

Stop the Bleed Education Implementation in Allegheny County High Schools

by

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Objective: To understand the implementation and perceived barriers to offering Stop the Bleed training to students in Allegheny County high schools.

Study Design: Stop the Bleed training is not mandatory in Pennsylvania high schools. A multiple-choice survey was distributed to the principals of Allegheny County high schools investigating school demographics, participation in Stop the Bleed training, funding, implementation barriers, and bleeding control kits.

Results: Twenty-one schools responded (22%) with the majority of high schools having 100-500 students and 25-50 staff and faculty members. 62% of responding schools were aware of the Stop the Bleed campaign but only two high schools had successfully implemented training into their curriculum. Time commitment, cost, and availability of training equipment were ranked as the most common perceived barriers to implementation. Stop the Bleed kits were placed in 43% of responding high schools. Three schools reported having bleeding emergencies where a bleeding control kit could have been used in the last 10 years.

Conclusions: Little progress has been made to implement Stop the Bleed training programs into Allegheny County high schools. Many schools that responded were unaware of the program, so increased education to improve awareness may be needed. Among the schools who were aware of the program, majority had not implemented due to a number of barriers.

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1.0 Introduction

Accidental injuries are the leading cause of death in the United States for individuals 1-44 years of age.¹ Specifically, there are 2.6 million hospitalizations, 34.9 million emergency room visits, and 87.6 million medical office visits per year related to accidental injuries.¹ These numbers have improved significantly since the introduction of cardiopulmonary resuscitation (CPR) and basic life support in the 1960's, however, it is still the case that fewer than 30% of out-of-hospital resuscitation attempts are initiated by lay bystanders.¹ Basic first aid training is designed to provide immediate and efficient treatment for a wide variety of incidents including home injuries, mass casualty events, car crashes, or natural disasters. Training could include alerting emergency medical systems, maintaining the airway, breathing and circulation, respiratory and cardiac arrest and hemorrhage control.¹

Like any emergency situation, response time is critical, and training must be performed properly in order to potentially save lives and prevent further lifelong complications.¹ The Stop the Bleed campaign is intended to encourage bystanders to become trained, equipped, and empowered to help in a bleeding emergency before professional help arrives. Stop the Bleed techniques and interventions have been confirmed as effective following years of conflict and will assist trained civilians to optimize survival for bleeding victims.⁹ In August 2016, the Western Pennsylvania Stop the Bleed campaign was launched. By combining the efforts of regional trauma and non-trauma centers with an outreach program design, schools and law enforcement were targeted. As of June 2018, a total of 436 bleeding control kits were distributed to 102 public schools.⁸ Teachers and staffs have completed training in about 70 school districts.⁹

Stop the Bleed could have the potential to be as familiar as cardiopulmonary resuscitation (CPR) training in present day school systems. Currently, Pennsylvania does not have mandatory requirements for Stop the Bleed training in school curriculum. With over a million people in Allegheny County and several college campuses, this large community has the potential to promote a message of Stop the Bleed awareness to surrounding areas. Educating youth with Stop the Bleed training can increase the number of bystanders turning into first responders in communities each year. The purpose of this study is to investigate the progress and perceived barriers of implementing Stop the Bleed training into high schools by surveying Allegheny County high school principals.

2.0 Review of Relevant Literature

The Stop the Bleed Campaign has grown substantially over the last five years. The American College of Surgeons and the Federal Bureau of Investigation met in April 2013, following the shooting incident at Sandy Hook Elementary School, to bring leaders from the law enforcement, medical, fire and rescue, and EMS communities to discuss with military experts ways to improve survival of victims of mass casualty shootings.³ The goal was to take lessons learned from the battlefield and transform them into civilian responses to prevent unnecessary deaths resulting from active shooter incidents. Two years later, in 2015, the National Security Council Staff of the White House proposed the Stop the Bleed campaign. This movement encourages bystanders to become trained, equipped, and empowered to help stop bleeding in an injured person before first responders arrive.³ As of winter 2019, there have been 65,000 United States instructors and 1.1 million civilians trained.¹²

