



Tennessee Department of Education
Office of Coordinated School Health
Annual School Health Services Report
2015-16 School Year

Annual School Health Services Report

2015-16 School Year

The Office of Coordinated School Health surveys public and private school systems annually to monitor compliance with state school health laws and to assess the scope of school health services provided to Tennessee public school students as mandated in T.C.A § 49-50-1602. 142 local education agencies (LEAs) returned their survey for inclusion in this report. 82 private schools returned the Health Services Survey.

Public Schools Data

Wellness issues of students are supervised by licensed school nurses with the goals of appraising, protecting, and promoting health needs. Services provided by the school nurse include, but are not limited to assessment, planning, coordination, and direct care to all students including those with special needs or conditions. Also, the school nurse has the responsibility of collaborating with and/or referring students to community health care professionals to:

- ensure early intervention
- ensure access and referral to primary care services
- foster appropriate use of primary health care services
- prevent and control communicable diseases and other health problems
- provide emergency care for students and staff illness and injury
- provide daily and continuous services for children with special health care needs
- promote and provide optimum sanitary conditions for a safe school facility and school environment
- provide educational and counseling opportunities for promoting and maintaining individual, family, and community health

In addition, many services are provided by licensed and qualified professionals such as physicians, psychiatrists, psychologists, dentists, health educators, registered dietitians, school counselors, and allied health professionals (e.g., speech therapists, occupational therapists, and physical therapists).

Asthma

Asthma continues to be the number one chronic illness causing student absenteeism. A continuing concern based on health services trend data is the issue of ensuring that students with asthma are receiving the support they need to effectively manage their medical condition so students stay safe and can attend school ready to learn. Specific areas of concern include the availability of school nurses to respond to an emergency involving an asthmatic student, the development of individual and school level action plans for all diagnosed students, and the provision of asthma education to students. Following are data to support this concern:

- During the 2015-16 school year, there were **68,927** students in Tennessee schools with an asthma diagnosis.
- Students diagnosed with asthma represent the most common type of chronic illness/disability among Tennessee students (**30 percent of all diagnoses**).
- Since 2004-05, the number of students diagnosed with asthma has increased by **85 percent**.
- Of the **42,235** students identified as having asthma, only **17,404** students or **41 percent** of all students identified as having asthma were provided an individualized action treatment plan.
- Also, only **115** school systems/special schools (**80 percent of all school districts/special schools**) have developed a school-wide asthma action plan for all schools.
- During the 2015-16 school year, **38,244** teachers, coaches, and other school personnel were trained in asthma education using a formal curriculum. This represents a **12 percent increase** from the previous school year.
- An additional **17,707** asthmatic students received asthma education training in Tennessee public schools. However, this represents only **42 percent** of all students diagnosed with asthma who received asthma education training.
- During the 2015-16 school year, the most common type of emergency procedure provided to students was for "other," broken bones, resuscitation, burns, etc. (**49 percent**).
- School health services directors were asked if a nurse was present all day in schools where a student might need **asthma** medication administered during an emergency situation. **50 percent** (71 school systems/special schools) indicated "yes," while **50 percent** (71 school systems/special schools) reported "no."

2015-16 School Health Services Highlights Public Schools

Student Diagnoses

During the 2015-16 school year, **205,254** students in Tennessee public schools had a chronic illness or disability diagnosis. This represents **21 percent** of all Tennessee public school students statewide. Of those students with a diagnosis, the most common were asthma (**34 percent**), ADHD/ADD (**26 percent**), and severe allergies (**17 percent**). The total number of students with selected chronic illnesses or disability diagnoses increased by **236 percent** between 2004-05 and 2015-16.

Health Services Provided in Tennessee Schools

The most common types of health services provided by licensed health care providers in Tennessee schools include: care of ill and injured students (**72 percent** of all schools), medication administration to students (**66 percent** of all schools), immunization compliance monitoring of student records (**60 percent** of all schools), BMI screenings (**38 percent** of all schools), and blood pressure screenings (**97 percent** of all schools). The most common types of health services provided by unlicensed health care providers in Tennessee schools include hearing screenings (**47 percent** of all schools) and vision screenings (**45 percent** of all schools).

School Nurses

School systems/special schools hire nurses to serve the general and special education student populations.

Out of the **1,811** public schools in Tennessee, **47 percent** or **856** schools employed a nurse full time in their school. During the 2015-16 school year, **1,334** school nurses worked in Tennessee schools.

Of these, **35** were Master of Science Nurses (MSNs), **379** were Bachelor of Science Nurses (BSNs), **434** were Registered Nurses (RNs) and **486** were Licensed Practical Nurses (LPNs).

Also, **77 percent** of all Tennessee school nurses were hired by the LEA as full time employees, **30 percent** through public health departments, **5 percent** on an agency contract, **1 percent** through local hospitals, and **<.01 percent** from education service centers.

School systems reported **7 percent** of all school nurses served only special education students and **93 percent** served the general student population.

School districts/special schools reported that **141 out of 142** school systems/special schools meet the recommendation contained in the BEP formula for number of nurses per student ratio of 1:3,000. (This calculation does not include nurses who are contracted or hired to provide procedures or treatments only.) Most school systems in Tennessee are in compliance with this law.

During the 2015-16 school year, there were **3,885,680** student visits to a school nurse. **Eighty-seven percent** of those visits resulted in a student's ability to return to class instead of being sent home.

1,115 out of **1,811** public schools in Tennessee used an electronic medical records system during the 2014-15 school year. The most common systems used were Powerschool (**532** schools), Skyward (**337** schools), HealthOffice (**167** schools), SNAP (**69** schools), STAR Student (**10** schools), and other records systems (**696** schools).

Out of the **1,811** public schools in Tennessee, **47 percent** or **856** employed a nurse full time in their school. Also, there were **142** incidences during the 2015-16 school year when a school nurse was pulled from their school to take care of an immediate need elsewhere.

School health services directors were asked if a nurse was present all day in schools where a student might need **asthma** medication administered during an emergency situation. **Fifty percent** (**67** school systems/special schools) indicated "yes" while **50 percent** (**71** school systems/special schools) reported "no."

School health services directors were asked if a nurse was present all day in schools where a student might need **Diastat**[®] medication administered during an emergency situation. **Fifty-eight percent** (**83** school systems/special schools) indicated "yes" while **42 percent** (**59** school districts) reported "no."

