2003; Goal 3.2, p. 49). Detection of sub-clinical behavioral problems is most helpful if identified children are given access to effective therapies through community-based services that integrate the children's life settings (school and family) with mental health care (Glied, Cuellar, 2004). These types of services are designed with the knowledge that medical care does not encompass all mental health care needs. As documented in the present study, formal mental health care is largely not available for children in rural areas so these community-based providers may be the best alternative.

Mental health services provided through community mental health centers have documented effectiveness at reducing problems among children (Center, 1998). However, we found that living in a county with a community mental health center (CMHC) was *not* associated with increased utilization among children with a potential mental health disorder, although living

in a county that had a psychiatrist/child psychiatrist or a hospital with a child psychiatric unit was associated with higher utilization. The absence of an effect on children's utilization may stem from a focus on adult health on the part of CMHCs, from lack of coordination with schools and other providers of services to children, or alternatively from a lack of awareness on the part of parents that a low-cost mental health provider is available.

Multiple sources call attention to the need for the provision of mental health services in coordinated and integrated delivery systems (Anderson 2003).   How such systems are best implemented in rural communities, where the range of both institutions and practitioners is limited, is a ripe area for research. In particular, rural mental health care for children will require a definition of "system" that includes schools, the most likely setting in which children can be screened and, in some cases, receive treatment.   These systems must incorporate best clinical practices, wise management of scarce resources, and appropriate mechanisms for accountability.

Recommendations:

- Community Mental Health Centers, in cooperation with schools, primary care systems, and other community-based organizations, should assess the degree to which their services effectively screen, assess and treat children. Where gaps are identified, collaborative means of pooling local resources to ensure that all children are reached should be designed and tested.

- Parent education may be needed to raise awareness of the long-term implications of children's mental health problems and to reduce perceived stigma associated with treatment for children. As recommended by the Subcommittee on Rural Issues to the President's New Freedom Commission on Mental Health, the Substance Abuse and Mental Health Services Administration, working with other

relevant entities within the US Department of Health and Human Services, is

encouraged to form a public education collaborative that can inform rural parents

of the importance of early intervention for children with potential mental health

problems.

Research Recommendations

Methods for identifying rural children in need of mental health services. Since mental

health services are delivered in a more fragmented and dispersed environment in the rural setting

(Yuen, Gerdes, 1996; McCabe and Macnee, 2002), effective screening tools and diagnostic

instruments are especially important to identify children challenged by mental health problems.

Too little is known about how best to conduct screening and diagnosis in the rural setting, with

its special challenges. Universal screening approaches, implemented through schools, can

minimize differences in access to clinical services associated with lack of insurance, low parental

education, or cultural barriers. The analysis in the present research relied on a screening

questionnaire, yielding results that are broadly consistent with literature relying on more

sophisticated screening and assessment tools. If simple instruments can be adapted to screening

and assessment, they improve our capacity to identify youth in need and target the use of costly

resources. Research into the reliability, validity and acceptability of youth screening instruments

is needed.

Methods for providing services with restricted practitioner availability. Rural

communities are marked by the absence of specialized mental health practitioners. Effective

means of providing high quality, integrated mental health interventions using primary care

practitioners, school based personnel, and other sources of care must be identified.

Methods for insuring quality of care and effective outcomes. Both process and outcome

measures appropriate to children's mental health care in rural settings must be developed.

Process criteria that focus on provider qualifications, for example, would be unsuitable to an

environment that lacks many relevant disciplines. Appropriate outcome measures may range

from post-treatment scores for individual children through reductions in rates of juvenile drug

and violence offenses at the community level.

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Appendix A: Methods

Objectives of the study

The objectives of this study were the following:

- To examine the prevalence of sub-clinical mental health problems in rural children, including emotional problems, conduct problems, hyperactive behavior, peer relationship difficulties, and lack of abnormal social behavior.
- To explore potential risk factors associated with mental health problems in American rural children, including age, race, gender, family income, insurance status, and education.
- To assess the influence of local mental health provider availability on healthcare provider contact, and to estimate the number of rural children needing mental health care who live in provider shortage areas.

Study design and population.

This study employed a cross sectional design analyzing records from the 2001 National Health Interview Survey (NHIS). The population of interest was children ages 4 to 17.

The NHIS is an annual survey conducted for the National Center of Health Statistics (NCHS) by the U.S. Bureau of the Census and is the principal source of health information for the civilian, non-institutionalized population of the United States (NCHS, 2002). Information on child mental health status was obtained from the NHIS 2001 Sample Child file (NCHS, 2002). In 2001, as a part of a collaborative agreement with the National Institute of Mental Health (NImental health), the parent respondent version of the Strengths and Difficulties Questionnaire (SDQ) was added to the Sample Child Questionnaire to obtain information on children's mental health. The SDQ is a brief behavioral screening questionnaire for children ages 4 to 17 with additional questions on the duration and impact (on child and his/her family) of a problem. The Sample Child data set consists of health information for 13,579 sampled children ages 0 to 17. Additionally, the 2003 Area Resource File was linked to the children's information in the publicly available NHIS data set at the National Center for Health Statistics' Research Data Center. This allowed us to assess health care and mental health resource availability for children in rural areas.

Demographic Characteristics

Demographic characteristics of the child used for analysis included
- Race: Hispanic, Non-Hispanic White, Non-Hispanic Black, Non-Hispanic Other
- Residence: urban or rural, defined by living in Metropolitan Statistical Area (MSA) or non-MSA, respectively
- Age: grouped into 4-8, 9-11, 12-14, 15-17
- Sex: male or female

- Family income: above or below $20,000
- Health insurance status: private, public, or none
- Highest education level of responsible adult in household defined as having high school education or not
- Region of residence: Northeast, Midwest, South, and West
- Family structure: single parent, both parents, or neither
- Presence of developmental disorder: A child was classified as having a developmental disorder if a parent reported ever being told by a health professional that their child had one of the following conditions: a learning disability, Down's syndrome, autism, mental retardation, any other developmental delay or ADD/ADHD.

All these measures, except developmental disorders, coincide with those used in previous literature assessing prevalence of mental health conditions (Halfon and Newacheck, 1999) and utilization of medical and health related services among school age children and adolescents (Weller, Minkovitz, Anderson, 2003; Stein, Silver, 2003).

Measuring Mental Health Problems, Utilization, and Need

Sub-clinical mental health problems were defined using the Strengths and Difficulties Questionnaire (SDQ) included in the 2001 NHIS (NCHS, 2002; Goodman, 1997; Goodman, 1999; Goodman, Scott, 1999). The first part of the SDQ consists of 25 scale items (0=Not True, 1=Somewhat True, 2=Certainly True). These items can be divided into five subscales measuring the following psychological attributes or dimensions: emotional symptoms, conduct problems, hyperactive behavior, peer relationships, abnormal social behavior. A total score measuring general mental health was also created from the scales all the scales except abnormal social behavior. The 5 items for each attribute or dimension are listed below:

- o Emotional symptoms
  - Complains of headaches, stomach-aches, or sickness
  - Many worries, often seems worried
  - Often unhappy, depressed or tearful
  - Nervous or clingy in new situations
  - Many fears, easily scared
- o Conduct problems
  - Often has temper tantrums or a hot temper
  - Generally obedient, usually does what parents want (reverse score)
  - Often fights with other children or bullies
  - Often lies or cheats
  - Steals from home, school, or elsewhere
- o Hyperactive behavior
  - Restless, overactive, cannot stay still for long
  - Constantly fidgeting or squirming
  - Easily distracted, concentration wanders
  - Thinks things out before acting (reverse score)

- - Sees task through to the end, good attention span (reverse score)
  - o Peer relationships
    - - Rather solitary, tends to play alone
    - - Has at least one good friend (reverse score)
    - - Generally like by other children (reverse score)
    - - Picked on or bullied by other children
    - - Gets on better with adults than other children
  - o Abnormal social behavior
    - - Considerate of other people's feelings
    - - Shares readily with other children
    - - Helpful if someone is hurt, upset, or feeling ill
    - - Kind to younger children
    - - Often volunteers to help others

Scores on each subscale were dichotomized using the following cutpoints (indicating abnormal scores): total SDQ ≥ 17 (general mental health problems), emotional ≥ 5, conduct ≥ 4, hyperactive behavior ≥ 7, peer relationship ≥ 4, abnormal social behavior ≤ 4 (SDQ website, 2004). Having any mental health problem indicated by the SDQ was defined as having at least one of general, emotional, conduct, hyperactive, or peer relationship problems. The second part of the SDQ can be used to assess duration and impact of symptoms, but was not used for this study.

Mental health utilization and need in the past 12 months was measured using three questions:
1. During the past 12 months, have you [the parent] seen or talked to a mental health professional about your child? (Mental health professional includes psychiatrist, psychologist, psychiatric nurse, and clinical social worker.)
2. During the past 12 months, have you [the parent] needed mental health care or counseling for the child but was unable to afford it?
3. Did you [the parent] see or talk to a general doctor because of an emotional or behavioral problem that the child may have?

