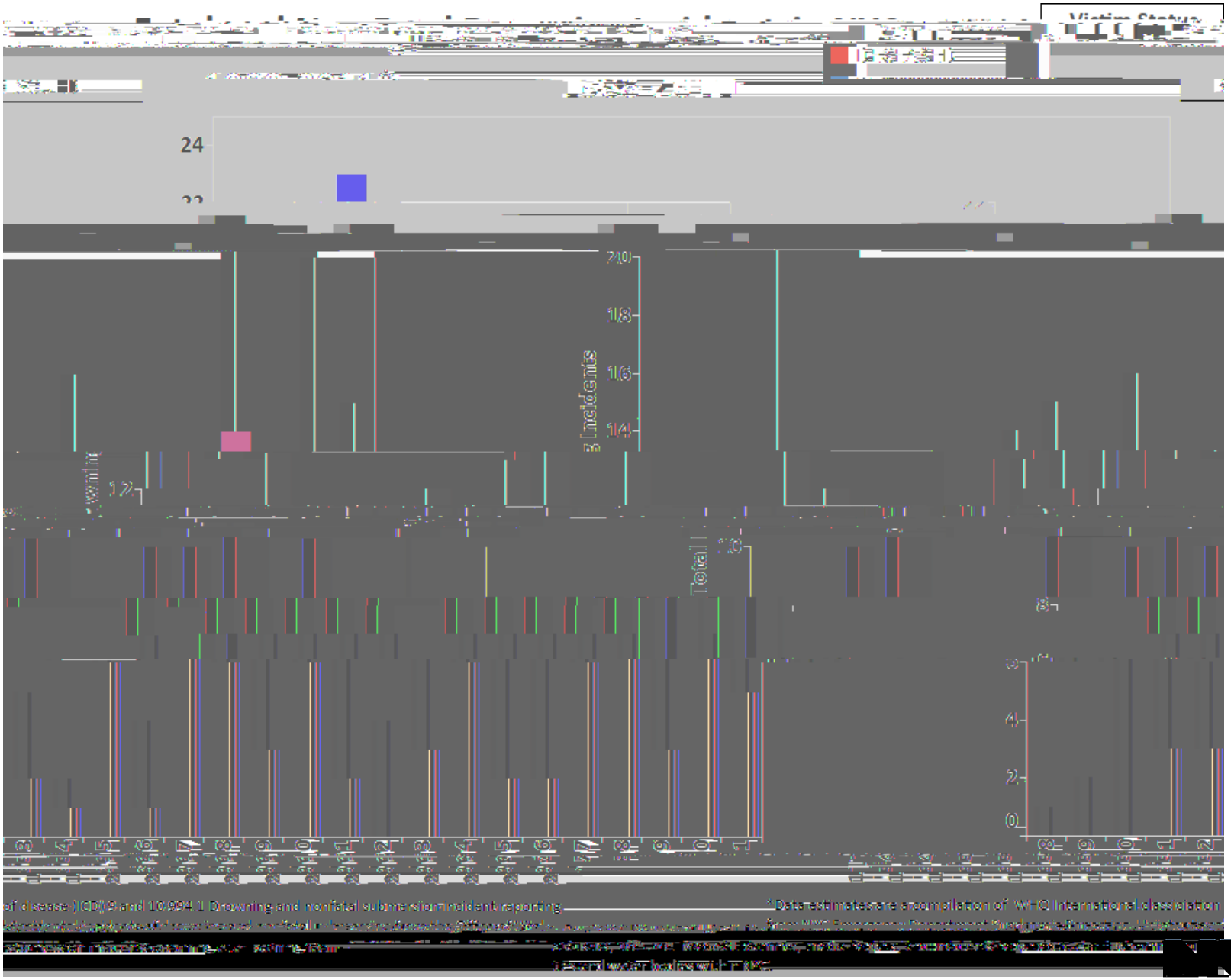
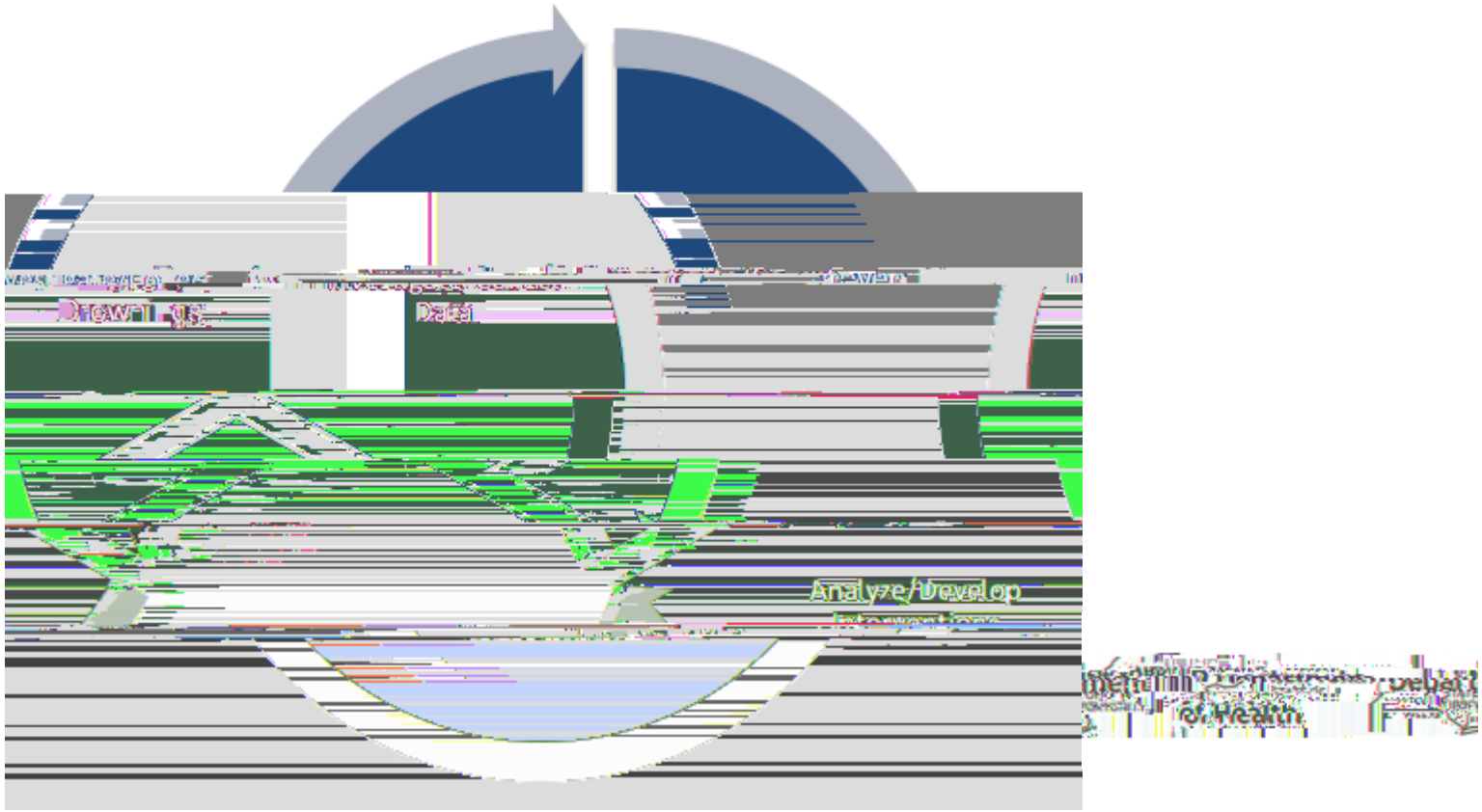
Active Drowning Surveillance in New York

