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Use of School Nurse Services Among Poor Ethnic Minority Students in the Urban Pacific Northwest

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ABSTRACT ***Objectives:*** To determine whether patterns in student use of school nurse services existed according to poverty, race, and ethnicity. ***Design and Sample:*** Cross-sectional descriptive study of 51,767 visits to school nurses made by 12,797 middle and high school students was conducted. Data were collected and analyzed by race, ethnicity, and poverty. ***Measures:*** Individual-level quantitative data on student visits to school nurses were collected via the School Nurse Entry Database. Numbers and types of student visits were measured, along with the demographic characteristics of student visitors. ***Results:*** Poverty was the largest driver of visits to school nurses among all racial and ethnic groups. Poverty was a larger influence on White students' use of services, suggesting that factors related to race, ethnicity, or culture may have larger effects on promoting visits to school nurses by students of color. Subethnic Asian and Hispanic groups showed visit patterns that deviated from aggregated visit rates. ***Conclusions:*** Knowledge of visit patterns among poor, ethnic, and subethnic populations is important—and particularly urgent with the advent of national health reform—in informing and improving public health and school nursing policy and practice.

Key words: access to health care, race, school health.

As subspecialists of public health nursing, the nation's estimated 56,000 school nurses are uniquely positioned to improve child and population health through access to approximately 55 million schoolchildren. National political and economic elements exist that elevate the important current and potential roles of school nurses in improving the nation's health. National health reform, increased numbers of ethnic minority students populating public schools (Fix & Passel, 2003; Hernandez, 2004; Schmidley, 2001), increased numbers and severity of chronic physical and mental health conditions present in schoolchildren (Akinbami, 2006; Brown & Bzosteck, 2003), and continued disproportionate rates of poverty and health problems experienced by children of color compared with their White peers (Bloom & Cohen, 2006; Boudreaux, Emond, Clark, & Camargo, 2003; Children's Defense Fund, 2006; DeNavus-Walt, Proctor, & Lee, 2006; Heslin, Casey, Shaheen, Cardenas, & Baker, 2006; Huang, Yu, & Ledsky, 2006) create public health concerns and opportunities that school nurses are uniquely positioned to address.

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Background

The presence of public health nurses in schools historically was intended to reduce student absenteeism and to promote learning readiness (Shipley Zaiger, 2000). While this is still the case, the specialty of school nurse practice has evolved to reflect and respond to sweeping demographic, legal, and social changes that inform the scope and delivery of health services provided in schools and communities (Button & Rienzo, 2002; The Center for Health and Health Care in Schools, 2003; Dryfoos, 1997). For example, while school nurses continue to perform long-standing epidemiologic and disease surveillance

functions, they also provide screening, referral, health education, case management services, and direct clinical care for chronic and acute health conditions to public school populations that are increasingly poor, ethnic minority, and immigrant (American Academy of Pediatrics, 2008; Fix & Passel, 2003; National Association of School Nurses [NASN], 2002). Apart from some community health clinics, school nurses are the only health providers who provide free and open access to health care for all public schoolchildren at a location where students spend a significant amount of their time. Appointments, enrollments, transportation, fees, or insurance are not needed for children to receive assessments and care from school nurses. Students may visit school nurses of their own accord, or they may be referred by school personnel, community-based providers, school nurses, or parents or guardians.

Because school nurses serve as gatekeepers who have the means to assess, treat, and refer poor and ethnic minority children whose numbers are growing, they are potentially important mediators for reducing health disparities between White populations and populations of color. Despite their critical role in health promotion and learning readiness, the accessibility of school nurses to students is limited in part by large nurse-to-student ratios. NASN (2006) recommends a ratio of 1 nurse to every 750 regular education students. Currently, nurse-to-student ratios vary considerably, with most school districts far exceeding NASN's recommendation (see Table 1 for ratios of the district in this study). To effectively improve child health and academic outcomes by carrying out the vast legal and ethical responsibilities that are assigned to school nurses, adequate staffing must be achieved (American Academy of Pediatrics, 2008).

TABLE 1. *School-Nurse-to-Student Ratios*

Number of schools	Student population	School nurse full-time equivalent	Ratio
10 middle schools	7,661	8.2	1:934
7 K-8 schools	1,840 in grades 6–8 (3,340 total)*	2.9	1:1,152
1 K-12 school	350 in grades 6–12 (591 total)	1.0	1:591
16 high schools	14,388	9.7	1:1,483
Total	24,239 (25,980)	21.8	1:1,191

*Total numbers include students in grades K-5.