Exsanguinations, bleeding to death, can happen in minutes therefore making bleeding control kits available can be an important step in addressing preventable trauma deaths. A bleeding control kit includes essential life-saving equipment used in a major trauma event such as vehicle accidents, mass shootings, sports-related injuries, or workplace and classroom mishaps. Having appropriate equipment readily available for the general public can be the difference between life and death. A bleeding control kit includes tourniquets, chest seals, compression bandages, bleeding control bandages, space emergency blankets, latex-free gloves, scissors, markers, and instruction documents.¹¹

Based on thirteen studies reporting mortality data for casualties treated with tourniquets, prehospital tourniquets are an effective treatment method for the prevention of death due to

exsanguinations. Casualties treated with prehospital tourniquets reported a range from 87%-100% survival rate.¹² Specifically, the military's experience treating external hemorrhage before and after using tourniquets during the wars in Iraq and Afghanistan prove that tourniquet use saves life, with manageable adverse side effects not outweighing the benefits of the use. In a meta-analysis of nine studies in military settings, prehospital tourniquet survival rate for casualties was between 91.9% and 95%.¹² In a Texas Tourniquet study, 1,026 patients with vascular injuries of the arms and legs were admitted to eleven urban Level 1 Trauma centers in Texas from 2011 to 2016. After multivariable analysis, groups with no tourniquet had almost six times greater odds of death than the group of patients who received a tourniquet.⁴

Unfortunately, mass shootings have increased over the past several years drawing attention to places that may be or have been targeted, such as schools. In 2019, active shooter events occurred in 40 out of 50 states and the District of Columbia. More specifically, 25 shooting incidents that occurred on school grounds or during school-sponsored events took the lives of eight people and injured 45 others.¹⁰ Twelve states in the U.S. have introduced or implemented legislations to educate and inform their citizens to save lives in the event of a bleeding emergency. In September 2019, Governor Greg Abbot of Texas signed HB 496, which is unofficially known as the Stop the Bleed law, requiring all Texas school districts and open enrollment charter schools to have bleeding control stations available on their campus.¹⁷ Similarly, Indiana has passed laws to install Stop the Bleed kits and trainings in schools. Georgia has included cost to install Stop the Bleed kits in schools as part of the state's budget while, Arkansas passed a bill requiring high school students to participate in Stop the Bleed training as a requirement for graduation.¹³ A study assessed the perceptions of self-efficacy and school preparedness of personnel in an urban high school after a basic bleeding control course.⁷ Following the completion of the 1-hour Stop the

Bleed course, personnel perceptions of self-efficacy and school preparedness significantly increased and individuals felt that their school required more equipment for a life-threatening bleeding incident.⁷

Individuals who complete the Stop the Bleed course have the potential to gain more than just a certificate. Currently, Stop the Bleed courses are offered free of charge although, sometimes expenses are incurred to hold one. All instructors volunteer their time and expertise to teach training. The Stop the Bleed website contains upcoming courses, which are updated on a regular basis. If there is not a course available near you, contacting the local hospital can help set one up to be held in your community.¹³ The course lasts no more than 90 minutes with a formal presentation followed by hands-on practice of applying direct pressure, packing a wound, and using a tourniquet to stop bleeding, with an instructor to student ratio of 8:1.¹³ The instructors will keep working with an individual until they demonstrate the correct skills to 'Stop the Bleed.' The costs of kits can vary depending on funding used to purchase them. Currently, there is no specific or direct federal funding behind Stop the Bleed to purchase kits. Schools can choose to use federal grant money, individual school budgets, or other organization fundraisers.³ Recently, a Stop the Bleed Training Kit Grant program has been announced. This program is funded by the Stop the Bleed Coalition and is designed to support schools, non-profit, government agencies, civic and faith-based organizations whom are responsible for training their communities but lack funds to purchase the equipment. If awarded the grant, a free Stop the Bleed training kit (\$1000 value) will be given to teach the hands-on portion of the course. Depending on how many kits are placed in schools, it can get costly. For example, the Wall Mounted Stop the Bleed Station includes 8 personal Stop the Bleed Kits but runs for \$800.¹¹