School health services directors were asked if a nurse was present all day in schools where a student might need **Glucagon**[®] medication administered during an emergency situation. **Fifty-eight percent** (**86** school systems/special schools) indicated "yes" while **42 percent** (**56** school systems/special schools) reported "no."

During the 2015-16 school year, **2,940** 911 emergency calls were made in Tennessee public schools. Of these calls, **2,138 (73 percent)** were made when a nurse was in the school building and **802 (27 percent)** were made when a nurse was **NOT** in the school building. Also, **12,531** students received emergency treatment for medical conditions caused by trauma or sudden illness such as broken bones, resuscitation, seizure, and burns during the school year. This represents a **14 percent** increase from the previous school year.

Medications

There were **1,995,487** medication doses administered to students in Tennessee public schools during the 2015-16 school year. The total number of medication doses administered to students in Tennessee public schools increased dramatically by 93 percent between 2008-09 and 2015-16. The vast majority of type of doses administered to Tennessee students were oral (**80 percent**) followed by inhaled (**10 percent**) and topical (**7 percent**).

All medications except those designated by an individual healthcare plan (IHP) must be maintained in a secure location under the supervision of a school nurse and/or other school personnel who have been oriented/trained and assigned to handle medications and record keeping per state guidelines. All school districts reported medications were locked in a secure storage location.

Student Health Screenings

Every year, parents of Tennessee public school students are notified by school staff of the availability of free student school health screenings. Why screen students for health concerns? We know that healthy children learn better. For example, if a child cannot hear very well it would be very hard for him/her to concentrate on school work. Likewise, if a student cannot see the board then it will be difficult for him/her to comprehend a classroom lesson. When a health concern is identified early through a regular school health screening, steps can be taken to access needed health care so health and academic issues do not develop into serious problems. All parents are given the opportunity to exclude their child from screenings if they wish to not take advantage of this service.

According to the *Tennessee School Health Screening Guidelines*, students in grades pre-K, K, 2, 4, 6, and 8 are screened annually for vision and hearing. Students in grades K, 2, 4, 6, 8, and one year of high school (usually Lifetime Wellness class) are screened annually for blood pressure and body mass index (BMI) in addition to vision and hearing. School staffs are encouraged to screen students for oral health problems and screen sixth grade students for scoliosis.

Most school systems/special schools provided vision, hearing, BMI, and blood pressure screening for their students. Approximately **46 percent** of all school districts/special schools provided dental screening, and **30 percent** of all school districts/special schools provided scoliosis screening.

During the 2015-16 school year, 1,391,762 student health screenings occurred in Tennessee schools. The percentage of screenings included Body Mass Index (BMI) (**25 percent**), vision (**24 percent**), hearing (**24 percent**), blood pressure (**22 percent**), dental (**3 percent**), and scoliosis (**1 percent**). The percentage of school health screenings increased by **24 percent** overall from 2008-09 to 2015-16. Student BMI screenings remained the same at **25 percent**, blood pressure screenings increased by **22 percent**, hearing screenings remained the same at **24 percent**, scoliosis screenings increased by **39 percent**, dental screenings decreased by **54 percent**, and vision screenings increased by **24 percent**.

During the 2015-16 school year, **133,597** student referrals were made to a health care provider as a result of a school health screening. Referral suggestions are provided by the school nurse in the form of a letter sent home to parents. Most referrals were a result of body mass index (BMI) screenings (**36 percent**), vision screenings (**33 percent**), blood pressure screenings (**13 percent**), hearing screenings (**9 percent**), dental screenings (**7 percent**), and scoliosis screenings (**<2 percent**).

The total number of students referred to health care providers increased **149 percent** between 2006-07 and 2015-2016. The most significant increase in referrals from 2006-07 to 2015-16 were for body mass index (BMI) (**36 percent**), vision (**33 percent**), and blood pressure (**13 percent**). Referrals decreased for scoliosis **by 7 percent**.

During the 2015-16 school year, **10 percent** of students who participated in school health screenings received a referral to a healthcare provider. Of those students who were referred to a healthcare provider, **17 percent** were confirmed by school staff that the student actually visited their healthcare provider.

504 - Individual Health Care Plans (T.C.A. §49-50-1602)

During the 2015-16 school year, **130** school districts (**92 percent**) reported all students with chronic or long-term illnesses had an individual health care plan (IHP) in place whereas **12** school districts (**8 percent**) reported they had not provided plans for all applicable students.

Health Care Procedures Performed at School

During 2015-16, **11,680** students received a procedure on a daily or routine basis at school from a licensed health care professional. The most frequent procedures performed by licensed health care professionals were: blood glucose monitoring (**18 percent**), other procedures (**18 percent**), carb counting (**17 percent**), diabetes injections (**13 percent**), insulin pump management (**11 percent**), and nebulizer treatments (**10 percent**).

Between 2006-07 and 2015-16, the total number of procedures performed by a licensed health care professional increased by **150 percent**.

During 2015-16, **4,272** students performed their own procedure on a daily or routine basis at school without assistance. The most frequent procedures performed by students without any assistance were blood glucose monitoring (**27 percent**), diabetic injections (**22 percent**), carb counting (**21 percent**), insulin pump management (**13 percent**), and urine ketone testing (**11 percent**).

During 2015-16, licensed health care providers and unlicensed assistive personnel (UAP's) performed **12,082** procedures annually on all students. The most frequent procedures performed were blood glucose monitoring (**19 percent**), "other" (**18 percent**), carb counting (**18 percent**), and urine ketone testing (**11 percent**).

During 2015-16, **402** students received a procedure on a daily or routine basis at school from an unlicensed health care professional. The most frequent procedures performed by unlicensed health care professionals were blood glucose monitoring (**44 percent**), carb counting (**25 percent**), urine ketone testing (**20 percent**), and "other" (**12 percent**).

Emergency Procedures

During the 2015-16 school year, **12,531** students received an emergency procedure in Tennessee schools. Almost all of the emergency procedures were provided to students for asthma (**50 percent**) and in the "other" category (**49 percent**).

The total percentage of students receiving an emergency procedure decreased by **50 percent** from 2008-09 to 2015-16. The largest area of decrease involved using Diastat® (**19 percent**) and an asthma inhaler (**81 percent**) as an emergency procedure. The emergency administration of Glucagon® decreased by **34 percent**.