While school nurses provide care and case management services to millions of children, many more students may receive access to care if federal health reform dollars materialize to boost school nurse-to-student ratios. To prepare for this possible eventuality—or to improve school nursing services should the status quo remain—it is important to understand which populations most use school nurse services, to what extent, and for what reasons. Such information may help to inform and improve new and existing school health policies and programs.

Previous research has attempted to explain the reasons for different populations' use of school nurse services by using aggregated data (Blake, Ledsky, Goodenow, & O'Donnell, 2001; Schainker, O'Brien, Fox, & Bauchner, 2005). The authors of these studies suggested that individual-level data be analyzed in future studies to improve validity in linking student demographic data to usage patterns. That is what this research does: it enumerates and analyzes individual-level data on students' use of school nurse services according to poverty, race, and ethnicity.

When this study was conducted in 2007 and 2008, the most recent data available for analyses were for the 2005–2006 school year. All visits (n = 51,767) to school nurses by middle and high school students (n = 12,797) were collected and analyzed according to ethnicity and poverty, both separately and together, to determine whether and to what extent these characteristics were associated with usage frequency and quality.

Research questions

The central questions guiding this study are: Which student populations made visits to school nurses in the 2005–2006 school year? How frequently were these visits made? What were the primary reasons for the visits? Did usage rate patterns of school nurse visits exist that were associated with ethnicity and poverty? How were these usage patterns alike or different? What might account for these differences?

Methods

Design and sample

The school district under study is located in an urban region of the Pacific Northwest. The demographic characteristics of the student population are similar to those of other urban school districts, thus making a reasonable case for study. The student population is

composed of a White minority, with 41% of students living in poverty, and 12% of students enrolled in bilingual education.

This research is part of a larger descriptive study that examined and compared the rates of students visiting school nurses to those making visits to providers working in school-based health centers (SBHCs). Because the purpose of this study is to determine the factors that may contribute to students making visits to school nurses, a cross-sectional designed was used. Secondary analyses were conducted on data that were collected from two existing databases. The first data set contained visit information that school nurses input into the School Nurse Entry Database (SNED), which provides visit details of individual student encounters. The second data set contained student demographic data. These data were originally collected and stored by the city in which the school district resides. Individual student identification numbers were identically scrambled and applied to both data sets in order to analyze data at the individual level as well as to link student demographic variables to student visit data.

The original sample included only those students who made visits to school nurses and other school-based health providers. Because SBHCs are located exclusively in middle and high schools in the district under study, the sample for this study was confined to all middle and high school students who used school nurse services. The total number of middle and high school students who made visits to 22 school nurses was 12,797, and the total number of visits made by these students was 51,767. With a total enrollment of 24,239 middle and high school students in the 2005–2006 school year, more than half of all enrolled students visited the school nurse at least one time. This study was approved by the human subjects division of the university in the state in which the school district resides. School district protocols for research on human subjects were also approved and followed.

Measures

Nominal measures were used to categorize student use of school nurse services according to race, ethnicity, and poverty. Data on frequencies and types of visits made to school nurses were descriptively analyzed among and between these populations to determine whether usage patterns existed according to the categorical variables. The instrument used to obtain types and quantities of visits to school nurses was the SNED, which school nurses use to document student visits. The SNED contains information relating to reason for visit, length of time of visit, student disposition, assessment(s) conducted; service(s) provided; consultation(s) made; and referral(s) made. Data analyzed from SNED for this study were limited to reason(s) for visits and frequency of visits by individual students.

Demographic data were collected from the city in which the school district is situated. The city stores these data as part of a levy agreement with the school district. The categorical variables that were analyzed were poverty (free and reduced price lunch [FRPL] was used as a proxy for poverty in this study), race, and ethnicity. Ethnicity is distinguished from race in this study. It is defined as membership in a group in which cultural values and mores are shared. Alternatively, race assumes an exclusive focus on phenotypic characteristics. For example, while Asian students often are grouped as a whole, this study analyzes Asian groups in the aggregate as well as by subethnic Asian groups such as Filipinos and Vietnamese to determine whether ethnocultural differences exist in usage rate patterns. Individual identification numbers assigned to students were scrambled to ensure anonymity, as well as to link visit numbers and types of visits to student demographic variables.