Stop the Bleed training can be important for reducing morbidity and mortality from bleeding emergencies. Over the last few years, there has been increased effort to expand Stop the Bleed awareness and trainings but there can still be barriers related to cost and logistics. There is no evidence specifically regarding barriers to implementing Stop the Bleed perceived by school administrators.

3.0 Methodology

This study was performed by distributing electronic surveys to all 98 Allegheny County, Pennsylvania public and private high school principals. The list of high schools was obtained from High-Schools.com, under the category of ‘high schools located in Allegheny County, PA’. A 14-question multiple-choice survey was created to collect Stop the Bleed data about the high schools. (Appendix A Survey). The survey was designed to investigate awareness, implementation, obstacles to implementation, and funding of the Stop the Bleed Campaign within these schools. Principal email addresses were obtained from staff directories found on the school’s public website. The initial email included an introductory paragraph explaining the purpose and length of the survey followed by the survey link. There were no foreseeable risks associated with the survey nor were there any direct benefits. Potential participants were contacted via email with the initial survey, followed by a reminder 1 week later, and a final reminder at day 10. Principals with emails that were “undeliverable” were cold called. If they could not be reached via phone or email, they were excluded from the study. Qualtrics, an Internet-based survey software was used to collect and analyze survey results. The recorded replies of the survey were collected anonymously, and results could be analyzed in group reports or individual answers. The survey was reviewed by the University of Pittsburgh Institutional Review Board and assigned a determination of “Not Human Research” because the survey was determined to be about a program instead of the individual respondents.

4.0 Results/Findings

Twenty-one high schools in Allegheny County completed and submitted the survey, for a response rate of 23%. The breakdown of survey completion is expressed in a flow chart (Figure 1). Responding high schools consisted of fourteen public schools and seven private schools. Total students ranged from fewer than 100 up to 2000. The Table specifies the responding school's demographics, including faculty and staff size. Four of the high schools had a current First Aid course offered to their students. Thirteen out of the twenty-one (62%) responding high schools were aware of the Stop the Bleed campaign with two schools implementing training for students into their curriculum. The two schools that have implemented training for students were classified as public high schools and their training was funded by a health education budget. Observed barriers to implementation were time commitment, cost, and availability of training equipment, ranked in decreasing order by number of responses (Figure 2). Seven schools responded regarding barriers with three schools selecting more than one perceived barrier. Time commitment was reported as an obstacle in five of the schools while cost was selected in three of the reporting schools. Of responding high schools, 33% reported that faculty and staff is trained in Stop the Bleed. Seven of the thirteen high schools that were aware of the Stop the Bleed campaign had their faculty and staff trained, with only one of those schools identifying as a private school. 43% of responding high schools had Stop the Bleed kits on their school grounds. The bleeding control kits were obtained from a variety of sources including school district funds, Jewish Federation of Greater Pittsburgh, and Stop the Bleed Campaign (Figure 3). Responding schools showed interest in training students at different grade levels (Figure 4). In the last 10 years, 14% of responding schools had a bleeding emergency where a Stop the Bleed kit could have been used.

