School Health Services in Indiana:

Student Health Needs and the Role of the School Nurse

November 2018

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Executive Summary

The Indiana Department of Education ("IDOE") collects data from traditional public, public charter, and state-accredited nonpublic schools on student health and school health services. Some data is required by law (information on vision and hearing screenings; immunization data; and administration of emergency medications), while other information is collected to inform the IDOE about the state of student health and health services. In the summer of 2018, the IDOE contracted with Chamberlin/Dunn, LLC for analysis and reporting of these various data collection tools. Chamberlin/Dunn offers research, planning, and consulting to public and nonprofit organizations.

About the Report

School Health Services in Indiana includes information collected through two required reports, the School Health Report (a mandatory collection for all public and accredited non-public schools), which is covered in the School Health Report section; and data on the administration of emergency medications collected through the Administration of Emergency Medications Report, which is covered in the Administration of Emergency Medications section. In addition, the report provides analysis of data submitted through the School Nurse Survey, which was a voluntary survey for all public, charter, and private schools. Information from the survey is covered in the School Nurse Survey section. Where possible, results are disaggregated by grade spans and school type. More information about each report is provided below.

2018 School Health Report: This report is required for all public and accredited non-public schools as part of the school's accreditation process. The report was completed by 99 percent of schools, representing 1,008,895 students in Indiana. This report contains data regarding the schools' vision and hearing screenings, as well as immunization verification. Although public charter schools are required to complete the mandatory screenings, they are not required to report to the IDOE. Based on 2018 data, 15 percent of visual acuity screenings were failed across grades required to test, while two percent of hearing screenings were failed in grades required to test. Further, 95 percent of students had completed immunizations in 2018.

2018 Administration of Emergency Medication Report: As of July 1, 2017, all Indiana schools that stock and administer an emergency dose of Albuterol, Epinephrine, or Naloxone must report the administration to the IDOE within ten days of administration. Per Indiana Code 20-34-4.5, schools were permitted to stock Epinephrine beginning July 2014. Although it was not mandatory at the time, many schools notified the IDOE when a dose of Epinephrine was administered in the school. As of July 1, 2017, schools were permitted to stock two additional medications (Albuterol and Naloxone), and the mandatory requirement for reporting the administration of any of the three stock emergency medications was added. Based on data reported, there were 141 administrations of Albuterol in 2018; 75 administrations of Epinephrine; and zero administrations of Naloxone. In reported cases of Albuterol administration, 21 percent had no known history of asthma, and in 20 percent of

Epinephrine administrations, there was no known history of allergy. This suggests the importance of stocking emergency medications. Currently, 78 percent of public schools stock Epinephrine, 26 percent stock Albuterol and 21 percent stock Naloxone.

2018 School Nurse Survey: This survey was created and administered by the IDOE and was open to school nurses in traditional public, public charter, and non-public schools. 1,017 school nurses completed the survey, representing 617,912 students in preK-12th grade, approximately 54 percent of the total enrollment in Indiana. Nurses in approximately 56 percent of all public schools; 14 percent of non-public schools; and five percent of charter schools responded to the survey. The survey was voluntary, and responses were anonymous, although nurses were invited to provide their email addresses if so desired. Respondents were asked to provide which geographic area of the state they were located in; all geographic areas were represented. While the response rate to the survey was relatively strong, responses represented only those who elected to participate in the survey (a statistical sample was not used). Limitations to the school nurse survey data are described in the Data Strengths and Limitations section of the report.

Summary of Conclusions and Recommendations

Conclusions

- Survey respondents reported a total of 186,694 students who were diagnosed with at least one of the 32 chronic diseases listed in the survey (31 percent). Further, there were nearly 67,000 medications prescribed for administration during the school day (short-term, long-term, specific and self-carry medications) and 86 percent of the school nurse respondents reported performing at least one healthcare procedure listed in the survey.
- The ten most prevalent chronic health conditions reported on the school nurse survey were asthma, attention deficit disorder, environmental allergies, mental health disorders, severe food allergies, migraines, gastrointestinal disorders, seizures, cardiac conditions/hypertension, and hearing disorders.
- School nurses reported that at least 1,290 calls were made to 911 and nearly 1,600 doses of emergency medications were administered.
- The top five health-related issues rated as most significant by school nurses were asthma, severe food allergies, injuries, poverty, and mental health.
- The top four roles reported by school nurse respondents included caring for the ill or injured, managing students with chronic health conditions, discussing health issues with parents, and training and educating staff regarding student health conditions.
- School nurses are completing the state-mandated requirements for vision, hearing and immunizations, with 15 percent of students being referred for vision failure, two percent of students being referred for hearing failure, and three percent of students being referred for incomplete immunizations.
- The recommended ratio of school nurses (RN's) to students in Indiana is 1:750 per 511 IAC 4-1.5-2. The nurses responding on behalf of schools in the school nurse survey had a ratio of approximately 1:917 (one RN for every 917 students).

- The majority of school nurses (nearly 80 percent) are employed by school districts, with 15 percent hired through contracts with local hospitals or health care systems.

Recommendations

Encourage the development of school policies regarding the care of students with chronic diseases. All schools should have a written policy that addresses and delineates the proper care of students with chronic health conditions. This policy should include the requirement that students with chronic health conditions have medical orders and emergency action plans completed by his/her provider as well as an individual health plan written by the school nurse if the student's condition requires care while at school.

Encourage the stocking of emergency medications. Nearly 1 in 5 school nurse survey respondents (18 percent) reported not stocking the three emergency medications, Albuterol, Epinephrine, and Naloxone. Stocking emergency medications, particularly in cases where individuals may have had no history of asthma or allergies, appears to be vital to ensure the safety of students and staff.

Encourage training for uncommon and common health procedures. All nurses should feel comfortable administering insulin, performing nebulizer treatments, performing tube feedings, and conducting bladder care/catheterization, as school nurse survey respondents reported these were the procedures they most commonly provided in the last year.

Provide training on awareness and administration of Epinephrine and Albuterol. EMS should be called each time Epinephrine is administered to ensure proper care post-administration. However, calling EMS when Albuterol administration has occurred should be based on the student's emergency action plan. While schools may pay closer attention at the lower grades to minimize exposure to allergens for younger students, schools must also ensure that vigilance is in place with older students, as the highest rate of Epinephrine administration was in high school grades. Additionally, as asthma and severe allergy symptoms frequently occurred in the classroom and administrations of Epinephrine were reported to happen on field trips, it is important that teachers, administrators, and other staff are properly trained to recognize signs and symptoms of asthma attacks and anaphylaxis.

Encourage an improvement in the student-to-RN ratio. Survey respondents indicated that many students had health-related needs (chronic health conditions, medications, and treatments) and that school nurses were performing a variety of complex health care task (caring for the sick and injured, administering medical procedures, conducting screenings and responding to emergencies). In order to safely manage and care for students who have health needs, schools are encouraged to meet the state and national recommended ratio of one RN for every 750 students.

Consider more frequent administrations of the School Nurse Survey. The survey is a potential wealth of information about school health services in Indiana schools. The IDOE should consider administering shorter portions of the survey yearly or biyearly. By administering portions (instead of the whole survey), the IDOE can keep the survey short, but can also obtain information on key data points for decision making.

Indiana School Health Services by the Numbers

Student Health Issues (School Nurse Survey)

617,912 students were estimated to be represented by school nurse survey respondents, representing 54% of the Indiana school population.

31,042 students were estimated to take a daily short- or longer-term medication.

25,870 students were estimated to have specific, prescribed medications on an as needed basis (for the treatment of asthma, allergies, diabetes or seizures).

10,051 students were estimated to self-carry Epi auto-injectors, asthma inhalers, or diabetes medications.

31% of students were estimated to have at least one chronic health condition listed in the survey.

1,583 administrations of emergency medication (Albuterol and Epinephrine) were reported by school nurse survey respondents, which includes student's own medication, stock medication, and self-carry medication (141 and 75 administrations of stock only emergency Albuterol and Epinephrine were reported on the Administration of Emergency Medication Report).

93.5% of school nurse survey respondents indicated having at least one student in their schools taking longer-term medications, with 77% of schools reported at least one student taking shorter-term medications.

97% of school nurse survey respondents reported having at least one student in their schools with asthma, estimated to affect 7% of students.

1,290 the number of times 911 was called for medical emergencies.

Administration of Emergency Medicine[1]

78% of public schools stock Epinephrine, 26% stock Albuterol and 21% stock Naloxone.

141 administrations of stock Albuterol were reported in AY2018,

96% of emergency Albuterol administered was given via Nebulizer.

75 administrations of stock Epinephrine were reported in AY2018.

10 doses of Epinephrine and 5 of Albuterol were administered to staff.

0 administrations of stock Naloxone were reported in AY2018.

44% of individuals who were administered Albuterol and had a history of asthma, lacked an asthma action plan or medical treatment order; while 37% of individuals with a history of allergy who were administered Epinephrine did not have an allergy action plan or medical treatment order.

19% of Albuterol administrations were in response to symptoms that began before the school day, compared with 12% of Epinephrine administrations.

[1] Emergency stock medication also includes Naloxone, but no schools reported administering Naloxone in AY2018.

97% of Albuterol administrations occurred in the school health clinic, compared with 85% of Epinephrine administrations.

85% of Albuterol administrations were given by a Registered Nurse (RN), compared with 75% of Epinephrine.

86% of Albuterol administrations were given within 10 minutes of the reporting of symptoms, compared with 70% of Epinephrine.

21% of students given emergency Albuterol did not have a known history of asthma, and 20% of students receiving Epinephrine had no known history of allergies.

Student Screenings and Immunizations (School Health Report)

15% of visual acuity screenings were failed in required grades.

2% of hearing screenings were failed in required grades.

17% of first graders failed visual acuity screening and 2.5% of 1st grades failed hearing screenings, the highest rate among required grades.

95% of students had complete immunizations in AY2018: 3% were in progress, 1.5% had a religious objection, and 0.3% had a medical exemption.

School Nurse Qualifications and Roles (School Nurse Survey)

73% of schools completing the school nurse survey are primarily served by a Registered Nurse (RN). An additional 25% are supervised by an RN.

68% of nurses are full-time in one building only.

80% of school nurse services are administered by the school corporation or school, with another 15% of schools contracted through a local hospital, health care system, or provider.

86% of nurse respondents indicated they had performed at least one healthcare-related procedure.[2] Of these, 71% had conducted nebulizer treatments and 57% had administered insulin.

67.5% of respondents ranked "caring for the ill or injured" as the #1 role of a school nurse. School nurses also believe an important aspect of their role is to manage students with chronic health conditions and discuss health issues with parents.

917:1 is the estimated student-to-RN ratio in Indiana, based on school nurse survey responses.

Policies (School Nurse Survey)

99% of respondents indicated their school had some type of written health policy, and 75% had written policies for all six components.

82% of schools stocked at least one of the three emergency medications (Albuterol, Epinephrine, Naloxone).

[2] Includes insulin administration, nebulizer treatment, tube feeding, bladder care/catheterization, and 8 additional, less common healthcare-related procedures. (See Figure 40 for details.)

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School Health Report

All public and state-accredited non-public schools are required to submit information on results of state-required screening information, including vision and hearing tests and immunizations. 99 percent of applicable schools had completed and submitted data by the end of June 2018.

Visual Acuity

Visual acuity testing is required for students in Kindergarten or 1st grade.[3] In Academic Year (AY) 2017-2018, the majority of schools elected to screen students in Grade 1 (83 percent of first graders were screened, compared to 38 percent of Kindergarteners). In addition, schools must screen all students in grades 3, 5, and 8, and any student referred for testing due to a suspected visual deficit in any other grades. In total, 341,384 students were vision-screened in AY2017-2018 in grades K-12. 84 percent of screenings were rated as passed; 15 percent failed; and 1 percent were identified as borderline. These results were the same as in AY2016-2017.

For grades required to test (K or 1, 3, 5, and 8), 324,127 tests were conducted. Over 80 percent of screens in each required grade were passed, with Kindergarten and Grade 5 having the highest passing rate, and Grade 1 having the lowest passing rate.

Table 1: Visual Acuity Results: Grades Required to Screen

	Grade Levels					
Results	K	1	3	5	8	**TOTAL**
# of tests	28,420	63,984	77,189	78,235	76,299	**324,127**
% passed	84.8%	81.2%	84.0%	84.8%	84.4%	**83.8%**
% failed	14.1%	17.2%	15.1%	14.3%	14.5%	**15.1%**
% borderline	1.1%	1.6%	1.0%	0.9%	1.2%	**1.1%**

Because visual acuity screenings are not required in grades other than those in Table 1, far fewer screenings (17,257) were conducted in Grades 2, 4, 6, 7, and 9-12). The failure rate was slightly higher, which is to be expected given that screenings are only conducted in these grades when there is a suspected visual deficit. In non-required grades, 80 percent of screenings were passed, while 18.5 percent were failed, and one percent were borderline. The highest failure rates were in Grade 6 (21 percent) and Grade 4 (20.5 percent). The highest passing rates were in high school grades.

Table 2: Visual Acuity Results: Grades Not Required to Screen

	Grade Levels								
Results	2	4	6	7	9	10	11	12	TOTAL
# of tests	4,723	4,417	2,483	1,929	1,252	1,486	685	282	**17,257**
% passed	80.3%	78.2%	77.0%	80.2%	83.6%	84.6%	81.0%	90.5%	**80.1%**
% failed	17.9%	20.5%	21.3%	19.2%	15.6%	14.2%	17.1%	8.8%	**18.5%**
% borderline	1.8%	1.2%	1.6%	0.6%	0.8%	1.2%	1.9%	0.7%	**1.4%**

[3] It is the schools' choice which grade they elect to screen.

Modified Clinical Technique (MCT) Waiver

According to Indiana law, students in either Kindergarten or Grade 1 are to be tested using the modified clinical technique (MCT). The MCT includes a visual acuity test to determine ability to see at various distances; a refractive error test to determine focusing power of the eye; an ocular health test to determine any external or internal eye abnormalities; and a binocular coordination test to determine if the eyes work together properly. By law, the MCT screening must be conducted by a licensed eye professional. If a school corporation, public charter school, or non-accredited public school is unable to conduct an MCT screening, it must obtain a waiver. If a waiver is granted, the school must still conduct a visual acuity screening, which is a test that determines the student's ability to see at various distances.

In AY2018, 18,129 students in Kindergarten, and 44,183 in Grade 1, were screened using MCT. This represented an increase from 2017, when 17,312 kindergarteners were screened using MCT, and 43,966 first graders were screened.

In total, 140 schools requested a waiver. Of these, 36 schools (26 public, two charter, and eight non-public) requested waivers for kindergarten students (3,385 students), and 104 schools (91 public, 11 nonpublic, and two charter) requested waivers for 1st grade students (11,209 students). The most common reason provided for requesting a waiver was the inability to obtain the volunteer services of a properly licensed eye professional. Schools requesting waivers indicated they would have the school nurse, trained volunteers, or another agency (such as the Health Department or Lion's Club) complete the vision acuity screening for students.

Hearing

Hearing tests are required for students in Grades 1, 4, 7, and 10, as well as students in other grades who may be suspected of having hearing defects. In AY2018, 360,248 hearing tests were conducted. Overall, 98 percent of screenings were passed.

In grades required to conduct hearing tests, 295,268 screenings were conducted. 98 percent of screenings were passed. While passing rates in all grades were above 97 percent, Grade 1 had the highest failure rate, with 2.5 percent of screenings failed.

Table 3: Hearing Test Results: Grades Required to Screen

	Grade Levels				
Results	1	4	7	10	TOTAL
# of tests	74,082	76,623	74,232	70,331	**295,268**
% passed	97.5%	97.9%	97.8%	98.0%	**97.8%**
% failed	2.5%	2.1%	2.2%	2.0%	**2.2%**

For students in grades not required to screen, 64,980 tests were administered, with a passing rate of 97 percent. While all grades had passing rates of over 90 percent, hearing tests in Grade 12 had the lowest passing rate (93 percent).

Table 4: Hearing Test Results: Grades Not Required to Screen

	Grade Levels									
Results	K	2	5	6	8	9	10	11	12	TOTAL
# of tests	37,219	5,924	5,295	4,221	3,666	2,916	3,286	1,721	732	**64,980**
% passed	97.1%	96.6%	96.5%	95.9%	96.0%	96.4%	96.4%	94.2%	92.6%	**96.7%**
% failed	2.9%	3.4%	3.5%	4.1%	4.0%	3.6%	3.6%	5.8%	7.4%	**3.3%**

Immunizations

Indiana Code requires children enrolled in accredited schools be immunized against a number of diseases, including diphtheria, pertussis, tetanus, measles, rubella, poliomyelitis, mumps, varicella, hepatitis A, hepatitis B, and meningitis, unless a waiver for religious objection under Indiana Code 20-34-3-3 or an exemption for the student's health under Indiana Code 20-34-3-3 is granted.

In AY2018, 95 percent of students had completed immunizations in place, and three percent had immunizations in progress. 1.5 percent received a waiver for religious objection, and less than one percent (0.3 percent) received a medical exemption. All grades except Kindergarten, 6, and 12 had 95 percent or more students with completed immunizations.[4]

Table 5: Immunization Status by Grade

	Immunization Status			
Grade Level	% completed	% in-process	% religious objection	% medical exemption
Kindergarten	92.6%	5.1%	2.1%	0.2%
Grade 1	95.1%	2.8%	1.9%	0.2%
Grade 2	96.0%	2.2%	1.6%	0.2%
Grade 3	95.9%	2.3%	1.6%	0.2%
Grade 4	96.4%	2.0%	1.4%	0.2%
Grade 5	96.3%	2.3%	1.2%	0.2%
Grade 6	93.6%	4.4%	1.7%	0.3%
Grade 7	95.8%	2.3%	1.5%	0.4%
Grade 8	96.5%	1.9%	1.3%	0.4%
Grade 9	96.1%	2.4%	1.2%	0.3%
Grade 10	96.1%	2.4%	1.2%	0.3%
Grade 11	96.1%	2.4%	1.1%	0.4%
Grade 12	90.8%	7.1%	1.5%	0.6%
TOTAL	**95.2%**	**3.0%**	**1.5%**	**0.3%**

[4] Kindergarten, 6, and 12 likely have more students with immunizations in process due to new vaccinations being required at these grades. In addition, Grade 12 having the largest percentage (7 percent) of students with vaccinations in progress may in part be explained by the requirement for the MCV4 booster (the second shot for Meningococcal immunization) going into effect just last year.

