American Red Cross

Scientific Advisory Council

ARC SAC SCIENTIFIC REVIEW
Safe Aquatic Outings

Questions to be addressed:

What are appropriate/minimum guidelines for licensed day-care, elementary schools and other child service providers (Salvation Army, Churches, etc.) to follow as they prepare for a safe aquatic outing?
What are minimum staff / child ratios for supervision (excluding trained lifeguards) of children during aquatic outings?
Should some level of aquatic training be required of non-aquatic supervisory staff accompanying children on aquatic outings?

Introduction/Overview:

Drowning is a leading cause of accidental death that disproportionately affects children. Though drowning deaths do not occur in epidemic proportions the drowning of even one child is an incomprehensible tragedy and immeasurable loss to his/ her parents and family. Much has been written about ways to prevent childhood drowning. Strategies include but are not limited to: secure fencing, lifeguard supervision, lifejackets for weak or non-swimmers, learning to swim and most importantly, parental supervision. But, what of the times when parents are not part of the solution providing supervision, times such as, when the child is at school or with a day-care provider.

Each year, as schools come to a close, teachers search for fun and exciting activities for that last field trip of the year and day-care agencies and child service providers are organizing summer activities. One of the most popular activities is an aquatic outing. Unfortunately and all too often, pre-planning is poor or non-existent and child care staff and teachers tend to rely solely on lifeguards rather than providing active supervision for their charges. The consequences of poor planning and inattention by staff can end in tragedy. In Dallas, Texas, two children nearly drown during an aquatic outing attended by 55 other children ages 6 and 7. A five year old kindergarten student drowned when he and 107 other students attended an aquatic outing at a local pool. A seven year old girl drowns while attending a day camp with 38 other campers and 6 counselors. No one really knows how she got from the 3 foot to 5 feet where she was found. All 6 counselors where within the swimming pool area that was also staffed by 3 lifeguards and yet a child still drowned. These are only a few examples of the dozens of swimming pool drownings that are recorded every year in the United States between Memorial day (May) and Labor Day (September).

Should parents not have an expectation of safety when the school or day-care has charge of their child? Should parents not have an expectation that proper pre-planning and adequate supervision have been addressed before an aquatic outing? The purposes of this paper are to educate parents, day care providers, teachers and elementary school principals about the potential risks of

drowning, to provide guidelines for systematic pre-planning and to recommend ratios for staff supervision for aquatic outings.

Search Strategy and Literature Search Performed

Key Words Used
Aquatic safety, childcare guidelines, child drowning, drowning prevention

Inclusion Criteria (time period, type of articles and journals, language, methodology)

Exclusion Criteria (only human studies, foreign language, etc…)

Databases Searched and Additional Methods Used (references of articles, texts, contact with authors, etc...)

The literature review process began with inquiries to agencies and associations that might have relevant information about the question. The information solicited included any minimum requirements for lifeguard supervision during group outings to an aquatic environment, minimum staff/child supervision ratios for groups attending an aquatic outing and relevant information about the safety requirements of the aquatic facility. This information is to be used to support the final guidelines and recommendations set for by the SAC.

The following agencies responded to the inquires:

- American Camping Association (ACA)
- Boy Scouts of America (BSA)
- International Life Saving Federation
- Iran Life Saving and Diving Federation
- Irish Water Safety
- National Recreation and Parks Association (NRPA)
- Redwoods Group (insurer of YMCAs)
- Royal Life Saving Society
- Salvation Army
- YMCA

In addition to these agencies, information was sought (via google search) from:
American Academy of Pediatrics
Center for Disease Control and Prevention
Consumer Product Safety Commission
The National Association of Elementary School Principals (no response)
National School Age Care Alliance
National Resource Center for Health and Safety in Child Care and Early Education
World Health Organization

Networking with aquatic professionals added a few other resource materials for this review. Of interest was a Coroners' inquest into the drowning death of a 5 year old kindergartener attending an aquatic outing with 107 other children from the same school (In the Matter of: "The Fatality Inquiries Act" and In the Matter of: Joshua Harder, deceased). This inquest led to updates of the Public Health Act and to generation of the Swim Safe Programs* A Reference Guide for Schools developed in collaboration with Seine River School Division.

