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## **A Project Evaluation of the California Education Code's Aquatic Mandate and Related Safety Protocols in High School Aquatics Courses**

Jesus Raygoza

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***A Project Evaluation of the California Education Code's Aquatic Mandate  
and Related Safety Protocols in High School Aquatics Courses***

by

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A Thesis Quality Research Project Submitted  
in Partial Fulfillment of the Requirements  
for the Degree of  
Masters of Public Administration

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## PROBLEM STATEMENT

California Education Code (CEC) 33352 b.7 mandates that all Physical Education (PE) curriculum in California public schools must include aquatics in their lesson plan; however, the mandate fails to provide adequate guidelines to mitigate against potential injury to both the student and the instructor. The only guidance provided by the Board of Education is in the Physical Education Framework. It states that instructors should be "...prepared to handle emergencies [and that the] class size is conducive to providing a safe environment" (Curriculum Development and Supplemental Materials Commission, 2009, p. 193).

California Health and Safety Code (HSC) 116045 states that all public pools must provide certified lifeguards if there is a direct fee paid for entry or service. Because schools do not charge a direct fee for PE lessons, schools may elect not to have certified lifeguards on the pool deck during lessons (Michels & Lew, n.d.).

Uninterrupted supervision is a critical factor in preventing drownings. A U.S. study found that 49 percent of drownings were due to inadequate supervision (Safe Kids Worldwide, 2016), and an Australian study claimed that seven out of ten drownings were due to insufficient supervision (Hansen, 2018). Unfortunately, there are many examples of inadequate supervision leading to near-drownings and drownings during public school swim lessons. The following near-drownings and drownings have occurred in the United States since 1999:

- a. 1999, Dante Arce, Los Angeles, CA; Fatal; No lifeguard (Los Angeles Times, 2000)
- b. 2005. Kwong Lee, Devenport, Iowa; Fatal; Lifeguard on-duty (Treiber, 2005)
- c. 2007, Cesar Urena, La Quinta, CA; Fatal; No lifeguard (Kozen, 2009)
- d. 2008, John Erlanson, Atascadero, CA; Fatal; No lifeguard (Cornejo, 2011)

- e. 2010, Student name not found, Poway, CA; Near-drowning; Lifeguard on duty (CBS 8, 2010)
- f. 2010, Juanya Spady, Bethlehem, PA; Fatal; Lifeguard on-duty, but improper positioning for proper supervision (Sawyer, 2017)
- g. 2011, Antonio Reyes, Seattle, WA; Fatal; No lifeguard (McLain, 2014)
- h. 2012, Marcum Asiamah,; Hartford, CT; Fatal; No lifeguard (Griffin, 2012)
- i. 2012, Malvrick Donkor, Manchester, CT; Fatal; No lifeguard (Leavenworth, 2012)
- j. 2014, Abdullahi Charif, Saint Louis Park, Minnesota; Fatal; No lifeguard (Yuen, 2014)
- k. 2015, Demariont'e Elliot, Omaha, NE; Fatal; No lifeguard (Anderson, 2015)
- l. 2017, Jeremy Pham. Milpitas, CA; Near-drowning; No lifeguard; Save made by non-certified personnel (Skipitares, 2007)
- m. 2018, Benjamin Curry, Danville, CA; Fatal; No lifeguard (Gafni, 2018)

It is important to note that of the 13 incidents, only two students survived. The save made in a 2017 Milpitas high school swim class was by a school security guard and fellow students (Skipitares, 2007), and a certified lifeguard made the second save in 2010 at a Poway high school swim lesson (CBS 8, 2010).

When a lifeguard was on-duty, one of the two victims survived. When a lifeguard was not on-duty, only one of the 11 victims survived. In these cases, the survival rate of victims with a lifeguard on-duty was 50 percent, and only nine percent with no on-duty lifeguard. The discrepancy of survival rates between the two groups suggests that having lifeguards on-duty will dramatically increase students' ability to survive their aquatic emergency.

This problem affects several different groups: first, the student body; second, school staff; and third, California taxpayers. This issue impacts the student body because they are directly in

danger of drowning during an aquatic class. School staff is affected because of inadequate training and ratios that are too large to ensure safety. This issue impacts California taxpayers when families sue school districts to recover their losses when inadequate supervision was provided during a swim lesson. For example, one jury awarded \$4.2 million to the family of Dante Arce after his death during a PE swim lesson (Los Angeles Times, 2000).

### **Solutions to the Problem**

This issue must be addressed as soon as possible to mitigate future injury, loss of life, or litigation against California public school districts. Multiple layers of intervention are needed to minimize injury and loss of life. One layer of mediation is the constant and uninterrupted supervision of those in the water (Minnesota Department of Education, 2016). Potential amendments to CEC and the HSC are:

- a. Require lifeguards to be present during a public school's swim instruction unit
- b. The lifeguard's sole responsibility is to supervise the facility and the people within. No other duties shall be assigned
- c. If the PE instructor is acting as the swim instructor, then the PE instructor cannot serve as the lifeguard
- d. Schedule lifeguards at a ratio of one lifeguard per 25 students
- e. The ratio of swim instructor-to-students should not exceed more than one to ten
- f. All students must receive a swim assessment before the swim instruction unit. When instruction necessitates the use of the deep end of the pool, PE teachers will administer a swim test to ensure the child is water safe
- g. PE teacher will group students based on skillset, as well as swimmers versus non-swimmers

- h. Students categorized as non-swimmers will remain in the shallow end of the pool until they can pass the swim assessment.

### **RESEARCH QUESTION**

The CEC requires high schools to provide swim lessons for their students. How can the CEC and HSC be amended to ensure the safety of students in swim classes? What best practices should they follow?

### **BACKGROUND**

One of the leading causes of accidental death of a youth in America is drowning (American Red Cross Scientific Advisory Council, 2014). Although drowning has not reached epic proportions, the loss of one life to something preventable is unconscionable. Underpinning this pointless loss of life is statistical data that reveals that minorities and families of the lower-socioeconomic scale suffer from this loss at a higher rate than their counterparts (Saluja et al., 2006).

#### **Education Code and its Genesis**

In 1976, California enacted the Education Code Section 33352. This section outlines the criteria for all PE programs. It states that all PE curriculum, from grades nine through 12, must include aquatics in the lesson plan. PE teachers must instruct students on the fundamentals and techniques of aquatics, design the lesson to maximize the student's ability to achieve the standard, and must conduct the class in such a way as to ensure quality and safety.

The California Department of Education (CDE) acknowledges that this instruction is essential to students who reside in California. The CDE makes this explicit by mandating that students be given aquatics instruction even if the school does not have a swimming pool (California Department of Education, 2018). The CDE recommends that students practice their strokes on land and learn drowning prevention techniques if a pool is not accessible (California



Department of Education, 2018). The CDE feels that aquatic instruction is vital to those students who live in California because California residents live close to, and may visit, bodies of water such as a beach, a creek, or a neighborhood pool (Curriculum Development and Supplemental Materials Commission, 2009).

