# Hazmat event reporting in the media

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# The Project


- I used Google to collect newspaper headlines related to hazmat events, beginning in 2010. The scope of the search is English stories from the global press. The Google algorithm has changed over time, but the results do not seem to have varied significantly as a result.
- As of July 24, 2017, I collected 12,618 events (4.6 events/day) that google identified as containing these key words: “hazmat”; “chemical” and (“fire” or “explosion”); “laboratory” or (“fire” or “explosion” or “accident” or “injury”)
- The Coast Guard National Response Center receives about 70 hazmat reports a day, so the headlines collection does not reflect all events, but those that attract local media attention.
- Over the last few years, I have included “discovery” stories that reflect the tone of the government or media in addressing chemical issues.

# Why?

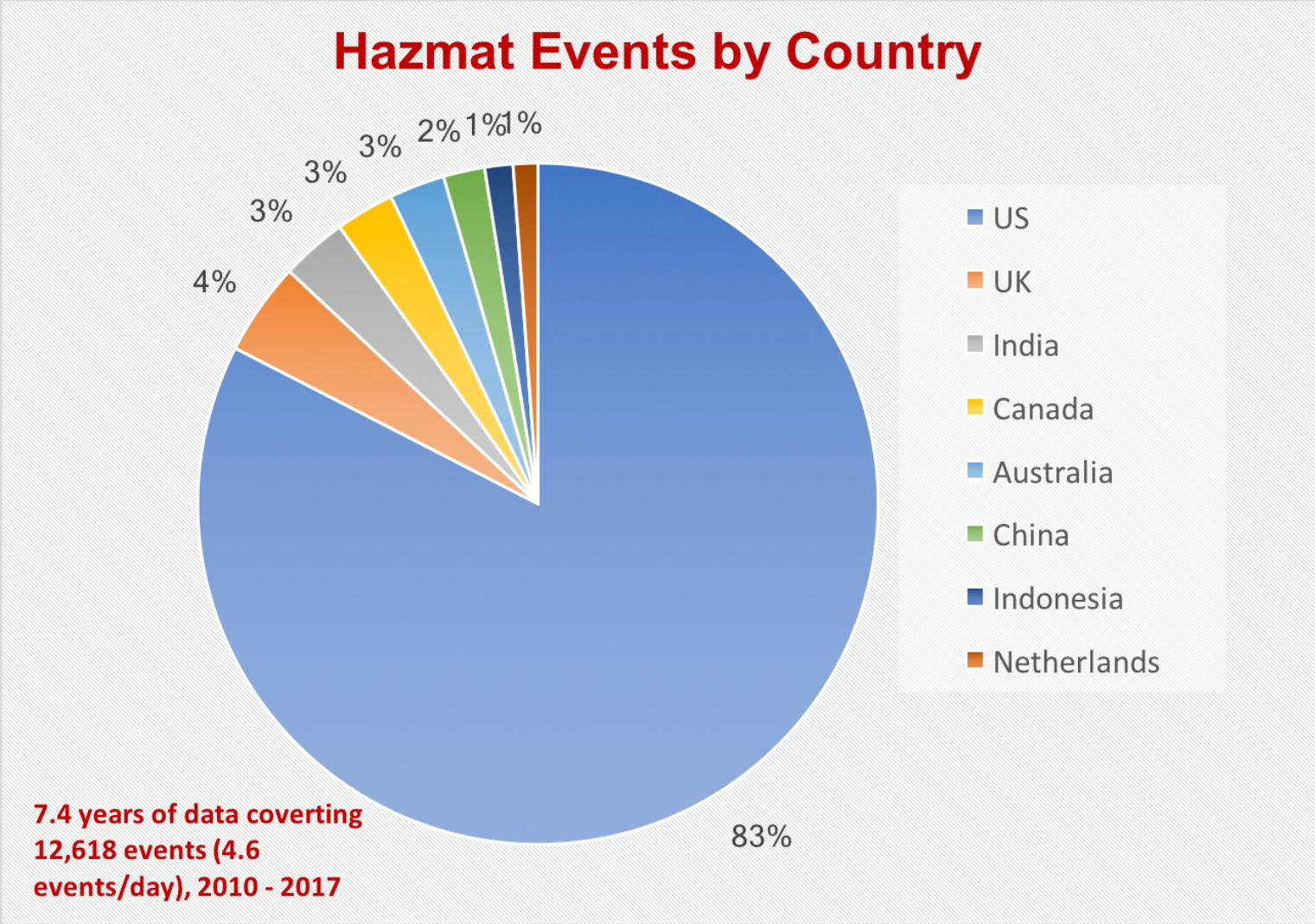

- The purpose is to provide context to specific lab events around hazardous materials (UCLA fire, Texas Tech explosion).