Scientific Foundation:

There is little doubt that lack of supervision is a major risk factor for drowning. The American Academy of Pediatrics stance on drowning prevention suggests that supervision be close, constant and capable. Parents and care givers should "never-even for a moment-leave small children alone or in the care of another young child while in bathtubs, pools, spas or wading pools". The Center for Disease Control (Morbidity and Mortality Weekly Report 2012) states that "Parents and caregivers of children, and participants in and supervisors of activities in or near water, should be aware of drowning hazards, use appropriate prevention strategies and be prepared with life-saving skills . . ." The International Life Saving Federation includes the absence of parental supervision as a drowning risk factor in children under the age of 5. Petrass, Blitvich and Finch (2011) studied unintentional drowning in Australia over a nine year period and found that lack of supervision was a contributing factor in 71.7% of all unintentional drowning in children ages 0-14. The U.S. Consumer Product Safety Commission (CPSC) states clearly not to allow a young child near a pool without an adult. It would seem intuitive, based on these guidelines and recommendations, that in absence of the parent, there is an expectation of adult supervision whenever children are in or near the water.

There are no national standards written to address the scope of this question, mainly because there is no scientific evidence to support standards relating to specific staff/child ratios for an aquatic outing. Certain Agencies have established their own guidelines for supervision of all programs including aquatics but few agencies in the United States have established specific staff/child supervision ratios. The Boy Scouts of America (BSA) defer to state pool codes for required lifeguard supervision at pools. However, when lifeguards are not provided by host agencies, the BSA maintains that the adult supervisor must assign at least two rescue personnel, with additional numbers to maintain a ratio of 1 staff for every 10 campers. The American Camping Association (ACA) does not specify staff/to camper ratios due to the great variety of aquatic venues (pools, lakes, shallow water pools) as well as the camper population served. The Redwoods Group, an insurer of YMCAs replied via email that they do not have specific ratios for supervision but rely on other agencies such at State licensing agencies and the American Camping Association to establish minimum ratios. They did recommend the aforementioned standards as the minimum and that they are increased for individuals with disabilities. The YMCA Aquatic Safety guidelines recommend that lifeguard/patron ratios be adjusted based on a number of factors but they do not address child supervision ratios for groups visiting the venue. The international community has a better record for established minimum staff/child supervision ratios for aquatic type activities. Irish water safety has the following standards established for pool supervision for children ages 1-5, 6-10 and 11 and up:

- Children ages 1-5 must be accompanied by a responsible adult in the pool
- Children ages 6-10 must be accompanied by a responsible adult who must remain in view of a child in the pool
- Children ages 11 and up may be unaccompanied.

Notice however, that there is no mention of how many children ages 1-5 or 6-10 that one adult can supervise and there is no consideration of swimming ability as part of the recommendation. The Australia report of the Royal Life Saving Society, Department of Education (2008) found that 5 of 8 states and territories require a minimum of 2 adult supervisors at all times when the children are in the water. However, supervision ratios for swimming activities vary between

states and territories and ranging from 1-5 ratio for pre-school and preparatory students to 1-16 for children ages 3-6. The Royal Life Saving Association "Keep Water at Public Schools" Program policy provides more stringent supervision guidelines:

- Children under 10 are not allowed entry to the facility unless under the active supervision of a person 16 years or older ("active supervision is defined as: dressed and ready for action including unexpected entry to the pool)
- Parents and guardians should actively supervise their children at all times
- For 0-5 year olds and non-swimmers, a parent or guardian is in the water at all times within arms' reach of the child.
- For 6-10 years olds constant, active adult supervision is required
- For 11-14 year olds it is recommended that a parent or guardian check up on their child ("check up" by physically going to the point where the child is, in or around the water.

The Swedish Life Saving Association makes the following recommendations but only for swim schools.

In the U.S, individual states currently establish standards for staff/child ratios which are included in the Child Care Licensure Regulations. Twenty-eight of 50 states (56%) have guidelines for supervision for aquatic activities. Of these states, 15 (30%) have staff/child ratios that differ from those established for a normal day- time routine. Unfortunately, there is no continuity among the standards in regards to age range, or staff/child ratio. Age ranges are self selected and range from generalizations like "toddlers up to 3 years" to specific increments such as "children 48-59 months". Some states selected school labels such as "pre-school to kindergarten" instead of an age range. Connecticut is the only state that has established a maximum number of children (20) allowed to attend an aquatic outing as a group.