### **State Created Physical Education Framework**

The California State Board of Education adopted a course outline that PE teachers may use to plan their core curriculum. The State provided this framework not as a prescribed or mandated lesson plan, but as a guide for PE teachers. The structure is a system of courses that builds upon itself. Course One, which occurs in the student's freshman year, introduces fundamentals of swimming and drowning prevention to all students. If students wish to advance their skills in aquatics, they may continue taking lessons in their junior and senior years. The Course One outline only provides students with essential knowledge and skills for water safety (Curriculum Development and Supplemental Materials Commission, 2009).

The PE teacher must assess all students to measure whether the student is making advancements in his understanding of the topic. Teachers should no longer ask, "Did I teach the material?" The questions that must be answered are, "Did my students learn?" and "What evidence of that learning do I have?" (Curriculum Development and Supplemental Materials Commission, 2009, p. 158). They should assess the student's skills before the class begins to understand the child's abilities, then continue with assessments throughout the lesson to ensure that the student is advancing. Skill determination can also help the teacher group students together with similar skill sets for ease of instruction (Curriculum Development and Supplemental Materials Commission, 2009).

There is nothing in the framework that mandates the instructor to possess a Water Safety Instructor (WSI) certification, or any other type of necessary swim instruction certification (Curriculum Development and Supplemental Materials Commission, 2009). This certification is vital because it gives the instructor basic principles of how to maintain safety and quality.

### **Assembly Bills, California Education, and Health and Safety Codes**

Many Assembly Bills (AB) have been enacted, and CECs and HSCs have been adopted, to prevent drownings in California and to assist responders in the rescue or resuscitation of drowning victims. The following codes are appropriate measures in the discussion of aquatic injury mitigation:

#### **Assembly bill no. 2009.**

CEC sections 35179.4 and 35179.6 were added because of AB No. 2009. If public and charter schools decide to offer interscholastic sports, the AB calls for public and charter schools to develop a written emergency action plan in case of medical emergencies, and for the schools to have one automated external defibrillator (AED) available on the school site. The AEDs must be made available as of July 1, 2019.

#### **California education code 44259(c)(4)(A).**

Requires that all teachers become CPR certified before they gain their teaching credential; however, it does not require teachers to maintain their certification after obtaining their credential.

#### **California education code 35179.1(c)(6).**

States the desire for coaches to hold a current First Aid and CPR certification, but does not require it as a condition of employment.

**Health and safety code 116033.**

This code requires anyone:

...providing aquatic instruction, including, but not limited to, swimming instruction, water safety instruction,... at a public swimming pool shall possess current certificates from an American Red Cross or YMCA of the U.S.A. lifeguard training program, or have equivalent qualifications, as determined by the department. Also, these persons will gain their certification in standard first aid and cardiopulmonary resuscitation (CPR) (California Association of Environmental Health Administrators, 2015, p. 8).

**Health and safety code 116045.**

This code indicates that lifeguards are to be scheduled at a public swimming pool if there is a direct fee charged for services. Other pools that do not charge a direct fee may self-select to either schedule a lifeguard or erect signs stating that lifeguards are not present (California Association of Environmental Health Administrators, 2015).

**Health and safety code 65539.**

Mandates that pool operators ensure that scheduled lifeguards maintain constant surveillance of the pool area, only provide services outlined in the HSC, and have uniforms that make the lifeguard readily identifiable to the public (California Association of Environmental Health Administrators, 2015).

**Health and safety code 65540.**

Calls for pool operators to ensure that the following equipment is available and in good condition:

- a. 17-inch minimum (outer diameter) life ring that has a rope attached. The line should be long enough to go the width of the pool
- b. A 12-foot minimum fixed-length pole with a permanently attached body hook. This piece of equipment is also known as a shepherd's hook
- c. Provide a Red-Cross 10-person Industrial First Aid kit if lifeguards are scheduled to supervise the facility
- d. An operating telephone if lifeguards are expected to oversee the facility
- e. A backboard and a head immobilizer if lifeguards are scheduled to supervise the facility
- f. If a pool exceeds 75 feet in length or 50 feet in width, then the pool operator must provide the pool ring and shepherd's hook on both sides of the pool (California Association of Environmental Health Administrators, 2015).

**California Swimming Pool Safety Act.**

In 1996, many HSCs signed into law became known as the Swimming Pool Safety Act.

HSC 115921.d, 115922, and 115923 are of particular interest and described below:

***Health and safety code 115921.d.***

This code describes the standards for an approved safety pool cover (California

Swimming Pool Safety Act of 1996).

***Health and safety code 115922.***

Requires newly constructed pools and spas, as well as remodeled pools and spas, at a private single-family home to outfit the pool with at least two of the following seven drowning prevention safety features:

- a. An enclosure that separates the swimming pool and spa from the family dwelling

- b. Removable mesh fencing that is self-latching and self-closing
- c. An approved safety pool cover. The pool cover description is in HSC 115921.d
- d. An exit alarm on doors leading from the single-family dwelling to the pool location
- e. A release mechanism for self-latching and self-closing gates no lower than 54-inches above the floor
- f. Any other safety features that are equal to or greater than those described above
- g. An alarm in the pool that will sound once there is an accidental or unauthorized entrance into the pool
- h. The pool must comply with this code, or the building permit will not be approved (California Swimming Pool Safety Act of 1996).

***Health and safety code 115923.***

This code gives further detail as to the standards of the self-closing and self-latching gates to the enclosure described in HSC 115922:

- a. The gate opens away from the pool
- b. The self-latch mechanism cannot be lower than 60-inches from the ground
- c. Gate is a minimum height of 60-inches
- d. Maximum clearance of the gateway to the floor is two-inches
- e. Voids in the gate cannot be larger than 4-inches
- f. The area surrounding the fence and gate should be free of foot or handhold structures that may allow for someone to climb over the fence and gate (California Swimming Pool Safety Act of 1996).

### **Virginia Graeme Baker pool and spa safety act.**

Named after a child who drowned in a family spa, the Baker Act was made effective in 2008. The child unknowingly sat on a floor drain, where she was not able to release herself from the drain (Ross, Eslocker, & Gassiott, 2008). This incident led to a federal mandate that affected pools across the U.S. Because of this act, public and private pools had to make modifications to the drain covers and drain systems (Association of Pool & Spa Professionals, n.d.).

### **Teacher to Student Ratio for Swim Lessons**

Although the ABs, CECs, Framework, and HSCs outline specific requirements, there are other aspects of instruction that the bills, codes, and framework leave out. For example, there was no standard that defines the ratio of teacher to student. The undefined class size means the ratio is left up to districts to decide. Dependent upon the number of students enrolled in an instructor's PE period, the ratio may be too high to monitor students safely.

For example, Table 2, located in the Findings Section, shows an average ratio of one instructor to 38 students in Santa Clara County high schools. Research indicates that basic water safety classes and swim instruction should have ratios that are far lower than one finds in the average Santa Clara County PE class.

Organizations recognized both nationally and worldwide were examined to determine industry best practices. These ratios will be discussed and compared to the ratio currently found in Santa Clara County schools in the Analysis Section.

