2012 PROGRAM UPDATE: ESSENTIAL SCHOOL HEALTH SERVICES

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Introduction

In recent years, research has highlighted major societal, legal, and medical technological changes and their effect on the demand for school health services. These changes include: (1) increased awareness of the relationship between health and educational achievement; (2) improved medical technology; (3) increase in the number of students with special health care needs combined with an increase in condition severity in these students; (4) rapid restructuring of the health care delivery system; (5) laws requiring inclusion; (6) changes in family structure and patterns of parental employment; (7) rise in social morbidities such as substance abuse, depression, and violence among children; and (8) impact of diverse cultural and linguistic groups.

- Attendance in the early grades is correlated with school achievement and dropout rates. School nurses support attendance by providing needed health services in school. They also provide assessments of illness and injuries. School nurses are significantly less likely to dismiss a student than an unlicensed counterpart (Pennington & Delaney, 2008), and in one study 57% less likely (Wyman, 2005).

- As neonatal intensive care unit survivors enter early intervention services and kindergarten, the need for school health services increases (Clement, Barfield, Ayadi & Wilber, 2007). Data show that the students in the Commonwealth's schools require increasingly complex health care during the school day. The current (FY12) Essential School Health Data Report indicates that 27% of the students in ESHS and partner districts (districts that agree to work towards ESHS program goals and receive a small level of funding) have at least one special health care need. Children with special health care needs (CSHCN) are defined by the Department of Health and Human Services, Health Resources and Services Administration, Maternal and Child Health Bureau (MCHB) as: "...those who have or are at increased risk for a chronic physical, developmental, behavioral, or emotional condition and who also require health and related services of a type or amount beyond that required by children generally" (McPherson et al., 1998).

- Nationally, the incidence of diabetes among adults 18 - 79 has almost doubled in the last 10 years (CDC, 2008), and diabetes is increasingly being diagnosed in children and adolescents (Hannon, Rao, and Arslanian, 2005). In Massachusetts the percentage of children prescribed epinephrine for life threatening anaphylaxis more than doubled between 2001 and 2011, rising from .72% to 2.31%. In addition, the Cedar Rapids v. Garret Supreme Court decision of 1999 clarified the extent to which school districts are required to provide school nursing services for medically fragile children.

- Children assisted with medical technology, e.g. catheterizations, tracheostomies, ventilators, etc., are now attending school. Likewise terminally ill children are in the Commonwealth's classrooms, necessitating end of life planning.

- 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 such

as acute asthma and diabetes, formerly managed in a hospital setting (Chabra et al., 2000; Coffman et al., 2008; Leslie et al., 1998; Schutte et al., 1997).

- Social attitudes that promote inclusion, as well as state and national laws, such as the Individuals with Disabilities Act and Section 504 of the Rehabilitation Act of 1973 specify disability rights and access to education, resulting in more children requiring nursing care and other health-related services in school (Palfrey et al., 1992; Raymond, 2009; Small et al., 1995).

- 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 (Smolensky and Gootman, 2003; Thurber et al., 1991; Uphold & Graham, 1993; U.S. Census Bureau, 2000; Wold, 2001). In Massachusetts ESHS-funded districts, 66.8% of health encounters in 2010-2011 were for the purpose of health maintenance.

- Students spend a large part of their day at school; therefore, the school has become an important site where health and education risks, e.g. depression, absenteeism, substance use, may be identified and timely interventions initiated. One in five young people between that ages of 9 and 17 experiences symptoms of mental health problems, and one in ten children and adolescents has a mental illness severe enough to cause some level of impairment; yet in any given year, only about one-fifth of children in need of mental health services actually receive them. (US Surgeon General's Conference on Children's Mental Health, 2000). This disproportion can result in increased demands for professional health services in the schools (Thurber et al., 1991).

- Massachusetts schools have many “newcomer” groups, both immigrants and refugees, as well as those families who move between different communities. Often such families rely on the school for 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, look to the school health service for assistance.

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, 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 Services Program (ESHS). (The Essential School Health Services Program was originally entitled the Enhanced School Health Service Program.)

In 1993, thirty-six school districts were funded for three and half years to: (a) strengthen the infrastructure of school health services in the areas 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 the 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. 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 of participants to 106 school districts in the spring of 2003. Three more schools withdrew from the grant in 2004, and one additional school withdrew in 2006, leaving 102 districts in the ESHS program.

In 2009 a new funding cycle started and 80 school districts were funded (see **Appendix A)**. Of these 80 funded districts, 68 (85%) had been funded during the previous cycle. Thirty-four districts in the previous funding cycle (33% of the 102 districts included in the earlier funding cycle) were not included in the new funding cycle. The number of funded districts was reduced because some funds were freed to establish an extension of the ESHS programs, namely mentored/partnered schools. Each of the 68 experienced programs (with the exception of the large cities) was required to mentor or partner with two other school districts in order to increase adoption of the standards established in the ESHS program initiative. Therefore 146 additional mentored/partnered school districts,[3] each with a limited amount of funding, were added to the model. These school districts were required to meet a specified scope of service. Of note is that

[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 (private and parochial) schools, 30 charter schools.

[3] Partner school district: In an effort to increase the impact of the ESHS programs, the Department requires that each experienced ESHS program partner or mentor with two other school districts. The expectation is that the partner schools will agree to work towards ESHS program goals by meeting, planning and collaborating with the ESHS districts and fulfilling some of the requirements that apply to the funded districts. Partner schools receive a small amount of funding from the ESHS budget to assist in this effort, e.g., fund substitute nurses and travel so that the nurse leaders may meet.
All public school districts were invited to join this program. . A number of vocational schools, educational collaboratives and charter schools were also invited to participate in this program when an opening in a geographic area was available.

in the FY10 school year, these mentored/partnered school districts began to submit some data, consistent with ESHS requirements.

In addition to the Mentor/Partner School Program component of the 2009 grant cycle, a Regional Consultation program was also included in the funding. These six regional ESHS programs (based on the EOHHS defined regions) were selected to provide consultation to ESHS programs within their general geographical area. Regional consultation school districts must have been previously awarded the Essential School Health Service (ESHS) or Essential School Health Service with Consultation programs (ESHSC). The general goal of the ESHS Regional Consultation grant is to maximize the existing school nursing expertise, leadership and infrastructure to provide additional consultation to ESHS programs (including their mentored/ partnered school districts and community public schools as appropriate) within a general region.

In October 2009, 9C cuts to the ESHS programs resulted in the reduction to 50% funding for 13 programs. These reductions impacted data collection efforts in these school districts. At the end of 2010, 7 programs were defunded. In addition, at the end of 2011, 1 additional program was defunded. Therefore, the FY12 report has fewer districts (72) reporting on certain indicators.

Throughout this report, comparison data from previous years are presented. Because the mix of school districts included in the program has changed over the years, caution should be exercised when interpreting these data, as differences may be the result of the changing composition of school districts in the program.

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

Executive Summary

The information collected by the Essential School Health Services Program provides a valuable snapshot of school nursing practice in a diverse 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. In addition, some school nurses provide services to school staff.

Analysis of the ESHS program data for the school year beginning September, 2011 and ending June, 2012 showed the following:

- 860 schools in 72 ESHS school districts reported a total of 4,601,114 student health encounters, and 62,282 staff health services.
- In a typical district, students visited the school nurse an average of 1.1 times per month.[4] There was substantial variability among school districts, with the encounter rate ranging from 0.6 to 2.1 visits per month.
- After assessment and/or treatment by a school nurse, the majority (93.1%) of the students visiting the nurse's office with an illness or injury complaint were returned to the classroom to continue their studies.
- 6.7% of the more serious injuries to students were classified as intentional, compared to 8.5% in the previous school year. These include injuries resulting from assaults (e.g. physical fighting) and those that were self-inflicted (e.g. intentional drug overdose, suicide attempts).
- There were 9,104 diagnosed or suspected head injuries in ESHS districts, and 3,472 such injuries in partner districts.
- School nurses in ESHS districts referred students to urgent health care services a total of 6,654 times. 23.7% of these involved medical 9-1-1 ambulance calls, 7.1% involved behavioral health 9-1-1 ambulance calls, and 7.5% involved mobile crisis unit calls. In the remaining cases, parents or others were called to transport the student to health services.
- The majority (91.0%) of the prescriptions managed by the school nurse were for medications dispensed on a PRN, or "as needed" basis.[5]
    - Among students taking PRN medications, asthma medications were the most common (39.9 prescriptions per 1,000 enrolled students).
    - The prescription rate for "as needed" epinephrine increased from 7.2 per 1,000 students in 2003 to 25.1 per 1,000 in 2012.
    - Among students on scheduled prescription medications, psychotropic medications (drugs affecting perception, emotion or behavior) were by far the most common (6.0 per 1,000 enrolled students).

[4] "Typical" is defined in this report as the median district. It is the district lying in the middle of the group, with half the districts having higher values and half having lower values.

[5] 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, based on a nursing assessment.

- In the ESHS districts, school nurses administered an average of 131,483 doses of prescription medication to students per month. Fifty-six percent of the scheduled doses were for psychotropic medication, and 53% of the PRN prescription doses were for asthma medication.
- School nurses in 160 ESHS and partner districts conducted Body Mass Index screenings on 190,865 students in grades 1, 4, 7 and 10. Overall, 32.2% of the students screened were overweight or obese (16.0% obese, 16.2% overweight).
- Diabetes care procedures continue to account for an significant amount of nurses' time. Blood glucose testing, the most common medical procedure, occurred at a rate of 74.1 procedures per 1,000 students each month. While the proportion of students requiring glucose testing may be relatively small, the number of daily tests on those students requires considerable nursing time and assessment, as each child usually requires glucose monitoring several times a day.
- Nurses provided emotional support interventions at a rate of 11.4 interventions per 1,000 students per month.
- Oral health screenings were performed in ESHS districts at a rate of 77.7 per 1,000 students (for the school year).
- Tobacco prevention and cessation programs reached substantial numbers of individuals, although activity levels varied widely across districts.
  - 2,182 students attended individual tobacco cessation counseling sessions (44 districts).
  - 8,076 students participated in group tobacco prevention activities.
- A total of 179,251 students with special health care needs were reported to school nurses in ESHS and partner districts (265.9 per 1,000 students).
  - The most common physical/developmental condition reported to school nurses was asthma (127.6 per 1,000 enrolled students).
  - The most commonly reported behavioral/emotional condition was Attention-Deficit/Hyperactivity Disorder (62.3 per 1,000 enrolled students).
- Almost 89% of the ESHS school districts have at least one AED in all of their school buildings, up from 29.7% in 2003-2004. All ESHS districts have deployed AEDs in at least one school building. Only 8.3% of school buildings in ESHS districts do not have an AED.

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 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

In the ESHS program, 1,058.6 full-time school nurses (or full-time equivalents) provided health care services to students and staff in the 72 ESHS funded public school districts. The student-to-nurse ratio was 431 students per nurse (compared to 412 the prior year).[6] An additional 472.7 school nurses provided care in 87 partner school districts. In the partner districts, the student-to-nurse ratio was 444, compared to 438 the prior year. Finally, 9.4 school nurses provided care in 9 partner charter schools and 36.5 school nurses provided care in 9 educational collaboratives.[7] Thirty-five percent of ESHS RN school nurses have an advanced degree (Table 1a). Compared to ESHS and partner districts, an Associate's degree is more common in charter schools and collaboratives.

