THE ESSENTIAL SCHOOL HEALTH SERVICES PROGRAM DATA REPORT

(Formerly the Enhanced School Health Services Program)

2002 – 2003 School Year

(September through December)

Mitt Romney, Governor
Kerry Healey, Lieutenant Governor
Ronald Preston, Secretary of Health and Human Services
Christine C. Ferguson, Commissioner of Public Health
Sally Fogerty, Associate Commissioner, Center for Community Health
Teresa Anderson, Director, Statistics and Evaluation, Center for Community Health

Massachusetts Department of Public Health
Bureau of Family and Community Health
Applied Statistics, Evaluation and Technical Services

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Massachusetts Department of Public Health
Bureau of Family and Community Health
Applied Statistics, Evaluation and Technical Services
250 Washington Street, 5th Floor
Boston, MA 02108-4619

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Introduction

In recent years, four major changes have dramatically affected school health services: (1) changes in family structure and patterns of parental employment; (2) the impact of diverse cultural and linguistic groups; (3) an increase in the number and severity of illness in students with special health care needs who are enrolled in schools; and (4) a rise in social morbidities such as substance abuse, depression, and violence among children.

These changes have resulted in an increased demand for health services in the schools:

- With more working parents, children who are sick with mild or chronic conditions are less likely to be monitored at home on school days and more likely to be sent to the school nurse for assessment and a determination as to whether they need to see a physician (Thurber et al., 1991; Uphold & Graham, 1993; U.S. Census Bureau, 2000; Wold, 2001).

- Some "newcomer" groups rely on the school as a source of information about what services or providers are available in the community. They may not know how to obtain care elsewhere because of language or cultural barriers and, therefore, may look to the school health service for assistance.

- Improved medical technology has enhanced the health of children and adolescents with a variety of conditions and diseases previously associated with short life expectancy, e.g. cystic fibrosis, childhood leukemia, diabetes, juvenile rheumatoid arthritis and kidney disease. In addition, children assisted with medical technology, e.g. catheterizations, tracheostomies, ventilators, etc., are now attending school. Social attitudes that promote inclusion, as well as state and national laws related to disability rights and access to education, have resulted in more children requiring nursing care and other health-related services during the school day (Palfrey et al., 1992; Small et al., 1995).

- Students spend a large part of their day at school; therefore, the school can be an important site where health and education risks, e.g. depression, absenteeism, substance use, may be identified and timely interventions initiated. This can result in increased demands for professional health services in the schools (Thurber et al., 1991).

- The rapid restructuring of the health care delivery system has dramatically impacted school health service programs. With reduced hospitalizations and/or reduced lengths of stay, school nurses are now often responsible for supervising the care of children who have illnesses like acute asthma and diabetes that were formerly managed in a hospital setting (Chabra et al., 2000; Leslie et al., 1998; Schutte et al., 1997).

The Massachusetts Department of Public Health (MDPH) recognizes the need for quality school health services and provides consultation to all of the Commonwealth's school districts. Since 1993, with resources from the Massachusetts Health Protection Fund, the Department of Public Health has extended to a number of school systems the opportunity to expand on the basic school health services model by establishing the Essential School Health Service Program (ESHS). The goals of the Essential School Health Service model are to:

(1) provide high quality school health services to all children within the community; (2) support the educational process; and (3) link the school health service programs to all aspects of the health care delivery system that serves children and their families.

In 1993, thirty-six school districts were funded for three and half years to: (a) strengthen the infrastructure of school health services in the area of personnel and policy development, programming, and interdisciplinary collaboration; (b) incorporate health education programs, including tobacco prevention and cessation programs, into the existing school health programs; and (c) develop linkages between school health service programs and community health care providers.

In October 1997, the Department funded 19 school districts under the Essential model (Essential School Health Services, ESHS) and 8 school districts with experience in developing the Essential model to provide consultation to approximately 42 additional school districts ("recipient schools") across the Commonwealth (Essential School Health Services with Consultation, ESHSC). These recipient school districts were interested in developing similar school health service programs.

In November, 1999, the Massachusetts legislature allocated additional funding to the Essential School Health Service Programs (ESHS and ESHSC). School systems for both models were selected for participation through a competitive bid process based on a Request for Response (RFR) developed by MDPH. As a result of 1999 RFR process, a total of 77 school districts (or affiliated school systems)[1] received awards in 2000: 11 Essential School Health Services with Consultation and 66 basic Essential Programs (see **Appendix A**). An added component of the 1999 RFR was that each applicant public school district was required to provide some elements of basic school health services (vision/hearing screening, immunization review, etc.) to all non-public and charter schools within the community (77 award recipients in 2000 served 253 non-public and charter schools)[2]. An additional 32 school districts received awards in 2001; all of these were basic Essential Programs (Sheetz, 2003).

In February 2003, midyear budget reductions eliminated most funding for the ESHS programs for the remainder of the fiscal year. Because of this, three programs decided to withdraw from the ESHS grant, thus reducing the number to 106 school districts in the Spring of 2003.

The staff of the School Health Unit, Division of Primary Care and Health Access in the MDPH Bureau of Family and Community Health administer the programs.

[1] ESHS funding was awarded to local public school systems, regional academic school systems, independent vocational systems, vocational-technical regional systems, and school unions.
[2] 223 non-public schools, 30 charter schools.

Executive Summary

The information collected by the Essential School Health Services Program provides a valuable snapshot of school nursing practice in a diverse but non-representative cohort of Massachusetts public schools. The data reveal that school nurses perform a wide array of duties -- direct care, health education, administrative case management, and policy/program development and oversight -- on behalf of students whose health needs range from routine to serious and complex.

Analysis of the ESHS program data for the part of the school year beginning September, 2002 and ending December 31, 2002 showed the following:

- 95 ESHS school districts reported a combined total of 2,525,743 student health encounters.
- In a typical district, students went to see the school nurse 1.2 times per month. There was substantial variability among school districts, with the encounter rate ranging from 0.6 to 5.9 visits per month.
- After assessment and / or treatment by a school nurse, the majority (87.9%) of students visiting the nurse's office with an illness or injury complaint were returned to the classroom to continue their studies.
- 11.0 % of the more serious injuries to students were classified as intentional. These include injuries resulting from assaults (e.g. physical fighting) and those that were self-inflicted (e.g. intentional drug overdose, suicide attempts).
- School nurses in the 95 districts referred students to emergency health services a total of 5,591 times.
- The majority (76.8%) of the students taking prescription medications took them on an as-needed (PRN) basis, rather than on a daily basis.
  - Among students taking as-needed (PRN) medications, asthma medications were the most common (22.7 per 1,000 enrolled students).
  - Among students on daily prescription medications, psychotropic medications were by far the most common (7.0 per 1,000 enrolled students).[3]
  - School nurses in the 95 ESHS districts administered an average of **122,840.4 doses** of medication to students per month. A little over half of these were doses of psychotropic (mostly psychostimulant) medications.
- Each full-time school nurse (or equivalent) performed an average of 25.3 medical procedures per month. Blood glucose testing, lung auscultation and blood pressure testing were the procedures most frequently performed.
- Tobacco prevention programs reached substantial numbers of individuals, although activity levels varied widely across districts:
  - Participation was much higher in individual tobacco cessation counseling (4,153 students and 293 adults) than in group cessation counseling (793 students and 17 adults).
  - Participation was much higher in group activities focused on education (12,536 students and 1,505 adults) than group activities focused on counseling (793 students and 17 adults).

Continued refinements in data collection and analysis will more accurately capture school nursing and school health activity, improve our ability to monitor the health needs and status of the school age population, and identify areas for improvements in services and quality of care. Identifying trends in school health encounters and student health indicators may assist school nursing staff in improving the

[3] Rates shown are those reported by the typical (median) district in the ESHS program.

delivery of prevention, education, and intervention services to the school community. Future data collection efforts will seek to increase our knowledge of health needs in the school setting and in the school age population, explore the relationship between student health status and educational outcomes, and investigate ways in which health services and prevention activities in schools can help children live healthier lives.