### **American Red Cross.**

The American Red Cross (ARC) (2014) recommends a ratio of one instructor to six students when youth or adult students are learning the basics of swimming. ARC

increases the ratio only when youth and adult students have learned the basics of swimming and are considered to be water safe. When students are considered to be water safe, the ARC increases the ratio to one instructor to ten students (American Red Cross, 2014).

#### **Australian Swimming Coaches and Teachers Association.**

Australian Swimming recommended that the ratio for youth ages 13 to 17 be one instructor to 25 students, but only if all the students knew how to swim. If the class has non-swimmers, the ratio dropped to one instructor to ten students. The report went on to say that if one or more students in a class could not swim, then the ratio should default to the least capable student. Therefore, swim classes with mixed abilities should have a ratio of one instructor to ten students (Australian Swimming Coaches and Teachers Association, 2014).

#### **Caring for our children.**

To determine proper safety performance standards, the American Academy of Pediatrics, American Public Health Association, and National Resource Center for Health and Safety in Child Care and Early Education entered into a collaborative project. This collaboration produced a book that lists safety protocols and standards in various situations found in youth programming. One of the areas the project covered was proper supervision in an aquatic setting. The team of collaborators recommended a ratio of one adult to every six students when children are engaged in swimming or water play (American Academy of Pediatrics, American Public Health Association, National Resource Center for Health and Safety in Child Care and Early Education, 2011).

### **USA Swimming Foundation.**

The USA Swimming Foundation recommends that parents seek out learn-to-swim programs that meet or exceed aquatic industry standards, and also encourage learn-to-swim programs to have a maximum ratio of one instructor to six students (USA Swimming Foundation, n.d.).

### **Swim England.**

The national governing body for swimming in England is called Swim England (Swim England, 2017). Swim England recommends that beginner classes have a ratio of one instructor to 12 students. If the course is for intermediate swimmers, then the ratio increases to one instructor to 20 students. When a class has mixed abilities of beginners and intermediate swimmers, Swim England suggests that the ratio remains at one instructor to 20 students. Swim England, however, does recommend that instructors adjust their ratios if the environment is not ideal. For example, if the water is deep and the instructor has a mixed skills class, the ratio should decrease because of the risk involved with having beginner swimmers in deep water (Swim England, n.d.).

### **The Importance of Low Ratios**

Because swimmers do not typically alert the instructor if they are in distress, it is essential for instructors to monitor the students closely. If the instructor has both the responsibilities of the instructor and the lifeguard, tragedy may strike. See Table 1 for a description of the drowning behaviors.



**TABLE 1 (Comparing Behaviors of Distressed Swimmers and Drowning Victims with Swimmers)** (America Red Cross, 2014, p. 45)

<b>Behaviors</b>	<b>Swimmer</b>	<b>Distressed Swimmer</b>	<b>Active Drowning Victim</b>	<b>Passive Drowning Victim</b>
Breathing	Rhythmic breathing	Can continue breathing and may call for help	Struggles to breathe; cannot call out for help	Not breathing
Arm and Leg Action	Relatively coordinated	Floating, sculling or treading water; may wave for help	Arms to sides alternately moving up and pressing down; no supporting kick	None
Body Position	Horizontal	Horizontal or diagonal, depending on means of support	Vertical	Horizontal or vertical; face-down, face-up or submerged
Locomotion	Recognizable	Little or no forward progress; less and less able to support self	None; has only 20–60 seconds before submerging	None

During the drowning process, the victim is struggling to keep his mouth above water. He is distressed and doing all he can to stay above water. Drowning has been called a silent killer for this reason. One may expect a drowning victim to wave his arms and cry for help, but in that moment of distress, the victim is scared, struggling to stay above water, and most likely not able to call for help. As seen in Table 1, it takes as little as 20-seconds for someone to submerge and slip under the water. Therefore, it is critical for someone to recognize a swimmer in distress in less than 20-seconds (America Red Cross, 2014).

Larger instructor to teacher ratios is dangerous because it does not allow for instructors to closely monitor the students. In a large class setting, increased movement in the water may make it difficult to see below the water's surface (The Redwoods, 2013). Also, for the weak swimmer or non-swimmers, the instructor should be within arm's reach and be able to give individualized attention to those students in need of additional instruction (American Red Cross, 2014). According to the American Red Cross (2014), this type of "close supervision is necessary for effective practice and safety" (p. 331).

### **Centers for Disease Control and Prevention**

The Centers for Disease Control and Prevention (CDC) believed that further guidance was needed in the area of aquatics because "drowning... and suction injuries continue to be documented as major public health issues associated with aquatics facilities" (CDC, 2018b, p. 1).

#### **Centers for Disease Control and Prevention (CDC) Aquatic Health Code 6.3.2.1<sup>A</sup>.**

This code specifies which aquatic facilities are required to have a certified lifeguard on deck. Most notably, the CDC (2018) believes that facilities that are "deeper than five-feet... at any point" (p. 167), as well as any facility holding swim lessons, should have a lifeguard scheduled (Centers for Disease Control and Prevention, 2018).

#### **CDC Aquatic Health Code 6.3.4.3.4 <sup>A</sup>.**

This code requires that lifeguards not be given other jobs or tasks other than surveilling patrons in and around the water. If lifeguards are scheduled to guard the pool, they may not have any additional items that may detract from the primary duty of ensuring the safety of the patrons (CDC, 2018).

#### **Effectiveness of lifeguards.**

This CDC report was fashioned to aid administrators in determining whether lifeguards were effective at preventing injury and death. Although the report did not use empirical studies to display the effect lifeguards have on open water and recreation pools, the report took anecdotal accounts to indicate the worth of lifeguards (Branche & Stewart, 2001).

Between 1988 and 1997, the United States Lifesaving Association (USLA) reported that of the less than 100 drownings reported at a United States ocean beach, more than two-thirds occurred on unguarded beaches. USLA further claimed that the possibility of drowning at a beach with a stationed lifeguard is less than one in 18 million per year. These two statistics are significant because it shows that drownings occur much less when lifeguards were on the beaches (Branche & Stewart, 2001).

For example, American Beach had their lifeguard protections removed in 1989 as a county cost-savings measure. On Memorial Day of 1990, there were five drownings and 20 near-drownings because of severe ocean conditions. The incident received much media coverage, and, shortly after that, the county restored lifeguard services at American Beach. Some eight years later, on the release date of the CDC study, it was reported that no one had drowned at American Beach after the reinstatement of lifeguards (Branche & Stewart, 2001).

There were other cases that the CDC report studied that had similar, if not identical, results. The anecdotal examples and statistics provided in this report indicate that lifeguards are effective at mitigating injuries, death, and drowning rates (Branche & Stewart, 2001).

### **Responsibility to Protect Student Safety**

California created standards and laws which indicate that the protection of students on school campuses is a top priority. It is seen in everything from the California Code of Regulations (CCR) to the California Government Codes (CGC) to the Field Act. The following are examples of California's intent on making the school and learning environments safe for students.

#### **California Code of Regulations (CCR) § 10060.**

Outlines criteria which make for a quality physical education program. Subsections (f) and (h) are of note when discussing the safe delivery of physical education programs.

