

# A Public Health Emergency Simulation Tool for Enhanced Training in Emergency Preparedness and Response

## KFL&A Public Health

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# Overview

Introduction	(5 minutes)
Background	(10 minutes)
Scenario	(60 minutes)
Debrief	(15 minutes)

# Disclosure

- No relationships with commercial sponsors
- No potential conflicts of interest to declare
- Grant from Queen's University PHPM Residency program to develop this tool

# Learning Objectives

1. Participants will gain knowledge and skills in core emergency management competencies such as risk assessment, risk communication, and the incident management system; and in using ACES and PHIMS to inform action in a public health emergency.
2. Workshop will enable improved training and decision making by Public Health officials during a public health emergency, and develop skills and knowledge that can be applied to future training and planning.
3. Participants will reflect on the activity and provide feedback on the simulation tool to facilitators.

# Introduction

- This is a simulated event - it is fictional
- Local public health context
- This is a safe and open learning environment
- Work together to discuss and build on your responses
  - Within your group
  - With other groups
- Ask questions!
- Give feedback!

# Background:

- KFL&A Public Health is developing a series of public health emergency scenarios for education and training in Public Health Emergency Preparedness
  - Wide range of events (outbreaks, extreme weather, bioterrorism)
  - Based on actual occurrences (H1N1, Walkerton, Quebec City legionella outbreak, 2001 anthrax attacks)
  - Uses real-time surveillance informatics tools
  - Designed for PHPM resident training and assessment with potential for other applications
- In May 2016, simulation scenarios were reviewed by a group of emergency preparedness experts from across Canada to provide feedback and recommendations for appropriate management.

# Background:

For each simulation residents receive:

- Scenario Manual with day by day action
- CanMEDs objective of training
- Entrustable Professional Activities
- Supporting Documents
  - Guidelines, standards, and protocols related to the scenario
  - [Public Health Ontario Public Health Emergency Preparedness Course](#)

# Emergency Management Cycle



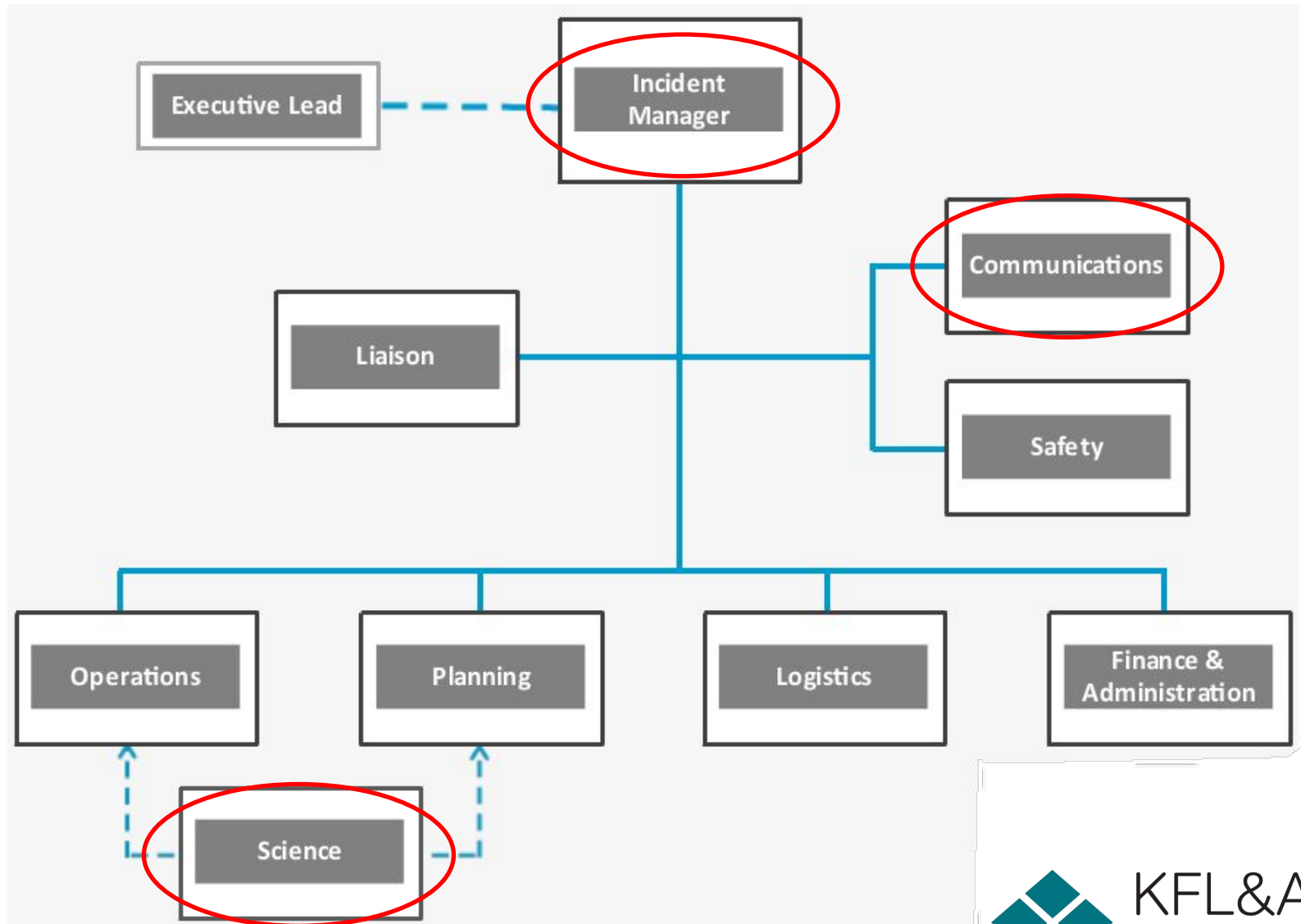
Source: Public Health Ontario, [Public health emergency preparedness course](#)