Table 1 Demographics of responding schools

	Mode	Range
School Size	100-500	<100 to >5000
Faculty/Staff Size	25-50	<25 to >200

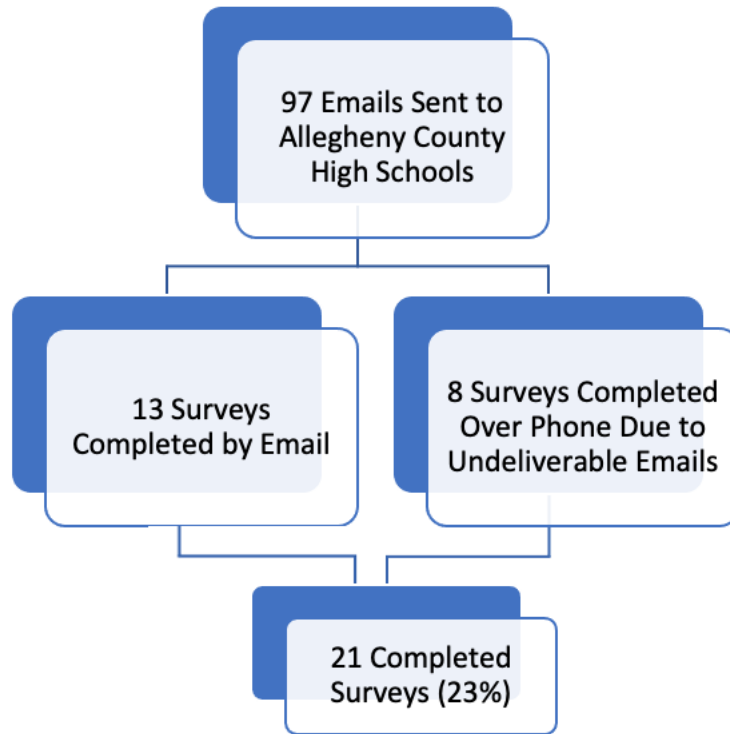


Figure 1 Survey response breakdown

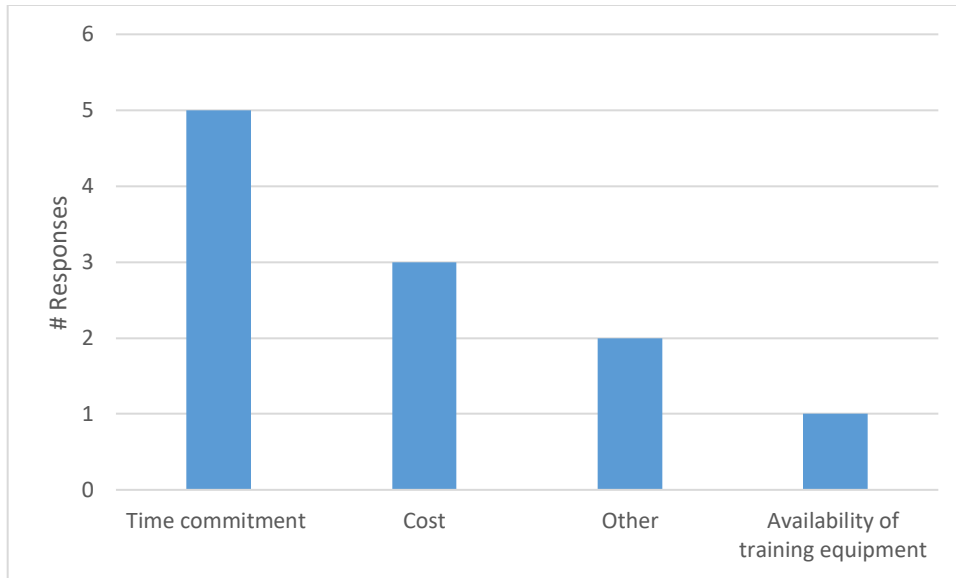


Figure 2 Perceived Barriers to Implementation – Subsample Includes 7 Schools

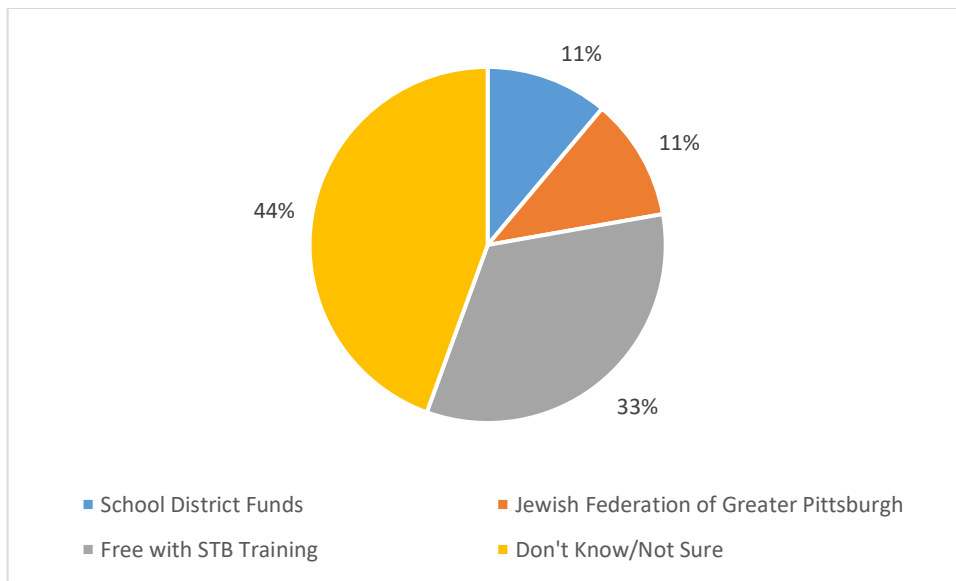


Figure 3 Sources of Funding for Stop the Bleed Kits – Subsample Includes 9 Schools

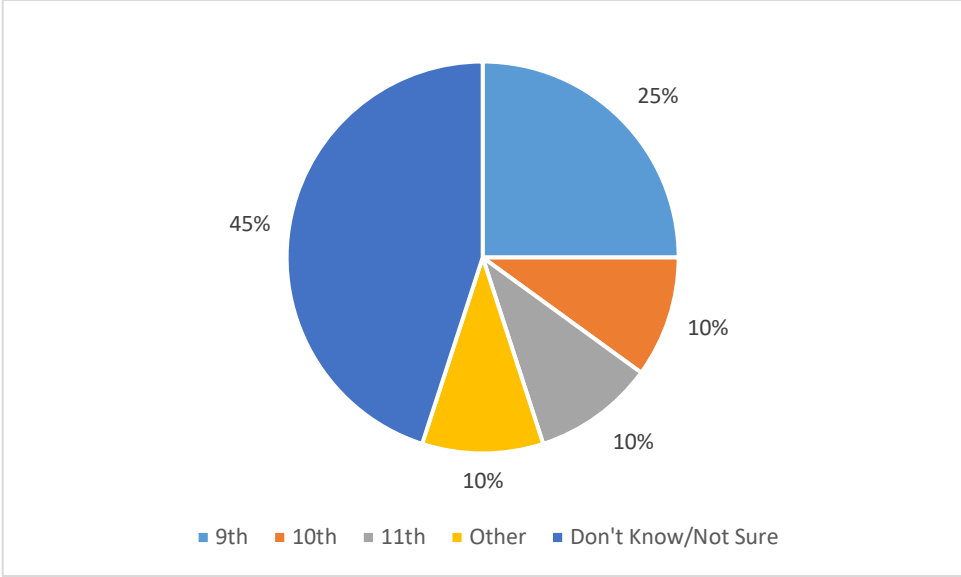


Figure 4 Grades of Interest for Training – Subsample Includes 12 Schools

5.0 Discussion

The results of the survey distributed to Allegheny County high school principals show that the awareness of the Stop the Bleed campaign is not equal across the county. The reality of Stop the Bleed implementation into schools is low, with the majority of schools not even having a current first aid course offered to their students. There were similarities between observed barriers in this study compared to the challenges of a Stop the Bleed implementation program on John Hopkins University campus. John Hopkins University reported their biggest challenges were obtaining approval to train students and staff and procuring funding for kits and training supplies.¹⁶ The implementation barriers of Allegheny County high schools are logical for an individual school. Time commitment was a large concern, especially this school year with COVID-19 regulations, due to the hours that the students are physically on school grounds. Of the schools that reported perceived barriers, only one of the schools was classified as private and had similar obstacles of cost and time commitment as the reporting public schools. Even though the number of private schools is less than public schools in Allegheny County, the size of student body did not influence the barrier they reported. A school with 100 students is equally as concerned with cost and time commitment as a school with 2000 students. The lack of programs in high schools demonstrates that the burden on individual schools to execute the program into their curriculum is high.