Asthma

During the 2015-16 school year, there were **68,927** students in Tennessee schools with an asthma diagnosis. Students diagnosed with asthma represent the most common type of chronic illness/disability among Tennessee students (**30 percent of all diagnoses**). Since 2004-05 the number of students diagnosed with asthma increased by **85 percent**.

Of the **68,927** students identified as having asthma, **42,235** students were provided an individualized action treatment plan and **17,404** of the plans were signed by the medical provider (someone who prescribes medication). Also, **115** school systems/special schools (**81 percent of all school districts/special schools**) have developed a school-wide asthma action plan for all schools. Of these **113** school districts/special schools, **105** school districts/special schools report that the plan is implemented in all schools.

During the 2015-16 school year, **38,244** teachers, coaches, and other school personnel were trained in asthma education using a formal curriculum. This represents an increase of **11 percent** from the previous school year. An additional **17,707** asthmatic students received asthma education training in Tennessee public schools. This represents only **18 percent** of all students diagnosed with asthma who attend a Tennessee public school.

Also, **22,822** students with asthma have a prescribed medication available at school.

Seizure Disorders

In 2015-16, there were **1,721** students with a seizure disorder diagnosis with Diastat® available for use at school compared to **835** students in 2008-09. This represents a dramatic increase over the past seven years.

A total of **107** doses of Diastat® were administered to students in school systems during the 2015-16 school year compared to **197** doses in 2014-15. This represents a **46 percent** decrease over the past school year.

School health services supervisors in **106 LEAs (75 percent)** reported having a district Diastat® policy in place, while **40 LEAs (25 percent)** reported they did not have a district Diastat® policy.

School districts report **95** school systems (**67 percent**) have a policy allowing the nurse to administer the first dose of Diastat® at school; **19** LEAs did not allow nurses to administer the first dose of Diastat® at school (**13 percent**) and **28** LEAs did not answer the question (**20 percent**).

There were **525 students** with an order to administer Diastat® during the 2015-16 school year who did not have a full-time nurse assigned to the school compared to **172** students in 2008-09. In addition, **277** nurses were assigned to a school to serve as a full-time nurse for the student with an order to administer Diastat®.

During the 2015-16 school year, **27** students received Diastat® more than once per year compared to **24** students in 2008-09.

136 out of **142** school systems/special schools called 911 immediately as the standard protocol when Diastat® was administered compared to **117** school systems in 2008-09. Diastat® was administered **99** times at school by a nurse, **12** times by a trained volunteer, and **16** times by parents or guardians during the 2015-16 school year.

Also, **138** school systems/special schools (**97 percent**) reported if a student who has Diastat® at school has a seizure and no nurse is available to administer the medication, then a 911 call serves as standard protocol. **Four** LEAs answered that this was **not** their standard protocol.

During the 2015-16 school year, **65** LEAs (**46 percent**) had a policy allowing trained volunteers to administer Diastat®, **52** LEAs (**37 percent**) did not have a policy, and **25** LEAs (**18 percent**) did not answer the question.

Allergies

There were **131,184** students diagnosed with allergies in Tennessee schools during the 2015-16 school year. The most common types of allergies among students were "other," which includes allergies to medicines (**30 percent**), environmental (**29 percent**), nuts (**12 percent**), "other – food" (**12 percent**) and insects (**9 percent**).

From 2010-11 to 2015-16 school years, the number of students identified with allergies increased by **63 percent**. Nut (**17 percent**), shellfish (**33 percent**), latex (**62 percent**) and egg (**33 percent**) allergies increased the most from the 2010-11 to 2015-16 school year.

Substantial increases have occurred during the past five years regarding the number of students that have Epi-Pens® available at schools (**51 percent increase**). The number of students requiring administration of the Epi-Pen® at school declined by **3 percent** and the number of school personnel trained to administer an Epi-Pen® if needed increased by **45 percent**.

During the 2015-16 school year, **55 percent** of all school districts/special schools (**78** school districts/special schools) chose to maintain epinephrine auto-injectors in at least two unlocked, secure locations with the intent to be administered to any student believed to be having a life-threatening or anaphylactic reaction.

Diabetes

There were **3,741** students in Tennessee schools with a diagnosis of diabetes during the 2015-16 school year. Of these, **3,025** students (**81 percent**) were diagnosed with Type I diabetes and **716** students (**19 percent**) were diagnosed with Type 2 diabetes. The highest percentage of students diagnosed with diabetes attended high schools (**49 percent**) followed by middle schools (**28 percent**) and then elementary schools (**20 percent**).

The number of students diagnosed with Type I and Type II diabetes in Tennessee schools increased overall by **12 percent** from 2009-10 to 2015-16. However, kindergarten and elementary data actually showed a decline in percentages since the 2009-10 school year.

Also, **90 out of 142** school systems/special schools report they have a policy that allows trained volunteers to administer Glucagon® in schools. When asked if school systems/special schools had developed a policy permitting emergency administration of Glucagon® by school personnel, **54 percent** (**90** school systems/special schools) reported “yes” and **46 percent** (**52** school systems/special schools) reported “no.”

Head Injury/Concussions

Ninety-eight percent of all school districts/special schools (**139** districts/special schools) have adopted guidelines and policies concerning the nature, risk, and symptoms of concussion and head injury.

HIV and Blood-borne Pathogens Training

During the 2015-16 school year, **142 out of 142** school districts/special schools provided HIV and blood-borne pathogens training to school staff.

Cardio-Pulmonary Resuscitation (CPR) (TCA§49-5-414)

During the 2015-16 school year, **22,213** full-time school employees were currently certified in CPR. LEAs reported that **136 out of 142** school systems/special schools provided CPR training as a professional development opportunity this past school year (2014-15).

In the 2013-14 school year, **276** schools provided CPR training to students. Also, **34,742** students received CPR training during the 2014-15 school year. During the 2015-2016 school year, **329** schools provided CPR to students (TCA§49-5-414) and **43,772** students were trained in CPR.

Automated External Defibrillators (AED)

Eighty-seven percent of all Tennessee public schools have an automated external defibrillator (AED). During the 2015-16 school year, schools used their AED **10** times.

Immunizations and Meningococcal Information to Parents

Almost **all** school districts/special schools (**141 out of 142** school districts/special schools) report that they require proof of immunization prior to new student admission to any public school, nursery school, kindergarten, pre-school, or day care and provide special provisions for homeless children (TCA §49-6-5001).

