

Summary of Swimmer's Itch Data from the CSA Beach, 2013-2017

INTRODUCTION:

During each of the past five summers, lifeguards at the Congregational Summer Assembly (CSA) beach have collected information on the number of swimmers and cases of swimmer's itch (SI). Data are recorded daily for: the number of swimmers, total cases of SI, time of day (morning/afternoon), prevailing wind direction, wind speed, and water temperature. Results are collected each day from the third week of June through the middle of August.

RESULTS:

Overall Incidence:

As shown in Table 1, the overall SI incidence has been approximately 4.4% (i.e. 4.4 cases for every 100 swimmers) over the past five years. Incidence rates climbed from 2.9% in 2013 to 5.3% in 2015, but decreased to 4.8% in 2016 and 3.8% in 2017.

Anecdotal reports during 2016/17 indicated that the incidence had improved dramatically. It is also noteworthy that over 85% of all cases in 2015, 2016, and 2017 occurred on six days. Most other days reported very low levels.

TABLE 1: OVERALL INCIDENCE BY YEAR

YEAR	TOTAL SWIMMERS	TOTAL SI CASES	INCIDENCE RATE (% = #CASES/100 SWIMMERS)
2013	3981	114	2.9%
2014	5068	244	4.8%
2015	6894	367	5.3%
2016	5084	245	4.8%
2017	4468	151	3.8%
TOTAL	25495	1121	4.4%

Associated Variables:

Two variables, wind direction and time of day, have been consistently associated with an increased risk of SI. Table 2 presents data for wind direction. In each year, the probability of having at least one case of SI was significantly higher on days when the prevailing winds were from the northwest, north or northeast (i.e. “onshore” winds). At least one case of SI was reported for 60.2% of the days with onshore winds, versus only 10.9% of days with prevailing offshore winds. It is believed that onshore winds act to concentrate schistosome cercaria in shallow areas near the shoreline, thus increasing the probability of SI.

TABLE 2: DAYS WITH POSITIVE SI CASES BY WIND DIRECTION

WIND DIRECTION	PERCENT OF DAYS WITH AT LEAST ONE CASE OF SI					
	2013	2014	2015	2016	2017	TOTAL
ONSHORE*	68.8% (11/21)	79.2% (19/27)	54.5% (12/22)	59.1% (13/22)	62.5% (10/16)	60.2% (65/108)
OFFSHORE**	31.2% (5/27)	20.8% (5/26)	3.3% (1/30)	10.0% (3/30)	5.9% (2/34)	10.9% (16/147)
SIGNIFICANCE LEVEL	p = 0.03	p = 0.003	not available	not available	not available	not available

* Onshore = North, Northwest or Northeast

** Offshore = South, Southwest, Southeast, West, or East

Incidence rates for morning versus afternoon swimmers are presented in Table 3. Overall, the incidence rate for morning swimmers was 9.6%. This is three times higher than the afternoon rate (3.2%). We do not know why this difference occurs, however, it has been consistent throughout the course of this study. One possible explanation is that cercarial concentrations are higher in the morning, however, there is no data to confirm this.

TABLE 3: INCIDENCE BY TIME OF DAY

TIME OF DAY	INCIDENCE RATE OF SI (CASES/TOTAL WATER USES)					
	2013	2014	2015	2016	2017	TOTAL
MORNING	5.2% (51/972)	13.1% (117/890)	13.3% (161/1209)	9.6% (98/1022)	6.0% (55/916)	9.6% (482/5009)
AFTERNOON	2.1% (63/3009)	3.0% (127/4178)	3.9% (220/5687)	3.8% (155/4090)	2.7% (96/3552)	3.2% (661/20516)

	INCIDENCE RATE OF SI (CASES/TOTAL WATER USES)					
SIGNIFICANCE LEVEL	P<0.0001	P<0.0001	not available	not available	not available	not available

Wind speed and water temperatures were not consistently associated with higher probabilities of SI.

CONCLUSIONS:

It appears that the overall incidence of SI may be stabilizing or decreasing in Crystal Lake. In addition, the risk of SI appears to be higher for swimmers entering the water on days with onshore winds, and during the morning hours.

Al Flory