

PEDIATRICS®

**Access to Care for Children of Migratory Agricultural Workers: Factors
Associated With Unmet Need for Medical Care**
Andrea Weathers, Cynthia Minkovitz, Patricia O'Campo and Marie Diener-West
Pediatrics 2004;113;276-282
DOI: 10.1542/peds.113.4.e276

This information is current as of December 20, 2005

The online version of this article, along with updated information and services, is
located on the World Wide Web at:
<http://www.pediatrics.org/cgi/content/full/113/4/e276>

PEDIATRICS is the official journal of the American Academy of Pediatrics. A monthly publication, it has been published continuously since 1948. PEDIATRICS is owned, published, and trademarked by the American Academy of Pediatrics, 141 Northwest Point Boulevard, Elk Grove Village, Illinois, 60007. Copyright © 2004 by the American Academy of Pediatrics. All rights reserved. Print ISSN: 0031-4005. Online ISSN: 1098-4275.

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™



Access to Care for Children of Migratory Agricultural Workers: Factors Associated With Unmet Need for Medical Care

Andrea Weathers, MD, DrPH*; Cynthia Minkovitz, MD, MPP‡; Patricia O'Campo, PhD‡; and Marie Diener-West, PhD§

ABSTRACT. *Objective.* To assess the correlates of unmet need for medical care among migrant children.

Design and Setting. A cross-sectional household survey used multistage sampling to identify migrant families in eastern North Carolina.

Participants. Three hundred adult caretakers of 1 (per household) randomly selected child <13 years old.

Results. Fifty-three percent of the children had an unmet medical need. The most common reasons for unmet medical need were lack of transportation (80%) and lack of knowledge of where to go for care (20%). Unmet medical need was associated inversely with less than very good health (odds ratio [OR]: 0.31; 95% confidence interval [CI]: 0.16–0.61) and less than high school caretaker education (OR: 0.62; 95% CI: 0.39–0.98) and was associated directly with 1) having bed-days due to illness (OR: 2.46; 95% CI: 1.42–4.26), 2) lacking an annual well examination (OR: 1.89; 95% CI: 1.12–3.20), 3) transportation dependence (OR: 1.97; 95% CI: 1.24–3.13), 4) female gender (OR: 1.69; 95% CI: 1.07–2.67), 5) preschool age (OR: 2.24; 95% CI: 1.28–3.92), and 6) very high caretaker work pressure (OR: 5.01; 95% CI: 2.98–8.42). Adjustment using multiple logistic regression reveals unmet medical need to be independently associated with preschool age (OR: 2.08; 95% CI: 1.05–4.13) and very high caretaker pressure to work (OR: 5.93; 95% CI: 3.24–10.85). Of sampled children, 27% were preschool aged, and 40% had caretakers categorized with high work pressure.

Conclusions. Medical-access barriers among migrant children are largely nonfinancial. Preschool-aged migrant children disproportionately experience unmet medical need. Decreasing forgone care among migrant children will likely require a combination of individual, health-system, and labor-policy modifications. *Pediatrics* 2004;113:e276–e282. URL: <http://www.pediatrics.org/cgi/content/full/113/4/e276>; *transients, migrants, health services needs and demand, health-services accessibility, Hispanic Americans, child.*

ABBREVIATIONS. OR, odds ratio; WIC, Women, Infants, and Children; CI, confidence interval.

From the *Department of Maternal and Child Health, University of North Carolina, Chapel Hill, North Carolina; and Departments of ‡Population and Family Health Sciences and §Biostatistics, Johns Hopkins Bloomberg School of Public Health, Baltimore, Maryland.

Received for publication Nov 15, 2002; accepted Dec 1, 2003.

Address correspondence to Andrea Weathers, MD, DrPH, University of North Carolina School of Public Health, 402A Rosenau Hall, CB 7445, Chapel Hill, NC 27599-7445. E-mail: andrea.weathers@unc.edu
PEDIATRICS (ISSN 0031 4005). Copyright © 2004 by the American Academy of Pediatrics.

Access to care often is defined as the degree to which individuals are able to obtain needed health care.^{1–8} The inability to obtain needed health care is used to indicate unmet needs for care.⁹ A small and growing literature describes the prevalence and correlates of unmet need for health care among children.^{9–19} The prevalence of any unmet need for care among US children <18 years old is 7.3%⁹ and varies by the type of care. For example, the proportion of children reported to experience an unmet need for medical care is 1.6%, whereas 5.3% of children are reported to experience unmet need for dental care.⁹ Among all children, unmet need for care is consistently associated with poverty and a lack of insurance.^{9–12,14,15,17–19} Adjusted associations with unmet need for care among US children include 1) school age, 2) living in a single-parent household, 3) less than very good health status (including bed-days or activity limitation), and 3) lack of a usual source of care.⁹

Few studies examine the prevalence and correlates of unmet health needs among children categorized as ethnic/racial minorities. Although these studies reveal trends, several inconsistencies are evident. As compared with white (non-Latino) children, the prevalence of unmet health needs is generally higher among African American and Latino children.^{9,20–24} Moreover, Latino children have increased unadjusted odds of unmet need (odds ratio [OR]: 1.31; $P < .01$).⁹ After multivariable control, the association between unmet need and ethnic/racial category became insignificant,^{21,22,25} exhibited an inverse association,⁹ or persisted among Latino females, as compared with males.²¹ Similarly, the prevalence of unmet mental health needs is higher among African American, Latino, and Asian/Pacific Islander children, as compared with white (non-Latino) children,^{20,23} However, African American and Latino parents report fewer mental-health-access barriers.²³ These findings point to the need to characterize better “the influence of cultural factors on barrier endorsement”²³ and nontraditional access barriers.