During the 2015-16 school year, **134** school districts (**94 percent**) shared Meningococcal vaccine information with parents. **Eight** school districts (**6 percent**) did not provide this information with parents.

School-based Clinics

In 2015-16, **48,825** EPSDTs (well child exam) were provided to Tennessee students either by a school clinic practitioner, a private provider in the schools, or a county health department via school transport. Of these, **88 percent** received EPSDT through *Well Child, Inc.* or another private provider at school, and **12 percent** received an EPSDT through a school-based clinic.

The number of schools with school-based clinics decreased from **186** in 2013-14 to **185** in 2014-15 (**0.5 percent decrease**), and to **155** school-based/school linked clinics in 2015-16. Also, survey respondents said their school districts planned to open **16** new clinics during the 2014-15 school year. Of the **155** schools that provided clinic services in 2015-16, **77 percent** used tele-medicine, **82 percent** provided services to staff as well as students, **39 percent** provided immunizations, and **43 percent** provided dental services in the clinics.

Data Charts

Student Diagnoses

Number of Students and Percent of Total by Chronic Illness or Disability Diagnosis 2015-16

Chronic Illness or Disability Diagnosis	Number of Students 2015-16	Percent of Total
Asthma	68,927	30%
ADHD/ADD	53,227	24%
Severe Allergy	34,046	15%
Intellectual Disability	14,565	6%
Other (Cerebral Palsy, Sickle Cell, Cystic Fibrosis)	21,023	9%
Mental Health	13,550	7%
Autism	9,041	4%
Seizure Disorder	7,031	3%
Diabetes	3,867	2%
Total	22,378	100%

During the 2015-16 school year **226,378** students in Tennessee public schools had a chronic illness or disability diagnosis. This represents **20 percent** of all Tennessee public school students statewide. Of those students with a diagnosis, the most common diagnoses were asthma (**30 percent**), ADHD/ADD (**24 percent**), and severe allergy (**15 percent**).

**Number and Percent Change of Students by Selected Chronic Illness or Disability Diagnosis
between 2004-05 and 2015-16**

Chronic Illness or Disability Diagnosis	Number of Students 2004-05	Number of Students 2014-15	Percent Change
ADHD/ADD	19,939	53,227	167%
Asthma	38,676	68,692	78%
Diabetes	2,388	3,636	62%
Other (Cerebral Palsy, Sickle Cell, Cystic Fibrosis, Spinal Bifida, etc.)	14,536	19,408	45%
Total	75,539	147,044	95%

The total number of students with selected chronic illnesses or disability diagnoses increased by **95 percent** between 2004-05 and 2015-16. The number of ADHD/ADD diagnoses increased by **167 percent** in ten years. The number of students diagnosed with asthma increased by **78 percent** and the number of students diagnosed with diabetes increased by **62 percent** during the same time period.

Health Services Provided In Schools

Types of Health Services Provided in Public Schools Using Licensed and Unlicensed Health Care Providers and Percent Compared to All Public Tennessee Schools 2015-16

Types of Health Services	Number of schools using licensed health care providers	Percent of All TN Public Schools (N=1,811)	Number of schools using unlicensed health care providers	Percent of All TN Public Schools (N=1,811)
Skilled Nursing Services to Students With Health Needs (general education student/504)	1,631	73%	61	3.3%
Training and Supervision of Non-Medical Personnel	1,685	81%	98	5.4%
Health Counseling/Referral	1,501	75%	91	5%
Care of Ill/injured students	1,370	72%	504	28%
Care of Ill/Injured Staff	1,409	78%	402	22%
Medication Administration	1,198	66%	613	34%
Immunization Compliance Monitoring	1,094	60%	683	38%
Nursing Services to Students With Special Needs who have an IEP	1,215	67%	52	3%
Blood Pressure Screening	1,759	97%	52	3%
Health Education for Students	713	40%	800	44%
Staff Wellness Activities	722	40%	788	44%

Types of Health Services	Number of schools using licensed health care providers	Percent of All TN Public Schools (N=1,811)	Number of schools using unlicensed health care providers	Percent of All TN Public Schools (N=1,811)
Vision Screening	892	49%	821	58%
Hearing Screening	902	50%	853	59%
BMI Screening	685	38%	0	n/a
Dental Screening	1,759	97%	0	n/a
Scoliosis Screening	219	12%	69	4%

The most common types of health services provided by licensed health care providers in Tennessee schools include: training and supervision of non-medical personnel (**5.4 percent** of all schools), skilled nursing services to students with health needs (general education student/504) (**3.3 percent** of all schools), health counseling/referral (**5 percent** of all schools), care of ill/injured students (**28 percent** of all schools) and care of ill/injured staff (**22 percent** of all schools). The most common types of health services provided by unlicensed health care providers in Tennessee schools include: hearing screenings (**47 percent** of all schools), vision screenings (**45 percent** of all schools), staff wellness activities (**44 percent** of all schools), and health education for students (**44 percent**).

Medications

Total Number of Medication Doses Administered in Tennessee Schools Daily and As Needed (PRN) (Count Doses for the Year) 2015-16

Type of Medication Administered	Number of Medication Doses Administered Daily	Number of Medication Doses Administered on an as Needed Basis (PRN)	Total Number	Percent of Total
Oral	1,235,714	382,448	1,618,162	81.1%
Inhaled	61,257	136,584	197,841	10.1%
Topical	20,546	121,446	141,992	7.1%
Ophthalmic and Otic	8,068	16,972	25,040	1.2%
Parenteral Medications other than INSULIN OR IV	7,413	361	7,774	.0125%
Intranasal	1357	2,672	4,029	.0020%
Parenteral Medication INTRAVENOUS ONLY	461	16	477	.0002%
Rectal	56	116	172	.0009%
Total	1,334,872	660,615	1,995,487	100%

There were **1,995,487** medication doses administered to students in Tennessee public schools during the 2014-15 school year. The vast majority of type of doses administered to Tennessee students were oral (**81.1 percent**) followed by inhaled (**10.1 percent**) and topical (**7.1 percent**).

