THE ESSENTIAL SCHOOL HEALTH SERVICES PROGRAM DATA REPORT

2010 – 2011 School Year

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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 (FY11) Essential School Health Data Report indicates that 29% of the students in ESHS and partner districts have at least one special health care need.[1] 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

[1] "Partner" districts receive mentoring and some funding through a relationship with an ESHS funded district.

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)[2] 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)[3]. 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,[4] 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

[2] ESHS funding was awarded to local public school systems, regional academic school systems, independent vocational systems, vocational-technical regional systems, and school unions.

[3] 223 non-public (private and parochial) schools, 30 charter schools.

[4] 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 tow 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. Therefore, the FY11 report has fewer districts (73) 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, 2010 and ending June, 2011 showed the following:

- 928 schools in 73 ESHS school districts reported a total of 4,387,183 student health encounters, and 69,056 staff health services.
- In a typical district, students visited the school nurse an average of 1.0 times per month.[5] There was substantial variability among school districts, with the encounter rate ranging from 0.6 to 2.0 visits per month.
- After assessment and/or treatment by a school nurse, the majority (91.4%) of the students visiting the nurse's office with an illness or injury complaint were returned to the classroom to continue their studies.
- 8.5% of the more serious injuries to students were classified as intentional, compared to 9.5% 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).
- School nurses in ESHS districts referred students to urgent health care services a total of 6,888 times, 1,842 of which involved 9-1-1 ambulance calls. In the remaining cases, parents or others were called to transport the student to health services.
- The majority (90.0%) of the prescriptions managed by the school nurse were for medications dispensed on a PRN, or "as needed" basis.[6]
    - Among students taking PRN medications, asthma medications were the most common (36.7 prescriptions per 1,000 enrolled students).
    - The prescription rate for "as needed" epinephrine increased from 7.2 per 1,000 students in 2003 to 23.1 per 1,000 in 2011.
    - Among students on scheduled prescription medications, psychotropic medications (drugs affecting perception, emotion or behavior) were by far the most common (5.6 per 1,000 enrolled students).
- In the ESHS districts, school nurses administered an average of 125,559 doses of prescription medication to students per month. Fifty-five percent of the scheduled doses were for psychotropic medication, and 54% of the PRN prescription doses were for asthma medication.

[5] "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.

[6] PRN is an abbreviation for "pro re nada," a Latin term meaning "as needed." PRN medications are not scheduled for set times, but given as needed, based on a nursing assessment.

- School nurses in 154 ESHS and partner districts conducted Body Mass Index screenings on 174,800 students in grades 1, 4, 7 and 10. Overall, 32.9% of the students screened were overweight or obese (16.2% obese, 16.6% overweight).
- Diabetes care procedures account for an increasing amount of nurses' time. Insulin pump care decreased from 7.0 procedures per 1,000 students the prior year to 2.7 procedures per 1,000 students this year. Blood glucose testing, the most common medical procedure, increased from 66.0 procedures per 1,000 students each month the prior year to 76.2 procedures per 1,000 students. 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.
- 14,936 students received an oral health screening from a school nurse, and 27,657 were screened by a dentist or hygienist.
- Tobacco prevention and cessation programs reached substantial numbers of individuals, although activity levels varied widely across districts.
  - 921 students attended individual tobacco cessation counseling sessions (39 districts).
  - 11,858 students participated in group tobacco prevention activities.
- A total of 186,678 students with special health care needs were reported to school nurses in ESHS and partner districts (29% of enrollment).
  - The most common physical/developmental condition reported to school nurses was asthma (128.7 per 1,000 enrolled students).
  - The most commonly reported behavioral/emotional condition was Attention-Deficit/Hyperactivity Disorder (58.9 per 1,000 students).
- Almost 84% 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 6.8% of school buildings in ESHS districts do not have an AED.

While it is impossible at this point to know if the greater performance of the ESHS districts is the direct result of participation in the ESHS program, and 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. 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. In the coming years in this report, we plan to give greater attention to unique impact of nurse leaders.

Findings

School Nurse Staffing

In the districts served by the ESHS program, 1,129.6 full-time school nurses (or full-time equivalents) provided health care services to students and staff in the 71 ESHS funded public school districts.[7] The student-to-nurse ratio was 412 students per nurse (same as the prior year).[8] An additional 409 school nurses provided care in 70 partner school districts. In the partner districts, the student-to-nurse ratio was 438, compared to 466 the prior year. Finally, 31 additional school nurses provided care in 6 partner charter schools and 9 partner educational collaboratives.[9] Nearly 30 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, 2010-2011))

Type of District	Total RN FTEs (Number)	Diploma RN (Percent)	Associate Degree (Percent)	Bachelor's Degree (Percent)	Advanced Degree (Percent)	Other (Percent)
ESHS	958.5	4.6	4.3	61.6	29.6	0.0
Partner	371	8.3	3.7	65.4	22.6	0.0
Charter	8.8	11.4	34.1	54.5	0.0	0.0
Collaborative	31	3.2	30.3	60.0	6.5	0.0
Total	1369.3	5.7	4.9	62.4	27.0	0.0

Includes Nurse Leaders. "Advanced Degree" includes Master's and Doctoral degrees. Source: 71 ESHS districts, 70 partner districts, 6 charter school districts, and 9 collaboratives. The educational level of some school nurses was not reported.

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

In addition, compared to partner districts, more than twice as many ESHS districts have a Nurse Leader (100% ESHS districts; 40% partner districts).

[7] There are 2 ESHS districts with missing data.

[8] 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.

[9] 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, 2010-2011))			
	FTEs	**DESE Licensed**	**NCSN Certified**
Educational Degree	(Number)	(Percent)	(Percent)
Diploma RN	78.4	73.7	NA
Associates Degree (AD)	61.7	39.5	NA
Associates (Other than AD)	5.3	24.5	NA
Bachelor's (BSN)	774.9	83.9	23.6
Bachelor's (Other than BSN)	79.0	68.8	26.1
Master's (MSN)	156.6	71.8	21.8
Master's (MPH)	9.6	59.5	0.0
Master's (MEd)	151.2	84.3	21.5
Master's (Other)	51.6	59.9	15.6
Doctoral	1.0	100.0	0.0
Total	1369.3	72.7	22.1

Source: 71 ESHS districts, 70 partner districts, 6 charter school districts, and 9 collaboratives

Student Demographics

In 2010-2011, 48.3 percent of Massachusetts public school students were enrolled in an ESHS-funded school district. The racial and ethnic composition of the student population in ESHS funded districts 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 (2010-2011)		
	ESHS Schools	**State Public Schools**
Race/Ethnicity	**Percent**	**Percent**
African American or Black	11.9	8.2
Asian	7.0	5.5
Hispanic or Latino	22.3	15.4
Multi-race, Non-Hispanic	2.6	2.4
Native American	0.3	0.2
Native Hawaiian or Pacific Islander	0.1	0.1
White	55.8	68.0
Total Population	461,987	955,563

Source: Massachusetts Department of Elementary and Secondary Education.
Note: There are 163,693 students in the 71 Partner school districts that submitted end-of-year data reports..