Findings

School Nurse Staffing Patterns

Staffing patterns were available for 94 of the 95 ESHS/ESHSC districts whose data contributed to this report. In those districts, the equivalent of **1,221.4** full-time school nurses served a total of **510,490** students during the 2002-2003 school year.[4] The funding sources for these nurses were as follows:

- **209.0 (17.1%)** were funded by the MDPH Essential School Health Services Program.
- **1,012.4 (82.9%)** were funded through local school budgets and other sources.

School Health Services Activity

The primary goals of the Essential School Health Services Program are to reinforce the infrastructures of existing school health services programs and to improve the delivery of health services to students. Toward that end, program participants were required to assess over time the type and scope of school nursing activity in their districts. These activities were divided into six categories of data: **1) health encounters, 2) injury reports, early dismissals, and referrals for emergency health services, 3) medication management, 4) medical procedures 5) oral health, and 6) linkages.** *Unless otherwise specified, the following data provide a four-month* ***overview*** *of the health services activity in these districts during the 2002-03 school year.* Data collection methods, analytical procedures, and technical notes are discussed in **Appendix C**.

Health Encounters

Each month, districts reported the total number of student health encounters. An "encounter" was defined as *any contact with a student during which the school nurse provided counseling, treatment, or aid of any kind*. Casual conversations fell outside this definition and were not counted. In addition, mandatory screenings were not counted as encounters because these are routine population-based activities. Screenings were tracked separately, however.

Between September 1, 2002 and December 30, 2002, 95 school districts reported a combined total of **2,525,743** student health encounters. The number of encounters per district was partly a function of district size, with individual districts averaging between **264.0** and **65,704.5** encounters per month. While some students may need to be seen several times each month, others do not need to be seen at all. In a typical district, each student visited the school nurse an average of **1.2 times per month,** although the encounter rate varied across the 95 districts, ranging from **0.6 to 5.9** visits per month. The school nurse workload, measured by the number of encounters a nurse logs each month, varied across the districts, ranging from **131.6 to 2,028.8** encounters *per full-time school nurse each month*, with the rate in the typical district being **473.5** encounters per month.[5] "Nursing assessment," "first aid," and "medication administration" were the most common primary reasons for visits to the school nurse (Figure 1).

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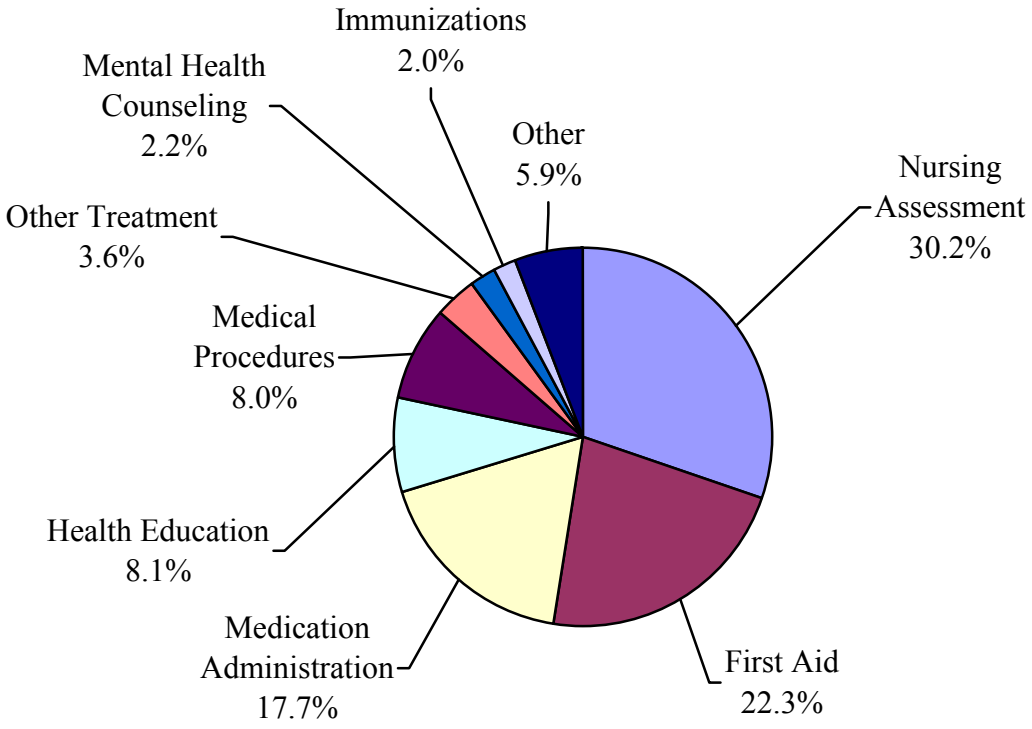
[4] These statistics include data from the ESHSC *lead* districts, but do not include data from the ESHSC *recipient* districts. The count of "School Nurses" includes only Registered Nurses (RNs) and nurse leaders, but excludes other health support staff which may have been funded by the ESHS contract.

[5] For these calculations, "school nurses" includes only RNs and nurse leaders.

Figure 1. Types of Student Health Encounters (By Primary Presenting Issue)

September 1, 2002–December 31, 2002 (n= 95 districts)



"Nursing Assessment" includes assessment, triage, and reassessment of illness by nurses.
Source: *Monthly Activities Reports* submitted by districts in the Essential School Health Services program.

In some encounters, students reported more than one type of health complaint. In the 95 districts providing data, **405,308** secondary complaints were reported. Whereas "individual health education" and "mental health counseling" accounted for a relatively small proportion of the "primary" reasons for student health encounters, these issues were more likely to be uncovered when measuring "secondary" reasons for health encounters (Table 1).

Health services were also provided to school staff (i.e., teachers and administrators). School nurses in 95 districts reported a total of **72,160** staff health encounters. Across the 95 districts, monthly averages ranged from **1.3** to **2,262.8** staff health encounters per month.

Table 1. Number and Percentage of Student and Staff Health Encounters September 1, 2002 - December 31, 2002 (n=95 districts)

	Students				Staff	
	Primary Issue		Secondary Issue			
	Number	Percent	Number	Percent	Number	Percent
Nursing Assessment*	762,712	30.2 %	75,941	18.7 %	15,775	21.9 %
First Aid	564,111	22.3	40,843	10.1	10,652	14.8
Medication Administration	447,037	17.7	28,720	7.1	9,322	12.9
Health Education	203,990	8.1	158,848	39.2	13,511	18.7
Medical Procedures	202,723	8.0	22,756	5.6	9,741	13.5
Other Treatment	90,754	3.6	15,453	3.8	2,546	3.5
Mental Health Counseling	56,490	2.2	24,336	6.0	2,754	3.8
Immunizations	49,620	2.0	289	0.1	3,730	5.2
Other	148,306	5.9	38,122	9.4	4,129	5.7
TOTAL	2,525,743	100.0 %	405,308	100.0 %	72,160	100.0 %

*"Nursing Assessment" includes assessment, triage, and reassessment of illness by nurses.
Source: *Monthly Activities Reports* submitted by districts in the Essential School Health Services program.

Injury Reports, Early Dismissals and Referrals for Emergency Health Services

An important function of school nursing practice is to provide on-site health services to students who are sick, injured, or experiencing a serious health emergency. Each month, districts tallied the number of on-campus injury reports, early dismissals due to illness, and referrals for emergency health services in their districts. These events represent a small subset of the total number of student health encounters in a school system.

After assessment and / or treatment by a school nurse, the majority (87.9%) of students visiting the nurse's office with an illness or injury complaint were returned to the classroom to continue their studies, and did not have to interrupt their educational activities further (Table 2 and Figure 2).