TABLE 1a. Educational Level of RN School Nurses in ESHS and Partner Districts (Percent of total RN FTEs, 2011-2012)

Type of District	Total RN FTEs (Number)	Diploma RN (Percent)	Associate Degree (Percent)	Bachelor's Degree (Percent)	Advanced Degree (Percent)	Unknown/ Other (Percent)
ESHS	1,058.6	4.0	5.7	55.2	35.1	0.1
Partner	467.7	9.1	5.1	58.3	25.4	2.0
Charter	7.4	6.3	12.5	43.8	18.8	18.8
Collaborative	36.5	16.7	30.6	44.4	8.3	0.0
Total	1,570.2	5.9	6.1	55.8	31.4	0.9

Includes Nurse Leaders. "Advanced Degree" includes Master's and Doctoral degrees. Source: 72 ESHS districts, 87 partner districts, 9 charter school districts, and 8 collaboratives.

Among ESHS and partner districts, 76.1% of school nurses had been licensed by the Department of Elementary and Secondary Education (compared to 72.7% last year), and 32.5% had a National Certified School Nurse (NSCN) certification (compared to 22.1% last year, Table 1b).

[6] These statistics include data from the ESHS districts, but do not include data from any associated 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.

[7] Enrollment numbers for educational collaboratives are not available.

TABLE 1b. Percent of School Nurses with DESE and NCSN Certifications By Highest Educational Degree (ESHS and Partner Districts, 2011-2012)			
	Nurses	**DESE Licensed**	**NCSN Certified**
Educational Degree	(Number)	(Percent)	(Percent)
Diploma RN	94	78.0	NA
Associates Degree (AD)	59	43.1	NA
Associates (Other than AD)	39	17.9	NA
Bachelor's (BSN)	815	88.5	34.0
Bachelor's (Other than BSN)	80	76.9	35.9
Master's (MSN)	186	87.6	27.5
Master's (MPH)	12	83.3	33.3
Master's (MEd)	202	95.0	42.0
Master's (Other)	95	73.4	25.5
Doctoral	7	100.0	50.0
Total	1,589	76.1	32.5

Source: 72 ESHS districts, 87 partner districts, 9 charter school districts, and 8 collaboratives. Each full- or part-time nurse is counted once.

Student Demographics

In 2011-2012, 48.0 percent of Massachusetts public school students were enrolled in an ESHS-funded school district. The racial and ethnic composition of the ESHS student population is different than that found in the Massachusetts public school population, however. There is a higher percentage of Black and Hispanic students in ESHS-funded districts (Table 2). In addition, a higher percentage of students in ESHS-funded districts are low income, have limited English proficiency, and have a first language that is not English (Table 3).

TABLE 2. Race/Ethnicity of Students in ESHS Districts and Massachusetts Public Schools (2011-2012)		
	ESHS Schools	**State Public Schools**
Race/Ethnicity	**Percent**	**Percent**
African American or Black	11.8	8.3
Asian	7.1	5.7
Hispanic or Latino	23.3	16.1
Multi-race, Non-Hispanic	2.8	2.5
Native American	0.2	0.2
Native Hawaiian or Pacific Islander	0.1	0.1
White	54.6	67.0
Total Population	457,798	953,369

Source: Massachusetts Department of Elementary and Secondary Education.

TABLE 3. Selected Characteristics of Students in ESHS Districts and Massachusetts Public Schools (2011-2012)		
	ESHS Schools	**State Public Schools**
Characteristic	**Percent**	**Percent**
First Language Not English	23.7	16.7
Limited English Proficient	11.9	7.3
Low Income	45.5	35.2
Total Population	457,798	953,369

Source: Massachusetts Department of Elementary and Secondary Education.

Of the 298,905 students in 61 ESHS funded districts whose health insurance status was reported, 61.2% had private insurance, 37.5% had public insurance, and 1.3% had no insurance (Table 4). The status of 17.8% of students in ESHS funded districts and 11.7% of partner districts was unknown.

TABLE 4. Health Insurance Status of Students in ESHS and Partner Districts (2011-2012)				
		Type of Insurance		
District Type	**Number of Students**	**Private (Percent)**	**Public (Percent)**	**No Insurance (Percent)**
ESHS funded	298,905	61.2%	37.5%	1.3%
Partner	106,000	81.5%	17.6%	1.0%

Source: *Status Reports* submitted by 61 ESHS and 53 partner districts. Districts reporting insurance status for less than 30% of their student enrollment were excluded. Percentages may not add up to 100 due to rounding error.

School Health Services Activity

The **primary goal** of the Essential School Health Services Program is to improve the delivery of health services to students by reinforcing the school health service infrastructure. Toward that end, program participants were required to report throughout the year the type and scope of school nursing activity in their districts. These activities were divided into nine categories of data:

1) **Health encounters, including dispositions following assessment**
2) **Injury reports, early dismissals, and referrals for emergency health services**
3) **Medication management**
4) **Screenings**
5) **Medical procedures**
6) **Linkages to health care and insurance providers**
7) **Oral health**
8) **Health education, tobacco prevention, and support groups**
9) **Nursing case management**

1. 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 fall outside this definition and were not counted. In addition, mandatory screenings (such as vision, hearing, BMI and postural) were not counted as encounters because these are routine population-based activities. Screenings were tracked separately, however.

During FY2006, the ESHS Evaluation Committee refined the monthly and annual data collection tools. As a result, the FY07, FY08, and FY09 encounter categories are not comparable to those used in previous years. In addition to changes in encounter categories, districts no longer report secondary reasons for an encounter.[8] The major impact of that change is that the multifaceted nature of the health encounter, which often includes health education and mental health counseling components, is not fully reflected in these data: The following rules are used to help define encounter categories:

- *Every* encounter includes nursing assessment and health education. An encounter is recorded as an Individual Health Education encounter only when the primary issue is health education and there is no illness or injury involved. Individual Health Education encounters previously made up a large percentage of the reported secondary issues.
- An illness encounter may include illness assessment, acute illness, chronic health condition, etc. It excludes scheduled medication administrations (e.g. daily medication administration for ADHD) and scheduled procedures (ostomy care, scheduled glucose testing).
- Mental/Behavioral Health Support includes any encounter requiring active listening, anticipatory guidance, stress management, behavior modification/program support or evaluation of altered mental status. The primary reason for the encounter is related to a mental/behavioral health need. Mental/behavioral health services tend be under-reported as nurses will often categorize an encounter according to the presenting complaint (e.g., headache) even if it is determined that the complaint has an underlying mental/behavioral health origin.

Between September 1, 2011 and June 30, 2012, 72 ESHS school districts reported a combined total of 4,601,114 student health encounters. In a typical district, 82.6 percent of the student enrollment visited the health room at least once during the school year.[9] "Health maintenance" and "Injury/first aid" were the most common reasons for visits to the school nurse (Table 5a). The number of encounters reported per district varied widely, with individual districts averaging between 716 and 35,420 encounters per month. These differences were largely due to district size. In a typical district, each student visited the school nurse an average of 1.1 times per month,

[8] While the goal of recording secondary reasons for an encounter was to capture the mental health services being provided, this goal was not achieved. Nurses frequently categorize the encounter with the presenting symptom, e.g., headache, when, upon further assessment, the underlying cause relates to behavioral health.

[9] 72 districts reporting.

although the encounter rate varied across the districts from 0.6 to 2.1 visits per month. While some students are seen several times each month, many others are never seen. The school nurse workload, measured by the number of encounters logged by a full-time nurse each month, varied greatly across the districts, with the school nurse workload in a typical district being 408.9 student encounters per month[10].

An additional 1,523,819 student encounters and 21,240 staff services were reported by 52 partner school districts, 6 charter school districts, and 5 partner collaboratives. In a typical partner district, 81.2 percent of the student enrollment visited the health room at least once during the school year (slightly less than in ESHS districts), and each student visited the health room an average of 0.9 timer per month (slightly less than in ESHS districts). The typical nurse workload in partner districts was 337.7 student encounters per month, lower than the workload in funded districts.

The type of health services provided to students varied by type of school district. Compared to ESHS and partner districts, school nurses in charter districts provided a smaller percentage of mental health services and a greater percentage of first aid services. School nurses in collaboratives provided a much higher percentage of mental health services and a lower percentage of first aid services.

TABLE 5a. Percent of Student Health Services by Type of School District

September 1, 2011- June 30, 2012

	Type of District			
	ESHS	**Partner**	**Charter**	**Collaborative**
Number of Services:	4,598,291	1,372,480	20,748	47,110
Type of Health Service	**(%)**	**(%)**	**(%)**	**(%)**
Health Maintenance	65.6	65.1	57.8	77.4
Injury/First Aid	22.3	22.8	31.2	2.0
Mental/Behavioral Health	1.9	2.6	1.4	17.6
Miscellaneous	10.1	9.5	9.6	3.0

Note: In the ESHS program, a "service" is not equivalent to an "encounter", and as a result the total number of services may not equal the total number of encounters.

Health services were also provided to school staff (i.e., teachers and administrators). School nurses in 72 ESHS districts reported providing a total of 62,282 health services to staff (Table 5b). Across all districts, monthly averages ranged from 0 to 4,870 staff health services per month. In ESHS districts, the rate of services per staff FTE per month was 1.1, compared to 1.4 in partner districts.

[10] For these calculations, "school nurses" includes only RNs. The "typical" district workload was the workload that fell in the middle of the group (Half the ESHS districts had a higher workload, and half a lower workload).

The type of health services provided to school staff varied by type of district. Compared to ESHS and partner districts, in charter districts, health maintenance services accounted for the vast majority of health services, while in collaboratives, mental health services accounted for a comparatively large percentage of services.

TABLE 5b. Percent of Staff Health Services by Type of School District

September 1, 2011 - June 30, 2012

	Type of District			
	ESHS	**Partner**	**Charter**	**Collaborative**
Number of Services:	62,282	20,282	652	306
Type of Health Service	**(%)**	**(%)**	**(%)**	**(%)**
Health Maintenance	57.5	66.1	87.6	61.1
Injury/First Aid	20.2	17.7	11.5	30.7
Mental/Behavioral Health	5.2	3.7	0.2	4.9
Miscellaneous	17.1	12.5	0.8	3.3

*"Health Maintenance". Includes all visits for an illness assessment, acute illness, chronic health condition, etc. It includes scheduled medication administrations and scheduled procedures completed as well as all individual health education provided. Does not include visits for mandated screenings.

Source: *Monthly Activities Reports* submitted by 72 ESHS districts, 52 partner districts, 6 charter school districts, and 5 collaboratives..