TABLE 3. Selected Characteristics of Students in ESHS Districts and Massachusetts Public Schools (2010-2011)				
	ESHS Schools		**State Public Schools**	
Characteristic	**Number**	**Percent**	**Number**	**Percent**
First Language Not English	108,258	23.4	155,757	16.3
Limited English Proficient	54,677	11.8	67,845	7.1
Low Income	208,861	45.2	326,803	34.2
Total Population	461,987		955,563	

Source: Massachusetts Department of Elementary and Secondary Education.

Of the 298,622 students in 60 ESHS funded districts whose health insurance status was reported, 64% had private insurance, 35% had public insurance, and 1% had no insurance (Table 4). The status of 18% of students in ESHS funded districts and 9% of partner districts was unknown.

TABLE 4. Health Insurance Status of Students in ESHS and Partner Districts (2010-2011)				
		Type of Insurance		
District Type	**Number of Students**	**Private (Percent)**	**Public (Percent)**	**No Insurance (Percent)**
ESHS funded	298,622	63.9	34.8	1.3
Partner	100,982	80.9	17.9	1.3

Source: *Status Reports* submitted by 60 ESHS and 51 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.[10] 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, 2010 and June 30, 2011, 73 ESHS school districts reported a combined total of 4,387,183 student health encounters. In a typical district, 85.7 percent of the student enrollment visited the health room at least once during the school year.[11] "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 825 and 32,273 encounters per month. These differences were largely due to district size. In a typical district, each student visited the school nurse an average of 1.030 times per month, although the encounter rate varied across the districts from 0.6 to 2.0 visits per month. While some students are seen several times each month, many others are never seen. The school

[10] 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.

[11] 73 districts reporting.

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 400.8 student encounters per month[12].

An additional 1,202,645 student encounters and 18,042 staff services were reported by 45 partner school districts, 5 charter school districts, and 5 partner collaboratives. In a typical partner district, 83.4 percent of the student enrollment visited the health room at least once during the school year (slightly less than in ESHS districts). The typical nurse workload in partner districts was 405.8 student encounters per month, slightly higher than the workload in funded districts. Each student in a typical district visited the school nurse an average of 0.876 times per month, which is lower than the rate in ESHS districts,[13]

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, 2010 - June 30, 2011

	Type of District			
	ESHS	**Partner**	**Charter**	**Collaborative**
Number of Services:	4,574,024	1,140,246	18,827	30,486
Type of Health Service	**(%)**	**(%)**	**(%)**	**(%)**
Health Maintenance	66.8	64.8	51.4	60.3
Injury/First Aid	22.0	23.1	32.4	2.9
Mental/Behavioral Health	1.7	3.4	0.7	33.5
Miscellaneous	9.5	8.7	15.5	3.3

Health services were also provided to school staff (i.e., teachers and administrators). School nurses in 73 ESHS districts reported providing a total of 69,056 health services to staff (Table 5b). Across all districts, monthly averages ranged from 0 to 782 staff health encounters per month. In ESHS districts, the typical district reported 1.0 staff encounter per staff member per year, compared to 0.8 encounters per staff member in partner districts.

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

[12] 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).

[13] . There were 32 partner districts with available encounter data.

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, 2010 - June 30, 2011*				
	Type of District			
	ESHS	**Partner**	**Charter**	**Collaborative**
Number of Services:	69,056	17,103	457	482
Type of Health Service	**(%)**	**(%)**	**(%)**	**(%)**
Health Maintenance	56.5	66.0	95.4	42.5
Injury/First Aid	22.1	18.1	0.9	29.7
Mental/Behavioral Health	4.9	6.9	0.4	17.0
Miscellaneous	16.4	9.0	3.3	10.8

*"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 73 ESHS districts, 45 partner districts, 5 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 (91.4%) 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 and Figure 1). These on-site services provide major benefits. Students who are treated on-site 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.

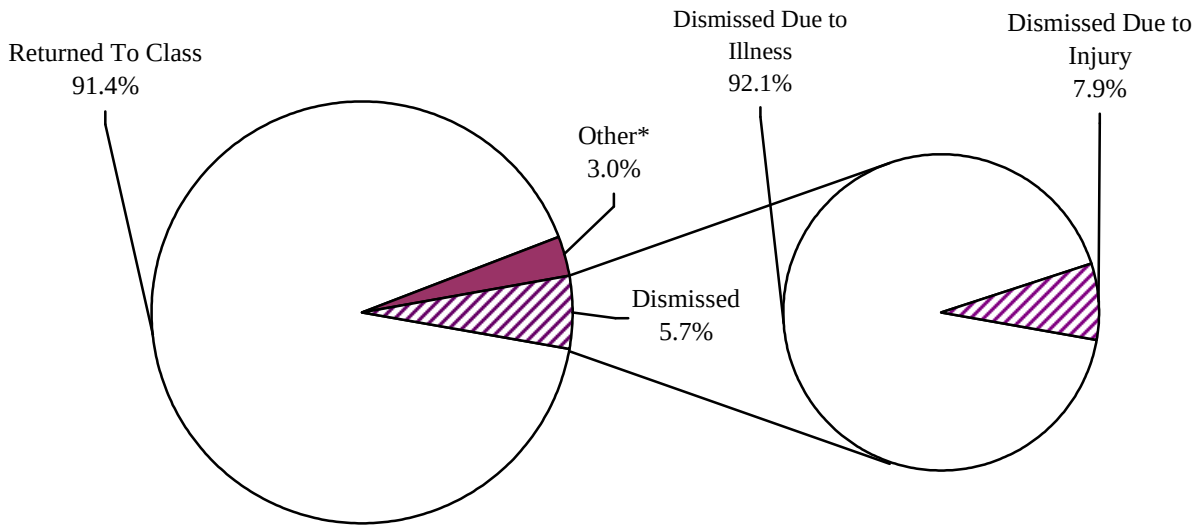
TABLE 6. Disposition After Illness/Injury Assessment *ESHS Districts, September 1, 2010- June 30, 2011*		
	Students	
Disposition	**Number**	**Percent**
Returned to Class	3,980,487	91.4
Dismissals	246,161	5.7
Other*	128,734	3.0
Total	4,355,382	100.0

* Includes “Stayed in health office” and “Referred to counselor’s office”.
Source: *Monthly Activities Reports* submitted by 73 districts in the Essential School Health Services program.

When students had to be dismissed, it was usually the result of illness (92.1%) rather than injury (7.9%).

The returned-to-class rate for student health encounters reported by 44 partner districts (which have a higher student-to-nurse ratio than funded districts) was 88.7%, which was lower than that reported by funded districts, and the dismissal rate was 7.9%, higher than that reported by funded districts.