One population of minority children for whom little is known regarding the prevalence and correlates of unmet health need is the children of migratory agricultural workers.^{26–29} Migrant farm workers are among the most socially, economically, and medically vulnerable populations in the United States. Migrant families migrate among farms, from state to state, and internationally to plant and harvest crops.

This migration has been conceptualized traditionally to occur across 3 "streams" or pathways: the eastern stream, the midwestern stream, and the western stream.³⁰ Although largely of Latino ethnicity, this population is culturally diverse and includes African Americans, Native Americans, Asians, whites, and immigrants from the Caribbean.³¹⁻³³ The vulnerability of Latino migrant children to forego care may be increased, as compared with nonmigrant Latinos, due to greater geographic isolation and mobility, subsistence-level incomes, inadequate housing, vulnerable immigration status, nontraditional work hours, harmful work environments (including exposure to pesticides), and exclusion from protective labor legislation.³³⁻³⁶

High proportions of migrant children experience unmet medical need. A recent study reported that 53% of sampled migrant children had an unmet medical need.³⁷ This proportion is 24 times that of US children overall (2.2%), 29 times that of US (non-Latino) white children (1.8%), 20 times that of non-Latino black children (2.7%), and 15 to 16 times that of Mexican American (3.5%) and Latino children overall (3.4%).³⁸ The proportion of unmet medical need among the sampled migrant children also is 7 times that of the combined proportion of unmet need for a variety of different types of health care among US children (7.3%).⁹ This recent study³⁷ did not characterize children with an unmet medical need (who may be both users and nonusers of health services). Another recent study, of largely US-born children in migrant Head Start centers (at the US-Mexico border), reported no association between insurance status and unmet health needs.³⁹ Characterization of those migrant children likely to forego needed care should inform program planning and outreach efforts.

This analysis characterizes migrant children with unmet medical need and examines the independent associations of foreign birth and insurance status with unmet medical need while controlling for confounders. The Behavioral Model for Vulnerable Populations⁴⁰ guided covariate selection. An expansion of the Behavioral Model of Health Services Use,⁴¹ this model recognizes the role of indicators of migration to health-services use outcomes. The hypotheses tested are that 1) children with unmet medical need will report less favorably on predisposing factors and resource possession but will have greater need for care, and 2) foreign child birth and insurance possession will be independently associated with unmet medical need after adjustment for known confounders. These independent associations are expected because of anticipated socioeconomic differences, including mobility, between the 2 groups.

METHODS

Data are from a cross-sectional, household survey of 300 migrant families in 4 counties in eastern North Carolina. These 4 counties have high levels of agricultural activity. Each county had a health facility; all had a county health department, 3 had a hospital with an emergency department, and 2 had a migrant/community health center. Migrant/community health centers pro-

vide comprehensive and culturally responsive medical and outreach services to migrant and seasonal farm workers.

A multistage sampling procedure was used. The North Carolina Migrant Education Program's school-based lists provided the sample frame. This program has served the educational and outreach needs of migratory children for >20 years. The extensive geographic and individual outreach of this agency (to families, farmers, camps, service agencies [health, social services, and employment], schools, and retail agencies) make it a comprehensive sampling frame within which to identify addresses at which migratory families with children are known to live. One hundred addresses per county were identified randomly from 3 of the 4 counties by using the random-number-generator function of a handheld calculator. No list was available for the fourth county; the interviewer was instructed to sample several noncontiguous locations across the county.

Before interview, households were screened for the presence of migrant workers according to the definition: "an individual whose principal employment is in agriculture on a seasonal basis, who has been so employed within the last 24 months, and who establishes for the purpose of such employment a temporary abode."^{42,43} A single child <13 years old per family was selected randomly as the unit of analysis, using the "last-birth-date" method of selection.⁴⁴ After informed consent was obtained in either Spanish or English, the adult caretaker who knew the most about the selected child was interviewed.

A 40-item questionnaire was developed for face-to-face interviews. Questions allowed only multiple-choice responses, including the categories of "don't know" and "other." In several cases, validated questions from the 1997 National Health Interview Survey³⁷ and the 1999 National Agricultural Workers Survey³¹ were used. The survey questionnaire was translated into Spanish and then subsequently and independently translated back into English by professionals skilled in survey and document translation for Spanish speakers in general, and migrant workers specifically (Bilingual Communications, Inc, Cary, NC; www.bicomms.citysearch.com). The content and syntax of each survey question were informed both by focus group and pretest input from Latina migrant mothers. All participants chose to be interviewed in Spanish.