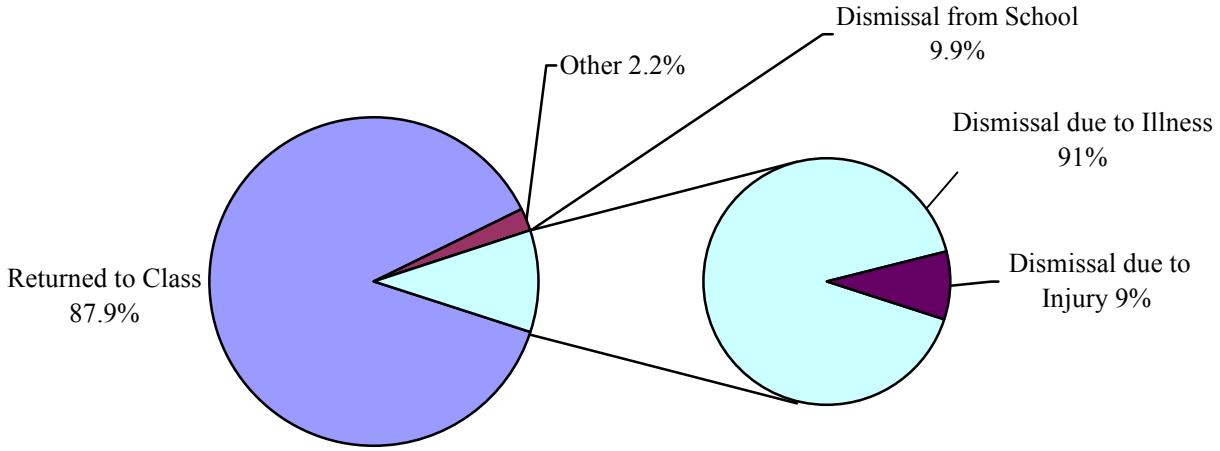
Table 2. Disposition After Nursing Assessment September 1, 2002 - December 31, 2002 (n=95 districts)

	Number	Percent
Returned To Class	1,115,157	87.9 %
Dismissal . . .		
Due to Illness	114,498	9.0
Due to Injury	11,128	0.9
Other*	28,275	2.2
TOTAL	1,269,058	100.0 %

* Includes "Stayed in health office" and "Referred to counselor's office".
Source: *Monthly Activities Reports* submitted by districts in the Essential School Health Services program.

When students had to be dismissed, it was usually the result of illness (91%) rather than injury (9%).

Figure 2. Disposition After Nursing Assessment
September 1, 2002 – December 31, 2004
(n=95 districts)



Source: *Monthly Activities Reports* submitted by districts in the Essential School Health Services program.

For injuries that were of a more serious nature, school nurses filed *injury reports* according to state and local policy. For the four-month period September 1 through December 31, 2002, 95 districts reported a total of **14,825** student injury reports and **1,239** staff injury reports (Table 3):

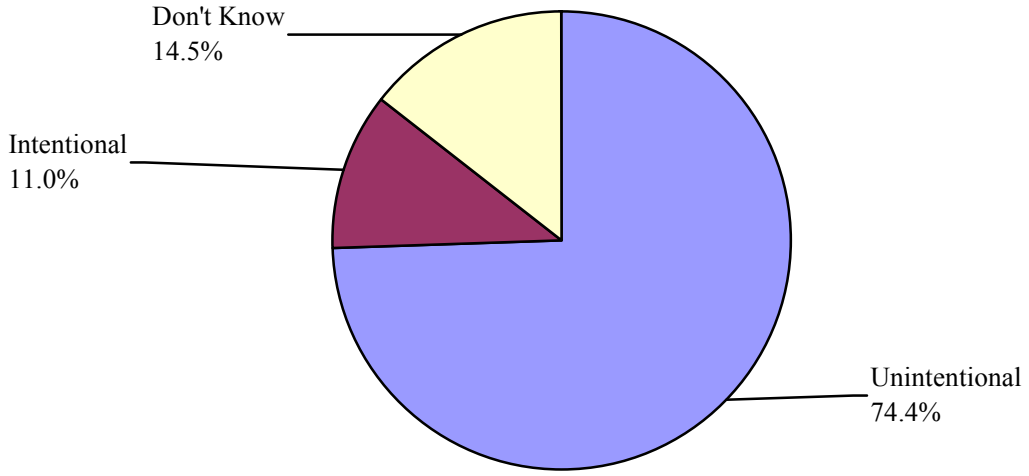
Table 3. Number of Student and Staff Injury Reports
September 1, 2002 – December 31, 2002 (n=95 districts)

	Number	Percent
Student		
Intentional	1,634	11.0 %
Unintentional	11,034	74.4
Don't Know	2,157	14.5
Total Student	14,825	100.0 %
Staff		
Intentional	156	12.6 %
Unintentional	994	80.2
Don't Know	89	7.2
Total Staff	1,239	100.0 %

Source: *Monthly Activities Reports* submitted by districts in the Essential School Health Services program.

Of the student injury reports tracked by school nurses, 11.0 % involved the intentional infliction of injury (Figure 3). These include injuries resulting from assaults (e.g. physical fighting) and those that were self-inflicted (e.g. intentional drug overdose, suicide attempts).

Figure 3. Student Injury Reports by Intent
September 1, 2002 – December 31, 2002
(n=95 districts)



Source: *Monthly Activities Reports* submitted by districts in the Essential School Health Services program.
Intentional: Includes injuries resulting from assaults (e.g. physical fighting) and those that were self-inflicted (e.g. intentional drug overdose, suicide attempts).

In addition, school nurses in the 95 districts referred students to *emergency health services* a total of **5,591** times**.**

- In **807** (14.4%) of these events, 9-1-1 or ambulance services were called.
- In the remaining **4,784** events, parents or others were called to transport the student to emergency health services.

Medication Management

In 1993, the Massachusetts Department of Public Health promulgated regulations governing the administration of medications in public and private schools. The purpose of these regulations (105 CMR 210.000) is to provide minimum safety standards for the administration of prescription medications to students during the school day.

The school nurse's role in managing the medication administration program for the district is broad in scope. In addition to developing district-wide medication policies in collaboration with the school committee, school administration, and school physician, the school nurse:

- administers medications to students (including monitoring students' response to medications);
- delegates the administration of selected medications to appropriately trained school staff (if the district is registered with the MDPH to do so);
- ensures the proper training and supervision of these designated staff; and
- establishes a formal record-keeping system for the district's medication administration program.

ESHS districts tracked the number of *students* using prescription medications as well as the number of *prescriptions* that had been ordered for their students. Implicit in the description of medication administration is the nurses' responsibility for the following: development of the medication

administration plan; assessment of the child prior to administering each medication; and follow-up evaluation of medication efficacy and side effects.

During the reporting period, 95 districts reported a total of **23,885** students with at least one prescription for medication. In other words, **46.8 of every 1,000** enrolled students were either using medications or had prescriptions for medications. There was substantial variability across districts, however, as the rate of students with prescriptions ranged from 6.8 to 106.8 per 1,000 students. Across the 4 month reporting period, the total number of prescriptions reported to school nurses averaged **29,706** for the 95 districts (see table below). Note that because some students had more than one prescription, the number of prescriptions is larger than the number of students with prescriptions. Among prescriptions taken on a scheduled, daily basis, psychotropic medications were the most common, while among prescriptions taken on an "as-needed" (PRN) basis, asthma medications were the most common.[6]

Table 4. Number of Student Prescriptions by Type Reported to School Nurses (Monthly Average) September 1, 2002 - December 31, 2002 (n=95 districts)

	Daily Medications (All Districts)	PRN Medications (All Districts)	Total (Daily & PRN) Medications
Analgesics	112.8	4,579.3	4,692.2
Antibiotics	471.5	99.0	570.5
Anticonvulsants	234.0	107.3	341.3
Antihypertensive	77.0	98.3	175.3
Asthma	482.5	11,801.8	12,284.3
Epinephrine	26.3	3,780.5	3,806.8
Insulin	225.5	525.0	750.5
Psychotropic*	4,550.3	511.3	5,061.6
Others	697.8	1,325.8	2,023.5
Total	6,877.7	22,828.1	29,705.8
Row Percent	23.2%	76.8%	100.0%

* "Psychotropic" includes psychostimulants. "PRN" refers to medications taken on an "as-needed" basis.
Source: *Monthly Activities Reports* submitted by districts in the Essential School Health Services program.