- The first question in my mind was:
  "*Can we tell if the safety performance of laboratories is different from other parts of the economy, in terms of hazmat incidents?"*
- A second question became:
  *"How is **hazmat** perceived in the popular press and how does that relate to the image of chemicals in the larger society?"*
- Because of the many filters between an event and the press as well as between the press and the readers, there is no statistical intent. But, population numbers provide context for an individual report.
- Another goal is to help the chemical health and safety community stay aware of headline events, both to plan related responses and to be ready for questions from the public.

# How?

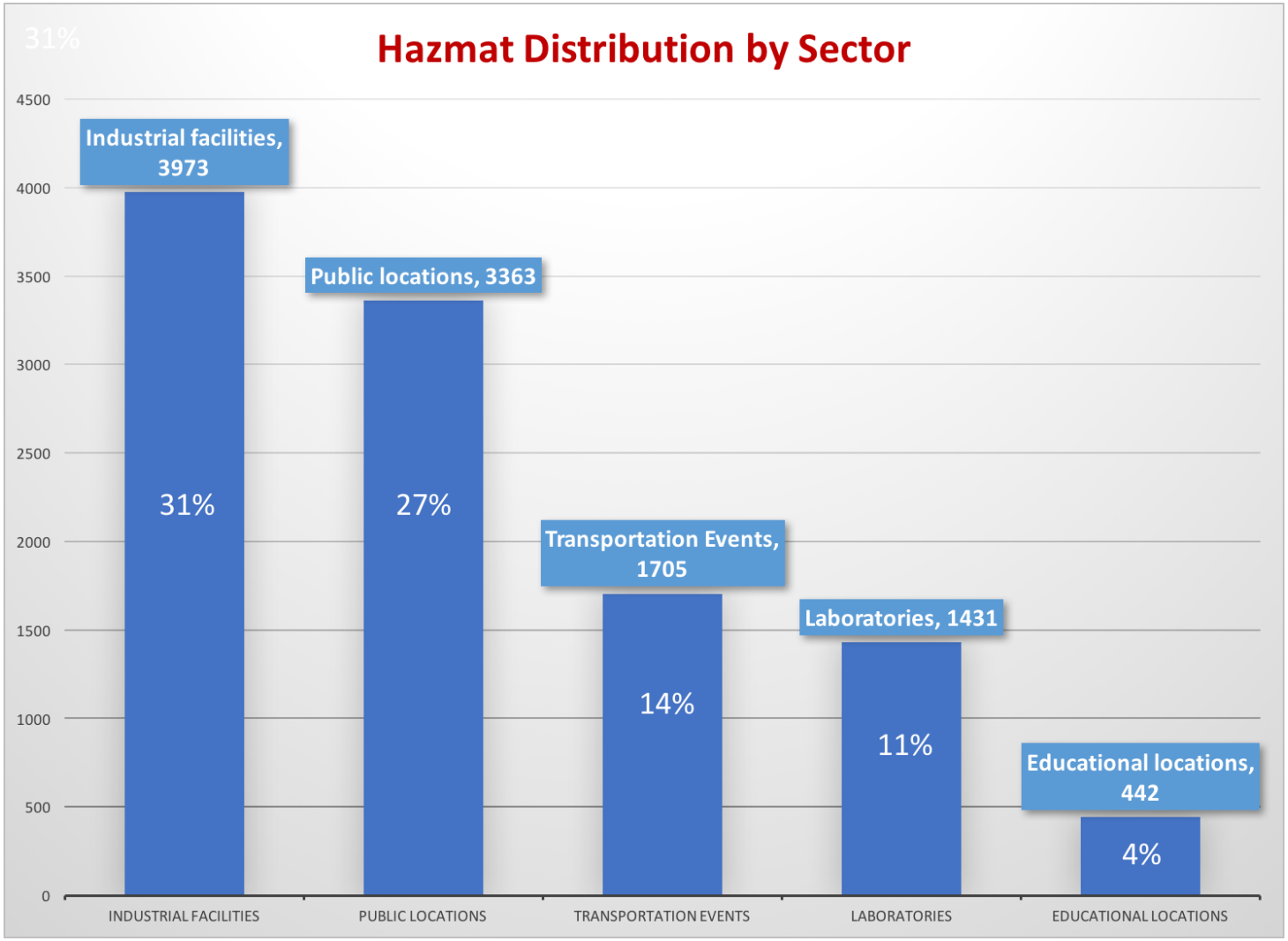

- I review the stories and classify them based on:
  - Location
  - Economic sector (industrial, transportation, public, lab, other)
  - Type of event (explosion, fire, release, discovery)
  - Extent of damage (response, injury, death, follow-up)
  - Primary Chemical Involved