Data collection occurred over a 2½-week period (August 9, 1999 through August 26, 1999) in "peak harvest season," during which the highest numbers of migrant workers are in North Carolina. Bilingual outreach workers affiliated with migrant health centers in the study counties and who had both prior qualitative and quantitative survey experience with farm workers interviewed the participants. The interviewers received a 4-hour structured training session and were blinded to the study's hypotheses. Interviews were conducted during morning, afternoon, or evening hours. After interview completion, respondents were remunerated with either a phone card to Mexico or a grocery voucher, both of \$10 in value. The study was approved by the Committee on Human Research of the Johns Hopkins Bloomberg School of Public Health (Baltimore, MD) and the Institutional Review Board of the University of North Carolina (Chapel Hill, NC).

Of 313 caretakers approached, the caretakers of 300 children (96%) were interviewed. All listed addresses were residences for migratory agricultural workers with children. The minimum study power was 0.90 for a 20% effect size and $\alpha = .05$. Missing data were encountered in 11 (4%) items. Three percent of items were reported as either "don't know" (6 entries) or had partial responses (4 entries). No imputation was performed for missing items; however, imputation was performed for "don't-know" or partial responses. Results were robust with and without imputation.

Measurement and Coding

The dependent variable is unmet need for medical care. Based on caretaker reports and structured similarly to a validated 1997 National Health Interview Survey³⁷ question, unmet medical need is operationalized by inquiry about the number of times over the past year that the caretaker felt that the child needed medical care but could not receive it. Focus-group input from Latina migrant mothers revealed that it was necessary to emphasize that their opinion was sought. Without this emphasis, the determination of need would be inferred to originate with the physician.

The 2 primary independent variables are the child's country of birth (non-US-born versus US-born) and the child's general health status. Variables were recoded before analysis. Health status was operationalized by the caretaker's perception of the child's general health over the past year as excellent, very good, good, fair, or poor. Health status was dichotomized as less than very good health (good/fair/poor) versus very good/excellent health. Analysis using fair/poor annual health as a separate category was unstable (6 children with fair health and 1 with poor health). Other need variables included 1) child bed-days (the number of days spent in bed for more than half a day due to illness or injury) over the past 3 months, 2) >1 and >3 years since the last routine health screen, and 3) >1 year since the last dental examination.

Enabling resources included 1) self-reported caretaker English proficiency (very good and well versus poor and not at all), 2) interpreter availability for medical visits (no versus yes), 3) transportation dependence (yes [public or none] versus no [own or borrowed automobile]), 4) any family member using the Women, Infants, and Children (WIC) program (no versus yes), 5) child health insurance coverage of any kind over the past 3 months (no versus yes), and 6) income at last paycheck from all workers in the family if received in the past 2 weeks (<\$500 versus \geq \$500). Child sociodemographic variables included gender, age (\leq 3 years, >3 through 6 years, and >6 through 12 years), length of stay at current address (<6 months versus \geq 6 months), and mobility (number of address changes over the past year). Caretakers reported the level of ease or difficulty in taking time off from work for the child's medical appointments (very difficult versus difficult/easy/very easy/no work), educational level (not a high school graduate versus high school graduate or greater), cumulative US length of stay (\leq 5 years versus >5 years), and self-reported current immigration status (undocumented versus documented or citizen). The 6-month cutoff for length of stay at the current address captures the in-migration of farm workers to North Carolina for planting and harvesting.

Statistical Procedures

Descriptive statistics summarized family, caretaker, and child characteristics. χ^2 statistics tested associations of dependent and independent categorical variables. Two sample *t* tests analyzed the bivariate associations of the dependent variable with normally distributed interval covariates; for nonnormal interval covariates, nonparametric testing was performed. Ordinal covariates were tested for trends. Correlation matrices assessed multicollinearity ($r \geq .8$) among all variables. Retention or exclusion of multicollinear variables was based on their relevance to the research questions. For all analyses, the significance level was $P < .05$.

All covariate groups were entered sequentially into multivariable logistic regression models in the following order: US birth, health insurance, health status, enabling resource variables, and sociodemographic variables. The order of covariate entry reflects the desire to examine policy-mutable primary variables of interest (foreign birth and health insurance) while controlling for potential confounders. Because little is known about the correlates of unmet medical need among migrant workers' children, this exploratory analysis reflects operationalization of the theoretical model rather than an attempt to develop a parsimonious model. Therefore, all nonmulticollinear variables regardless of significance level were included. Each model's goodness of fit was tested with the Hosmer-Lemeshow χ^2 .⁴⁵ Cold-deck imputation, using central tendency values from the data, was performed for "don't-know" responses.⁴⁶ Stata 7⁴⁷ was used for data analysis.