2. Injury Reports, Early Dismissals and Referrals for Emergency Health Services

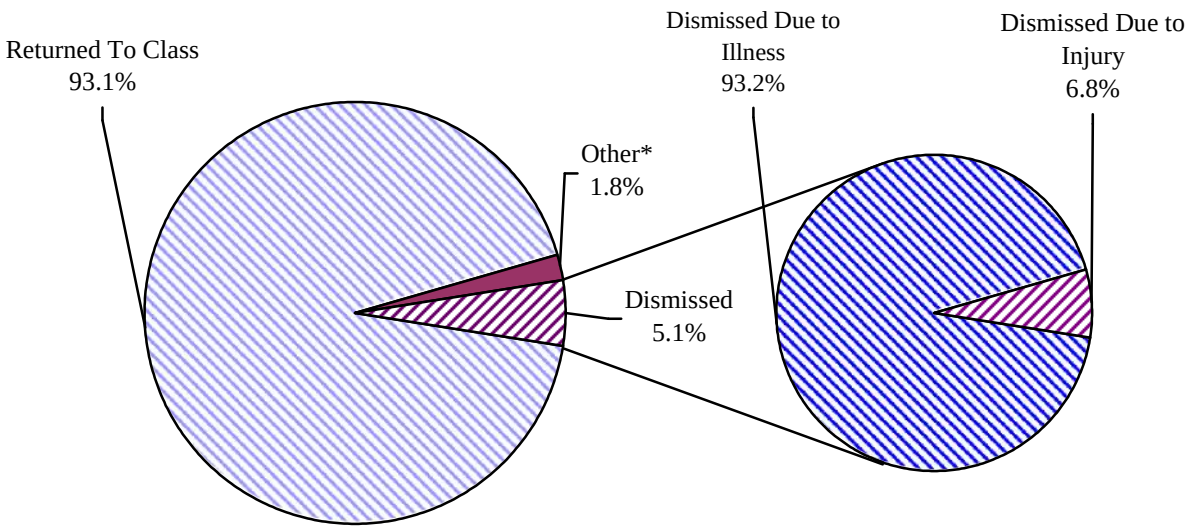
An important function of school nursing practice is to provide on-site health services to students who are sick, injured, or experiencing a serious health emergency. Each month, districts tallied the number of on-campus injury reports, early dismissals due to illness, and referrals for emergency health services. After assessment and/or treatment by a school nurse, the majority (93.1%) of students visiting the nurse's office making a health maintenance visit or with an injury complaint returned to the classroom to continue their studies (Table 6, Figure 1). These on-site services provide major benefits. Students who are treated can be returned to the classroom with minimal interruption of their educational activities; working parents do not have to take time off from work to provide care; and the high cost of treatment in a doctor's office is avoided. When students had to be dismissed, it was usually the result of illness (93.2%) rather than injury (6.8%).

TABLE 6. Disposition After Illness/Injury Assessment *ESHS Districts, September 1, 2011- June 30, 2012*		
Disposition	**Students**	
	Number	**Percent**
Returned to Class	4,227,879	93.1
Dismissals	232,321	5.1
Other*	82,928	1.8
Total	4,543,128	100.0

* Includes "Stayed in health office" and "Referred to counselor's office".
Source: *Monthly Activities Reports* submitted by 72 districts in the Essential School Health Services program.

The returned-to-class rate for student health encounters reported by 54 partner districts (which have a higher student-to-nurse ratio than funded districts) was 92.0%, which was lower than that reported by funded districts, and the dismissal rate was 5.7%, higher than that reported by funded districts.

FIGURE 1. Disposition After Nursing Assessment
Student Health Encounters, ESHS Districts
September 1, 2011- June 30, 2012



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

For injuries of a more serious nature, school nurses filed *injury reports* according to state and local policy. For the 2011-2012 School Year, ESHS districts reported 28,261 student injury reports and partner districts reported 7,738 student injury reports (Table 7a). Of the student injury reports filed by school nurses, 6.7% involved the intentional infliction of injury, compared

to 8.5% the previous year. These include injuries resulting from assaults (e.g. physical fighting) and those that were self-inflicted (e.g. intentional drug overdose, suicide attempts).

TABLE 7a. Number of Student Injury Reports

September 1, 2011 - June 30, 2012

Intent	ESHS Districts			Partner Districts		
	Number	Percent	Rate Per 1,000 Students	Number	Percent	Rate Per 1,000 Students
Unintentional	22,575	79.9	49.3	7,064	91.3	51.0
Intentional	1,903	6.7	4.2	277	3.6	2.0
Unknown intent	3,783	13.4	8.3	397	5.1	2.9
Total	28,261	100.0	61.7	7,738	100.0	55.9

Source: *Monthly Activities Reports* submitted by 72 ESHS districts and 54 partner districts.

The percentage of intentional injuries reported in the ESHS districts was higher that reported in the partner districts, and in the ESHS districts the percentage of injuries of unknown intent was more than twice that reported in the partner districts.

There were also 2,324 staff injury reports in ESHS districts and 656 staff injury reports in partner districts (Table 7b). The rate of injuries in ESHS districts was 40.6 per FTE, compared to 38.7 per FTE in partner districts.

TABLE 7b. Number of Staff Injury Reports

ESHS and Partner Districts, September 1, 2011 - June 30, 2012

Intent	ESHS Districts			Partner Districts		
	Number	Percent	Rate Per 1,000 Staff FTEs	Number	Percent	Rate Per 1,000 Staff FTEs
Unintentional	1,473	63.4	25.7	452	68.9	3.3
Intentional	403	17.3	7.0	85	13.0	0.6
Unknown intent	448	19.3	7.8	119	18.1	0.9
Total	2,324	100.0	40.6	656	100.0	4.7

Source: *Monthly Activities Reports* submitted by 72 ESHS districts and 54 partner districts.

In addition, school nurses in the 72 ESHS districts referred students to *urgent health care services* a total of 6,654 times (Table 7c), and referred staff to urgent health care services a total of 841 times (Table 7d)..

TABLE 7c. Emergency Referrals, Students *ESHS and Partner Districts, September 1, 2011 - June 30, 2012*		
	ESHS	**Partner**
Type of Referral	**Percent**	**Percent**
Medical 911 calls	23.7%	18.9%
Behavioral health 911 calls	7.1%	6.6%
Mobile crisis unit calls	7.5%	6.2%
Other referrals to emergency health services	61.7%	68.3%
Total Number	6,654	1,523
Rate per 1,000 students	14.5	11.0

Source: *Monthly Activities Reports* submitted by 72 ESHS districts and 54 partner districts.

TABLE 7d. Emergency Referrals, Staff *ESHS and Partner Districts, September 1, 2011 - June 30, 2012*		
	ESHS	**Partner**
Type of Referral	**Percent**	**Percent**
Medical 911 calls	40.0%	47.2%
Behavioral health 911 calls	1.0%	2.3%
Other referrals to emergency health services	59.1%	50.6%
Total Number	841	176
Rate per 1,000 staff FTEs	14.7	10.4

Source: *Monthly Activities Reports* submitted by 72 ESHS districts and 54 partner districts.

There were 9,104 cases of diagnosed or suspected head injuries reported in ESHS districts and 3,472 such injuries in partner schools (Table 7e). The percentage of head injuries occurring during school hours was greater in ESHS districts than in partner districts. In addition, there were 150 staff cases reported in ESHS districts and 37 staff cases in partner districts.

TABLE 7e. Number of Diagnosed or Suspected Student Head Injuries *September 1, 2011 - June 30, 2012*				
	Type of District			
	ESHS	**Partner**	**Charter**	**Collaborative**
Total number	9,104	3,472	65	<5
Percent occurring during:				
School hours	56.3%	39.0%	95.4%	0.0%
Extra-curricular activities	43.7%	61.0%	4.6%	100.0%

Source: *Monthly Activities Reports* submitted by 72 ESHS districts, 54 partner districts, 6 charter school districts, and 5 collaboratives.

3. 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.

Implicit in the description of medication administration is the nurse's responsibility for the following: development of the medication administration plan; assessment of the child prior to administering each medication; follow-up evaluation of medication efficacy and side effects; and ongoing communication with parents and providers.

ESHS districts tracked the number of *prescriptions* that had been ordered for their students. Throughout the year, the total number of prescriptions reported to school nurses averaged 82,740.3 per month for the 72 districts (Table 8). 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 basis, psychotropic medications were the most common, while among prescriptions taken on an "as-needed" (PRN) basis, analgesics and asthma medications were the most common.

TABLE 8. Number of Student Prescriptions Reported to School Nurses in ESHS Districts (Monthly Average) September 1, 2011 - June 30, 2012			
Medication Class	**Medication Schedule**		
	Scheduled	**PRN (As needed)**	**Total (Daily & PRN) Medications**
Analgesics	146.6	20,550.9	20,697.5
Antibiotics	239.6	121.7	361.3
Anticonvulsants	142.3	752.2	894.5
Antihypertensive	80.6	52.3	132.9
Antihistamines	42.1	6,686.6	6,728.7
Asthma Medications	434.8	18,267.5	18,702.3
Epinephrine	0.0	10,391.1	10,391.1
Glucagon	0.0	998.1	998.1
Insulin	989.2	842.6	1,831.8
Psychotropic	3,682.1	717.3	4,399.4
Other Prescription/OTC Meds	1,717.5	15,885.2	17,602.7
Total	7,474.8	75,265.5	82,740.3
Row Percent	9.0%	91.0%	100.0%

Source: *Monthly Activities Reports* submitted by 72 districts in the Essential School Health Services program.

Tables 9a and 9b 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.[11] 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 decrease in the at-school psychotropic prescription rate over the last few years (from 21.0 per 1,000 students in 2001 to 5.1 per 1,000 students in 2009) 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 treat 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. Aside from analgesics, asthma medications were the most commonly reported type of PRN prescription medication. As a result, prescription rates for these medications may be better estimates of the true overall prescription rate for the school age population.

[11] 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.

TABLE 9a. Prescription Medication Rate for Scheduled Medication (ESHS Districts, Prescriptions Per 1,000 Students)						
School Year	**Psychotropic**	**Asthma Medications**	**Antibiotics**	**Insulin**	**Anti-Convulsants**	**Others**
2000-2001	21.0	1.5	1.4	0.2	--	1.9
2001-2002	13.2	1.0	1.2	0.3	--	2.0
2002-2003*	7.0	0.5	0.8	0.3	0.2	0.9
2003-2004	7.3	0.9	0.8	0.6	0.5	1.3
2004-2005	5.6	0.4	0.8	0.6	0.3	1.1
2005-2006	5.8	0.3	0.7	0.8	0.3	1.2
2006-2007	5.5	0.6	0.8	1.0	0.3	1.4
2007-2008	5.0	0.5	0.8	1.3	0.2	1.5
2008-2009	5.1	0.6	0.6	1.5	0.2	1.6
2009-2010	5.3	0.6	0.6	1.7	0.2	1.6
2010-2011	5.6	0.7	0.6	2.3	0.3	1.8
2011-2012	6.0	0.6	0.6	2.3	0.2	2.0

While the scheduled medication rate for insulin increased (from 0.2 per 1,000 students in 2001 to 2.3 in 2012), rates for most other classes of scheduled medications decreased from 2000-2012 levels, including psychotropic medications, asthma medications, and antibiotics (Table 9a). In contrast, for "as needed" medications, rates for a number of medication classes have increased. For example, the epinephrine prescription rate increased from 7.2 per 1,000 students in 2001 to 25.1 per 1,000 in 2012 (Table 9b). Similarly, "as needed" prescription rates increased for insulin and anti-convulsants.

TABLE 9b. Prescription Medication Rate for As Needed (PRN) Medication (ESHS Districts, Prescriptions Per 1,000 Students)									
School Year	**Asthma Medi-cations**	**Epi-nephrine**	**Anal-gesic**	**Anti-hista-mines**	**Insulin**	**Psycho-tropic**	**Anti-Convul-sants**	**Anti-biotics**	**Others**
2000-2001	25.2	7.2	--	--	0.5	0.5	--	0.1	10.1
2001-2002	26.3	8.3	--	--	0.7	0.4	--	0.1	9.3
2002-2003*	22.7	8.1	4.5	--	1.0	0.2	0.1	0.1	12.6
2003-2004	30.2	9.8	15.6	--	1.2	1.4	0.4	0.2	3.7
2004-2005	28.0	12.1	4.2	--	1.3	1.2	0.3	0.1	3.5
2005-2006	30.9	12.8	4.4	--	1.4	1.1	0.4	0.1	3.3
2006-2007	32.2	15.3	5.7	4.8	1.5	0.8	0.7	0.0	6.4
2007-2008	33.4	16.9	6.7	5.7	1.6	1.1	0.7	0.0	6.4
2008-2009	35.3	18.8	6.2	8.1	1.5	1.0	1.1	0.0	6.3
2009-2010	34.5	20.5	6.2	9.5	1.6	1.0	1.2	0.0	5.6
2010-2011	36.7	23.1	7.6	12.0	2.1	1.4	1.5	0.0	8.0
2011-2012	39.9	25.1	8.3	11.2	2.0	1.2	1.3	0.0	7.9

* The 2002-2003 school year report only included data for 4 of the 10 months of the school year. The 2000-2001 school year had 74 districts reporting as compared to 103 districts in 2003-2004, 80 districts in 2008-2009, 73 districts in 2010-2011, and 72 districts in 2011-2012.
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

School nurses in the 72 ESHS districts administered an average of 131,483 doses of medication to students per month. Psychotropic medication was the most commonly administered type of scheduled prescription medication, and asthma medication was the most commonly administered type of PRN prescription medication. Among medications administered per school protocol, analgesic medication was the most common. (Table 10).[12]

[12] "PRN doses administered per protocol" refers to medication orders, signed by the school physician, which permit school nurses to administer over-the-counter (non-prescription) medications to students, according to guidelines provided by the Board of Registration in Nursing. "PRN doses per prescription" refers to medication orders written for prescription medications, which are to be administered to specific students.