Any mental health care utilization was defined by responding "Yes" to either having seen or talked to a mental health professional or a general doctor about the child's emotional or behavioral problems.

Mental health care availability was measured from the 2003 ARF and linked to the child's county of residence. The measures used were
- o Number of all patient care MD's, general practice MD's, psychiatrists, child psychiatrists, psychologists, and social workers. These were converted to practitioner to population ratios.
- o Number of community mental health centers and mental health hospitals in the child's county. These were dichotomized into present or absent categories.
- o Availability of a hospital with psychiatric care, child wellness, alcohol and drug abuse outpatient services, teen outreach services, and child/adolescent psychiatric services. Each of these was dichotomized into present or absent categories.

o   Designation as primary care or mental health Health Professional Shortage Area.

Statistical Analysis.

Analysis was conducted in SAS-callable SUDAAN to take into consideration the complex sampling design employed by NHIS. Initial analysis was conducted at the SCRHRC using public-use data sets. Linkage of data from the NHIS to Area Resource File data by FIPS codes allowed us to assess associations between mental health needs and the availability of practitioners, and to estimate the number of rural children who require services but live in areas where they are not available. For confidentiality reasons, this analysis was carried out at the Research Data Center of the National Center for Health Statistics.

The major variable of interest was rural or urban residence defined as living in a non-Metropolitan Statistical Area (nonMSA) or not. Demographic variables of interest were compared for rural and urban children ages 4 to 17.

To meet the first study objective, the prevalence of each sub-clinical mental health problem was estimated for rural and urban children, by race/ethnicity. Differences in prevalence were tested using Chi-square tests of independence. The number of children having mental health problems was large enough in most cases across race/ethnicity groups to be considered statistically reliable (number of cases greater than 30), therefore we looked at the combined variable of residence and race/ethnicity and differences in prevalence of mental health problems.

To meet the second study objective, we tested the association of other potential risk factors with mental health problems (age, sex, family income, highest level of education of a parent/caretaker, living situation, insurance status, and region*)* in rural and urban children using Chi-square tests of independence.

For descriptive purposes we assessed mental health resource availability (ARF) for all 4-17 year-old rural and urban children stratified by race/ethnicity. We also looked at mental health resources for rural children with abnormal SDQ scores.

For the third objective, we investigated unmet need for mental health care in children identified as having mental health problems via the SDQ. For general description of utilization in all children, we compared the percentages of all rural and urban children having seen a mental health professional or a general doctor for emotional/behavioral problems in the past 12 months (any mental health utilization, Table 4). We assume children having abnormal scores on the SDQ need mental health care. We estimated the number of <u>rural</u> children with unmet mental health care need by looking only at children who need mental health care but live in health professional shortage areas in mental health (HPSA mental health). The criteria for an area being classified as a HPSA mental health are in Appendix C. We also used multiple logistic regression to investigate the effects of demographic variables (mentioned above) on accessing mental health care in the past 12 months among rural and urban children with mental health problems (Table 6).

Also for the third study objective, we determined if local mental health provider availability was associated with the healthcare provider contact in the past 12 months. This analysis compared the percentage of children reporting mental health care utilization in the past 12 months across levels of health care resource availability (Table 10). Race/ethnicity was not used in this analysis due to small sample sizes among rural minority children.

Appendix B: Selected Tables

Table 1A. Demographic characteristics of rural US children, ages 4-17 (NHIS 2001)

	Total %(SE)	NH White %(SE)	Hispanic %(SE)	NH Black %(SE)	NH Other %(SE)	p-values for testing reace/ethnicity
Unweighted count	1,912	1,367	267	221	57	---
Weighted population estimate	11,687,612	9,166,400	878,865	1,182,419	459,928	---
% Population	100%	78.6%	7.5%	10.3%	3.9%	p<0.0001
Age						
4-8	31.9 (1.3)	31.7 (1.4)	38.3 (3.6)	34.0 (3.4)	*19.4 (4.2)*	
9-11	22.8 (1.3)	22.7 (1.4)	19.9 (2.6)	26.3 (3.4)	*22.6 (9.0)*	
12-14	22.0 (1.0)	21.8 (1.2)	21.0 (2.5)	20.6 (2.4)	*31.5 (8.6)*	0.2107
15-17	23.3 (1.3)	23.8 (1.4)	20.8 (3.0)	19.2 (3.6)	*26.5 (6.7)*	
Testing rural/urban (Age)	0.0768	0.1675	0.9234	0.8353	0.0256	
Sex (Male)	50.7 (1.5)	50.7 (1.4)	51.3 (3.7)	50.8 (2.7)	48.8 (6.3)	
Testing rural/urban (Sex)	0.6816	0.6177	0.9360	0.9962	0.8665	
Family Income (below $20,000)	20.5 (1.3)	15.1 (1.4)	37.1 (2.7)	46.8 (4.1)	*28.1 (6.9)*	< 0.0001
Testing rural/urban (Income)	0.0020	< 0.0001	0.0092	0.0020	0.0513	
Health Insurance						
Private or Military	65.7 (1.6)	72.9 (1.6)	37.0 (3.4)	39.4 (4.2)	*41.9 (12.8)*	
Public	22.1 (1.2)	18.0 (1.2)	33.2 (3.5)	45.6 (3.9)	*22.1 (7.8)*	< 0.0001
None	12.3 (1.1)	9.0 (1.0)	29.8 (3.1)	15.1 (5.0)	*36.1 (12.0)*	
Testing rural/urban (Insurance)	0.0039	< 0.0001	0.2647	0.0080	0.1339	
Family Education (< HS)	10.0 (0.9)	6.3 (0.7)	38.1 (3.8)	18.2 (2.7)	*8.8 (4.3)*	< 0.0001
Testing rural/urban (Education)	0.0306	0.0294	0.6901	0.3757	0.5997	
Region of residence						
Northeast	11.7 (1.2)	14.0 (1.4)	*2.7 (1.6)*	*3.5 (2.0)*	*2.9 (2.9)*	
Midwest	30.3 (1.5)	35.9 (1.8)	*10.2 (3.6)*	*8.0 (2.2)*	*13.2 (6.2)*	
South	41.8 (1.8)	34.7 (1.9)	54.3 (8.0)	87.1 (3.1)	*44.3 (10.1)*	< 0.0001
West	16.2 (1.6)	15.4 (2.0)	32.9 (6.6)	*1.5 (0.9)*	*39.7 (10.2)*	
Testing rural/urban (Region)	< 0.0001	< 0.0001	0.0001	< 0.0001	0.0050	
Household composition	2.6 (0.3)	1.5 (0.3)	*2.3 (3.9)*	*9.8 (2.2)*	*4.9 (1.4)*	
Neither Parent	23.1 (1.2)	19.1 (1.3)	22.2 (3.9)	52.3 (3.8)	*29.8 (6.7)*	< 0.0001
Single parent	74.4 (1.3)	79.4 (1.3)	75.5 (4.2)	38.0 (3.8)	65.3 (6.4)	
Both parents						
Testing rural/urban (Household)	0.0225	0.7483	0.4389	0.6057	0.0001	

(all numbers presented in italics are based on unweighted n < 30 or have relative standard errors > 30%)

Table 1B. Demographic characteristics of urban US children 4-17 (NHIS 2001)

	Total %(SE)	NH White %(SE)	Hispanic %(SE)	NH Black %(SE)	NH Other %(SE)	p-values for testing reace/ethnicity
Unweighted count	8,455	4,161	2,446	1,497	351	---
Weighted population estimate	45,119,127	27,294,388	8,195,431	7,442,492	2,186,816	---
% Population	100%	60.5%	18.2%	16.4%	4.9%	
Age 4-8 9-11 12-14 15-17	35.5 (0.6) 22.5 (0.6) 21.3 (0.6) 20.7 (0.6)	35.1 (0.9) 22.1 (1.0) 21.6 (0.8) 21.2 (0.7)	38.9 (1.2) 21.3 (1.0) 20.6 (1.0) 19.1 (1.1)	32.9 (1.5) 24.0 (1.3) 22.0 (1.2) 21.1 (1.3)	37.5 (3.1) 25.8 (2.9) 17.7 (2.5) 19.0 (2.4)	0.0794
Sex (Male)	51.3 (.07)	51.7 (0.9)	51.0 (1.3)	50.8 (1.7)	49.9 (2.8)	0.9226
Family Income (below $20,000)	16.1 (0.5)	9.0 (0.6)	28.2 (1.1)	30.8 (1.4)	13.0 (1.9)	< 0.0001
Health Insurance Private or Military Public None	71.0 (0.7) 18.2 (0.5) 10.8 (0.4)	83.8 (0.7) 9.9 (0.6) 6.3 (0.4)	43.9 (1.5) 30.2 (1.1) 25.9 (1.3)	53.9 (1.8) 35.8 (1.7) 10.3 (1.0)	70.8 (2.9) 17.8 (2.3) 11.4 (2.2)	< 0.0001
Family Education (< HS)	12.2 (0.5)	4.5 (0.4)	36.4 (1.5)	15.5 (1.2)	6.4 (1.5)	< 0.0001
Region of residence Northeast Midwest South West	21.1 (0.5) 21.5 (0.7) 33.6 (0.7) 23.8 (0.7)	23.3 (0.7) 25.8 (0.9) 32.3 (1.0) 18.6 (0.8)	16.4 (1.1) 7.7 (0.8) 27.9 (1.4) 48.1 (1.6)	18.7 (1.2) 23.3 (1.7) 49.3 (2.0) 8.8 (0.9)	18.6 (2.5) 14.6 (2.4) 18.3 (2.3) 48.6 (3.4)	< 0.0001
Household composition Neither parents Single parent Both parents	2.7 (0.2) 26.8 (0.7) 70.5(0.7)	1.5 (0.2) 20.2 (0.7) 78.4 (0.7)	2.8 (0.4) 27.9 (1.1) 69.4 (1.1)	7.4 (0.7) 53.2 (1.6) 39.4 (1.6)	1.4 (0.5) 15.7 (2.4) 82.9 (2.4)	< 0.0001