- I exclude “white powder” and fuel releases during normal traffic accidents.

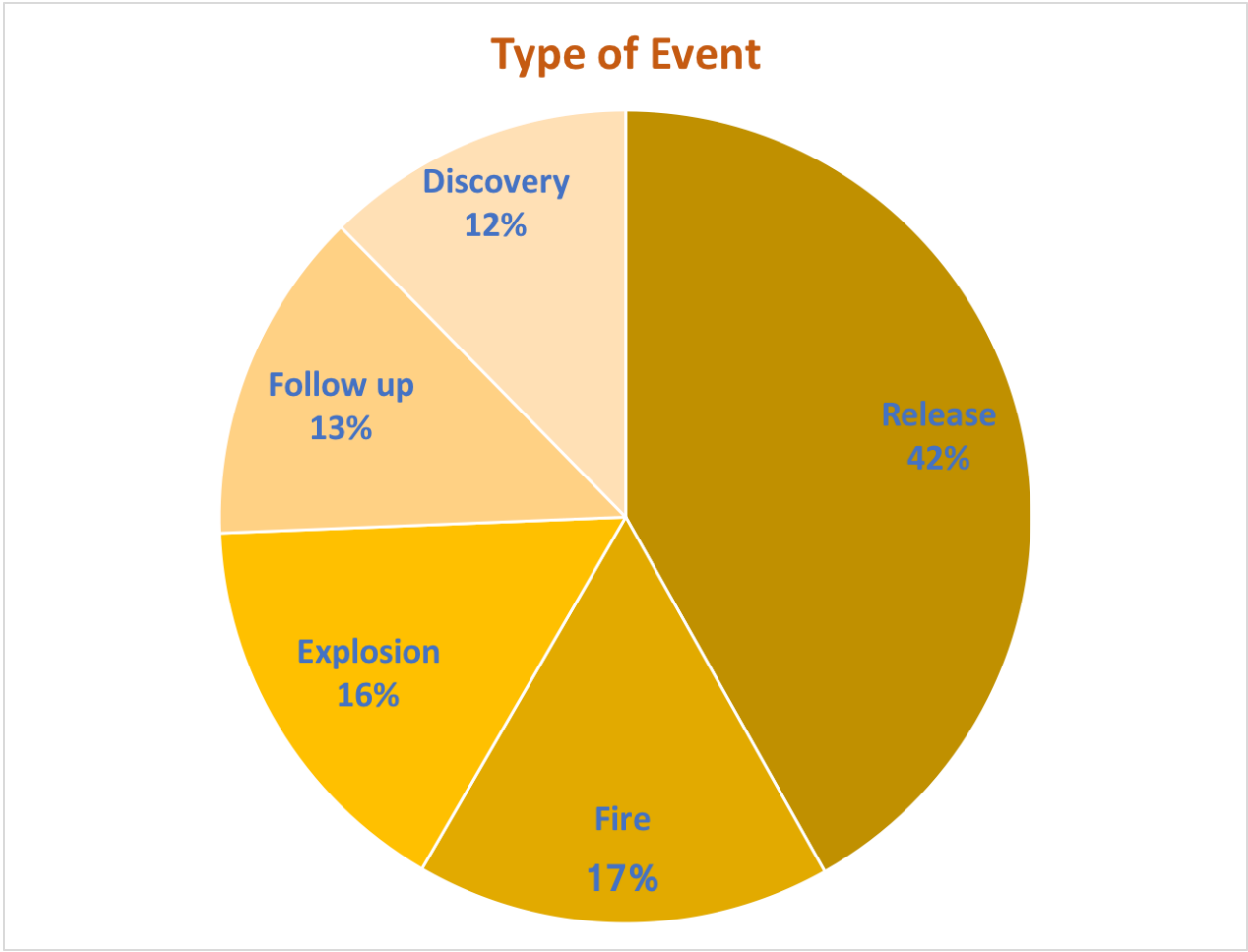
# Results:
# Where are hazmat events reported?