Analytic strategy

Data from the SNED and from the city were placed into Access 2000 for categorization and analyses. Using Access 2000, 51,767 individual encounters, reasons for visits, and student demographic variables were compiled. Three sets of analyses were conducted. The first was a broad cross-analysis of frequency and types of student visits according to race and poverty. Further analysis was conducted between single aggregate ethnic groups (e.g., Hispanics) and subethnic groups within that category (e.g., Black Hispanics, White Hispanics, and Indian Hispanics) to discern whether ethnocultural differences influenced these students' use of school nurse services. Similarly, comparative analyses were conducted among Asians in the aggregate and among the 9 subethnic Asian groups recognized by the district under study.

Finally, comparative analyses were conducted on both inter- and intragroup use of school nurse services. This allowed inferences to be made concerning reasons for visit patterns according to common group membership as well as cross-group membership. For

example, poor Blacks were compared with nonpoor Blacks for visit rates pertaining to physical health. Using race as a controlled variable, this analysis helped to determine the influence of poverty in driving student visits to school nurses. It was also useful in comparing the relationship between poverty and race in making intragroup inferences, such as those between poor and nonpoor Blacks, Hispanics, Asians, and Whites.

Results

Twenty-two middle and high school nurses had 51,767 encounters with 12,797 students in the 2005–2006 school year. As Table 2 shows, the majority of visits (73%) were for physical health reasons. Because many children present with physical symptoms for social or emotional problems, this category includes both types of visits. It is not possible, however, to determine the percent of physical health visits that are caused by social or emotional problems. The SNED database does not require nurses to specify the type of physical health problem assessed. In descending order, the next top five reasons for school nurse visits were injuries (9%); nursing treatments (such as tube feedings, catheterizations, and nebulizer treatments) (6%); social/emotional (6%); health screen/rescreen (3%); and immunizations (2%).

Race, poverty, and school nurse visits

With 15,112 visits, poor Black children (those eligible for FRPL) accounted for 29% of all visits to school nurses, making them the most frequent visitors (see Figs. 1 and 2 for demographic comparisons of student population and visit percentages).

TABLE 2. *School Nurse Visits by Reason*

Reason description	Number of visits	Percent of visits
Physical health problem/complaint	37,987	73.40
Injury	4,530	8.75
Nursing treatment	2,922	5.64
Social/emotional	2,853	5.51
Health screen/rescreen	1,602	3.09
Immunization	1,033	2.00
Referral process: assess/reassess	747	1.44
Possible abuse/neglect	50	0.009
Alcohol or drug	43	0.008
Total	51,767	99.85

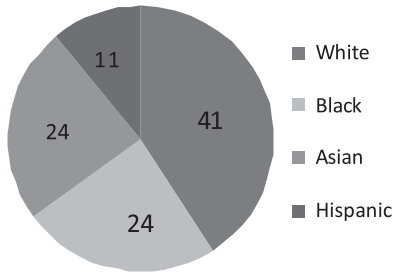

Figure 1. Percent of Students by Race 2005–2006

Because of the nature of individual-level data, which provides multiple visits by the same students, comparing data in aggregate form is not possible. Instead, data displayed in the tables below are calculated to measure the frequency of visits on a per student basis. Because of the large number of data, the impact of "frequent flyers"—those students who make repeat visits to nurses with no discernable diagnoses—is negligible.

Each poor Black child visited a school nurse an average of 4.33 times during the school year, seeking services nearly twice as often as their nonpoor Black peers. The next most frequent nurse visitors were poor White children, each of whom saw the school nurse an average of 3.32 times during the school year. Poor Hispanic children averaged 3.29 visits per child during the same period, and poor Asians were the least frequent visitors, with 1.97 visits per student.