When comparing Stop the Bleed and CPR training, both movements could increase awareness of the purpose of bleeding kits and AED's and amplify the ease and safety of providing help in a traumatic situation. June of 2019, Governor Tom Wolf signed Act 7 that requires the Pennsylvania Department of Education to create curriculum for cardiopulmonary resuscitation.⁵

With the curriculum and guidelines to be developed by the beginning of 2019/2020 school year, Allegheny County is appearing to be behind with these first aid courses considering only four schools have a current course. With sudden cardiac arrest being the leading cause of death in the United States, a study in the American Journal of Medicine concluded that training unselected laypersons in CPR/defibrillation is costly compared with other public health initiatives, although training laypersons selected by occupation, low training costs, or having high-risk household companions is substantially more efficient.⁶ With high schools across the United States requiring students to be trained in CPR to graduate, similar curriculum for Stop the Bleed training could educate hundreds of students yearly.

With the increase in intentional mass casualty events on school grounds over recent years, there is a surprising lack of Stop the Bleed education implementation into schools in Allegheny County. Fortunately, school mass shootings have not been an issue in Allegheny County although, high schools reported having incidents where a bleeding control kit would have been used. This furthers the need to be prepared in all scenarios including sports-related injuries or human-error mishaps that could occur in school. In October of 2018, a man entered the Tree of Life Congregation in Squirrel Hill, Pennsylvania and opened fire killing 11 individuals and injuring 6 others, including two police officers. Of the individuals that survived, several of them arrived at Presbyterian Hospital wearing tourniquets. This massacre has acted as a stimulus for an increased focus on community awareness to be prepared in any location, even a place of peaceful worship. Furthermore, this could potentially be the reason the Jewish Federation of Greater Pittsburgh has purchased bleeding control kits for a high school in Allegheny County.

Almost half of the high schools have bleeding control kits installed but do not have faculty, staff, or students that are trained. An issue may arise when the location of the kit may not be in the

same area as the trained faculty or staff member. If a school were to go into lock down, the location of the bleeding control kits is crucial. Training students in 9th grade, similar to the survey findings, can help increase the probability that a trained individual will be nearby and ready to act upon an emergency situation.

Notable limitations are recognized in studies involving surveys. The survey responses were anonymous with limited school demographics being collected, so it was not possible to conduct a detailed analysis of school characteristics or location. It is likely that if the deadline to respond to the survey was extended past 10 days, more responses could have been recorded, though the response rate is comparable to other studies that have used web-based surveys.³ The role of the person completing the survey was not asked because the link was emailed directly to the principal. A response bias could have existed because there is no certainty that the principal was the one to complete the survey. For example, two different times while cold calling, the call was transferred over to the nurse to complete the questions. A nurse may be more aware of current first aid trainings or protocols. Additionally, high schools operating remotely part-time due to COVID-19 has created a time commitment obstacle for training but may not be relatable to past or future years. Pennsylvania does not have mandatory Stop the Bleed education laws in place, therefore the results may not be generalizable to other states.

6.0 Conclusions

Stop the Bleed training is a critical step for survival in a bleeding emergency. Turning bystanders into first responders with high school Stop the Bleed training programs can help to educate hundreds of civilians at once. This survey demonstrates that there is still a lot of work to be done in Allegheny County raising awareness of the campaign. In this process, success has been found in several schools taking the initiative to educate their faculty and staff in bleeding control methods. Developing strategies that allow for growth of Stop the Bleed knowledge is essential for Allegheny County and may lead to better implementation of the program across the state and improved dissemination of its principles into schools.

