

Chemical accident risks in Europe and beyond – Where are we now?

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Stimulating innovation
Supporting legislation*



- This presentation presents results from a JRC study intended for publication in 2017
 - Chemical accident disasters around the world 2012-2016, Publication TBD (2017)
(A JRC study undertaken to give evidence of trends and identify and confirm themes for the State of the Science report.)

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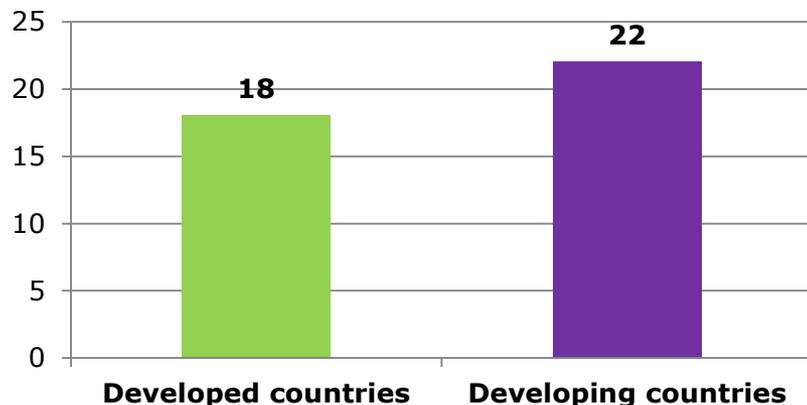
Z. Gyenes (JRC), L. Allford (European Process Safety Centre)

Chemical accident prevention in 2016: Where are we now?

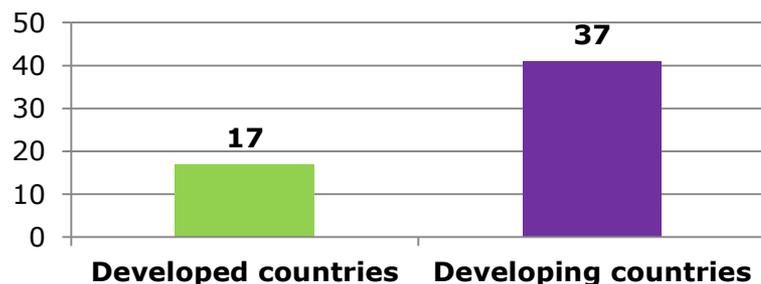
- **Does anyone really know?**
- **We tried to find out. (It wasn't easy.)**



Number of chemical accident disasters around the world 2012-2016*



Number of local chemical accident shocks around the world 2012-2016*



40 chemical disasters/54 local shocks

- Includes **fixed facilities** and **pipelines**
- Excludes Natch and offshore
- Local shocks are representative only (Impossible to know actual number)
- 2016 data are preliminary

Sources

- Media
- Insurance companies
- EU eMARS database
- Investigation reports
- Dedicated websites

Aligned with the European Gravity Scale

- **Disasters – Levels 5-6**
- **Local Impacts – Levels 3-4**

... in consideration of other subjective factors (e.g., government/media attention)

Recent chemical disasters in the EU & globally



Photo:
bdchronicle.com

Gorni Lom, Bulgaria – October 2014, 15 deaths, demining factory explosion



Photo:
Twitter/@betoefiasm

Photo: the
chronicleherald.ca

Sonora, Mexico and Mount Polley, Canada – August 2014, Massive spill of toxic mining waste



Photo:
medugnonordine.it

Modugno, Italy – July 2015, Fireworks factory explosion kills 9



Photo:
dailymail.co.uk

Tianjin, China – August 2015, 165 deaths, 798 injuries, chemical warehouse explosion