KFL&A  
Public Health

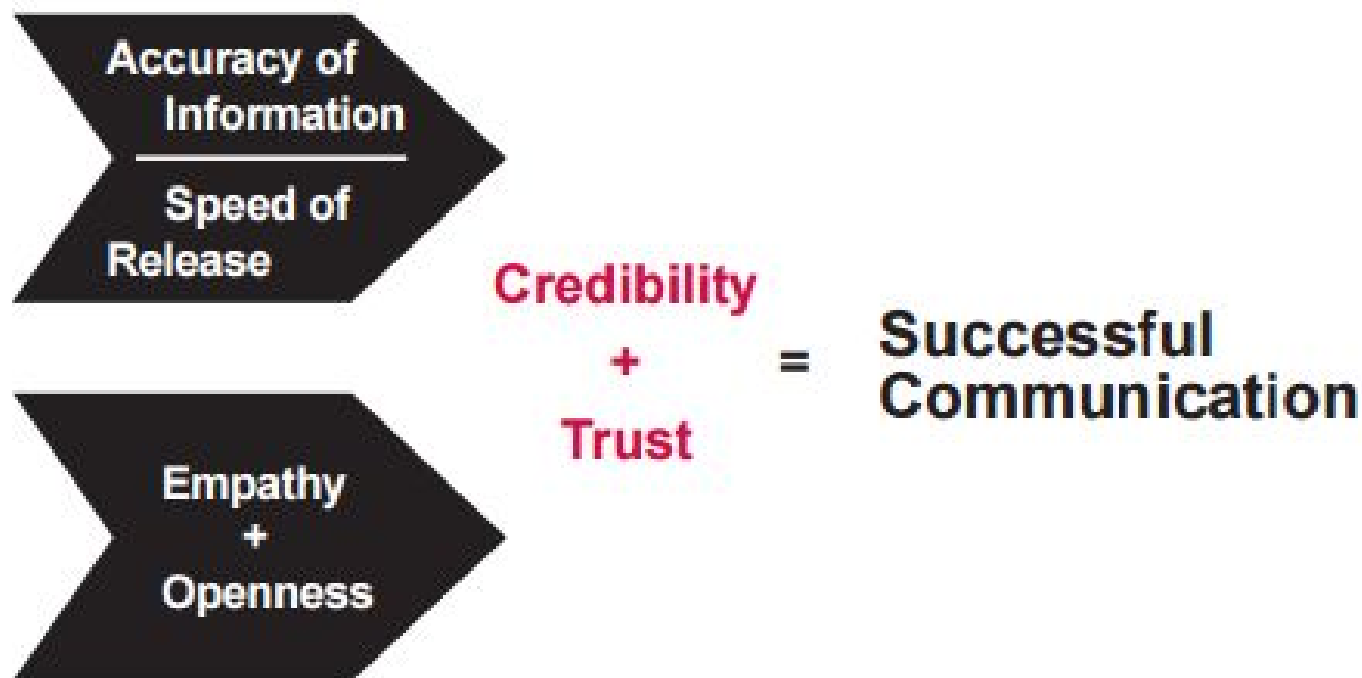


# Incident Management System



# Crisis and Emergency Risk Communication

- Communicating effectively with the public during times of crisis



# PHIMS

- Public Health Information Management System
- Uses **GIS technology** to enhance **real-time situational awareness** and assist with evidence informed **decision-making** to help protect the health of the population.
- PHIMS displays:
  - Environmental / Weather data. Current and Forecasted.
  - Demographic data.
  - Emergency and health infrastructure data.
  - Transportation infrastructure.
  - Tools to help you interact with and understand all of the data provided.

# ACES

- Acute Care Enhances Surveillance Application
- Real-time syndromic surveillance system
  - Monitors ED volume and hospital admissions
  - Temporal and spatial capabilities
- Monitors changes and trends in the incidence of endemic disease and detects new or emerging public health threats
- Real-time data from over 120 hospitals across Ontario

# Scenario Roles

- **Group 1:** Incident Management
- **Group 2:** Environmental Health Assessment (PHIMS)
- **Group 3:** Population Health Assessment (ACES)
- **Group 4:** Communications

# **Scenario: Extreme Heat**

# Scope

## **Type of Emergency:**

Extreme Heat

## **Geographic Location:**

Barrie, Ontario

## **Functions:**

- Incident Command,
- Environmental Health,
- Communications,
- Management








## **Personnel:**

- Medical Officer of Health,
- Environmental Health Team,
- Human Resources,
- Communications

# Day 1: Tuesday July 5, 2016

This morning at 9:00 AM you receive a heat warning for South-Central Ontario from Environment Canada.

The 7-day forecast from Environment Canada for the City of Barrie shows that temperatures are expected to stay above 30 °C and humidex values above 40°C for the rest of the week.