#### ***CCR § 10060, Subsection f.***

California regulation calls for the class size to be in proportion with providing quality and safe instruction. As outlined earlier in this paper, the aquatic industry standard requires as low as a one-to-six to as high as a one-to-twenty ratio of instructor-to-student.

#### ***CCR § 10060, Subsection h.***

Requires there to be sufficient stations to deliver proper instruction of items listed in subsection (a) of the regulation. If California schools were to create stations based on the higher instructor-to-student ratio described in subsection (f), then at least two stations should be provided during the PE aquatic unit.

### **California Government Code § 815.2 and § 820.**

These codes state that a public employee may be held liable for injury caused by his or her act or omission, and that public entities may also be held responsible for injury brought on by negligent acts of the employee of the public entity. These codes make it clear that public entities and staff of a public entity can be held liable in cases where their negligence led to injury or loss.

### **Field Act.**

In 1933, there was a 6.3 magnitude earthquake in Long Beach, California. This earthquake had devastating effects on public school building structures, which fortunately were empty at 5 pm when the earthquake occurred. After witnessing the destruction, the community and California Assemblyman Charles Field sponsored the Field Act. The act created the most stringent school building codes in the country, forbidding the use of unreinforced masonry in new construction, requiring designs that could withstand lateral forces, and creating the Office of State Architect to oversee school construction (Cutcliffe, 2000). The Garrison Act was passed in 1939 to apply the Field Act to existing buildings. The Greene Acts passed in 1967 and 1968 provided a deadline for existing public schools to be inspected (Jephcott, 1986).

### **California School Safety Plans.**

CEC 32280 through 32289 created the School Safety Plans mandate. These CECs call for all districts to create a safety plan by developing “strategies aimed at the prevention of, and education about, potential incidents involving crime and violence on the school campus.” The school is to develop procedures for a variety of different situations that may arise at a school, including crime, earthquake, and other emergencies.

### **Safe Schools Governing Board Strategies.**

The California School Boards Association (CSBA) developed a guidebook to give educators a thorough safety plan to promote an environment where students can excel.

The CSBA believes it is the top priority of every school district in the state to provide a safe and violence-free zone for the students. It is only within this construct where children will achieve high academic success (California School Boards Association, 2011).

These examples are all indications of California's desire to protect the students who are mandated to go to school and learn. The desire to keep students in a safe learning environment is undeniable; however, legislation mainly falls silent on setting safety protocols for public school aquatic units. The school districts and the teachers have the discretion to create these protocols locally.

### **San Jose State University Training of Physical Education Teachers**

To provide future PE teachers with the skills to teach the aquatics unit, San Jose State University (SJSU) must ensure that its pre-service teacher students' training meets accreditation standard 5.4, which states that pre-service teacher students must demonstrate knowledge of aquatic skills such as water safety, swimming strokes, diving, and water fitness activities and games. To ensure that pre-service teacher students attain this standard, SJSU offers all PE teacher students course KIN 105. In this course, students earn their ARC WSI certification (D. Daum, personal communication, October 30, 2018).

### **Why Practitioners and Legislators Should Care**

There are two primary reasons why this research is meaningful. First is the costs associated with drowning and near-drowning. Second is the availability of lifesaving mitigation efforts which

may prevent needless future drownings.

### **Costs of drowning and near-drownings.**

Drownings and near-drownings are costly for the individual and the state: first, costs of funeral arrangements for the deceased; second, costs of medical bills for ongoing medical treatment in near-drownings; third, costs to the economy while a victim recovers.

For every one drowning, five near-drownings require hospitalization (Green, 2017). Of those cases, 50 percent need further medical care because of complications such as brain damage (Center for Disease Control and Prevention, 2016b). In 2014, it was reported by the *Sacramento Bee* (2014) that California taxpayers subsidized care for more than 700 such cases. According to Edgar Snyder & Associates (n.d.), near-drownings may cost “more than \$8,000 for initial treatment...\$250,000 each year if long-term care is needed... (and if) injury results in brain damage, the overall cost of medical treatment... could cost as much as \$5.5 million” (para 22 and 23). Santa Clara County Public Health (2015) estimated the economic cost for 11 drownings that occurred in the county in 2013 to be \$12,918,000.

In a meeting with the City of Sunnyvale’s Risk Manager, Scott Mann claimed that the “Joint Powers Authority... requires insurance coverage at five million dollars per occurrence and ten million dollars on aggregate. [Sunnyvale] also ha[s] excess liability coverage to 40 million dollars for a catastrophic loss” (S. Mann, personal communication, March 1, 2019). Agencies must carry ample insurance coverage because it is possible that if the agency is found liable for a drowning death that occurred during their program, the agency may have to pay damages in the millions. For example, the parents of a teen who drowned in a school district pool sued the Murrieta Unified School

District claiming that they lacked safety protocols that could have saved their son. The district did not admit to wrongdoing but came to an \$11 million settlement. The District also agreed to change its safety plan (Associated Press, 2018).

### **Overall drowning in California and PE aquatic settings in the United States.**

From January 1, 2000, through December 31, 2017, the Santa Clara County Coroner's Office reported that 276 drownings occurred within the county limits. Of the 276 drownings that happened in the county, 54 cases involved children ages 0-13, and an additional 222 instances involved ages 14 and up (C. Perez, personal communication, December 3, 2018). No information gave insight into the cause or circumstances surrounding the reported drownings.

As noted above in the Problem Statement section, there have been 13 incidents where students experienced a near-drowning or a drowning in a swim lesson offered by a public high school.

It is important to note that of the 13 incidents, only two students survived. The save made in a 2017 Milpitas high school swim class was by a school security guard and fellow students (Skipitares, 2007), and a certified lifeguard made the second save in 2010 at a Poway high school swim lesson (CBS 8, 2010).

Of the two instances where there was a lifeguard on-duty, one of the victims survived. Of the 11 instances where lifeguards were not on-duty, only one victim survived. In these cases, the survival rate of victims with a lifeguard on-duty was 50 percent, and only nine percent with no on-duty lifeguard. The discrepancy of survival rates between the two groups suggests that having lifeguards on-duty will dramatically increase one's ability to survive an aquatic emergency. If supervised appropriately, the



PE lessons offered in public school districts in California would enjoy a reduction of risk and injury to students.

## LITERATURE REVIEW

The CEC mandating swim lessons is essential for all California students because it helps to mitigate the likelihood of swimming-related loss of life by ensuring that all incoming freshman learn to be water safe before graduation. CECs or HSCs do not have a clear standard of care for the PE aquatic unit. The lack of guidance in these codes could lead to injury and death in public schools during aquatic PE units. This research was conducted to evaluate industry standard safety protocols observed during swim lessons. The study is necessary to bring to light areas in which California schools can better align themselves with proper safety protocol in their PE aquatic unit.

The researcher is an aquatic professional who has overseen aquatic facilities, risk mitigation, swim lessons, and aquatic personnel. Google Scholar, San Jose State Library article databases, San Jose State Kinesiology Department faculty, Education Reference Librarians, and the *International Journal of Aquatic Research and Education* were consulted to identify articles related to aquatic risk management, swim lessons, and lifeguard effectiveness. The researcher could not identify empirical studies that discuss the safest way to run a swim lesson, the best swim instructor-to-student ratio, or the ideal lifeguard to participant ratio. The explanation for the lack of data may be because “drowning prevention, much like other areas of injury prevention, is a young and emerging field” (Branche & Stewart, 2001, p. 2).