FIGURE 1. Disposition After Nursing Assessment
Student Health Encounters
ESHS Districts, September 1, 2010- June 30, 2011



* Includes "Stayed in health office" and "Referred to counselor's office".
Source: *Monthly Activities Reports* submitted by 73 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 2010-2011 School Year, ESHS districts reported 23,093 student injury reports and partner districts reported 8,390 student injury reports (Table 7a). Of the student injury reports filed by school nurses, 8.5% involved the intentional infliction of injury, compared to 9.5% 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, 2010 - June 30, 2011

Intent	ESHS Districts			Partner Districts		
	Number	Percent	Rate Per 1,000 Students	Number	Percent	Rate Per 1,000 Students
Unintentional	17,688	76.6	38.7	7,689	91.6	69.1
Intentional	1,965	8.5	4.3	320	3.8	2.9
Unknown intent	3,440	14.9	7.5	381	4.5	3.4
Total	23,093	100.0	50.5	8,390	100.0	75.4

Source: *Monthly Activities Reports* submitted by 73 ESHS districts and 42 partner districts.

While the overall injury rate per 1,000 students was higher in partner districts, the rate varied by type of intent. For unintentional injuries, the injury rate was higher in partner districts, while for intentional injuries and unknown intent injuries, the injury rate was higher in ESHS districts (Table 7a).

There were also 2,495 staff injury reports in ESHS districts and 495 staff injury reports in partner districts (Table 7b).

Source: *Monthly Activities Reports* submitted by 73 ESHS districts and 42 partner districts.

TABLE 7b. Number of Staff Injury Reports

ESHS and Partner Districts, September 1, 2010 - June 30, 2011

Intent	ESHS Districts			Partner Districts		
	Number	Percent	Rate Per 1,000 Students	Number	Percent	Rate Per 1,000 Students
Unintentional	1,728	69.3	30.0	369	74.5	26.9
Intentional	398	16.0	6.9	65	13.1	4.7
Unknown intent	369	14.8	6.4	61	12.3	4.4
Total	2,495	100.0	43.3	495	100.0	36.0

Source: *Monthly Activities Reports* submitted by 73 ESHS districts and 42 partner districts.

In addition, school nurses in the 73 ESHS districts referred students to *urgent health care services* a total of 6,888 times.

- In 1,842 (26.7%) of these events, 9-1-1 or ambulance services were called.
- In the remaining 5,046 (73.3%) events, parents or others were called to transport the student to health services.

There were 9,200 cases of diagnosed or suspected head injuries reported in ESHS districts and 5,150 such injuries in partner schools (Table 7c). The percentage of head injuries occurring during school hours was greater in ESHS districts than in partner districts.

TABLE 7c. Number of Diagnosed or Suspected Student Head Injuries

September 1, 2010 - June 30, 2011

	Type of District			
	ESHS	Partner	Charter	Collaborative
Total number	9,200	5,150	92	11
Percent occurring during:				
School hours	76.2%	43.9%	95.7%	72.7%
Extra-curricular activities	23.8%	56.1%	4.3%	27.3%

Source: *Monthly Activities Reports* submitted by 73 ESHS districts, 42 partner districts, 5 charter school districts, and 3 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 106,432.4 per month for the 73 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, 2010 - June 30, 2011			
Medication Class	**Medication Schedule**		
	Scheduled (All ESHS Districts)	**PRN (As needed) (All ESHS Districts)**	**Total (Daily & PRN) Medications**
Analgesics	138.9	35,459.2	35,598.1
Antibiotics	265.1	1,868.5	2,133.6
Anticonvulsants	152.3	697.7	850.0
Antihypertensive	66.4	24.8	91.2
Antihistamines	26.9	8,979.5	9,006.4
Asthma Medications	401.8	17,204.0	17,605.8
Epinephrine	0.0	9,550.6	9,550.6
Glucagon	0.0	987.2	987.2
Insulin	1,036.8	861.2	1,898.0
Psychotropic	3,435.1	659.9	4,095.0
Other Prescription/OTC Meds	5,255.9	20,347.8	25,603.7
Total	10,779.2	96,640.4	107,419.6
Row Percent	10.0%	90.0%	100.0%

Source: *Monthly Activities Reports* submitted by 73 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.[14] 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. As a result, prescription rates for these medications may be better estimates of the true overall prescription rate for the school age population.

[14] 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

While the scheduled medication rate for insulin increased (from 0.2 per 1,000 students in 2001 to 2.3 in 2010), rates for most other classes of scheduled medications decreased from 2000-2001 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 23.1 per 1,000 in 2011 (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

* 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, and 73 districts in 2010-2011.
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 73 ESHS districts administered an average of 125,559 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).[15]

TABLE 10. Average Number of Medication Doses by Type Administered to Students by School Nurses* Per Month ESHS Districts, September 1, 2010- June 30, 2011

Medication Class	Medication Schedule					
	Scheduled Doses		PRN Doses per Prescription		PRN Doses per Protocol**	
	N	%	N	%	N	%
Analgesic	1,392.9	1.8	2,456.0	14.4	18,741.2	62.2
Antibiotic	1,011.8	1.3	38.0	0.2	621.3	2.1
Anticonvulsant	1,903.9	2.4	13.8	0.1	0.4	0.0
Antihypertensive	807.3	1.0	2.0	0.0	3.3	0.0
Antihistamine	170.3	0.2	254.1	1.5	542.0	1.8
Asthma	2,324.6	3.0	9,127.0	53.7	349.9	1.2
Epinephrine	0.0	0.0	34.5	0.2	5.5	0.0
Glucagon	0.0	0.0	0.3	0.0	0.0	0.0
Insulin	14,068.9	17.9	2,920.3	17.2	73.6	0.2
Psychotropic	43,050.3	54.9	421.6	2.5	18.2	0.1
Other	13,675.7	17.4	1,738.8	10.2	9,791.6	32.5
TOTAL	78,405.7	100.0	17,006.4	100.0	30,147.0	100.0

* Includes supervised self-administration ** These are protocols for non-prescription medications written by school physicians.
Source: *Monthly Activities Reports* submitted by 73 districts in the Essential School Health Services program.

School nurses also administered an average of 2,382 doses of medication to school staff per month, including 2,293 monthly doses of OTC/PRN medications, and 89 monthly doses of other prescription medications.

[15] "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.

4. Health Screenings

Public schools in Massachusetts are required by law to conduct postural, hearing, vision, and height/weight screening on all students.[16] 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 71 ESHS districts and 70 partner districts conducted the following number of required and voluntary student health screenings (Table 11). These numbers represent *initial* screenings, and do not include *re-screenings*.

TABLE 11a. Yearly Student Health Screenings and Referrals
ESHS Districts, School Year 2010-2011

Type of Screening	Screenings		Referrals		Completed Referrals*	
	Number	% of All Students	Number	% of Screened Students	Number	% of Referred Students
Hearing	222,984	49.3	4,392	2.0	1,571	35.8
BMI	151,190	33.4	28,375	18.8	3,012	10.6
Postural	135,888	30.1	4,427	3.3	1,442	32.5
Vision	268,094	59.3	30,204	11.3	10,511	34.8

Source: *Status Reports* submitted by 71 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 2010-2011

Type of Screening	Screenings		Referrals		Completed Referrals*	
	Number	% of All Students	Number	% of Screened Students	Number	% of Referred Students
Hearing	83,394	48.4	1,452	1.7	547	37.7
BMI	59,327	34.4	7,374	12.4	458	6.2
Postural	54,196	31.4	1,397	2.6	426	30.5
Vision	93,556	54.3	7,378	7.9	2,713	36.8

Source: *Status Reports* submitted by 70 partner districts.
* 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 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

[16]. 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.