TABLE 10. Average Number of Medication Doses by Type Administered to Students by School Nurses Per Month ESHS Districts, September 1, 2011- June 30, 2012*				
Medication Class	**Medication Schedule**			
	Scheduled Doses		**PRN Doses per Prescription**	
	N	**%**	**N**	**%**
Analgesic	1,349.3	1.6	2,590.1	14.5
Antibiotic	911.4	1.1	20.7	0.1
Anticonvulsant	1,654.8	2.0	20.3	0.1
Antihypertensive	947.4	1.1	12.2	0.1
Antihistamine	231.3	0.3	281.0	1.6
Asthma	2,225.0	2.7	9,423.7	52.9
Epinephrine	0.0	0.0	15.0	0.1
Glucagon	0.0	0.0	10.4	0.1
Insulin	14,525.3	17.3	3,404.7	19.1
Psychotropic	46,940.5	56.0	423.2	2.4
Other	14,974.2	17.9	1,615.5	9.1
TOTAL	83,759.2	100.0	17,816.8	100.0

* Includes supervised self-administration.
Source: *Monthly Activities Reports* submitted by 72 districts in the Essential School Health Services program.

School nurses also administered an average of 1,991 doses of medication to school staff per month, including 1,951 monthly doses of OTC/PRN medications, and 89 monthly doses of other prescription medications.

4. Health Screenings

Public schools in Massachusetts are required by law to conduct postural, hearing, vision, and height/weight screening on all students.[13] Some school systems conduct additional health screenings based on the particular health needs of their students. School nurses are responsible for screening students and making referrals for follow-up care when needed. Parents are responsible for making appointments for the follow up care specified in the referral, and for ensuring that students keep the appointments. During the school year, school nurses at 72 ESHS districts and 88 partner districts conducted the following number of required and voluntary student health screenings (Table 11a, b). These numbers represent *initial* screenings, and do not include *re-screenings*.

TABLE 11a. Yearly Student Health Screenings and Referrals
ESHS Districts, School Year 2011-2012

Type of Screening	Screenings		Referrals		Completed Referrals*	
	Number	% of All Students	Number	% of Screened Students	Number	% of Referred Students
Hearing	214,700	47.0	5,050	2.4	1,744	34.5
BMI	141,533	31.0	29,296	20.7	3,906	13.3
Postural	132,500	29.0	4,338	3.3	1,492	34.4
Vision	261,178	57.1	30,313	11.6	15,494	51.1

Source: *Status Reports* submitted by 72 districts in the Essential School Health Services program.
* A "completed" referral is one in which an appointment for follow-up care has been made and kept.

TABLE 11b. Yearly Student Health Screenings and Referrals
Partner Districts, School Year 2011-2012

Type of Screening	Screenings		Referrals		Completed Referrals*	
	Number	% of All Students	Number	% of Screened Students	Number	% of Referred Students
Hearing	89,102	41.9	1,808	2.0	898	49.7
BMI	62,982	29.6	13,102	20.8	3,874	29.6
Postural	59,620	28.0	2,225	3.7	754	33.9
Vision	103,211	48.5	7,980	7.7	3,401	42.6

Source: *Status Reports* submitted by 88 partner districts in the Essential School Health Services program.
* A "completed" referral is one in which an appointment for follow-up care has been made and kept.

Body Mass Index (BMI) Screenings

The Centers for Disease Control and Prevention recommends the use of Body Mass Index (BMI) measurement to *screen* for obesity in children. BMI is a number calculated from height and weight, and is considered a reliable indicator of body fat in *most* people. For children and teens, BMI is age and sex specific. The measure is plotted on BMI growth charts to reveal the child's

[13]. Beginning in FY11, all public schools were required to complete BMI screenings for students in grades 1, 4, 7, and 10. See 105 CMR 200 for further changes in screening requirements.

percentile ranking, which indicates the relative position of the child's BMI among children of the same age and sex. The BMI percentile can then be used as a screen for overweight or underweight. BMI percentiles derived from direct measurements should be more accurate than those derived from self-reports in student surveys. Nurses were asked to complete BMI screenings for all students in grades 1, 4, 7 and 10. For grades 1, 4, and 7, more than 85% of districts screened at least 90% of their student enrollment, which indicates that the results are highly representative of the students in those districts. In grade 10, the screening rate fell slightly, with 69% of districts screening at least 90% of enrollment. Still, with 94% of districts providing BMI results for at least 70% of their grade 10 enrollment, the results are still a good representation of the weight status of the grade 10 students in those districts. School nurses in 160 ESHS and partner districts provided BMI screening results for 1 or more grade levels, reporting on a total of 190,4865 students (Table 12).

TABLE 12. Number of ESHS and Partner Districts Providing Universal BMI Screening September 1, 2011 - June 30, 2012 (n = 160 districts)

Grade	Districts		Students Screened	
	n	%	n	%*
1	154	96.3	49,939	96.6
4	154	96.3	49,643	97.3
7	156	97.5	49,413	95.9
10	159	99.4	41,870	84.2
All grades	160	100.0	190,865	92.5

Notes: Includes 72 ESHS districts and 88 partner districts. A total of 120 local districts, 22 regional academic districts, 7 educational collaboratives, 7 regional vocational technical districts, 6 charter districts, 4 school unions, and 1 independent vocational district. *Percent of enrollment in districts included.

These data include only ESHS funded and partner districts. A comprehensive BMI report covering all school districts in the state will be issued at a later date.

Overall, 32.2% of the students screened were overweight or obese (16.0% obese, 16.2% overweight). In each of the 4 grade levels, at least 28% of the students screened were overweight or obese, with males in all 4 grades more likely to be overweight or obese than females (Table 13). The results of each student's BMI screening and guidelines for interpreting the results are communicated to the student's parents or guardians.

TABLE 13. Percentage of Under- and Overweight Students in Grades 1, 4, 7, and 10 in ESHS and Partner Districts as Reported by School Nurses Conducting Universal BMI Screenings (160 Massachusetts Public School Districts, 2011-2012 School Year)

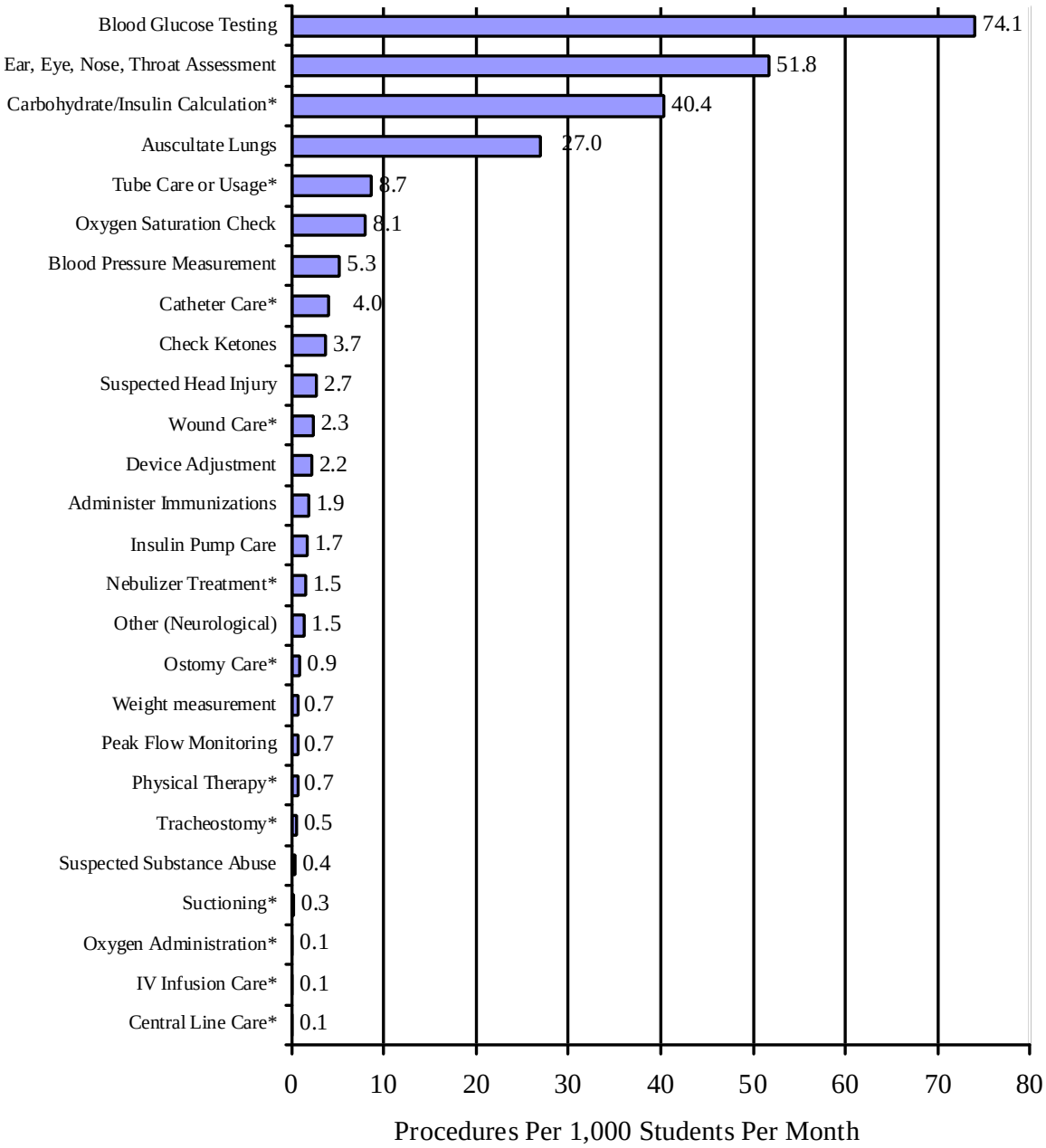
		Grade 1		**Grade 4**		**Grade 7**		**Grade 10**	
		Male	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
	Total students screened:	25,634	24,305	25,327	24,316	25,516	23,897	21,230	20,640
Weight category*	**BMI Percentile Range**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**
Underweight	Less than the 5th percentile	2.7	2.9	2.2	2.8	3.0	2.5	2.2	1.4
Healthy Weight	5th percentile to less than the 85th	68.5	69.7	60.9	64.2	61.4	65.2	63.5	69.5
Overweight	85th to less than the 95th percentile	14.9	14.5	17.2	16.7	16.7	16.9	16.3	16.0
Obese	Equal to or greater than the 95th	13.9	12.9	19.6	16.2	19.0	15.3	18.0	13.1
Total		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Subtotal: Overweight or Obese		29.4	27.5	36.6	33.6	37.5	33.8	33.9	30.5

* These weight categories are consistent with recommendations released by a committee of experts representing 15 medical and health organizations (Expert Committee, 2007).