Forecast						
Wednesday July 6	Thursday July 7	Friday July 8	Saturday July 9	Sunday July 10	Monday July 11	Tuesday July 12
						
32°C	35°C	36°C	39°C	35°C	30°C	28°C
Feels like: 38	Feels like: 43	Feels like: 45	Feels like: 43	Feels like: 42	Feels like: 35	Feels like: 32



# Day 1: 10 Minutes

***What action do you take in response to this heat warning and to prepare for the continuing high temperatures throughout the week?***

**Group 1:** What is your role and responsibilities? Who are your partners?

**Group 2:** What hazards are associated with extreme heat?

What data in PHIMS should be monitored?

**Group 3:** What are the health effects of extreme heat? Who is at risk?

What data in ACES should be monitored?

**Group 4:** How do you communicate the heat warning?

# Group 1: Incident Management

## What is the role of local public health?

- Communicate heat warnings and appropriate health protective measures
- Partner with local stakeholders on a local extreme heat response
- Conduct surveillance of local heat related health impacts
- Evaluate the extreme heat response
- Other?

## Who are your partners?

- **Local:** municipal government, hospitals, EMS, police, shelters, parks and recreation, long term care facilities, primary care, community centres, animal services, municipal office of emergency management, others?
- **Provincial:** Public Health Ontario, neighbouring health units
- **Federal:** Environment and Climate Change Canada, Health Canada, Public Health Agency of Canada

# Group 2: PHIMS

## **What hazards are associated with extreme heat?**

- Prolonged extreme heat, morbidity and mortality
- Weather events (extreme thunderstorms, tornados)
- Power Outages

## **What data in PHIMS should be monitored?**

- Air Quality
- Storm Events
- Air temperature, cloud cover, humidity, winds
- Vulnerable populations: deprivation, % population age 4 and under, % population age 65+

# Group 3: ACES

## **What are the health effects of extreme heat?**

- Heat stroke, heat exhaustion, heat fainting, heat edema
- Symptoms: dizziness, fainting, nausea/vomiting, headache, rapid breathing/heartbeat, extreme thirst, decreased urination
- Increased risk: Elderly, children, chronically ill, homeless and underhoused, persons using certain medications, persons who work/exercise outside, persons without access to air conditioning

## **What data in ACES should be monitored?**

- Heat related syndromes: ENVIRO, DEHY, CV, ELECT, HEAD
- Age (who is being affected by heat related illness?)
- Postal Code (where are heat related illness patients coming from?)

# Group 4: Communications

## How do you communicate the heat warning?








- Target audience: general public, primary and acute care, long term care, specific community organizations, (e.g. shelters, community centres, day camps/daycares)
- Key messages:
  - extreme heat is a health risk,
  - who is at increased risk,
  - protective health actions (drink water, avoid sun exposure, reschedule activities, visit neighbours/friends/family at risk, etc)
  - how to get more information
- Communication channels: media release, website, email, twitter, radio, etc.
- Consider the need for consistent messaging across agencies

# Day 3: Thursday July 7, 2016

**Weather Report:** Sunny – daytime high 36 (Humidex 47), evening low 24 (humidex 29)

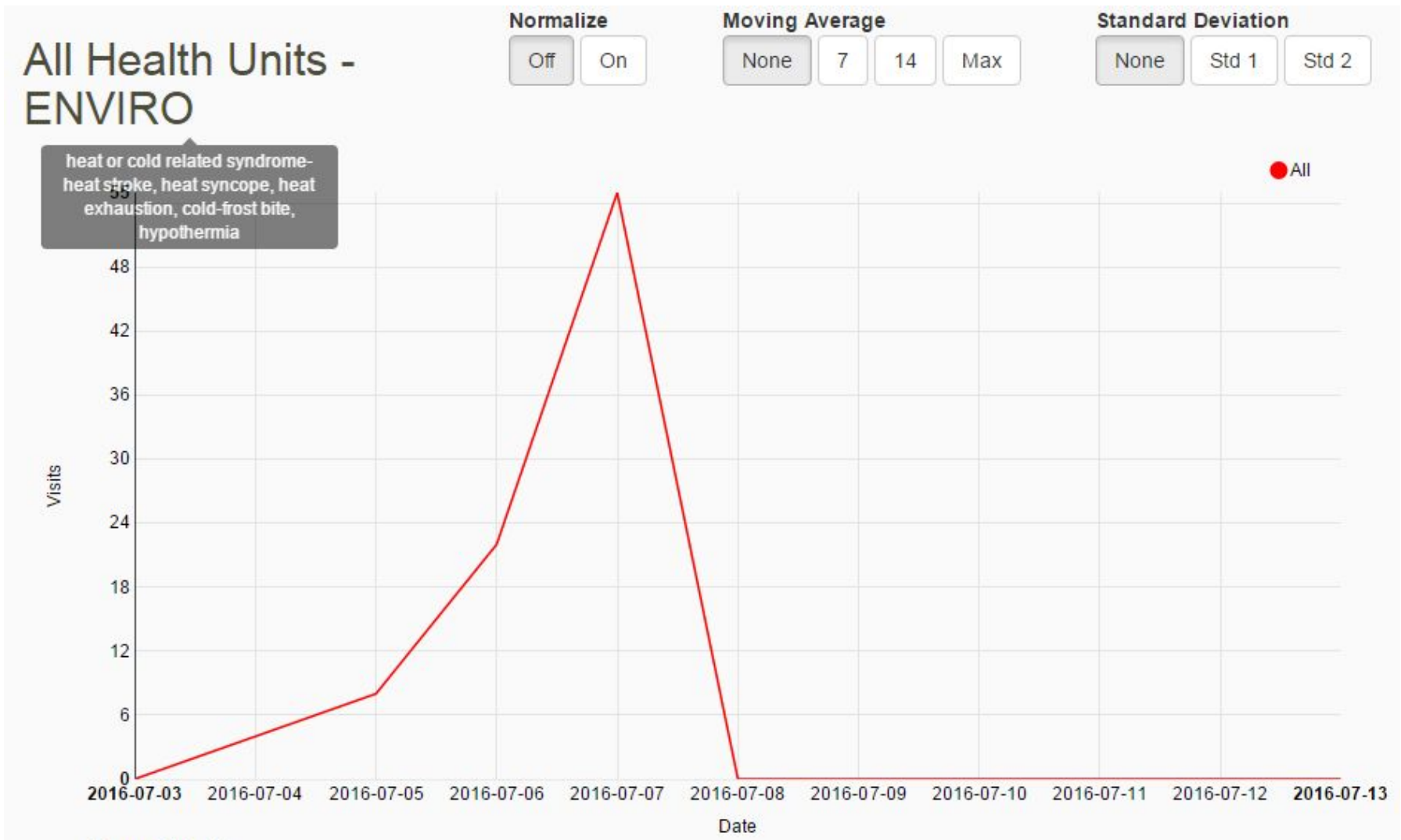
The oppressive heat continues on Thursday with a scorching high of 36°C. The municipality has opened cooling centres and water-facilities across the city; and has **activated the municipal emergency control group** to coordinate a response to the ongoing heat event.