RESULTS

Descriptive analyses from this data set have been reported.³⁷ Caretakers were largely foreign-born (99%) mothers (79%) who had <5 years cumulative stay in the US (mean 3.6 years). Two fifths (40%) of caretakers were categorized as having very high pressure to work. The children were largely foreign-born (Mexico: 62%; Guatemala: 5%; Honduras: 1%; and Colombia/Canada/Puerto Rico: each <1%). The following age distribution was reported: \leq 3 years (23%), >3 through 6 years old (27%), and >6 through

12 years old (50%). The majority of children lacked insurance (73%) and never or rarely had an interpreter available for medical appointments (65%). Despite high proportions of children reported by their caretakers to be in excellent (20%) or very good health (64%) over the past year, 1) just over one third (34%) of the children were reported to have never had a well-child examination, 2) the last well-child examination for slightly more than one half (51%) of the children was reported to be \geq 3 years ago, 3) almost four fifths (79%) were reported to have never had a dental examination, and 4) 53% of the sampled children were reported to have had an unmet need for medical care over the past year. Additionally, 181 children (60%) had made \geq 2 moves in the past year. Reported housing included mobile homes (52%), single or multifamily homes (34%), and barracks-type camps (14%).

Children categorized as having less than very good health were 69% (OR: 0.31; 95% confidence interval [CI]: 0.16–0.61) less likely to have had an unmet medical need (Table 1). Other correlates of foregone medical care include the experience of any bed-days due to illness over the past year, lack of a well-child examination over the past year, and lack of a dental examination for >1 year (including never having had a dental examination). Among enabling resources tested, only transportation dependence was associated with unmet medical need (OR: 1.97; 95% CI: 1.24–3.13). Female gender, preschool age, and high caretaker work pressure were directly associated with unmet medical need; however, lack of completion of high school among caretakers was inversely associated with unmet medical need. Among children with an unmet medical need, the most frequently cited reasons were a lack of transportation (80%) and a lack of knowledge of where to go for care (20%) (Table 2). Of the 219 persons reporting a very difficult or difficult ability to leave work for a child's medical care, the reason identified for 175 (80%) was fear of job loss (data not shown).

In multivariable logistic regression analysis, the inverse association between need for care and unmet need was significant after adjusting for foreign birth (OR: 0.30; 95% CI: 0.14–0.60 in model 1; Table 3). This association remained significant after adjustment for enabling resources; in this model, being dependent on others for transportation nearly doubled the odds of unmet need (OR: 1.93; 95% CI: 1.13–3.29 in model 2; Table 3). After inclusion of sociodemographic factors in the final model, only preschool age (OR: 2.08; 95% CI: 1.05–4.13) and very high caretaker pressure to work (OR: 5.93; 95% CI: 3.24–10.85) revealed independent adjusted associations with unmet medical need (model 3 in Table 3). Because insurance coverage was multicollinear with foreign birth of the child ($r = .8$), separate analyses were performed by using insurance status rather than foreign birth in models 1 through 3, which yielded comparable results. The results of these multivariable logistic regression models also were robust in models for which child health status was categorized as excellent versus less than excellent health; the only exception was observed in model 3 in which

TABLE 1. Unadjusted Associations With Unmet Medical Need Among Migrant Latino Children

	Unmet Need		OR	95% CI
	Yes (<i>n</i> = 160)	No (<i>n</i> = 140)		
Country of birth				
Foreign-born child	71%	67%	1.18	0.72–1.92
Need for care indicators				
Less than very good annual health status*	9%	24%	0.31	0.16–0.61
Bed-days, past year*	34%	17%	2.46	1.42–4.26
No well check, past year†	80%	68%	1.89	1.12–3.20
>3 years since last well check	53%	49%	1.16	0.74–1.83
Ever had dental exam	18%	24%	0.72	0.41–1.26
Last dental exam >1 year ago‡	92%	81%	2.58	1.27–5.24
Enabling resources				
Uninsured child	73%	74%	0.98	0.59–1.63
No interpreter for medical visits	70%	60%	1.56	0.96–2.51
Very well/well caretaker english proficiency	23%	23%	0.98	0.57–1.68
Dependent transportation‡	64%	47%	1.97	1.24–3.13
No family member with WIC	71%	66%	1.25	0.77–2.04
Sociodemographic factors				
Female gender‡	59%	46%	1.69	1.07–2.67
<\$500 last pay check	63%	66%	0.89	0.56–1.43
Age category, y				
≤3	21%	25%	1.07	0.60–1.89
>3 to ≤6‡	34%	19%	2.24	1.28–3.92
>6 to <13 (reference)	44%	56%	1.00	1.00
≤24 Weeks Local Stay	89%	83%	1.63	0.84–3.15
≥2 Moves, past year§	64%	56%	0.73	0.46–1.17
Caretaker not married	13%	19%	0.63	0.33–1.18
Very high pressure to work*¶	56%	20%	5.01	2.98–8.42
Caretaker not high school graduate*	43%	55%	0.62	0.39–0.98
Caretaker US stay <5 y	76%	66%	1.57	0.95–2.59
Undocumented caretaker	78%	75%	1.19	0.70–2.03
Dwelling type				
Mobile home	56%	47%	1.22	0.74–2.02
Barracks camp	11%	18%	0.65	0.31–1.34
Single/multifamily house	33%	35%	1.00	1.00

n = 300; * *P* < .001; † *P* < .05; ‡ *P* < .009; § trend test: *P* = .10; || includes 5 people married, but not living with spouse; ¶ trend test: *P* < .01.