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 88% 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 66% of districts screening at least 90% of enrollment. Still, with 95% 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 154 ESHS and partner districts provided BMI screening results for 1 or more grade levels, reporting on a total of 174,800 students (Table 12).

TABLE 12. Number of ESHS and Partner Districts Providing Universal BMI Screening September 1, 2010 - June 30, 2011 (n = 154 districts)

Grade	Districts		Students Screened	
	n	%	n	%*
1	138	89.6	45,823	96.5
4	139	90.3	45,737	98.6
7	141	91.6	44,093	93.6
10	143	92.9	39,147	85.4
All grades	154	100.0	174,800	93.1

Notes: Includes 73 ESHS districts and 81 partner districts. A total of 112 local districts, 18 regional academic districts, 9 educational collaboratives, 5 regional vocational technical districts, 6 charter districts, 3 school unions, and 1 independent vocational district. *Percent of enrollment in districts included.

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

Overall, 32.9% of the students screened were overweight or obese (16.2% obese, 16.6% 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 (154 Massachusetts Public School Districts, 2010-2011 School Year)

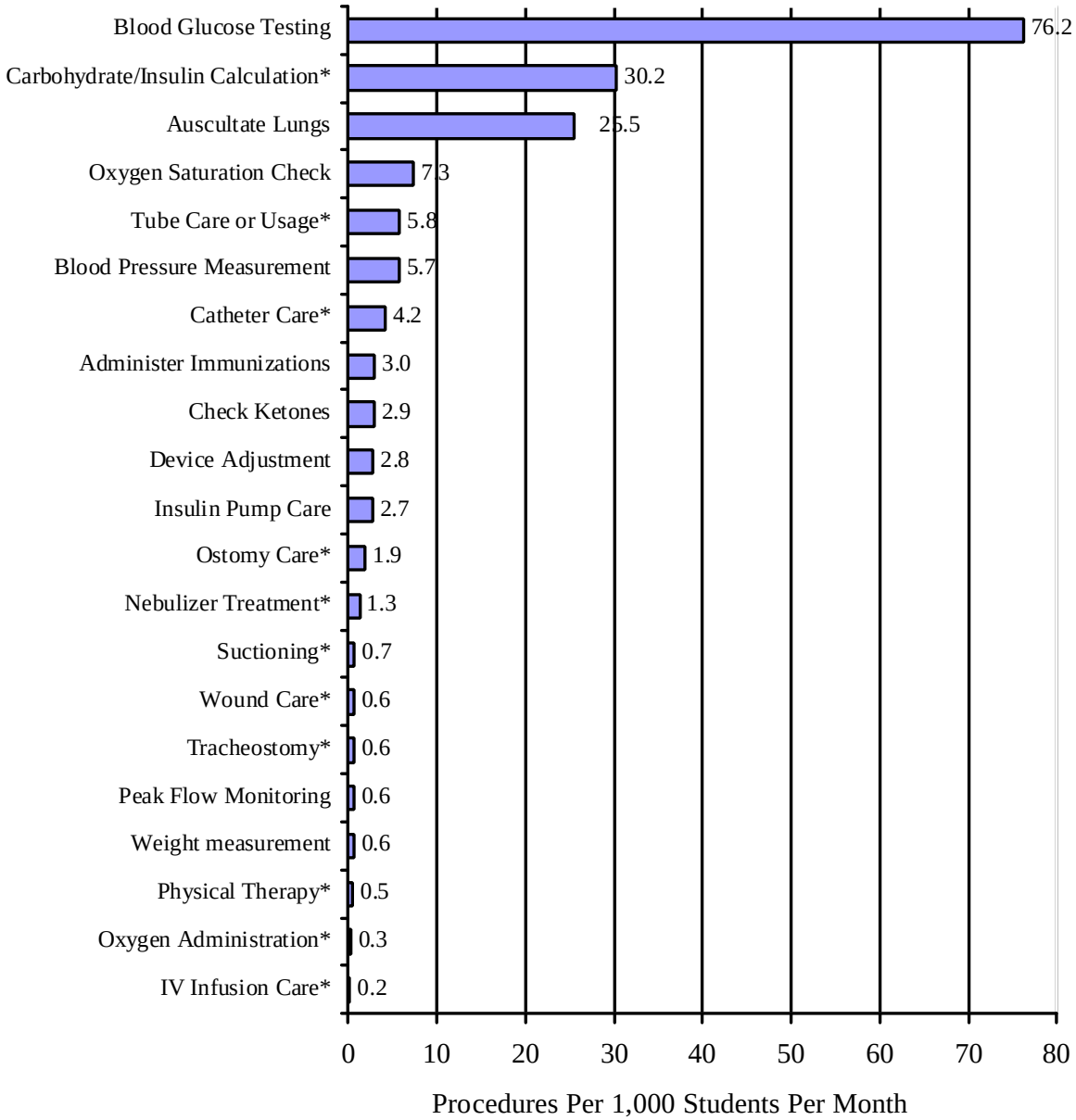
		Grade 1		**Grade 4**		**Grade 7**		**Grade 10**	
		Male	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
	Total students screened:	23,518	22,305	23,606	22,131	22,440	21,653	19,520	19,627
Weight category*	**BMI Percentile Range**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**
Underweight	Less than the 5th percentile	2.7	3.2	2.4	2.4	2.7	2.4	2.8	2.0
Healthy Weight	5th percentile to less than the 85th	67.9	69.3	61.0	64.1	59.8	63.8	63.3	67.5
Overweight	85th to less than the 95th percentile	14.7	14.2	17.1	17.0	18.2	18.4	16.4	17.3
Obese	Equal to or greater than the 95th	14.7	13.3	19.6	16.5	19.3	15.3	17.5	13.2
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 2 and 3.