New York State Department of Health (NYSDOH) Bureau of Community Environmental Health and Foo Protection policy to investigate & report on drownings (*NYS Sanitary Code 6-1*).

The Office of Public Health Engineering (OPHE) within the New York City Department of Health and Mental Hygiene (NYC DOHMH) conducts active surveillance of drowning incidents at NYC Permitted Bathing Facilities.


24
2.0
1.8
1.6
1.4
Incidents
1.2
Total
8
4
2
0

Drowning Investigation Process Overview



OPHE Drowning Incident Investigation

Standard investigation:

- Site & Supervision characteristics

Environmental Risk Factors:

- Location of drowning
- Activity at the time of the incident (*Interviews**)

Victims Personal Risk Factors:

- Gender
- Age
- Swim ability
- Medical history
- Drug and Alcohol consumption

Precipitating Event: Hyperventilation Before Breath-Holding Underwater

In 2011, a drowning incident was reported to OPHE o two healthy young men that died at a NYC regulated outdoor swimming pool.

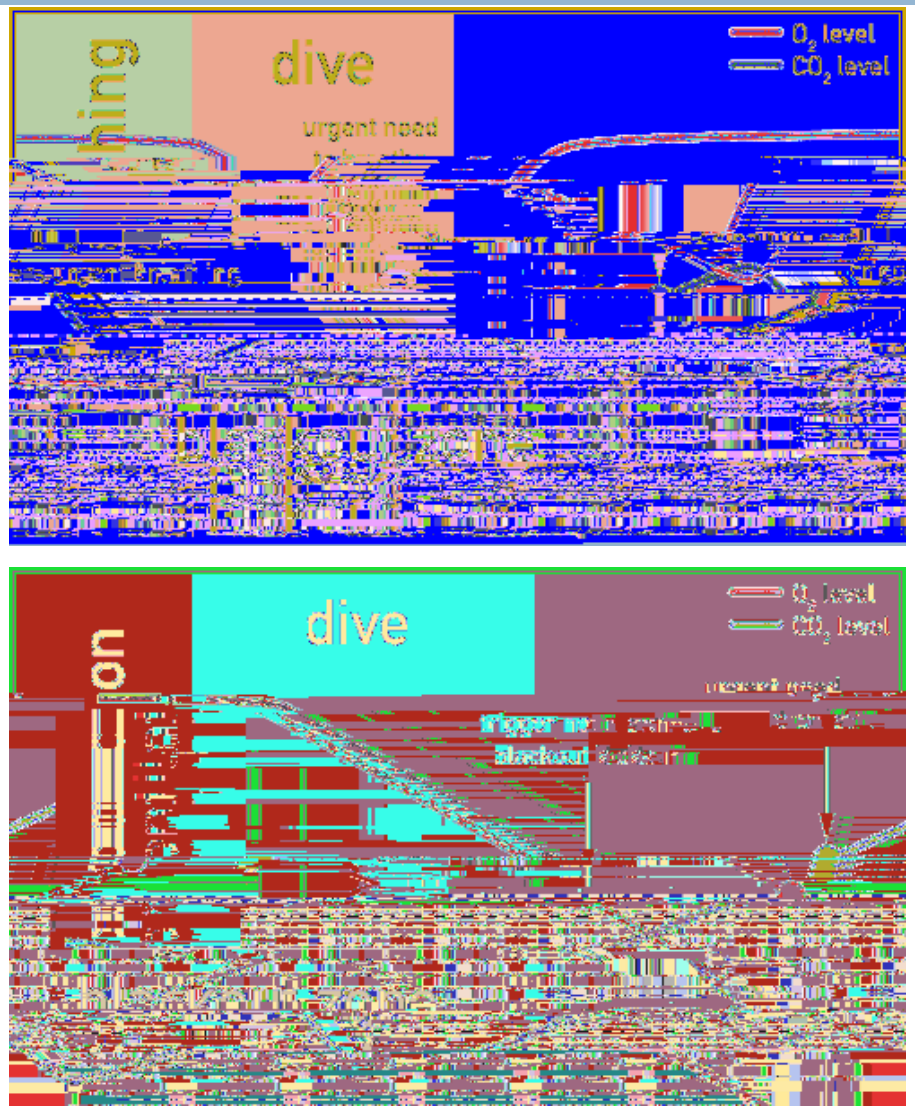
Environmental Risk Factors:

- Prolonged duration of submersion
- Supervision Level

Victims Personal Risk Factors:

- Male
- 21 and 22 years old
- Good Health
- Advanced Swim Ability
- Training for U.S Military Fitness Testing

Physiology of Breath-Holding and Prolonged Submersion



Epidemiology of Breath Holding Behaviors

Differential diagnosis – phenomenon of hypoxic blackout.

Hyperventilation prior to submersion reduces carbon dioxide sensitivity, allowing hypoxia to develop, leading to unconsciousness.

Carbon dioxide reservoir is depleted due to hyperventilation

Drowning Case Review

DOHMH collaborated with the NYSDOH to investigate historical drowning cases with similar dangerous behavioral underpinnings.

Database case review of all drowning incidents at NYSDOH regulated swimming facilities from 1988 to 2011