TABLE 2. Primary Reason for the Last Episode of Unmet Medical Need (*n* = 158)*

	No (%)
Individual characteristics	
Lack of transportation	80 (51)
Did not know where to go	32 (20)
No money to pay for service	5 (3)
No insurance	2 (1)
Did not want to miss work	2 (1)
Do not believe in doctors	2 (1)
Illness not very serious	2 (1)
Health system characteristics	
Clinic schedule not convenient	10 (6)
Difficult to make an appointment	9 (6)
Long office wait	2 (1)
No one spoke their language	2 (1)
Insurance not accepted	1 (<1)
External characteristics	
No permission to leave from work	9 (6)

* Two missing values.

the inverse association between unmet medical need and lack of caretaker completion of high school became statistically significant (OR: 0.47; 95% CI: 0.27–0.83).

DISCUSSION

Unmet medical need is reported among high proportions of migrant children. Lack of transportation and lack of knowledge of where to go for care are

common reasons for foregoing care among migrant children. After accounting for a variety of confounders, only preschool age and very high caretaker pressure to work retain independent associations with unmet medical need among migrant children. Except for the global indicator of need for health care, the hypothesized association between unmet medical need among migrant children and indicators of need for care was substantiated. Alternatively, the hypothesized association between unmet medical need and both enabling resources and sociodemographic factors was substantiated for selected rather than the majority of variables.

The barriers created by a lack of transportation are readily understandable. Transportation independence is problematic for many farm workers due to dependence on multiperson transportation from farm labor contractors or “crew leaders” and farmers, heightened mobility across international and state borders to seek work, and subsistence-level incomes.³² Moreover, the rural settings for agricultural work limit the availability of public transportation. Plausible explanations for the other findings include 1) the proximal importance to migrant families of nonfinancial and labor-related barriers, 2) the social vulnerability of preschool-aged migrant children, as compared with older and younger children, and 3) differences in perceived or actual need for care

TABLE 3. Multiple Logistic Regression Analyses of Factors Associated With Unmet Medical Among a Sample of Migrant Latino Children

	Model 1: Adjusted OR (95% CI)	Model 2: Adjusted OR (95% CI)	Model 3: Adjusted OR (95% CI)
Country of birth			
Foreign-born child	0.88 (0.52–1.50)	0.78 (0.41–1.47)	0.62 (0.25–1.52)
Need for care			
Less than very good annual health status	0.30 (0.14–0.60)*	0.31 (0.14–0.66)†	0.47 (0.19–1.16)
Enabling resources			
No interpreter for medical visits	—	1.05 (0.58–1.89)	0.91 (0.42–1.97)
Dependent transportation	—	1.93 (1.13–3.29)‡	1.46 (0.79–2.69)
No family member with wic	—	0.87 (0.46–1.62)	0.99 (0.49–2.04)
<\$500 last pay check	—	0.95 (0.56–1.60)	0.89 (0.49–1.61)
Sociodemographic factors			
Female gender	—	—	1.61 (0.94–2.75)
Age category, y			
≤3	—	—	1.63 (0.66–3.98)
>3 to 6‡	—	—	2.08 (1.05–4.13)‡
>6 to 12 (reference)	—	—	1.00
<24 weeks local stay	—	—	1.21 (0.53–2.73)
Very high pressure to work	—	—	5.93 (3.24–10.85)*
Caretaker not high school graduate	—	—	0.57 (0.31–1.05)
Caretaker US Stay <5 yrs	—	—	0.99 (0.42–2.35)
Undocumented caretaker	—	—	0.95 (0.41–2.22)

* $P < .001$; † $P < .005$; ‡ $P < .05$.

among preschool-aged children, as compared with older and younger children.

The association between unmet medical need and caretaker pressure to work may reflect the combined result of the unique financial compensation system for migratory agricultural workers, the legal vulnerability of migrant workers under immigration law, and employment vulnerability secondary to a ready supply of replacement workers. Among migrant workers, the desire for labor-force participation (ie, pressure to work) drives immigration. Moreover, many migrant workers are undocumented immigrants.^{32,33} Unlike nonagricultural workers, payment for most migrant farm workers is based on a sub-minimum-wage or “piece-rate” system rather than on a minimum wage.³² Many workers are paid by the “bushel” or “barrel” or some other method linked to direct human mass production. As a result, the increase in hourly wages for farm workers over the past decade lags behind that for private, nonfarm sector workers.³² This stagnant economic situation is perpetuated by an oversupply of other immigrants (largely undocumented) willing to perform agricultural work.³² Often, workers express the concern that to miss even 1 day of work could cost them their job. Migrant workers may forego activities that portend decreased production such as health care seeking. Medical care seeking by those with the highest levels of pressure to work may be discretionary and subject to being foregone.