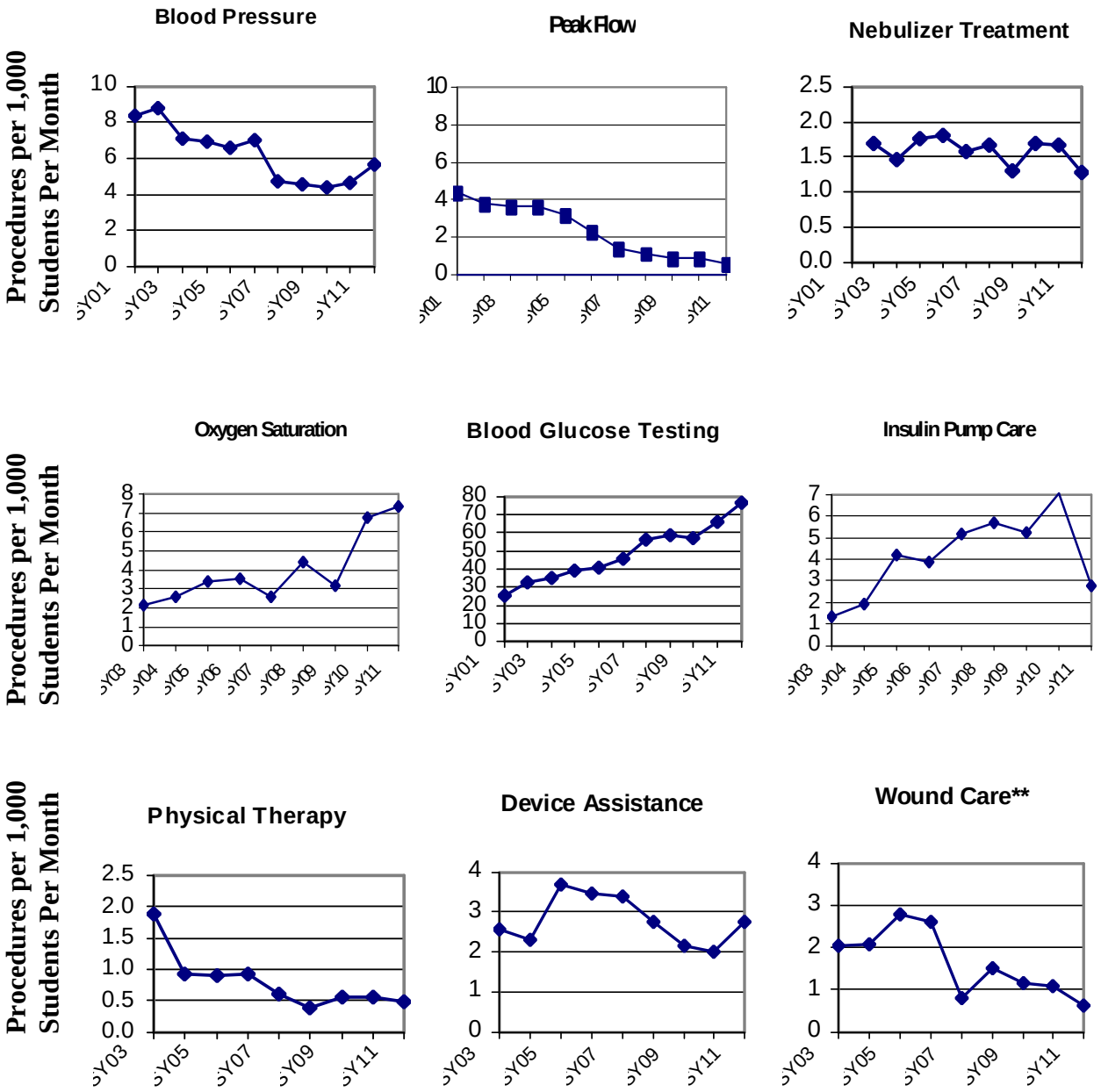
FIGURE 2. Medical Procedure Rates (Students)
ESHS Districts, Sepember 1, 2010 - June 30, 2011



Source: *Monthly Activities Reports* submitted by 73 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.

*FIGURE 3. Procedure Rates per 1,000 Students per Month**
ESHS Districts, School Years 2000-2001 through 2010-2011



*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, 2010- June 30, 2011

Type of Procedure	Number of Procedures Per Month	
	Students	Staff
Administer Immunizations	1,086	407
Auscultate Lungs	13,265	255
Blood Glucose Testing	30,661	55
Blood Pressure Monitoring	2,935	1,529
Carbohydrate/Insulin Calculation	12,482	11
Catheter Care	2,164	25
Central Line Care (a)	118	1
Check Ketones	1,587	0
Device Adjustment (e)	1,857	7
Insulin Pump Care	2,657	9
IV Infusion Care	84	2
Nebulizer Treatment	1,047	6
Ostomy Care (c)	476	0
Oxygen Administration	178	2
Oxygen Saturation Check	4,192	94
Peak Flow Monitoring	1,037	7
Physical Therapy	931	3
Suctioning	196	0
Tracheostomy Care	248	2
Tube Care or Usage (b)	3,746	17
Weight measurement (d)	430	273
Wound Care	2,706	71

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 15.2 per 1,000 students per month.
Source: *Monthly Activities Reports* submitted by 73 districts in the Essential School Health Services program.

6. Linkages to health care and insurance providers

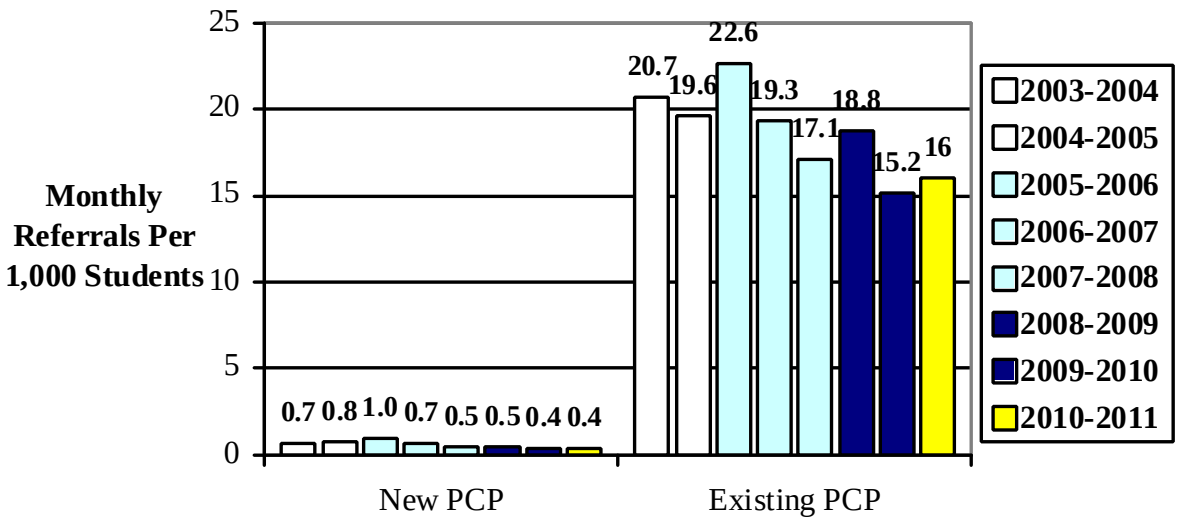
ESHS school systems identified students without a primary care provider and, in consultation with their families, referred them to appropriate health care services. A referral is reported whenever an actual appointment has been set up with a provider or agency.[17] School systems also referred many students to their existing primary care providers. During the 2010-2011 school year, participating districts reported the following:

- A total of 95,081 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:

  - 7,230 referrals to new primary care providers (7.6% of total primary care referrals). In a typical district, monthly referrals to new primary care providers averaged 1.8 students, a rate of 0.4 referrals per 1,000 enrolled students per month (Figure 4).