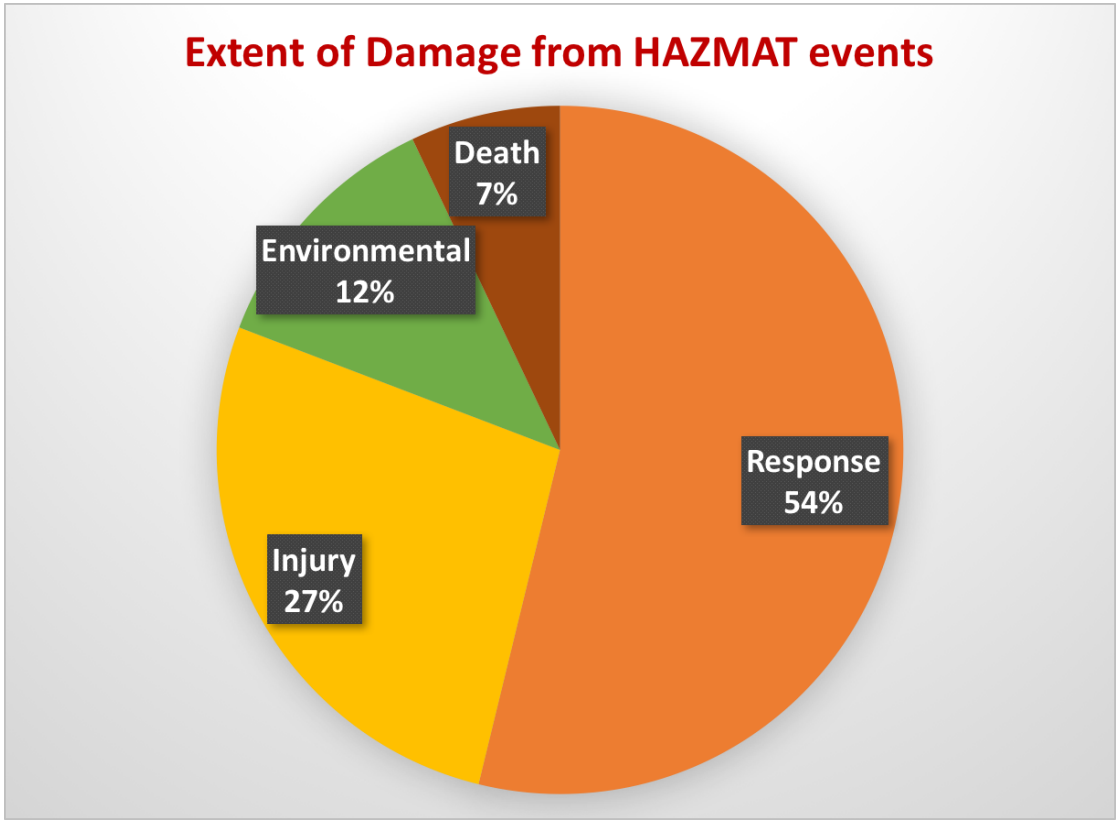
# Results:
# What Sector was Involved?