Administration of Emergency Medication

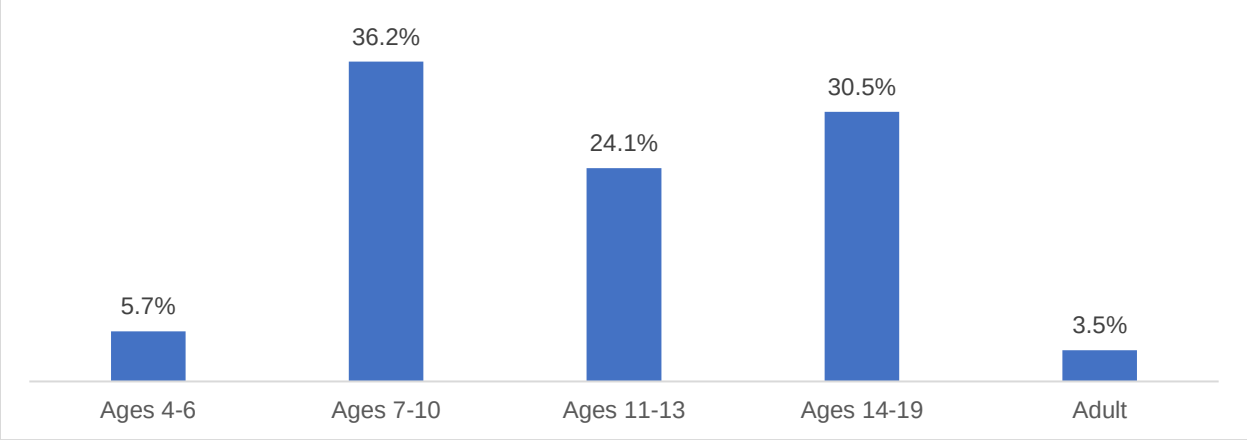
As of July 1, 2017, traditional public, public charters, and state accredited non-public schools must report to the Indiana Department of Education on incidents in which they administered an emergency stock medication, which includes Albuterol, Epinephrine, and Naloxone.[5]

Emergency Administration of Albuterol

In AY2018, 74 schools reported on the emergency administration of Albuterol. Of the total 141 reported administrations, 136 (96 percent) were administered to students and five (four percent) were administered to staff. The majority of administrations (96 percent) were via nebulizer, to a combination of staff and students. The remaining four percent were administered via inhaler—all inhaler administrations were provided to students.

By gender, 55 percent of administrations were to females. In terms of age group, 51 administrations (36 percent) were to students ages 7-10, followed by 43 administrations (30.5 percent) to students ages 14-19.

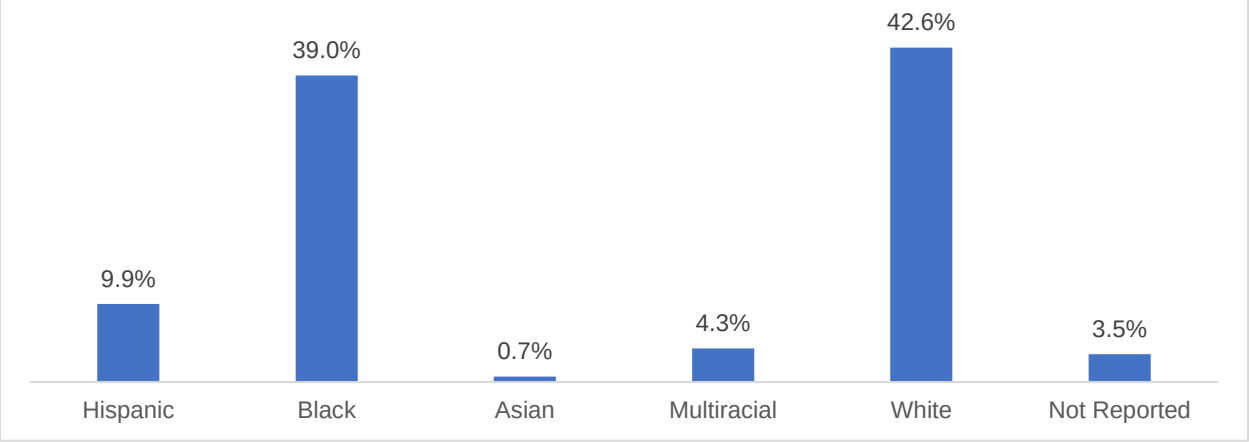
Figure 1: Albuterol Administrations by Age Group



[5] In AY2018, no schools reported administering Naloxone. Additionally, according to Indiana Department of Education officials, because reporting on the administration of emergency medication is a new law, some districts may not yet be aware that they need to report on administration of emergency medication, which may be why a small number of districts reported.

White students made up the largest percentage of administrations (43 percent), followed by Black students (39 percent) and Hispanic students (10 percent).

Figure 2: Albuterol Administrations by Race/Ethnicity



Seven in ten Albuterol administrations were to individuals having a history of asthma, and 17 percent had a history of hospitalization. While the majority of students did have a history of asthma, more than one in five (21 percent) had no known history of asthma. This suggests the continued importance of stocking Albuterol for emergency preparedness, even if a school does not have students with known histories of asthma.

Figure 3: History of Asthma

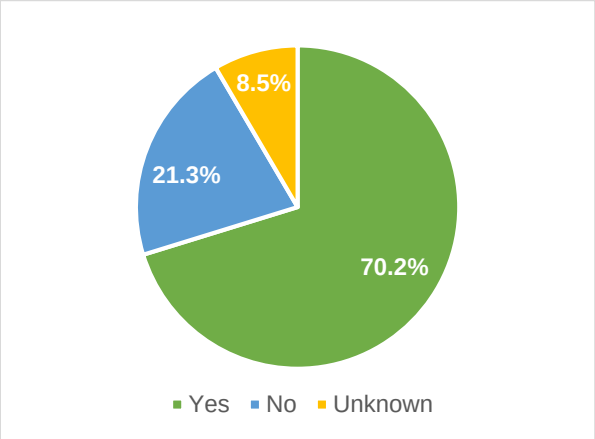
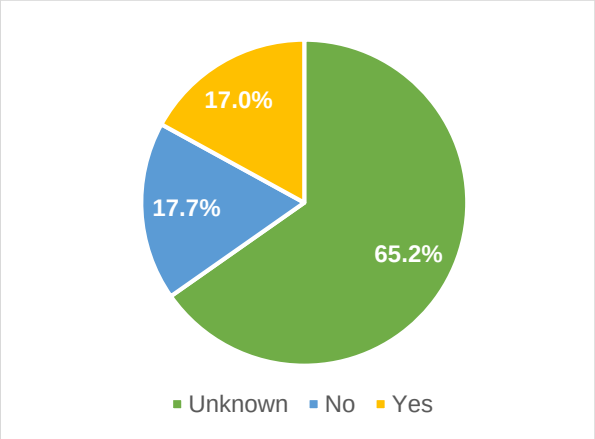


Figure 4: History of Hospitalization



Respondents indicated that 62 percent of students receiving Albuterol did not have an Individual Health Plan on file. Of those having a history of asthma (n=99), just over half (56 percent) had asthma action plans in place or medical treatment orders available.

Figure 5: Individual Health Plan

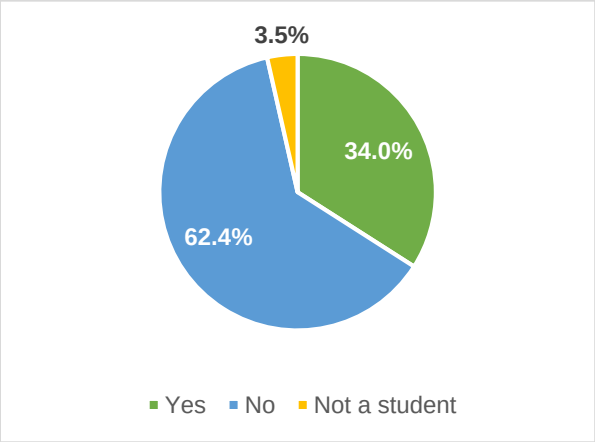
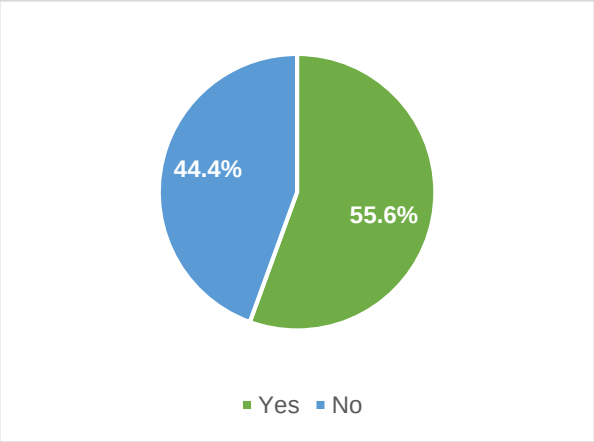


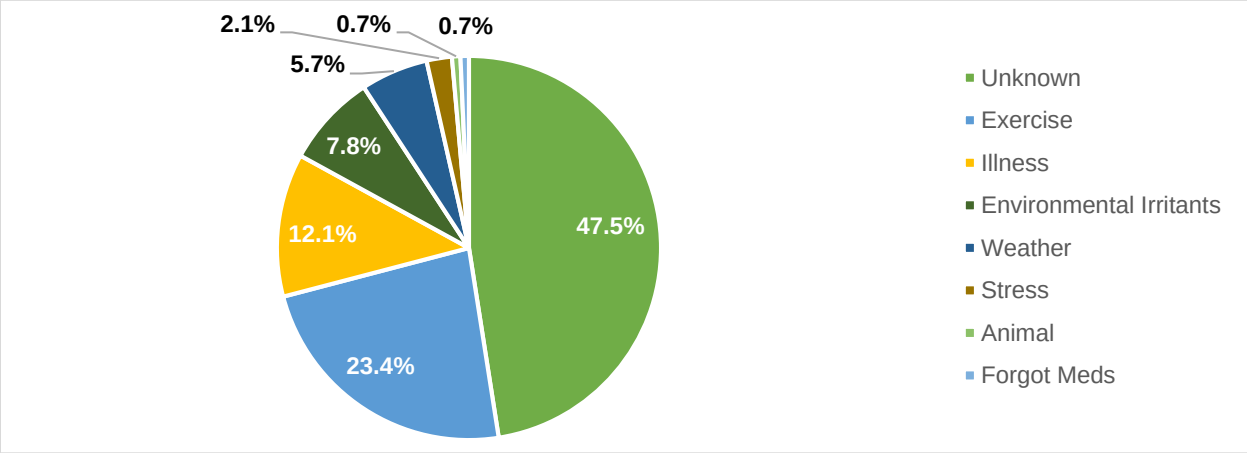
Figure 6: Asthma Action/Medical Treatment



Reasons for Administration

For just under half of the administrations of Albuterol, the individuals filling out the report were unaware of what triggered the asthma event. About 23 percent were triggered by exercise and 12 percent by illness. Other factors that may have affected students included environmental irritants, such as dust, perfume, or smoke; weather; stress; animals; or forgetting to take medication.

Figure 7: Reason for Asthma Event



Symptoms of Asthma Incidents

In 43 percent of cases where Albuterol was administered, it was unknown whether symptoms leading to the attack began prior to school. In 38 percent of the cases, symptoms did not begin prior to school, while in 19 percent, they did. In terms of specific location where the symptoms occurred, most incidents occurred in the classroom (55 percent), with 16 percent happening on the playground and 16 percent in the gym, locker room, or other physical education-related location (such as the track).

Figure 8: Did Symptoms Begin Prior to School

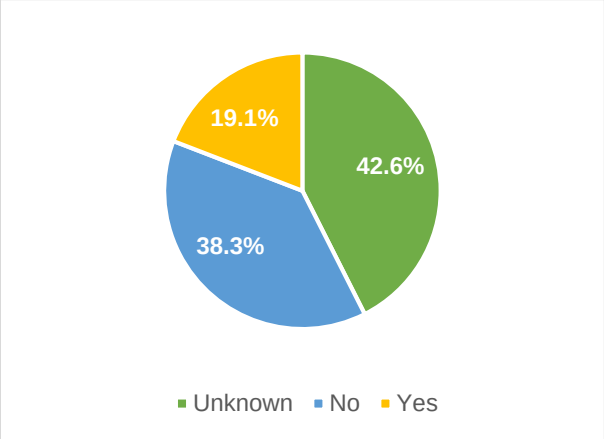
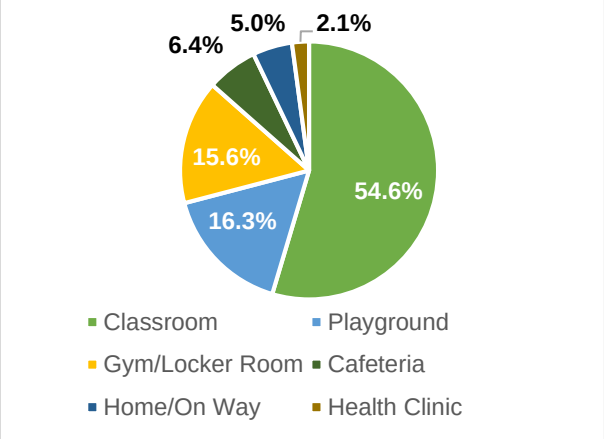
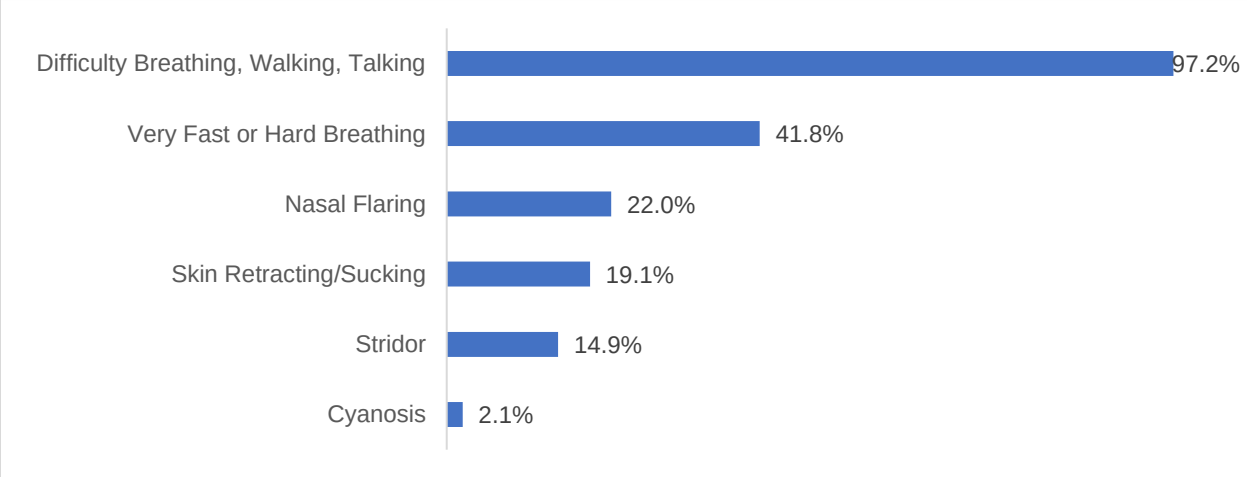


Figure 9: Location of Symptom Occurrence



The most common symptoms reported were difficulty breathing, walking, and talking as a result of the asthma-related event (reported in 97 percent of the cases of Albuterol administration), followed by very fast or very hard breathing, reported in 42 percent of cases of administration. In 59 percent of the incidents, two or more symptoms were reported.

Figure 10: Reported Symptoms[6]



[6] An incidence could be characterized by more than one symptom.

Albuterol Administration Details

All but two (99 percent, or 139 of 141) Albuterol administrations were given in a school health clinic. The other two were administered in the classroom. 85 percent of Albuterol administrations were conducted by Registered Nurses (RNs), followed by 12 percent conducted by LPNs or Health Aides. Three were self-administered, and one was conducted by non-licensed school personnel. It is important to note that while 98% of the students' symptoms did not occur in the clinic (see Figure 9), the majority of Albuterol was still administered by the school nurse (RN).

Figure 11: Location of Administration

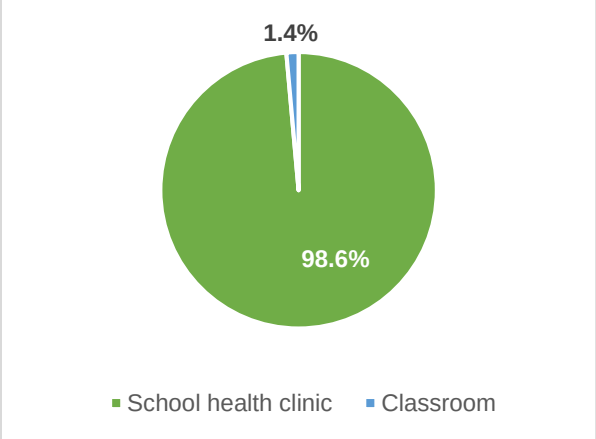
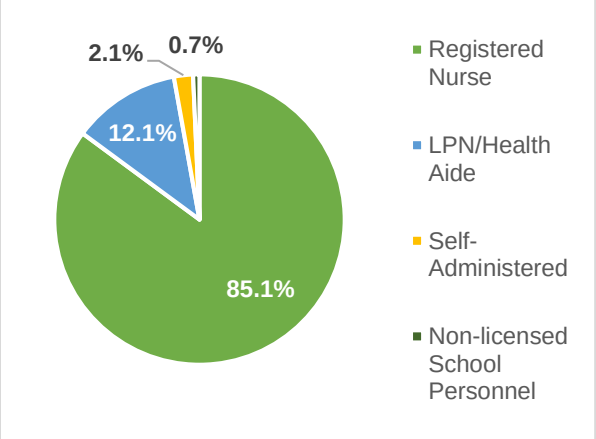


Figure 12: Individual Administering Albuterol



In all but one incident (140 of 141), the Albuterol was stored in the health clinic. In the one remaining incident, the parent was called and brought in the Albuterol. In all but four administrations (97 percent), the Albuterol was stock Albuterol maintained by the school. In the other four instances, the Albuterol was the student's own medication provided to the school by the parent.