Several states added criteria based on swimming competence (swimmer/non-swimmer) but did not define what "swimming competence" means. Texas requires a lifeguard be present only if children are swimming in water more than 2 feet deep. Tennessee addresses the supervision issue with a very broad, inclusive statement. "The Management of the agency shall maintain a system that enables all children in the agencies care to receive a level of supervision appropriate to their age and their age and their developmental status so as to ensure their health and safety and the allows agency personnel to know the whereabouts of each child in their care." Ohio requires that staff be "actively supervising" but does not define what that means.

Although inconsistencies among states with established supervision ratios make it difficult to set a standard in the industry, there are some recurring themes directed at providing a safe aquatic outing experience. These include:

- The need for some form of pre-program planning
    - Program plan implemented
    - Inclusion of an EAP and documented practice
    - Safety check completed the day of the event
    - Child care staff review swimming and water safety rules
- An acknowledgement that aquatic activities and or field trips require additional supervision
    - Children in the water require closer supervision to reduce the risk of drowning.

    - Lifeguards shall not be counted as part of the staff child ratio
    - If some children are on deck and others in the water, there shall be a least 2 staff
- An acknowledgement that the facility must meet criteria for a safe facility.
    - Based on state and local regulations
    - With certified lifeguard
- Some form of training for staff and or water safety personnel (not lifeguards)
    - Water safety and swimming rules
    - At least 2 years experience the activity s/he is supervising
    - CPR
    - In water over 4 feet deep, only adults who can swim will be counted in the staff/child ratio
- A certain level of training for lifeguards supervising the outing
    - Trained certified lifeguards
- An acknowledgment that age, skill, type of venue and water depths play a role in staff/child ratios
    - Swimmers and non-swimmers
    - Wearing PFDs
    - Children in water shallower / deeper than 2 feet
    - If water is over the chest of the child who cannot swim there will be 1-1 supervision
    - Children who cannot swim 15 yards unassisted . .
    - Non-swimmers, 3 and older in water chest deep require more supervision
- The need for some form of swimmer / non- swimmer identification.
    - A child will be restricted to an area of the pool or beach that is within the childs' swimming ability
    - There shall be a system of checking to ensure that each child is safe in the water
    - Each child is tested by a certified lifeguard
    - Before a child can enter water over his/her shoulders, s/he will be tested by a staff member

Some action has already been taken in the area of preventing further drowning in aquatic outings. A coroner's inquest into the drowning death of a kindergartner at a school aquatic outing yielded new recommendations and updates of existing documents to improve pre-planning, lifeguard standards, school staff supervision and emergency planning and response in Manitoba and Seine River School Division. The outcome was a written document (Swim Safe Programs: a Reference Guide for Schools) that includes but is not limited to the following requirements:

- The completion of a swim trip preparation check list
- Swim Day Controls
    - Review rules and responsibilities of staff and volunteers
    - Review EAP
    - All non swimmers K, 1 & 2 have government approved PFDs and must be worn at all times
    - Certified lifeguards review the rules with students
    - Certified lifeguards conduct the endurance test (see resource form)
    - Buddy system in effect and tested every 15 minutes
- Adequate Supervision defined

- One teacher for each 25 students
- Recommended: One qualified lifeguard for each 25 students in or near the water. Additional adult supervisors are required when students are in or near the water
- For grade(s)
  - K – adult ratio is 1-4
  - 1-4 – adult ratio is 1-6
  - 5-8 – adult ratio is 1-8
  - 9-12 – adult ratio is 1-12
- When students are in or near the water adult supervisors must position themselves so that the students are in clear sight and they can provide immediate assistance if required.

"Christian's Bill", signed into law on Tuesday July 24, 2012 requires that camps and recreational programs comply with the following:

- Determine each child's swimming ability, at the first swimming session, in order to identify and classify non-swimmers and at-risk swimmers;
- Confine children to swimming areas within the limits of their assessed swimming skills;
- Adhere to Department of Public Health- promulgated regulations, establishing a system to have Coast Guard approved Personal Flotation Devices (PFDs) for minors designated as non-swimmers or at-risk swimmers; and
- Allow programs to require parents, guardians and custodians to provide PFDs for their minor children

It is evident that there is no consistency in requirements for planned outings or staff to child ratios. Even a frequency table of the information provided by State Child Care Licensing only provides generalities for a variety of age groups. Therefore, the overall recommendation is to provide some guidance via options to plan for and provide supervision of children at aquatic outings.

Limitations:

We did not review all of the State Swimming pool codes. I know that NY state has requirements for camps that have swimming.