The figures below show the *at-school* prescription rates reported by the ESHS districts. The at-school prescription rate reflects the medications that are to be administered at school, during school hours, by the school nurse (or under the supervision of the school nurse). These rates *understate* the actual number of students taking prescription medications, however. There are two reasons for this. First, students who self-administer at school without the knowledge of the nurse are not counted in the nurse's data reports.[7] This type of "counting error" may disproportionately lower reported prescription rates for certain categories of students. Middle and high school students, for example, might be more likely to self-administer than elementary school students, and, therefore, would be less likely to be counted in the numbers reported by the school nurse. Second, medications taken only at home, as some types of *daily* medications are, are unlikely to be reported to school nurses. For example, the continued decrease in the

[6] PRN is an abbreviation for "pro re nada," a Latin term meaning "as needed." PRN medications are not scheduled for set times, but given as needed. For example, an analgesic medication that is given whenever pain or discomfort occurs is considered a PRN medication.

[7] Regulations require that students inform nurses about self-administered medications. If students do not comply with regulations, these medications may not come to the attention of school nurses.

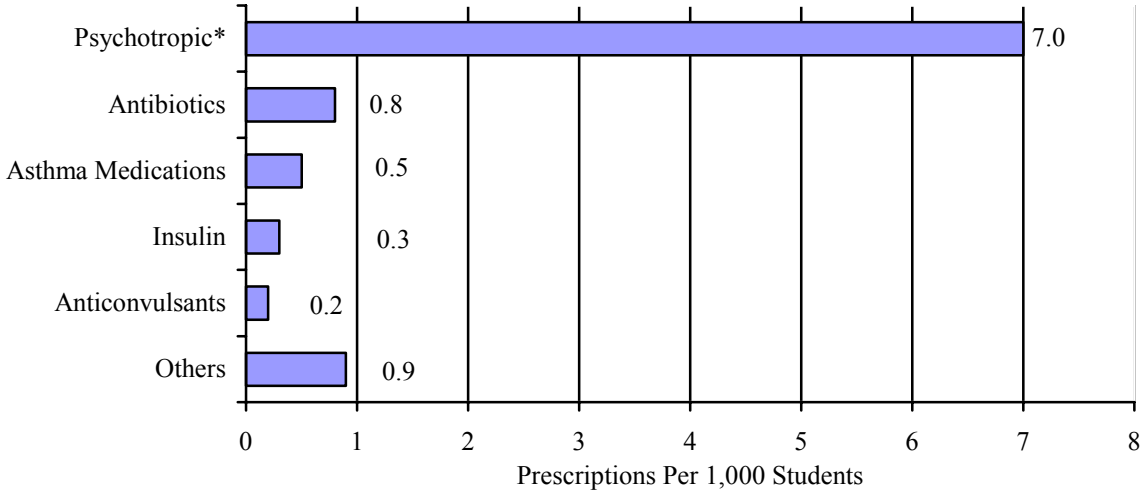
at-school psychotropic prescription rate over the last two school years (from 21.0 per 1,000 students in 2001 to 13.2 in 2002 and 7.0 in 2003) may be due to the use of new one-dose slow-release psychostimulant drugs which are administered at home and are not reported to school nurses. On the other hand, PRN medications (medications prescribed for administration on an 'as needed' basis) such as medications taken to stop asthma attacks or allergic reactions, are more likely to be reported to the school nurse because of the potential need for administration during the school day. As a result, prescription rates for these medications may be better estimates of the true overall prescription rate for the school age population.

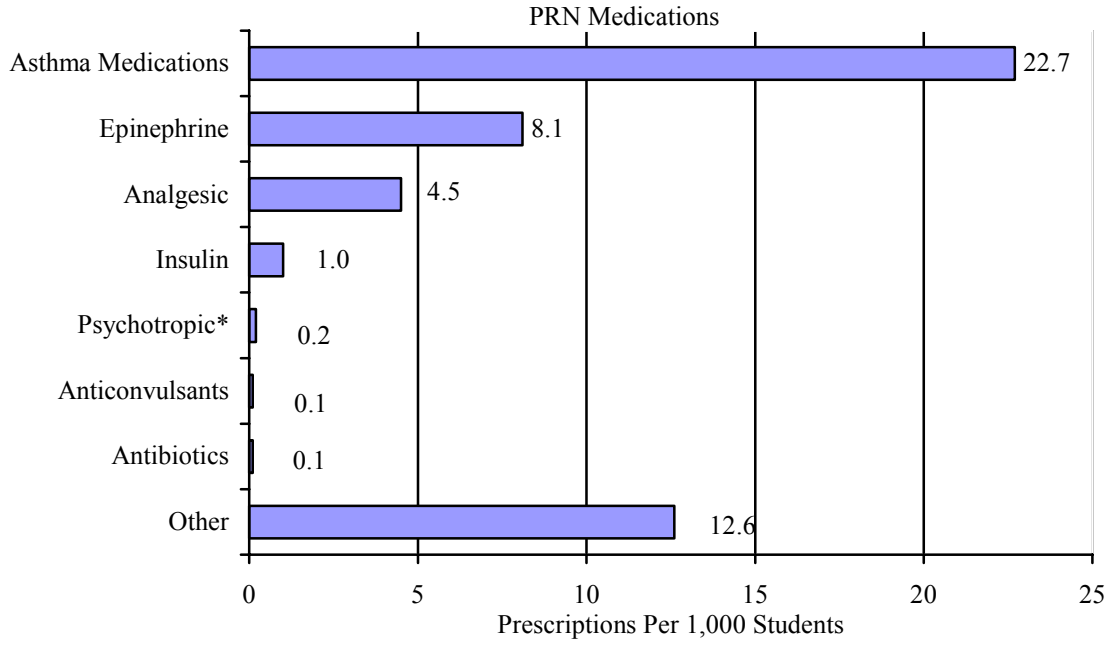
Figure 4. Prescription Medication Rate*

(Per 1,000 Students)

September 1, 2002 – December 31, 2002 (n=95 districts)

Daily Medications





* Rates shown are those reported by the typical (median) district in the ESHS program. Rates only include prescriptions reported to school nurses. "Psychotropic" medications includes psychostimulants such as Ritalin that are used for treating Attention-Deficit/Hyperactivity Disorder, a condition characterized by high levels of inattention and / or hyperactivity. Source: *Monthly Activities Reports* submitted by districts in the Essential School Health Services program.

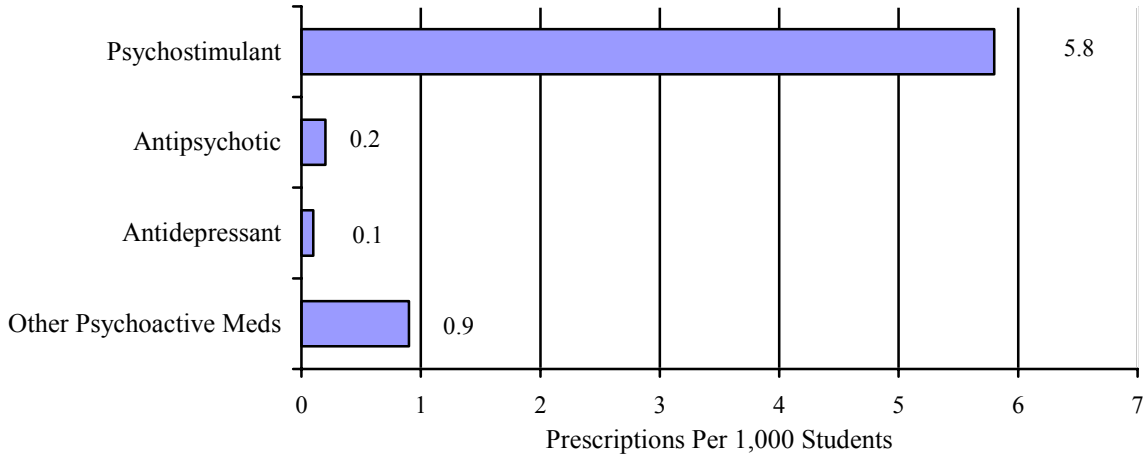
School nurses tracked the number of prescriptions for several different types of *psychotropic* medications. Psychostimulants were the most commonly reported psychotropic medication (in both daily and PRN categories) during the four-month period (Table 5).