Table 2A. Sub-clinical mental health problems of US rural children ages 4-17 (NHIS 2001, unweighted n=1912, weighted population=11,687,612).

	Total %(SE)	NH White %(SE)	Hispanic %(SE)	NH Black %(SE)	NH Other %(SE)	p-value for race/ethnicity
Unweighted count	1,876	1,347	256	219	54	---
Weighted population estimate	11,451,683	9,025,370	847,051	1,145,619	433,643	---
Abnormal score						
Total score	7.7 (0.7)	7.2 (0.8)	*6.4 (2.0)*	*13.5 (3.2)*	*5.2 (2.7)*	0.2849
Emotional symptoms	8.3 (0.7)	8.3 (0.9)	*7.1 (1.8)*	*10.7 (2.1)*	*5.7 (2.8)*	0.5227
Conduct problems	11.3 (1.0)	9.3 (1.1)	16.9 (3.5)	22.7 (2.8)[a]	*11.3 (5.2)*	0.0069
Hyperactive behavior	9.9 (0.9)	9.8 (0.9)	*5.9 (1.7)*	15.7 (4.2)	*4.0 (2.4)*	0.0447
Peer relationships	11.2 (0.9)	10.2 (1.0)	*7.3 (2.1)[b]*	20.0 (4.5)	*15.0 (6.6)*	0.1054
Abnormal social behavior	3.9 (0.6)	3.1 (0.5)	*1.8 (0.7)[c]*	*8.6 (3.6)*	*11.8 (5.1)*	0.0881
Parental limitations due to mental health	3.0 (0.5)	3.3 (0.5)[d]	*0.9 (0.6)*	*2.8 (1.1)*	*2.4 (2.4)*	0.1152
Developmental disorder[***]	11.8 (0.9)	12.6 (1.1)	*8.2 (2.2)*	*10.1 (2.2)*	*5.1 (3.0)*	0.0411
Any mental health problem[**]	24.5 (1.0)	22.9 (1.2)	24.5 (3.9)	36.5 (4.8)	25.7 (7.5)	0.1108
Any mental health problem[**] (SDQ) or developmental disorder	28.9 (1.3)	27.8 (1.4)	28.0 (4.2)	38.6 (4.3)	*28.7 (8.1)*	0.2084

[**]Any mental health problem is defined as having at least one of general, emotional, conduct, hyperactive, or peer relationship problems
[***]Ever told: learning disability, Down's syndrome, autism, mental retardation, any other developmental delay, or ADD/ADHD
[a] Rural urban comparison significant at p = 0.03.
[b] Rural urban comparison significant at p = 0.02.
[c] Rural urban comparison significant at p = 0.04.
[d] Rural urban comparison significant at p = 0.01.
(all numbers presented in italics are based on unweighted n < 30 or have relative standard errors > 30%)

Table 2B. Sub-clinical mental health problems of urban US urban children 4-17 (NHIS 2001, unweighted n=8453, weighted population=45,119,127)

	Total	NH White	Hispanic	NH Black	NH Other	p-value for race/ethnicity
Unweighted count	8,142	4,061	2,316	1,440	325	---
Weighted population estimate	43,620,230	26,720,505	7,739,898	7,115,161	2,044,666	---
Abnormal score	%(SE)	%(SE)	%(SE)	%(SE)	%(SE)	
Total Score	7.1 (0.3)	6.4 (0.4)	8.5 (0.8)	8.9 (1.0)	*5.8 (1.7)*	0.0314
Emotional symptoms	7.5 (0.3)	7.3 (0.4)	9.3 (0.7)	7.0 (0.8)	*3.9 (1.1)*	0.0006
Conduct problems	10.4 (0.4)	8.2 (0.5)	13.8 (0.9)	15.5 (1.2)	9.0 (2.3)	< 0.0001
Hyperactive behavior	9.1 (0.4)	8.9 (0.5)	8.4 (0.7)	11.1 (1.0)	8.0 (2.0)	0.1355
Peer relationships	9.9 (0.4)	8.2 (0.6)	13.8 (0.9)	12.5 (1.0)	9.5 (1.9)	< 0.0001
Abnormal social behavior	3.1 (0.3)	2.6 (0.3)	3.9 (0.6)	3.8 (0.7)	*4.8 (1.4)*	0.0894
Parental limitations due to mental health	1.9 (0.2)	1.8 (0.3)	1.3 (0.2)	2.6 (0.6)	*2.8 (1.1)*	0.0582
Developmental disorder[***]	12.7 (0.4)	14.1 (0.6)	8.9 (0.8)	13.1 (1.2)	*8.2 (2.1)*	<0.0001
Any mental health problem[**]	22.9 (0.5)	20.5 (0.7)	27.7 (1.2)	27.4 (1.3)	19.3 (2.6)	<0.0001
Any mental health problem[**] (SDQ) or developmental disorder?	28.5 (0.6)	27.1 (0.8)	30.7 (1.2)	33.2 (1.5)	22.7 (2.7)	<0.0001

[**]Any mental health problem is defined as having at least one of general, emotional, conduct, hyperactive, or peer relationship problems

[***]Ever told: learning disability, Down's syndrome, autism, mental retardation, any other developmental delay, or ADD/ADHD

(all numbers presented in italics are based on unweighted n < 30 or have relative standard errors > 30%)

Table 3A Factors associated with mental health problems (based on SDQ) among rural children (unweighted n=1912, weighted population=11,687,612).

	Total SDQ %(SE)	Emotional %(SE)	Conduct %(SE)	Hyperactive %(SE)	Peer relationships %(SE)	Abnormal social Behavior %(SE)
Race/ethnicity						
Hispanic	*6.4 (2.0)*	7.1 (1.8)	16.9 (3.5)	5.9 (1.7)	7.3 (2.1)	*1.8 (0.7)*
Non-Hispanic White	7.2 (0.8)	8.3 (0.9)	9.3 (1.1)	9.8 (0.9)	10.2 (1.0)	3.1 (0.5)
Non-Hispanic Black	*13.5 (3.2)*	10.7 (2.1)	22.7 (2.8)	15.7 (4.2)	20.0 (4.5)	*8.6 (3.6)*
Non-Hispanic Other	*5.2 (2.7)*	5.7 (2.8)	11.3 (5.2)	4.0 (2.4)	15.0 (6.6)	*11.8 (5.1)*
p-value	0.2849	0.5227	0.0069	0.0447	0.1054	0.0881
Age						
4-8	8.9 (1.4)	7.9 (1.4)	12.6 (1.9)	12.8 (1.7)	12.1 (1.5)	4.7 (0.9)
9-11	8.7 (1.8)	8.1 (1.6)	13.0 (2.1)	10.6 (1.8)	11.2 (2.0)	2.3 (0.9)
12-14	8.7 (1.7)	10.6 (1.7)	11.4 (1.9)	8.9 (1.7)	10.8 (1.8)	5.3 (1.5)
15-17	4.0 (0.9)	7.0 (1.6)	7.7 (1.3)	6.0 (1.2)	10.2 (1.8)	2.9 (1.1)
p-value	0.0135	0.3629	0.0686	0.0070	0.8289	0.1101
Sex						
Male	9.8 (1.2)	8.0 (0.9)	14.3 (1.6)	14.0 (1.4)	12.8 (1.3)	5.7 (0.8)
Female	5.4 (0.9)	8.6 (1.1)	8.2 (1.2)	5.6 (1.0)	9.4 (1.1)	2.1 (0.6)
p-value	0.0042	0.6901	0.0017	< 0.0001	0.0318	0.0001
Family Income						
Below $20,000	12.6 (2.2)	14.4 (2.3)	17.7 (2.7)	15.0 (2.6)	16.6 (2.2)	6.4 (1.7)
Above $20,000	6.6 (0.7)	6.8 (0.7)	9.9 (1.1)	8.6 (0.9)	10.2 (0.9)	3.5 (0.6)
p-value	0.0084	0.0014	0.0095	0.0237	0.0038	0.1110
Health Insurance						
Private or Military	5.0 (0.7)	5.3 (0.7)	8.4 (1.1)	8.2 (0.9)	8.5 (1.0)	2.7 (0.6)
Public	14.3 (2.2)	14.9 (2.3)	19.7 (2.3)	15.3 (2.4)	16.0 (2.0)	7.4 (1.7)
None	10.0 (2.5)	11.3 (2.6)	11.3 (2.5)	9.6 (2.4)	16.9 (3.4)	4.0 (1.5)
p-value	< 0.0001	< 0.0001	< 0.0001	0.0149	0.0001	0.0271
Parental Education						
< HS	12.1 (2.8)	13.4 (2.7)	20.0 (2.7)	10.8 (2.7)	17.5 (3.2)	5.5 (1.2)
HS or more	7.2 (0.7)	7.8 (0.8)	10.3 (0.9)	9.8 (0.9)	10.4 (0.9)	3.7 (0.7)
p-value	0.0639	0.0346	0.0074	0.6964	0.0205	0.2457
Region of residence						
Northeast	8.2 (2.2)	10.7 (2.8)	9.6 (2.8)	12.7 (2.2)	9.6 (2.4)	2.5 (1.2)