Students in all racial groups saw the school nurse more frequently if they were poor. However, differences existed in the extent to which poverty drove visits among races. As shown in Table 3, White students stood apart from other racial groups in the wide difference in visits between poor and nonpoor students. Poor White students were nearly three times as likely as their nonpoor peers to visit the school nurse. Conversely, poor Blacks, Hispanics, and Asians were, respectively, 1.91%, 2.01%, and 1.77% more

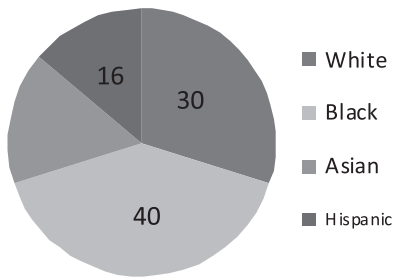

Figure 2. Percent of Students Visiting School Nurses by Race 2005–2006 School Year

TABLE 3. *Nurse Visits Per Student by Race and Poverty*

	Number of visits[a]		Number of students		Nurse visits per student		
Race	Poor	Not poor	Poor	Not poor	Poor	Not poor	Visit ratio
White	4,018	10,620	1,211	8,426	3.32	1.26	1:2.63
Black	15,112	4,800	3,488	2,119	4.33	2.27	1:1.91
Asian	5,317	3,211	2,698	2,881	1.97	1.11	1:1.77
Hispanic	4,813	1,994	1,462	1,227	3.29	1.63	1:2.02
Total	29,260	20,625	8,859	14,653			

Note. Visit ratio illustrates the number of visits per nonpoor student in comparison with each poor student who visited the school nurse. For every nonpoor White child, for example, each poor White child visited the school nurse 2.63 times.
[a]There are 1,882 visits unaccounted for by American Indian and Alaskan Native students whose visits were not included in the analyses since their population accounted for $<2\%$ of the school population.

likely to visit school nurses than their nonpoor peers. These percentages show that poverty was a substantially greater factor in White students' visits to school nurses than for other racial groups, suggesting that race—or other factors associated with race—may be independent variable in visit frequencies.

In comparing intragroup visits among poor students, the greatest differences were between Blacks (4.33 visits per student) and Asians (1.97). Poor Whites (3.32) and Hispanics (3.29) visited with similar frequencies. The greatest differences between nonpoor racial groups were also between Blacks (2.27 visits per child) and Asians (1.11). Each nonpoor Hispanic child saw the school nurse 1.63 times, and each nonpoor White child saw the school nurse 1.26 times.

Reasons for visits to school nurses

Physical health complaints, totaling 37,987 visits, were the most frequent reasons for nurse visits for students of all races, irrespective of poverty status. Poor Black children made the most visits in every health category (see Table 4 for a representation by race and poverty of the five top reasons for school nurse visits). For physical health complaints, poor Black children made 10,833 visits, accounting for 29% of all visits. They were more than three times as likely as their nonpoor Black peers (who made 3,555 visits, or 9.4% of all visits) and nearly four times more likely than poor White children (2,906 visits, or 7.6%) to visit the nurse for physical health reasons.

For injuries, the second highest overall reason for visiting a school nurse, poor Black children were again overrepresented, reporting 1,442, or 33%, of all reported injuries. Nonpoor White children were seen by school nurses for 757 reported injuries (17%), followed by nonpoor Black children, who reported 432 injuries (10%).

Poor White and Hispanic children visited school nurses most frequently (1 in every 3 children) for social/emotional concerns, while 1 in 10 poor Asian and nonpoor Black children used these services. Poor Black children were the second highest users of this service (1 in 5 children), and nonpoor Asians rarely were seen by school nurses for social/emotional health (less than one half of 1%).

The highest level of nursing treatments was provided for poor Black children, one third of whom received nursing treatments (e.g., tube feedings and catheterizations). Poor White children received the second highest number of nursing treatments, followed by poor Hispanic, poor Asian, and nonpoor Black children. Hispanic children (17%) received the most health screening and rescreening services (such as vision and hearing screenings, and special education assessments), followed by nonpoor Hispanic children (1 of 8), poor Asian children (1 of 9), and poor Black children (1 of every 10).

Some students make multiple visits to school nurses for a variety of reasons: nursing treatments, medication administration, and physical complaints with or without psychological origins are some common reasons. Because there were 36 weeks in the school year in 2005–2006, the 24 children who visited the nurse an average of once per week, or 36 times or more during the school year, are considered to be children who may have unmet or special health care needs. Some of these 24 children may visit the nurse for daily medication administration. Others may present with vague symptoms of unknown clinical etiology that may be psychological or physical in origin. These children accounted for 1,632, or 13%, of