Figure 13: Location of Albuterol

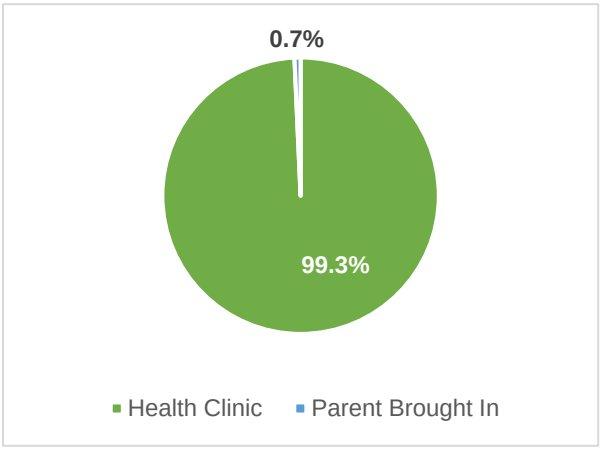
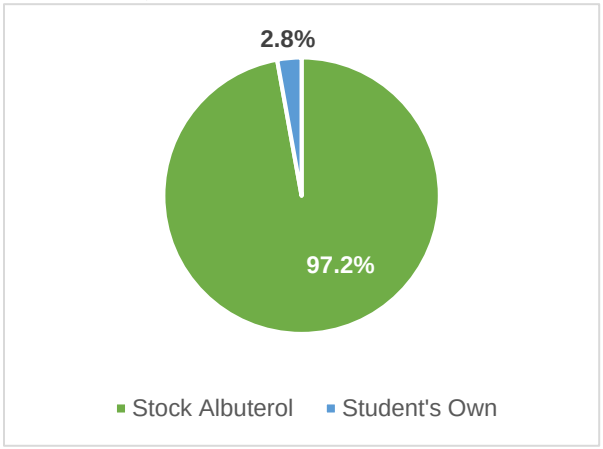


Figure 14: Type of Albuterol



Immediate Outcomes of Administration

Most Albuterol administrations occurred quickly, with 86 percent happening within 10 minutes of communication of symptoms, and 55 percent within less than five minutes. Only eight percent of administrations occurred 20 or more minutes after symptoms began.

In 90 percent of cases where Albuterol was administered, it was not necessary to call Emergency Medical Services (EMS). In 63 percent of administrations, the symptoms subsided enough that transport or parent/family member pick up was not deemed necessary, while in 27 percent, the parent or guardian (or in one case, family member of a staff person) was called and picked up the individual. In these cases, most frequently, the parent or guardian indicated plans to take the student to a family doctor or urgent care (in one case, the parent took the student to the ED). EMS transport to a medical facility occurred in only four percent of cases. In an additional 3.5 percent, EMS was notified but the parent or guardian elected to transport, and in two percent more, transport was declined.

Figure 15: Time: Symptoms to Administration

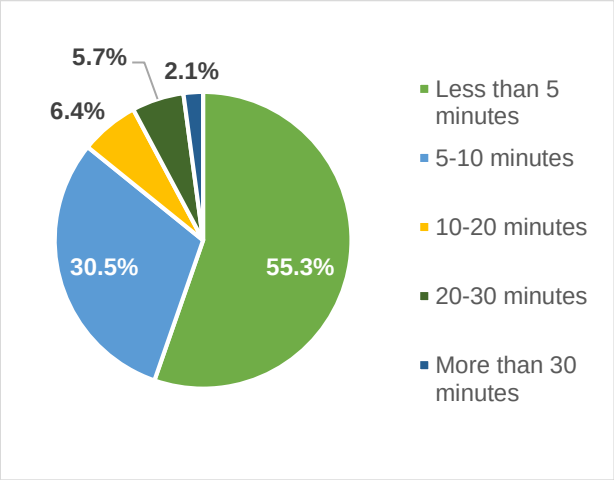
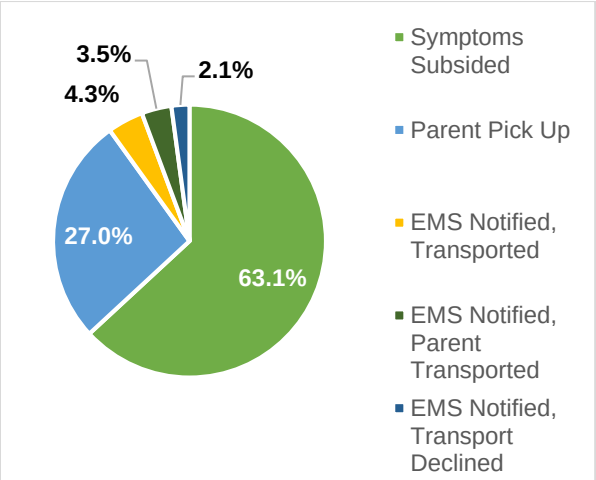


Figure 16: Immediate Outcome



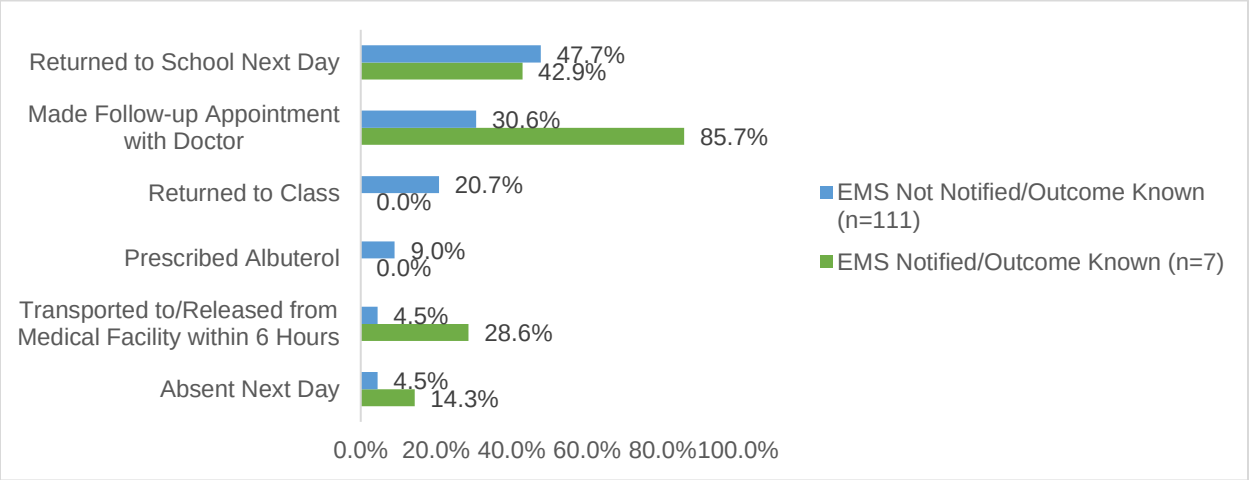
Later Outcomes of Administration

After each administration of Albuterol, those completing the report were asked to provide information on the non-immediate outcomes of the Albuterol administration. More than one outcome could be selected, and respondents also had the opportunity to indicate they were unaware of the outcome. This response usually occurred when the parent or guardian picked up the student, or the student had been transported by EMS, and the respondent was unaware of the outcome that occurred after the transport.

Outcomes in this section are divided into two groups—those for whom EMS was called, regardless of whether EMS transported the individual to a medical facility, and those for whom EMS was not called. Further, outcomes are limited to those for whom a later outcome was known. In 50 percent of cases when EMS was notified, and in 13 percent of cases where EMS was not notified, the individual completing the report was unaware of the outcome. Those cases are excluded from the chart.

In cases in which EMS was not notified and the outcome was known, 48 percent of individuals returned to school the next day (the most common outcome), compared to 43 percent of those where EMS was notified. While 31 percent of individuals had a follow up appointment with a doctor in cases where EMS was not notified, 86 percent (six of seven) had a follow up appointment when EMS was notified.

Figure 17: Later Outcomes by EMS Notification Status (where outcome was known)



Conclusion

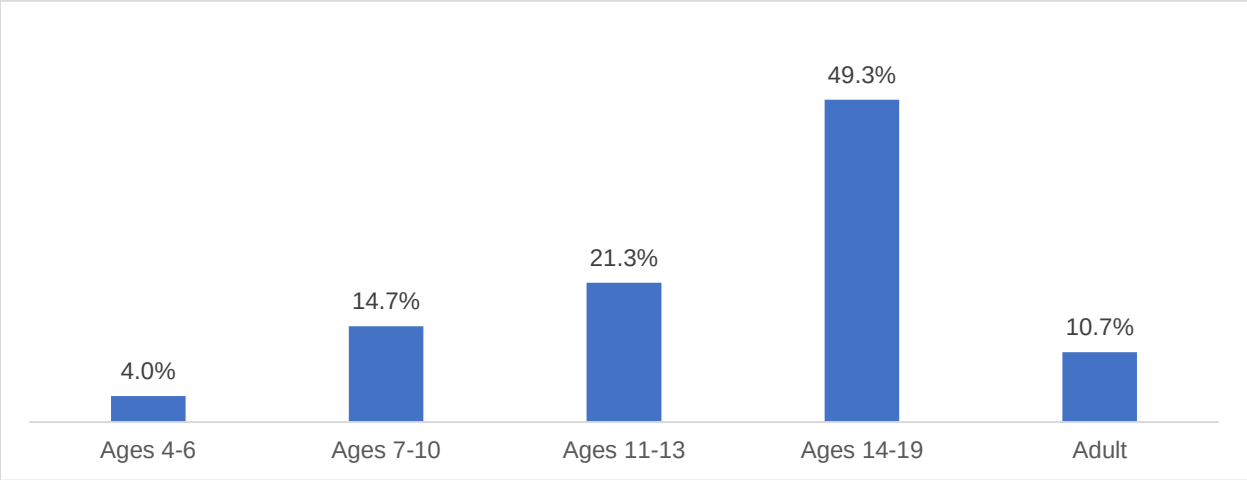
In the majority of cases, having and administering stock Albuterol prevented the escalation of student symptoms, decreased the need for EMS transport, and the majority of students were able to return to class.

Emergency Administration of Epinephrine

In AY2018, 42 public school corporations and three state-accredited non-public schools submitted reports on emergency administration of Epinephrine, with a total of 75 incidents reported. All administrations were auto-injectable. In 85 percent of the incidents (64 of 75), the administration was to a student. In 13 percent, it was to a staff member, and there was one incident reported where Epinephrine was administered to a visitor.

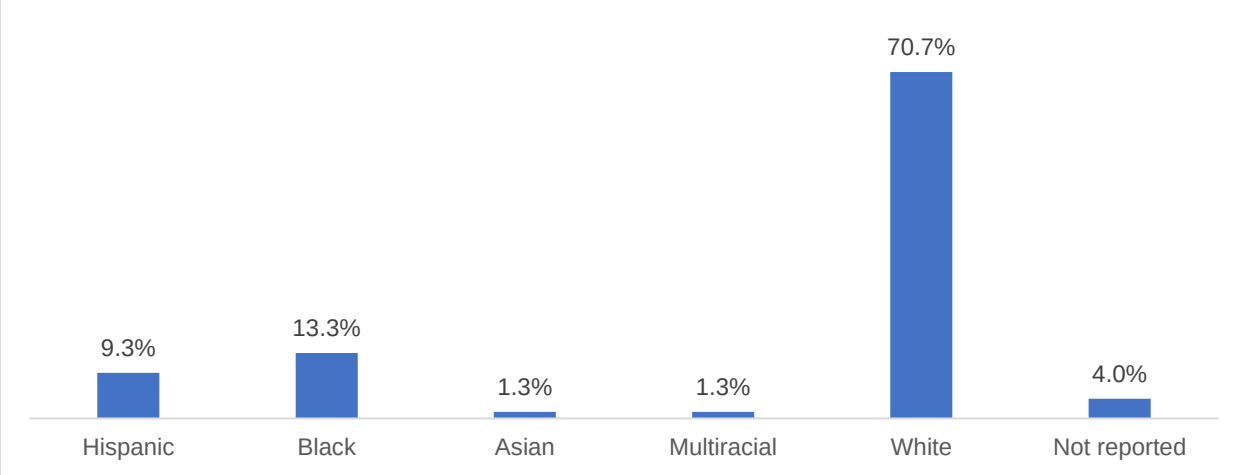
By gender, more than half (57 percent) of Epinephrine administrations were to females. By age, just under half (49.3 percent) of Epinephrine administrations reported were to students ages 14-19, with just over one in five (21 percent) to students ages 11-13.

Figure 18: Epinephrine Administration by Age Group



Of the Epinephrine administrations, 71 percent were administered to children or adults who are White, with the next highest race/ethnicity children or adults who are Black (13 percent).

Figure 19: Epinephrine Administrations by Race/Ethnicity



In 72 percent of the incidences, the individual had a history of allergy, while 20 percent of individuals had no known previous documented history of allergy. As with Albuterol, the fact that one in five individuals did not have a known history of allergy speaks to the importance

of stocking Epinephrine as an emergency medication. Further, in 44 percent of cases, individuals reported a previous history of anaphylactic reaction that included the administration of Epinephrine, while 37 percent did not have a history.

Figure 20: History of Allergy

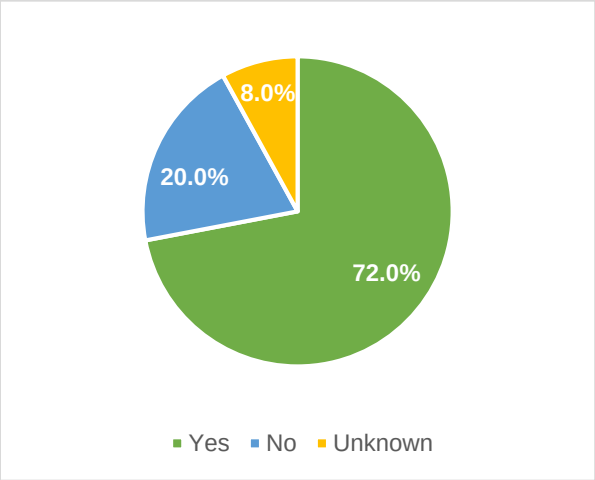
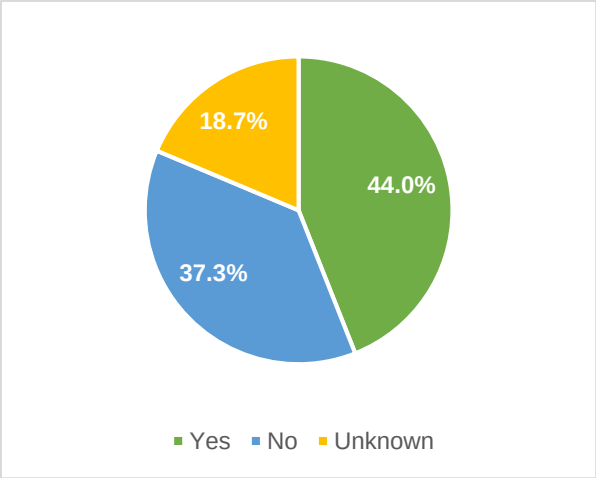


Figure 21: History of Previous Administration



In all administrations of Epinephrine, respondents indicated that 57 percent of students did not have Individual Health Plans, while 37 percent did. In the 54 administrations where the individual had a history of allergy, 63 percent had an Allergy Action Plan or medical treatment orders available at the school.

Figure 22: Individual Health Plan

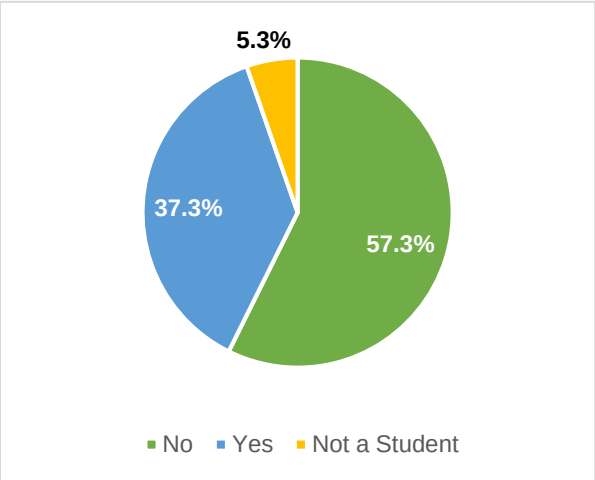
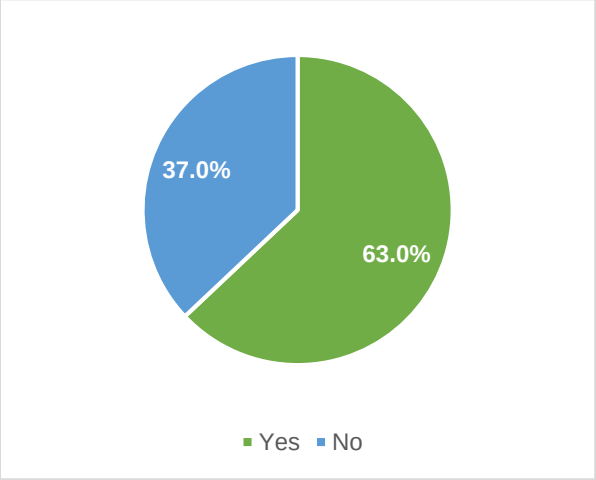


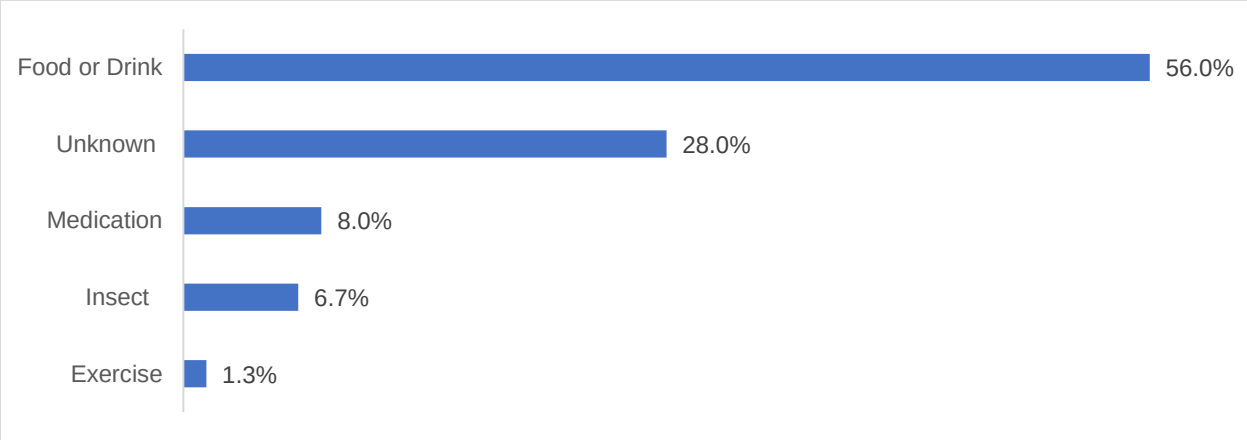
Figure 23: Allergy Action Plan/Treatment Orders



Reasons for Administration

In over half (56 percent) of the Epinephrine administrations reported, the allergen that triggered the event was food or drink. Common foods included nuts (peanuts, tree nuts); animal products (milk, eggs, beef); and fruit or vegetables. In 28 percent of the cases, the allergen was unknown. Medication and insect bites accounted for about 15 percent of the cases, and one case was caused by exercise.