Midwest	6.3 (1.2)	6.1 (1.2)	8.4 (1.4)	8.9 (1.4)	8.5 (1.7)	3.2 (1.0)
South	9.3 (1.3)	9.2 (1.0)	13.8 (1.6)	10.4 (1.6)	14.9 (1.5)	5.0 (1.0)
West	5.6 (1.4)	8.5 (1.8)	11.6 (3.5)	8.0 (1.8)	7.7 (2.0)	3.5 (1.6)
p-value	0.1796	0.2144	0.0853	0.3406	0.0089	0.4136
Household composition						
Neither parent	*8.7 (4.2)*	*12.3 (5.3)*	*14.1 (4.5)*	*17.6 (6.4)*	*17.4 (6.2)*	*10.3 (5.4)*
Single parent	11.8 (1.8)	13.3 (2.0)	15.6 (2.0)	14.0 (2.0)	16.6 (2.2)	5.3 (1.3)
Both parents	6.3 (0.7)	6.7 (0.8)	9.8 (1.2)	8.3 (0.9)	9.3 (0.9)	3.3 (0.6)
p-value	0.0141	0.0036	0.0393	0.0255	0.0053	0.1554
Ever told child has: LD, Down's syndrome, autism, MR, any other develop. delay, or ADD/ADHD						
Yes	33.4 (3.9)	28.4 (3.2)	34.0 (4.3)	40.8 (4.4)	31.7 (3.8)	8.7 (2.0)
No	4.2 (0.5)	5.7 (0.6)	8.2 (0.9)	5.7 (0.7)	8.4 (0.8)	3.3 (0.7)
p-value	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0196

(all numbers presented in italics are based on unweighted n < 30 or have relative standard errors > 30%)

Table 3B Factors associated with mental health problems(based on SDQ) among urban children (unweighted n=8453, weighted population=45,119,127)

	Total SDQ %(SE)	Emotional %(SE)	Conduct %(SE)	Hyperactive %(SE)	Peer relationship %(SE)	Abnormal social Behavior %(SE)
Race/ethnicity						
Hispanic	8.5 (0.8)	9.3 (0.7)	13.8 (0.9)	8.4 (0.7)	13.8 (0.9)	3.9 (0.6)
Non-Hispanic White	6.4 (0.4)	7.3 (0.4)	8.2 (0.5)	8.9 (0.5)	8.2 (0.6)	2.6 (0.3)
Non-Hispanic Black	8.9 (1.0)	7.0 (0.8)	15.5 (1.2)	11.1 (1.0)	12.5 (1.0)	3.8 (0.7)
Non-Hispanic other	5.8 (1.7)	3.9 (1.1)	9.0 (2.3)	8.0 (2.0)	9.5 (1.9)	4.8 (1.4)
p-value	0.0314	0.006	< 0.0001	0.1355	<0.0001	0.0894
Age						
4-8	6.5 (0.5)	5.6 (0.5)	11.1 (0.6)	9.6 (0.7)	8.4 (0.6)	3.5 (0.5)
9-11	7.2 (0.7)	7.5 (0.7)	9.5 (0.9)	9.4 (0.8)	11.7 (0.9)	2.8 (0.5)
12-14	9.8 (0.8)	10.1 (0.9)	11.6 (0.9)	10.2 (0.9)	10.6 (1.0)	3.5 (0.6)
15-17	5.5 (0.6)	8.0 (0.8)	9.1 (0.8)	6.9 (0.7)	9.9 (0.8)	2.5 (0.5)
p-value	0.008	0.0001	0.0761	0.0044	0.0078	0.4181
Sex						
Male	8.5 (0.5)	6.4 (0.5)	11.9 (0.6)	12.2 (0.6)	10.8 (0.6)	4.0 (0.4)
Female	5.7 (0.4)	8.6 (0.5)	8.8 (0.5)	5.9 (0.4)	9.0 (0.5)	2.1 (0.3)
p-value	< 0.001	0.0012	0.0001	< 0.0001	0.0183	< 0.0001
Family Income						
Below $20,000	12.6 (0.1)	12.5 (1.1)	18.1 (1.2)	12.5 (1.1)	17.0 (1.1)	5.2 (0.8)
Above $20,000	6.3 (0.4)	6.6 (0.3)	8.9 (0.5)	8.6 (0.4)	8.7 (0.5)	2.7 (0.3)
p-value	< 0.0001	< 0.0001	< 0.001	0.0005	< 0.0001	0.0050
Health Insurance						
Private or military	4.8 (0.3)	5.8 (0.4)	6.9 (0.4)	7.7 (0.4)	7.5 (0.5)	2.2 (0.3)
Public	15.5 (1.1)	12.0 (0.9)	21.4 (1.3)	15.3 (1.1)	16.5 (1.2)	5.7 (0.9)
None	8.5 (1.2)	11.0 (1.6)	14.7 (1.5)	7.9 (1.1)	15.0 (1.3)	4.6 (0.9)
p-value	< 0.0001	<0.0001	< 0.001	< 0.0001	< 0.0001	0.001
Family Education						

< HS	11.2 (1.1)	11.0 (1.1)	20.2 (1.6)	10.5 (1.1)	15.8 (1.3)	6.3 (1.2)
> HS	6.6 (0.3)	7.0 (0.3)	9.1 (0.4)	9.0 (0.4)	9.2 (0.4)	2.7 (0.2)
p-value	< 0.0001	0.005	< 0.0001	0.2256	< 0.0001	0.0026
Region of Residence						
Northeast	5.9 (0.6)	6.5 (0.6)	8.1 (0.9)	7.0 (0.7)	9.2 (0.9)	1.9 (0.4)
Midwest	7.8 (0.8)	7.3 (0.7)	10.3 (0.9)	10.3 (0.9)	9.9 (1.2)	2.3 (0.5)
South	7.5 (0.5)	7.3 (0.5)	11.7 (0.7)	10.4 (0.7)	9.8 (0.6)	3.8 (0.5)
West	7.2 (0.7)	8.7 (0.7)	10.8 (1.0)	8.1 (0.8)	10.7 (0.8)	4.0 (0.5)
p-value	0.1765	0.1399	0.0149	0.0011	0.6685	0.0013
Household Composition						
Neither	13.8 (2.2)	14.0 (2.1)	18.3(2.9)	14.3 (2.9)	18.0 (2.5)	*8.5 (2.3)
Single parent	10.9 (0.8)	10.3 (0.8)	16.6 (0.9)	12.3 (0.8)	13.0 (0.8)	4.4 (0.6)
Both parents	5.5 (0.4)	6.2 (0.4)	7.8 (0.5)	7.8 (0.4)	8.5 (0.5)	2.4 (0.3)
p-value	< 0.0001	< 0.0001	< 0.0001	< 0.0001	<0.0001	0.006
Ever told child has: LD, Down's syndrome, autism, MR, any other develop. delay, or ADD/ADHD						
Yes	30.3 (1.6)	20.9 (1.4)	26.3 (1.7)	38.3 (1.7)	24.2 (1.7)	6.9 (1.0)
No	3.8 (0.3)	5.5 (0.3)	8.1 (0.4)	4.9 (0.3)	7.8 (0.4)	2.6 (0.3)
p-value	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

Table 4. Utilization of care for mental health reasons among US children 4-17 (NHIS 2001)

