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?

Hazmat Events by Country

- US: 83%
- UK: 3%
- India: 3%
- Canada: 3%
- Australia: 2%
- China: 4%
- Indonesia: 3%
- Netherlands: 1%
- 7.4 years of data covering 12,618 events (4.6 events/day), 2010 - 2017
Results:
What Sector was Involved?

Hazmat Distribution by Sector

- Industrial facilities, 3973 (31%)
- Public locations, 3363 (27%)
- Transportation Events, 1705 (14%)
- Laboratories, 1431 (11%)
- Educational locations, 442 (4%)
Results: What Happened?

- Release: 42%
- Explosion: 16%
- Fire: 17%
- Follow up: 13%
- Discovery: 12%
Results: How Bad Was It?

Extent of Damage from HAZMAT events

- Response: 54%
- Injury: 27%
- Environmental: 12%
- Death: 7%
Results: What Chemicals?

Chemicals Involved in HAZMAT responses

- 34% unknown
- 13% others
- 8% chlorine

- Unknown chemical
- Other chemical
- Chlorine
- Flammables
- Ammonia
- Acids
- Meth lab
- Petroleum
- Ag chemicals
- Wastes
- Cleaners
- Bombs
- Mercury
Results: Interesting Observation

METH LAB REPORTS

U.S. Viewers (In Millions)

*Viewership data for Season 2 episodes 7, 9, 10, 11, and 12 is unavailable.
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 mean 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].
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
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
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?