Figure 24: Causes of the Allergy Event



In 84 percent of the cases, the reaction that led to the Epinephrine administration did not begin prior to school. The classroom was the most common location where symptoms were reported to have begun (44 percent of cases). Although the classroom was most frequently reported as the location where symptoms began, based on comments from respondents, in many cases they estimated that the cause (e.g., ingestion of food or medication) may have occurred elsewhere, such as at breakfast or lunch or while at home. In 29 percent of cases, symptoms began in the cafeteria (particularly for food or drink-related incidents). In 12 percent, symptoms occurred in other indoor school locations, including the gymnasium, the front office, the teacher's lounge, or the health clinic.

Figure 25: Did Symptoms Begin Prior to School

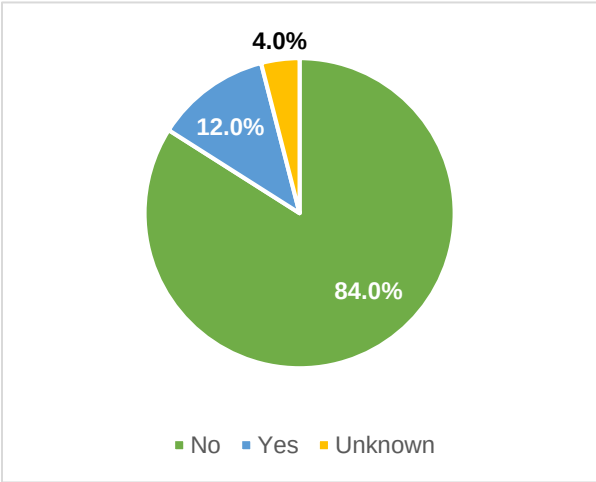
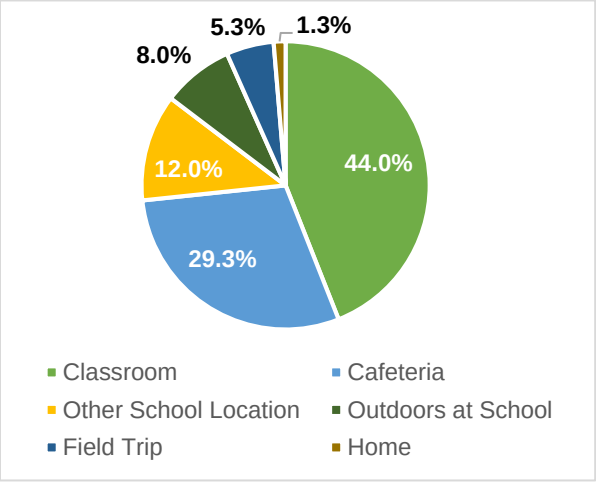


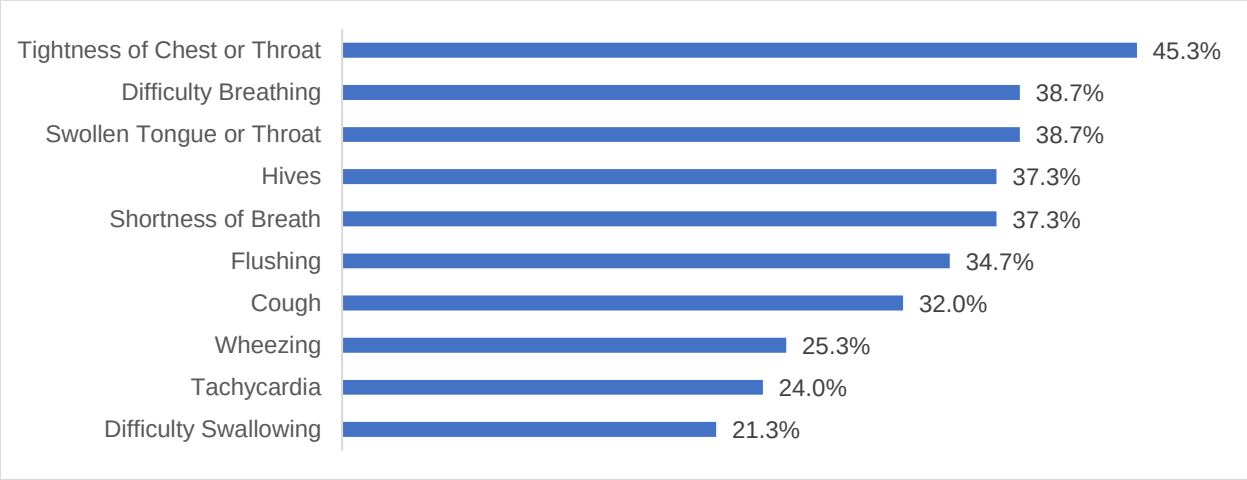
Figure 26: Location of Symptom Occurrence



Symptoms of Epinephrine Incidents

In terms of symptoms, respiratory were the most likely type to be reported, indicated in 63 of the 75 administrations (84 percent). Across all types of symptoms (respiratory, skin, cardiac/vascular, gastrointestinal, and other), the most common symptoms were tightness of chest or throat (experienced in 45 percent of cases), followed by difficulty breathing and swollen tongue or throat (both 39 percent).

Figure 27: Most Common Reported Symptoms[7]



While tightness of chest and throat was a common symptom for the older age groups, and the most common for students ages 15-19, it was not in the top three most common symptoms for younger students. The most common symptoms for younger students were swollen tongue or throat, or hives (both reported in 45 percent of instances). Difficulty breathing was a top three symptom for all but the 12-14 age group (it was reported in only 20 percent of instances for that age group).

Table 6: Top Three Symptoms by Age Group

Age Group	#1 Symptom	#2 Symptom	#3 Symptom
Ages 4-11 (n=20)	- Swollen Tongue/Throat - Hives (both 45%)	- Cough (35%)	- Difficulty Breathing - Shortness of Breath (both 30%)
Ages 12-14 (n=15)	- Flushing (53%)	Tightness of Chest or Throat (47%)	Hives (47%)
Ages 15-19 (n=32)	- Tightness of Chest or Throat (72%)	- Difficulty Breathing (47%)	- Shortness of Breath (44%)
Adult (ages 20 and older) (n=8)	- Shortness of Breath (75%)	- Difficulty Breathing (63%)	- Hives - Cough (both 50%)

[7] An incidence could be characterized by more than one symptom.

Epinephrine Administration Details

In 85 percent of the administrations where location was reported, the Epinephrine was administered in a school health clinic. Another location in or near the school (e.g., classroom, playground, football field, or school office) was reported in 10 percent of the administrations. In three instances, the Epinephrine was administered offsite during a school field trip. In three-quarters of administrations (56 of 75), a registered nurse (RN) administered the Epinephrine, and in seven percent of cases each, it was administered by an LPN; self-administered; or administered by other school staff (including health aides, an athletic trainer, and a parent who was a staff member). In the five cases of self-administration, three of the individuals were middle-school aged (ages 11-14), and two were high school aged (ages 15-19).

In contrast to Epinephrine, Albuterol was administered by an RN or LPN/Health Aide in 97 percent of the administrations, and only three instances were self-administered. A possible reason for differences in administration of Albuterol and Epinephrine is discussed on the next page.

Figure 28: Location of Administration

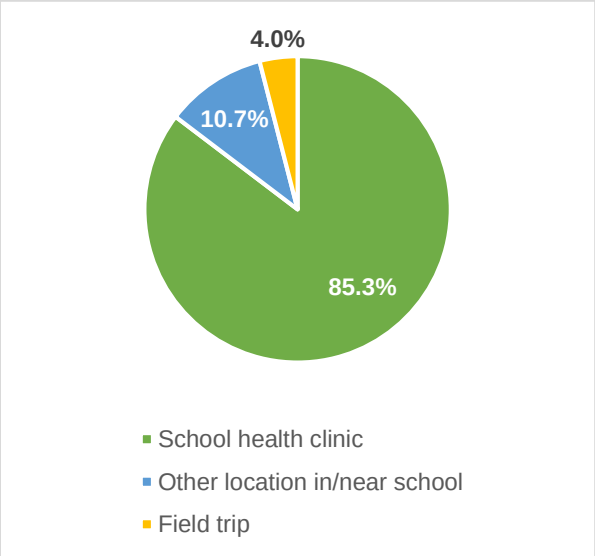
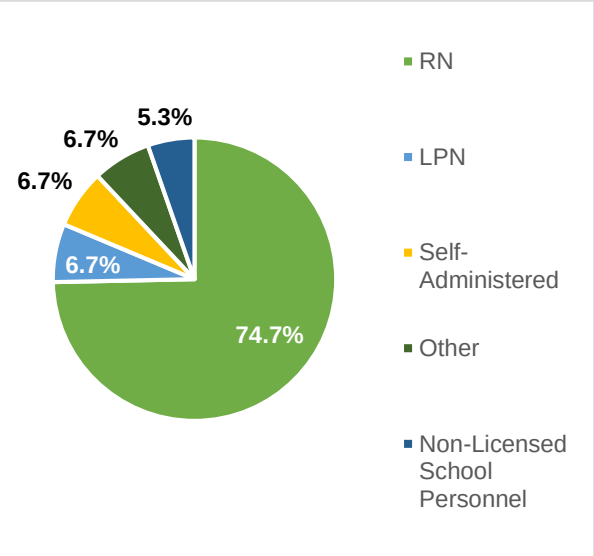


Figure 29: Individual Administering Epinephrine



In terms of where the Epinephrine was stored, most commonly (in 77 percent of cases), it was in or near the school health clinic. While health clinic storage did represent the majority of cases, in 16 percent of cases, the Epinephrine was carried by the student or individual. In contrast, in all but one case of Albuterol administrations, the Albuterol was stored in the health clinic and was not the student's own. Further, while in 65 percent of Epinephrine administrations, the Epinephrine was stock medication maintained by the school, in 34 percent, it belonged to the student (provided to the school by the parent). In one case, the Epinephrine belonged to the staff or visitor to whom it was administered. Again, this is in contrast to Albuterol administrations, where Albuterol was stock medication maintained by the school in 97 percent of cases, and there were only four instances where the Albuterol belonged to the student.

This illustrates the need for schools to stock Albuterol, due to the fact that many schools have students with a diagnosis of asthma, and these students can have sudden, unexpected symptoms in the "yellow" zone. Further, often they do not carry their own inhalers, and having a dose of stock Albuterol can alleviate their symptoms and the need for EMS to be called.

Additionally, differences in Albuterol and Epinephrine administrations may in part be explained by the fact that the Epinephrine Law was passed in 2014. Over the past four years, schools have been successful in creating policies and procedures; training staff; and encouraging students, especially older students, to carry and self-administer Epinephrine. Comparatively, Albuterol was added to the Stock Emergency Law far more recently, in 2017. It is anticipated that with time, the difference will narrow.

Figure 30: Location of Epinephrine

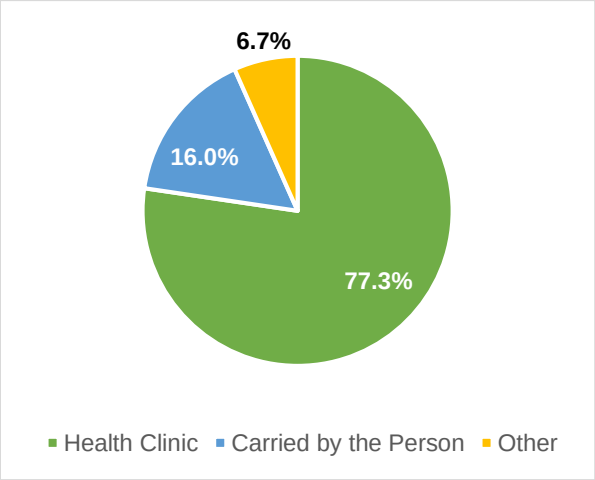
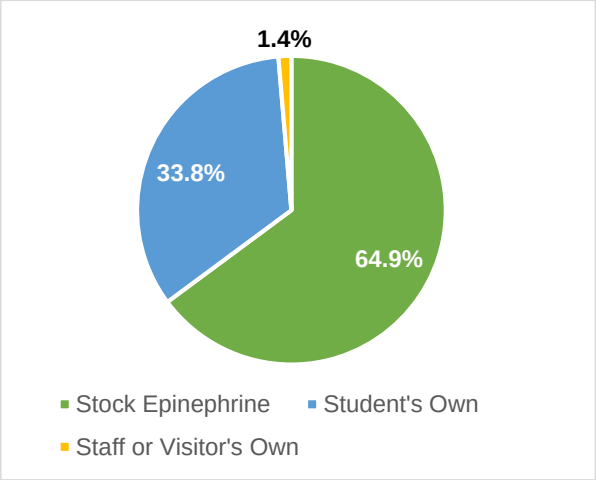


Figure 31: Type of Epinephrine



Immediate Outcomes of Administration

In just under 70 percent of administrations, the Epinephrine was given in 10 minutes or less from when the symptoms occurred, with 40 percent of administrations given in less than five minutes. Eight percent were administered over 20 minutes after symptoms began.

In 64 of the 75 Epinephrine administrations (85 percent), the individual was taken to the emergency department (ED), although ED transport was not always by Emergency Medical Services (EMS). In 76 percent of the administrations, emergency medical services (EMS) was called, and in 65 percent of cases, EMS transported the individual to the ED or local medical facility. In 13 percent of cases, EMS was not called but the parent (or in one case, the school) transported the student to the ED themselves. In 11 percent of cases, EMS was not notified but the parent or family member was notified, and the decision was made not to go to the ED. In seven percent of cases, EMS was notified but the parent decided to transport the student to the ED, and in four percent, EMS was notified but the parent (or adult, in the case of staff members) declined transport to the ED.

Figure 32: Time: Symptoms to Administration

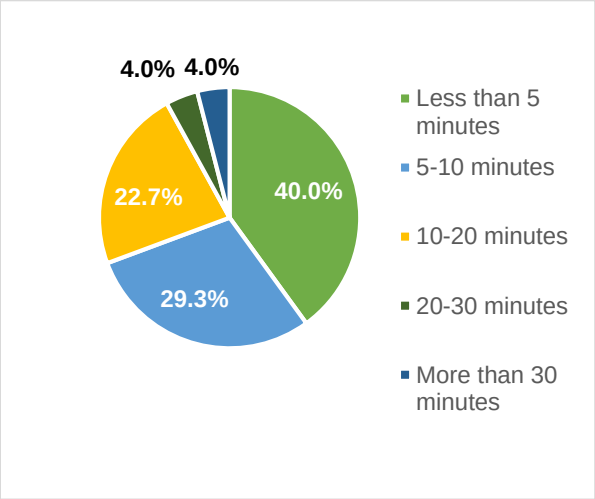
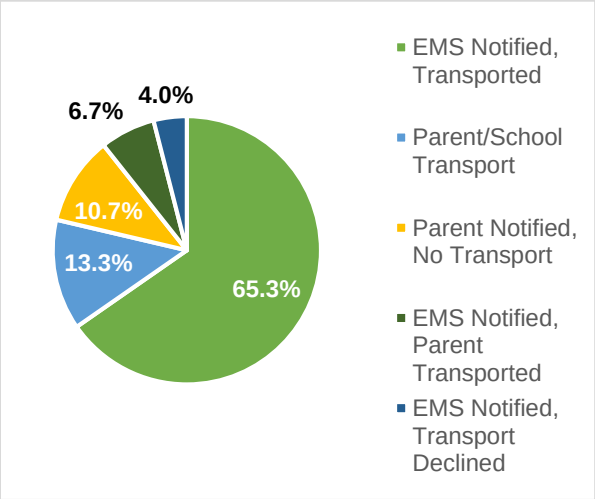


Figure 33: Immediate Outcome

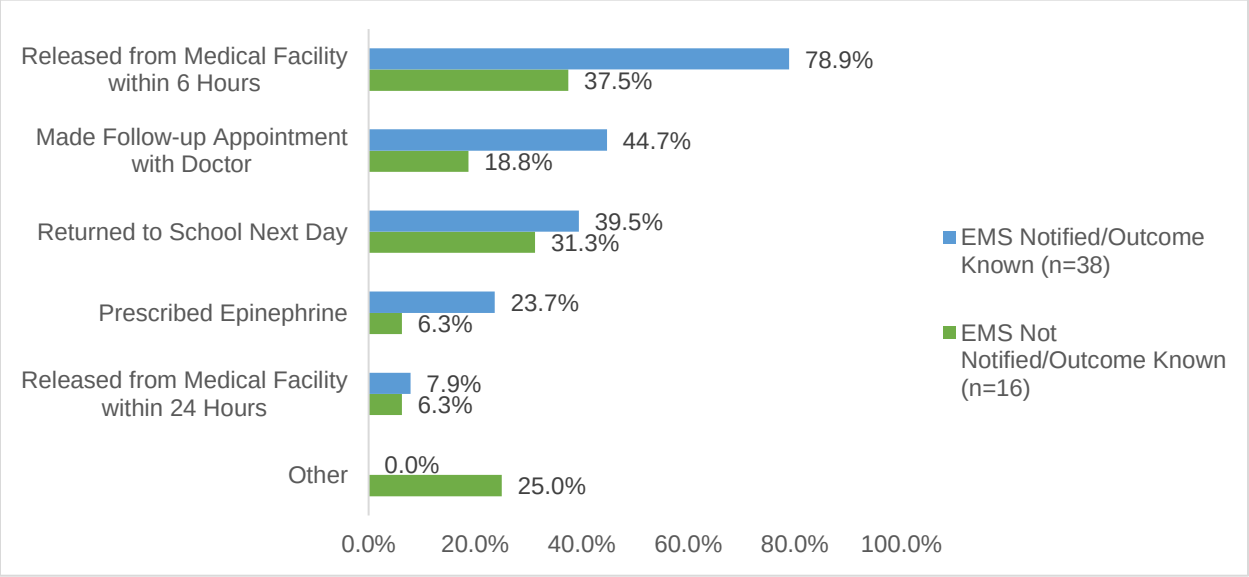


Later Outcomes of Administration

Outcomes in this section are divided into two groups—those for whom EMS was called, regardless of whether EMS transported the individual to a medical facility, and those for whom EMS was not called. Further, outcomes are limited to those for whom a later outcome was known. In 25 percent of cases where EMS was notified, and in 11 percent of cases where EMS was not notified, the individual completing the report was unaware of the outcome. Those cases are excluded from the chart.