Rural	Total	Non-Hispanic White	Hispanic	Non-Hispanic Black	Non-Hispanic Other	p-value for race/ ethnicity
Unweighted count	1,912	1,367	267	221	57	---
Weighted population estimate	11,687,612	9,166,400	878,865	1,182,419	459,928	---
During past 12 months…	**%(SE)**	**%(SE)**	**%(SE)**	**%(SE)**	**%(SE)**	
Parent has seen or talked to mental health professional about child.	5.9 (0.7)	5.9 (0.8)	*1.5 (0.8)	*7.6 (2.4)	*9.0 (6.2)	0.0133
Test for rural vs urban	0.2209	0.0047	0.0148	0.1528	0.5751	
Parent needed mental health care or counseling for child but was unable to afford it.	1.2 (0.3)	*1.3 (0.4)	*0.4 (0.4)	*0.8 (0.6)	0.0 (0.0)	0.0276
Test for rural vs urban	0.6586	0.8626	0.1162	0.5440	0.2160	
Parent has seen or talked to a general doctor because of an emotional or behavioral problem that child may have	4.8 (0.6)	5.4 (0.7)	*2.1 (1.1)	*3.7 (1.5)	*2.0 (2.1)	0.0844
Test for rural vs urban	0.9028	0.8561	0.1342	0.4570	0.4056	
Urban	Total	Non-Hispanic White	Hispanic	Non-Hispanic Black	Non-Hispanic Other	p-value for race/ ethnicity
Unweighted count	8,455	4,161	2,446	1,497	351	---
Weighted population estimate	45,119,127	27,292,452	8,195,431	7,442,492	2,186,816	---
During past 12 months…	**%(SE)**	**%(SE)**	**%(SE)**	**%(SE)**	**%(SE)**	
Parent has seen or talked to mental health professional about child.	6.9 (0.3)	8.6 (0.5)	4.0 (0.4)	4.1 (0.5)	*5.3 (1.7)	< 0.0001
Parent needed mental health care or counseling for child but was unable to afford it.	1.3 (0.2)	1.4 (0.2)	1.2 (0.3)	*1.3 (0.4)	*0.6 (0.4)	0.4034
Parent has seen or talked to a general doctor because of an emotional or behavioral problem that child may have	4.9 (0.3)	5.2 (0.4)	3.9 (0.5)	4.9 (0.7)	*4.3 (1.6)	0.2640

Table 5. Utilization among rural and urban children with mental health problems.

Rural	General Problems (from SDQ score)	Emotional Problems	Conduct Problems	Hyper-active Behavior	Peer relation-ship Problems	Abnormal social Behavior Problems	Any mental health problem (SDQ)
Unweighted count	142	160	206	188	212	62	482
Weighted population estimate	876,28	956,343	1,293,910	1,130,297	1,277,346	445,963	2,861,485
	%(SE)	%(SE)	%(SE)	%(SE)	%(SE)	%(SE)	%(SE)
Parent has seen or talked to mental health professional about child.	33.3 (5.1)	28.0 (4.6)	22.7 (3.7)	22.4 (4.3)	19.9 (3.6)	17.5 (5.4)*	16.1 (2.0)
p-value rural/urban	0.9095	0.8507	0.7647	0.2596	0.6253	0.9628	0.3968
Parent needed mental health care or counseling for child but unable to afford it.	6.5 (2.7)*	7.2 (2.6)*	3.4 (1.5)*	2.2 (0.9)*	5.1 (2.0)*	0.7 (0.7)*	2.9 (1.0)*
p-value rural/urban	0.4482	0.6185	0.4840	0.0319	0.9523	0.1351	0.2704
Parent saw or talked to a general doctor because of an emotional or behavioral problem that child may have?	28.8 (4.9)	23.2 (3.8)*	17.4 (3.0)	22.1 (4.1)	16.6 (3.2)*	17.0 (5.0)*	14.3 (1.6)
p-value rural/urban	0.8506	0.7964	0.6887	0.4037	0.6512	0.3989	0.8732
Urban							
Unweighted count	609	668	874	779	876	236	2035
Weighted population estimate	3,115,014	3,255,002	4,551,069	3,986,301	4,337,291	1,359,847	10,331,133
	%(SE)	%(SE)	%(SE)	%(SE)	%(SE)	%(SE)	%(SE)
Parent has seen or talked to mental health professional about child.	34.0 (2.5)	29.0 (2.2)	21.4 (1.8)	27.7 (1.9)	17.9 (1.6)	17.8 (3.1)	18.1 (1.1)
Parent needed mental health care or counseling for child but unable to afford it.	8.9 (1.5)	8.6 (1.5)	4.6 (0.9)	5.2 (1.0)	5.2 (1.0)	3.2 (1.5)*	4.1 (0.6)
Parent saw or talked to general doctor because of an emotional or behavioral problem that child may have?	29.8 (2.4)	22.1 (2.0)	16.1 (1.6)	25.9 (2.1)	15.0 (1.5)	12.2 (2.6)*	14.6 (1.0)

Table 6. Factors associated with any mental health utilization among rural and urban children with any mental health problem[**] detected using the SDQ.

	With mental health problem (SDQ)	
	OR	95% CI
Rural	1.06	0.78, 1.43
p-value	0.7302	
Race/ethnicity		
Hispanic	0.67	0.45, 1.00
NH White	1.00	-----
NH Black	0.64	0.45, 0.91
NH Other	0.71	0.35, 1.43
p-value	0.0405	
Insurance		
Private	1.00	-----
Public	1.40	0.97, 2.02
Uninsured	0.58	0.37, 0.89
p-value	0.0022	
Family education		
< HS		
	0.52	0.32, 0.83
p-value	0.0064	
Living situation		
Neither parent	1.16	0.50, 2.69
Single parent	1.52	1.11, 2.10
Both parents	1.00	-----
p-value	0.0359	
Ever told child has: LD, Down's syndrome, autism, MR, any other develop. delay, or ADD/ADHD		
Yes	10.51	8.02, 13.78
No	1.00	-----
p-value	<0.0001	

[*]The following variables were also included in the model, but were not significant: age, sex of child, family income, and region.

[**]Any mental health problem is defined as having at least one of general, emotional, conduct, hyperactive, or peer relationship problems

Table 7. Mental health care availability in county of residence among rural and urban US children 4-17 (NHIS 2001).

Rural	Rural Total	Urban Total
Unweighted count	1,912	8,455
Weighted population estimate	11,687,612	45,119,127
Average practitioner/population ratio	Mean (SE)	Mean (SE)
MDs, Total Patient Care (Non Federal, 2001)	12.1 (0.79)	25.8 (0.79)
MDs, Total General Pract, Patient Care (NF, 2001)	2.9 (0.11)	2.9 (0.03)
Psychiatrists Patient Care (2001)	0.5 (0.05)	1.4 (0.04)
Child Psychiatrists Patient Care (2001)	0.1 (0.01)	0.2 (0.01)
Social workers (1990)	20.1 (0.69)	24.0 (0.19)
Psychologist (1990)	4.1 (0.33)	7.5 (0.10)
Presence of the following in the county of residence	% (SE)	% (SE)
Psychiatric Short Term Hospital (2001)	4.3 (1.7)	46.5 (1.2)
Short Term Community Hospital (2001)	88.8 (2.4)	98.1 (0.3)
Short Term AOHA Hospital (2001)	1.5 (0.9)	19.5 (0.8)
Rehabilitation Short Term Hospital (2001)	3.4 (1.6)	37.2 (1.1)
Children's Psych Short Term Hosp (2001)	0	3.2 (0.3)
Psychiatric LT Hosp (2001)	5.7 (2.0)	33.9 (1.1)
Rehabilitation LT Hosp (2001)	0.2 (0.17)	1.4 (0.25)
Community Mental Health Centers (2001)	18.8 (2.9)	56.5 (1.2)
Rural Health Clinic (2001)	43.8 (3.3)	26.9 (1.0)
Hosp with Psychiatric Care (2001)	33.0 (10.8)	82.8 (1.0)
Federally Qualified Health Center (2001)	33.4 (3.2)	69.3 (1.1)
Hosp with Child Wellness (2001)	20.00 (3.7)	69.1 (1.2)
Hosp with Alcohol and Drug Abuse Outpatient Services (2001)	15.6 (3.2)	69.2 (1.1)
Hosp with Teen Outreach Services (2001)	8.00 (2.0)	61.9 (1.2)
Hosp with Child/Adolescent Psychiatric Services (2001)	17.6 (3.3)	63.9 (1.1)
HPSA Primary Care (2001)	75.5 (3.4)	77.2 (0.9)
HPSA mental health (2001)	67.8 (3.6)	39.1 (1.2)

Table 8: Resource availability among rural children with mental health problems, NHIS respondent households.