Knowledge Gaps and Future Research:

Statistics and analysis of all drowning that have occurred during aquatic outings embarked upon by pre-schools, day cares, elementary schools and day camps.

Overall Recommendation:

It is recommended that any government or private entity that has as its responsibility the supervision of young children, and who in the course of their programming, intend to include aquatic outings should develop a written safety plan that identifies safety measures and appropriate supervision of all students attending an aquatic outing.

Recommendations and Strength:

Standards:

Guidelines:

It is recommended that any government or private entity that has as its responsibility the supervision of young children, and who in the course of their programming, intend to include aquatic outings should develop a written safety plan that identifies safety measures and appropriate supervision of all students attending an aquatic outing.

Options:

The plan should include but should not be limited to the following:

- Program plan implemented
  - Includes a preparation check list
- Inclusion of an EAP and documented practice
- Safe Swim Day check list
  - Review rules and responsibilities of staff and volunteers
  - Review EAP
  - Confirm established staff/student ratios (see options below)
- Upon arrival Check list
  - Certified lifeguards review the rules with students
  - Certified lifeguards conduct water competency test and assign children to ability groups
  - Water competency must include
    - Entry with total submersion
    - Recovery to the surface and remain there for at least one minute (floating or treading)
    - Orientation – position to be able to turn 360° and orient to the exit
    - Propulsion – level off and move on front and/or back position for at least 25 yards
    - Exit from the water

Staff/child ratio for aquatic outings (based on the assumption that children are non swimmers, that all supervisors are in the water with the children and that groups that include individuals with cognitive, behavioral or medical issues require more supervision.)

In water ≤ 18 inches

Age range in months	Staff / child ratio
6 – 23 months	1:1
24 – 35 months	1:2
36 – 47 months	1:4
48 – 59 months	1:5
Over 60 months	1:8

In water over 18 inches

Age range in months	Staff / child ratio
6 – 35 months	1:1
36- 47 months	1:2
47 - 60 months	1:3
Over 60 months	1:5

Implications for ARC Programs:

Learn to swim programs that include skills referenced for "Water Competency"
Basic Water Rescue for supervisors of young children
Lifeguard training programs
Design a model work book including Safe Swim Day check lists.

Frequency of Age groups for Childcare Facilities in the United States
Staff / Child(ren) Supervision Ratios for Aquatic Activities

When groups are not of mixed ages

Age Category 1	**Frequency**	**Ratio of staff to child(ren)**	**States**
Children up to 3 years			
Birth to 2 years Birth to 23 months	2	1:1 1:1	SC TX
6 weeks to 1 year *12 months and under?*	1	1:1	WV
6 weeks to 2 years	1	1:1	NE,
13 – 24 months	1	1:2	WV
6 weeks to 36 months Swim instruction only – different water depths have different ratios	1	1:1	OR
Infants under 12 months	1	1:1	CN,
Under 2.5 years	2	1:2, 1:1	GA, AL,
24 – 35 months 2-3 years (24 months – 3 years)	3	1:2, 1:2 1:2	NH, SC, NE
2 years in water less than 2' deep	1	1:2 2:5	TX
Less than 3 years old	4	1:1, 1:1, 1:4, 1:1	NV, MI, VT, WI
Toddlers up to 3 years	1	1:2	CN
3 years	1	1:6	TX
Age Category 2 **Misc. *(Toddler to Preschool Ages)***	**Frequency**	**Ratio of staff to children**	**States**
2.5 – 4 years	2	1:4, 1:5	AL, GA
25 – 59 months	1	1:4	WV
Age Category 3	**Frequency**	**Ratio of staff to children**	**States**
More than 3 but less than 6			
3 years – 5 years 3-5 years At least but less than 6	5	1:2, 1:4 1:6, 1:6 1:4	AK, WI VT, OR NV
3-4 years Swimmers ages 3-4	2	1:3 ?	SC MI
4 years In water more than 2' deep	2	1:3 1:8	AK TX
Pre- school ages 3-5 3 years to kindergarten	2	1:4 1:3	CN NE
4 years and older who cannot swim	1	1:6	GA

a distance of 15 yards unassisted 4 years and older who CAN swim 15 yards unassisted		1:15	
4-5 years 48-59 months	4	1:6, 1:6, 1:10 1:6	SC, WI, NC NH
4-6 years	1	1:6	AL
5 years in water more than 2' deep	2	1:5 1:8	AK TX
Age Category 4	**Frequency**	**Ratio of staff to children**	**States**
Over 5 and 6 and over			
K + Swim instruction only – different water depths have different ratios	1		OR
5 + K and up	3	1:13 1:8 2:25	NC, AK SC
School age children	2	1:2, 1:6	CN, MI
59 months and up Children 6 and over At least 6 60 months First Grade and up	7	1:8 1:10, 1:12 1:6, 1:8 1:8 1:5	NH AL, WI NV, VT WV NE
Children ages 8 and older	1	1:10	VT