5a. Medical Procedures

School enrollment of children assisted by medical technology has increased in recent years. This phenomenon presents multiple challenges for school administrators, parents and guardians, school health services personnel, teachers, and students. ESHS school districts collected information on the number and type of procedures that involved medical technology, as well as other medical procedures performed by school nurses. Consistent trends in the school health data may be associated with emergent public health issues. For example, the increase in Blood Glucose Testing and Insulin Pump Care over the past 5 years may be a consequence increasing diabetes prevalence in face of the current obesity/diabetes epidemic. Monthly medical procedure rates per 1,000 enrolled students are shown in Figures 2a and 3.

FIGURE 2a. Medical Procedure Rates (Students)
ESHS Districts, Sepember 1, 2011 - June 30, 2012



Source: *Monthly Activities Reports* submitted by 72 districts in the Essential School Health Services program.
Note: Rates were calculated from those districts performing the procedure at least once.

The procedures listed in Figure 2 required differing amounts of nursing time. Those procedures identified with an asterisk (*) require significant amounts of professional nursing care, health education and monitoring. Many of these procedures were formerly performed in a hospital setting.

School nurses also perform a variety of behavioral health interventions (Figure 2b).

FIGURE 2b. Behavioral Health Intervention Rates (Students)
ESHS Districts, Sepember 1, 2011 - June 30, 2012

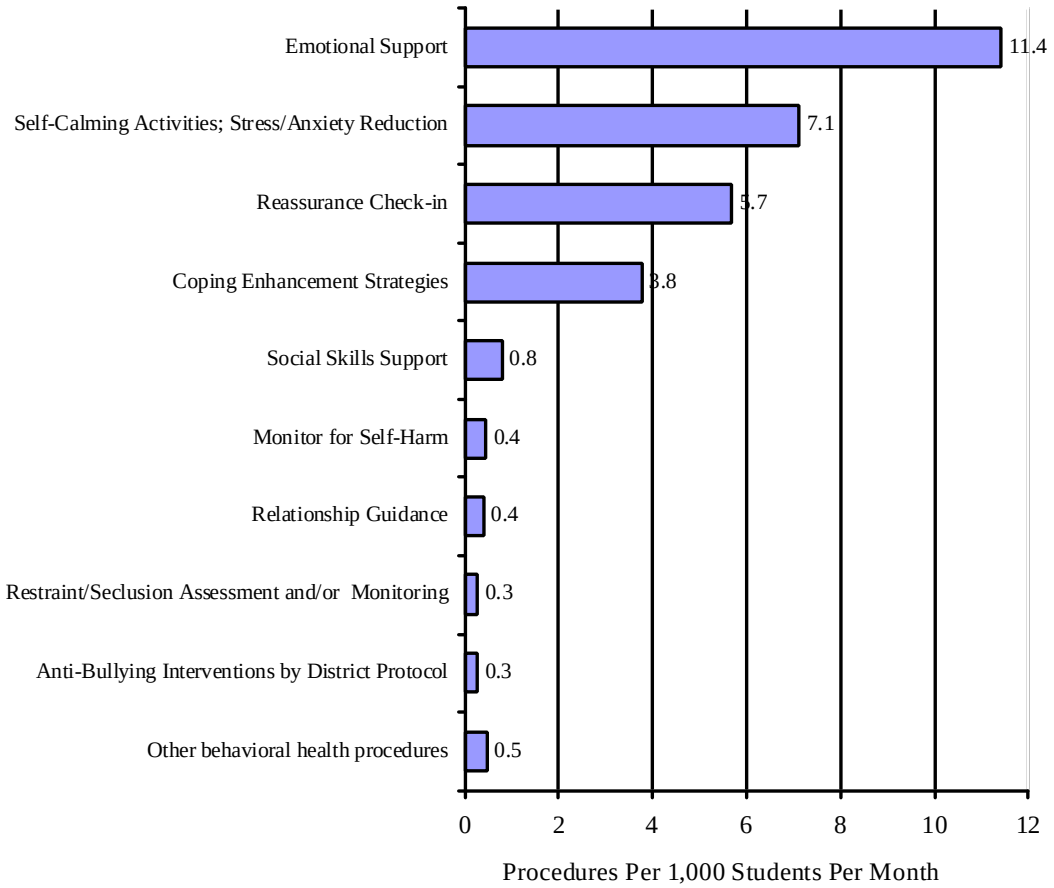
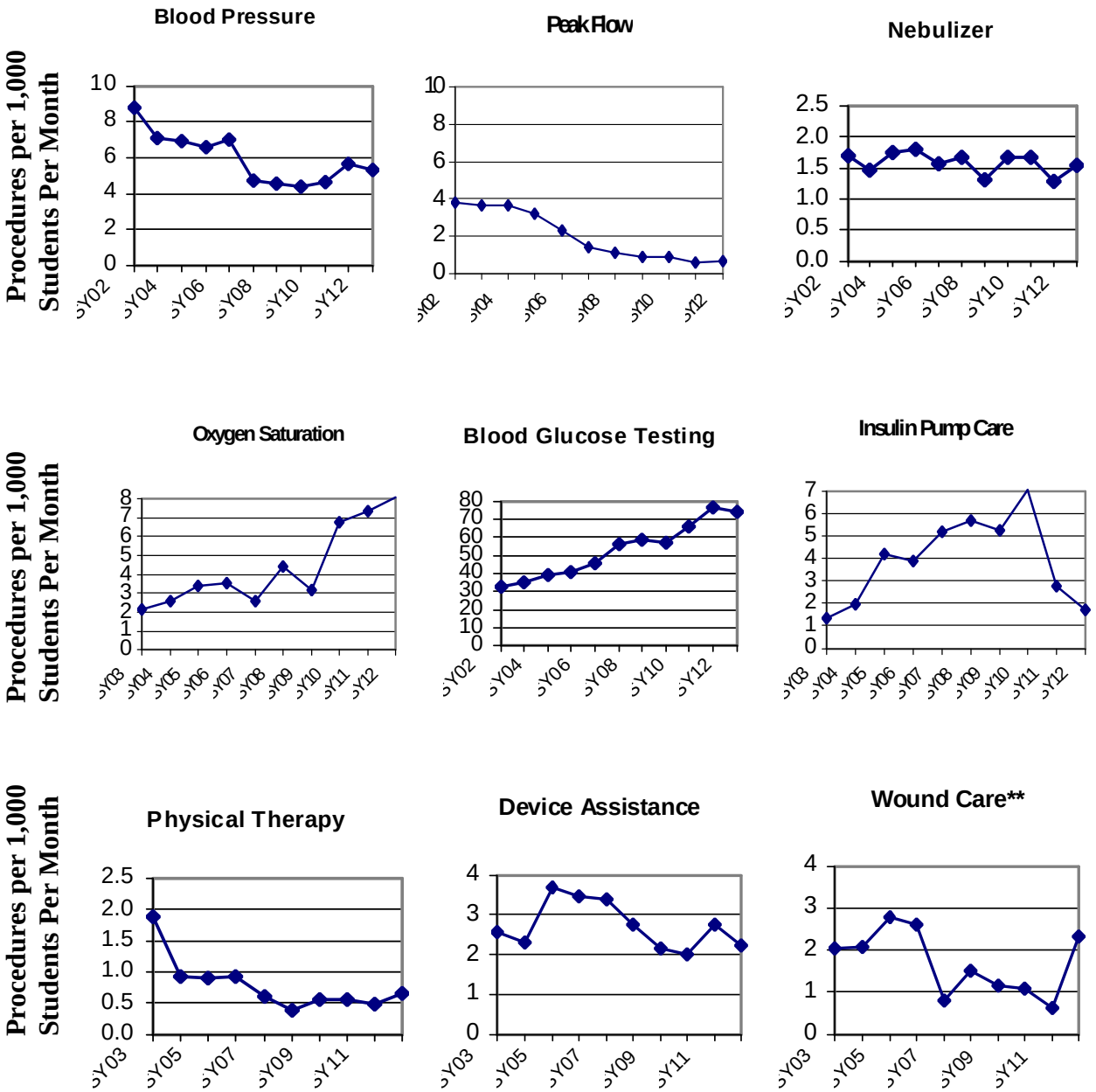


FIGURE 3. Procedure Rates per 1,000 Students per Month*
ESHS Districts, School Years 2000-2001 through 2011-2012



*Among those districts performing the procedure at least once.
** The definition of Wound Care was changed in 2007, so that dressing changes are no longer counted.
Note that in 2002-2003, data was available for only 4 out of 10 months. If there are no data points then data was not available for that year. 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 number of districts and the socio-demographic profile of students varies somewhat each year.

While some procedure rates have declined (blood pressure monitoring, wound care), procedures related to diabetes management (blood glucose monitoring) have increased.

Monthly medical procedure totals are summarized in Table 14:

TABLE 14 Medical Procedure Types and Totals
ESHS Districts, September 1, 2011- June 30, 2012

Type of Procedure	Number of Procedures Per Month	
	Students	Staff
Administer Immunizations	1,085	205
Auscultate Lungs	14,618	359
Blood Glucose Testing	31,767	72
Blood Pressure Monitoring	2,783	1,254
Carbohydrate/Insulin Calculation	15,814	1
Catheter Care	2,187	0
Central Line Care (a)	145	0
Check Ketones	1,917	0
Device Adjustment	1,689	8
Ear, Eye, Nose, Throat Assessment	21,466	236
Insulin Pump Care	1,914	1
IV Infusion Care	127	5
Nebulizer Treatment	1,058	7
Ostomy Care (c)	342	0
Other (Neurological)	1,088	20
Oxygen Administration	106	1
Oxygen Saturation Check	5,646	148
Peak Flow Monitoring	881	12
Physical Therapy	1,105	2
Suctioning	336	0
Suspected Head Injury	1,731	12
Suspected Substance Abuse	181	0
Tracheostomy Care	188	0
Tube Care or Usage (b)	4,463	1
Weight measurement (d)	435	142
Wound Care	6,778	113

a) Central Line Care: Monitor infusion or administration, Pump monitoring, IV Bag Change, dressing change.
b) Naso-Gastric, Gastronomy or Other Feeding Tube Care or Usage
c) Ostomy Care- Colostomy/Ileostomy/Urostomy
d) Weight management for medical conditions not related to screening
e) Includes orthotic or prosthetic device adjustment, wheelchair assistance, and crutch walking instructions.
In addition to medical procedures, school nurses performed head checks for pediculosis at a rate of 18.4 per 1,000 students per month.
Source: *Monthly Activities Reports* submitted by 72 districts in the Essential School Health Services program.