Table 5. Number of Student Psychotropic Prescriptions by Type Reported to School Nurses
(Monthly Average) September 1, 2002 - December 31, 2002 (n=95 districts)

	Daily Medications (All districts)	PRN Medications (All districts)
Anti-anxiety	101.3	69.3
Anti-depressant	218.2	20.0
Anti-psychotic	277.5	52.8
Mood stabilizer	193.5	3.3
Psychostimulant	3,093.3	270.8
Other Psychoactive	666.7	95.3
Total	4,550.3	511.3
Row Percent	89.9%	10.1%

PRN refers to medications taken on an "as-needed" basis.
Psychostimulants include medications such as Ritalin that are used for treating Attention-Deficit/Hyperactivity Disorder, a condition characterized by high levels of inattention and / or hyperactivity.
Source: *Monthly Activities Reports* submitted by districts in the Essential School Health Services program.

Figure 5. Psychotropic Prescription Medication Rate*
(Per 1,000 Students)
September 1, 2002 – December 31, 2002 (n=95 districts)
Daily Medications



*Rates shown are those reported by the typical (median) district in the ESHS program. Psychostimulants include medications such as Ritalin that are used for treating Attention-Deficit/Hyperactivity Disorder, a condition characterized by high levels of inattention and / or hyperactivity.

School nurses in the 95 ESHS districts administered an average of **122,840.4 doses** of medication to students per month. A little over half of these were doses of psychotropic medications, followed by over-the-counter (OTC) medications and asthma medications (Table 6).

Table 6. Number of Medication Doses by Type Administered to Students by School Nurses*
(Monthly Average) September 1, 2002 through December 31, 2002 (n=95 districts)

Medication Category	Number of Doses	Percent
Analgesic	2,967.0	2.3 %
Antibiotic	2,357.3	1.8
Anticonvulsant	3,434.5	2.7
Antihypertensive	754.3	0.6
Asthma	13,435.0	10.5
Epinephrine	8.3	0.0
Insulin	4,239.5	3.3
Psychotropic*	66,067.8	51.5
Other	8,422.3	6.6
OTC Analgesic	20,767.0	16.2
Other OTC	5,805.3	4.5
Total	128,258.1	100.0 %

*Includes supervised self-administration

For epinephrine, 90 out of 95 districts reported

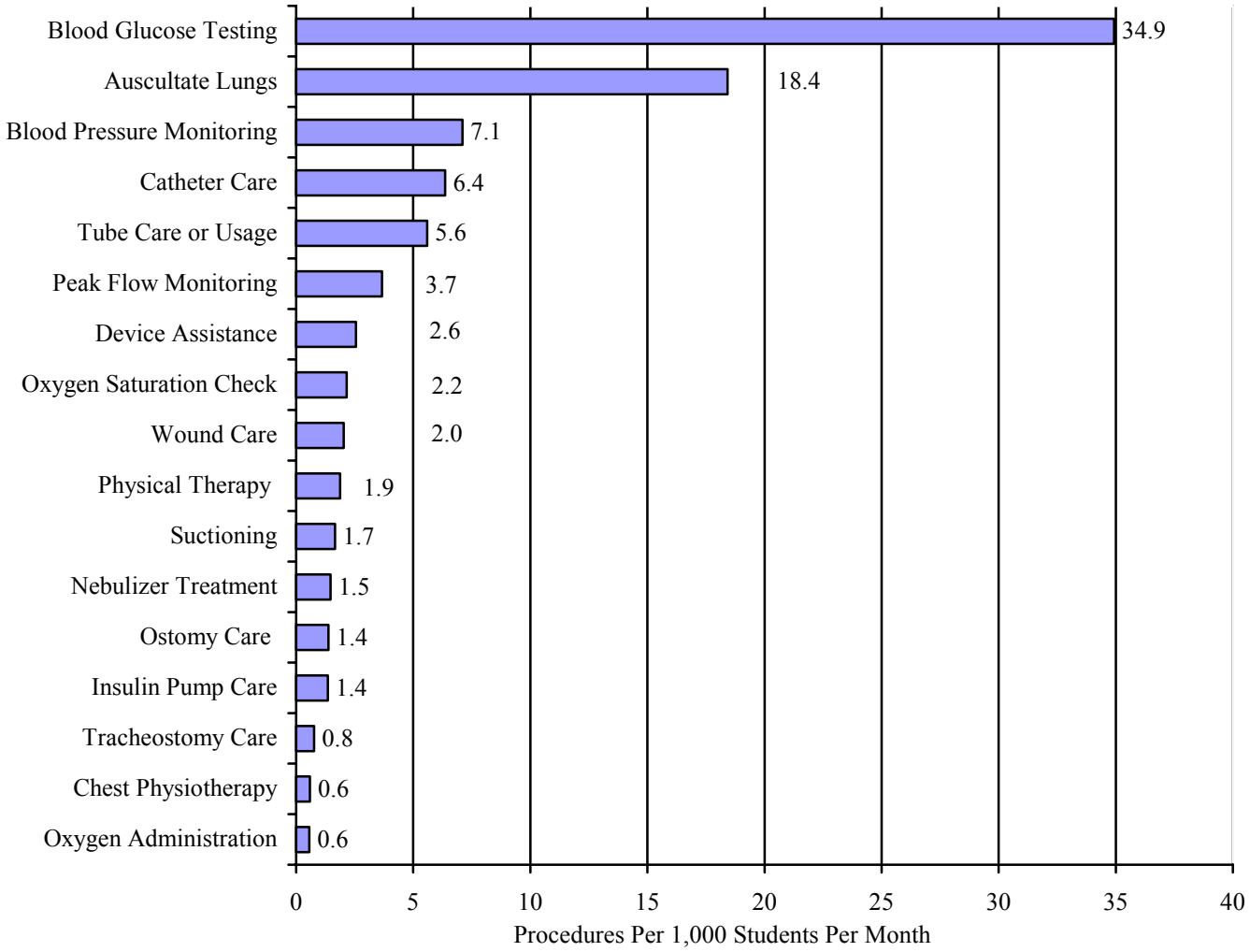
"Psychotropics" includes psychostimulants such as Ritalin used for treating Attention-Deficit/Hyperactivity disorder.

Source: Monthly Activities Reports submitted by districts in the Essential School Health Services program.

Medical Procedures

Enrollment of children assisted by medical technology in the public school system has increased in recent years. This phenomenon presents multiple challenges for school administrators, parents and guardians, school health services personnel, teachers, and students. ESHSP school districts collected information on the number and type of procedures performed by nurses that involved medical technology, as well as other medical procedures performed by school nurses. Monthly medical procedure rates per 1,000 enrolled students are shown in Figure 6:

Figure 6. Medical Procedure Rates*
Number of Procedures Per 1,000 Enrolled Students Per Month
September 1, 2002 – December 31, 2002 (n=95 districts)



*Among those districts performing the procedure at least once.
Rates shown are those reported by the typical (median) district in the ESHS program.
Source: *Monthly Activities Reports* submitted by districts in the Essential School Health Services program.

The median number of medical procedures per full-time nurse each month was **34.3** procedures (among the 93 districts reporting).