TABLE 4. *Nurse Visits by Race, Poverty, and Reason*

		Number visits		Total number of students		Nurse visits per student	
Reason for visit	Race	Poor	Not poor	Poor	Not poor	Poor	Not poor
Physical health problem/complaint	White	2,906	8,611	1,211	8,426	2.40	1.02
	Black	10,833	3,555	3,488	2,119	3.11	1.68
	Asian	3,628	2,461	2,698	2,881	1.34	0.85
	Hispanic	3,208	1,508	1,462	1,227	2.19	1.23
Injury	White	282	757	1,211	8,426	0.23	0.09
	Black	1,442	432	3,488	2,119	0.41	0.20
	Asian	560	319	2,698	2,881	0.21	0.11
	Hispanic	449	152	1,462	1,227	0.31	0.12
Social/emotional	White	360	406	1,211	8,426	0.30	0.05
	Black	754	240	3,488	2,119	0.22	0.11
	Asian	259	105	2,698	2,881	0.10	0.04
	Hispanic	442	115	1,462	1,227	0.30	0.09
Nursing treatment	White	222	307	1,211	8,426	0.18	0.04
	Black	1,143	301	3,488	2,119	0.33	0.14
	Asian	433	151	2,698	2,881	0.16	0.05
	Hispanic	219	68	1,462	1,227	0.15	0.06
Health screen/rescreen	White	89	270	1,211	8,426	0.07	0.03
	Black	401	104	3,488	2,119	0.11	0.05
	Asian	242	97	2,698	2,881	0.09	0.03
	Hispanic	255	95	1,462	1,227	0.17	0.08

the total number of school nurse visits. An additional 8,852 children (69%) saw the school nurse more than once during the course of the school year.

Ethnicity and school nurse visits

To better understand how ethnicity may influence student visits to school nurses, it is important to disaggregate and analyze ethnic groups that contain heterogeneous populations. For example, 5,686 Asian middle and high school students represent 23% of the student body, making them the most populous non-White group in the school district. Nearly 30% of Asian students are designated limited English proficient or equal English proficient (Data Profile, District Summary, 2006). These students are combined in district data sets as one group representing nine distinct ethnicities (two of these categories, "other Asian/Pacific Islander [PI]," and "other Southeast Asian" contain multiple ethnic groups). Table 5 presents health visit data by Asian ethnic subgroup, and Table 6 provides the same data for Hispanic subgroups.

A compelling feature of the data in Table 5 is that, when viewed as independent groups, the visit rates of Asian students are different than when aggregate data are presented. For example, when weighted as one group as shown in Table 3, poor Asians are represented as using health services less frequently than every other ethnic group, with 1.97 visits per student. When the groups are disaggregated, however, three subethnic Asian groups (East Indian [2.45 visits per student], Japanese [2.11], and other Asian/PI [2.00]) exceed the poor Asian aggregate rate in visits to school nurses. In addition, the visit ratio was higher for Samoan, Vietnamese, other Asian/PI, and Japanese students than it was for Asians in the aggregate (1:1.77). And while Asian students often are typified as enjoying better health and academic status than their Hispanic peers, these Asian subgroups had visit rates similar to three of the four poor Hispanic subethnicities shown in Table 6. Furthermore, poor Asian/PI children had higher usage rates for nurse visits than every nonpoor aggregate ethnic group—except Black children—shown in Table 3. These data illustrate the importance of understanding the heterogeneity of Asian populations, and suggest that commonly held assumptions about Asians in the aggregate be challenged. It should be noted that the sample sizes for Japanese, Korean, and East Indian students are small in comparison with other groups, and therefore may not accurately reflect usage rates for these populations.

Like Asians, Hispanics are also a heterogeneous population. In the school district under study,

TABLE 5. *Asian Nurse Visits by Ethnic Subgroup*

	Total number of visits		Total number of students		Nurse visits per student		
Ethnicity	Poor	Not poor	Poor	Not poor	Poor	Not poor	Visit ratio
Chinese	802	705	568	755	1.41	0.93	1:1.52
East Indian	385	97	51	104	0.13	1.07	1:0.12
Filipino	822	957	372	737	2.20	1.30	1:1.69
Japanese	97	314	38	351	2.55	0.89	1:2.87
Korean	39	143	27	135	1.44	1.06	1:1.36
Other Asian/PI	325	150	111	13	2.93	1.12	1:2.62
Samoan	377	89	151	76	2.50	1.17	1:2.14
Other SE Asian	906	400	493	334	1.84	1.20	1:1.53
Vietnamese	1,863	382	863	386	2.16	0.99	1:2.18

Note. PI = Pacific Islander; SE = Southeast.