See Oregon Table

Staff: Child Ratios by Age Groups Frequency Table

Staff: Child Ratio	Age Groups	States/Frequencies
1:1	Birth to 2 years; birth to 23 months; 6 weeks to 1 year; *12 months and under?;* 6 weeks to 2 years; 6 weeks to 36 months (swim instruction only – different water depths have different ratios); Infants under 12 months; under 2.5 years; less than 3 years old	SC, TX, WV, NE, OR, CN, AL, NV, MI, WI [10]
1:2	13 – 24 months; under 2.5 years; 24 – 35 months; 2-3 years (24 months – 3 years); 2 years; toddlers up to 3 years; school-age children; 3 years – 5 years; School age children	WV, GA, NH, SC, NE, TX, CN*, AK [8] *multiple age groups
2:5	2 years (in water less than 2' deep)	TX [1]
1:3	3-4 years; 4 years; 3 years to kindergarten	SC, AK, NE [3]
1:4	Less than 3 years; 2.5 – 4 years; 25 – 59 months; 3 years – 5 years; at least but less than 6; pre- school ages 3-5;	VT, AL, WV, WI, NV, CN [6]
1:5	2.5 – 4 years; 5 years; first grade and up	GA, AK, NE [3]
1:6	3 years; 3 years – 5 years; 4 years and older who cannot swim a distance of 15 yards unassisted; 4-5 years; 48-59 months; 4-6 years; School age children; at least 6,	TX, VT, OR, GA, SC, WI, NH, AL, MI, NV [10]
1:8	4 years (in water more than 2' deep); 5 years (in water more than 2' deep); K and up; 59 months and up; at least 6; 60 months	TX, AK, NH, VT, WV [5]
1:10	Children 6 and over; children ages 8 and older	AL, VT [2]
1:12	Children 6 and over	WI [1]
2:25	K and up	SC [1]
1:13	5 +	NC [1]
1:15	4 years & older who CAN swim 15 yards unassisted	GA [1]
	K + (swim instruction only – different water depths have different ratios – see OR chart)	OR [1]

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Summary of Key Articles/Literature Found and Level of Evidence/Bibliography:

Author(s)	Full Citation	Summary of Article (provide a brief summary of what the article adds to this review)	LOE
Amateur Swimming Association	Amateur Swimming Association. Safe Supervision for Teaching and Coaching Swimming, down loaded from http://britishswimming.org	Addresses programmed activities – those with a formal structure: disciplined, supervised or controlled and continuously monitored from poolside Supervision: Ratio of teachers/coaches to participants Give consideration to: • Qualifications and number of teachers/coaches/lifeguards required • Skill of the above • Degree of support provided by appropriate helpers (parents, school assistants . .) • Age of pupils • Range of swimming ability • Use of flotation aids • Ability of pupils to comprehend instructions • Presence of physical or learning disabilities Max to supervise 20-1 Swimmers with disabilities 8-1	
American Academy of Pediatrics; American Public Health	American Academy of Pediatrics; American Public Health Association; Maternal and Child Health Bureau. Caring for our Children: National Health and Safety Performance Standards –	Information on drowning statistics and drowning prevention	