Medical procedure rates are summarized in Table 7:

Table 7. Medical Procedure Rates, Types, and Totals September 1, 2002 - December 31, 2002 (n=95 districts)

Type of Procedure	Monthly Rate Per 1,000 Students (Median District)	Number of Procedures Per Month (All Districts)	% of Districts Performing Procedure
Auscultate Lungs	18.4	11,660.8	96.8%
Blood Glucose Testing	34.9	17,379.5	97.9%
Blood Pressure Monitoring	7.1	4,622.8	97.9%
Catheter Care	6.4	2,205.3	47.4%
Central Line Care (a)	0.3	190.8	11.6%
Chest Physiotherapy	0.6	306.0	20.0%
Device Assistance	2.6	2,814.0	77.9%
Feeding Tube Care (b)	5.6	2,917.5	47.4%
Insulin Pump Care	1.4	841.8	51.6%
Nebulizer Treatment	1.5	1,534.8	87.4%
Ostomy Care (c)	1.4	388.5	27.4%
Oxygen Administration	0.6	147.3	20.0%
Oxygen Saturation Check	2.2	1,666.0	35.8%
Peak Flow Monitoring	3.7	4,546.0	88.4%
Physical Therapy	1.9	851.3	27.4%
Suctioning	1.7	309.0	18.9%
Tracheostomy Care	0.8	240.3	15.8%
Wound Care	2.0	2,321.5	83.2%

a) Central Line Care: Monitor infusion or administration, Tube Replacement or adjustment, Pump monitoring, IV Bag Change
b) Naso-Gastric, Gastronomy or Other Feeding Tube Care or Usage
c) Ostomy Care- Colstomy/Ileostomy/Urostomy
d) Rates are calculated from those districts that performed the procedure at least once.
Source: *Monthly Activities Reports* submitted by districts in the Essential School Health Services program.

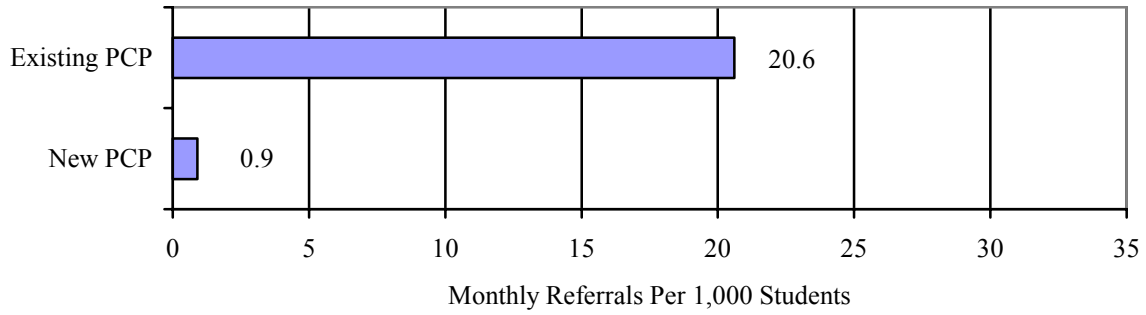
Linkages

ESHS school systems identified students without primary care and, in consultation with their families, referred them to appropriate health care services. School systems also provided many referrals to students' existing primary care providers. During the four month reporting period in 2002-2003, 95 participating districts reported the following:

- A total of **70,915 students** requiring primary care services were identified and referred to primary care providers. Those students without primary care providers were referred to new providers. Referrals included:

- **5,499** referrals to new primary care providers (7.8% of total primary care referrals). In a typical district, monthly referrals to new primary care providers averaged 13 students, a rate of 0.9 referrals per 1,000 enrolled students per month;
- **65,416** referrals to existing primary care providers (92.2% of total referrals). In a typical district, monthly referrals to existing primary care providers averaged 293 students, a rate of 20.6 referrals per 1,000 enrolled students per month

Figure 7. Primary Care Provider Referrals
Median Monthly Rate Per 1,000 Students
September 1, 2002- December 31, 2002
(n=95 districts)



Source: *Monthly Activities Reports* submitted by districts in the Essential School Health Services program.

In addition, during the four month period, 95 districts reported receiving from providers Massachusetts Asthma Action Plans (MAAP) for **533.3 students** monthly. Individual districts received between **0.0 and 69.5 action plans per month**.

Oral Health

School nurses perform oral health related activities. Table 8 summarizes these activities for the four-month reporting period.

The typical district participating in oral health screening activities screened students at a rate of **1.5 per 1,000** enrolled students per month.8 There was considerable variability across districts, with the most active district performing 209.6 screenings per 1,000 students per month. School nurses played a very active role in oral screenings; for every student screened by a dentist or hygienist, 3.1 were screened by the school nurse (see table below).

[8] Rate is based on those districts that performed one or more oral health screening activities.

Table 8. Summary of Oral Health Related Activities September 1, 2002 - December 31, 2002 (n=95 districts)

Oral Health Related Activity	% of Districts Performing Activity	Number of Students (Total)
Screened by school nurse	58%	14,630
Screened by dentist or hygenist	38%	4,793
Third grader screenings	37%	2,033
Dental sealant applied in school	18%	609
Flouride rinse administered in school	49%	37,162
Referred to dental provider	58%	3,528

Source: *Monthly Activities Reports* submitted by districts in the Essential School Health Services program.

Health Education, Tobacco Prevention and Support Groups

School nurses are often called upon to deliver health education in the classroom. In this teaching role they provide information to students on topics such as nutrition education, injury prevention, and human growth and development. Over the four-month period, school nurses in 95 districts delivered **6,324 classroom presentations** (in a typical district, each full-time school nurse delivered 0.9 presentations per month).

In addition to classroom presentations, nurses in 95 districts provided individual assistance and counseling on nutritional issues to **9,106** students per month (in a typical district, 11.5 out of every 1,000 enrolled students received nutritional counseling per month).

During the four month period, school nurses in ESHS districts provided the following tobacco prevention/cessation services:

- A total of **12,536 students** and **1,505 adults** participated in tobacco prevention education groups in 22 districts; **621** tobacco prevention group meetings were held**.**

- A total of **793 students** and **17 adults** participated in tobacco cessation groups in 13 districts; **60** tobacco cessation group meetings were held.

- A total of **4,153 students** and **293 adults** received individual tobacco cessation counseling in 68 districts**.**

- A total of **325 students** and **126** adults in 33 districts were referred to other tobacco prevention/cessation services.

Support Groups

Table 9 summarizes participation in student support group activities led or assisted by school nurses for the four-month period of September 1 through December 31, 2002. It does not include tobacco-related support groups which were discussed previously.

Table 9. Support Group Activities
September 1, 2002 – December 31, 2002

Support Group Topic	% of Districts Offering Group	Total Number of Meetings	Total Number of Participants
Emotional Support (a)	41.1%	641	2,267
Food Allergy	34.7%	132	1,443
Anger Mgmt (b)	30.5%	344	2,480
Nutrition	30.5%	272	2,588
Peer Leadership	26.3%	250	1,626
Diabetes	23.2%	145	612
Asthma	22.1%	103	621
Substance Abuse (c)	16.8%	118	2,803
GLBT (d)	14.7%	87	563
Other	40.0%	332	1,851

a) Emotional / Psychosocial Support
b) Anger / Conflict / Violence Management
c) Alcohol or Substance Abuse
d) Gay / Lesbian / Bisexual / Transgender
Source: *Monthly Activities Reports* submitted by districts in the Essential School Health Services program.

The support group most likely to be offered was "Emotional/Psychosocial Support" (offered by 41.1% of districts); such groups also generated the greatest number of total meetings (641) and attracted a comparatively large number of participants (2,267). The support group that attracted the largest number of participants was "Alcohol or Substance Abuse," although only a relatively small percentage (16.8%) of districts offered such groups. The support group least likely to be provided was "Gay/Lesbian /Bisexual/Transgender" (14.7%).