6. Linkages to health care and insurance providers

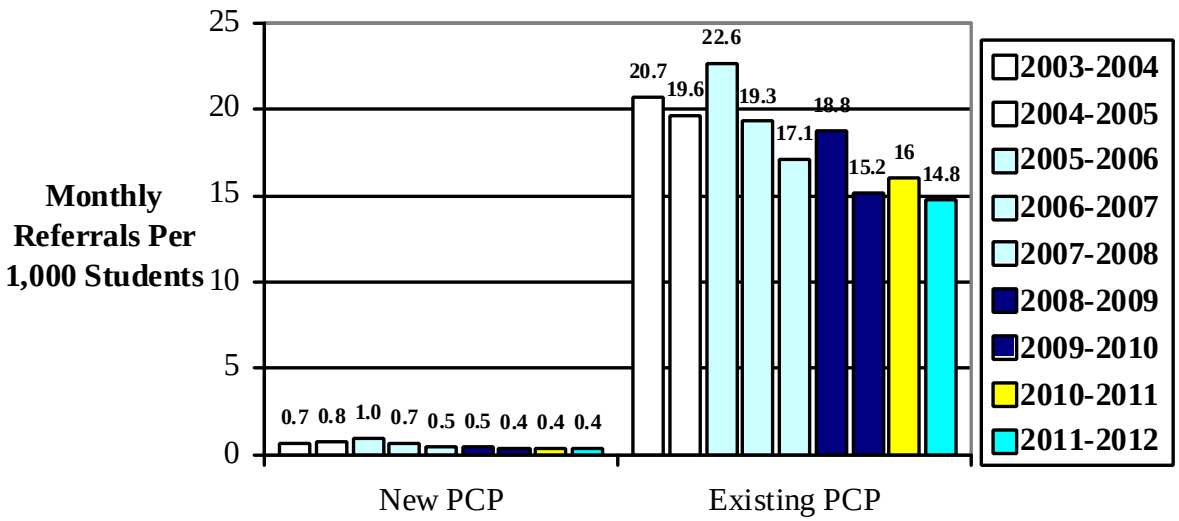
ESHS school systems identified students without a primary care provider and, in consultation with their families, referred them to appropriate health care services. A referral is reported whenever an actual appointment has been set up with a provider or agency.[14] School systems also referred many students to their existing primary care providers. During the 2011-2012 school year, participating districts reported the following:

- A total of 88,435 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:

  - 6,186 referrals to new primary care providers (7.0% of total primary care referrals). In a typical district, monthly referrals to new primary care providers averaged 1.7 students, a rate of 0.4 referrals per 1,000 enrolled students per month (Figure 4).

  - 82,249 referrals to existing primary care providers (93.0% of total primary care referrals). In a typical district, monthly referrals to existing primary care providers averaged 61.5 students, a rate of 14.8 referrals per 1,000 enrolled students per month.

FIGURE 4. Primary Care Provider Referrals
Median Monthly Rate Per 1,000 Students
ESHS Districts, School Years 2003-2004 to 2011-2012



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

[14] Prior to 2006-2007, a referral was counted whenever the student was advised to follow-up with a provider.

In addition, districts in the ESHS program provided the following referrals for students during 2011-2012:

- 4,468 referrals to insurance providers.
- 13,074 referrals for mental/behavioral health services.

Each month, school nurses receive Massachusetts Asthma Action Plans (MAAPs) from health care providers.[15] These written plans provide individualized instructions for managing asthma episodes and administering asthma medications. During the school year, 72 ESHS districts reported receiving MAAPs for 7,940 students. Individual districts received between 1 and 2,066 action plans.

[15] This section refers only to Standard Triplicate Form Massachusetts Asthma Action Plans.

7. Oral Health

School nurses are increasingly performing oral health related activities. Tables 15a and 15b summarize these activities for the 2011-2012 school year.

The typical ESHS district participating in oral health screening activities screened students at an annual rate of 77.7 per 1,000 students, compared to a rate of 27.3 per 1,000 students in partner districts.[16] There was considerable variability across districts, with the range being 0.6 to 458 screenings per 1,000 students. Slightly more than one-third of oral health screenings (34%) in ESHS districts were performed by school nurses (Table 15a), compared to 18% in partner districts.

TABLE 15a. Number of Students Receiving Oral Health Services by Type of District, September 1, 2011- June 30, 2012

Type of Oral Health Activity	ESHS	Partner	Charter Schools	Collabor-atives
Oral health screenings by a school nurse	15,182	1,103	0	4
Oral health screenings by a dentist or hygienist	29,248	4,933	82	75
Referrals to a dental provider	8,546	1,580	6	10
Referrals completed	3,681	372	6	2
Screenings of third grade students	5,627	582	2	1
Dental sealants applied in school	19,734	1,152	42	0
Flouride rinse treatments applied in school	33,403	5,982	393	7

Source: *Monthly Activities Reports* submitted by 72 ESHS districts, 88 partner districts, and 9 charter school districts, and 8 collaboratives.

TABLE 15b. Percent of Districts Providing Oral Health Services by Type of District, September 1, 2011 - June 30, 2012

Type of Oral Health Activity	ESHS Districts	Partner Districts
Oral health screenings by a school nurse	33.3	16.1
Oral health screenings by a dentist or hygienist	59.7	39.1
Referrals to a dental provider	63.9	35.6
Referrals completed	51.4	25.3
Screenings of third grade students	56.9	24.1
Dental sealants applied in school	48.6	24.1
Flouride rinse treatments applied in school	62.5	33.3

Source: *Monthly Activities Reports* submitted by 72 ESHS districts and 87 partner districts.

[16] This is a median rate based on those districts that performed one or more oral health screening activities..

8. Health Education, Tobacco Prevention, and Support Groups

School nurses are often called upon to provide health education and deliver presentations. In this teaching role they provide information to students, staff, and community members on topics such as nutrition education, life threatening allergies, and human growth and development. Throughout the 2011-2012 school year, school nurses in 72 ESHS districts reported making 13,605 classroom presentations. In addition, 2,112 presentations were made in 58 partner districts and charter schools, and 54 presentations were made in 5 collaboratives. In a typical ESHS funded district, each full-time school nurse delivered 1.0 presentation every month (range: 0 to 10.5 presentations per nurse per month). The types of presentations given most frequently in funded districts were fitness/nutrition/wellness, life threatening allergies, and oral health/hygiene (Table 16). During the school year, school nurses in funded districts made an average of 12.9 presentations per nurse, while the average in partner districts was 5.6 presentations per nurse, the average in collaboratives was 2.1 presentations per nurse.

TABLE 16. Number of Wellness/Safety Presentations and Number of Participants, by Topic Area ESHS Districts, September 1, 2011 June 30, 2012

Topic Area	Number of Presentations Per Month	Number of Participants Per Month		
		Students	Staff	Community
Blood Borne Pathogens	64.2	290.8	1,840.6	3.1
CPR/AED Programs	50.4	198.1	588.0	32.5
Crisis Team	20.3	171.2	249.6	5.2
Environmental Health	24.0	885.4	190.7	6.9
Fitness/Nutrition/Wellness	227.9	7,979.9	1,116.1	208.9
Growth/Development	84.9	2,260.9	112.0	119.6
Life Threatening Allergies	224.3	1,101.8	2,734.9	37.6
Mental Health/Wellness	35.7	1,239.0	184.4	69.6
Oral Health/Hygiene	402.5	9,360.2	405.0	33.6
Other	226.3	7,328.4	1,404.2	659.6

Source: *Monthly Activities Reports* submitted by 72 districts in the Essential School Health Services program.

Health education was also promoted through the preparation of flyers and mailings. During the school year, school nurses in funded districts were involved in the creation of a total of 12,618 health promotion / education flyers or mailings, and nurses in partner districts were involved in the creation of 7,998 such mailings . In the typical funded district, each nurse was involved in the creation of 1.0 flyer or mailing per year, compared to 0.7 flyers or mailings per year in partner districts .

During the school year, school nurses in ESHS districts provided the following tobacco prevention/cessation and substance abuse services:

- A total of 774 tobacco group prevention meetings were held in 17 districts, in which attendance summed to 8,076 students and 1,029 adults.

- A total of 279 tobacco group cessation meetings were held in 10 districts, in which attendance summed to 1,856 students and 153 adults.

- A total of 2,182 students and 264 adults received individual tobacco cessation counseling (44 districts).[17]

- In 30 districts, students were referred to other tobacco prevention/cessation services 2,844 times, and adults were referred to outside sources 177 times.

During the 2002-2003 school year, the MDPH School Health Unit collaborated with the University of Massachusetts, Department of Preventive and Behavioral Medicine, in conducting a randomized controlled trial (RCT) to determine if school-nurse intervention could help individual students stop using tobacco. The intervention consisted of a series of scheduled appointments with content designed to address tobacco triggers, barriers to quitting, and helpful techniques. The student was required to designate a quit date. The study was implemented in 71 Massachusetts schools. The results demonstrated the feasibility and potential efficacy of this intervention in increasing self-reported short term (6 week and 3 month) quit rates among adolescent smokers who wished to quit.

Based on these outcomes, the National Institutes of Health (NIH) awarded the University of Massachusetts Medical School (UMMS) a four-year grant to test this intervention in a randomized controlled trial, designed to be delivered by the school nurse in the course of her/his routine clinical duties through four individual 15 to 20 minute sessions with individual teens. As a result of the partnership with the UMMS Department of Preventive and Behavioral Medicine and the MDPH School Health Unit, thirty-six public high schools with an enrollment of at least 350 students participated in this NIH grant study.[18] Additional collaborative studies, designed to improve long term smoking abstinence and reduce smoking intensity, are ongoing. Prior to the NIH study, the Northeastern School Health Institute had been offering trainings to school nurses based on the results of the 2002-2003 study.[19] These trainings were resumed in FY10.

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[17] Trainings of School Nurse Interventions to Assist Students to Stop Smoking resumed in FY10. Each ESHS district is required to have at least one high school nurse trained and implementing the program.

[18] Over 1,000 teens were recruited during the course of two years with baseline assessments including salivary cotinine (metabolic of nicotine) and follow-up assessments 3 and 12 months following baseline (Pbert, Druker, & DiFranza et al., 2011). Cotinine validation and 12 month follow-up assessment is considered the gold standard of tobacco research.

[19] The Northeastern School Health Institute is the continuing education vendor tor the MDPH School Health Unit, providing relevant programs for approximately 2,000 school nurses a year.

Support Groups

Table 17 summarizes participation in student support group activities led or assisted by school nurses. It does not include tobacco-related support groups which were discussed previously. Across all topic areas, a total of 334 support group meetings were conducted every month.

TABLE 17. Participation in Support Group Activities, by Topic Area
ESHS Districts, September 1, 2011- June 30, 2012 (n=72 districts)

Topic Area	% of ESHS Districts Offering Group	Monthly Group Meetings	Monthly Participants		
			Students	Staff	Parent/ Community
Alcohol or Substance Abuse	26.4	12.4	125.4	15.0	11.4
Anger/Conflict/Violence Management	22.2	12.9	60.9	15.4	1.9
Asthma	8.9	9.6	26.9	3.1	12.7
Diabetes	17.1	18.6	38.0	33.5	25.7
Emotional / Psychosocial Support	37.5	95.0	263.4	71.8	12.3
Food Allergy	9.7	8.5	10.4	61.9	9.3
Gay/Bisexual/Lesbian/ Transgender	0.5	5.4	24.4	3.0	0.4
Health Careers	17.6	15.3	102.8	7.2	15.5
Nutrition/Physical Activity	51.9	37.2	306.2	114.2	34.6
Peer Leadership	10.5	15.2	158.6	19.9	0.3
Other	11.0	103.6	453.7	151.2	58.2
Total*		333.7	1,570.7	496.2	182.3

Source: *Monthly Activities Reports* submitted by districts in the Essential School Health Services program.
* Those participants that are in more than 1 group may be counted twice.

The type of support group most likely to be offered was "Nutrition/Physical Activity." This type of group was offered by 52% of districts and attracted the highest number of participants, among both students and staff. The second most common type of support group was "Emotional/psychosocial," offered by 38% of districts. "Emotional/psychosocial" support groups met more frequently than other types of groups.

During the school year, nurses in funded districts provided an average of 7.4 meetings per 1,000 students, while nurses in partner districts provided an average of 3.2 meetings per 1,000 students.