Type, Number, and Percent of Students Receiving a Health Care Procedure on a Daily or Routine Basis at School from a Licensed Health Care Professional 2015-16

Procedure Performed by Licensed Health Care Professional	Number of Students Receiving Procedure on a Daily or Routine Basis at School from Licensed Health Care Professional	Percent of Total
Other	2,091	18%
Blood Glucose Monitoring	2,099	18%
Carb Counting	2,028	17%
Diabetes Injections	1,537	13%
Urine Ketone Testing	1,233	11%
Nebulizer Treatment	1,113	10%
Insulin Pump	811	7%
G/T Tube Feeding	605	5%
C.I.C.	163	1%
Total	11,680	100%

During 2015-16, **11,680** students received a procedure on a daily or routine basis at school from a licensed health care professional. The most frequent procedures performed by licensed health care professionals were: “other” (**18 percent**), blood glucose monitoring (**18 percent**), carb counting (**17 percent**), diabetes injections (**13 percent**), urine ketone testing (**11 percent**), and nebulizer treatment (**10 percent**).

Type, Number, and Percent Change of Students Receiving a Health Care Procedure on a Daily or Routine Basis at School from a Licensed Health Care Professional 2006-07 to 2015-16

Procedure Performed by Licensed Health Care Professional	Number of Students Receiving Procedure on a Daily or Routine Basis at School from Licensed Health Care Professional 2006-07	Number of Students Receiving Procedure on a Daily or Routine Basis at School from Licensed Health Care Professional 2015-16	Percent Change
Blood Glucose Monitoring	2,490	2,099	-16%
Carb Counting	1,532	2,028	93%
Other	776	2,091	63%
Diabetes Injections	911	1,537	41%
Nebulizer Treatment	735	1,076	34%
Urine Ketone Testing	NA	1,113	NA
Insulin Pump	NA	811	NA
G/T tube feeding	867	605	-30%
C.I.C.	287	163	-43%
Total	7,598	11,680	35%

Between 2006-07 and 2015-16, the total number of procedures performed by a licensed health care professional increased by **35 percent**.

**Type, Number and Percent of Students Performing Own Procedure at School Without Assistance
2015-16**

Procedure Performed by Student	Number of Students Performing Own Procedure on a Daily or Routine Basis at School Without Assistance	Percent of Total
Blood Glucose Monitoring	1,158	27%
Carb Counting	912	21%
Diabetes Injections	928	22%
Urine Ketone Testing	550	13%
Insulin Pump	457	11%
Other	73	.02%
Nebulizer Treatment	113	.03%
G/T tube Feeding	10	.002%
C.I.C.	71	.016%
Total	4,272	100%

During 2015-16, **4,272** students performed their own procedure on a daily or routine basis at school without assistance. The most frequent procedures performed by students without any assistance were blood glucose monitoring (**27 percent**), diabetes injections (**22 percent**), carb counting (**21 percent**), and urine ketone testing (**13 percent**).

**Procedures Performed Annually On All Students by Licensed Health
Care Provider and UAP 2015-16**

Procedure Performed Annually On All Students by Licensed Health Care Provider and UAP	Number of Procedures Performed Annually On All Students By Licensed Health Care Provider and UAP	Percent of Total
Other	2,139	18%
Carb Counting	2,127	17%
Blood Glucose Monitoring	2,275	19%
Diabetes Injections	1,537	13%
Urine Ketone Testing	1,312	11%
Nebulizer Treatment	1,113	9%
Insulin Pump	811	7%
G/T tube Feeding	605	5%
C.I.C.	163	1%
Total	12,082	100%

During 2015-16, Licensed Health Care Providers and Unlicensed Assistive Personnel (UAP's) performed **12,082** procedures annually on all students. The most frequent procedures performed were blood glucose monitoring (**19 percent**), "other" (**17 percent**), carb counting (**17 percent**), and diabetes injections (**13 percent**).

Type, Number and Percent of Students Receiving a Health Care Procedure on a Daily or Routine Basis at School from an Unlicensed Health Care Professional 2015-16

Procedure Performed by Unlicensed Health Care Professional	Number of Students Receiving Procedure on a Daily or Routine Basis at School from Unlicensed Health Care Professional	Percent of Total
Other	48	12%
Blood Glucose Monitoring	176	44%
Carb counting	99	25%
Urine Ketone Testing	79	20%
Total	402	100%

During 2015-16, **402** students received a procedure on a daily or routine basis at school from an unlicensed health care professional. The most frequent procedures performed by unlicensed health care professionals were blood glucose monitoring (**44 percent**), "other" (**58 percent**), carb counting (**25 percent**), and urine ketone testing (**20 percent**), and urine ketone testing (**20 percent**).

Number and Type of Personnel Trained Annually to Administer Medications 2015-16

Personnel Trained Annually to Administer Medications	Number	Percent of Total
Teachers	10,264	53%
Secretaries	2,264	12%
Teaching Assistants	1,641	11%
Other	3,081	8%
LPN Nurses	584	3%
Principals	563	3%
Assistant Principals	492	2.5%
School Counselors	329	1.7%
Nurse Assistants/Health Room Aide	165	0.9%
Total	19,383	100%

The majority of school personnel trained annually to handle medications and record keeping in 2015-16 were teachers (**53 percent**) followed by secretaries (**12 percent**) and teaching assistants (**11 percent**).

All medications except those designated by an individual healthcare plan (IHP) must be maintained in a secure location under the supervision of a school nurse and/or other school personnel who have been oriented/trained and assigned to handle medications and record keeping per state guidelines. All school districts reported medications were locked in a secure storage location

School Nurses

Out of the **1,811** public schools in Tennessee, **47 percent** or **856** schools employed a nurse full time in their school.

Type, Number, and Method of Funding for School Nurses 2015-16

School Nurses	FTE's Employed by School System/Special Schools	FTE's Employed by Health Department	FTE's Employed by Hospital	FTE's Contracted by Agency	FTE's Ed Services Center	Totals
Master of Science (MSN's)						
General Student Population School Nurses	22	2.84	1	9.83	0	35.67
Special Ed Nurses						
Bachelors of Science (BSN's)						
General Student Population School Nurses	329.7	18.9	1	15	1.71	366.32
Special Ed Nurses	13	0	0	0	0	13
Registered Nurse (RN's)						
General Student Population School Nurses	363.3	22.3	3	32.13	0	420.73
Special Ed Nurses	16	0	1	0	0	17
Licensed Practical Nurse (LPN's)						
General Student Population School Nurses	446.79	0	14	8.42	0	469.21
Special Ed Nurses	94.9	0	0	0	0	101.9
Total	1,285.69	44.05	20	72.38	1.71	1,424

*FTE = Full Time Equivalent

**Basic Education Program (BEP) funds specified, other local, or federal sources used to employ or contract

***Special Education funds used to employ or contract

Position of Those Who Provided First Aid at the School in the Absence of the RN Nurse 2015-16

Position Title	Total Number of LEAs	Percent of 139 LEAs
Secretary	2,264	13%
Teacher	10,264	72%
Teacher Assistants	1,641	11%
Principal	563	25%
LPN	584	24%
Other	3,081	22%
School Counselor	329	.03%
Assistant Principal	492	.04%
Parent Volunteer	165	.09%
Total:	19,383	

First aid services provided in the absence of an RN school nurse were provided by teachers in **72 percent** of all cases, **25 percent** by principals, and **24 percent** by LPN.