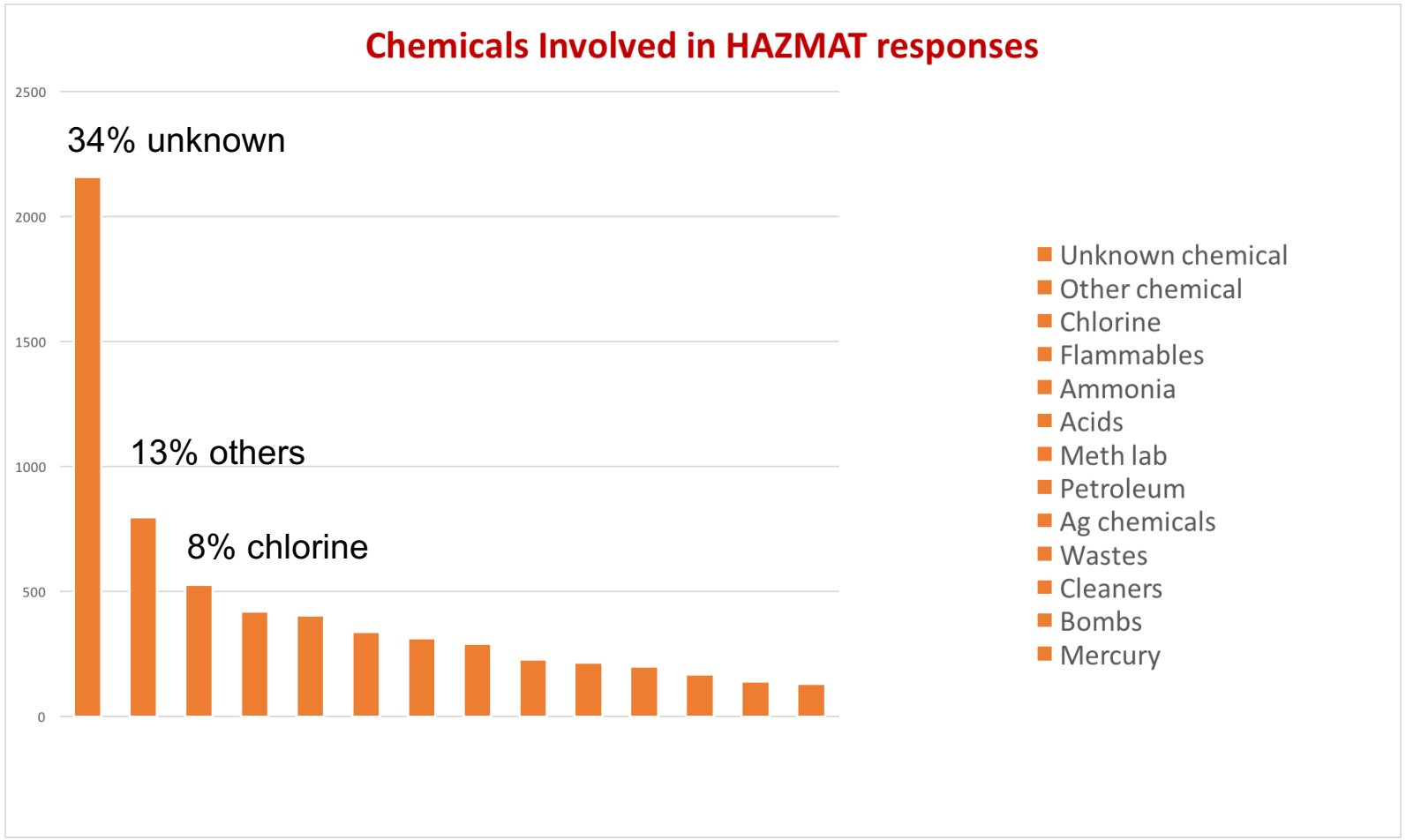
# Results: What Happened?



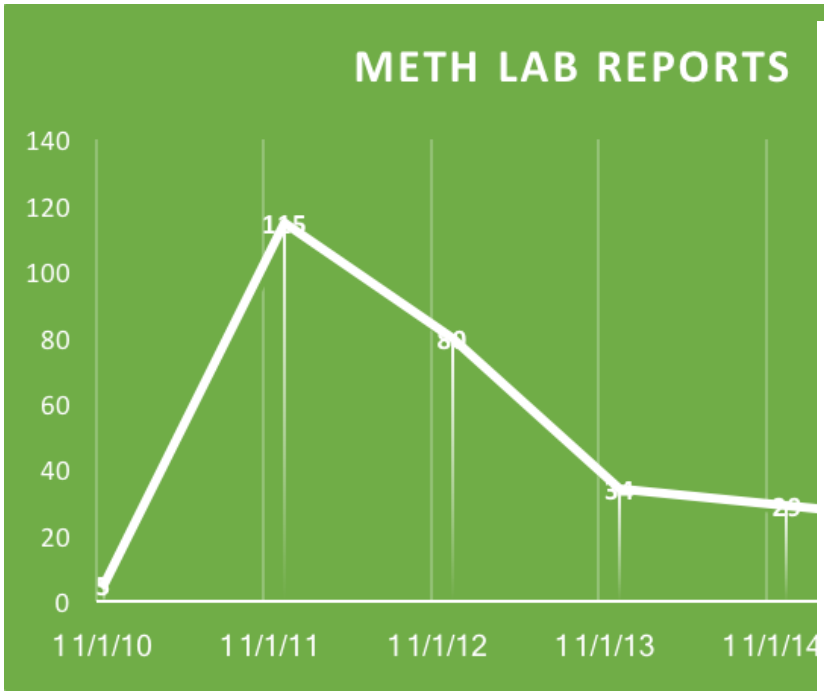
# Results: How Bad Was It?