### **Causes of Drowning**

Drowning is called a silent killer because victims are typically quiet and can slip under in only seconds (America Red Cross, 2014). Although not studied in an aquatic setting, inattention blindness may happen to a person trying to multi-task (United States Lifeguard Standards Coalition, 2011). Inattention blindness occurs when a person does not recognize objects that are

in plain view when that same person is asked to focus on an additional task (United States Lifeguard Standards Coalition, 2011). Inattention blindness may explain why adults or lifeguards sometimes miss a swimmer in distress who appears to be in their direct line of sight. If distracted or focused on something else, lifeguards or instructors may miss the victim who is drowning right in front of them.

In 1967, Daniel Webster sought to identify causes for drowning. Webster (1967) found two primary causes for drownings: first was the lack of adult supervision and the second was the lack of swim ability.

Over half of the 484 identified pool drownings in Webster's study showed that the victims were alone at the time of their incidents. Of the 484 drownings, 64 reported that only children were with the victim at the time of the incident. Furthermore, two-thirds of the 335 drownings in residential pools had only the victim present during the event (Webster, 1967).

Unsupervised swimmers constitute a significant cause of drownings and near-drownings (Harrell, 2001; Webster, 1967). It is, therefore, necessary to have constant and competent adult supervision. Supervision is an essential layer of protection for proficient and non-proficient swimmers alike. Qualified and properly trained personnel in an aquatic setting should be lifeguards or swim instructors. Because observation must be constant, lifeguards and swim instructors should not have additional tasks assigned to them (Webster, 1967).

There may be a thought that lifeguards are not necessary for proficient swimmers; however, lifeguards are still needed for constant supervision because these swimmers may suffer a heart attack, seizure, stroke, fatigue, or cramps while in water. If a lifeguard is not there to intervene, then the swimmer can still drown.

## **Effectiveness of Lifeguards**

In a study released in 2011, Pelletier and Gilchrist reviewed drownings that occurred in the United States between 2000 and 2008. In this report, they tried to establish whether drownings happen in lifeguard protected pools. The report concluded that, although uncommon, drownings do occur in lifeguarded protected pools (Pelletier & Gilchrist, 2011). Pelletier and Gilchrist (2011) stated, “to our knowledge, this is the first attempt to study drownings in pools with lifeguards” (p. 252). They also encouraged “additional studies... to assess the risk of drowning in pools with and without lifeguards. Such studies should control for aquatic exposure among different population groups” (Pelletier & Gilchrist, 2011, p. 253).

Although there are few studies in this area, there are some reports which wrestle with the notion of the importance of lifeguards in and around aquatic facilities. The common theme is that adults and lifeguards should constantly and adequately supervise participants (Pelletier & Gilchrist, 2011).

Supervision by adults and lifeguards is necessary because studies had shown that rule violations in an aquatic setting decreased when lifeguards monitored the actions of swimmers from the pool deck. Data indicates that an increase in lifeguards created a decrease in rule violations; therefore, it was concluded that lifeguards deterred rule violations at the pools that were a part of the study (Harrell, 2001).

A study conducted by Lanagan-Leitzel and Moore (2010) sought to calculate the differences in the ability to scan and identify significant events in the water. Although certified lifeguards, Group A, missed some events, they identified the most events in the study. When the results of Group A were compared to the results of untrained participants, Group C, researchers noticed a significant statistical difference between Group A and Group C. The study also noted

that participants who received basic training before the exercise, Group B, fared better than Group C but did not do as well as Group A. It is important to note that when Group B's results were compared with that of Group A, there was not a significant statistical difference between the two (Lanagan-Leitzel & Moore, 2010).

Lanagan-Leitzel and Moore's (2010) study demonstrates the importance of having trained personnel on-site, watching the water for distressed swimmers. Although there was not a statistical difference between Group A and Group B, the critical result from this study is that more significant events were identified as the groups received more training. It is, however, also essential to understand how to save the victim once the lifeguard identifies a distressed swimmer. Without acquiring proper save techniques, it is unsafe for a non-certified lifeguard to attempt to rescue a distressed swimmer.

Although drownings in lifeguarded pools are uncommon, they do occur. Even though these drownings occur, lifeguards are still considered to be a critical layer of protection in an aquatic facility (Pelletier & Gilchrist, 2011). The American Academy of Pediatrics recognizes the need for lifeguard intervention and recommended that community pools have certified lifeguards (Denny et al., 2019).

### **Importance of Class Size**

Supervision in a swim class plays a critical role in the instructor's ability to ensure a safe environment for his students.

In a study conducted to determine the impact of the teacher-to-student ratio, researchers concluded that lower ratios have a positive influence on the student's performance, allow for the teacher to devote more individualized attention to the student, and leads to the better overall

supervision of the class (Mulei, Waita, Mueni, Mutune, & Kalai, 2015). The study was completed in a classroom setting.

In the United States, the average class size is 21.6 students (Schanzenbach, 2014), and the average PE class size in Santa Clara County high schools is 38. Proper supervision is one of the recommended techniques to prevent drowning (Jordan et al., 2016). The higher the ratio is for instructors, the more difficult it becomes for the teacher to supervise the children properly.

### **Swim Lessons can Save Lives**

There are three reasons for California high schools providing swim lessons. First, the ability to swim is an essential lifesaving skill (Franklin et al., 2015) that should be accessible to all; second, lack of safety standards can lead to a death or injury during a PE class; and, third, those who took formal swim lessons saw an 88 percent reduction in risk of drowning (Weiss, 2010).

Unfortunately, not all communities can provide youth with proper swim lessons. In lower socioeconomic populations, pools may not be well-attended or have low enrollment in swim lessons because the residents cannot afford it (Waller & Bemiller, 2018). The combination of low enrollment and budget restrictions due to a sagging economy has led to the closures of pools in urban areas (Waller & Bemiller, 2018). Because of the lack of access due to finances or closures of public pools, low-income families are not able to become water safe. The issues of access are compounded by the fact that some first-generation migrant families do not understand the significance of being water safe (Savage & Franklin, 2015). The parent may have grown up in a country where bodies of water were not readily accessible. It is for this reason that migrant families may elect to forego sending their children to swim lessons (Savage & Franklin, 2015). Without intervention, the child will grow up without learning how to swim correctly.

This lack of accessibility shows itself when comparing drowning deaths within ethnic and socioeconomic groups. For example, African American children ages five to 19 drown at a rate of 5.5 times more than their white counterparts (Center for Disease Control and Prevention, 2016a), and the same is also true when one compares the drowning rates between Hispanic and whites. Hispanic males have a higher percentage of drowning than their white counterparts (Saluja et al., 2006).

Saluja et al. (2006) reviewed the household income levels of some 638 drowning victims, finding that about 49 percent of the drowning victims were low-income. The study went on to claim that income level was a significant indicator of drowning rates in the Hispanic and African American communities. By making swim lessons mandatory for those who do not know how to swim, all communities will attain an essential lifesaving skill (Saluja et al., 2006).