Types of Personnel the School Nurse Directs/Delegates/Trains and Supervises In the Performance of Skilled Nursing Tasks 2015-16

Types of Personnel the School Nurse Directs/Delegates/Trains and Supervises In the Performance of Skilled Nursing Tasks	Number	Percent of Total
Teachers	9,990	63%
Secretaries	1,925	12%
Other	1,508	9%
Principals	781	5%
LPN Nurses	737	5%
Bus Driver	584	4%
Parent Volunteer	171	.01%
Health Room Aide	158	<.01%
Personal Care Attendant	90	<.01%
Total	15,944	100%

Approximately **63 percent** of all personnel who the school nurse directs/delegates/trains and supervises in the performance of non-skilled nursing tasks are teachers followed by secretaries (**12 percent**) and “other” (**9 percent**).

During the 2015-16 school year, **15,944** people in Tennessee school districts/special schools were supervised by an RN to perform non-skilled tasks.

Health Screenings

Number of School Systems/Special Schools Providing Health Screening Programs

2015-16

Type of Health Screening	Number of School Systems/Special Schools (N=142)	Percent of Total Number of School Systems/Special Schools (N=142)
Vision	142	100%
Blood Pressure	142	100%
Body Mass Index (BMI)	142	100%
Hearing	142	100%
Dental	76	53%
Scoliosis	39	27%

All school systems/special schools provided vision, hearing, BMI and blood pressure screenings for their students. Approximately **27 percent** of all school districts/special schools provided scoliosis screenings, and **53 percent** of all school districts/special schools provided some type of dental screenings.

Type, Number and Percent of Total Number of Students Screened 2015-16

Type of Health Screening	Number of Students Screened	Percent of Total Number School Health Screenings
Vision	335,637	24%
Hearing	339,375	24%
Body Mass Index (BMI)	346,504	25%
Blood Pressure	304,923	22%
Dental	45,975	3%
Scoliosis	19,348	.01%
Total	1,391,762	100%

During the 2015-16 school year, **1,391,762** student health screenings occurred in Tennessee schools. The most common type of screenings were body mass index (BMI) (**25 percent**), vision (**24 percent**), hearing (**24 percent**) and blood pressure (**add in percent amount here**).

***Type, Number and Percent of Students Screened 2008-09 and
2015-16***

Type of Health Screening	Number of Students 2008-09	Number of Students 2015-16	Percent Change
Vision	395,415	335,637	-9%
Hearing	320,245	339,375	-1%
Body Mass Index (BMI)	289,617	346,504	+8%
Blood Pressure	281,033	304,923	-0.2%
Dental	107,093	45,975	-43%
Scoliosis	29,173	19,348	-66%
Total	1,422,576	1,391,762	-5%

The percentage of school health screenings decreased by **5 percent** overall from 2008-09 to 2015-16 and student BMI screenings increased by **18 percent**.

Hearing screenings decreased by **1 percent**, scoliosis screenings decreased by **66 percent**, dental screenings decreased by **43 percent**, and vision screenings decreased by **9 percent**.

Type, Number and Percent of Total Number of Students Recommended to Receive Health Screenings 2015-16

Type of Student Health Screening	Grades <u>Recommended</u> to be Screened	Total Number of Students in Tennessee Schools(in these grades)	Number of Students Screened	Percent of Total Number of Students <u>Recommended</u> to be Screened
Vision	Pre-K, K, 2, 4, 6, 8	402,180	335,637	83%
Hearing	Pre-K, K, 2, 4, 6, 8	402,180	339,375	84%
Body Mass Index (BMI)	K, 2, 4, 6, 8, and 9	406,650	346,504	85%
Blood Pressure	K, 2, 4, 6, 8, and 9	406,650	304,923	75%
Total		1,617,660	1,326,439	82%

During the 2015-16 school year, **82 percent** of all Tennessee students who were recommended to receive school health screenings received them. Also, **83 percent** of all students recommended to receive a vision screening received one, **84 percent** of all students recommended to receive a hearing screening received one, **85 percent** of all students recommended to receive a BMI screening received one, and **75 percent** of all students recommended to receive a blood pressure screening received one.

Type, Number and Percent of Students Referred to a Healthcare Provider As a Result of School Health Screening Programs 2015-16

Type of Health Screening	Number of Referral(s) made to a Healthcare Provider	Percent of Total
Body Mass Index	48,620	36%
Vision	44,484	33%
Dental	9,717	7%
Blood Pressure	17,683	13%
Hearing	12,053	9%
Scoliosis	1,040	.07%
Total	133,597	100%

During the 2015-16 school year, **133,597** student referrals were made to a health care provider as a result of a school health screening. Most referrals were a result of body mass index (BMI) screenings (**36 percent**), vision screenings (**33 percent**) and blood pressure screenings (**13 percent**).

Type, Number and Percent of Change for Students Referred to a Health Care Provider As a Result of School Health Screening Programs 2006-07 and 2015-16

Type of Health Screening	Number of Referral(s) made to a Health Care Provider 2006-07	Number of Referral(s) made to a Health Care Provider 2015-16	Percent Change
Body Mass Index	7,232	48,620	572%
Vision	19,875	44,484	124%
Dental	15,757	9,717	-16%
Blood Pressure	1,976	17,683	795%
Hearing	7,330	12,053	64%
Scoliosis	939	1,040	10.8%
Total	53,109	133,597	152%

The total number of students referred to health care providers increased **152 percent** between 2006-07 and 2015-16. The most significant increase in referrals from 2006-07 to 2015-16 were for body mass index (BMI) (**572 percent**), blood pressure (**795 percent**), and vision (**124 percent**). Referrals also increased for scoliosis **by 10.8 percent**.