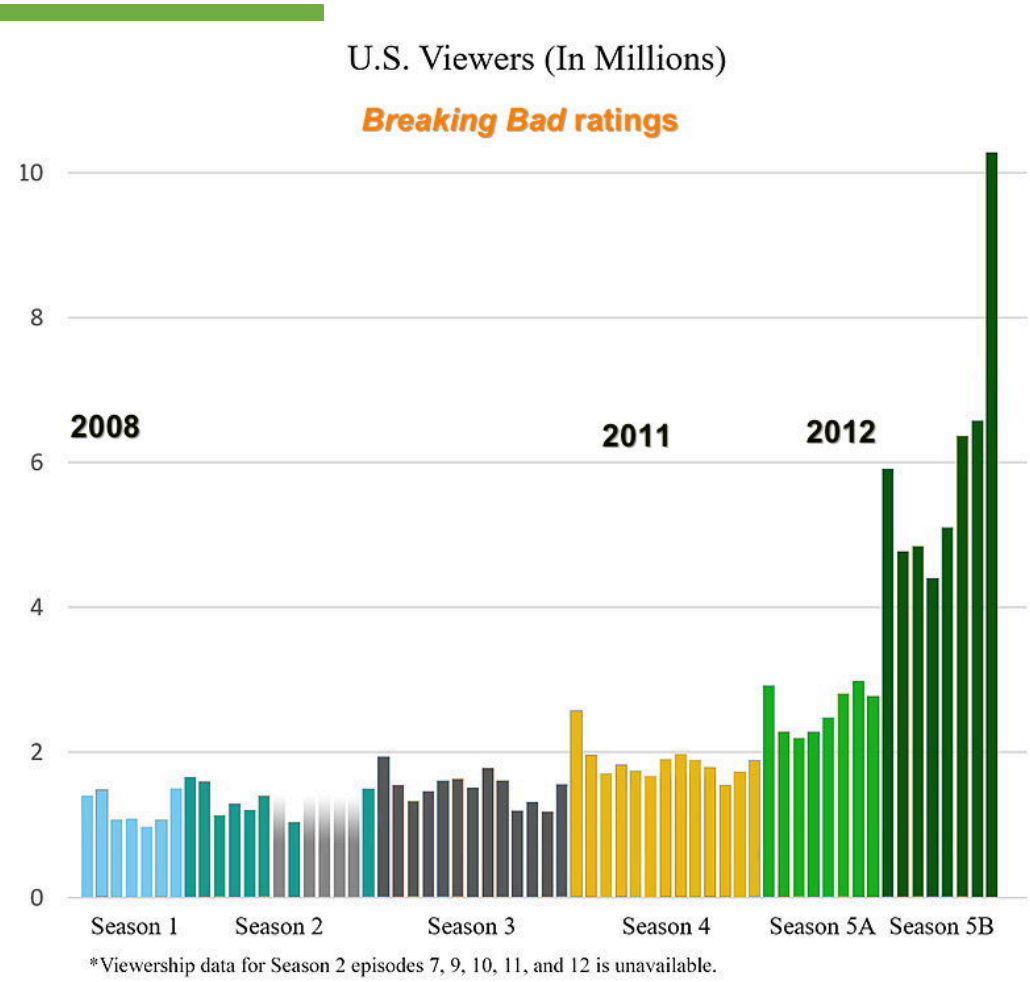


# Results: What Chemicals?



# Results: Interesting Observation



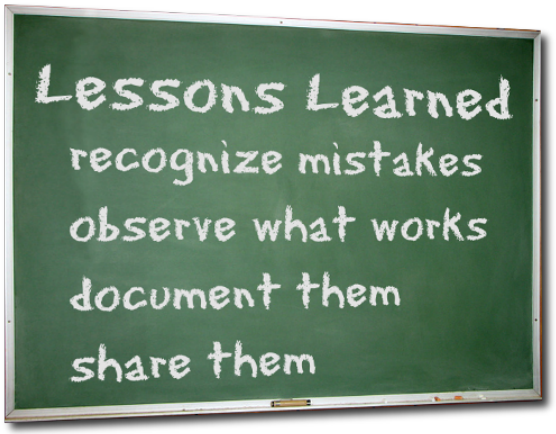



# Some Lessons from the Data

- HAZMAT happens - we should learn from it; there's a reason for the regulations.
- A big public event can develop from a small risk; upper management expect responders to use "an abundance of caution"
- Information moves in odd ways and rumors abound.
- The press isn't great (but it isn't bad) with chemical names; it's worse with follow up.