In nutrition programs, school nurse support can extend beyond making support groups available. Some students come to school without adequate breakfasts or lunches, and school nurses provide food and/or snacks. During the school year, school nurses reported they provided snacks a total of 114,262 times in 72 ESHS districts, 42,377 times in 52 partner districts, 1,142 times in 6 partner charter schools, and 990 times in 5 collaboratives..

9. Nursing Case Management

Data from the monthly activities report revealed that, beyond providing direct care to students, school nurses spent a significant portion of their day performing case management duties that included communication with families, other school staff, and community health care providers about student health concerns. The data presented below represents the totals recorded in the 72 ESHS districts. Average activity per FTE is presented for some activities in Table 18. During the school year, school nurses from 72 districts conducted:

- a total of 915,584 health counseling and education communications with parents (including phone calls and letters, but excluding meetings and home visits), with the typical district reporting 905.8 communications per month (range: 84.2 to 11,721.4 communications per month);

- a total of 950 home visits, with the typical district reporting 0.2 home visits per month (range: 0.0 to 15.5 home visits per month);

- a total of 335,375 communications with other school staff about student health issues, with the typical district reporting 328.2 communications per month (range: 11.2 to 4,060.8 meetings per month);

- a total of 114,759 communications with other agencies and health providers about student health issues, with the typical district reporting 35.1 communications per month (range: 0.8 to 2,813.7 phone calls per month).

- a total of 27,207 case management meetings, with the typical district reporting 17.6 meetings per month (range: 0.0 to 357.5 meetings per month).

The following table shows median case-management activity levels per school nurse FTE per month across the 72 participating districts:

TABLE 18. Nursing Case Management Activities: Student-Health Related Activities Per Month Per Nurse FTE ESHS and Partner Districts, September 1, 2011- June 30, 2012		
	Activities Per Month Per FTE	
Type of Activity	**ESHS**	**Partner**
Communications with parents	73.8	66.8
Communications with staff	27.7	13.4
Communications with community agencies/providers	4.2	1.8
Case management meetings	1.8	0.0

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

For children with special health care needs, nursing case management involves the development of Individual Health Care Plans (IHCPs) designed to maximize their potential for learning. An IHCP, usually developed by the school nurse in conjunction with the student's family, the school physician, other school staff, and relevant community health care providers, is an individualized care plan that stipulates a student's specific medical, nursing, emergency care, and educational needs while in school during the school day. IHCPs are reviewed on a regular basis to ensure that students receive the appropriate health care they need during the school day. The IHCP numbers do not include medication administration plans.

During the 2011-2012 school year, 72 ESHS districts reported:

- a total of 31,646 IHCPs for the year, with the median district reporting 218 IHCPs (range: 9 to 3,975 IHCPs);

- a median rate of 24.5 IHCPs per full-time school nurse (range: 2.6 to 172.8 IHCPs per full-time school nurse).

Program Development

School nurses perform program planning and development activities in coordination with other school district professionals, in areas such as environmental health, policy development, crisis management, and emergency preparedness. In addition, nurses attend meetings that contribute to their professional development. Meetings may be held at a specific school building or at the school district level. During the 2011-2012 school year, school nurses in 72 ESHS districts attended 1,332.0 program and professional development meetings per month (Table 19). Partner districts conducted an additional 414.3 meetings per month. In ESHS districts, nurses attended 12.5 meetings per FTE, compared to 13.2 meetings per FTE in partner districts.

TABLE 19. Number of Program Development Meetings Attended by School Nurses, by Topic Area *ESHS and Partner Districts, September 1, 2011 - June 30, 2012*				
	ESHS		**Partner**	
Topic Area	**Meetings Per Month**	**Meetings per FTE (Per Year)**	**Meetings Per Month**	**Meetings per FTE (Per Year)**
Crisis Management	82.4	0.8	45.6	1.5
Emergency Preparedness	56.2	0.5	18.4	0.6
Environmental	10.7	0.1	2.3	0.1
Mental Health	86.6	0.8	91.1	2.9
Policy Development	155.0	1.5	53.2	1.7
Professional Development	396.7	3.7	97.3	3.1
Other	544.4	5.1	106.4	3.4
Total	1,332.0	12.5	414.3	13.2

Source: *Monthly Activities Reports* submitted by 72 ESHS districts and 52 partner districts.

Students With Special Health Care Needs

1. Types of Special Health Care Needs

School nurses provide care for students with a wide variety of special health care needs. Table 20a shows the rates by type of condition. These rates are based on information provided to the school nurse by the student's primary care provider, who conducts a physical examination and submits a School Health Record once every 3 to 4 years. This information is supplemented by parent reports (on emergency cards and health information forms) submitted annually. Conditions not requiring special nursing care in school may be less likely to be reported to school nurses. For those conditions, these data may under-count the true rate in the student population. In the ESHS funded and partner schools that reported these data (72 funded districts, 88 partner districts, 9 charter school districts, and 8 collaboratives), the total enrollment was 674,143 (70.7% of the total public school enrollment in Massachusetts). In these schools, a total of 179,251 students with special health care needs were reported to school nurses (26.6% of enrollment). The most commonly reported physical/developmental condition is asthma (Table 20a). Other common conditions include allergies, migraine headaches, seizure disorder, and cardiac conditions. The most commonly reported behavioral/emotional condition is Attention-Deficit/Hyperactivity Disorder (ADHD).

Over the last three years, the largest increases in ESHS districts have been in the rates of food allergies, asthma, and ADHD/ADD, all of which increased at least 5 per 1,000 students (Table 20b and Figure 5). For conditions with small base rates (less than 15 per 1,000 students), large percentage increases (20% or more) were recorded for autoimmune disorders, cardiac conditions, celiac disease, diabetes type II, and autism.

TABLE 20a: Students With Special Health Care Needs (SHCN) Reported to School Nurses in Selected Massachusetts Districts (Rate Per 1,000 Enrolled Students) ESHS and Partner Districts, September 1, 2011- June 30, 2012

	All Districts	ESHS Districts	Partner Districts*
	(Per 1,000)	(Per 1,000)	(Per 1,000)
Student Enrollment	674,143	457,254	212,773
Physical/Developmental Conditions			
Allergies:			
Bee Sting Allergies	5.5	5.0	6.4
Food Allergies	50.8	51.9	48.0
Latex Allergies	2.4	2.4	2.4
Asthma	127.6	138.4	103.8
Autoimmune Disorders	2.3	2.4	2.1
Blood Dyscrasias:			
Hemophilia	0.2	0.2	0.4
Sickle Cell Disease	0.9	1.1	0.4
Other Blood Dyscrasias	2.5	3.3	0.8
Cancer	0.9	0.9	0.8
Cardiac Conditions	9.1	10.0	7.2
Celiac Disease	1.8	1.6	2.2
Cystic Fibrosis	0.3	0.3	0.4
Diabetes Type I	3.1	2.9	3.4
Diabetes Type II	0.5	0.6	0.3
Inflammatory Bowel Disease	3.8	4.0	3.5
Migraine Headaches	12.0	11.0	14.1
Neurologic Conditions:			
Cerebral Palsy	1.8	2.0	1.3
Spina Bifida	0.3	0.3	0.3
Seizure Disorder	8.4	9.1	6.5
Neuromuscular Degenerative Disorder	1.1	1.4	0.6
Other Physical/ Developmental conditions	36.9	46.6	14.8
Behavioral/Emotional Conditions			
ADHD/ADD	62.3	63.1	59.4
Autism	12.9	13.3	11.6
Depression	11.7	11.2	12.4
Eating Disorders	1.6	1.5	1.9
Other Behavioral/Emotional conditions	28.7	31.2	21.5
Total SHCN Students	265.9	302.9	184.8

Source: 72 ESHS districts, 88 partner districts, 9 charter districts, and 8 collaboratives. Data shown in the partner district column excludes charter districts and collaboratives.

Notes: Autoimmune Disorders includes Arthritis, Lupus, etc. Inflammatory Bowel Disease includes IBS, Crohn's, etc.

TABLE 20b: Students With Special Health Care Needs (SHCN), Trend Data (Rate Per 1,000 Enrolled Students) ESHS Districts, 2010 - 2012

	2010	2011	2012
	(Per 1,000)	(Per 1,000)	(Per 1,000)
Student Enrollment	468,386	452,130	457,254
Physical/Developmental Conditions			
Allergies:			
Bee Sting Allergies	5.2	5.1	5.0
Food Allergies	41.2	46.0	51.9
Latex Allergies	2.1	2.4	2.4
Asthma	130.0	137.8	138.4
Autoimmune Disorders	1.9	2.0	2.4
Blood Dyscrasias:			
Hemophilia	0.2	0.3	0.2
Sickle Cell Disease	1.3	1.4	1.1
Other Blood Dyscrasias	3.0	3.1	3.3
Cancer	0.8	0.9	0.9
Cardiac Conditions	8.4	9.2	10.0
Celiac Disease	1.2	1.4	1.6
Cystic Fibrosis	0.3	0.3	0.3
Diabetes Type I	2.8	2.9	2.9
Diabetes Type II	0.5	0.5	0.6
Inflammatory Bowel Disease	3.8	3.5	4.0
Migraine Headaches	11.1	11.0	11.0
Neurologic Conditions:			
Cerebral Palsy	1.8	1.8	2.0
Spina Bifida	0.3	0.4	0.3
Seizure Disorder	8.6	8.9	9.1
Neuromuscular Degenerative Disorder	1.5	1.6	1.4
Other Physical/ Developmental conditions	31.0	35.7	46.6
Behavioral/Emotional Conditions			
ADHD/ADD	57.3	60.5	63.1
Autism	10.4	11.9	13.3
Depression	11.3	11.4	11.2
Eating Disorders	1.8	1.5	1.5
Other Behavioral/Emotional conditions	24.9	27.7	31.2
Total SHCN Students	298.7	325.9	302.9

The set of school districts in the ESHS program varies slightly each year, since some districts dropped out of the program or did not submit data: 77 districts (2010), 71 districts (2011), 72 districts (2012)

2. Students With Do Not Resuscitate (DNR) Orders

For some students who are terminally ill, parents and medical providers may determine that cardio pulmonary resuscitation should not be performed, and a Comfort Care/Do Not Resuscitate order will be prepared. During the school year, 11 students with DNR orders were reported to school nurses in ESHS districts and partner districts, charter schools, and collaboratives.

3. Cardiovascular Health and Automated Electronic Defibrillators (AEDs)

An automated external defibrillator (AED) is a portable device used to restore normal heart rhythm to patients in cardiac arrest. If cardiac arrest is not treated within a few minutes, the condition is fatal. AEDs located in ESHS and partner districts were used 4 times during the school year (1 time with a student, 1 time with a staff member, and 2 times with a visitor). In 1 case, use of the AED successfully restored a heart rhythm and the patient had a pulse when Emergency Medical Services (EMS) arrived.

Almost 89% of the ESHS districts have at least one AED in all of their school buildings, up from 29.7% in 2003-2004 (Table 21). All ESHS districts have deployed AEDs in at least one school building. Only 8.3% of school buildings in ESHS districts do not have an AED, compared to 10.5% of buildings in partner districts, 11.1% of buildings in charter school districts, and 19.1% of building used by collaboratives.

TABLE 21. Deployment of Automated External Defibrillators (AEDs) in ESHS School Buildings and Districts

	2003-2004		2011-2012	
	n	%	n	%
Total buildings	870		903	
AED Status of Building				
No AEDs	596	68.5	75	8.3
One AED	218	25.1	646	71.5
More than One AED	56	6.4	182	20.2
Total districts	91		72	
AED Status of District				
No AEDs in any building	30	33.0	0	0.0
At least one AED in all buildings	27	29.7	64	88.9
At least one building with more than one AED	36	39.5	69	95.8

Source: *Status Reports* submitted by districts in the Essential School Health Services program.
Note: Since the group of districts participating in the ESHS program is not the same as it was in 2003-2004, the number of buildings is greater than it was in 2003-2004 even though the number of districts is smaller.