The association of unmet medical need with preschool age among migrant children most likely results from both social factors and need for care. Compared with caretakers of children >3 years old, caretakers of younger children may be less likely to work and therefore be available to facilitate health-services use. School-based professionals may facilitate access to health care among school-aged children with working caretakers. As compared with children <3 years old, caretakers of preschool-aged children

may be more likely to work; however, as compared with older children, those preschool-aged children may lack access to health care through schools or day care. These children may depend solely on caretaker resources and therefore be more likely to forego needed medical care.

The social context of preschool-aged migrant children, along with their perceived or actual health needs, may contribute to unmet medical need. Extreme financial impoverishment may lead migrant caretakers to organize child health needs under a “continuum of vulnerability.” This continuum would be associated inversely with both discretion in care seeking and age. Increasing child age would be associated with lower levels of perceived vulnerability, more discretion in health care seeking, and therefore fewer care-seeking attempts. Unmet need, therefore, would be expected to be lowest at the extremes of age: the youngest age groups, who overall would get health needs met, and the older age groups, for whom care seeking is either lower or realized via schools. Unmet need would be highest among the middle age group, whose relative vulnerability would stimulate medical care seeking but for whom access barriers are more likely to be encountered and identified.

Also, the “healthy migrant effect”^{48–54} may apply to migrant children. This effect predicts improved health status among persons who migrate, as compared with those who do not. Caretakers may select their healthiest children for migration and to help with fieldwork, thereby inflating reports of excellent health and decreased health need. If true, the population proportion of foreign-born children would be expected to increase with age. Findings from this data set support this trend (data not previously shown; the proportion foreign-born by age group: <3 years = 19%; 3–6 years = 70%; >6 through 12 years = 92%). The “healthier” children selected for migration, during the spring and summer months

(when children have fewer upper and lower respiratory tract illnesses), may have fewer actual acute and chronic health needs.

Limitations of this analysis include 1) the inability to assign antecedent-consequence certainty due to the study's cross-sectional design, 2) reliance on parental reports of health status and unmet need for medical care rather than on direct observations, 3) no assessment of delayed medical care, and 4) selection bias. Selection bias may have eliminated families with extreme levels of geographic isolation or those that were highly mobile, early moving, or early returnees south. Because migrant workers in North Carolina are largely of Latino ethnicity, these results may not be representative of findings for non-Latino farm workers. Also, the large numbers of foreign-born farm workers in North Carolina may differ from workers in the midwest and western streams (if those workers are more likely to be born in the United States) and therefore second- or later-generation immigrants. Efforts to reduce selection bias included the use of a comprehensive sample frame and the execution of sampling during peak harvest season. Despite these real and potential limitations, important strengths of this investigation are the use of probability sampling, the inclusion of caretakers' perceptions about child health, the inclusion of qualitative information into the questionnaire's design, the provision of anonymity for sensitive questions on immigration status, and the use of community outreach workers to perform interviews.

CONCLUSIONS

Nonfinancial factors are key to the experience of unmet medical need among migrant children. Lack of an independent means of transportation, lack of knowledge of where to go for needed care, and very high caretaker pressure to work contribute to unmet medical need among migrant children. Moreover, preschool-aged migrant children disproportionately experience unmet medical need. These findings likely reflect the employment-related vulnerability of migrant workers, the social context within which preschool-aged children live, and differences in perceived or actual health needs among this age group. The distribution of these nonfinancial access barriers suggests that labor policy directed to medical-care leave for migrant workers and increased community outreach to workers with children may constitute important components of efforts to improve access to care for migrant children. Fiscal and organizational expansion of the Migrant Education Program, to coordinate outreach efforts to preschool-aged children, may create an effective portal of health-services access for them. The delivery of health care during nontraditional working hours and in nontraditional sites, in proximity to farm workers, also would likely reduce access barriers for migrant children.

ACKNOWLEDGMENTS

The Office of Research, Demonstrations, and Rural Health Development of the North Carolina Department of Health and Human Services provided support for this project.

Grateful acknowledgment is extended to the North Carolina

Office of Research, Demonstrations, and Rural Health Development for its tangible and intangible support. In particular, the work and support of Mrs Caroline Whitehead-Doherty, MSW, MPH, was an irreplaceable contribution to this project. Also, we are very grateful to the faculty of the Department of Population and Family Health Sciences at the Johns Hopkins Bloomberg School of Public Health for support of and input into this work.