PE swim lessons should be safe and of high quality. When an instructor fails to make the lesson safe, tragedy may strike. For example, a California PE teacher was overseeing 56 students without a lifeguard on duty. Although the teacher once held a lifeguard certification, it had expired two months before the incident occurred. The class was engaged in a treading water endurance exercise when the teen slipped underwater and drowned. The teen was found hours later by the next PE class after their lunch period had ended (Gafni, 2018).

As a consequence of this drowning, the school canceled the rest of the year's swim lessons and mandated a lifeguard be present for every aquatic related activity (Gafni, 2018). Not only did improper protocol and policy cost this teen his life, but it denied other teens an opportunity to learn how to swim.

Some opponents of ensuring that all high-school students have access to swim lessons argue that an increase in swimming abilities may lead to an overall increase in drowning due to

increased exposure to the water (Brenner, Gitanjali, & Gordon, 2003). Brenner, Gitanjali, & Gordon (2003) claimed that an increase in swim ability would lead to a decrease in parental surveillance and an increase in risky behavior by the children who are now able to swim. This concern, however, was debunked in a later study which found that most drownings occurred during the day at a public pool and that the victims were not engaged in risky activities (Saluja et al., 2006).

### **Risk Management in Aquatic Facilities**

“Risk management has been described in a sport context as responsible for identifying and determining which methods to employ against potential threats that may negatively affect the sport event” (Hsiao, 2015, p. 15). In an aquatic setting, the pool operator must identify processes, procedures, and protocols to effectively mitigate injury or death (Hsiao, 2015).

United States court systems and aquatic professionals have acknowledged that in-water activities are hazardous and require direct supervision (Hsiao, 2005). Because of this acknowledgment, all aquatic activities should require an instructor in addition to a certified lifeguard (Hsiao, 2005). Those responsible for an aquatic facility should obtain various certifications, including pool operator, CPR, first-aid, and lifeguard certifications, which allow them to create a plan that provides a sufficient amount of support staff and supervision (Yarger, 2008). Staff responsible for oversight of aquatic activities, such as swim classes or recreation swim, should not be given multiple tasks, because multiple duties simultaneously needing attention will lead to a decrease in the quality of oversight (Yarger, 2008). In some situations, this loss of oversight can be deadly.

Hsiao (2005) attributed drownings to “...oversized classes, mixed abilities in classes, and a lack of continuous direct supervision by teachers or coaches. A secondary cause is the failure



of schools to provide lifeguards...” (p. 11). There is an inherent risk in providing aquatic classes; therefore, facilities that offer them should do what they can to prevent injury from occurring. For this reason, supervision of aquatic classes can be broken down into eight components:

...(1) Knowledge of Standard of Care, (2) Supervisory Competency, (3) Planning, (4) Participant Abilities, (5) Safe Environment, (6) Warnings and Instructions, (7) Emergency Management, and (8) Lifeguard Support. These eight components of aquatics supervision represent the minimum standards for an aquatic facility and program supervision (Hsiao, 2005, p. 21).

Activity supervision at an aquatic facility should consist of duly trained and certified lifeguards. Certified staff is vital because “an experienced and competent person causes the threat level to be reduced” (Wiesner & Rejman, 2014, p. 8). Trotter v School District highlights the need for a certified lifeguard and not an uncertified volunteer to conduct water supervision. In an example from one study, the PE teacher instructed experienced student swimmers to watch the pool during in-water lessons (Hsiao, 2005). The students given this responsibility were not lifeguard certified. During the class, they noticed that a student was in distress and attempted to save the student from drowning; however, their efforts were ultimately unsuccessful, and the student drowned (Hsiao, 2005).

Agencies may be held liable for negligent conduct during aquatic activities if:

... (1)... [the agency] owe[s] the plaintiff a legal duty of care, (2) the [agency] must breach that duty, (3) the [agency]’s breach of duty must be the proximate cause of the plaintiff’s injury, and (4) the plaintiff must incur actual loss or damages (Hsiao, 2005, p. 22).

Because California public schools are required to keep students safe, it would behoove the state of California, and the school districts which provide swimming lessons, to mitigate injury to students by providing adequate supervision and lifeguards in aquatic PE units.

### **Resolution to Require Lifeguards in Public PE Classes**

The Conference of California Bar Associations (CCBA) is a group of attorneys who strive to improve California laws. The CCBA adopted resolution 07-11-2015, but California state legislators did not use the resolution to create a bill (C. Rucker, personal communication, December 1, 2018). The resolution sought to require California public schools to provide lifeguards in addition to the PE teacher in all PE swim classes (Rucker, 2015).

Swim classes are an integral part of the California education system and are necessary to make students water safe. Being water safe can save lives, and these classes must be structured in a way that makes the safety and the standard of care the highest priority. There is strong evidence that suggests that constant supervision from instructors and lifeguards creates a safe environment for patrons and leads to a decrease in rules violations. Based on the information gathered through the literature review, it is not unreasonable for legislators to revisit Resolution 07-11-2015.

All schools have a responsibility to keep students safe when school is in session; therefore, safety protocols ought to be created to make class structures as safe as possible. Making PE aquatic units safer can be done by adopting the standards established by aquatic and risk management professionals. It is also ideal to have lifeguards in addition to the PE teacher, as it will lead to an increase in safety for both the teacher and student.

## METHODOLOGY

The methodology of the evaluation was a managerial audit. Audits are used to ensure the quality of the agency and the program which the agency runs. Quality assurance is accomplished by comparing the agency actions to that of industry best practices. The audit examines what the agency and its staff do versus how the agency should conduct business (Sylvia & Sylvia, 2012).

Typically, the managerial audit begins when an agency is faced with outside criticism because of an issue that occurred within an organization (Sylvia & Sylvia, 2012). The process starts with an auditor creating a set of questions and selecting a methodology “to determine whether an agency is operating appropriately and efficiently” (Sylvia & Sylvia, 2012, p. 89). The auditor will then meet with appropriate parties in the agency and start gathering information based on the developed questions (Sylvia & Sylvia, 2012). Once the inquiry is complete, the auditor will execute the methodology and will publish findings (Sylvia & Sylvia, 2012). The audit intends to bring issues to light (Sylvia & Sylvia, 2012). For example, the audit can determine whether an agency followed laws related to the agency’s field (Sylvia & Sylvia, 2012). “Even when an agency has met the sorts of compliance listed above, it may not be achieving an appropriate level of service for its clientele or meeting professional standards for service delivery” (Sylvia & Sylvia, 2012, p. 89). The identified problems may lead to a change to organizational practices to offer a better, safer, higher quality, or more efficient product (Sylvia & Sylvia, 2012).

In May 2018, a San Ramon Valley student drowned in a public high school PE aquatic class. This event led to community scrutiny regarding the structure and supervision of the course. From this tragedy came the reason and purpose for this managerial audit.