Association; Maternal and Child Health Bureau	Guidelines for Out-of-Home Child Care Programs. 2nd ed. Elk Grove Village, IL: American Academy of Pediatrics; 2002.		
American Academy of Pediatrics	Prevention of Drowning, Committee on Injury, Violence, and poison Prevention; Pediatrics 2010;126;178; originally published on line May 24, 2010; DOI: 10.1542/peds.2010-1264 Downloaded from http://pediatrics.aappublicationsss.org/contnet/126/1/178.full.html on September 4, 2012	"Parents and caregivers need to be advised that they should never-even for a moment-leave small children alone or in the care of another young child while in bathtubs, pools, spas, or wading pools . . ." "Supervision needs to be close, constant and capable" p.180 "Parents, caregivers, and pool owners should learn CPR . ."	
American Camping Association	Rhonda Mickelson in an email dated 6-08-12 to Terri Lees re: aquatic safety staff/camper ratios	ACA does not specify guard/staff to camper ratios do to the great variety of types of aquatic venues (pools, lakes, shallow pools, etc.) as well as the camper population served.	
American Red Cross	American Red Cross (2009). *Water Safety Instructor Manual*. American Red Cross	The ARC recommends instructor/ student ratio for each LTS and instructional programs in the presence of a lifeguard. Parent child 1:10 parent child pairs Preschool level1 1 : 6 Learn to swim – 1 : 6-10	
S.2075	"An Act Improving Water Safety for Children in the Commonwealth (Tuesday, July 24, 2012) Aka "Christian's Bill"	The legislation requires that camps and recreational programs meet requirements that ensure that at-risk swimmers are identified and that proper precautions are taken to decrease the risks of drowning. *Filed after the tragic death of 4 year old Christian Frechette – at a summer camp in 2007.* *His parents were not allowed to leave a lifejacket for him.*	

Boy Scouts of America	Boy Scouts of America (2012) Boy Scouts of America: Swimmer Classifications and Supervision. Compiled by David Bell, member, BSA National Health and Safety & Support Committee and National Aquatics Task Force 2/09/2012 Provided on line at www.scouting.org/scoutsource/Healthand Safety/GSS.aspx) under the Guide to Safe Scouting.	For all swimming activities, supervision is provided by an adult, age 21 or older . . . When the youth group does not provide its own lifeguards, the required number of lifeguards is that designated state code. Swim test into ability groups. Non-swimmers areas should be no more than waist to chest deep – enclosed by physical boundaries Buddy system; buddy checks,	
Boy Scouts of America	Boy Scouts of America Chapter 6: Swim Safe Defense p. 50-53 training may be accessed on line http://www.scouting.org	Adult leaders have completed Swim Safe Defense training with in past 2 years. Training applies to non-swimming activities whenever participants enter water over knee deep and submersion is likely. p. 50 "Swimming areas of appropriate depth must be defined for each ability group." P. 50 "When lifeguards are not provided by others, the adult supervisor must assign at least two rescue personnel, with additional numbers to maintain a ratio to participants of 1-10	
Center for Disease Control (CDC)	Drowning – United States, 2005-2009, Morbidity and Mortality Weekly Report (MMWR) May 18,2012/61(19);344-347 http://www.cdc.gove/HomeandRecreationalSafety/Water-Safety/drown-activities.html 9/04/2012	"Drowning is recognized worldwide as a leading cause of unintentional injury death that disproportionately affects children." Drowning prevention strategies include (but are not limited to); lifeguard supervision, lifejacket use for weaker swimmers and caregivers and supervisors trained in CPR. "Parents and caregivers of children, and participants in	

		and supervisors of activities in or near water, should be aware of drowning hazards, use appropriate preventions strategies and be prepared with life-saving skills . . .	
HealthNewsDigest.com	Children's Health (2012). Nearly 140 child drowning in pools and spas reported by media in summer of 2012. Downloaded from www.healthnewsdigest.com/news/children_s_health_200	"An analysis of news media reports for this summer show that 54 of these drowning occurred shortly after the child left an adult who was in their immediate vicinity, and 31 children drowned despite the presence of others in the pool." Pool Safely Campaign provides information on the simple steps parents, care givers and pool owners should take to ensure children and adults stay safe around pools and spas. "Stay close, be alert and watch children around the pool."	
International Life Saving Association Sweden	Email from Kristin Doblen info@sls.a.se	Recommendations for swim schools	
International Life Saving Federation	International Life Saving Federation (2007). World Drowning Report. International Life Saving Federation	Globally, drowning is the leading cause of death. In many countries children under 5 have the second highest drowning risk. Risk factors influencing the frequency of drowning in this age group were: the absence of parental supervision; and the absence of fencing around back yard pools.	
Iran Life Saving and Diving Federation			
Irish Water Safety	Lt Cdr John F M Leech in an email, dated 2/17/2012 to Linda Quan	Pool supervision: - Children ages 1-5 must be accompanied by a responsible adult in the pool - Children ages 6-10 must be accompanied by a responsible adult who must remain in view of a child in the pool - Children ages 11 and up may be unaccompanied	