Hispanics are accorded four subgroups: Black, White, Indian, and Asian. As with Asians, poverty appears to be the primary driver of visits by all Hispanic groups to school nurses, and distinct differences in visit rates among subethnic groups are apparent (see Table 6). The most striking finding in Table 6 is the comparatively high visit rate for poor Black Hispanics, with each child visiting the school nurse 5.41 times. Poor Black Hispanics made more than three times the number of visits to school nurses than did their nonpoor peers, a considerably high ratio in comparison with other Hispanic groups. Poor Hispanic Whites and Indians had approximately the same numbers of visits, but the rates of visits for nonpoor Hispanic Indians were slightly higher than those of Hispanic Whites. Hispanic Asians had the lowest numbers of visits by both poor and nonpoor students, and also have the lowest enrollment population.

Discussion

Poverty, ethnicity, and usage rates

The findings of this study strengthen the work of previous research that identifies poverty and race as variables associated with increased student visits to school nurses. In this study, poverty stands out as a variable consistently and strongly associated with increased rates of all types of student visits to school nurses. Poor children of all races and ethnic groups had higher school nurse visit rates than nonpoor children, and in many cases, considerably so.

The discrepancy between use of poor and nonpoor populations according to race was widest with White children, indicating that poverty was a larger factor in driving their visits than those of children of color. This indicates that race—or cultural or economic factors associated with race—may be independent variables in contributing to increased visits to school nurses. Determining what these factors are should be explored in future research.

This study also sheds new light on conventional thinking about school nursing usage practices of racial groups in the aggregate. Because usage rates among Hispanic and Asian populations varied widely according to subethnicity, use of aggregate data alone can be misleading in presenting an accurate view of the status quo. Assessing the strengths, needs, economic, and cultural factors associated with subethnicity may be more efficacious in informing and improving school and public health nursing programs and policies.

TABLE 6. *Hispanic Nurse Visits by Ethnic Subgroup*

	Total number of visits		Total number of students		Nurse visits per student		
Race/ethnicity	Poor	Not poor	Poor	Not poor	Poor	Not poor	Visit ratio
Hispanic Asian	75	132	46	96	1.63	1.38	1:1.18
Hispanic Black	655	134	121	82	5.41	1.63	1:3.32
Hispanic Indian	2,600	890	826	521	3.15	1.71	1:1.84
Hispanic White	1,483	838	469	528	3.16	1.59	1:1.99

Poverty, ethnicity, and social-emotional visits

Students who sought school nursing services for social-emotional reasons varied according to poverty status, race, and ethnicity. About one third of poor Whites and Hispanics made visits for social-emotional reasons, while only one fifth of Blacks and 1 in 10 Asians did. This indicates that cultural factors may be driving such visits. For example, Whites and Hispanics may be more likely to directly express social and emotional concerns to school nurses, while Blacks and Asians may be more likely to present with somatic complaints that disguise emotional concerns. These populations may also be meeting these needs by using health services outside of the school setting. Poor and nonpoor Asian groups were the clear outliers in visits to school nurses for social-emotional concerns, indicating the possible existence of a cultural taboo either in identifying emotional or mental health concerns as such, or in sharing this sensitive information with cultural outsiders.

Study limitations

Because some of the groups studied in this research had considerably smaller sample sizes than others, comparisons and inferences about the usage patterns of, notably, Japanese and Korean populations, may not be reflective of the actual usage patterns of these groups.

Recommendations for policy and future research

This research focused on students who used nursing services in schools. It did not compare these groups to students within the same schools who did not use school nurse services. Future research should compare these populations on an individual level to help ascertain the reasons why students do or do not use school nurse services. In addition, assessing frequency of visits among subpopulations of students, both in and outside the school setting, may be helpful in determining levels of health status. Both of these areas of future research are important to determine how public health nurses may best improve the health of students, families, and communities.

This work is particularly urgent, both in light of the passage of national health reform and in terms of improving school and public health nursing services to increasingly diverse and poor populations who shoulder disproportionate risks for poor health. Identifying priorities by understanding how and why diverse populations in the United States use school nurse services is critical to informing economically sound and effective public health nursing interventions, and to securing the financial means to implement them.

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