The most common outcome for cases where EMS was notified was release from the medical facility within six hours (79 percent of cases). This was also the most common outcome for individuals where EMS was not notified (37.5 percent of cases). In 45 percent of EMS notifications, a follow-up appointment was made with a doctor, compared to 19 percent of cases in which EMS was not notified. Just under one-third of administrations in which EMS was not notified returned to school the next day, compared to 39.5 percent of those where EMS was notified. "Other" outcomes for non-EMS notifications included one student admitted to the hospital; one student who was released to his/her parent; and two students who stayed at school. For the two students remaining at school, in both cases, the parent had been contacted (in one case, the parent was at school during the Epi administration). After discussion with the parents, the parents and school health personnel determined that the student could remain at school but with observation.

Figure 34: Later Outcomes by EMS Notification Status (where outcome was known)



School Nurse Survey

In late Spring of 2018, the Indiana Department of Education administered a voluntary, anonymous online survey to school nurses, to obtain information about school health services. 1,017 individuals[8] responded to at least one question, representing traditional public schools (n=963); non-public schools (n=49); and charter schools (n=5).[9] Nurses were asked to respond to questions at the school level, even if they represented multiple schools in a school district. Nurses in approximately 56 percent of traditional public schools, 14 percent of non-public schools, and five percent of charter schools responded to the survey.

Nurses were asked to indicate the number of students enrolled in various grade levels in the schools that they represented. The respondents reported serving 617,912 students in preK-12th grade in Indiana, representing approximately 54 percent of all students enrolled in school in Indiana in 2017-2018.

Table 7: Number of Students Served by School Nurse Survey Respondents

Grade Level	Number Reported	% of Total Number Reported	% of Total State Enrollment (AY2018)[10]
PreK	13,442	2.2%	52.6%
Kindergarten – Grade 4	228,409	37.0%	54.1%
Grade 5- Grade 6	92,413	15.0%	53.4%
Grade 7 – Grade 8	95,413	15.4%	55.7%
Grade 9 – Grade 12	188,235	30.5%	54.2%
TOTAL	**617,912**	**100%**	**54.2%**

In addition to providing information on the number of students that they represented, nurses who responded to the survey also were asked to identify the geographic area/county in which their school was located. All geographic areas were represented, with the central region (Indianapolis and surrounding counties) making up the largest percentage of responses (just under one-quarter), and south central making up the smallest percentage (just under four percent).

Table 8: Respondents by Geographic Location

Geographic Location/Counties Represented	% of Total Responses
Northwest (Jasper, Lake, LaPorte, Newton, Porter)	13.7%
North Central (Elkhart, Fulton, Kosciusko, Marshall, Pulaski, St. Joseph, Starke)	10.9%
Northeast (Adams, Allen, Dekalb, Huntington, Lagrange, Miami, Noble, Steuben, Wabash, Wells, Whitley)	13.2%
West (Benton, Carroll, Cass, Clinton, Fountain, Montgomery, Tippecanoe, Warren, White)	5.4%
Central (Boone, Hamilton, Hancock, Hendricks, Johnson, Marion, Morgan, Shelby)	23.6%

[8] One individual submitted email address but did not answer any of the questions; as such, that respondent was excluded. In addition, 13 responses were duplicates; duplicate responses were eliminated.
[9] Note that because of the small number of charter schools that responded to the survey, charter schools and traditional public schools are combined when disaggregating results by school type throughout the report.
[10] Source: compass.doe.in.gov

Geographic Location/Counties Represented	% of Total Responses
East (Blackford, Delaware, Fayette, Grant, Henry, Howard, Jay, Madison, Randolph, Rush, Tipton, Union, Wayne)	8.4%
West Central (Clay, Greene, Owen, Parke, Putnam, Sullivan, Vermillion, Vigo)	5.5%
South Central (Bartholomew, Brown, Jackson, Lawrence, Monroe, Orange, Washington)	3.9%
Southeast (Clark, Dearborn, Decatur, Franklin, Floyd, Harrison, Jefferson, Jennings, Ohio, Ripley, Scott, Switzerland)	5.8%
Southwest (Crawford, Daviess, Dubois, Gibson, Knox, Martin, Perry, Pike, Posey, Spencer, Vanderburgh, Warrick)	9.6%

It is important to note that, while the school nurse survey had a relatively strong response rate and generally represented schools covering the whole state, the survey was not a statistical sampling of school nurses in Indiana and instead represents only those nurses who elected to respond to the survey. Additional limitations to the school nurse survey data are discussed in the Data Limitations section.

Written Policies

Based on responses, board-approved policies on a variety of health-related components are commonplace, although more so for some components than for others. To illustrate, of those responding to each question, the most common written policy in place was a policy on medication administration; 99 percent of those responding indicated their schools have these types of policies. In contrast, only 86 percent of respondents indicated their schools have policies on management of student chronic diseases (e.g., individual health plans), which may be reflected in the number of individuals who were administered emergency stock medications and had a history of related conditions but lacked an action plan or medical treatment order. As reported in the Administration of Emergency Medication, only 34 percent of students administered Albuterol in 2018, and 37 percent of those administered Epinephrine, had individual health plans.

Table 9: Existence of Written School Policies[11]

Policy Type	% Yes	% No
Medication Administration (n=1,014)	98.8%	1.2%
Reporting of Student Injuries (n=1,004)	96.6%	3.4%
Procedures for Emergency Care (n=990)	92.1%	7.9%
Maintenance of School Health Records (n=994)	90.9%	9.1%
Monitoring for Communicable Diseases (n=992)	89.4%	10.6%
Management of Student Chronic Diseases (n=988)	86.4%	13.6%

Six respondents (0.6 percent) indicated their schools did not have written policies for any of the health-related components. For those having just one policy (n=7, or 0.7 percent), all had the policy for medication administration.

[11] This table excludes non-responses. The n size listed for each response indicates the number of respondents out of 1,017 individuals who answered at least one question related to policies.

Just over three-quarters of respondents (768, or 75.7 percent) indicated their schools had policies in place for all of the components. 76 percent of public and charter schools had policies in place for all six components, compared to 69 percent of private schools.

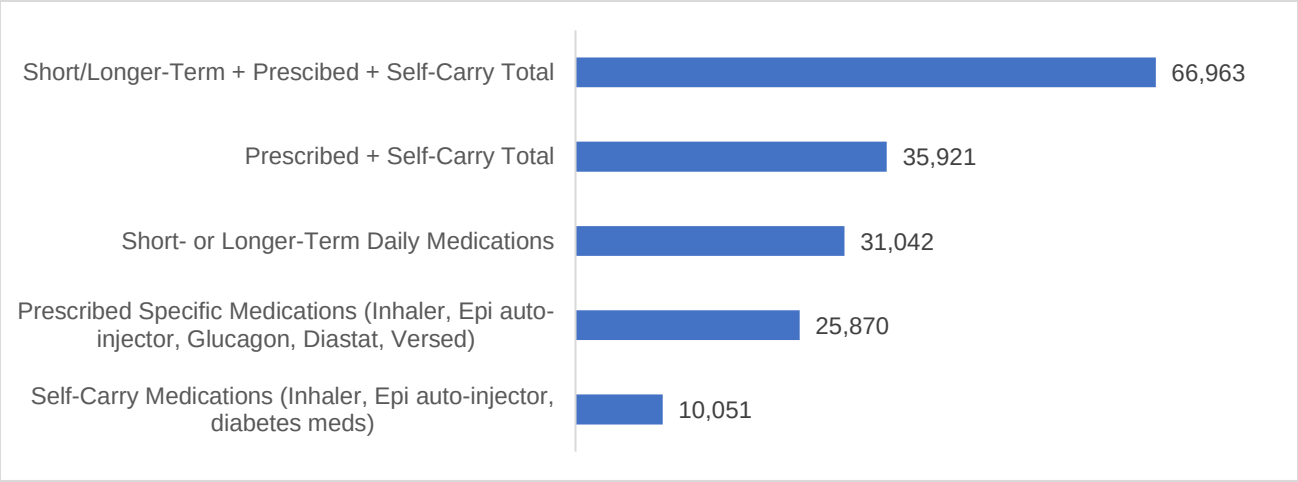
Table 10: Policies in Place by School Type

School Type	Number of Policies in Place			
	6	4 to 5	1 to 3	0
Public/Charter (n=965)	76.1%	14.5%	9.0%	0.4%
Private (n=49)	69.4%	14.3%	12.2%	4.1%

Student Medication

The survey included several questions about student medication, asking respondents to estimate the number of students in their school taking any medication at all (both short- and long-term), as well as to estimate the number of students either prescribed specific medications or known to self-carry specific medications.

Figure 35: Estimated Numbers of Medications (by Type, with Totals)



Nurse respondents estimated over 31,000 students taking short- or longer-term medications, and nearly 26,000 students with prescribed, specific medications including asthma inhaler, Epi auto-injector, Glucagon, Diastat, or Versed. When combining the two categories, there were 56,912 students estimated to take at least one kind of medication. In addition, respondents estimated over 10,000 students who self-carried inhalers, Epinephrine, or diabetes medications. In total, nearly 67,000 students were estimated to have some combination of prescribed short- or longer-term medications, prescribed specific medications, or to self-carry medications at school.[12] As the school nurse survey represents only about half of the students in the state (based on response rate calculation), the actual incidence of medications in schools is likely much higher.

[12] This is not necessarily an unduplicated count, as students may be counted across multiple categories—for example, a student may have been reported in counts of individuals with prescribed Epinephrine, as well as counts of self-carrying asthma inhalers.

Student Medication – Daily (Shorter- or Longer-Term)

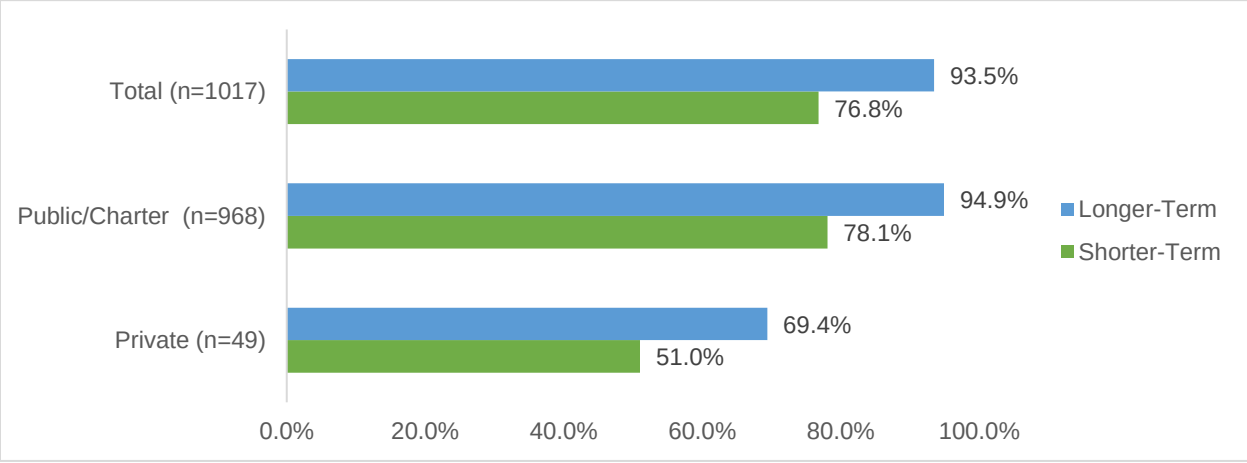
In total, about five percent of the estimated students served were taking shorter- or longer-term medication. Students in Grades 5 and 6 had the largest percentage of estimated medication takers, at six percent, while only two percent of Pre-K students were estimated to be taking medication. Students in grades K-8 were more likely to represent longer-term (more than three weeks) medication takers, while the opposite was the case for Pre-K students and those in Grades 9-12.

Table 11: Estimated Totals of Short- or Longer-Term Medication[13]

Grade Span	# of Short-Term Meds	% of Est. Total of Students	# of Long-Term Meds	% of Est. Total of Students	# Any Meds	% of Est. Total of Students
Pre-K	163	1.2%	137	1.0%	300	2.2%
K-4	5,053	2.2%	7,426	3.3%	12,479	5.5%
5-6	2,382	2.6%	3,102	3.4%	5,484	5.9%
7-8	1,859	1.9%	2,884	3.0%	4,743	5.0%
9-12	4,876	2.6%	3,160	1.7%	8,036	4.3%
TOTAL	**14,333**	**2.3%**	**16,775**	**2.7%**	**31,042**	**5.0%**

In 77 percent of the survey responses, schools reported at least one student taking shorter-term medication, and in 94 percent, schools reported at least one student taking longer-term medication. While 95 percent of traditional public and charter schools indicated having students on longer-term medication, only 69 percent of private schools did. Overall, private schools were less likely than public/charter schools to report serving students taking either shorter- or longer-term medication.

Figure 36: Percent of Schools Reporting Students Taking Medication



[13] Note that this table represents the estimated number of students taking short-term (three weeks or less) or long-term (more than three weeks) medication, compared to the number of students reported as served, by grade span, on the survey. Blanks were considered to be zero. Data was not reported at the student level and it is possible that students might be counted in more than one category.

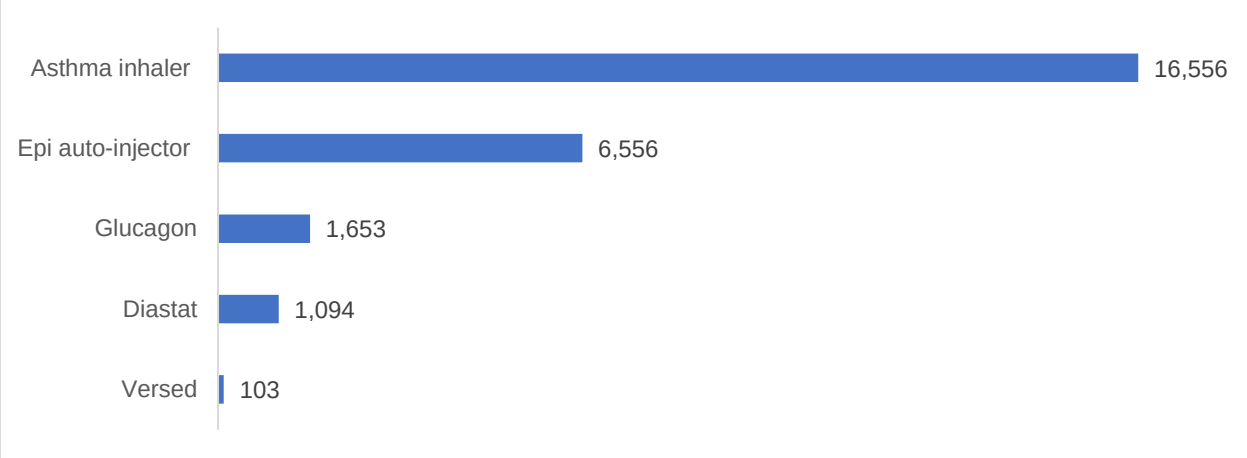
Student Medication – Specific Medications

Survey respondents were asked to estimate the number of students prescribed, or known to self-carry, specific medications, including Epi auto-injectors (typically administered for several allergic reactions); asthma inhalers; Diastat (typically used to treat epileptic seizures); Glucagon (typically used to treat diabetes); and Versed (among other uses, sometimes used to treat seizures).

Prescribed and Available

By far the most common prescribed and available medication was asthma inhalers, estimated at over 16,500, followed by Epi auto-injectors, at 6,556. Versed was the least common medication, with only 103 students estimated to have prescriptions for it.

Figure 37: Estimated Number of Students Prescribed Specific Medications



By grade level, Grades 5-6 had the highest percentage of students (five percent) estimated to be taking at least one of the listed medications, while Grades 7-8 had the smallest (two percent). About three percent of students in Grades K-4 and Grades 5-6 were prescribed asthma inhalers, and about one percent of students in all grade spans were prescribed Epi auto-injectors. However, other medications represented less than one percent of each grade span.

Table 12: Estimated Percentage/Number of Students Prescribed Medications, by Grade Span[14]

		Grade Span				
Medication	**TOTAL**	Pre-K	K-4	5-6	7-8	9-12
Asthma Inhaler	**2.7%**	1.7% (232)	3.1% (7,048)	3.2% (3,003)	2.6% (2,443)	2.0% (3,830)
Epi Auto-injector	**1.1%**	1.1% (142)	1.3% (2,921)	1.3% (1,233)	1.1% (1,061)	0.6% (1,199)
Glucagon	**0.3%**	<0.1% (6)	0.2% (349)	0.3% (250)	0.3% (320)	0.4% (728)
Diastat	**0.2%**	0.6% (75)	0.2% (525)	0.2% (156)	0.1% (127)	0.1% (211)
Versed	**<0.1%**	<0.1% (3)	<0.1% (26)	<0.1% (6)	<0.1% (23)	<0.1% (45)

[14] This table represents the estimated number of students taking specific medications, compared to the number of students reported as served, by grade span, on the survey. Blanks were considered to be zero. No data was provided or reported at the student level.

As shown in Table 13, with the exception of Diastat for private schools and Versed for both public/charter and private schools, the majority of schools (regardless of type) reported having at least one student with prescribed medications. Over 90 percent of traditional public/charter schools reported at least one student prescribed an asthma inhaler (95 percent) or an Epi auto-injector (91 percent). Just below 90 percent of private schools (88 percent each) reported at least one student with an inhaler or auto-injector. Over half of private schools had at least one student prescribed Glucagon, as did 63 percent of public and charter schools. Given the relatively high number of schools that enroll students with chronic diseases (as evidenced by carrying prescribed medications), the fact that schools were least likely to have written policies on managing chronic diseases (86 percent of schools responding) may suggest that guidance is needed to assist schools in ensuring that these policies are created and in place.