REFERENCES

1. Beck RG. Economic class and access to physician services under public medical care insurance. *Int J Health Serv.* 1973;3:341-355
2. Donabedian A. *Aspects of Medical Care Administration.* Cambridge, MA: Harvard University Press; 1973
3. Aday LA. Economic and non-economic barriers to the use of needed medical services. *Med Care.* 1975;13:447-456
4. Davis K, Reynolds R. The impact of Medicare and Medicaid on access to medical care. In: Rosett RN, ed. *The Role of Health Insurance in the Health Services Sector.* New York, NY: National Bureau of Economic Research; 1975
5. Hulka BS. Epidemiological applications to health services research. *J Community Health.* 1978;4:140-149
6. Lewis CE, Fein R, Mechanic D. *A Right to Health: The Problem of Access to Primary Medical Care.* New York, NY: John Wiley; 1976
7. Shortell SM, Richardson WC, LoGerfo LP, Diehr P, Weaver B, Green KE. The relationship among dimensions of health services in two provider systems: a causal model approach. *J Health Soc Behav.* 1977;18:139-159
8. Sloan F, Bentkover JD. *Access to Ambulatory Care and the U.S. Economy.* Lexington, VA: Lexington Books; 1979
9. Newacheck PW, Hughes DC, Hung YY, Wong S, Stoddard JJ. The unmet health needs of America's children. *Pediatrics.* 2000;105:989-997
10. Newacheck PW, Halfon N. Preventive care use by school-aged children: differences by socioeconomic status. *Pediatrics.* 1988;82:462-468
11. Newacheck PW, Pearl M, Hughes DC, Halfon N. The role of Medicaid in ensuring children's access to care. *JAMA.* 1998;280:1789-1793
12. Short PF, Lefkowitz DC. Encouraging preventive services for low-income children: the effect of expanding Medicaid. *Med Care.* 1992;30:766-780
13. Stoddard JJ, St. Peter RF, Newacheck PW. Health insurance status and ambulatory care for children. *N Engl J Med.* 1994;330:1421-1425
14. Lave JR, Keane CR, Lin CJ, Ricci EM, Amersbach G, LaVallee CP. The impact of lack of health insurance on children. *J Health Soc Policy.* 1998;10:57-73
15. Lave JR, Keane CR, Lin CJ, Ricci EM, Amersbach G, LaVallee CP. Impact of a children's health insurance program on newly enrolled children. *JAMA.* 1998;279:1820-1825
16. Simpson G, Bloom B, Cohen RA, Parsons PE. Access to health care. Part 1: Children. *Vital Health Stat 10.* 1997;(196):1-46
17. Rosenbach ML, Irvin C, Coulam RF. Access for low-income children: is health insurance enough? *Pediatrics.* 1999;103:1167-1174
18. Keane CR, Lave JR, Ricci EM, LaVallee CP. The impact of a children's health insurance program by age. *Pediatrics.* 1999;104:1051-1058
19. Zemer-Gembeck MJ, Alexander T, Nystrom RJ. Adolescents report their need for and use of health care services. *J Adolesc Health.* 1997;21:388-399
20. Kataoka SH, Zhang L, Wells KB. Unmet need for mental health care among U.S. children: variation by ethnicity and insurance status. *Am J Psychiatry.* 2002;159:1548-1555
21. Ford CA, Bearman PS, Moody J. Foregone health care among adolescents. *JAMA.* 1999;282:2227-2234
22. Yu S, Bellamy H, Schwalberg RH, Drum A. Factors associated with use of preventive dental and health services among U.S. adolescents. *J Adolesc Health.* 2001;29:395-405
23. Yeh M, McCabe K, Hough RL, Dupuis D, Hazen A. Racial/ethnic differences in parental endorsement of barriers to mental health services for youth. *Ment Health Serv Res.* 2003;5:65-77
24. Pollick HF, Pawson IG, Martorell R, Mendoza FS. The estimated cost of treating unmet dental restorative needs of Mexican-American children from Southwestern US HHANES, 1982-83. *J Public Health Dent.* 1991;51:195-204
25. Feinberg E, Swartz K, Zaslavsky A, Gardner J, Walker DK. Family income and the impact of a children's health insurance program on reported need for health services and unmet health need. *Pediatrics.* 2002;109(2). Available at: www.pediatrics.org/cgi/content/full/109/2/e29
26. National Migrant Resource Program. *Recommendations of the National Advisory Council on Migrant Health.* Austin, TX: National Migrant Resource Program; 1993