Type and Number of Students Screened, Referred to a Healthcare Provider and Confirmed Follow-ups by School Staff As a Result of School Health Screening Programs 2015-16 Public Schools

Type of Health Screening	Number of Students Screened	Number of Students Referred to Healthcare Provider	Number of Confirmed Referral Follow- ups by School Staff
Vision	335,637	44,484	12,500
Hearing	339,375	12,053	2,319
Body Mass Index (BMI)	346,504	48,620	795
Blood Pressure	304,923	17,683	3,533
Dental	45,975	9,717	3,831
Scoliosis	19,348	1,040	101
Total	1,391,762	133,597	23,079

During the 2015-16 school year, **10 percent** of students who participated in school health screenings received a referral to a healthcare provider. Of those students who were referred to a healthcare provider, **17 percent** were confirmed by school staff that the student actually visited their healthcare provider.

Emergency Procedures

Type, Number and Percent of Students Receiving Emergency Procedure by Licensed Health Care Providers in School 2015-16

Emergency Procedure	Number of Students	Percent of Total
Asthma	12,989	50%
Other – broken bones, resuscitation, burns, etc.	12,531	49%
Epi-Pen®	109	.004%
Diastat®	107	.004%
Glucagon®	6	.0002%
Total	25,742	100%

During the 2015-16 school year, **25,742** students received an emergency procedure in Tennessee schools. Almost all of the emergency procedures were provided to students for asthma (**50 percent**) and for “other” (**49 percent**).

Type, Number and Percent Change of Students Receiving Emergency Procedures by Licensed Health Care Providers in School 2008-09 and 2015-16

Emergency Procedure	Number of Students 2008-09	Number of Students 2015-16	Percent Change
Asthma	7,388	12,989	57%
Other	NA	12,531	NA
Epi-Pen®	84	109	7%
Diastat®	70	107	65%
Glucagon®	26	6	-65%
Total	7,568	25,742	30%

The total percentage of students receiving an emergency procedure increased by **30 percent** from 2008-09 to 2015-16. The largest area of increase involved using an asthma inhaler (**57 percent**). The emergency administration of Glucagon® decreased by **65 percent**.

Also, **89 out of 142** school systems/special schools report they have a policy that allows trained volunteers to administer Glucagon® in schools.

Allergies

Allergies – Use of Epi-Pens® 2009-10 and 2015-16

Types of Epi-Pen Use	2009-10	2015-16	Percent Change
Number of students that have Epi-Pens® available at schools	6,230	12,500	51%
Number of students that required administration of the Epi-Pen®	95	31	-3%
Number of teachers and staff trained to administer an Epi-Pen® if needed	19,240	42,849	45%

Substantial increases have occurred during the past six years regarding the number of students that have Epi-Pens® available at schools (**51 percent increase**). The number of students requiring administration of the Epi-Pen® at school declined by **3 percent** and the number of school personnel trained to administer an Epi-Pen® if needed increased by **45 percent**.

Type, Number and Percent of Student Allergies 2015-16

Type of Student Allergies	Number of Students with Allergies	Percent of Total
Environmental	38,044	30%
Other (Includes Allergies)	38,951	30%
Other - Food	13,609	10%
Nuts	15,863	12%
Insects	11,645	.09%
Shellfish	5,261	.04%
Eggs	3,442	.03%
Latex	2,364	.02%
Food/Dye	2,005	.01%
Total	131,184	100%

There were **131,184** students diagnosed with allergies in Tennessee schools during the 2015-16 school year. The most common types of allergies among students were “other (includes medicine allergies)” (**30 percent**), environmental (**30 percent**), and nuts (**12 percent**).

Type, Number and Percent Change of Student Allergies 2010-11 and 2015-16

Type of Student Allergies	Number of Students with Allergies 2010-11	Number of Students with Allergies 2015-16	Percent Increase
Environmental	26,785	38,0	42%
Other (Includes Allergies)	22,672	38,951	72%
Other - Food	8,938	13,607	52%
Insects	7,737	11,645	51%
Nuts	7,319	15,863	17%
Shellfish	2,254	5,261	33%
Eggs	1,831	3,442	88%
Food/Dye	1,720	2,005	16%
Latex	1,459	2,364	62%
Total	80,715	131,184	63%

From 2010-11 to 2015-16 school year, the number of students identified with allergies increased by **63 percent**. Eggs (**88 percent**), other “medication allergies” (**72 percent**), nuts (**77 percent**), latex (**62 percent**), and “other-Food” allergies (**52 percent**) increased the most from the 2010-11 to 2015-16 school year.

Seizure Disorders

Seizure Disorders/Diastat Medication 2008-09 and 2015-16

Number of students that had Diastat® available at school 2008-09	Number of students that had Diastat® available at school 2015-16	Percent Change	Number of students that required administration of Diastat® 2008-09	Number of times Diastat® was administered at school 2014-15	Percent Change
835	1,721	49%	87	107	8%

In 2015-16 there were **1,721** students with a seizure disorder diagnosis with Diastat® available for use at school compared to **835** students in 2008-09. This represents a **49 percent** increase over a six year period.

A total of **107** doses of Diastat® were administered to students in school systems this year compared to **87** doses in 2008-09. This represents an **8 percent** increase over a six year period. School Health Supervisors in **106 LEAs (75 percent)** reported having a district Diastat® policy in place, while **36 LEAs (25 percent)** reported they did not have a district Diastat® policy.

School districts report **95** school systems (**67 percent**) have a policy allowing the nurse to administer the first dose of Diastat® at school; **19** LEAs did not allow nurses to administer the first dose of Diastat® at school (**13 percent**) and **28** LEAs did not answer the question (**20 percent**).

There were **525** students with an order to administer Diastat® who did not have a full-time nurse assigned to the school compared to **172** students in 2008-09. In addition, **277** nurses were assigned to a school to serve as a full-time nurse for this student.

During the 2015-16 school year, **27** students received Diastat® more than once per year compared to **24** students in 2008-09. **136** out of **142** school systems/special schools called 911 immediately as the standard protocol when Diastat® was administered compared to **117** school systems in 2008-09. Diastat® was administered **99** times at school by a nurse, **12** times by a trained volunteer, and **16** times by parents or guardians during the 2015-16 school year.

Also, **138** school systems/special schools (**97 percent**) reported that if a student who has Diastat® at school has a seizure and no nurse is available to administer the medication, then a 911 call serves as standard protocol. **4** LEAs answered that this was **not** their standard protocol.