In this study, the managerial audit consisted of three steps. The first was to determine whether the local high school districts followed legislative mandates. To determine the expectations and safety protocols of public school's swimming lessons, the auditor reviewed the CECs, CGCs, and the HSCs. The codes relevant to this topic were discussed in the background section of the paper. Second, secondary data were collected from the five high school districts within Santa Clara County. The data were examined to evaluate whether high schools comply with California's Physical Education Class Framework, CGCs, and HSCs. Third, data were collected from agencies such as the ARC, National Education Policy Center, and the Australian Swimming Coaching and Teachers Alliance to determine the industry best practices in mitigating risk in aquatic classes. The data was then compared to the school district survey results to determine whether the school districts were meeting the professional and current industry standards for service delivery, an instructor-to-student ratio in aquatic classes, as well as a lifeguard-to-patron ratio in an aquatic facility. Finally, the researcher sought to identify gaps in compliance, unsafe practices or protocols, and appropriate instructor-to-student ratios for swimming lessons. This audit was done to shed light on any changes to the curriculum, lesson plans, or codes which may make public school's aquatic units safer.

## FINDINGS

In a managerial audit, the auditing party must first collect data to compare the findings against the industry standards (Sylvia & Sylvia, 2012). All of the high school districts within the County of Santa Clara cooperated with the audit. In Santa Clara County, there are five high school districts. District staff members were contacted to gather information about their PE program's aquatic unit expectations. Table 2 is a collection of the district staffs' responses.

All five districts in the county responded to the survey; however, Los Gatos High School from the Los Gatos-Saratoga Union High School District did not reply to the study. The researcher was able to confirm lifeguard presence at Los Gatos High School PE aquatic unit lessons (R. Amador, personal communication, February 26, 2019).

The responding districts represent 25 public high schools within the County of Santa Clara. The survey revealed the following:

- a. All students partake in a swim assessment before the beginning of the aquatic unit
- b. As a part of the aquatic unit, all students are to get into the water; however, some may seek an exception based on religious or health concerns
- c. If students do not get into the water, their grade may be adversely impacted
- d. Teachers in four of the five districts grade their students based on the improvement in ability when compared to the standard
- e. All schools in the survey have a pool on-site and mandate an aquatics unit where students must enter the water
- f. Aquatic unit lessons have ratios that range from 30 to 45 students to one instructor.
- g. For purposes of this investigation, the researcher used the average ratio of instructor-to-students. The average was calculated by adding 30 (low end of the range) to 45 (high end

of the range) and dividing by two. The answer was rounded to the nearest whole number.

The calculation yielded an average of 37.5 students per PE class; however, due to rounding, the average district ratio will be one instructor to 38 students.

- h. Except for Los Gatos High School, all remaining respondents confirmed that PE instructors in their districts are mandated to have a WSI certification
- i. Three of the high school districts and Saratoga High School do not mandate certified lifeguards to be present during the aquatic unit
- j. One out of the five school districts and Los Gatos High School do have certified lifeguards on the deck during the aquatic unit
- k. The East Side Union High School District noted that most teachers have non-participating students watch the pool during in-water lessons
- l. The five districts surveyed represent 25 public high schools within the County of Santa Clara. Only three of the 25 schools represented in this survey have lifeguards supervise in-water lessons.

**TABLE 2 (Collection of District Staff Responses)**

District	How many schools in district?	Are students swim abilities tested before class?	Do the students get into the water?	Does the students ability to swim have an effect on their grade?	How many high schools have pools in the district?	What is ratio of teacher to student?	Certification required of PE teacher?	Lifeguards required during instruction?
<b>Campbell Union High School</b>	5 high schools	No	In general, all students are required to participate in the swimming unit and participation means being in the water, not "dry land swim activities."	Yes	All 5 schools have a pool	42 to 1	Water Safety Cert; must keep current with District	No
<b>East Side Union High School</b>	11 high schools	All students are tested at start of swim unit (unit lasts for 6 wks in 9th grade)	Most sites have 100 percent participation and get in the water. Some students refuse (parents are notified), and they get a F for the unit	Philosophies may differ, but improvement in swim skills play a part in grading.	All 11 schools have a pool	42 to 1	WSI, every three years; Offers certifications renewal whenever teachers are to expire to ensure that they stay current	No - but most teachers put "non-dress" or "medical excuse" students on a chair to watch the pool.
<b>Fremont High School</b>	5 high schools	All students are tested at start of swim unit in 9th grade	Most do, but some exceptions. Religious and health reasons are the most common reason for not getting in.	Taught to improve the student skillset, however, they are graded against their Individual skills when compared to the standard	All 5 schools have a pool	Average of 32-40 to 1	Complete Water Safety course every two years	No Lifeguard, but multiple teachers on deck during class
<b>Los Gatos-Saratoga Union High School</b>	2 high schools	Saratoga HS = Tested in Spring before swim unit Los Gatos HS = No response	Saratoga = No not all students get in the water. Only freshman are required to take PE at Saratoga High School. We give PE credit for extracurricular activities. In fact, only 47 percent of our 9th graders are in a PE class taught by a credentialed PE teacher. Los Gatos = No response	Saratoga = No Los Gatos = No response	Both (2) schools have a pool	Saratoga = 30 to 1 Los Gatos = No response	Saratoga = Water Safety Cert Los Gatos = no response	Saratoga = No lifeguard required Los Gatos = Lifeguards provided by LGS Recreation. Lifeguard to student ratio do not exceed a 1 to 25 ratio
<b>Mountain View-Los Altos Union High School</b>	2 high schools	All students are tested at start of swim unit.	Most get into the water, but some refuse because of: lack of trust, religious or health reasons.	They are tested on their ability to freestyle, breaststroke, back stroke, tread water for 5 minutes, and a 20 minute swim.	Both (2) schools have a pool	30-45 students to one instructor	Swim instruction and water safety certification; must be up to date and district sends reminders	One lifeguard and the PE Teacher is provided during the swim unit

Responses provided by District Staff with exception to Los Gatos High School. Metropolitan Education was removed from the study because it is a technical school for high school aged students.

## ANALYSIS

The second part of the Managerial Audit is to compare and determine whether the findings from the district survey align with aquatic industry standards (Sylvia & Sylvia, 2012). This section will not only compare survey results to industry standards but will determine whether the surveyed schools fall in line with the government, education, and health and safety codes.

### **Santa Clara County School Districts' Compliance with California Government Code**

As noted above in the Background section, CGC's make it mandatory for schools to provide a safe environment for their students while at school. Currently, aquatic PE classes operating in the County of Santa Clara have an average ratio of 38 students to one instructor. With such a high ratio, it is not possible to produce a safe swim lesson. High ratios combined with an absence of lifeguard supervision on the pool deck compounds their safety issues. The lack of safety measures observed in PE aquatic units leads to an unsafe environment for both the student and faculty. Without the presence of certified personnel to execute in-water rescues, unqualified students and PE teachers may attempt a save. The rescue by an uncertified Good Samaritan is unsafe and may lead to two victims instead of one.

Although the Mountain View-Los Altos High School District and Los Gatos High School reduce risk by having lifeguards on duty, the ratio of teacher-to-student is not in line with industry safety standards. Also, three of the five school districts and Saratoga High School do not require a lifeguard during their aquatic unit. For these reasons, the districts are not compliant with the CGCs.