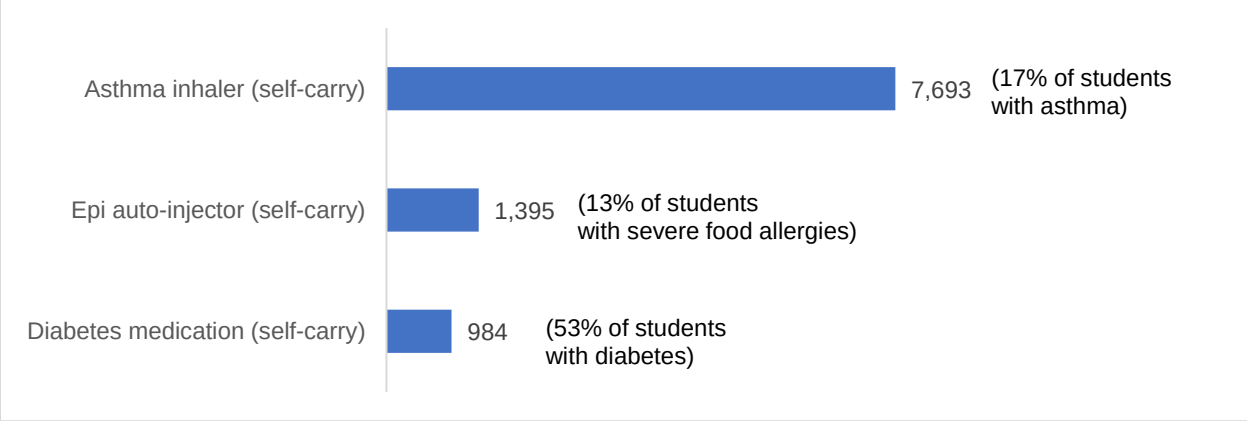
Table 13: Percentage Reporting At Least One Student Prescribed Medications, by School Type

	Medication				
School Type	Epi	Inhaler	Diastat	Glucagon	Versed
Public/Charter (n=968)	91.3%	95.0%	54.8%	62.8%	7.6%
Private (n=49)	87.8%	87.8%	22.4%	51.0%	10.2%

Self-Carry

For self-carry medications, asthma, allergies, or diabetes, asthma inhalers were the most commonly self-carried medication, with close to 7,700 students estimated to self-carry them (although overall, only about one percent of students were estimated to self-carry inhalers). Nearly 1,400 students were estimated to carry Epi auto-injectors (making up only about 0.2 percent of total students), and less than 1,000 students were estimated to self-carry diabetes medication.

Figure 38: Estimated Number of Students Self-Carrying Medications[15]



[15] Percent of students with asthma, severe food allergies, and diabetes is based on estimates provided schoolwide on the school nurse survey (see Table 21).

By grade level, only asthma inhalers at Grades 5-6, 7-8 and 9-12 equaled or exceeded one percent estimated to self-carry. While the percentages of students estimated to self-carry any of the medications were small, the percentages tended to increase by grade span, with slightly larger percentages of older students estimated to self-carry than younger students. However, the relatively small percentage of students self-carrying medications suggests the importance of schools stocking emergency medications, particularly for asthma and allergies—as reported in the Student Health Related Conditions and Issues section, these are two of the most common health conditions reported by school nurses on the survey. Data on stock medications is provided in the next section.

Table 14: Estimated Percentage/Number of Students Self-Carrying, by Grade Span[16]

		Grade Span				
Medication	**TOTAL**	Pre-K	K-4	5-6	7-8	9-12
Asthma Inhaler	**1.2%**	<0.1% (6)	0.2% (476)	1.2% (1,075)	2.0% (1,890)	2.2% (4,246)
Epi Auto-injector	**0.2%**	<0.1% (5)	0.1% (162)	0.2% (157)	0.3% (270)	0.4% (801)
Diabetes Medication	**0.2%**	<0.1% (1)	<0.1% (86)	0.1% (100)	0.2% (195)	0.3% (602)

Over 60 percent of respondents from public/charter and private school types reported having at least one student who self-carries an asthma inhaler, while over one-third of each school type reported having at least one student carrying an Epi auto-injector. Private schools were the most likely to report students self-carrying diabetes medication, with 45 percent indicating they had at least one student self-carrying this medication.

Table 15: Percentage Reporting Students Self-Carrying Medications, by School Type

	Medication		
School Type	Epi	Inhaler	Diabetes Medication
Public/Charter (n=968)	36.6%	65.4%	34.9%
Private (n=49)	34.7%	63.3%	44.9%

Emergency Medications

Respondents were asked questions about three emergency medications – Epinephrine, Albuterol, and Naloxone. Questions included whether the school stocks the medication, as well as the estimated number of times it was administered the past year. It is worth noting that larger percentages of schools stocking of Epinephrine, as compared to Albuterol and Naloxone, may be in part because the Epinephrine law was written and passed in 2014. Over the past four years, schools have worked to initiate policies and procedures; provide education and training to staff; and encourage students to carry and self-administer Epinephrine. Albuterol and Naloxone were only recently added to the Stock Emergency Law, and over time, gaps in the percentages of schools stocking these medications versus Epinephrine may close.

[16] This table represents the estimated number of students self-carrying specific medications, compared to the number of students reported as served, by grade span, on the survey. Blanks were considered to be zero. No data was provided or reported at the student level.

Stock Medications

Respondents were asked whether their school stocks emergency medications, including Epinephrine, Albuterol, and Naloxone. Of the respondents, 52 schools (five percent of total respondents) indicated stocking all three, while 188 (18 percent) reported stocking none. Both public/charter and private schools were most likely to stock Epinephrine than the other medications. However, over three-quarters of public/charter school respondents reported stocking Epinephrine, compared to just under half of private school respondents. Although over one-quarter of public and charter schools reported stocking Albuterol, and 21 percent reported stocking Naloxone, only four percent of private schools reported stocking these medications.

Table 16: Percentage of Schools Stocking Emergency Medication, by School Type

	Emergency Medication		
School Type	Albuterol	Epinephrine	Naloxone
Public/Charter (n=968)	26.4%	77.6%	21.4%
Private (n=49)	4.1%	49.0%	4.1%

Emergency Medication Administration

In the past year, respondents reported over 1,500 administrations of emergency Albuterol, but under 100 administrations of Epinephrine. There were no reported administrations of Naloxone. The most prevalent incidences of Albuterol administration were in Grades K-4 and Grades 5-6, while over half of the Epinephrine administrations were in Grades 9-12.

Table 17: Number of Times Emergency Medication Administered, by Grade Span

		Grade Span				
Medication	**TOTAL**	Pre-K	K-4	5-6	7-8	9-12
Albuterol	**1,504**	2.3% (35)	40.6% (613)	36.6% (552)	8.9% (130)	11.5% (174)
Epinephrine	**79**	3.8% (3)	16.5% (13)	12.7% (10)	11.4% (9)	55.7% (44)
Naloxone	**0**	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)

By school type, less than 10 percent of public/charter and private schools reported any incidents of Epinephrine administration. Only 16 percent of public schools reported Albuterol administrations, compared to 10 percent of private schools. Albuterol and Epinephrine that was administered by school respondents may have been stock medications; medications maintained by the student or brought in by the parent; or some combination thereof.

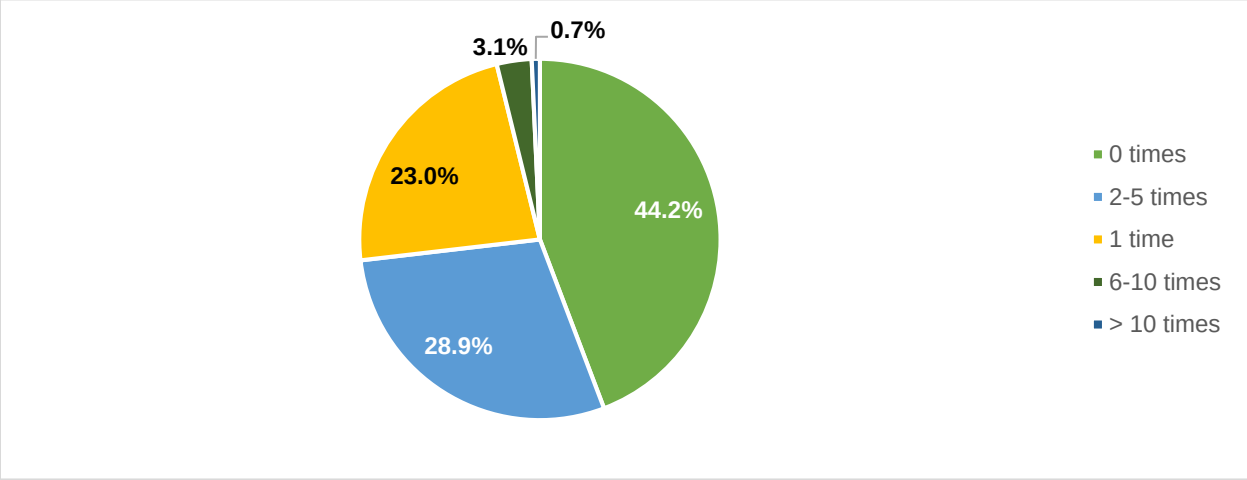
Table 18: Percentage of Schools Reporting any Emergency Medication Administration

	Emergency Medication		
School Type	Albuterol	Epinephrine	Naloxone
Public/Charter (n=968)	16.4%	5.5%	0%
Private (n=49)	10.2%	8.2%	0%

911 Calls

About 44 percent of respondents indicated 911 had not been called to their schools at all in the past year, while 29 percent of respondents indicated that 911 had been called between two and five times, and 23 percent, one time. In total, there were 1,290 reported times that 911 had been called to respondents' schools, to respond to emergencies related to students and/or staff members. On average, 911 was called 1.3 times per school.

Figure 39: Times 911 Called to School in Past Year[17]



[17] N = 961 for this question. Blank responses were excluded.

School Nurse Roles and Responsibilities

In addition to questions about written policies and student medication, survey respondents were asked questions about their roles and responsibilities, including healthcare procedures they have performed, as well as describing their top three roles related to a variety of healthcare topics.

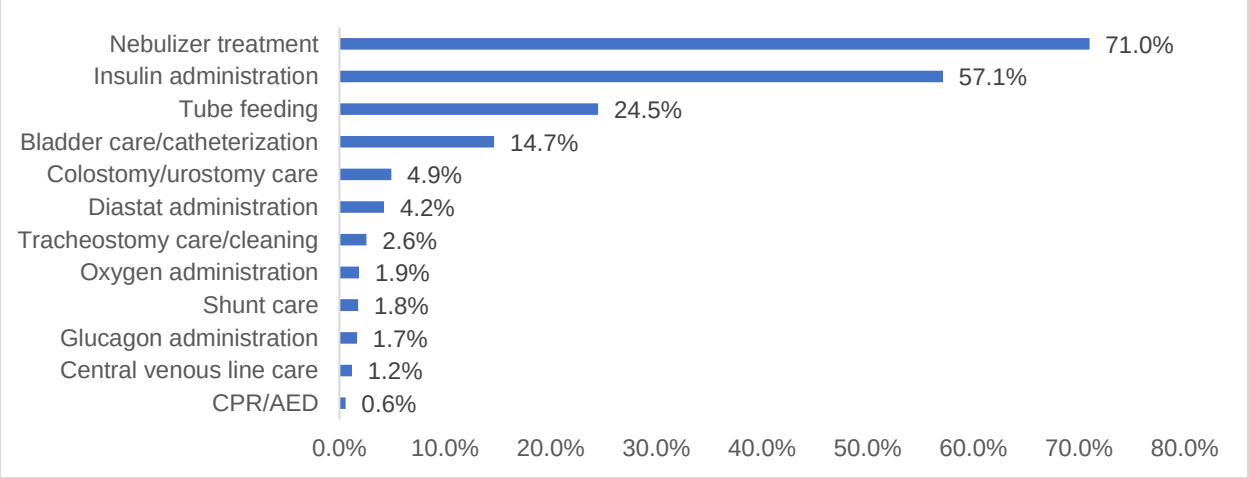
Healthcare-Related Procedures

Of the 1,017 respondents, 873 (86 percent) indicated they had performed at least one of the listed healthcare-related procedures in the past year. Most (69 percent) had done one or two of the procedures, while 28 percent had done three to four, and three percent had done five or more.

Nebulizer treatment was the most common procedure that school nurses had performed, with 71 percent indicating they had done this, followed by 57 percent of respondents indicating they had conducted insulin administration. While, as reported in the Student Health Related Conditions and Issues section, Types 1 and 2 diabetes are not as common as conditions such as asthma, the fact that over half of respondents had performed insulin administration in part demonstrates the intense daily care the condition requires.

Just under one-quarter had performed tube feeding, and 15 percent had provided bladder care/catheterization. The other procedures were less common, with under five percent indicating they had provided them in the past year.

Figure 40: Healthcare-Related Procedures Provided in the Past Year



There were 87 percent of school nurse respondents representing public and charter schools that indicated they had performed at least one of the listed procedures, compared to 57 percent of private school respondents. Only respondents representing public schools (excluding charter schools) indicated they had conducted CPR/AED, central venous line care, shunt care, tracheostomy care/cleaning, Diastat administration, and colostomy/urostomy care. Charter school respondents indicated having provided insulin treatment, nebulizer treatment, and tube feeding only. Of the non-public school respondents that had performed at least one of the procedures, the majority had performed

only insulin administrations or nebulizer treatments. Three non-public respondents had provided Glucagon administration; two, bladder care/catheterization; and one each had provided oxygen administration and tube feeding.

School Nurse Roles

From a list of activities, respondents were asked to select what they felt were the top three roles of the school nurse.[18] The role most commonly selected as #1, #2, or #3 (and the most commonly selected as #1) was caring for the ill or injured. This was selected by 887 respondents as one of the top three, and it was ranked first 67.5 percent of the time.[19] The second most commonly selected (by 686 respondents) was managing students with chronic health conditions. While it was ranked #1 only 17 percent of the time, it was ranked #2 39 percent of the time, the highest frequency of a #2 rating. Discussing health issues with parents was the third most commonly selected (by 364 respondents). This role also ranked highest in #3 ratings, selected as #3 19 percent of the time.

The least commonly selected roles included working with other agencies (selected by only 27 as #1, #2, or #3); attending case conferences (selected by only 45); writing individual health plans (selected by 52); and training and managing health care assistants (selected by 65 respondents).

Table 19: School Nurse Roles (Top Three Ranking)

	Ranking Status			
Role Description	# of times selected (1, 2, or 3)	% of times ranked #1	% of times ranked #2	% of times ranked #3
Caring for the ill or injured	887	**67.5%**	9.9%	6.3%
Managing students with chronic health conditions	686	16.7%	**38.7%**	9.8%
Discussing health issues with parents	364	2.6%	12.7%	**19.3%**
Training and education of staff regarding student health conditions	294	2.3%	8.1%	17.7%
Monitoring the immunization status of students	279	2.2%	8.8%	15.6%
Teaching students to self-manage their chronic health conditions	264	4.1%	8.7%	12.2%
Conducting state required screenings	198	1.2%	6.9%	10.7%
Training and managing health care assistants	65	2.1%	2.0%	2.1%
Writing individual health plans	52	0.6%	1.9%	2.5%
Attending case conferences	45	0.6%	1.4%	2.3%
Working with other agencies	27	0.3%	0.8%	1.5%

[18] There were 19 respondents who selected more than one "top three" (in other words, selected four or more items as the top three). One additional respondent selected two items as #1; one selected two items as #2; and one selected two items as #3. All responses were counted.

[19] Meaning, of all of the number one rankings, it was selected number one in 67.5 percent of instances.

Caring for the ill and injured was the most commonly selected #1 role by both public/charter school respondents and private school respondents. However, while 40 percent of public school respondents selected managing students with chronic health issues as the most common #2 role, 23 percent of private school respondents selected monitoring the immunization status of students. Further, while 20 percent of public school respondents selected discussing health issues with parents as #3, there were 22 percent of private school respondents that selected conducting required state screenings as the #3 most common role. In contrast, only eight percent of public school respondents selected monitoring immunization status as #2, and only 10 percent of public school respondents selected conducting state screenings as #3.

Table 20: School Nurse Roles (Top Three Ranking) by School Type

	Ranking Status		
School Type	# 1 Ranked Role	#2 Ranked Role	#3 Ranked Role
Public (n=968)	Caring for the ill or injured (67.5%)	Managing students with chronic health conditions (39.7%)	Discussing health issues with parents (19.6%)
Private (n=49)	Caring for the ill or injured (66.0%)	Monitoring the immunization status of students (22.6%)	Conducting state required screenings (22.0%)

Student Health-Related Conditions and Issues

Respondents were asked a series of questions about health-related issues, including estimating the number of students in their schools having a variety of health-related conditions, as well as the significance of certain illnesses, diseases, or conditions that may affect student health and well-being.

Student Health Conditions

Respondents were given a list of 32 health conditions and asked to identify, to the best of their knowledge, the number of students in their schools with each condition. In total, there were estimated to be 189,694 cases estimated of students with health conditions (31 percent of the total number of students).[20] Consistent with responses that indicated asthma inhalers as the most common prescribed or self-carried medication, asthma was the most common health condition reported, with over seven percent of students estimated to have this condition. The next most common condition was ADD, at six percent of students, and just under six percent were estimated to have environmental allergies. Mental health disorders (about three percent); severe food allergies (about two percent); and migraines (just over one percent) were the additional disorders estimated to affect more than one

[20] Note that number of students with each health condition was an estimate; data was not collected at the student level. In addition, it is possible that a student could have more than one health condition; as such, the total number is not necessarily an unduplicated count.

percent of students. Spina bifida, cystic fibrosis, muscular dystrophy, Addison's disease, and multiple sclerosis were estimated to affect less than one tenth of one percent of students.

The percentage of students with asthma and ADD is larger in grades 5-12 than in earlier grades. The same is true of environmental allergies and mental health disorders. Mental health disorders are most prevalent in high school students, as are migraines. While most other conditions, particularly those affecting less than one percent of students, were relatively evenly spread across grade spans, seizures were reported to affect over one percent of students only in Pre-K, as were chromosomal conditions. See Table 21.