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APPENDIX A

Essential School Health Services Program Districts: 2002-2003

DISTRICT NAME	ADMINISTRATION	REGION	TYPE	STUDENTS
Amesbury	Town	NE	R	2,775
Amherst-Pelham*	Regional Academic	W	R	3,998
Ashburnham-Westminster	Regional Academic	C	R	2,463
Ashland	Town	Metro West	R	2,553
Avon	Town	SE	R	730
Barnstable	Town	SE	R	6,229
Belchertown	Town	W	R	2,440
Berkshire Hills	Regional Academic	W	R	1,519
Boston	City	Boston	C	61,552
Bourne	Town	SE	R	2,612
Braintree	Town	Metro West	R	4,941
Bridgewater-Raynham	Regional Academic	SE	R	6,156
Brockton	City	SE	C	16,700
Brookline	Town	Boston	R	6,044
Cambridge	City	Metro West	R	6,775
Canton	Town	Metro West	R	2,957
Central Berkshire Regional (Dalton)	Regional Academic	W	C	2,316
Chelsea	City	Boston	C	5,777
Chicopee	City	W	R	7,702
Clinton	Town	C	R	1,984
Cohasset	Town	Metro West	R	1,392
Dedham*	Town	Metro West	R	2,983
Douglas	Town	C	R	1,483
East Longmeadow	Town	W	C	2,670
Fairhaven	Town	SE	R	2,343
Fall River	City	SE	R	12,132
Foxborough*	Town	Metro West	R	2,850
Framingham	Town	Metro West	C	8,364
Frontier	Regional Academic	W	R	1,676
Gardner	City	C	R	3,231
Gateway	Regional Academic	W	R	1,458
Georgetown	Town	NE	R	1,622
Gloucester	City	NE	R	4,146
Granby	Town	W	R	1,119
Hadley	Town	W	R	633
Hampden-Wilbraham	Regional Academic	W	R	3,878
Hanover	Town	SE	R	2,729

Appendix A continued

DISTRICT NAME	ADMINISTRATION	REGION	TYPE	STUDENTS
Harwich	Town	SE	R	1,500
Haverhill	City	NE	R	8,308
Holliston	Town	Metro West	R	3,083
Holyoke	City	W	R	7,255
Hudson	Town	Metro West	C	2,769
Lawrence	City	NE	C	12,587
Leominster	City	C	R	6,146
Lexington	Town	Metro West	R	6,051
Lowell	City	NE	R	15,479
Ludlow	Town	W	R	3,035
Lynn*	City	NE	R	15,114
Malden	City	NE	R	5,945
Mansfield	Town	SE	R	4,535
Marblehead	Town	NE	R	2,960
Masconomet Regional (Topsfield)*				
Boxford Elementary	Town	NE	R	999
Masconomet	Regional Academic	NE	R	1,890
Middleton Elementary	Town	NE	R	703
Topsfield Elementary	Town	NE	R	745
Medford	City	NE	R	4,722
Melrose	City	NE	R	3,498
Milford	Town	C	R	4,100
Milton	Town	Metro West	R	3,597
MohawkTrail Regional (Buckland)*	Regional Academic	C	R	1,735
Mount Greylock School Union (Lanesborough)	Town	W	R	554
Nashoba	Regional Academic	C	R	3,049
Natick	Town	Metro West	R	4,555
Needham*	Town	Metro West	R	4,639
New Bedford	City	SE	R	14,580
Newburyport	City	NE	R	2,375
Newton	City	Metro West	R	11,360
North Andover	Town	NE	R	4,320
North Attleborough	Town	SE	R	4,685
North Berkshire Union (Clarksburg)	City	W	R	381
Northampton	Voc. & Agricultural	W	R	2,919
Northampton Smith Voc. & Agricultural High	Town	W	R	447
Northboro-Southboro	Regional Academic	Metro West	R	4,761
Northbridge	Regional Academic	Metro West	R	2,490
Norwood	Town	Metro West	R	3,741
Palmer	Town	W	R	2,114

Appendix A continued

DISTRICT NAME	ADMINISTRATION	REGION	TYPE	STUDENTS
Pioneer Valley Regional (Northfield)	Regional Academic	W	R	1,124
Pittsfield*	City	W	R	6,718
Plymouth	Town	SE	R	8,931
Provincetown	Town	SE	R	291
Quincy	City	Metro West	R	8,846
Randolph	Town	Metro West	R	3,991
Rockland	Town	SE	R	2,796
Rockport*	Town	NE	R	1,069
Salem	City	NE	C	5,000
Sandwich	Town	SE	R	4,171
Shirley*	Town	C	R	758
Somerville	City	Metro West	R	5,757
Southbridge	Town	C	R	2,629
Southern Berkshire	Regional Academic	W	R	1,026
Southwick Tolland	Regional Academic	W	R	1,870
Springfield	City	W	C	26,594
Stoughton	Town	SE	R	4,121
Taunton	City	SE	R	8,395
Triton (Byfield)	Regional Academic	NE	R	3,565
Wachusett	Regional Academic	C	R	6,855
Walpole	Town	Metro West	R	3,676
Waltham	City	Metro West	R	4,825
Ware	Town	W	R	1,321
Watertown	Town	Metro West	R	2,422
West Bridgewater	Town	SE	R	1,027
Westborough	Town	Metro West	R	3,528
Westfield	City	W	R	6,724
Westford*	Town	NE	R	4,925
Weston	Town	Metro West	R	2,353
Weymouth	Town	Metro West	R	7,038
Whitman-Hanson	Regional Academic	SE	R	4,521
Wilmington	Town	Metro West	R	3,811
Winthrop	Town	Boston	R	2,138
Worcester	City	C	R	25,712
TOTAL				565,186

** Data from these districts are not included in the analysis.*

Notes:

1. "Type" refers to type of ESHS award: "R" means that the district is a part of the basic or regular ESHS program; "C" means that the district is a part of the ESHS With Consultation program.
2. "Region" refers to the six standard geographic regions defined by the Executive Office of Health and Human Services (EOHHS): "W" =Western, "C" = Central, "NE" = Northeastern, and "SE" = Southeastern. "Metro West" and "Boston" are self-explanatory.

APPENDIX B

Essential School Health Services Program
Minimum Deliverables

Infrastructure for the comprehensive School Health Program strengthened.
1. Quarterly meetings of School Health Advisory committee.
2. Implementation of school district and building emergency plan by Year 1.
3. 100% students requiring prescription medications during the day have medication administration plan by Year I.
4. Role of school health services in student support/intervention program established.
5. Minimum of 1 support group operational in addition to Tobacco by Year II.
6. Annual student health needs assessment conducted and analyzed.
7. A selected number of policies reviewed, revised and approved annually.
8. Position descriptions for school health personnel developed during Year I.
9. 100% of students with special health care needs have individualized health care plans by end of Year I.
10. Marketing brochure completed during Year II.

Comprehensive health education program, including tobacco prevention and cessation, strengthened.
1. Documentation of enforcement activities related to violation of the tobacco-free school policy yearly or enforcement plan for tobacco-free school policy implemented in Year I.
2. Completion of annual tobacco use assessment.
3. Establishment of target goal for reduction in tobacco use, Year II.
4. Documentation of coordinated planning with health education coordinator.
5. Participation in a local community-based coalition addressing child and adolescent health.

Students linked to primary care providers, other community health providers and community prevention programs, and referred to insurance plans if uninsured.
1. Design and implementation of on-going process for identifying primary care providers and health insurers (including HMOs) serving the current student population and referral mechanisms for children/families, Year I.
2. 90% of all students will have their primary care provider and insurance carrier identified by end of Year II.
3. 75% of all students identified as lacking a primary care provider will be referred to a provider within the first year, with incremental increases annually.
4. 100% of uninsured eligible children and adolescents referred to Children's Medical Security Plan (CMSP) or MassHealth for enrollment by end of Year I.

Management information system implemented.
1. 100% of the students' health records will be computerized by Year II.
2. Completed annual report on data specific to the program.

Development of quality improvement process with identification of projects to document the effectiveness and efficiency of the school health service program.
1. In relation to efficiency, work with BFCH to determine formula to calculate cost per encounter.
2. Identification of types of student encounters (health assessment, nursing care, nursing treatment, first aid, etc.) by end of Year I.
3. Develop one health status improvement measure such as % of six graders appropriately immunized, or decrease to less than 10% number of students who use tobacco, etc.

APPENDIX C

Data Collection Methods

Contractual obligations require districts in the ESHS and ESHSC programs to submit a monthly report to MDPH. This report, the ESHS **Monthly Activities Report**, provides a detailed, standardized summary of the health services activities that took place in the district during the prior month. It includes a count of the number of encounters, medications administered, medical procedures, and other types of services provided.