### **Santa Clara County School Districts' Compliance with California Health and Safety Codes**

HSC 116033 requires swim instructors to be lifeguard certified or to have someone on-site who is lifeguard certified (California Department of Education, 2018). Three of the 25 schools in the



county comply with code 116033, which would indicate that 22 of the remaining 25 schools are not compliant with this code. This conclusion, however, is misleading because of the loophole created by HSC 116045.

HSC 116045 states that all public pools must provide certified lifeguards if there is a direct fee paid for entry or service. The clashing codes give the districts a loophole because students cannot be charged a fee and are entitled to free education (California Department of Education, 2018). Because of HSC 116045, school districts may elect to not mandate lifeguards on the pool deck or that PE swim instructors be lifeguard certified. For this reason, 22 of the 25 schools are compliant with HSCs, and the remaining three schools that mandate a lifeguard at swim lessons go above and beyond the minimal requirement. For this reason, the districts are compliant with California HSCs.

### **Santa Clara County School Districts' Compliance with the California PE Lessons**

#### **Framework**

Four of the five districts complied with the structure of the classes. They also complied with how the instructor measured the student's progress against the standard outlined by the framework. The districts, however, did not comply with the framework's mandate to create a safe learning environment. Although the framework does not explicitly lay out a standard of care or swim class ratios, it did require "staff [to be] prepared to handle emergencies, class size is conducive to provide a safe environment,... and there is proper supervision of all physical activities" (Curriculum Development and Supplemental Materials Commission, 2009, p. 193). As mentioned in the previous section, the high instructor-to-student ratios and the lack of lifeguard supervision make for an unsafe environment. Based on the findings in the surveyed

responses, school districts in-part comply and in-part did not comply with the standards adopted by the State Board of Education.

### **California State Education and Health and Safety Codes Compliance to Aquatic Industry's Best Practices**

CECs and HSCs are not in compliance with industry standards and best practices. There is nothing in the education code that mandates PE instructor-to-student ratios, lifeguard-to-participant ratios, or a standard of care that would ensure that California public schools are compliant with aquatic risk management best practices.

According to The Redwoods (2013), the ratio of one lifeguard to pool participants should not exceed one for every 25, and, according to the American Red Cross (2007), it is typical for there to be two certified lifeguards in a facility with deeper water. Los Gatos High School was the only school in the survey to comply with this standard. All other high schools do not meet this criterion.

The present ratios found in the average Santa Clara County PE class is not in-line with industry standards. Currently, Santa Clara County PE swim lessons hold an average ratio of one instructor to every 38 students. Aquatic industry leaders recommend a ratio range of one instructor to six students to as high as one instructor to 20 students. Even on the upper end of the industry standard, Santa Clara County schools fall short.

### **Recommendations**

California laws that dictate guidelines for public education's aquatic unit are flawed, conflicted, and non-specific in their ability to mitigate risk. Aquatic swim lessons industry and risk management best practices can serve as a guide to improve California codes that regulate aquatic PE classes. If California wants to uphold its Government Codes to ensure the safety of students

while they are in school, the California CEC and HSC must be amended to align with these standards.

Legislators should review these standards and create a bill from Resolution 07-11-2015. This resolution would mandate that lifeguards supervise all public school swim lessons in addition to the presence of a PE teacher (Rucker, 2015). Mandating lifeguard protected swim lessons would add an essential layer of supervision to prevent drowning.

Legislators may add additional instructors to the aquatic unit. Adding a second full-time PE teacher may be cost-prohibitive, but schools can seek to lower the ratio by hiring instructor aids to assist the PE teachers with instruction and supervision. These aids should be paid school district employees.

Legislators may mandate ratios. The recommended ratio of instructor-to-student is one to ten, and the ratio recommended of a lifeguard to participant is one lifeguard per 25 students. Both the lifeguard and PE instructor should not have additional responsibilities. The PE instructor should instruct the class, and the lifeguard should only be scanning the water to search for distressed swimmers.

Legislators may mandate instructors to create different stations for each skill set. Instructors can break the stations into three categories: novice swimmers, intermediate swimmers, and advanced swimmers. These stations can rotate between on-land and in-water drills. If schools hire instructor aides to assist in PE swim lessons, then the instructor aides may assist with instruction and supervision at each station. If hiring instructor aides is cost-prohibitive, then school districts may also elect to collaborate with other agencies to provide lifeguard and swim instructor aides.

Legislators may mandate PE teachers to acquire certifications. PE teachers should have, hold, and maintain a first aid, CPR for the professional responder, and WSI certifications before, during, and throughout their time as a high school PE teacher. If the teacher maintains these certifications, he can take part in the resuscitation process should a child drown.

More empirical studies must be conducted in the area of risk reduction in the aquatic setting. There is a lack of statistical data to definitively prove the importance of lifeguards as a successful mitigating factor; however, there is plenty of anecdotal evidence to show the lifeguard's significance in preventing drownings and near-drownings. For this reason, the following identified topics need further research: first, ratio of an instructor-to-students for beginner, intermediate, and expert swimmers; second, the effectiveness of the lifeguard's ability to mitigate risk; lastly, the drowning rates which occur in lifeguard protected water activities versus the drowning rates of non-lifeguard protected water activities. Such research should go beyond California in seeking best practices at the high school level.

## CONCLUSION

When the HSCs were created, legislators acknowledged that lifeguards were an integral part of protecting the safety of participants in aquatic activities by passing HSC 116033; however, a conflict occurred when HSC 116045 was written into the code. HSC 116045 created a loophole that allowed for California public high schools to shirk the responsibilities of HSC 116033.

Although rare, drownings in lifeguarded waters do occur; however, there is only a one in 18 million chance of drowning in lifeguard protected beaches (Pelletier & Gilchrist, 2011). Pools are dangerous, and the result from lack of supervision may be devastating. Schools should continue to offer swim lessons because it is an integral piece of the education process. Free swim classes give students the ability to become water safe; however, if schools continue to offer the aquatic unit, they should come into compliance with industry standards to protect the safety of students and faculty.

If districts are found liable for a student drowning during the aquatic unit, districts may have to pay millions of dollars to settle lawsuits after a drowning occurs. For example, in a court case decided in 2000, the Los Angeles Unified School District paid a sum of \$4.25 million after they were found liable for a student drowning during a school-mandated swim class (Los Angeles Times, 2000).

Just as the legislators passed the Field Act to protect the children and the school faculty from collapsed buildings following a southern California earthquake, so is it the responsibility of the state to protect children and faculty during swimming lessons. One life lost to drowning is too many, and schools should do all they can to ensure the safety of students, teachers, and faculty in all class settings - especially in the classes which may be considered to be the most dangerous.

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## ACRONYMS LIST

ARC = American Red Cross

AB= Assembly Bill = AB

CCBA = Conference of California Bar Associations

CCR = California Code of Regulations

CDC = Centers for Disease Control and Prevention

CDE = California Department of Education

CEC = California Education Code

CGC = California Government Code

CSBA = California School Boards Association

HSC = Health and Safety Code

PE = Physical Education

SJSU = San Jose State University

USLA = United States Lifesaving Association

WSI = Water Safety Instructor