Summary

The primary goal of the Essential School Health Services Program is to improve the delivery of health services to students by reinforcing the school health service infrastructure.

The data collected from school districts and summarized in this report has the potential to be used as part of an evaluation of the ESHS program. In order to evaluate the ESHS program properly, however, DPH would need to have a group of comparison school districts, matched to the ESHS group on as many characteristics as possible, such as socio-demographic composition, geographic region, district size, and percentage of students with special health care needs, so that there are minimal differences between the ESHS group and the comparison group aside from participation in the ESHS program. Having this type of matched control group would help us to determine whether differences in outcome measures (the delivery of health services) are due to participation in the program rather than the result of pre-existing group differences.

In practice, there are significant obstacles to conducting this type of evaluation with the ESHS program. ESHS school districts include the largest districts in Massachusetts and also include many of the lowest income districts. As a result, it may not be possible to create a matched control group that is adequate for evaluation purposes. In addition, school districts that do not participate in the ESHS program do not collect the range of school health, program, and policy data that is collected by districts that do participate in the program. Even if they did collect the necessary data, they might not have the resources required to assemble the data and submit it to DPH each month, and there are no requirements that they submit such data to DPH and no incentives provided for doing so. As a result, collecting comparison data from districts not participating in the program would not be feasible.

While the absence of data from a set of directly comparable non-ESHS school districts may limit our ability to draw definitive conclusions about the impact of the program, data collected from the partner school districts provides a basis for comparison that is useful, and, despite the limitations described above, provides a reasonable estimate of the impact of the program.

ESHS school districts serve students from some of the more vulnerable segments of the population. Compared to the Massachusetts public school population, a higher percentage of students in ESHS-funded districts are low income, have limited English proficiency, and have a first language that is not English. In addition, the percentage of students who have a special health care need is 64% higher in ESHS districts than it is in partner districts. While there are a few health conditions for which ESHS students have lower rates (celiac disease, bee sting allergies, cystic fibrosis, diabetes type I, and migraine headaches), for most health conditions ESHS students have much higher rates. For example, compared to partner districts, ESHS students have a 33% higher rate of asthma, a 39% higher rate of cardiac conditions, more than double the rate of diabetes type II, a 41% higher rate of both seizure disorder, a 57% higher rate of cerebral palsy, more than twice the rate of neuromuscular degenerative disorders, and much higher rates of blood dyscrasias such as sickle cell disease.

Given the higher percentage of students with special health care needs in ESHS districts, the need for health services is higher, and this is reflected in a higher rate of utilization of health

services. The rate at which students in a typical district visit the health office is 6.4% higher in ESHS districts than it is in partner districts.

The resources provided by the ESHS program allows the ESHS school districts to hire additional school nurses to respond to those needs and to hire Nurse Leaders to provide clinical leadership and to ensure optimal standards of care. The student-to-nurse ratio in the ESHS program is lower than it is in the partner districts (412 students per nurse, ESHS districts; 438 students per nurse, partner districts). With more nurses available, ESHS districts are able to reduce the workload of school nurses to a level that is comparable to the partner districts (400.8 student encounters per month, ESHS districts; 405.8 student encounters per month, partner districts). Despite the fact that the percentage of students who have a special health care need is 45% higher in ESHS districts, the returned-to-class rate for student health encounters is higher in ESHS districts (91.4%) than it is in partner districts (88.7%).

In addition to providing medical tests and procedures to address the greater needs of students with chronic health conditions, ESHS nurses provide greater levels of some types of screenings, referrals, and prevention services. For example, the percentage of ESHS districts that provide oral health screening services is more than double that of partner districts (32.9% of ESHS districts; 14.3% of partner districts), the percentage that provide fluoride rinse and dental sealants in school is almost double that of partner school districts, and the percentage that provide referrals to dental providers is higher than in partner districts (63.0% ESHS districts, 44.3%, partner districts). In addition, ESHS districts offer twice as many wellness presentations to students and staff (35.6 presentations per 1,000 students, ESHS districts, 15.3 presentations per 1,000 students, partner districts), and more support group meetings (8.5 meetings per 1,000 students, ESHS districts, 5.2 meetings per 1,000 students, partner districts).

While it is currently impossible to know if the greater performance of the ESHS districts is the direct result of participation in the ESHS program, the value added by having Nurse Leaders freed from providing direct care, the increased collaboration with health educators and coordination with other health providers, or other aspects of the ESHS program, there is nothing in the data to contradict that hypothesis.

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APPENDIX A

School Districts and Student Enrollment
Essential School Health Services Program: 2011-2012

	District Name	REGION	ADMINISTRATION	ENROLLMENT
1	Acton-Boxborough	Metro West	Regional Academic	5,899
2	Amesbury	Northeast	City or Town	2,364
3	Andover	Northeast	City or Town	6,199
4	Arlington	Metro West	City or Town	4,858
5	Ashburnham-Westminster	Central	Regional Academic	2,277
6	Attleboro	Southeast	City or Town	5,933
7	Barnstable	Southeast	City or Town	5,267
8	Belchertown	Western	City or Town	2,518
9	Berkshire Hills	Western	Regional Academic	1,339
10	Billerica	Northeast	City or Town	5,720
11	Boston	Boston	City or Town	55,027
12	Braintree	Metro West	City or Town	5,478
13	Bridgewater Raynham	Southeast	Regional Academic	5,556
14	Brockton	Southeast	City or Town	16,162
15	Brookline	Boston	City or Town	6,875
16	Cambridge	Metro West	City or Town	6,052
17	Canton	Metro West	City or Town	3,250
18	Central Berkshire	Western	Regional Academic	1,845
19	Chicopee	Western	City or Town	7,844
20	Douglas	Central	City or Town	1,708
21	East Longmeadow	Western	City or Town	2,797
22	Fall River	Southeast	City or Town	9,834
23	Fitchburg	Central	City or Town	4,981
24	Framingham	Metro West	City or Town	8,172
25	Gardner	Central	City or Town	2,528
26	Gateway	Western	Regional Academic	1,084
27	Gloucester	Northeast	City or Town	3,091
28	Granby	Western	City or Town	1,095
29	Hadley	Western	City or Town	700
30	Hampden Wilbraham	Western	Regional Academic	3,468
31	Hampshire	Western	School Union	1,793
32	Harwich	Southeast	City or Town	1,314
33	Haverhill	Northeast	City or Town	6,980
34	Holyoke	Western	City or Town	5,877
35	Hudson	Metro West	City or Town	2,952

	District Name	REGION	ADMINISTRATION	ENROLLMENT
36	Lawrence	Northeast	City or Town	12,900
37	Leominster	Central	City or Town	6,181
38	Lexington	Metro West	City or Town	6,397
39	Lowell	Northeast	City or Town	13,548
40	Ludlow	Western	City or Town	2,886
41	Lynn	Northeast	City or Town	13,731
42	Mansfield	Southeast	City or Town	4,663
43	Marblehead	Northeast	City or Town	3,170
44	Marshfield	Southeast	City or Town	4,588
45	Medford	Northeast	City or Town	4,872
46	Middleborough	Southeast	City or Town	3,373
47	Nashoba	Central	Regional Academic	3,501
48	Natick	Metro West	City or Town	4,947
49	Needham	Metro West	City or Town	5,409
50	New Bedford	Southeast	City or Town	12,551
51	Newburyport	Northeast	City or Town	2,334
52	Newton	Metro West	City or Town	12,079
53	North Andover	Northeast	City or Town	4,687
54	North Attleborough	Southeast	City or Town	4,693
55	Northampton	Western	City or Town	2,704
56	Northboro Southboro	Metro West	School Union	4,818
57	Northbridge	Central	City or Town	2,618
58	Pittsfield	Western	City or Town	5,981
59	Plymouth	Southeast	City or Town	7,998
60	Quincy	Metro West	City or Town	9,236
61	Rockport	Northeast	City or Town	924
62	Sandwich	Southeast	City or Town	3,296
63	Springfield	Western	City or Town	25,680
64	Stoughton	Southeast	City or Town	3,819
65	Taunton	Southeast	City or Town	7,788
66	Walpole	Metro West	City or Town	4,015
67	Waltham	Metro West	City or Town	4,994
68	West Bridgewater	Southeast	City or Town	1,263
69	Weston	Metro West	City or Town	2,361
70	Weymouth	Metro West	City or Town	6,925
71	Wilmington	Metro West	City or Town	3,620
72	Worcester	Central	City or Town	24,411
	TOTAL			457,798

Notes:
Source: Massachusetts Department of Elementary and Secondary Education (DESE)
ESHS-funded districts may include schools not included in DESE -defined districts, so the enrollment numbers shown above may differ from those provided by DESE.
“Region” refers to the six geographic regions defined by the Executive Office of Health and Human Services (EOHHS).

APPENDIX B

Scope of Service
Essential School Health Services Program

COMPONENTS

Each program must meet or continue to meet the following seven components as described below:

1. **School health service program infra-structure**
2. **Collaboration with the comprehensive, coordinated health education program, tobacco control program, etc.**
3. **Plan for linkage of students with primary care providers, dental providers, behavioral/mental health programs (as needed), community prevention programs, and health care insurance.**
4. **Development of a management information system.**
5. **Implementation of performance improvement (continuous quality improvement) and evaluation programs.**
6. **Services to private schools located in the applicant's community**
7. **Collaboration/consultation/networking among school nurses.**

For a more complete description of each of these components, please contact the School Health Unit.

APPENDIX C

Data Collection Methods

Contractual obligations require districts in the ESHS 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.[20] 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 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 mentored school districts in the program submit this report once a year, beginning in 2009-2010.

The statistics in this report were derived from the monthly activities reports submitted by districts participating in the ESHS program. Over the course of the 2011-2012 school year, monthly encounter data were collected successfully from 72 of the 72 ESHS award recipients. For these school systems, MDPH received 686 (95.3%) of the 720 expected monthly reports.

For the 72 districts that form the basis of this report, the median student enrollment was 4,838, with a range of 700 to 55,027 students. This sample includes school districts from many areas of

[20] 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.”

the state. It includes urban, suburban, and rural districts; city, town, and regional school systems; and large, medium, and small districts.

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 10-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 ten-month period (September through June).

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 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 year. For example, **the rate of health screenings per 1,000 students** is determined by dividing the total number of screenings *for the whole year* by the number of students enrolled and multiplying the result by 1,000.

Program-wide statistics describe not individual districts, but the ESHS 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 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 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 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 on the delivery of school health services by nursing staff. Project sites do not serve as a representative sample of the Commonwealth's schools. Therefore this report should not be used to make generalized statements about health services in all Massachusetts public schools. Furthermore, caution should be exercised when comparing ESHS statistics across years. Each year the set of districts that report data changes to some degree, which creates somewhat different sample sets. For example, in the 2000-2001 school year, 74 districts reported data, whereas in the school year 2003-2004, 103 districts reported data. In addition, in years prior to 2001, the number of districts that reported data (approximately 25) was drastically lower than in more recent years (approximately 100). Due to this difference in data sets, comparisons to data from years prior to 2001 would be considerably less valid. Also, data has not always been available for all months of the school year. Most notably, in the 2002-2003 school year, only the months September through December were reported. This noted, after 2001 the core group of districts has been relatively stable, and the sample size is large enough such that comparisons are not without merit. Where statistical differences are large, and trends continue for several years, comparisons are more likely to be meaningful.

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. 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.