Table 21: Estimated Percentage of Students with Health Conditions, by Grade Span[21]

Health Condition	Grade Span					
	TOTAL	Pre-K	K-4	5-6	7-8	9-12
Asthma	7.4% (45,542)	3.8% (506)	6.3% (14,441)	8.1% (7,483)	8.3% (7,896)	8.1% (15,216)
ADD	6.2% (38,512)	1.8% (240)	5.5% (12,539)	7.6% (7,068)	7.7% (7,313)	6.0% (11,352)
Environmental Allergies	5.7% (35,448)	3.1% (414)	4.8% (10,965)	6.5% (6,050)	6.5% (6,237)	6.3% (11,782)
Mental Health Disorders	2.6% (16,132)	1.1% (144)	1.4% (3,274)	2.4% (2,215)	3.0% (2,893)	4.0% (7,606)
Severe Food Allergy	1.7% (10,399)	1.6% (210)	1.8% (4,083)	1.9% (1,721)	1.7% (1,584)	1.5% (2,801)
Migraines	1.3% (7,761)	0.1% (10)	0.5% (1,187)	1.2% (1,073)	1.4% (1,361)	2.2% (4,130)
Gastrointestinal Disorders	1.0% (5,967)	0.8% (110)	0.8% (1,748)	1.1% (1,001)	1.0% (950)	1.1% (2,158)
Seizures	0.8% (5,128)	1.4% (193)	0.8% (1,776)	0.8% (701)	0.8% (790)	0.9% (1,668)
Cardiac Conditions/ Hypertension	0.6% (3,631)	0.6% (74)	0.4% (995)	0.5% (424)	0.5% (516)	0.9% (1,622)
Hearing Disorders	0.5% (2,935)	0.6% (87)	0.4% (1,009)	0.4% (399)	0.5% (492)	0.5% (948)
Visually Impaired (requiring school accommodations)	0.3% (1,960)	0.2% (33)	0.2% (563)	0.4% (357)	0.3% (239)	0.4% (768)
Diabetes - Type 1	0.3% (1,854)	0.1% (9)	0.2% (369)	0.3% (256)	0.4% (345)	0.5% (875)
Substance Abuse	0.3% (1,765)	0.0% (0)	<0.1% (1)	<0.1% (7)	0.1% (129)	0.9% (1,628)
Orthopedic Disability	0.3% (1,725)	0.7% (98)	0.2% (471)	0.2% (214)	0.3% (286)	0.3% (656)
Chromosomal Conditions	0.2% (1,490)	1.2% (156)	0.2% (558)	0.2% (172)	0.2% (225)	0.2% (379)
Renal Condition	0.2% (1,274)	0.2% (27)	0.2% (464)	0.2% (214)	0.2% (194)	0.2% (375)
Neurologic Condition (traumatic brain injury)	0.2% (1,159)	0.2% (30)	0.2% (424)	0.2% (151)	0.1% (140)	0.2% (414)
Cerebral Palsy	0.2% (1,034)	0.5% (61)	0.1% (325)	0.1% (134)	0.2% (154)	0.2% (360)
Blood Disorders/Bleeding Disorder	0.2% (935)	0.1% (20)	0.1% (289)	0.1% (136)	0.1% (143)	0.2% (347)

[21] Note that this table represents the estimated number of students with health conditions, compared to the number of students reported as served, by grade span, on the survey. Blanks were considered to be zero. No data was provided or reported at the student level.

Health Condition	Grade Span					
	TOTAL	Pre-K	K-4	5-6	7-8	9-12
Metabolic Conditions (hypo/hyperthyroidism)	0.1% (926)	0.1% (20)	0.1% (178)	0.1% (97)	0.2% (144)	0.3% (487)
Sickle Cell Trait/Anemia	0.1% (763)	0.1% (12)	0.1% (249)	0.1% (110)	0.1% (110)	0.1% (282)
Neuromuscular Condition	0.1% (736)	0.4% (48)	0.1% (223)	0.1% (117)	0.1% (134)	0.1% (214)
Fetal Alcohol Syndrome	0.1% (433)	0.1% (9)	0.1% (117)	0.1% (79)	0.1% (141)	<0.1% (87)
Cancer	0.1% (400)	0.1% (8)	0.1% (130)	0.1% (60)	<0.1% (46)	0.1% (156)
Rheumatic Condition	0.1% (384)	<0.1% (1)	<0.1% (96)	<0.1% (44)	0.1% (52)	0.1% (191)
Bulimia/Anorexia	0.1% (367)	<0.1% (1)	<0.1% (48)	<0.1% (35)	0.1% (78)	0.1% (205)
Diabetes - Type 2	0.1% (333)	<0.1% (2)	<0.1% (22)	<0.1% (28)	0.1% (49)	0.1% (232)
Spina Bifida	<0.1% (240)	0.1% (16)	<0.1% (85)	<0.1% (40)	<0.1% (32)	<0.1% (67)
Muscular Dystrophy	<0.1% (159)	0.1% (14)	<0.1% (54)	<0.1% (25)	<0.1% (16)	<0.1% (50)
Cystic Fibrosis	<0.1% (158)	<0.1% (5)	<0.1% (64)	<0.1% (24)	<0.1% (23)	<0.1% (42)
Addison's Disease	<0.1% (105)	0.0% (0)	<0.1% (21)	<0.1% (16)	0.1% (49)	<0.1% (19)
Multiple Sclerosis	<0.1% (39)	0.0% (0)	<0.1% (7)	<0.1% (4)	<0.1% (9)	<0.1% (19)
TOTAL[22]	**30.7% (189,694)**	**19.0% (2,558)**	**24.9% (56,775)**	**33.0% (30,455)**	**34.3% (32,770)**	**35.7% (67,136)**

Nearly all schools reported having at least one student with asthma, and over 80 percent of both public/charter and private schools reported at least one student with ADD. For 29 of the health conditions, private schools reported having at least one student in the same or fewer instances than public/charter schools. However, larger percentages of private schools reported having students with substance abuse, bulimia or anorexia, and Addison's disease than both public/charter schools, although each of these conditions had a relatively small percentage of both types of schools reporting at least one student with the conditions. See Table 22.

Table 22: Percentage of Schools Reporting At Least One Student, by School Type

Health Condition	School Type	
	Public (n=968)	Private (n=49)
Asthma	97.1%	95.9%
ADD	91.8%	83.7%
Environmental Allergies	82.0%	71.4%
Mental Health Disorders	70.6%	44.9%
Severe Food Allergy	87.9%	75.5%
Migraines	79.0%	61.2%

[22] Total represents sum of all estimates of student with health conditions, and percentages are the total divided by the total number of students estimated to be enrolled in respondents' schools. Students may have been counted in more than one category; as such, the total does not necessarily represent an unduplicated count.

Health Condition	School Type	
	Public (n=968)	Private (n=49)
Gastrointestinal Disorders	74.1%	57.1%
Seizures	90.2%	57.1%
Cardiac Conditions/Hypertension	68.3%	53.1%
Hearing Disorders	73.5%	55.1%
Visually Impaired (requiring school accommodations)	40.5%	26.5%
Diabetes - Type 1	65.0%	57.1%
Substance Abuse	7.9%	8.2%
Orthopedic Disability	48.2%	26.5%
Chromosomal Conditions	44.9%	16.3%
Renal Condition	46.7%	28.6%
Neurologic Condition (traumatic brain injury)	35.5%	24.5%
Cerebral Palsy	45.1%	14.3%
Blood Disorders/Bleeding Disorder	44.1%	26.5%
Metabolic Conditions (hypo/hyperthyroidism)	33.3%	32.7%
Sickle Cell Trait/Anemia	25.7%	8.2%
Neuromuscular Condition	30.3%	16.3%
Fetal Alcohol Syndrome	14.8%	10.2%
Cancer	26.8%	4.1%
Rheumatic Condition	22.6%	20.4%
Bulimia/Anorexia	15.4%	20.4%
Diabetes - Type 2	17.6%	12.2%
Spina Bifida	19.9%	6.1%
Cystic Fibrosis	14.0%	10.2%
Muscular Dystrophy	10.0%	10.2%
Addison's Disease	3.0%	4.1%
Multiple Sclerosis	3.0%	0.0%

Significance of Health-Related Issues

Also consistent with other responses in the survey, the health-related issue most commonly rated as highly significant or significant was asthma, with 92.5 percent of participants rating it as highly significant or significant (41 percent rated it as highly significant). The next most significant issue was food allergies, with 86 percent rating it as highly significant or significant (37 percent indicated it as highly significant). Over three-quarters of respondents (77 percent for each) indicated that injuries, poverty, and mental health issues were significant or highly significant health-related issues in their schools. Headaches/migraines, autism-related disorders, and environmental allergies also were identified by over 70 percent of respondents as highly significant or significant in their schools. Suicide, neurologic conditions, teenage pregnancy, and Type 2 diabetes were identified as not significant health-related issues by 72 percent or more respondents.

Table 23: Significance Level of Health-Related Issues

Health-Related Issue	Significance		
	Highly Sig.	Sig.	Not Sig.
Asthma	40.8%	51.8%	7.5%
Food Allergies	37.0%	48.6%	14.4%
Injuries	24.5%	52.2%	23.2%
Poverty	32.3%	44.4%	23.4%
Mental Health Issues	30.1%	46.5%	23.4%
Headaches/Migraines	15.8%	56.8%	27.4%

Health-Related Issue	Significance		
	Highly Sig.	Sig.	Not Sig.
Autism-Related Disorders	18.5%	53.4%	28.1%
Environmental Allergies	17.4%	53.4%	29.1%
Neglect/Abuse	17.2%	45.2%	37.6%
Diabetes - Type 1	30.2%	31.8%	37.9%
Bullying	14.8%	47.0%	38.2%
Seizures	16.4%	41.7%	41.8%
Violence Outside of School	10.6%	31.7%	57.7%
Homelessness	7.3%	31.3%	61.4%
Dermatology-Related Issues	3.0%	30.0%	67.0%
Violence in School	9.6%	23.0%	67.4%
Suicide	9.0%	19.3%	71.7%
Neurologic Condition (traumatic brain injury)	5.7%	18.5%	75.8%
Teenage Pregnancy	4.4%	13.0%	82.6%
Diabetes - Type 2	5.6%	11.2%	83.2%

While respondents from all school types rated asthma and food allergies as the conditions that were most highly significant or significant, a lower percentage of respondents from private schools rated these as highly significant or significant. In fact, private school respondents rated all of the health-related issues as less significant than public/charter school respondents did. While only 29 percent of private school respondents rated poverty as highly significant or significant, nearly 80 percent of public/charter school respondents rated it as such. Close to three-quarters of public school respondents rated autism-related disorders as highly significant or significant, compared to only 39 percent of private school respondents. Neglect/abuse was also much more likely to be selected as highly significant or significant by public school respondents.

Table 24: Percentage Rating Highly Significant or Significant, by School Type

Health-Related Issue	School Type	
	Public	Private
Asthma	93.4%	75.5%
Food Allergies	86.2%	73.5%
Injuries	77.8%	56.3%
Poverty	79.1%	29.2%
Mental Health Issues	77.8%	54.2%
Headaches/Migraines	73.8%	50.0%
Autism-Related Disorders	73.6%	38.8%
Environmental Allergies	71.6%	57.1%
Neglect/Abuse	64.8%	16.7%
Diabetes - Type 1	62.5%	53.1%
Bullying	62.4%	50.0%
Seizures	59.8%	26.5%
Violence Outside of School	43.7%	16.7%
Homelessness	40.2%	6.4%
Dermatology-Related Issues	34.0%	14.3%
Violence in School	33.7%	10.4%
Suicide	28.7%	20.8%
Neurologic Condition (traumatic brain injury)	24.5%	18.8%
Teenage Pregnancy	18.3%	0.0%
Diabetes - Type 2	16.9%	13.3%

Further analysis was conducted to identify whether there were differences in respondents rating health issues as highly significant or significant if they had students in those schools with those issues.

Unsurprisingly, respondents who reported having at least one student with a particular health condition were more likely to identify that condition as highly significant or significant, compared to respondents in schools that reported no students with those conditions. Interestingly, however, over 80 percent of respondents, regardless of whether their schools had students or not, indicated that asthma was significant or highly significant (93 percent of those with students, and 81.5 percent of those without students). Further, over 70 percent of respondents having no students with severe food allergies indicated that this was a significant or highly significant health issue in their schools.

Table 25 shows the differences in respondents who felt that health conditions were significant or highly significant, based on whether or not they reported having any students with that condition. For example, as indicated in the School Nurse Roles and Responsibilities section, over half of respondents indicated that they had administered insulin at least once in the past year, but Type 1 diabetes was reported as significant or highly significant by only 62 percent of total respondents. However, of those reporting at least one student with Type 1 diabetes, 88.5 percent indicated that it is a highly significant or significant health issue in their schools, compared to fewer than 10 percent of those without students having Type 1 diabetes. There was also a substantial difference in respondents with students having Type 2 diabetes versus those without students—59 percent of respondents that have students with the health issue reported it to be a highly significant or significant issue, compared to just seven percent of those without students having Type 2 diabetes. Mental health issues and seizures were the two other health issues with fairly large differences in perception of significance, based on having students enrolled with those issues. For those respondents having students with mental health issues, 88 percent indicated this to be a significant or highly significant health issue, compared to just under 50 percent of those without students. Over 60 percent of respondents having students with seizures indicated these were significant or highly significant, compared to under 20 percent of those without.

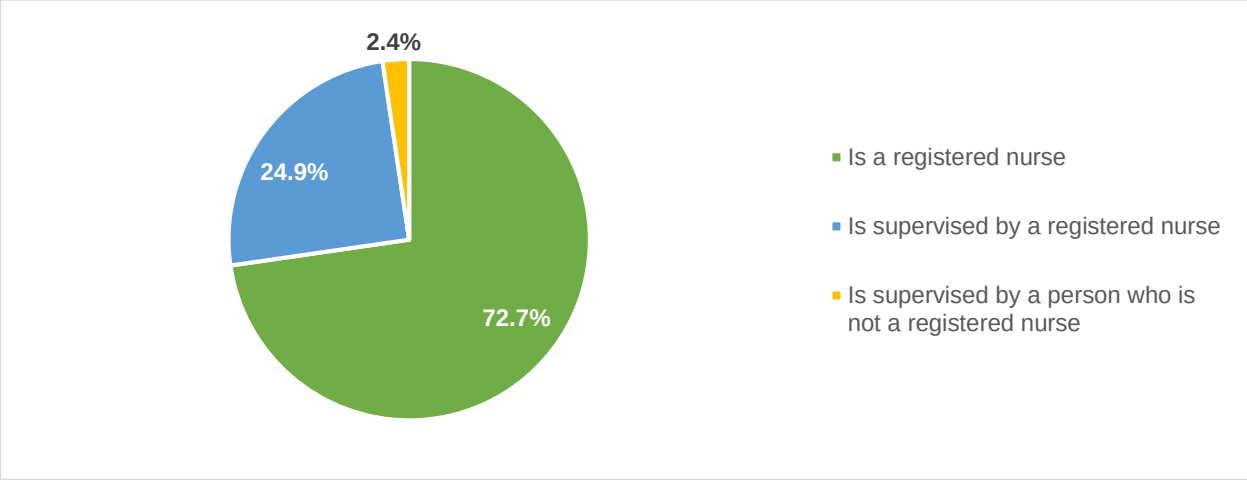
Table 25: Percentage of Schools Reporting "Highly Significant" or "Significant" (based on whether they reported students with those conditions)

	Has/Does Not Have Students	
Health Condition	Ranked as Highly Significant or Significant With Students	Ranked as Highly Significant or Significant Without Students
Asthma	92.8%	81.5%
Environmental Allergies	75.2%	49.7%
Mental Health Disorders	87.7%	49.7%
Severe Food Allergy	87.7%	70.5%
Migraines	78.1%	52.4%
Seizures	62.5%	19.8%
Diabetes - Type 1	88.5%	9.7%
Diabetes – Type 2	59.4%	7.2%
Neurologic Condition (Traumatic Brain Injury)	39.9%	15.3%

Characteristics of School Nurses/Health Providers

Nearly 73 percent of respondents indicated that the primary person providing direct care for students in the school is a registered nurse. For those who are not registered nurses, 25 percent are supervised by registered nurses, and only two percent are supervised by individuals who are not registered nurses. As noted in the Data Strengths and Limitations section, it is important to note that the 73 percent of respondents reporting that their primary care person is a registered nurse is likely not representative of the state as a whole, and only represents the 1,017 individuals who responded to the survey.

Figure 41: Supervision of Primary Person Providing Care in the School



By school type, 73 percent of public/charter school respondents indicated that the person providing direct care in the school was a registered nurse (RN). In contrast, only 58 percent of private school respondents indicated that their primary care person is a registered nurse. Just over one-quarter of-public/charter school respondents indicated that their primary care individual is supervised by a registered nurse, and just one percent of public/charter school respondents indicated that their primary care person is supervised by a person who is not an RN. In contrast, nearly three in ten private school respondents indicated that the person providing primary care is neither an RN, nor supervised by a person who is an RN.

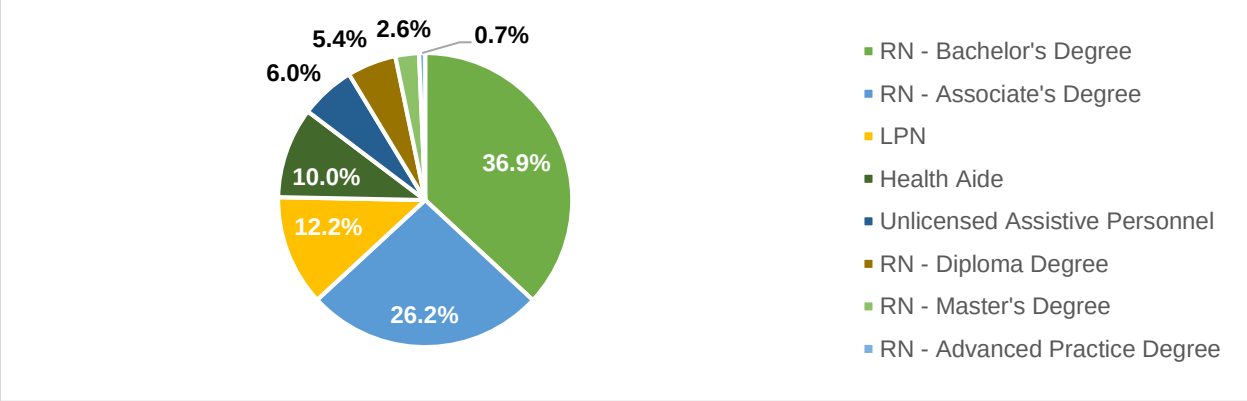
Table 26: Supervision Status by School Type

Supervision Status	School Type	
	Public/Charter (n=968)	Private (n=49)
Is a registered nurse	73.4%	58.3%
Is supervised by a registered nurse	25.5%	12.5%
Is supervised by a person who is not a registered nurse	1.0%	29.2%

Personnel Qualifications

A plurality (37 percent) of respondents indicated their primary person providing school health services was a Registered Nurse (RN) with a Bachelor's degree, followed by 26 percent served by RNs with Associate degrees. LPNs were the primary person providing services for 12 percent of respondents, and 10 percent had health aides. Only six percent of respondents reported having unlicensed assistive personnel acting as their primary providers of school health services.