27. Rust GS. Health Status of migrant farm workers: a literature review and commentary. *Am J Public Health*. 1990;80:1213–1217.
28. American Academy of Pediatrics. *Guidelines for the Care of Migrant Farmworkers' Children*. Elk Grove, IL: American Academy of Pediatrics; 2000
29. American Academy Pediatrics, Committee on Community Health Service. Health care for children of farmworker families. *Pediatrics*. 1995; 95:952–953
30. Leone LP, Johnston HL. Agricultural migrants and public health. *Public Health Rep*. 1954;69:1–8
31. Sanders, M. *40 Years of Migrant Health*. Austin, TX: National Center for Farmworker Health; 2002
32. Mines R, Gabbard S, Steirman A. *A Profile of U.S. Farm Workers: Demographics, Household Composition, Income and Use of Services*. Washington, DC: US Department of Labor; 1997
33. US Department of Labor. Report to Congress: The agricultural labor market—status and recommendations. 2000. Available at: http://migration.ucdavis.edu/rmn/word-etc/dec_2000_labor.htm. Accessed August 11, 2003
34. Commission on Security and Cooperation in Europe. *Migrant Farm Workers in the United States: Briefings of the Commission on Security and Cooperation in Europe*. Washington, DC: US Government Printing Office; 1994
35. Taylor JE, Martin PL, Fix M. *Poverty Amid Prosperity: Immigration and the Changing Face of Rural California*. Washington, DC: The Urban Institute Press; 1997
36. Linder, M. *Migrant Workers and Minimum Wages: Regulating the Exploitation of Agricultural Labor in the United States*. Boulder, CO: Westview Press; 1992
37. Weathers A, Minkovitz C, O'Campo P, Diener-West M. Health services use by children of migratory agricultural workers: exploring the role of need for care. *Pediatrics*. 2003;111:956–963
38. Bloom B, Tonthat L. Summary health statistics for U.S. children: National Health Interview Survey, 1997. *Vital Health Stat 10*. 2002;10:37. Available at: www.cdc.gov/nchs/data/series/sr_10/sr10_203.pdf.
39. Seid M, Castaneda D, Mize R, Mirjana Z, Varni J. Crossing the border for health care: access and primary care characteristics for young children of Latino farm workers along the US-Mexico border. *Ambul Pediatr*. 2003;3:121–130
40. Gelberg L, Andersen RM, Leake BD. The behavioral model for vulnerable populations: application to medical care use and outcomes for homeless people. *Health Serv Res*. 2000;34:1273–1302
41. Andersen RM. Revisiting the behavioral model and access to medical care: does it matter? *J Health Soc Behav*. 1995;36:1–10
42. US Department of Health and Human Services, Public Health Service, Health Resources and Services Administration, Bureau of Health Care Delivery and Assistance, Migrant Health Program. *An Atlas of State Profiles Which Estimate Number of Migrant and Seasonal Farm Workers and Members of Their Families*. Rockville, MD: Migrant Health Program; 1990
43. US Department of Health and Human Services, Health Resources and Services Administration, Bureau of Primary Health Care, Migrant Health Program. The children's health initiative and migrant and seasonal farmworker children: the current situation and the available opportunities. 1997. Available at: <http://bphc.hrsa.gov/migrant/migrant.html>. Accessed September 23, 2003
44. Aday L. *Designing and Conducting Health Surveys: A Comprehensive Guide*. San Francisco, CA: Jossey-Bass; 1989:110
45. Hosmer D, Lemeshow S. *Applied Logistic Regression*. New York, NY: John Wiley & Sons; 1989
46. Aday L. *Designing and Conducting Health Surveys: A Comprehensive Guide*. San Francisco, CA: Jossey-Bass; 1989:227
47. *Stata* [computer program]. Release 7.0. College Station, TX: StataCorp; 2001
48. Razum O, Zeeb H, Akgun HS, Yilmaz S. Low overall mortality of Turkish residents in Germany persists and extends into a second generation: merely a healthy migrant effect? *Trop Med Int Health*. 1998; 3:297–303
49. Stern M, Wei M. Do Mexican Americans really have low rates of cardiovascular disease? *Prev Med*. 1999;29:S90–S95
50. Verheij RA, van de Mheen HD, de Bakker DH, Groenewegen PP, Mackenbach JP. Urban-rural variations in health in the Netherlands: does selective migration play a part? *J Epidemiol Community Health*. 1998;52:487–493
51. Abraido-Lanza AF, Dohrenwend BP, Ng-Mak DS, Turner JB. The Latino mortality paradox: a test of the “salmon bias” and healthy migrant hypotheses. *Am J Public Health*. 1999;89:1543–1548
52. Bentham G. Migration and morbidity: implications for geographical studies disease. *Soc Sci Med*. 1988;26:49–54
53. Shai D, Rosenwaike I. Mortality among Hispanics in metropolitan Chicago: an examination based on vital statistics data. *J Chronic Dis*. 1987;40:445–451
54. Guendelman S, Buekens P, Blondel B, Kaminski M, Notzon FC, Masuy-Stroobant G. Birth outcomes of immigrant women in the United States, France, and Belgium. *Matern Child Health J*. 1999;3:177–187

**Access to Care for Children of Migratory Agricultural Workers: Factors
Associated With Unmet Need for Medical Care**
Andrea Weathers, Cynthia Minkovitz, Patricia O'Campo and Marie Diener-West
Pediatrics 2004;113;276-282
DOI: 10.1542/peds.113.4.e276

This information is current as of December 20, 2005

**Updated Information
& Services**

including high-resolution figures, can be found at:
<http://www.pediatrics.org/cgi/content/full/113/4/e276>

References

This article cites 35 articles, 14 of which you can access for free
at:
<http://www.pediatrics.org/cgi/content/full/113/4/e276#BIBL>

Subspecialty Collections

This article, along with others on similar topics, appears in the
following collection(s):
Premature & Newborn
http://www.pediatrics.org/cgi/collection/premature_and_newborn

Permissions & Licensing

Information about reproducing this article in parts (figures,
tables) or in its entirety can be found online at:
<http://www.pediatrics.org/misc/Permissions.shtml>

Reprints

Information about ordering reprints can be found online:
<http://www.pediatrics.org/misc/reprints.shtml>

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™