  - 87,851 referrals to existing primary care providers (92.4% of total primary care referrals). In a typical district, monthly referrals to existing primary care providers averaged 56.5 students, a rate of 16.0 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 2010-2011



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

[17] 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 2010-2011:

- 5,612 referrals to insurance providers.
- 14,367 referrals for mental/behavioral health services.

Each month, school nurses receive Massachusetts Asthma Action Plans (MAAPs) from health care providers.[18] These written plans provide individualized instructions for managing asthma episodes and administering asthma medications. During the school year, 73 ESHS districts reported receiving MAAPs for 7,735 students. Individual districts received between 0 and 1,797 action plans.

[18] 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 2010-2011 school year.

The typical ESHS district participating in oral health screening activities screened students at an annual rate of 50.0 per 1,000 students, compared to a rate of 32.7 per 1,000 students in partner districts.[19] There was considerable variability across districts, with the range being 0.2 to 497 screenings per 1,000 students. Slightly more than one-third of oral health screenings (35%) in ESHS districts were performed by school nurses (Table 15a), compared to 27% in partner districts.

TABLE 15a. Number of Students Receiving Oral Health Services by Type of District, September 1, 2010 - June 30, 2011

Type of Oral Health Activity	ESHS Districts	Partner Districts	Charter School Districts
Oral health screenings by a school nurse	14,936	1,315	49
Oral health screenings by a dentist or hygienist	27,657	3,656	0
Referrals to a dental provider	8,096	1,734	7
Referrals completed	2,907	319	6
Screenings of third grade students	5,775	384	0
Dental sealants applied in school	14,024	817	0
Flouride rinse treatments applied in school	28,653	6,076	465

Source: *Monthly Activities Reports* submitted by 71 ESHS districts, 70 partner districts, and 6 charter school districts.

TABLE 15b. Percent of Districts Providing Oral Health Services by Type of District, September 1, 2010 - June 30, 2011

Type of Oral Health Activity	ESHS Districts	Partner Districts	Charter School Districts
Oral health screenings by a school nurse	32.9	14.3	33.3
Oral health screenings by a dentist or hygienist	56.2	41.4	-
Referrals to a dental provider	63.0	44.3	33.3
Referrals completed	49.3	22.9	16.7
Screenings of third grade students	53.4	25.7	-
Dental sealants applied in school	46.6	25.7	-
Flouride rinse treatments applied in school	64.4	34.3	33.3

Source: *Monthly Activities Reports* submitted by 71 ESHS districts, 70 partner districts, and 6 charter school districts..

[19] 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 2010-2011 school year, school nurses in 73 ESHS districts reported making 16,280 classroom presentations. In addition, 1,772 presentations were made in 43 partner districts, and 46 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 26.4 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 14.9 presentations per nurse, while the average in partner districts was 9.3 presentations per nurse, the average in collaboratives was 4.6 presentations per nurse.

TABLE 16. Number of Wellness/Safety Presentations and Number of Participants, by Topic Area ESHS Districts, September 1, 2010- June 30, 2011

Topic Area	Number of Presentations Per Month	Number of Participants Per Month		
		Students	Staff	Community
Blood Borne Pathogens	43.3	65.6	1,685.9	2.3
CPR/AED Programs	34.8	163.7	263.7	27.2
Crisis Team	23.6	304.9	232.0	29.6
Environmental Health	22.7	608.2	114.1	3.7
Fitness/Nutrition/Wellness	251.1	6,663.0	1,075.6	182.8
Growth/Development	117.5	2,073.5	81.9	104.6
Life Threatening Allergies	218.1	1,057.4	2,355.7	142.1
Mental Health/Wellness	46.4	963.0	146.5	72.1
Oral Health/Hygiene	586.7	8,658.9	386.2	19.6
Other	283.8	8,185.1	1,432.4	590.9

Source: *Monthly Activities Reports* submitted by 73 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 13,874 health promotion / education flyers or mailings. In the typical funded district, each nurse was involved in the creation of 10.4 flyers or mailings per year.

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

- A total of 394 tobacco group prevention meetings were held in 11 districts, in which attendance summed to 11,858 students and 220 adults.

- A total of 90 tobacco group cessation meetings were held in 8 districts, in which attendance summed to 403 students and 36 adults.

- A total of 921 students and 70 adults received individual tobacco cessation counseling (39 districts).[20]

- In 21 districts, students were referred to other tobacco prevention/cessation services 133 times, and adults were referred to outside sources 39 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.[21] 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.[22] These trainings were resumed in FY10.

[20] 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.

[21] 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.

[22] 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 389 support group meetings were conducted every month.

TABLE 17. Participation in Support Group Activities, by Topic Area
ESHS Districts, September 1, 2010- June 30, 2011

Topic Area	% of ESHS Districts Offering Group	Monthly Group Meetings	Monthly Participants		
			Students	Staff	Parent/ Community
Alcohol or Substance Abuse	21.9	16.9	137.9	26.8	6.7
Anger/Conflict/Violence Management	15.1	19.9	61.7	9.5	7.1
Asthma	7.7	10.0	46.7	5.6	8.2
Diabetes	10.6	19.9	71.5	31.6	14.8
Emotional / Psychosocial Support	27.0	98.5	294.1	77.9	17.4
Food Allergy	11.1	13.7	20.8	43.0	4.6
Gay/Bisexual/Lesbian/ Transgender	0.7	8.4	129.7	11.9	0.3
Health Careers	13.1	16.8	154.5	10.1	2.8
Nutrition/Physical Activity	38.1	72.1	372.2	107.1	12.1
Peer Leadership	11.9	16.5	283.0	43.7	3.0
Other	6.2	96.0	626.4	170.3	82.4
Total*		388.7	2,198.5	537.5	159.4

Source: *Monthly Activities Reports* submitted by 73 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 38% 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 27% of districts. Support groups in the "Gay/Bisexual/Lesbian/Transgender" and "Emotional/psychosocial" areas met more frequently than the other types of single-topic support groups.

During the school year, nurses in funded districts provided an average of 9.4 meetings per 1,000 students, while nurses in partner districts provided an average of 7.1 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 114,052 times.

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 73 ESHS districts. Average activity per FTE is presented for some activities in Table 18. During the school year, school nurses from 73 districts conducted:

- a total of 933,087 health counseling and education communications with parents (including phone calls and letters, but excluding meetings and home visits), with the typical district reporting 874.7 communications per month (range: 61.0 to 10,182.2 communications per month);

- a total of 799 home visits, with the typical district reporting 0.1 home visits per month (range: 0.0 to 18.4 home visits per month);

- a total of 346,778 communications with other school staff about student health issues, with the typical district reporting 325.0 communications per month (range: 10.9 to 4,197.6 meetings per month);

- a total of 97,012 communications with other agencies and health providers about student health issues, with the typical district reporting 34.2 communications per month (range: 0.0 to 2,099.7 phone calls per month).