The importance of general first aid training needs to be expressed to high schools, considering the low proportion of schools without any first aid courses. Schools need to be held responsible for modifying their curriculum to reflect Governor Wolf's Act 7 requirements. Specifically, high schools should focus on making sure their staff and students are fully aware of the significance of Stop the Bleed training prior to planning to implement training into their curriculum. If high schools are unable to restructure their curriculum, there should be available information where students are able to go and get trained on their own. Additionally, high schools could provide some sort of incentive, such as extra credit or a future half-day of school, for students who complete Stop the Bleed training. On a larger scale, Stop the Bleed awareness needs to be broadcasted on billboards, commercials, sides of busses, etc. Novel platforms, such as social media, can create advertisements or short video to influence individuals to 'Stop the Bleed'.

Appendix A Stop the Bleed Survey

The purpose of this survey is to help understand the awareness and implementation progress of the STOP THE BLEED ® campaign in high schools across Allegheny County. This assessment will only take 5-10 minutes to complete. Your results will remain anonymous. Thank you for your time!

- 1) How many students are enrolled in your school?
 - a) Fewer than 100
 - b) 100-500
 - c) 500-1000
 - d) 1000-2000
 - e) Greater than 2000
- 2) How many faculty/staff members are employed in your school?
 - a) Fewer than 25
 - b) 25-50
 - c) 50-100
 - d) 100-250
 - e) Greater than 250
- 3) How is your high school classified?
 - a) Public
 - b) Private
- 4) Is there an existing First Aid course for students?
 - a) Yes
 - b) No
 - c) Don't Know/Not Sure
- 5) Are you aware of the STOP THE BLEED ® campaign?
 - a) Yes
 - b) No
 - c) Don't Know/Not Sure
- 6) Has your school implemented STOP THE BLEED ® training into its curriculum?
 - a) Yes
 - b) No
 - c) No, but we plan to
 - d) No, but we are interested in more information
 - e) Not applicable
 - f) Don't Know/Not Sure
- 7) If so, how do you fund the training?
 - a) State funds
 - b) School district funds
 - c) Student/community donations
 - d) Health education budget
 - e) School bond
 - f) Other _____
 - g) Not applicable
 - h) Don't Know/Not Sure
- 8) When (grade level) would your students be trained?
 - a) 9
 - b) 10
 - c) 11
 - d) 12

- e) Other _____
- f) Not applicable
- g) Don't Know/Not Sure

9) Is your faculty/staff trained in STOP THE BLEED ®?

- a) Yes
- b) No
- c) Not Applicable
- d) Don't Know/Not Sure

10) Do you have STOP THE BLEED ® kits in your school?

- a) Yes
- b) No
- c) Not currently, but we would like to have them available in the future
- d) Not applicable
- e) Don't Know/Not Sure

11) If so, where does the funding come from to purchase the kits?

- a) State funds
- b) School district funds
- c) Student/community donations
- d) Health education budget
- e) School bond
- f) Other _____
- g) Not applicable
- h) Don't Know/Not Sure

12) What has been the biggest barrier to implementation of STOP THE BLEED ® training in your school? (Check all that apply)

- a) Cost
- b) Availability of training equipment
- c) Staffing
- d) Time commitment
- e) Liability concerns
- f) Other _____
- g) Not applicable
- h) Don't Know/Not Sure

13) Has there been a bleeding trauma on your school grounds in the last 10 years where a STOP THE BLEED ® kit could have been used?

- a) Yes
- b) No
- c) Not applicable
- d) Don't Know/Not Sure

14) If you have any additional comments, please add them below:

YOUR POSITION: **PRINCIPAL** **VICE PRINCIPAL** **ATHLETIC DIRECTOR**
SCHOOL NURSE **OTHER**_____

The survey is complete – thank you for your participation!

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