Record review of all drowning investigation documentation

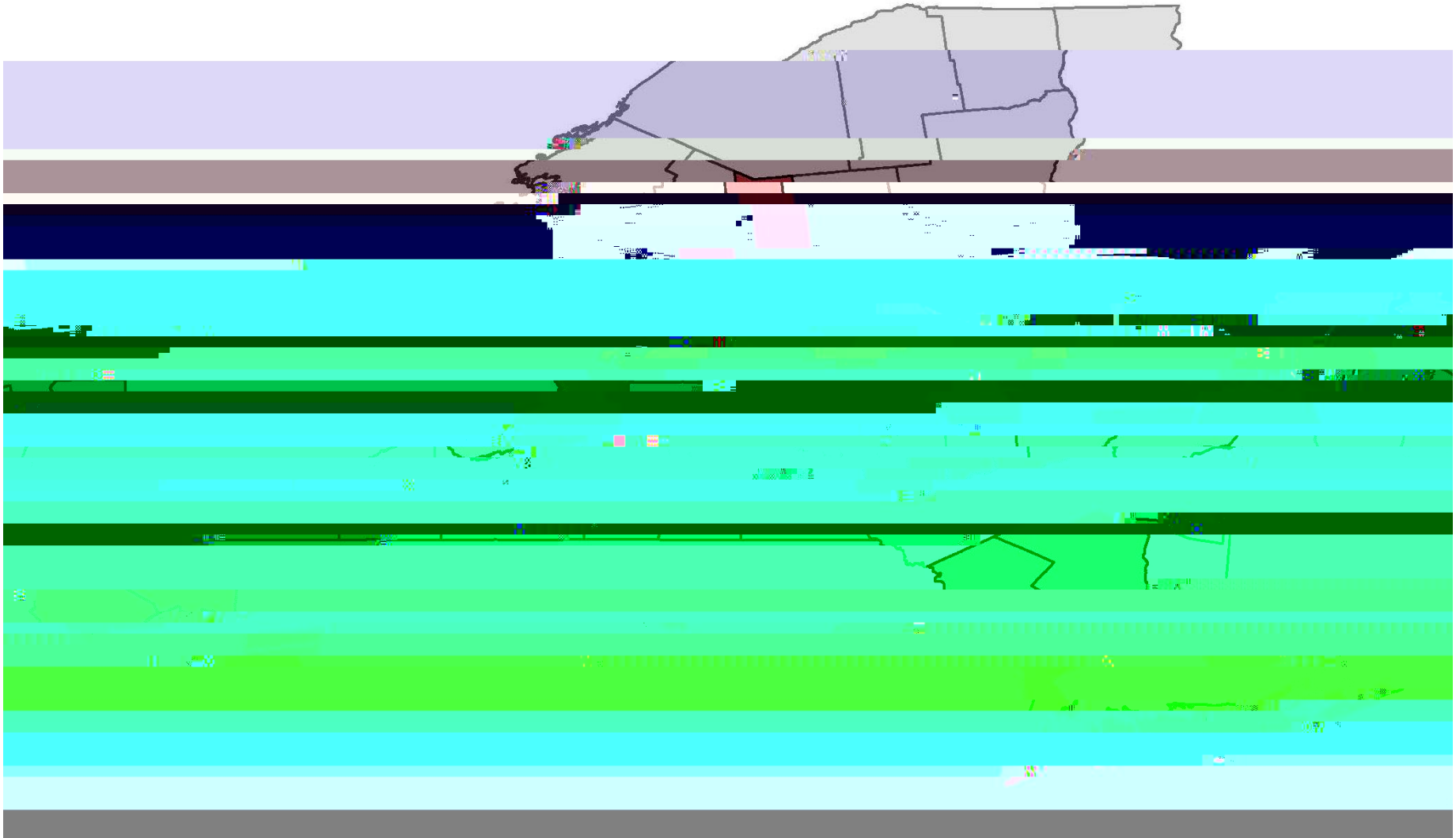
DUBBS Case Review

Generated keywords through a review of the available literature and expert opinion from aquatic programs such as the American Red Cross and YMCA

Victims' behaviors (keywords) included:

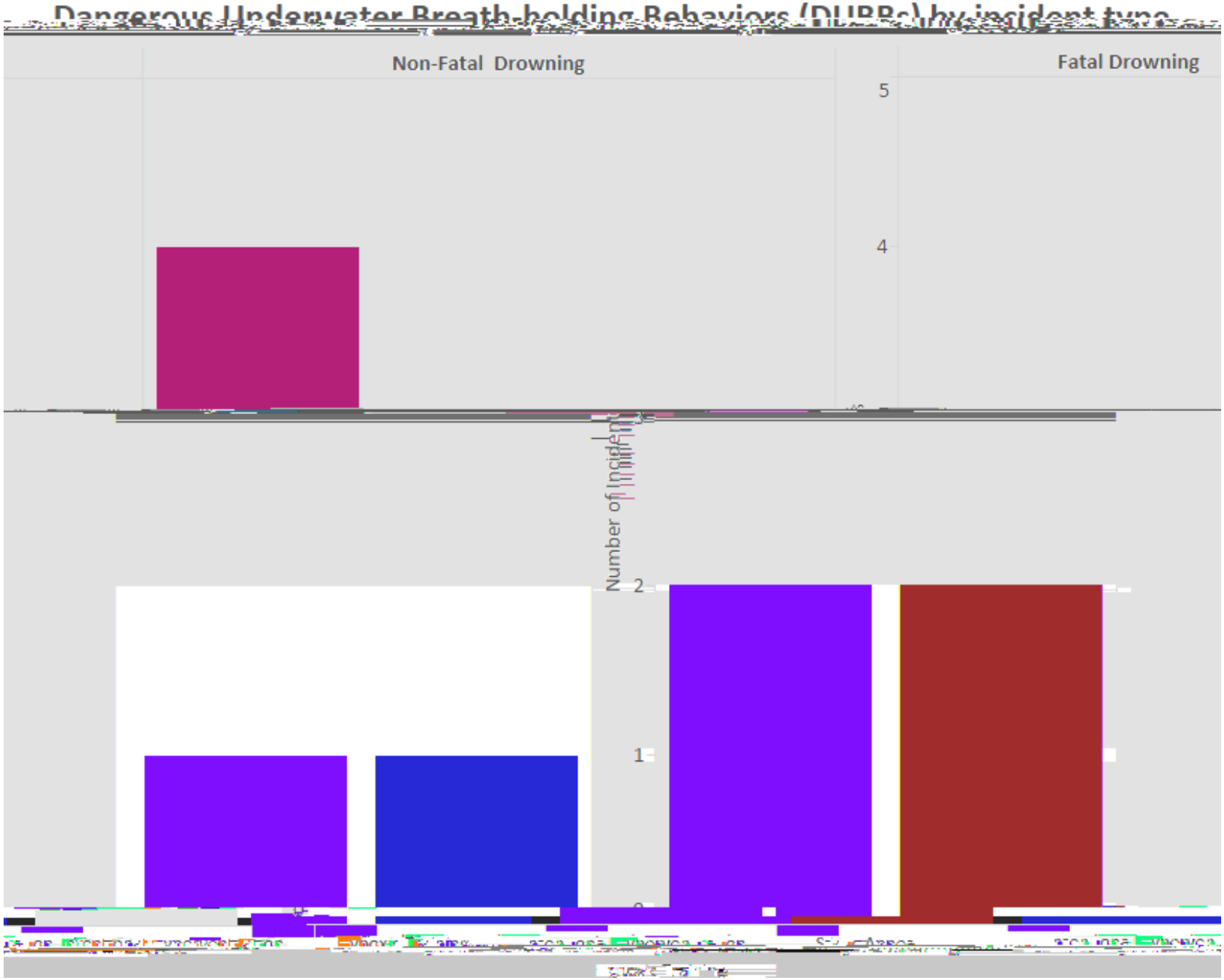
- repeated breath-holding
- breath-holding games/competition
- prolonged/extended submersion
- underwater distance swimming
- hyperventilation

New York County Distribution of Fatal and Non-Fatal Drowning Incidents Potentially Attributed to Dangerous Underwater Breath-Holding Behaviors 1988-2011



Identification of DUBBS Behavior Types

DUBBS Behavior							
Intentional Hyperventilation		Static Apnea		Hypoxic Training		Intentional Hyperventilation & Hypoxic Training Coactivity	
N	%	N	%	N	%	N	%
3	19%	6	38%	5	31%	2	13%


Non-Fatal Drowning
Fatal Drowning
5
4
Number of Incidents
2
1

DUBBS Analysis & Outcomes

Practicing more than one DUBB increased the risk for fatality.

A signid BT40 re W* n BT 7

Learn to Swim Program

Drowning prevention strategy for children and young adults.

New York City Department of Parks and Recreatic (DPR), Youth and Community Development (DYC and DOHMH.

Provides free instruction on water safety and swimming skills to children and adolescents ages 18 years old in low-income neighborhoods.

1,400 participants to date.

Pictorial Risk Messaging to Reduce DUBBS

In 2013, OPHE conducted a signage evaluation

Acknowledgements

Division of Environmental Health, New York City Department of Health and Mental Hygiene:

Christopher Boyd, Trevor McProud MESM, Li Huang PE, E
Ranese Simms MPH, Carolyn Olson MPH, Nadine Alexander MPH

Bureau of Community Environmental Health and Food Protection, New York State Department of Health:

Eric Wiegert MPH, Douglas Sackett, Timothy Shay, Aman
TarrierMPH

Additional Resources

- Water Safety in New York City
- Pictographic Signage required by New York City Health Code