Among rural children with……	General Problems (total SDQ score)	Emotional Problems	Conduct Problems	Hyper-active Problems	Peer relation-ships Problems	Abnormal social Behavior Problems	Any mental health problem (SDQ)
Unweighted count	142	160	206	188	212	62	482
Weighted population estimate	876,428	956,343	1,293,910	1,130,297	1,277,346	445,963	2,861,485
Average practitioner/population ratio (2001 unless noted)	Mean (SE)	Mean (SE)	Mean (SE)	Mean (SE)	Mean (SE)	Mean (SE)	Mean (SE)
MDs, Tot Pat Care (Non Fed)	11.9 (0.96)	13.7 (1.6)	12.2 (0.89)	12.0 (0.66)	11.4 (0.8)	9.3 (1.27)	12.2 (0.94)
MDs, Tot Gen Pract Pt Care (NF)	2.9 (0.16)	3.0 (0.17)	3.0 (0.15)	2.98 (0.14)	2.77 (0.13)	2.6 (0.28)	2.9 (0.11)
Psychiatrists Patient Care , Child Psychiatrists Patient Care	0.5 (0.09) 0.06 (0.02)	0.62 (0.12) 0.07 (0.02)	0.50 (0.08) 0.06 (0.01)	0.49 (0.06) 0.06 (0.01)	0.43 (0.07) 0.05 (0.01)	0.38 (0.09) 0.03 (0.01)	0.49 (0.06) 0.06 (0.01)
Social workers (1990)	20.5 (1.13)	20.6 (1.3)	20.3 (0.95)	20.5 (0.96)	20.5 (1.09)	18.9 (2.1)	20.21 (0.8)
Psychologist (1990)	4.1 (0.34)	5.0 (0.64)	3.66 (0.43)	4.2 (0.44)	4.0 (0.49)	3.3 (0.64)	4.0 (0.4)
Presence of the following in the county of residence (all 2001)	% (SE)	% (SE)	% (SE)	% (SE)	% (SE)	% (SE)	% (SE)
Psychiatric ST Hospital	6.4 (3.4)	15.0 (2.7)	7.4 (3.1)	5.2 (2.7)	5.0 (2.3)	5.6 (4.1)	3.8 (1.6)
ST Community Hospital	85.5 (3.3)	92.9 (2.1)	88.7 (2.9)	86.6 (3.5)	86.2 (3.4)	84.7 (6.5)	89.0 (2.4)
ST AOHA Hospital	2.1 (1.7)	2.6 (1.6)	3.0 (1.6)	3.1 (2.3)	1.7 (1.2)	1.4 (1.4)	2.6 (1.4)
Rehabilitation ST Hosp	2.3 (1.5)	5.9 (3.2)	2.4 (1.6)	1.5 (0.94)	3.1 (1.8)	1.4 (1.4)	3.7 (1.9)
Children's Psych ST Hosp	--	--	--	--	--	--	--
Psychiatric LT Hosp	4.0 (2.4)	4.4 (2.3)	4.7 (2.0)	4.0 (2.1)	2.9 (1.6)	3.9 (2.4)	3.8 (1.5)
Rehabilitation LT Hosp	--	--	--	--	--	--	--
Community mental health Center	15.6 (3.9)	19.9 (4.5)	25.1 (4.9)	12.7 (3.3)	14.8 (2.9)	15.3 (5.8)	19.5 (3.1)
Rural Health Clinic	44.7 (5.7)	42.5 (5.1)	44.7 (5.4)	45.4 (5.4)	43.1 (5.0)	48.1 (9.9)	45.0 (4.0)
Hosp with Psychiatric Care	31.2 (5.3)	37.9 (5.6)	32.5 (5.0)	34.5 (5.6)	34.4 (5.0)	21.2 (6.1)	33.7 (3.9)
Federally Qualified Health Center	29.3 (5.5)	34.6 (5.9)	29.9 (4.5)	31.6 (4.7)	34.2 (5.0)	39.2 (7.0)	33.3 (3.7)
Hosp with Child Wellness	17.7 (5.3)	26.0 (6.8)	16.6 (4.7)	15.3 (4.3)	19.3 (4.9)	15.1 (6.0)	19.1 (4.2)
Hosp with Alcohol and Drug Abuse Outpatient Services	16.2 (4.4)	21.7 (4.6)	17.2 (4.6)	12.5 (3.7)	17.6 (3.8)	18.8 (6.4)	15.7 (3.1)
Hosp with Teen Outreach Services	8.6 (3.0)	13.4 (3.2)	7.7 (2.2)	9.3 (2.9)	8.7 (3.6)	7.0 (4.1)	9.0 (2.2)
Hosp with Child/Adolescent Psychiatric Services	20.3 (5.2)	26.4 (6.1)	21.2 (5.0)	21.2 (4.7)	21.0 (5.3)	15.4 (5.4)	19.7 (3.9)
HPSA Primary Care	81.5 (4.8)	77.8 (4.9)	76.9 (4.8)	76.9 (4.8)	77.5 (5.0)	81.1 (6.7)	77.2 (3.7)
HPSA mental health	69.0 (5.8)	68.7 (6.2)	66.9 (5.1)	65.3 (5.2)	69.4 (5.4)	73.5 (6.8)	68.1 (4.1)

Table 9: Percentage of rural children with mental health problems (via SDQ) reporting mental health care utilization in the past 12 mths stratified by health care resource availability in the child's county of residence.

	% mental health care visit in past 12 months (SE)
Unweighted count	482
Weighted population estimate	2,861,485
All MD pop ratio quartile of county of residence	
0 to 6.3 per 100,000 (0-25%)	*21.2 (3.7)*
6.3 to 10.1 per 100,000 (25-50%)	*16.7 (3.4)*
10.1 to 16.1 per 100,000 (50-75%)	*25.6 (4.5)*
more than 16.1 per 100,000 (75-100%)	33.9 (5.2)
p-value	0.0557
All GP pop ratio quartile of county of residence	
0 to 1.9 per 100,000 (0-25%)	*21.6 (3.8)*
1.9 to 2.7 per 100,000 (25-50%)	*28.1 (4.2)*
2.7 to 3.7 per 100,000 (50-75%)	*21.1 (4.7)*
more than 3.7 per 100,000 (75-100%)	*27.9 (4.5)*
p-value	NS
Psychiatrists/Child Psychiatrist in county of residence	
Yes	29.9 (2.9)
No	17.4 (2.7)
p-value	0.0039
Psychologist in county of residence	
Yes	26.4 (2.3)
No	*18.0 (3.6)*
p-value	0.0618
Comm Mental Health Center in county of residence	
Yes	*19.5 (4.2)*
No	25.8 (2.5)
p-value	NS
FQHC in county of residence	
Yes	21.2 (2.8)
No	26.2 (2.8)
p-value	NS
Rural Health Clinic in county of residence	
Yes	22.5 (2.9)
No	26.2 (2.9)
p-value	NS
Hosp with Alcohol & Drug Abuse Outpt Services	
Yes	*41.1 (6.8)*
No	21.5 (2.2)
p-value	0.0107
Hosp with Child/Adolescent Psychiatric Services	
Yes	*37.1 (5.7)*
No	21.5 (2.2)
p-value	0.0149
County of residence is HPSA Primary Care	
Yes	24.7 (2.3)
No	*24.1 (4.6)*
p-value	NS
County of residence is HPSA mental health	
Yes	21.8 (2.4)
No	30.4 (4.2)
p-value	NS

Appendix C: Background on Children's Mental Health Issues

Prevalence

The 1999 MECA Study (Methodology for Epidemiology of Mental Disorders in Children and Adolescents), conducted by the National Institute of Mental Health, is one of the largest and most recent studies to estimate the prevalence of mental health problems in children. It found that nearly 21 percent of U.S. children between the ages of 9 and 17 had a diagnosable mental or addictive disorder associated with at least a minimum functional impairment level as rated by the Child Global Assessment Scale (see chart, Shaffer et al 1996), and almost half of these (11%, or an estimated 4 million youth) had significant functional impairments (U.S. Public Health Service 2000). Other overall mental health prevalence levels in children have been estimated nationally, using DSM criteria, at between 17.6% and 22% (Costello et al 1996) and 16% (Roberts et al 1998). The latter study further found that children with mental disorders tend to carry those disorders over into their adult lives. Nearly three quarters (74%) of 21 year olds with mental disorders were previously diagnosed with childhood mental disorders. In a single state survey, 21% of youth exhibited one or more DSM-IV psychiatric disorders within the last three months (U.S. Public Health Service 2000).

Children and adolescents age 9–17 with mental or addictive disorders, combined MECA sample, 6-month (current) prevalence*	
	(%)
Anxiety Disorders	13.0
Mood Disorders	6.2
Disruptive Disorders	10.3
Substance Use Disorders	2.0
Any Disorder	20.9

* Disorders include diagnosis-specific impairment and Child Global Assessment Scale = or < 70 (mild global impairment)
Source: Shaffer et al., 1996

As reported by Adelsheim (2002), "by 2020, childhood neuropsychiatric disorders will rise by over 50% internationally to become one of the five most common causes of morbidity, mortality, and disability." Adelsheim estimates that 9 to 13 percent of US children aged 3-17

years meet the definition of serious emotional disturbance, and an estimated 70% of those identified as such will receive the mental health treatment that their condition requires.