- a total of 28,264 case management meetings, with the typical district reporting 19.9 meetings per month (range: 0.1 to 411.5 meetings per month).

The following table shows median case-management activity levels per school nurse FTE per month across the 73 participating districts:

TABLE 18. Nursing Case Management Activities: *Student-Health Related Activities Per Month Per Nurse FTE* *ESHS Districts, September 1, 2010 - June 30, 2011*	
Type of Activity	**Activities Per Month Per FTE**
Communications with parents	81.9
Communications with staff	28.4
Communications with community agencies/providers	4.1
Case management meetings	1.9

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 2010-2011 school year, 73 ESHS districts reported:

- a total of 36,274 IHCPs for the year, with the median district reporting 31 IHCPs (range: 0 to 4,238 IHCPs);

- a median rate of 25.7 IHCPs per full-time school nurse (range: 3.7 to 188 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 2010-2011 school year, school nurses in 73 districts attended 1,395.1 program and professional development meetings per month (Table 19). Partner districts, partner collaboratives, and private schools conducted an additional 415.3 meetings per month.

TABLE 19. Number of Program Development Meetings Attended by School Nurses, by Topic Area *ESHS Districts, September 1, 2010 - June 30, 2011*	
Topic Area	**Number of Meetings Per Month (All Districts)**
Crisis Management	109.3
Emergency Preparedness	70.2
Environmental	15.4
Mental Health	103.3
Policy Development	121.6
Professional Development	432.1
Other	543.2
Total	1,395.1

Source: *Monthly Activities Reports* submitted by 73 districts in the Essential School Health Services program.

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 19 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 (71 funded districts, 70 partner districts, 6 charter school districts, and 5 collaboratives), the total enrollment was 638,929 (66.9% of the total public school enrollment in Massachusetts). In these schools, a total of 186,678 students with special health care needs were reported to school nurses (29% of enrollment). The most commonly reported physical/developmental condition is asthma (Table 20). The asthma rate among the schools reporting increased from 97.7 in 2006-2007 to 128.7 per 1,000 students in 2010-2011. 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).

TABLE 20: 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, 2010- June 30, 2011

	All Districts	ESHS Districts	Partner Districts*	Difference between ESHS and Partner Districts
	(Per 1,000)	(Per 1,000)	(Per 1,000)	(%)
Student Enrollment	627,088	452,130	172,408	
Physical/Developmental Conditions				
Allergies:				
Bee Sting Allergies	5.5	5.1	6.3	-18.7
Food Allergies	45.2	46.0	43.2	6.5
Latex Allergies	2.3	2.4	2.1	15.2
Asthma	128.7	137.8	104.5	31.9
Autoimmune Disorders	1.9	2.0	1.7	19.8
Blood Dyscrasias:				
Hemophilia	0.3	0.3	0.3	0.1
Sickle Cell Disease	1.1	1.4	0.4	258.7
Other Blood Dyscrasias	2.6	3.1	1.4	124.9
Cancer	0.9	0.9	0.8	19.1
Cardiac Conditions	8.4	9.2	6.4	44.0
Celiac Disease	1.6	1.4	2.0	-33.4
Cystic Fibrosis	0.4	0.3	0.4	-10.4
Diabetes Type I	3.1	2.9	3.5	-16.9
Diabetes Type II	0.5	0.5	0.3	46.1
Inflammatory Bowel Disease	3.4	3.5	3.4	2.6
Migraine Headaches	11.7	11.0	13.5	-18.3
Neurologic Conditions:				
Cerebral Palsy	1.7	1.8	1.3	36.8
Spina Bifida	0.3	0.4	0.2	83.9
Seizure Disorder	8.3	8.9	6.5	37.2
Neuromuscular Degenerative Disorder	1.4	1.6	0.7	128.2
Other Physical/ Developmental conditions	29.5	35.7	13.6	162.2
Behavioral/Emotional Conditions				
ADHD/ADD	58.9	60.5	53.5	13.2
Autism	11.6	11.9	10.4	15.1
Depression	11.6	11.4	11.7	-2.9
Eating Disorders	1.5	1.5	1.5	3.0
Other Behavioral/Emotional conditions	26.3	27.7	20.2	36.6
Total SHCN Students	297.7	325.9	224.4	45.3

Source: 71 ESHS districts, 70 partner districts, 6 charter districts, and 9 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.

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, 7 students with DNR orders were reported to school nurses.

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, and 2 times with staff, and 1 time 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 84% 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 6.6% of school buildings in ESHS districts do not have an AED, compared to 12.4% of buildings in partner districts, and 33% of buildings in charter school districts.

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

	2003-2004		2010-2011	
	n	%	n	%
Total buildings	870		879	
AED Status of Building				
No AEDs	596	68.5	58	6.6
One AED	218	25.1	644	73.3
More than One AED	56	6.4	163	18.5
Total districts	91		73	
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	61	83.6
At least one building with more than one AED	36	39.5	64	87.7

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.

Actions to Promote Healthy Weight

Newly Funded Essential School Health Service Districts

Shown in the tables below are the FY2011 responses of the 9 school districts whose ESHS funding began in FY09 (and who had not been funded the prior year). The percentages reported below may be expected to fluctuate from year to year due to the small number of respondents in this group.

Shown in Table 26 below is the percentage of respondents reporting obesity concerns. Shown in tables 27 through 29 below is the percentage of respondents who reported the school action or policy as being either fully or partially in place.

Obesity Concern in the Community

As shown by Table 26, concerns about obesity are reported to have increased in the communities served by newly funded districts. Most of the respondents report that school and school staff are making efforts to improve the nutritional quality of meals and snacks available to students. Support for these efforts among parents has increased.

Table 26. Obesity concerns

Questions	08-09	09-10	10-11
1. Obesity is a concern in the community?	73%	91%	89%
2. Efforts are being made in school to improve the nutritional quality of meals and snacks available to students?	91%	100%	100%
3. School staff support efforts to improve the nutritional quality of meals and snacks, for example, reduce fat and/or caloric content or replace sugared drinks with water or 100% juices?	91%	91%	89%
4. Parents support efforts to improve the nutritional quality of meals and snacks, for example, reduce fat and/or caloric content or replace sugared drinks with water or 100% juices?	55%	73%	56%

Physical Activity

The action these schools were least likely to undertake was "all students receiving at least 150 minutes of PE per week."

Table 27. School actions undertaken to increase physical activity

Increased Physical Activity	08-09	09-10	10-11
5. Providing at least 20 minutes of recess each day	100%	91%	100%
5a. Monitors encouraging students to be active at recess	82%	91%	89%
6. Using a sequential PE curriculum that is consistent with state or national standards	91%	91%	100%
7. All students receiving at least 150 minutes of PE per week	27%	36%	56%
7a. Spreading PE over at least 3 days (preferably 5 days) per week	36%	45%	67%
8. Promoting walking /biking to school	55%	45%	78%

Nutrition

All of these schools offer low fat items on menus. Only about half offer low fat items in vending machines, parties, or after school programs.