With the forecast calling for continuing high temperatures over the weekend, the MECG requires your support and scientific advice to better understand the heat related health impacts in the community.

Forecast						
Thursday July 7	Friday July 8	Saturday July 9	Sunday July 10	Monday July 11	Tuesday July 12	Wednesday July 13
						
35°C	37°C	32°C	35°C	30°C	28°C	24°C
Feels like: 46	Feels like: 49	Feels like: 38	Feels like: 40	Feels like: 35	Feels like: 32	Feels like: 27

# Day 3: Thursday July 7, 2016

Heat related emergency room visits July 3 – July 7



# Line Listings - heat related emergency room visits July 7

## - ENVIRO

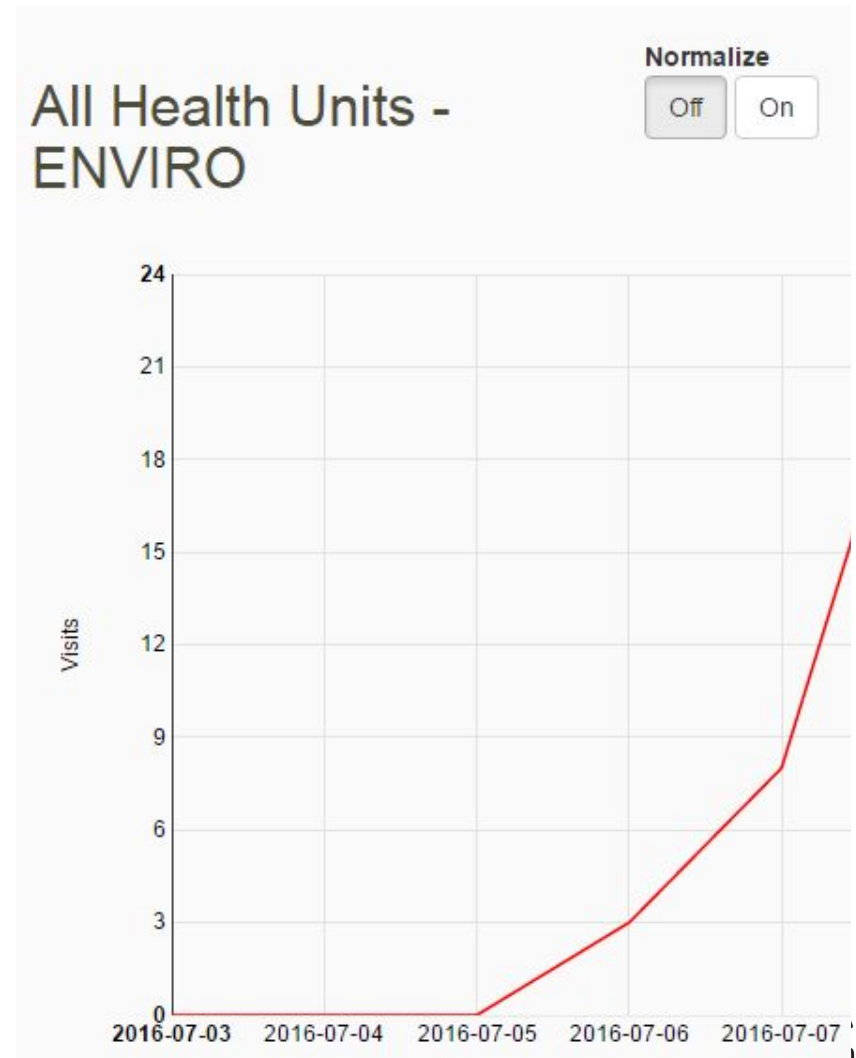
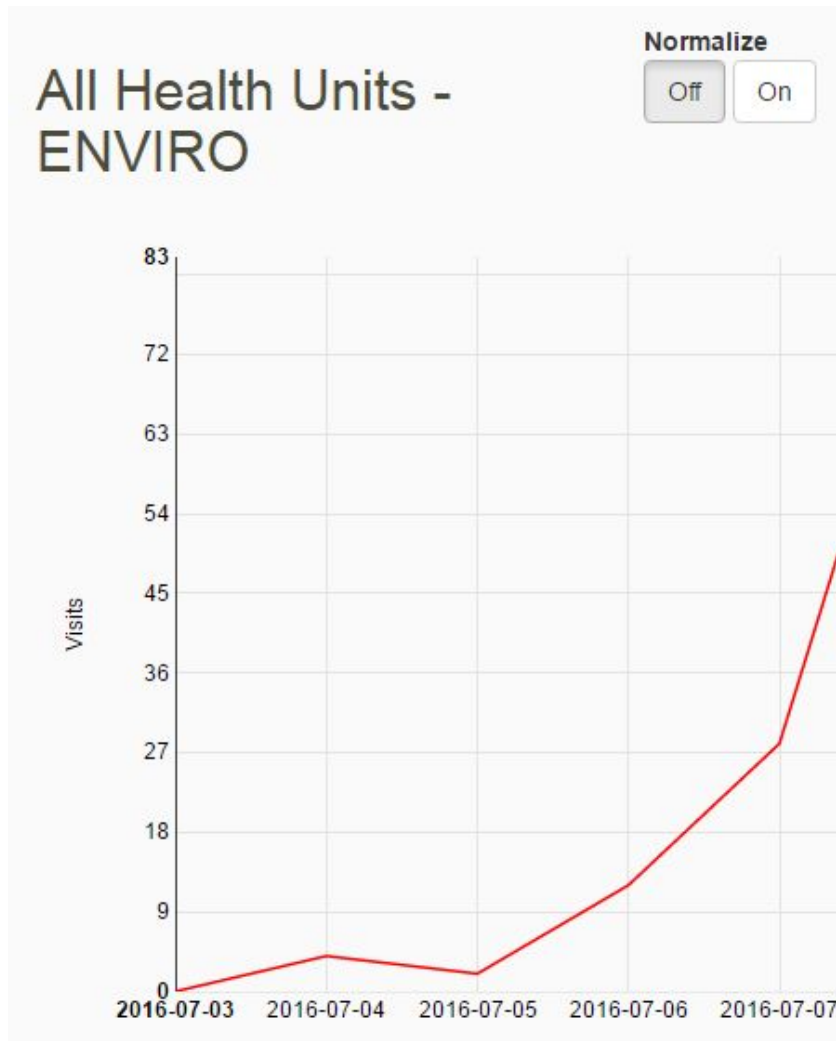
Date ▼	Time	Age	Gender	Syndrome	Complaint	Hospital	FSALDU	CTAS	Admission
2016-07-08	12:30:57	34	M	ENVIRO	HEAT EXPOS...	RVH	L4R	5	ED Visit
2016-07-08	12:26:10	92	M	ENVIRO	HEAT EXPOS...	OSMH	L4M	4	ED Visit
2016-07-08	12:21:14	9	F	ENVIRO	HEAT EXPOS...	RVH	L4M	5	ED Visit