Information for these reports is gathered from each school nurse. In most districts, school nurses enter health encounter data into a computer database loaded on a computer located in the school health office. The database facilitates data reporting as well as helps the nurse maintain systematic records and schedule follow-ups.[9] Nurses are encouraged to enter information during or directly after a health encounter. Each district in the ESHS program selects its own database software. Across the program, ten or more different software products are used, although the majority of districts use one of two popular applications. Within a district, all school nurses usually use the same software product. The software products operate differently. Many districts use a networked database that links all schools to the same database and permits the data coordinator to run district-wide data reports, while other districts use stand-alone databases in which data reports must be run separately at each school before being compiled at the district level. Due to resource constraints, nurses in a few school districts maintain paper logs and manually tabulate the data. Although districts use different software applications and some districts tabulate data manually, all districts are required to tabulate their data the same way and to submit a standard data report to MDPH. In any event, information is gathered from each school nurse in the district, tabulated, and entered into the Monthly Activities Report form in summary (or aggregate) form.

In addition, districts in the ESHS and ESHSC programs submit **status reports** once a year. This report measures progress in meeting program objectives, and includes performance measures relating to health services infrastructure, MIS development, linkages to all aspects of the health delivery system, and quality evaluation. It also summarizes the number of health screenings performed and health surveys administered during the school year. The recipient school districts in the ESHSC program submit this report once a year.

Data from the monthly activities reports submitted by ESHS/ESHSC program districts during the 2002-2003 school year is the primary source of information for the statistics presented here. Due to resource constraints, the state-wide data collection system did not operate after December 2002. As a result, the summary statistics contained in this report were generated from monthly reports submitted during the four month period between September 1, 2002 and December 31, 2002, rather than the full ten month school year. *As a result, the reader is advised to exercise caution when comparing the statistics presented in this report to statistics presented in prior reports. Note also that the statistics presented in the 1997-1998 and earlier editions of the annual data report covered the January 1 - April 30 time period (four months).*[10] *As a result, the reader is advised to exercise caution when comparing the*

[9] Paper logs are still used to record data elements that are not typically included in most school health software programs. For example, one item that is usually logged by hand is "Number of support group meetings."

[10] This applies to the annual data reports covering the 1995-1996, 1996-1997, and 1997-1998 school years.

statistics in this report to statistics published in those reports. In most cases, direct comparisons should be avoided.

Over the course of the 2002-2003 school year, monthly encounter data were collected successfully from 94 of the 106 ESHS award recipients that were required to submit data (88.7% of program total), serving a total of **510,490 enrolled students** (51.9% of the state public school enrollment total). Because one award funds two districts, these 94 recipients include a total of 95 school districts, and for analytical purposes it is these 95 districts that are referenced throughout the remainder of this report. For the 95 school systems that submitted data during the 4-month period, MDPH received a very high proportion (96.3%) of the 380 expected monthly reports. For consistency, missing data from the monthly reports that were not received were filled with district averages.

For the 95 districts that form the basis of this report, the median student enrollment was 3,565, with a range of 291 to 61,552 students. Urban, suburban, and rural districts were represented in these samples, as were regional and vocational school systems.

Data Analysis Methods

In order to reduce the potential for confusion, the statistical concepts and terms used in this report are described below.

For each measurement or "indicator," a ***district-level statistic*** is determined in each district by calculating a monthly average for the 4-month evaluation period. The **monthly average** for a particular district is calculated by adding the total number of events or encounters that occurred in a particular district during the evaluation period and dividing that total by the number of months included in that evaluation period. Because it is awkward to refer constantly to the "monthly average for the district" or the "district-based monthly average," these data are referred to as the **district average**. These two terms--the monthly average and district average--are used interchangeably in this report. All monthly averages in this report were calculated over the same four-month period (September through December).

Wherever possible, standard units of analyses (*rates*) are used, as they facilitate both cross-district and historical comparisons, which can provide context and meaning to the statistics. The standard units of analysis that were used most frequently in this report are the monthly rate per 1,000 student health encounters, the monthly rate per 1,000 enrolled students, and the monthly rate per full-time equivalent (FTE) nurse. The **monthly rate per 1,000 student health encounters** is calculated by dividing the monthly average for that indicator by the total number of student health encounters in that district and multiplying the result by 1,000. Similarly, the **monthly rate per 1,000 enrolled students** is calculated by dividing the monthly average by the total number of enrolled students in that district and multiplying the result by 1,000. Rates per thousand enrolled students were calculated utilizing October 2002 student enrollment figures provided by the Massachusetts Department of Education (see Appendix A). Finally, the **monthly rate per full-time equivalent (FTE) nurse** is calculated by dividing the monthly average by the total number of Registered Nurse FTEs in that district. Sometimes the rate is not based on an average of *monthly* data but on aggregate data for the full four- month period. For example, **the rate of health screenings per 1,000 students** is determined by dividing the total number of screenings *for the whole four-month period* by the number of students enrolled and multiplying the result by 1,000.

Program-wide statistics describe not individual districts, but the ESHS/ESHSC program as a whole. In these calculations, each district represents a data point that is used in calculating summary statistics. For example, if averages are calculated for 100 districts, the result is a collection of 100 district averages that can be arrayed from lowest to highest along a frequency distribution. When frequency distributions are *skewed* (that is, the values tend to clump around either the lowest or highest value, rather than around the middle), the *median,* rather than the *average*, is used to measure central tendency. *Because most of the ESHS/ESHSC frequency distributions were skewed, the median is used throughout this report.* The **median** represents the number above and below which exactly 50% of the districts fall. It is a better measure of central tendency than the *average* for skewed data, because the average tends to be more affected by extreme values. The most common use of median in this report is with district-based monthly averages; for a particular indicator, the median for the group of ESHS/ESHSC districts (a *program-level* statistic) is the district average (or monthly average) above and below which exactly 50% of the individual district averages fell. The **range** of a set of district averages refers to the lowest and highest values across the entire group of ESHS/ESHSC districts. The district with the median value for an indicator is sometimes referred to as the **median district** or the **typical district**. The median value across all the monthly district averages is also referred to as the **median district average**.

Medians can also be calculated for rates. For example, the **median Emergency Referral rate** (i.e., Emergency Referrals per 1,000 health encounters) is calculated by first putting the total number of Emergency Referrals in the form of a rate (for each district, dividing the total number of Emergency Referrals by the number of student health encounters and multiplying by 1,000), and then finding the median of these rates.

Data Limitations

This report focuses exclusively on the delivery of school health services by nursing staff. In addition, because project sites were not selected to serve as a representative sample of the Commonwealth, this summary is descriptive in nature and is not intended to be used to make generalized statements about health services in all Massachusetts public schools. Furthermore, many of the statistics presented in this year's report should not be directly compared to statistics presented in past reports. This is because different school districts have participated in the program in different years, not all school districts involved in the program in a given year submitted complete data, and the statistics presented in the reports were calculated from data collected in different portions of the school year (from either a 4-month or a 10-month period). The descriptive data presented here also do not capture the dynamic and multi-faceted nature of health services delivery in a school system, which would require in-depth qualitative analysis of the program participants. Differences in data collection and data tabulation procedures may account for some of the variability observed across districts. Furthermore, a small percentage of the school districts in the program did not have computerized records of office visits and relied on paper logs and hand tallying of data by individual nurses. In these cases, it is impossible to control for factors such as data-entry errors at the district level, consistent misinterpretation of data elements, and numerical "guesstimates" provided by participants. Some of these data quality problems can lead to significant under- or over-counting. Finally, interpretation of the data is limited because we have not attempted to analyze the influence of school district demographics or other participant differences.

Participating districts were required to implement, in a short period of time, both program innovations that entailed major organizational change and, in most cases, the development of an internal data

collection system (see Appendix B). Therefore, this report represents a preliminary attempt to measure the health services activity in participating school systems. Improvements in data collection procedures, data collection tools, and data collection instructions and training occur on a continuing basis, leading to corresponding improvements in data validity and reliability.