Table 28. School actions to improve nutrition

Improved nutrition	08-09	09-10	10-11
9. Providing a variety of foods on school menus	91%	100%	100%
10. Offering low-fat and skim milk every day	100%	100%	100%
11. Offering at least one appealing low fat item from each of the following food groups every day: fruits, vegetables, grains, and dairy products?	91%	91%	100%
12. Allowing ample time for lunch and breakfast	82%	73%	100%
13. Vending machines exist in school?	91%	82%	89%
14. Restricting access to vending machines (among districts with vending machines)	90%	91%	89%
15a. Offering appealing low fat items in vending machines	27%	45%	44%
15b. Offering appealing low fat items at parties	36%	55%	56%
15c. Offering appealing low fat items at after school programs	36%	55%	44%

School Nurse

Compared to the prior year, more school districts reported promoting physical activity and healthy eating through small group activities, and more school districts reported collaborating to promote these activities. In addition, all of the respondents now report a system in place for measuring BMI's. The percentage of districts that have procedures for reporting BMIs to families and physicians and for managing students at risk for weight increased over the prior year,.[23]

Table 28. School nurse actions to improve physical activity and nutrition

Improved physical activity and nutrition	08-09	09-10	10-11
16. Promoting physical activity through:			
• Educational materials	73%	91%	100%
• Individual advice	82%	100%	89%
• Small groups	18%	27%	67%
• Presentations	27%	45%	33%
17. Promoting healthy eating through:			
• Educational materials	82%	82%	100%
• Individual advice	100%	100%	100%
• Small groups	18%	45%	56%
• Presentations	45%	55%	67%
18. Collaborating to promote health eating and physical activity through:			
• Policy development	73%	64%	89%
• Curriculum development	55%	64%	78%
• Unit and lesson planning	27%	45%	78%
• Special events/planning	36%	55%	89%
• In service training	18%	55%	44%
Having a system in place to measure student BMI's	82%	100%	100%
Reporting BMI's to students' families	18%	64%	100%
Reporting BMI's to students' physicians	0%	36%	44%
Managing students identified as at risk for overweight using a written protocol	0%	9%	33%

[23] Please note: In late FY07 the MDPH issued the Comprehensive Growth Screening Guidelines which will facilitate school districts in addressing these issues, and these guidelines were updated in 2009.

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 45% 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 32% higher rate of asthma, a 44% higher rate of cardiac conditions, a 46% higher rate of diabetes type II, a 37% higher rate of both seizure disorder and 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 17.6% 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: 2010-2011

	District Name	REGION	ADMINISTRATION	ENROLLMENT
1	Acton-Boxborough	Metro West	Regional Academic	5,993
2	Amesbury	Northeast	City or Town	2,434
3	Andover	Northeast	City or Town	6,178
4	Arlington	Metro West	City or Town	4,808
5	Ashburnham-Westminster	Central	Regional Academic	2,337
6	Attleboro	Southeast	City or Town	5,855
7	Barnstable	Southeast	City or Town	5,304
8	Belchertown	Western	City or Town	2,607
9	Berkshire Hills	Western	Regional Academic	1,351
10	Billerica	Northeast	City or Town	5,792
11	Boston	Boston	City or Town	56,037
12	Braintree	Metro West	City or Town	5,467
13	Bridgewater Raynham	Southeast	Regional Academic	5,707
14	Brockton	Southeast	City or Town	15,828
15	Brookline	Boston	City or Town	6,627
16	Cambridge	Metro West	City or Town	6,019
17	Canton	Metro West	City or Town	3,218
18	Central Berkshire	Western	Regional Academic	1,933
19	Chicopee	Western	City or Town	7,875
20	Douglas	Central	City or Town	1,731
21	East Longmeadow	Western	City or Town	2,846
22	Fall River	Southeast	City or Town	9,873
23	Fitchburg	Central	City or Town	4,881
24	Framingham	Metro West	City or Town	8,182
25	Gardner	Central	City or Town	2,563
26	Gateway	Western	Regional Academic	1,103
27	Gloucester	Northeast	City or Town	3,203
28	Granby	Western	City or Town	1,131
29	Hadley	Western	City or Town	710
30	Hampden Wilbraham	Western	Regional Academic	3,596
31	Hampshire	Western	School Union	1,842
32	Harwich	Southeast	City or Town	1,333
33	Haverhill	Northeast	City or Town	6,804
34	Holyoke	Western	City or Town	5,896
35	Hudson	Metro West	City or Town	2,993

	District Name	REGION	ADMINISTRATION	ENROLLMENT
36	Lawrence	Northeast	City or Town	12,784
37	Leominster	Central	City or Town	6,214
38	Lexington	Metro West	City or Town	6,366
39	Lowell	Northeast	City or Town	13,600
40	Ludlow	Western	City or Town	2,987
41	Lynn	Northeast	City or Town	13,547
42	Mansfield	Southeast	City or Town	4,826
43	Marblehead	Northeast	City or Town	3,206
44	Marshfield	Southeast	City or Town	4,671
45	Medford	Northeast	City or Town	4,849
46	Middleborough	Southeast	City or Town	3,457
47	Nashoba	Central	Regional Academic	3,495
48	Natick	Metro West	City or Town	4,825
49	Needham	Metro West	City or Town	5,358
50	New Bedford	Southeast	City or Town	12,538
51	Newburyport	Northeast	City or Town	2,267
52	Newton	Metro West	City or Town	11,934
53	North Andover	Northeast	City or Town	4,638
54	North Attleborough	Southeast	City or Town	4,692
55	Northampton	Western	City or Town	2,681
56	Northboro Southboro	Metro West	School Union	4,838
57	Northbridge	Central	City or Town	2,603
58	Pittsfield	Western	City or Town	5,978
59	Plymouth	Southeast	City or Town	8,126
60	Quincy	Metro West	City or Town	9,125
61	Rockport	Northeast	City or Town	946
62	Sandwich	Southeast	City or Town	3,432
63	Scituate	Metro West	City or Town	3,276
64	Springfield	Western	City or Town	25,702
65	Stoughton	Southeast	City or Town	3,777
66	Taunton	Southeast	City or Town	7,912
67	Walpole	Metro West	City or Town	3,961
68	Waltham	Metro West	City or Town	4,796
69	West Bridgewater	Southeast	City or Town	1,299
70	Weston	Metro West	City or Town	2,365
71	Weymouth	Metro West	City or Town	6,935
72	Wilmington	Metro West	City or Town	3,732
73	Worcester	Central	City or Town	24,192
	TOTAL			461,987

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.[24] 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 2010-2011 school year, monthly encounter data were collected successfully from 73 of the 73 ESHS award recipients. For these school systems, MDPH received 722 (97.5%) of the 730 expected monthly reports.

For the 73 districts that form the basis of this report, the median student enrollment was 4,808, with a range of 710 to 56,037 students. This sample includes school districts from many areas of

[24] 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.