# Broader Lessons

- There are reasons for individuals to be chemophobic in the broader economy – particularly around swimming pools, clandestine labs, ammonia systems and flammables
- Chemophobia around personal products is more problematic: The term "*toxic chemical*" needs to be clarified; GHS presents an important opportunity in this regard
- STEM education and "phobia": Chemists can be as regulo-phobic as the public is chemophobia
- Science education engagement needs to include safety education



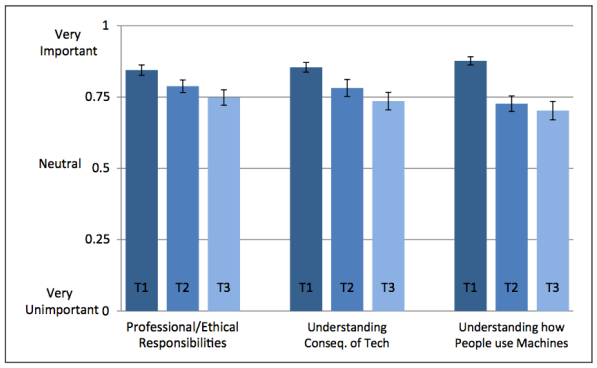




**Figure 3.** Public welfare beliefs in time 1, time 2, and postgraduation work (time 3), among engineering students who enter engineering jobs.
*Note:* Each bar represents the meane value on that measure at time 1 (darkest bar), time 2 (middle bar), and time 3 (lightest bar). Only those students who graduated and went on to enter an engineering job are included in these values. Means on all values were scaled as follows: ([mean − 1]/5).

# Case 4: Public Perception of Chemicals

You are from Bangor, ME and studying chemistry at Keene State College. The Bangor paper publishes an editorial entitled *"The consumer game of whack-a-mole with chemical dangers".* Your high school chemistry teacher sends you an e-mail wanting to know what you think about the article from a chemistry point of view. Your answer is intelligent enough that she wants you to write a letter to the editor responding to the editorial because it is important to show taxpayers that Bangor kids are learning good science.

After this suggestion, you do some googling on the topic and find it interesting but are more confused than you were before you did this research. Do you have an ethical obligation to write the letter?

A. Yes, all citizens should understand and discuss state law, no matter what their educational level

B. Yes, citizens educated in chemistry have an obligation to weigh in on topics of public interest that they have expertise in

C. No, this is not a chemistry issue, but a public health issue that goes well beyond chemistry.

D. No, your research is so confusing that you just want to get back to your lab work


BANGOR DAILY NEWS

The consumer game of whack-a-mole with chemical dangers (https://bangordailynews.com/2016/04/18/opinion/editorials/the-consumer-game-of-whack-a-mole-with-chemical-dangers/)

# An ACS CCS Initiative: Apply Risk Assessment concepts to chemical videos and demos

## Key Ideas behind the Rubric

- Include good news (why we are doing this?) in tandem with bad news (precautionary statements and emergency scenarios)
- Include safety education as part of science
- Leverage the common language of the Globally Harmonized System