Manitoba School Boards Association in Collaboration with Seine River School Division	Swim Safe Programs* A Reference Guide for Schools. Endurance test: enter deep water, demonstrate 50m with coordinated arms and legs and comfortably place face in the water. This must be completed with a reasonable degree of strength.	One teacher for each 25 students Recommended: One qualified lifeguard for each 25 students in or near the water. additional adult supervisors are required when students are in or near the water For grade(s) K – adult ratio is 1-4 1-4 – adult ratio is 1-6 5-8 – adult ratio is 1-8 9-12 – adult ratio is 1-12 When students are in or near the water adult supervisors must position themselves so that the students are in clear sight and they can provide immediate assistance if required.	
	Model Aquatic Health Code	Speaks to safe facility characteristics Lifeguard requirements Lifeguard plan Emergency action plans	
National Association of Elementary School Principles		No response as of 8-20-12	
National Child Care Association And National Resource Center for Health and	See attached information by state http://nrckids.org/STATES/states.htm	Individual states currently establish standards for staff/child ratios which are included in the child care licensure regulations 28 of 50 (56%) states have guidelines and or staff/child ratios specifically for aquatic activities Of these states 15 (30%) have staff/child ratios for aquatic activities that differ from those established for those established for the normal day-time routine	

Safety in Child Care and Early Education			
National Recreation and Parks Association	To access our members-only professional networking site, www.nrpaconnect.org , simply log-in using your on-line account information (or you can create an account) and "add" the aquatics group to your groups list.	Did not answer this question directly but referred to a networking site	
NSW Department of Education and Training	NSW Department of Education and Training (2009). Water Safety Guidelines for Unstructured Aquatic Activity. Sydney. NSW Department of Education and Training	The teacher: student supervision ratio must not exceed 1:20. The number of supervising teachers required at the activity will depend on the number of students, students with special needs, medical conditions, age and maturity, type of activity and conditions at the venue.	
Petrass, LA., Blitvich, JD, and Finch, CF	Petrass, LA., Blitvich, JD, and Finch, CF (2011). Lack of caregiver supervision: a contributing factor in Australian unintentional child drowning deaths, 200-2009. MJA 194(5), 228-231	These authors used the NCS database to investigate drowning deaths of children 0-14 over 9 years. 339 cases were included in the study. "Supervision was identified as a contributing factor in almost three-quarters (71.7%) of all unintentional cases of child drowning." P.229	
Provincial Court of Manitoba	In the Provincial Court of Manitoba, In the Matter of; "The Fatality Inquires Act", and in the Matter of: Joshua Harder, Deceased. Release date: July 22, 2003	A review of the fatal drowning of Joshua Harder, a five year old kindergarten student who was attending a school outing. There were 108 children ranging from 5-10 years old, whose swimming abilities were unknown to anyone at school. They were accompanied by 3 adult supervisors, none of who were in the pool watching the children and guarded by two lifeguards, one with 5 years experience and one new guard, no experience. The article describes the documents with guidelines for supervision which should have been reviewed and followed to help prevent this tragedy and the recommendations that will hopefully keep this from	

		happening.	
Public Health of Manitoba	Public Health Act of Manitoba C. C. S. M. P210. "Swimming Pools and other Recreational Facilities Regulations." Regulation 132/97. Registered June 13, 1997. Amended 2,000.	Policies respecting the use of the pool by organized groups take into account: Configuration of the pool; type of bather activity allowed; equipment in use; age of bathers; bather heights compared to pool depth; swimming ability; Whether there are persons accompanying the bathers who are able to provide direct supervision	
The Redwoods Group	The Redwoods Group (2005) Swim Testing Policy Implementation: A guide to making a comprehensive swim test policy work in your YMCA Released 06/28/2005	All children must be evaluated. For those who do not pass or decline testing; May not use the deep end "Always within arm's length of an actively involved adult care giver." P.1 Or "shallow water competent" and in "arm pit deep" or less. *"Shallow water competent"* defined as ability to readily regain their footing in water that is armpit deep or less. P. 3 "All tested children must be clearly marked so they are easily identifiable." p.1 or 6 "The use of a PFD is not failsafe and cannot replace active supervision. . . the use of a PFD is no guarantee against drowning." P.4 "Even if a PFD is used the parent or caregiver cannot ever leave the child unsupervised in the pool area." P.4	
The Redwoods Group	The Redwoods Group In an email dated 3-03-12 to Linda Quan	"We do not have a specific ratio for supervision, but rather rely on other supervision ratios from groups like	