2016-07-08	12:15:57	5	F	ENVIRO	HEAT EXPOS...	RVH	L0K	2	ED Visit
2016-07-08	12:07:59	66	M	ENVIRO	HEAT EXHAU...	RVH	L4R	4	ED Visit
2016-07-08	12:07:13	23	F	ENVIRO	? HEAT EXHA...	GBGH	L3V	2	ED Visit
2016-07-08	12:06:16	93	F	ENVIRO	HEAT EXPOS...	GBGH	L0K	0	ED Visit
2016-07-08	12:01:54	0	F	ENVIRO	HEAT EXHAU...	OSMH	L4N	5	ED Visit
2016-07-08	11:56:51	48	M	ENVIRO	? HEAT EXHA...	RVH	L4M	5	ED Visit
2016-07-08	11:52:07	2	F	ENVIRO	HEAT EXPOS...	OSMH	L0L	4	ED Visit
2016-07-08	11:50:21	103	M	ENVIRO	? HEAT EXHA...	OSMH	L0K	0	ED Visit
2016-07-08	11:42:45	24	M	ENVIRO	HEAT EXPOS...	RVH	L4M	2	ED Visit
2016-07-08	11:35:41	4	M	ENVIRO	HEAT EXHAU...	GBGH	L4M	0	ED Visit
2016-07-08	11:35:15	108	F	ENVIRO	HEAT EXPOS...	RVH	L4N	4	ED Visit
2016-07-08	11:31:33	33	F	ENVIRO	? HEAT EXHA...	OSMH	L0K	0	ED Visit
2016-07-08	11:29:37	86	F	ENVIRO	HEAT EXPOS...	MAH	L4N	2	ED Visit
2016-07-08	11:26:24	99	F	ENVIRO	? HEAT EXHA...	RVH	L0K	0	ED Visit