Photo:
daytodayGK.com

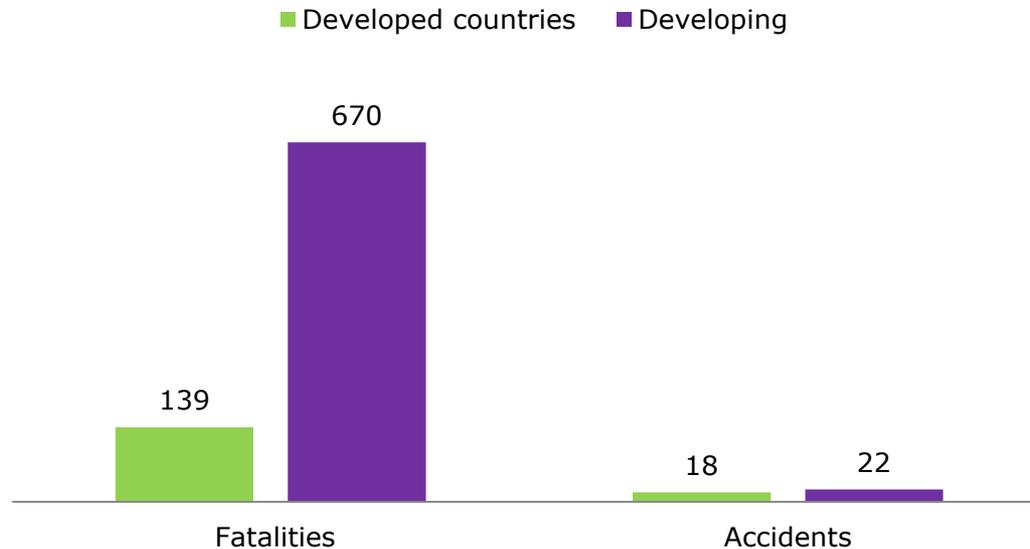
Amazon region, Peru – February 2016, 475,000 litres of crude oil, pipeline spill



Photo:
reuters.com

Coatzacoalcos, Mexico – April, 2016, 32 deaths in vinyl chloride plant explosion

Chemical accident disasters 2012-2016



- **Developed and developing countries have the same number of disasters**
- **Developing countries are causing far more fatalities.**
- **Developed country disasters have reduced human exposure to the worst impacts, but still have other high costs.**

“From the perspective of the individual facility manager, catastrophic events are so rare that they may appear to be essentially impossible, and the circumstances and causes of an accident at a distant facility in a different industry sector may seem irrelevant. However, from our nationwide perspective at [U.S.] EPA and OSHA, while chemical accidents are not routine, they are a monthly or even weekly occurrence, and there is much to learn from the story behind each accident.”