Risk Factors

Risk factors that contribute to the incidence of mental health problems in children and adolescents can be divided into biological factors and psychosocial experiences (U.S. Public Health Service 2000). As a whole, however, single risk factors do not have equal potency from one individual to the next. Kraemer et al (1997) have developed a framework of risk factors for psychiatric research that deals with causality and risk along these lines using a proposed standardized terminology and causality criteria.

Biological factors (caused by experience, injury, or genetics) have been implicated in many mental health disorders in youth populations (U.S. Public Health Service 2000), including pervasive developmental disorder (Piven & O'Leary 1997), autism (Piven 1997), schizophrenia (McClellan & Werry in press), social phobias (Pine 1997), obsessive-compulsive disorders (Leonard et al 1997), and Tourette's disorder (Leckman et al 1997). Genetic risk factors have been identified most commonly in autism, schizophrenia, bipolar disorder, and ADHD (National Institute of Mental Health 1998). Concerning biologic risk factors that are not genetically based, there is evidence to suggest that intrauterine exposure to alcohol or cigarette smoke (Nichols & Chen 1981), perinatal trauma (Whitaker et al 1997), environmental exposure to lead (Needleman et al 1990), malnutrition of pregnancy, traumatic brain injury, nonspecific forms of mental retardation, and specific chromosomal syndromes all contribute to the incidence of mental health problems in children and adolescent populations (U.S. Public Health Service 2000).

Psychosocial risk factors have been identified as contributing to child/adolescent mental health illness; many of these act through the relationship between children and their parents.

Economic hardship and related socioeconomic factors in families can indirectly put children at

risk through increased parental behavioral problems and child abuse (Dutton 1986, Link et al

1986, Wilson 1987, and Schorr 1988). Zann-Waxler et al (1990) have shown that deficiencies in

parental caregiving activities increase the probability of depression in those families. Childhood

attachment to parents is also an important factor in predicting childhood mental health disorders

(Rutter 1995, van IJzendoorn et al 1995); the quality of this parent-child bonding during the

infant-to-toddler years has been implicated as an influential predictor of childhood depression,

especially in abusive home environments (Toth and Cicchetti 1996), and also to conduct

disorders later in life (Sampson and Laub 1993). Maziade et al (1985) have suggested that clear

rules and their consistent enforcement in familial home environments are protective factors

against mental health problems, and likewise, Werner and Smith (1992) have shown that

children without this consistent disciplinary environment are at a greater risk for behavioral

problems later in life. Exposure to violence and violent behavior can cause stress-related mental

health problems (Jenkins and Bell 1997).

The parent-child relationship is an example of the interplay between biologic and

psychosocial risk factors for mental health disorders. Children are affected by characteristics

"inherited" from their parents in both a genetic and behavioral sense. Multiple studies have

shown a particularly strong association between childhood depression and a familial history of

depression. These studies have estimated that 20 to 50 percent of depressed children have a

family history of depression (Puig-Antich et al 1989, Todd et al 1993, Williamson et al 1995,

Kovacs, 1997b). Wiessman et al (1997) have shown that, in this situation, the genetic and

environmental influences have an interactive effect that results in increased risk. Other research

has shown that children of depressed parents are three times as likely to experience a depressive

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episode as compared to their peers with non-depressed parents (Birmaher 1996a and 1996b). Children are also at a greater risk of depression if both parents have had depression at some point in their lives, either parent had a depressive episode at a young age, or if a parent has had multiple episodes of depression (Merikangas et al 1988, Downey and Coyne 1990, McCracken 1992a and 1992b, Mufson et al 1992, Warner et al 1995, Wickramaratne and Weissman 1998). Parental depression has also been shown to increase the risk of anxiety and conduct disorders, as well as substance abuse (Downey and Coyne 1990, Weissman et al 1997, Wickramaratne and Weissman 1998).

Stressful life events have also been linked to childhood mental disorders (Garmezy 1983, Jensen et al 1991), and especially to childhood depression (Hammen 1988, Garber and Hilsman 1992). These events can include parental divorce or death of a family member, and have an increasing effect the earlier they occur in the life of the child. Other studies have confirmed the effect of stress on adverse outcomes, and multiple stressors have been shown to contribute in an interactive manner in child populations (Friday and Hage 1976, Loeber and Farrington 1998). In a study by McFarlane et al (2003), "children of abused mothers had significantly higher internalizing, externalizing, and total behavior problems." Also, Lai (1999) found that the exposure of adolescents to violence, as either a witness or a victim, was associated to higher self-reported psychiatric symptoms, higher levels of depression, and more self-esteem problems, as well as contributing to an increased level of violence committed by the adolescents. Studies by Slovak and Singer (2002) and Kilpatrick et al (2003) also support these findings.

Childhood abuse and neglect have associations to many behavioral problems in children. They are associated with mental health disorders such as post-traumatic stress disorder, conduct disorder, and ADHD (Famularo et al 1992), as well as depression (Kaufman 1991) and impaired

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social functioning (Salzinger et al 1993). Psychological forms of child abuse are thought to be more prevalent than physical abuse (Cicchetti and Carson 1989), at these forms in particular are strongly associated with depression, conduct disorders, and delinquent behavior (Kazdin et al 1985), and impair social and cognitive function levels (Smetana and Kelly 1989).

Service Use/Availability

According to estimates by Thomas and Holzer (1999), there are insufficient numbers of child psychiatrists and appropriately trained clinical child psychologists in the U.S., and of those currently practicing, there is an uneven distribution over geographic areas. These providers "were significantly more likely to be located in metropolitan counties and counties with a low percentage of children living in poverty." The authors concluded that "the shortage of child and adolescent psychiatrists is accentuated for nonmetropolitan areas and youth at greatest risk for mental disorders by the current pattern of distribution." Mohatt (2002) states that "more than 90% of all psychologists and psychiatrists (any specialty), and 80% of all MSW's (Master of Social Work degree holders) work exclusively in metropolitan areas." This contributes to more than 60% of rural Americans living in mental health professional shortage areas. However, a contradictory findings, of particular interest to child and adolescent mental health service provision, may be noted. Weist et al (2000) found that suburban and rural schools provided more mental health services than urban schools. Also, Glasser et al (1985) noted that a 458% increase in practicing psychotherapist populations resulted in no significant effect on suicide and violent death rates, both associated with mental health disorders, in a rural Connecticut area, though they do concede that poor utilization patterns may be the prime factor in their findings.

The four types of mental health treatment intervention are outpatient treatment, partial hospitalization/"day treatment," residential treatment centers, and inpatient treatment (U.S.

Public Health Service 2000). Both the utilization of these services and the research findings of these interventions tend to support a trend away from resource-intensive inpatient services towards more effective (by outcomes and by cost) outpatient-based services. Of all the available methods of treatment for mental health disorders in children and adolescents, outpatient psychotherapy is the most common (Burns et al 1998). Annually, it is estimated that 5 to 10 percent of children and their families use this service in the U.S. Contributing to the preference for outpatient treatments are third-party payer positions against partial hospitalization/day treatment (Kiser 1986). Pires (2002) describes a continuum of evidence of the efficacy of treatment services (based on Burns et al 1998) that ranges from case management and in-home services (being the most efficacious), to crisis services, mentoring, and family education (with intermediate efficacy), followed by inpatient, residential, and group home treatment (with the least amount of evidential support).

The rural mental health service delivery environment is very different from that of metropolitan areas. According to Mohatt (2002), the most common mental health crisis responder is a law enforcement officer and more than 65% of rural Americans get their mental health care from their primary care provider. Rural Americans tend to "enter care later, sicker, and with a higher severity" and resultant cost than their metropolitan counterparts. He states that although rural and urban areas have similar mental health prevalence levels, rural areas have larger problems with "accessibility, availability, and acceptability." On accessibility, he finds that "rural Americans travel further to provide and receive (mental health) services, are less likely to have mental health insurance benefits, and are less likely to recognize mental illnesses and understand their care options." On availability, he reiterates that "rural areas suffer from chronic shortages of mental health professionals," have very few mental health specialty services

available, and rural community mental health care centers are expected to serve limited

comprehensive services to populations with less ability to afford them. Finally, Mohatt sites that

few programs are available to train and retain competent mental health professionals to work in

rural areas.

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Appendix D: HPSA Mental Health Designation Criteria

This information comes from the website
http://bhpr.hrsa.gov/shortage/hpsacritmental.htm and was accessed on June 17, 2004.