# Heat related emergency room visits July 3 – July 7

Adults aged 65+

Children aged 0-4



# Day 3: Thursday July 7, 2016

**Group 1:** What are the elements of your extreme heat response plan and IMS structure?

**Group 2:** The MECG wants to open additional cooling centres, where would you recommend opening cooling centres?

**Group 3:** What can you tell the MECG about the health impact of this heat wave so far?

**Group 4:** What is your risk communication strategy and what are the health unit's priority messages?

# Group 1: Management

## **What are the elements of your internal extreme heat response plan and IMS structure?**

- Personnel – who might be involved?
- IMS roles – which ones do you need?
- Key operations/actions for local public health?
  - Communication and health protection messaging
  - Coordination with other health system agencies
  - Focus on vulnerable/special populations

## **Group 2 - PHIMS**

- Using PHIMS, we can locate areas with high % of vulnerable populations and consider this when identifying locations for placement of cooling centres

## **Group 3 – ACES**

- Using ACES, describe the syndromic surveillance for heat related ED visits
  - Are visit volumes above normal?
  - Who is most affected?

# Group 4: Communications

- Describe your risk communications strategy:
  - Consider your audience
  - The information being communicated
  - Engaging your audience
  - Also think about your internal communications and communications with partners

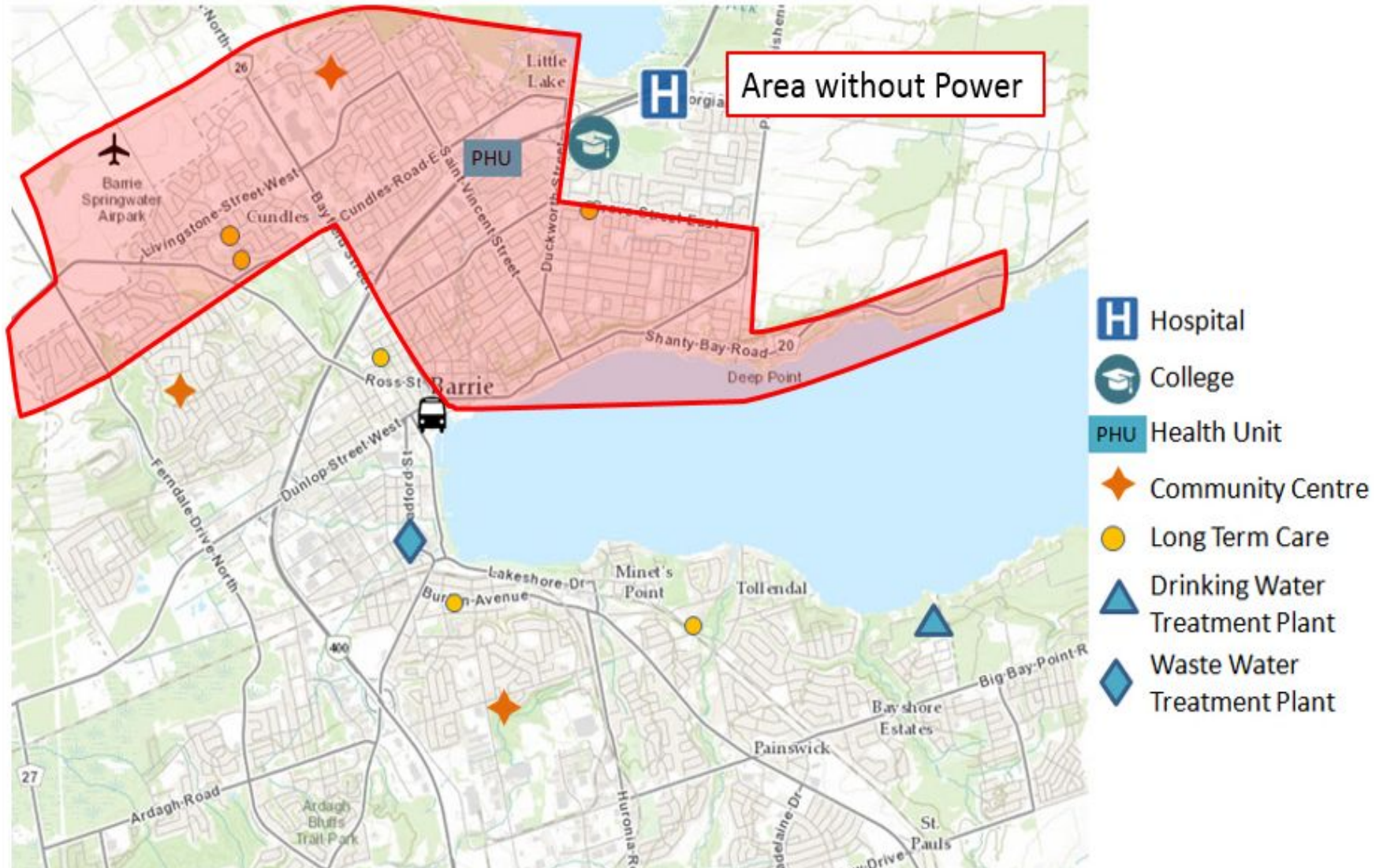
# Day 4: Friday July 8, 2016

**Weather Report:** Sunny – daytime high 37 (Humidex 42), evening low 24 (humidex 29)

The extended heat event continues to strain the power grid and has led to **intermittent power outages across Southern Ontario**. Shortly after 1:00 pm a mid-range transmission cable fails, **cutting power to most of the north end of the city**. The power utility's initial assessment states that full power may not be restored until Sunday.