During the 2015-16 school year, **68** LEAs (**48 percent**) had a policy allowing trained volunteers to administer Diastat®; **74** LEAs (**52 percent**) did not have a policy.

Diabetes

Number of Students Diagnosed with Type I or Type II Diabetes by Grade Level 2015-16

Grade Level	Number of Students Type I Diabetes	Number of Students Type II Diabetes	Total Number of Students Diagnosed with Type I and Type II Diabetes
Pre-school	21	1	22
Kindergarten	74	4	78
Grades 1-5	657	82	739
Grades 6-8	862	198	1,060
Grades 9-12	1,411	431	1,842
Total	3,025	716	3,741

There were **3,741** students in Tennessee schools with a diagnosis of diabetes during the 2015-16 school year. Of these, **3,025** students or **80 percent** were diagnosed with Type I diabetes and **716** students or **19 percent** were diagnosed with Type 2 diabetes. The highest percentage of students diagnosed with diabetes attended high schools (**49 percent**) followed by middle schools (**28 percent**) and then elementary schools (**20 percent**).

Number of Students Diagnosed with Type I or Type II Diabetes by Grade Level 2009-10 and 2015-16

Grade Level	Number of Type I and Type II Students 2009-10	Number of Type I and Type II Students 2015-16	Percent Change
Pre-school	23	22	9%
Kindergarten	98	78	-28%
Grades 1-5	923	739	-12%
Grades 6-8	867	1060	26%
Grades 9-12	1,446	1842	27%
Total	3,357	3741	10%

The number of students diagnosed with Type I and Type II diabetes in Tennessee schools decreased overall by **10 percent** from 2009-10 to 2015-16. However, kindergarten and elementary school data actually showed a decline in percentages since the 2009-10 school year.

Management Tasks for Type 1 Diabetic Students 2015-16

Management Tasks for Type I Diabetic Students	Number of Type I Diabetic Students
Number of students that required management tasks by a licensed health care professional (to provide injections)	1,420
Number of students that require assistance by a school staff member (to provide injections)	246
Number of students managing their own injections but a nurse is required to monitor them at least 2 times per year	552
Number of students that require minimal (at least two times per year) assistance with management of diabetic pumps	443
Number of students that require management of diabetic pumps by a licensed health care professional	801
Number of students that require assistance to manage diabetic pumps by a school staff member	214
Number of times a student's insulin pump malfunctioned at school this year	0
Number of students that have Glucagon® ordered as an emergency treatment for low blood glucose	2,955
Number of LEA's with a policy that allows trained volunteers to administer Glucagon®	90
Number of students with Type I diabetes that have Glucagon® available at school	2955
Number of schools that have a full-time nurse assigned to the school because of a student(s) with Type 1 diabetes	295
Number of students with Type 1 diabetes that require a full-time nurse to be on the premises at all times at that school	810

During the 2015-16 school year, **2,218** students with Type 1 diabetes were managed by using a pen/syringe during the school day. An additional **1,458** students with Type 1 diabetes were managed by using pumps.

Management Tasks for Type 2 Diabetic Students 2015-16

Management Tasks for Type 2 Diabetic Students	Number of Type II Diabetic Students
Number of students with Type 2 Diabetes that require management tasks by a licensed health care professional (to provide injections)	57
Number of students with Type 2 Diabetes only needs nurse to monitor at least two times per year	81
Number of students with Type 2 Diabetes that are managed by injections	80
Number of students with Type 2 Diabetes that require assistance by a school staff member	10

Of the **716** students in Tennessee public schools with a Type II Diabetes diagnosis, **81** students (**11 percent**) did not require assistance with management tasks during the school day.

School-Based Clinics

Comparisons between Various School-Based Clinic Indicators 2013-14 and 2015-16

School-based Clinic Indicators	2013-14	2015-16	Percent Change
Number of LEAs with school clinics	37	33	-12%
Number of schools with clinics	186	155	-0.2%
Number of students served in school clinics (physical health only)	29,310	59,579	49%
Number of student referrals to other health care providers	3,223	7,018	46%
Number of student referrals "confirmed" by clinic staff	2,043	4,103	50%
Number of EPSDT exams by clinic	6,314	5,915	-.07%
Number of EPSDT exams by private provider (<i>Well Child Inc.</i> , etc.)	41,164	42,910	.04%
Number of students received an EPSDT exam due to schools transporting students to the local health depart	4	0	-100%
Number of school-based/school-linked clinics providing behavioral health services for students	93	125	7%
Number of students receiving behavioral health services in school-based/school-linked clinics	NA	5,104	NA
Number of students referred to community behavioral health provider	3,614	2,175	-60%
Number of behavioral health referrals confirmed by clinic staff	1,278	1,585	24%
Number of school clinics using tele-medicine	87	120	47%

Number of school clinics providing dental services	31	66	212%
Number of students receiving dental services in clinics	23,507	16,050	-68%
Number of school clinics providing staff services	99	127	28%
Number of school staff served in school clinics	2,800	3,342	19%
Number of school clinics providing immunizations	73	60	-82%
Number of students receiving immunizations in clinics	3,141	22,343	141%
Number of school-based/school-linked clinics provided immunizations using Vaccine For Children program	42	133	32%
Number of school-based clinics provided private pay/insurance billable immunizations for students	71	96	7%

In 2015-16, **7,018** student referrals were made to other health care providers (optometrist, audiologist, pediatrician, etc.). The number of school systems/special schools with school-based clinics increased from **32** in 2014-2015 to **33** in 2015-16 (**1 percent increase**).

Out of the **62** school districts that responded to this question, **155** report having at least one school-based clinic, ranging from 1 clinic up to 23 clinics. Also, survey respondents said their school districts planned to open **16** new clinics during the 2015-16 school year. Of the **155** schools that provided clinic services in 2015-16, **77 percent** used tele-medicine, **82 percent** provided services to staff as well as students, **38 percent** provided immunizations, and **43 percent** provided dental services in the clinics.

In 2015-16, **42,910** EPSDTs (well child exam) were provided to Tennessee students either by a school clinic practitioner, a private provider in the schools, or county health department via school transport. Of these, **90 percent** received EPSDT through *Well Child, Inc.* or another private provider at school, and **10 percent** received an EPSDT through a school-based clinic. The total percentage of students receiving immunizations in clinics increased by **141 percent** from 2013-14 to 2015-16.