Health Professional Shortage Area Mental Health Designation Criteria

RELEVANT EXCERPTS FROM 42 CODE OF FEDERAL REGULATIONS (CFR), CHAPTER 1, PART 5, Appendix C (October 1, 1993, pp. 34-48)
Criteria for Designation of Areas Having Shortages of Mental Health Professionals

Part I -- Geographic Areas
A. Criteria.
A geographic area will be designated as having a shortage of mental health professionals if the following four criteria are met:
1. The area is a rational area for the delivery of mental health services.
2. One of the following conditions prevails within the area:
(a) The area has --
(i) A population-to-core-mental-health-professional ratio greater than or equal to 6,000:1 and a population-to-psychiatrist ratio greater than or equal to 20,000:1, or
(ii) A population-to-core-professional ratio greater than or equal to 9,000:1, or
(iii) A population-to-psychiatrist ratio greater than or equal to 30,000:1;
(b) The area has unusually high needs for mental health services, and has --
(i) A population-to-core-mental-health-professional ratio greater than or equal to 4,500:1 and a population-to-psychiatrist ratio greater than or equal to 15,000:1, or
(ii) A population-to-core-professional ratio greater than or equal to 6,000:1, or
(iii) A population-to-psychiatrist ratio greater than or equal to 20,000:1;
3. Mental health professionals in contiguous areas are overutilized, excessively distant or inaccessible to residents of the area under consideration.
B. Methodology.
In determining whether an area meets the criteria established by paragraph A of this part, the following methodology will be used:
1. Rational Areas for the Delivery of Mental Health Services.
(a) The following areas will be considered rational areas for the delivery of mental health services:
(i) An established mental health catchment area, as designated in the State Mental Health Plan under the general criteria set forth in section 238 of the Community Mental Health Centers Act.
(ii) A portion of an established mental health catchment area whose population, because of topography, market and/or transportation patterns or other factors, has limited access to mental health resources in the rest of the catchment area, as measured generally by a travel time of greater than 40 minutes to these resources.
(iii) A county or metropolitan area which contains more than one mental health catchment area, where data are unavailable by individual catchment area.
(b) The following distances will be used as guidelines in determining distances corresponding to 40 minutes travel time:
(i) Under normal conditions with primary roads available: 25 miles.
(ii) In mountainous terrain or in areas with only secondary roads available: 20 miles.
(iii) In flat terrain or in areas connected by interstate highways: 30 miles.
Within inner portions of metropolitan areas, information on the public transportation system will be used to determine the distance corresponding to 40 minutes travel time.
2. Population Count.
The population count used will be the total permanent resident civilian population of the area, excluding inmates of institutions.
3. Counting of mental health professionals. (a) All non-Federal core mental health professionals (as defined below) providing mental health patient care (direct or other, including consultation and supervision) in ambulatory or other

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short-term care settings to residents of the area will be counted. Data on each type of core professional should be presented separately, in terms of the number of full-time-equivalent (FTE) practitioners of each type represented.

(b) Definitions:

(i) Core mental health professionals or core professionals includes those psychiatrists, clinical psychologists, clinical social workers, psychiatric nurse specialists, and marriage and family therapists who meet the definitions below.

(ii) Psychiatrist means a doctor of medicine (M.D.) or doctor of osteopathy (D.O.) who

(A) Is certified as a psychiatrist or child psychiatrist by the American Medical Specialities Board of Psychiatry and Neurology or by the American Osteopathic Board of Neurology and Psychiatry, or, if not certified, is "board-eligible" (i.e., has successfully completed an accredited program of graduate medical or osteopathic education in psychiatry or child psychiatry); and

(B) Practices patient care psychiatry or child psychiatry, and is licensed to do so, if required by the State of practice.

(iii) Clinical psychologist means an individual (normally with a doctorate in psychology) who is practicing as a clinical or counseling psychologist and is licensed or certified to do so by the State of practice; or, if licensure or certification is not required in the State of practice, an individual with a doctorate in psychology and two years of supervised clinical or counseling experience. (School psychologists are not included.)

(iv) Clinical social worker means an individual who --

(A) Is certified as a clinical social worker by the American Board of Examiners in Clinical Social Work, or is listed on the National Association of Social Workers' Clinical Register, or has a master's degree in social work and two years of supervised clinical experience; and

(B) Is licensed to practice as a social worker, if required by the State of practice.

(v) Psychiatric nurse specialist means a registered nurse (R.N.) who --

(A) Is certified by the American Nurses Association as a psychiatric and mental health clinical nurse specialist, or has a master's degree in nursing with a specialization in psychiatric/mental health and two years of supervised clinical experience; and

(B) Is licensed to practice as a psychiatric or mental health nurse specialist, if required by the State of practice.

(vi) Marriage and family therapist means an individual (normally with a master's or doctoral degree in marital and family therapy and at least two years of supervised clinical experience) who is practicing as a marital and family therapist and is licensed or certified to do so by the State of practice; or, if licensure or certification is not required by the State of practice, is eligible for clinical membership in the American Association for Marriage and Family Therapy.

(c) Practitioners who provide patient care to the population of an area only on a part-time basis (whether because they maintain another office elsewhere, spend some of their time providing services in a facility, are semi-retired, or operate a reduced practice for other reasons), will be counted on a partial basis through the use of full-time-equivalency calculations based on a 40-hour week. Every 4 hours (or 1/2 day) spent providing patient care services in ambulatory or inpatient settings will be counted as 0.1 FTE, and each practitioner providing patient care for 40 or more hours per week as 1.0 FTE. Hours spent on research, teaching, vocational or educational counseling, and social services unrelated to mental health will be excluded; if a practitioner is located wholly or partially outside the service area, only those services actually provided within the area are to be counted.

(d) In some cases, practitioners located within an area may not be accessible to the general population of the area under consideration. Practitioners working in restricted facilities will be included on an FTE basis based on time spent outside the facility. Examples of restricted facilities include correctional institutions, youth detention facilities, residential treatment centers for emotionally disturbed or mentally retarded children, school systems, and inpatient units of State or county mental hospitals.

(e) In cases where there are mental health facilities or institutions providing both inpatient and outpatient services, only those FTEs providing mental health services in outpatient units or other short-term care units will be counted.

(f) Adjustments for the following factors will also be made in computing the number of FTE providers:

(i) Practitioners in residency programs will be counted as 0.5 FTE.

(ii) Graduates of foreign schools who are not citizens or lawful permanent residents of the United States will be excluded from counts.

(iii) Those graduates of foreign schools who are citizens or lawful permanent residents of the United States, and practice in certain settings, but do not have unrestricted licenses to practice, will be counted on a full-time-equivalency basis up to a maximum of 0.5 FTE.

(g) Practitioners suspended for a period of 18 months or more under provisions of the Medicare-Medicaid Anti-Fraud and Abuse Act will not be counted.

4. Determination of unusually high needs for mental health services. An area will be considered to have unusually high needs for mental health services if one of the following criteria is met:

(a) 20 percent of the population (or of all households) in the area have incomes below the poverty level.

(b) The youth ratio, defined as the ratio of the number of children under 18 to the number of adults of ages 18 to 64, exceeds 0.6.

(c) The elderly ratio, defined as the ratio of the number of persons aged 65 and over to the number of adults of ages 18 to 64, exceeds 0.25.

(d) A high prevalence of alcoholism in the population, as indicated by prevalence data showing the area's alcoholism rates to be in the worst quartile of the nation, region, or State.

(e) A high degree of substance abuse in the area, as indicated by prevalence data showing the area's substance abuse to be in the worst quartile of the nation, region, or State.

5. Contiguous area considerations. Mental health professionals in areas contiguous to an area being considered for designation will be considered excessively distant, overutilized or inaccessible to the population of the area under consideration if one of the following conditions prevails in each contiguous area:

(a) Core mental health professionals in the contiguous area are more than 40 minutes travel time from the closest population center of the area being considered for designation (measured in accordance with paragraph B.1(b) of this part).

(b) The population-to-core-mental-health-professional ratio in the contiguous area is in excess of 3,000:1 and the population-to-psychiatrist ratio there is in excess of 10,000:1, indicating that core mental health professionals in the contiguous areas are overutilized and cannot be expected to help alleviate the shortage situation in the area for which designation is being considered. (If data on core mental health professionals other than psychiatrists are not available for the contiguous area, a population-to-psychiatrist ratio there in excess of 20,000:1 may be used to demonstrate overutilization.)

(c) Mental health professionals in contiguous areas are inaccessible to the population of the requested area due to geographic, cultural, language or other barriers or because of residency restrictions of programs or facilities providing such professionals.

Part II -- Population Groups

A. Criteria. Population groups within particular rational mental health service areas will be designated as having a mental health professional shortage if the following criteria are met:

1. Access barriers prevent the population group from using those core mental health professionals which are present in the area; and

2. One of the following conditions prevails:

(a) The ratio of the number of persons in the population group to the number of FTE core mental health professionals serving the population group is greater than or equal to 4,500:1 and the ratio of the number of persons in the population group to the number of FTE psychiatrists serving the population group is greater than or equal to 15,000:1; or,

(b) The ratio of the number of persons in the population group to the number of FTE core mental health professionals serving the population group is greater than or equal to 6,000:1; or,

(c) The ratio of the number of persons in the population group to the number of FTE psychiatrists serving the population group is greater than or equal to 20,000:1.