DRAFT

**RAMP Safety Assessment Rubric for Chemical Demonstrations and Videos**

| Evaluation Scale | Problematic (up to 1 pt) | 3 - Average (up to 3 pts) | Excellent (up to 5 pts) | Points awarded |
|---|---|---|---|---|
| **Pedagogical Intent** | Attention getting only; no science concept mentioned | Concept explained but student inquiry not encouraged | Student discussion of their observations and application of concept shown | |
| Safety education included | Injury or illness involved in video | Safety concerns described during video | Pre-demo safety info included | |
| Venue appropriateness | Workspace clearly not appropriate for chemistry performed | Some concerns about space arise during course of work | Space has appropriate equipment and layout for chemistry performed | |
| Audience appropriateness | Audience not age appropriate for this level of chemical hazard | Audience instructions appropriate to age group involved | Discussion of changes necessary for other audiences included | |
| **Recognize Hazards** | No information about chemicals used or process provided | Key chemicals identified, no safety information provided; No process hazards identified | Chemicals clearly identified with form, concentation, and amounts; process hazards described | |
| *(Chemical hazards are identified by Globally Harmonized System requirements. Process hazards are changes in temperature, pressure or potential unplanned chemical reactions.)* | | | | |
| **Assess Risks** | No risk information provided | Selected risks mentioned and implicitly prioritized | All chemical and process risks clearly described and prioritized | |
| *(Assessing risks involves prioritizing scenarios in which the potential hazards are likely to cause damage and developing control strategies for those scenarios.)* | | | | |
| **Manage Safety** | | | | |
| Ventilation | Ventilation concern arises in the course of the video (e.g. smoke obscures visibility) | Ventilation concerns implicitly addressed by equipment used | Ventilation requirements explcitly mentioned as part of the video | |
| Personal Protective Equipment for demonstator | No PPE or a problem results from demonstrator's PPE arises in the course of the video | Demonstrator's PPE appropriate for chemistry and worn correctly | Demonstrator's PPE appropriately used and explained | |
| Personal Protective Equipment for audience | Problem resulting from audience PPE arises in the course of the video | Audience PPE used appropriately | Audience PPE appropriately used and explained | |
| Planning by demonstrator | No evidence of planning - confused presenter throughout | Some confusion as demonstration proceeds | Presenter clearly in control and experienced with demonstration | |
| Instructions for audience | Audience injuries from lack of instruction | Audience participates in an orderly fashion; presenter understanding of risk implicit | NFPA 45 style briefing provided for audience | |

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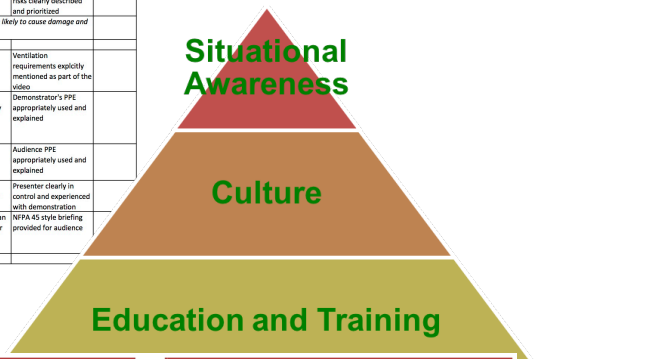



**Physical Hazards**

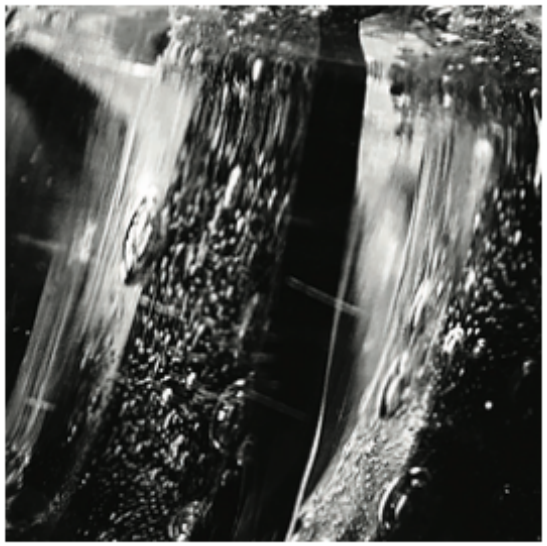
| Pictogram | GHS class | Signal Words |
|---|---|---|
|  | Explosive | Danger or Warning |
|  | Oxidizer | Danger or Warning |
|  | Flammable | Danger or Warning |
|  | Corrosive | Warning only (physical) |
|  | Compressed Gas | Warning only |

**Health Hazards**

| Pictogram | GHS class | Signal Words |
|---|---|---|
|  | Corrosive | Danger only (health) |
|  | Toxic | Danger only |
|  | Health Hazard | Danger or Warning |
|  | Irritant | Warning only |
|  | Environmental | Warning only |

# Questions?

Divergent ideas
Coexisting in harmony
Resilient Progress



Resilience through innovation depends on a divergent co-existence of ideas. Responsive and resilient solutions to societal challenges and opportunities – and solutions that can be adapted or substituted within a rapidly changing and uncertain world – require a rich feedstock of divergent, novel ideas that can be combined in creative ways. How can such a rich diversity of ideas best be nurtured?