		the American Camping Association and State licensing agencies. We recommend that the ratios be used as minimums, increased for individuals with disabilities."	
Royal Life Saving Society	Australia Report (2008)	Department of Education analysis of policies related to aquatic activity at primary schools in Australia found - 5 of 8 states and territories require supervision ratio of a minimum of 2 adult supervisors at all times when children are in the water. - Supervision ratios for swimming activities from 1:5 to 1:16	
Royal Life Saving Society Australia	Royal Life Saving Society-Australia. Keep Watch Information Manual. Sydney: Royal Life Saving Society-Australia, 2010.	Children under 10 are not allowed entry to facility unless under active supervision of a person 16 years or older Parents and guardians should actively supervise their children at all times For 0-5 year olds and non-swimmers a parent or guardian is in the water at all times within arms' reach of the child. For 6-10 years olds constant active adult supervision is required For 11-14 year olds it is recommended that a parent or guardian check up on their child by walking to the location of the child in the pool. "actively supervised": be dressed and ready for action, including unexpected entry into the pool.	
American Red Cross SAC	American Red Cross, Scientific Advisor Council, Aquatic Sub-Council definition of Water Competency	Water Competency must include the following: 1. Entry – with total submersion 2. Recovery to the surface and remain there for at least one minute (floating or treading) 3. Orientation – position to be able turn 360 degrees and orient to the exit 4. Propulsion – level off and move on front and/or on back position for at least 25 yards	

		5. Exit from water Water competency is influenced by conditions of the aquatic environment (water temperature, movement, depth, clothing, distance, etc.) into which the person may be introduced. Demonstration of skills in one aquatic environment may not transfer to another.	
U.S. Consumer Product Safety Commission	U.S. Consumer Product Safety Commission Publication No. 359. How to plan for the unexpected: Preventing Child Drownings Downloaded from www.cpsc.gov	"Child drowning is a silent death. There's no splashing to alert anyone that the child is in trouble." Never leave a child unsupervised near a pool. Do not allow a young child in the pool without an adult Do not consider young children to be drown proof because they had swim lessons	
World Health Organization	World Health Organization (2010). Drowning Fact Sheet No347. World Health Organization Downloaded from http://www.who.int/mediacentre/factsheets/fs347/en/index.html 9-24-12	Drowning Statistics Who is at risk Prevention strategies Individual and community education on drowning awareness, risks associated with drowning, learning water survival skills, parental supervision	
YMCA	YMCA of the USA (2011) Enjoying Water Safely: Aquatic Safety Guidelines for Ys	Adjust lifeguard/patron ratios based on; Code compliance Size and shape of the pool Available equipment Number and ages of patrons Skill level of patrons Skill level of lifeguards	

		Type of program Environmental factors Availability and qualifications of other support staff. P. 12 Drowning Prevention Strategies Require a swim test Outside groups required orientation "reach supervision" Require non-swimmers to wear a PFD in addition to "reach supervision" p.15	

Level of Evidence	Definitions (See manuscript for full details)
Level 1a	**Experimental and Population based studies -** population based, randomized prospective studies or meta-analyses of multiple higher evidence studies with substantial effects
Level 1b	**Smaller Experimental and Epidemiological studies -** Large non-population based epidemiological studies or randomized prospective studies with smaller or less significant effects
Level 2a	**Prospective Observational Analytical** - Controlled, non-randomized, cohort studies
Level 2b	**Retrospective/Historical Observational Analytical** - non-randomized, cohort or case-control studies
Level 3a	**Large Descriptive studies** – Cross-section, Ecological, Case series, Case reports
Level 3b	**Small Descriptive studies** – Cross-section, Ecological, Case series, Case reports
Level 4	**Animal studies or mechanical model studies**
Level 5	**Peer-reviewed Articles** - state of the art articles, review articles, organizational statements or guidelines, editorials, or consensus statements
Level 6	**Non-peer reviewed published opinions -** such as textbook statements, official organizational publications, guidelines and policy statements which are not peer reviewed and consensus statements
Level 7	**Rational conjecture** (common sense); common practices accepted before evidence-based guidelines
Level 1-6E	**Extrapolations** from existing data collected for other purposes, theoretical analyses which is on-point with question being asked. Modifier E applied because extrapolated but ranked based on

	type of study.