Figure 42: Qualifications of Primary Persons Providing Care[23]



By school type, public/charter school respondents reported higher percentages of RNs with Associate degrees than private schools, while the percentage of RNs with Bachelor's, Master's, and Advanced Practice degrees were roughly the same for public/charter and private school respondents. Private school respondents reported a slightly higher percentage of RNs with diploma degrees (eight percent versus five percent). However, private school respondents reported a much higher percentage of unlicensed assistive personnel than public and charter schools (39 percent versus only four percent).

Table 27: Qualifications by School Type

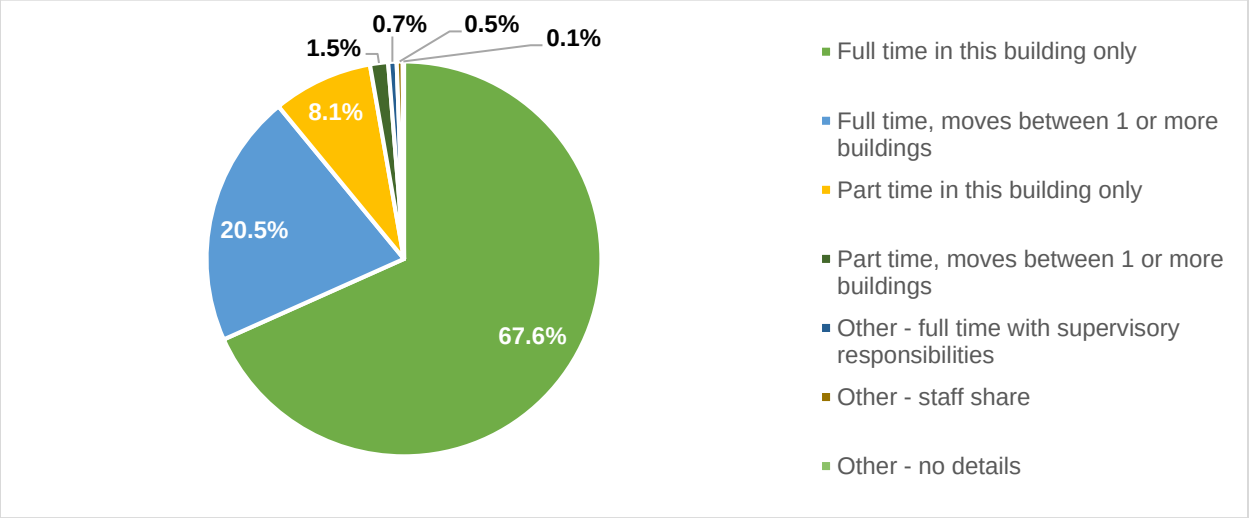
Qualifications	School Type[24]	
	Public (n=989)	Private (n=49)
RN - Associate's Degree	27.1%	8.2%
RN - Bachelor's Degree	36.9%	36.7%
RN - Master's Degree	2.6%	2.0%
RN - Diploma Degree	5.3%	8.2%
RN - Advanced Practice Degree	0.7%	0.0%
LPN	12.6%	4.1%
Health Aide	10.4%	2.0%
Unlicensed Assistive Personnel	4.3%	38.8%

[23] There were 23 public school respondents and one private school respondent that reported qualifications on more than one person, because of shared duties, or because the respondent reported on both the individual providing primary services and the RN providing supervision. All responses were included in the calculations. As such, total percentage of RNs reported in this figure is slightly lower than the percentage reported in Figure 37.
[24] N sizes in this table represent the total number of unique responses, although 23 public school respondents reported more than one qualification. All responses were counted in percentage calculations.

Building Responsibility

Respondents were asked to describe building responsibilities for individuals primarily providing school health services. The majority (68 percent) of respondents indicated their providers are full time in one building only, while 20.5 percent indicated their primary provider was full time but shared services across one or more buildings.[25] Eight percent of respondents reported that while their primary provider was part-time, s/he provided services only in that building. Less than two percent had part-time providers sharing services across buildings. Thirteen respondents reported other situations, including seven that have full-time nurses assigned to their building only, but who have supervisory duties across the rest of the school corporation; five who indicated they share staff members; and one who listed "other" but did not provide details. As previously reported, it is important to note that the relatively high percentage of full-time providers in one building only may not be generalizable to the state as a whole; as nearly 70 percent of respondents were full-time in one building only, which may not be the case for non-responding schools.

Figure 43: Building Responsibility



[25] Respondents that indicated that their primary provider offered services to connected buildings but different schools, or across PK-12 (located in the same building) were included in this category.

Public and charter school respondents reported 68 percent of their primary care providers as full-time in only one school, as did 67 percent of private school respondents. Private school respondents were more likely to have part-time staff, with 19 percent of respondents indicating a part-time person in a single building only, or a part time person moving between one or more buildings, compared to only nine percent of public and charter school respondents. Private school respondents were also more likely to report using a staff sharing model (three percent, compared to less than one percent for public and charter school respondents).

Table 28: Building Responsibility, By School Type

Organization	School Type	
	Public/Charter (n=965)	Private (n=48)
Full time in this building only	68.2%	67.2%
Full time, moves between 1 or more buildings	21.4%	10.3%
Part time in this building only	8.1%	13.8%
Part time, moves between 1 or more buildings	1.3%	5.2%
Other - staff share	0.3%	3.4%
Other - full time with supervisory responsibilities	0.7%	0.0%
Other - no details	0.1%	0.0%

Estimated Full-Time Equivalence (FTE)

The survey asked respondents to report on full-time equivalence (FTE) of RNs, LPNs, and Health Aides for each building for which they were reporting. From that reporting, plus the total number of students reported served in grades PK-12 for each respondent, a registered nurse (RN) to student ratio can be calculated. As previously noted, the ratio is representative only of those respondents to the survey.

There were 778 public and charter schools (80 percent of public school respondents); 27 private schools (55 percent of private school respondents) that reported an RN FTE of greater than 0.[26] This included schools with RNs as the primary care provider, as well as schools where RNs were supervising other personnel.

[26] 32 schools did not report any FTE data at all (they appeared to have skipped the question)—as such, their student totals were excluded from the calculation. There were 156 respondents where the reported FTE appeared to be incorrect, based on combinations of other responses. Where possible, FTE was corrected for these response.

An FTE of 660.5 was reported for RNs, which results in an overall 917:1 student to RN ratio.[27] This is much higher than the recommended 750:1 ratio. Interestingly, the ratio for private school respondents is closer to the recommended ratio than that of public and charter school respondents—768:1 for private schools, and 922:1 for public and charter schools. However, private school respondents also reported a much higher rate of non-RN care providers than public and charter schools (55 percent of private school respondents reported having RNs as primary care providers, compared to 73 percent of public and charter school respondents).

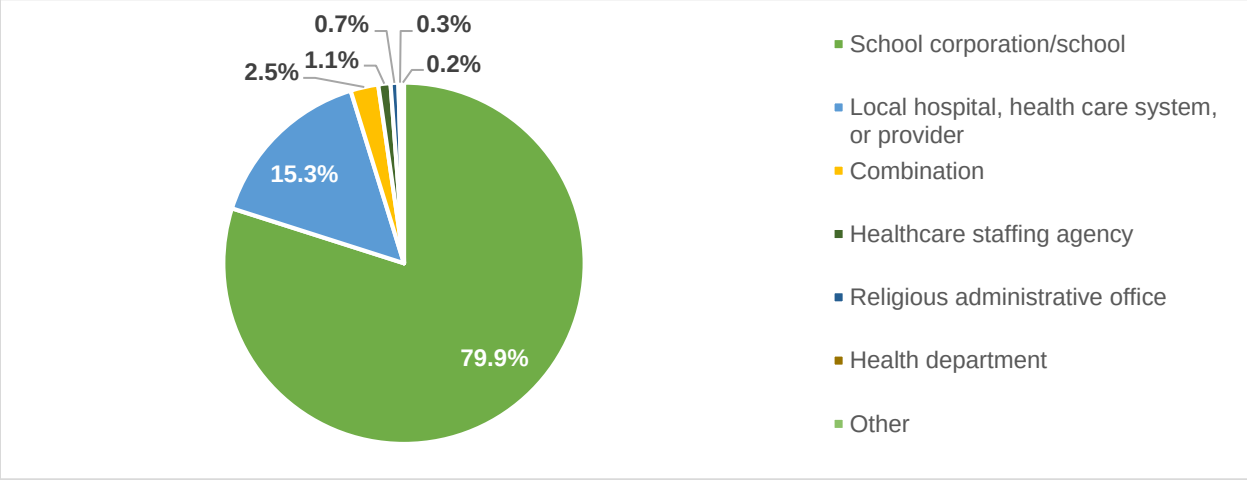
Figure 44: FTE by Health Provider and School Type, Compared to Recommended Ratio

[27] RN ratio calculated by total number of students reported enrolled (minus exclusions described in the previous footnote) divided by total of RN FTE calculation.

Fiscal/Employment Responsibility

The school corporation/school was reported as having primary responsibility for the school nursing services in the building in eight of 10 responses (80 percent). In 15 percent of cases, the school used a local hospital, health care system, or provider, and in 2.5 percent of cases, the school used some combination of listed services. About one percent of respondents indicated their school used a healthcare staffing agency, and seven private schools noted that the primary responsibility was with their religious administrative office. Two individuals selected "other" responses that could not be categorized—one respondent indicated that the school does not offer school nursing services, and a second respondent selected "other" but did not provide details.

Figure 45: Org. with Primary Responsibility/Employing School Nursing Services



By school type, public and charter school respondents were most likely to indicate that their school corporation was primarily responsible for providing health services (80 percent), although just under 70 percent of private schools indicated the same.

Table 29: Organization Having Primary Responsibility, By School Type

Organization	School Type	
	Public/Charter (n=960)	Private (n=40)
School corporation/School	80.4%	69.6%
Local hospital, health care system, or provider	15.7%	6.5%
Combination	2.4%	4.3%
Healthcare staffing agency	1.1%	0.0%
Religious administrative office	0.0%	15.2%
Health department	0.3%	0.0%
Other	0.0%	4.3%

Data Strengths and Limitations

Strengths:

- Vision and hearing data reports were submitted by 99 percent of school districts, representing data points that are highly reflective of the state's status regarding hearing and vision screenings.

- The School Nurse survey, while voluntary, had a relatively high response rate, particularly for public schools. Responses represented an estimated 54 percent of students in Indiana and 56 percent of public schools. In addition, responses were received from all geographic areas of the state, representing urban, rural, and suburban schools and districts.

- All data was analyzed by an independent, third party firm (Chamberlin/Dunn, LLC), representing a highly accurate analysis of the data collected.

Limitations:

- Because the requirement to report emergency administrations of Albuterol, Epinephrine, and Naloxone is new (in effect beginning with the 2017-2018 school year), it is possible that data was underreported.

- While the School Nurse survey had a relatively strong response rate, the survey was not conducted through statistical sampling and only represents responses of those school nurses who elected to participate in the survey. In addition, the survey is likely to be more reflective of public school-based nurses than those based in private or charter schools. Further, because responses are based on only those nurses who elected to participate in the survey, it is possible that responses represent a "best case scenario"—those school nurses who are most engaged or most interested in school health issues, or those with the lowest student populations.

- RN to student ratio is based on self-reporting by the School Nurse survey respondents, including self-reports of RN full-time equivalencies, and self-reporting of student enrollment. Further, in some cases it was identified that FTE ratios may have been incorrectly reported, and based on other responses, FTE counts were adjusted. As such, RN to student ratio should be interpreted with caution.

- Some questions on the School Nurse survey were left blank by respondents. As such, these were assumed to be "non-response" answers and eliminated from analysis. However, it is possible that respondents intended these answers to represent zeros.

Conclusions and Recommendations

Conclusions:

- The Indiana student population consists of students with complex physical, developmental, behavioral, and emotional conditions as evidenced by survey respondents reporting a total of 186,694 cases of students having at least one of 32 chronic diseases. Further, there were nearly 67,000 medications prescribed for administration during the school day (short-term, long-term, specific and self-carry medications), and 86 percent of the school nurses in this survey reported performing at least one healthcare procedure (insulin administration, nebulizer treatments, tube feedings, catheterizations, ostomy care, Diastat administration, tracheostomy care and others).
- Students are diagnosed with a variety of chronic health conditions. The ten most prevalent conditions reported on the school nurse survey were asthma, attention deficit disorder, environmental allergies, mental health disorders, severe food allergies, migraines, gastrointestinal disorders, seizures, cardiac conditions/hypertension, and hearing disorders.
- Life-threatening emergency situations occur frequently in schools. As such, school nurses must be prepared to respond to student and staff medical emergencies. School nurses reported that at least 1,290 calls were made to 911 and nearly 1,600 doses of emergency medications were administered in academic year 2017-2018 (Albuterol and Epinephrine).
- The top five health-related issues rated as most significant by school nurses were: asthma, severe food allergies, injuries, poverty, and mental health.
- School nurses perform a variety of unique roles in the school setting. When asked to select from a list of the most common roles for school nurses, the top four roles included: caring for the ill or injured, managing students with chronic health conditions, discussing health issues with parents, and training and educating staff regarding student health conditions.
- School nurses are completing the state-mandated requirements for vision, hearing and immunizations, with 15 percent of students being referred for vision failure, two percent of students being referred for hearing failure, and three percent of students being referred for incomplete immunizations.
- The recommended ratio of school nurses (RN's) to students in Indiana is 1:750 per 511 IAC 4-1.5-2. The nurses responding on behalf of schools in the school nurse survey had a ratio of approximately 1:917.
- The majority of school nurses (approximately 80 percent) are employed by school districts, with 15 percent hired through contracts with local hospitals or health care systems.

Recommendations:

Encourage the development of school policies regarding the care of students with chronic diseases. 14 percent of respondents to the school nurse survey lacked a written policy for managing students' chronic diseases. Additionally, respondents reported that they had close to 187,000 students with at least one chronic disease, and the majority of school nurses indicated that they had at least one student with asthma, severe food allergies, or environmental allergies. In order to properly manage students' chronic health conditions and to ensure consistency in care, all schools should have a written policy.

School policies should also include the requirement that any student with a medical order for the administration of Albuterol or Epinephrine should have an emergency action plan completed by his/her provider. This is due to the fact that 44 percent of the time when Albuterol was administered to an individual with a known history of asthma, and 37 percent of the time when Epinephrine was administered to an individual with a known history of severe allergies, it was given in situations where the individual lacked an action or treatment plan.

The policy should also require the school nurse to write an Individual Health Plan (IHP) for any student that has a chronic condition and a medical order that would require staff training and emergency procedures. The student's IHP should be based on the provider's medical order as well as the provider's emergency action or treatment plan.

Encourage the stocking of emergency medications. Nearly 1 in 5 school nurse survey respondents (18 percent) reported not stocking any of the three emergency medications, Albuterol, Epinephrine, and Naloxone. However, schools may want to consider stocking emergency medications as, based on data reported in the Administration of Emergency Medication Report, in 21 percent of Albuterol administrations, and 20 percent of Epinephrine administrations, the individuals needing the medication had no known history of asthma or allergies. Additionally, the report showed that in 90 percent of cases where emergency Albuterol was available and administered, it was not necessary to call EMS. This indicates that in the majority of cases, having and administering stock Albuterol prevented the escalation of student symptoms, decreased the need for EMS transport, and the majority of students were able to return to class. Stocking emergency medications, particularly in these cases, appears to be vital to ensure the safety of students and staff.

Encourage training for uncommon and common health procedures. All nurses should feel comfortable administering insulin, performing nebulizer treatments, performing tube feeding, and conducting bladder care/catheterization, as school nurse survey respondents reported these were the procedures they most commonly provided in the last year. The IDOE has developed an online school nurse manual and course outlining and describing the basics of school nursing. Chapters in this manual/course specifically include sections regarding guidelines and resources for common treatments and procedures performed by school nurses, as well as including other topics vital for school nurses to know such as appropriate delegation, health laws at the federal, state and local level, chronic disease

management, writing individual health plans, medication administration, vision and hearing screenings, immunizations, and mandatory reporting. Additionally, the IDOE has developed two other online courses to address the topics of the care of students with diabetes and emergency preparedness for school nurses. Further, the IDOE is creating an online course regarding the care of students with asthma. School administrators should encourage or require, as part of the school nurse's job description, that all school nurses take these courses and receive certificates of successful completion.

Provide training on awareness and emergency administration of Epinephrine and Albuterol. Based on data provided in the Administration of Emergency Medication Report, emergency medical services (EMS) was called in only 76 percent of cases of Epinephrine administration. School policies should require that EMS be called each time Epinephrine is administered to ensure proper post-administration care. However, in the case of Albuterol administration, individual assessment is required, as acute symptoms may resolve and EMS may not need to be contacted based on the student's emergency action plan. Additionally, the highest rate of Epinephrine administration was in high school grades, with over 55 percent of Epinephrine administrations reported by school nurse survey respondents in grades 9-12. While schools may pay closer attention at the lower grades, to minimize exposure to allergens for younger students, schools must also ensure that vigilance is in place with older students. Furthermore, as asthma and allergy symptoms frequently occurred in the classroom; the majority of students returned to the classroom after an administration of Albuterol; and administrations of Epinephrine were reported to happen on field trips, it is important that teachers, administrators, and other staff are properly trained to recognize signs and symptoms of asthma attacks and anaphylaxis.

Encourage an improvement in the student-to-RN ratio. Respondents to the School Nurse Survey indicated that many students had health needs – close to 190,000 students had at least one chronic disease; 97 percent of schools reported having at least one student with asthma; and almost 67,000 students had some type of medication available at school. The survey also indicated that school nurses were performing many complex healthcare tasks – 86 percent of respondents had performed at least one healthcare related procedure; 57 percent indicated they had administered insulin; 1,290 calls were made to EMS; over 700,000 students had vision and/or hearing screenings completed; and close to 1,600 doses of emergency medication were administered. It is also important to note that although 98 percent of student emergency symptoms occurred while the students were in the care of trained staff, 75 percent of the time Epinephrine, and 85 percent of the time Albuterol was needed, it was administered by the school nurse. This data clearly illustrates that students have a variety of health needs that must be addressed and managed during the school day. In order to safely manage and care for the health needs of students, schools are encouraged to meet the state and national recommended ratio of 1 RN for every 750 students.

Consider more frequent administrations of the School Nurse Survey. The survey is a potential wealth of information about school health services in Indiana schools. The IDOE

should consider administering shorter portions of the survey yearly or biyearly. By administering portions (instead of the whole survey), the IDOE can keep the survey short, potentially increasing response rate, while still obtaining information on key data points for policy and decision making.

www.chamberlindunn.com
mc@chamberlindunn.com
nd@chamberlindunn.com

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