Hundreds of residential dwellings, dozens of businesses and restaurants, three cooling centres, and the main office of the health unit are all affected by the outage. In addition, three long term care homes with approximately 450 elderly residents between them are affected. Generators are operational at two of the three facilities with a generator capacity for 12-16 hours.

# Day 4: Friday July 8, 2016



# Day 4: Friday July 8, 2016

**Group 1:** How does this new threat impact your response?  
Update your plan and IMS structure as needed

**Group 2:** What populations are most vulnerable? Evacuation may be necessary, how would you direct the evacuation using PHIMS?

**Group 3:** What are your health concerns with an ongoing power outage and extreme heat? What does/can the syndromic surveillance show?

**Group 4:** How does the power outage change your communication strategy and key messages?



# Group 1: Incident Management

**How does this new threat impact your response?**

**Activate or update the emergency response plan:**

- Update the incident management system
- Coordinate with local agencies and alert provincial agencies, for additional support.

**Tailor the response plan:**

- Work with Long Term Care to monitor and evacuate facilities
- Target outreach efforts to focus on vulnerable populations
- Consider need for additional cooling centres in other parts of the city
  - Encourage the city to offer free transit
- Public Health Inspectors – restaurants, community centre (pool), vaccine providers may require inspections due to power outage
- Occupational Health and Safety –safety of public health staff
- Enhance surveillance activities to understand who is most at risk and where they are located

# Group 2: PHIMS

**What populations are most vulnerable? How would you direct the evacuation using PHIMS?**

- Long Term Care homes
  - Facility without generator power
  - Monitor other facilities and prepare for evacuation if needed
  - Public Health would not lead but could help coordinate/inform
- Persons with risk factors for heat related illness
  - Encourage those who can to relocate to areas with power
  - Target outreach to vulnerable populations, work with other organizations doing outreach (CCAC, red cross, police services)
  - PHIMS can be used to identify neighbourhoods with high percentage of vulnerable populations,
  - Others?

# Group 3: ACES

**What are your health concerns with an ongoing power outage and extreme heat? What does/can the syndromic surveillance show?**

## **Health Concerns:**

- Without air-conditioning the risk of heat related illness is increased
- Power-outage related safety concerns
- Vaccine storage, cold chain could be compromised
- Food premises affected by power loss

## **Syndromic Surveillance:**

- inform health system partners if there is an increase in heat related ED visits so they can plan for the surge.
- Monitor for increases in other syndromes such as
  - Gastro (continue to monitor after power returns)
  - CO (is this likely?)

# Group 4: Communications

**How does the power outage change your communication strategy and key messages?**

- Customize communication messages to include power outage safety (food, pets, check on your neighbours and vulnerable populations)
- Encourage residents to temporarily relocate to other parts of the city
- Encourage residents to check on their family, friends, and neighbours
- How will you get your messages to populations without power?
- Enhance your communication with health system partners

# Day 7: Monday July 11, 2016

**Weather Report:** Sunny – daytime high 23 (Humidex 27), evening low 16 (humidex 20)

Power was completely restored to the entire city of Barrie on Sunday afternoon, some areas were only affected for about 12 hours while others were out for a full two days!

The heat wave breaks on Sunday evening with a cold front and windy weather moving into the area overnight. On Monday, the forecast shows a daytime high of 23°C.

# Day 7: Monday July 11, 2016

**All groups:**

The emergency is over! Now what?

# Day 7: Monday July 11, 2016

## **Recovery Phase:**

- De-escalate the emergency response
- Return to normal operations
- After an incident can be a key time for public health messaging, people are more receptive to the message
  - Heat safety, sun safety, power outage safety, emergency preparedness promotion
- Evaluate the response to the extreme heat event and apply to planning, prevention, and mitigation strategies
  - What are some mitigation strategies that would help protect against future heat events?

# Scenario 2: Regional Mass Opioid Overdose



# Day 1: February 27<sup>th</sup>, 2017

## 15:00h

- Paramedic services within the South East LHIN region, spanning Hastings and Prince Edward Counties Public Health; Kingston, Frontenac, Lennox, and Addington Public Health; and Leeds, Grenville and Lanark District Health Unit are experiencing **an increased service demand for suspected overdoses.**

# Day 1: February 27<sup>th</sup>, 2017

17:00h

- Surveillance data show increased number of emergency department presentations with suspected opioid overdoses across all hospitals in the HPE, KFLA, and LGL regions.
- There are 27 opioid overdose presentations to emergency rooms in the past 8 hours split across the 3 regions.
- Baseline regional data shows that hospitals in HPE, KFLA, and LGL combined receive less than 20 suspected opioid overdoses a month

# Day 1: February 27<sup>th</sup>, 2017

***What are the key response actions to be taken?***

***Whose role or responsibility are those actions?***

***What resources or services are required to respond?***

# Day 2: February 28<sup>th</sup>, 2017

12:00h

- Additional 35 patients with suspected opioid overdoses have presented to various hospitals in the past 18 hours.
- Paramedic duty supervisors are being notified by CACC of code red status (no paramedic services available for response) multiple times per day.

# Day 2: February 28<sup>th</sup>, 2017

***What are the key response actions to be taken?***

***Whose role or responsibility are those actions?***

***What resources or services are required to respond?***

# Day 3: March 1<sup>st</sup>, 2017

12:00h

- 43 more suspected opioid overdoses have presented to emergency rooms across the regions in the past 24 hours.
- Increasing CACC code red (no paramedic available for response) for all regions.
- Fire services have been responding to multiple tiered response calls for unconscious patients.
- Naloxone up to 2.4mg IV [0.4mg/vial] are needed for some cases.

# Day 3: March 1<sup>st</sup>, 2017

## 14:00h

- An investigation of the 105 suspected opioid overdose cases reveals that the majority of individuals were using heroin.
- Rumours from community partners reveal their clients have heard some form of “strong fentanyl” is circulating around.

# Day 3: March 1<sup>st</sup>, 2017

***What are the key response actions to be taken?***

***Whose role or responsibility are those actions?***

***What resources or services are required to respond?***



**March 2<sup>nd</sup> 2017****12:00h**

- 30 more suspected opioid overdose cases are seen in hospitals across the 3 regions.
- Local harm reduction programs are noting an increase demand for naloxone kits

**March 3<sup>rd</sup>, 2017****12:00h**

- Another 25 suspected opioid overdose cases are seen across the 3 regions.

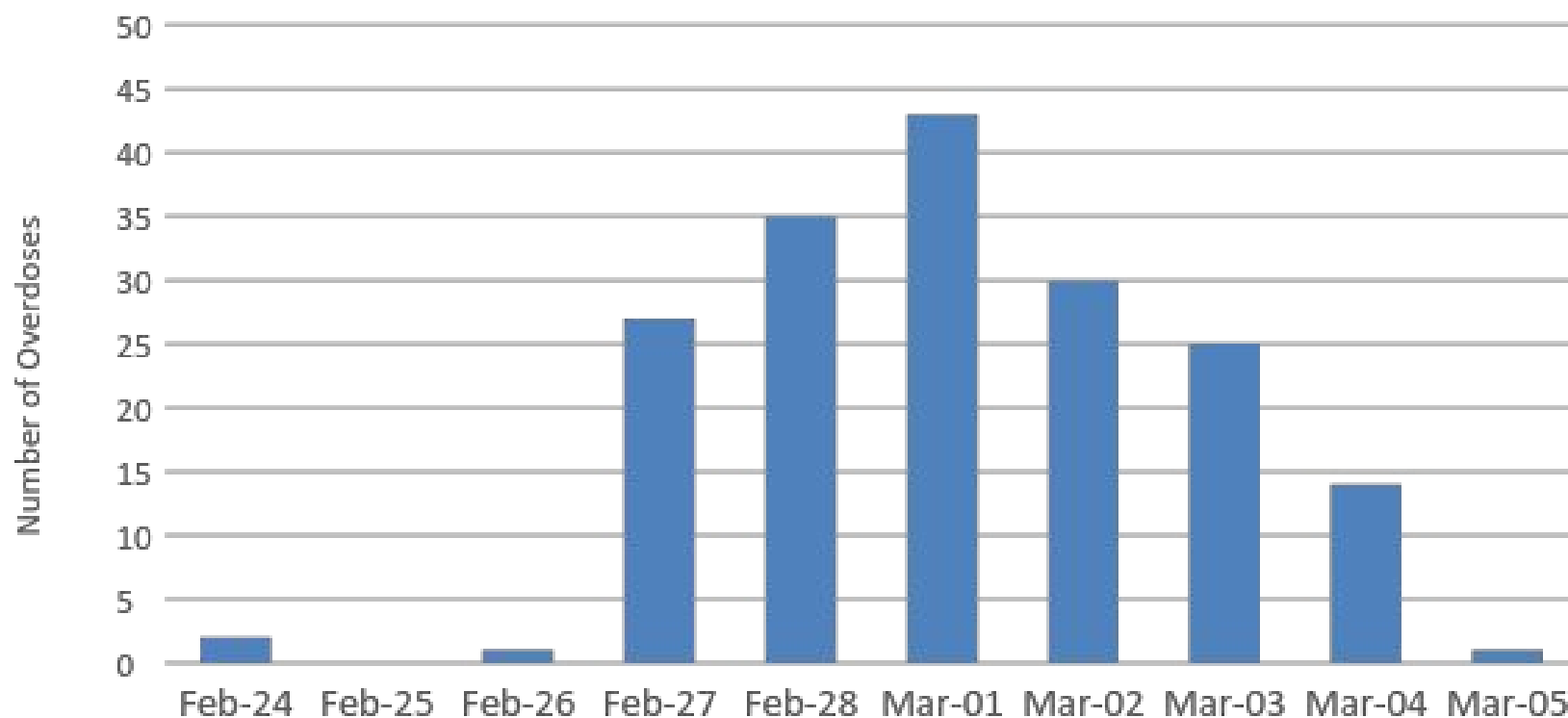
**March 4<sup>th</sup>, 2017****12:00h**

- 14 more suspected opioid overdoses cases are seen across the 3 regions.

**March 5<sup>th</sup>-12<sup>th</sup>, 2017**

- Numbers of suspected opioid overdoses are back at baseline numbers

## Suspected Opioid Overdoses in the South East Region



# Debrief

- Was this activity accessible and applicable to a wide range of public health backgrounds?
- Did this activity help you understand the use of PHIMS and ACES for emergency preparedness?
- How could we improve these scenarios for public health training?