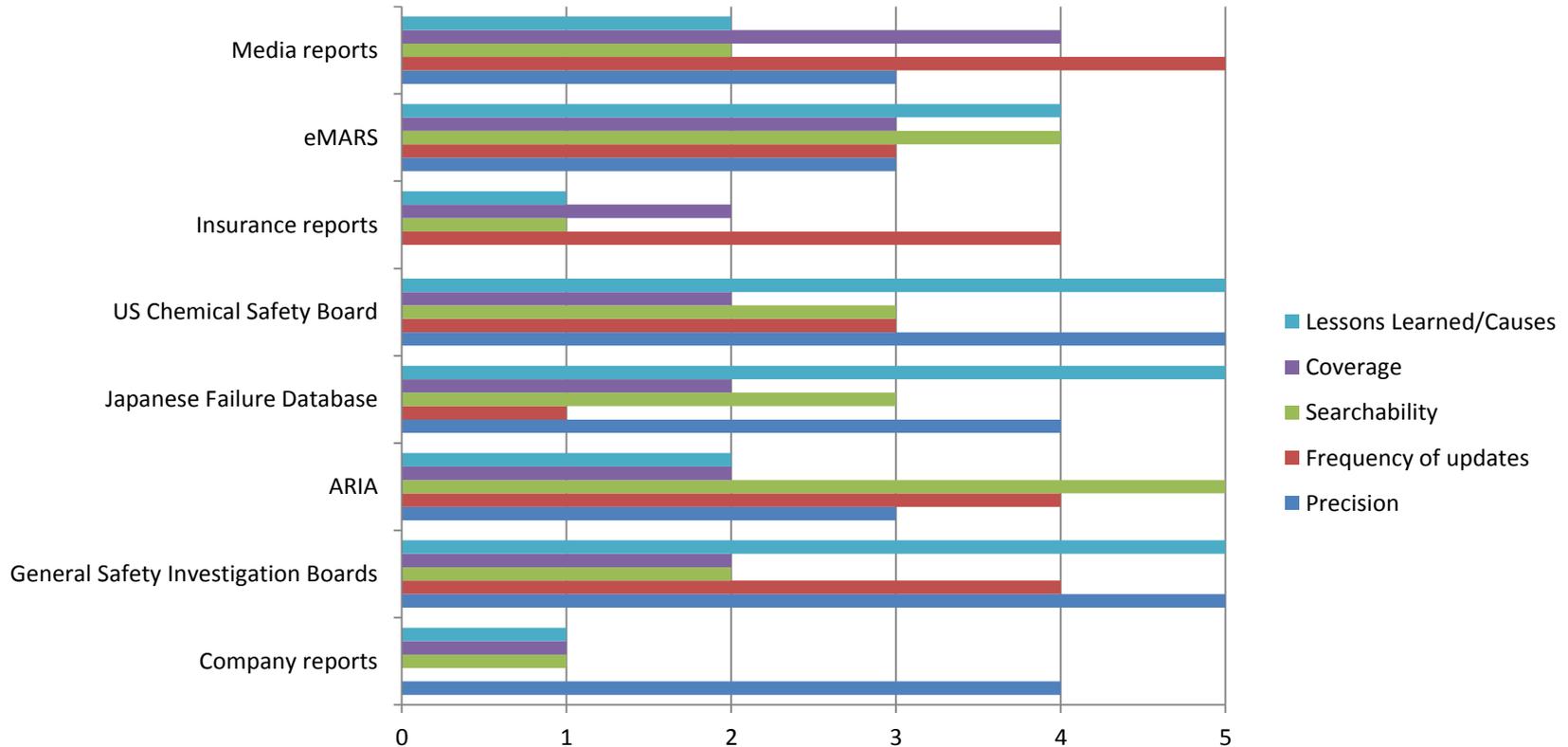
Jim Belke, U.S. Environmental Protection Agency, 1998

Findings related to accident data



- Almost no centralised sources of recent accident data
 - Exceptions are eMARS, ARIA
- National investigation boards and insurance company reports are good sources, BUT only capture accidents of certain profiles
- The media is a good source, even for details (that can be verified elsewhere), BUT
 - Requires a lot of effort to filter media reports
 - Sometimes have causes, almost never lessons learned

Reflection on existing sources of accident information



- Represents JRC-MAHB preliminary impressions
- 1-5 scale with 1 – Very weak, 5 - Very strong

Some preliminary conclusions



- There are many more accidents occurring, big and small, that we never hear about
 - Very fragmented by country, language, industry sector, type of impact
 - Environmental impacts, evacuations seem to get less attention than fatalities
- Fragmentation of accident data is a challenge because
 - It undermines visibility of chemical accidents as an ongoing concern
 - For the public and for decisionmakers, there are few sources that give a perspective on breadth or depth
 - Catastrophes overshadow everyday tragic accidents
- The problem of fragmentation is further magnified for lessons learned analysis and exchange

Some thoughts to consider



11

If the chain is “INCIDENT” to (MEDIA) REPORT to INVESTIGATION REPORT to CAUSES/LESSONS LEARNED



We have to focus on obtaining the parts of the chain, we need see where we can get parts of the chain.

HOW DO WE DO THAT?

One option - Media monitoring & crowdsourcing for notifications



Leading to more proactive exchange of lessons learned

Also <http://press.jrc.it/NewsBrief/alertedition/en/mahb.html>

<http://press.jrc.it/NewsBrief/alertedition/en/PetroleumRefineries.html>

Imagine one day having this in real time ...

Arctic Ocean

Arctic Ocean

Coatzacoalcos

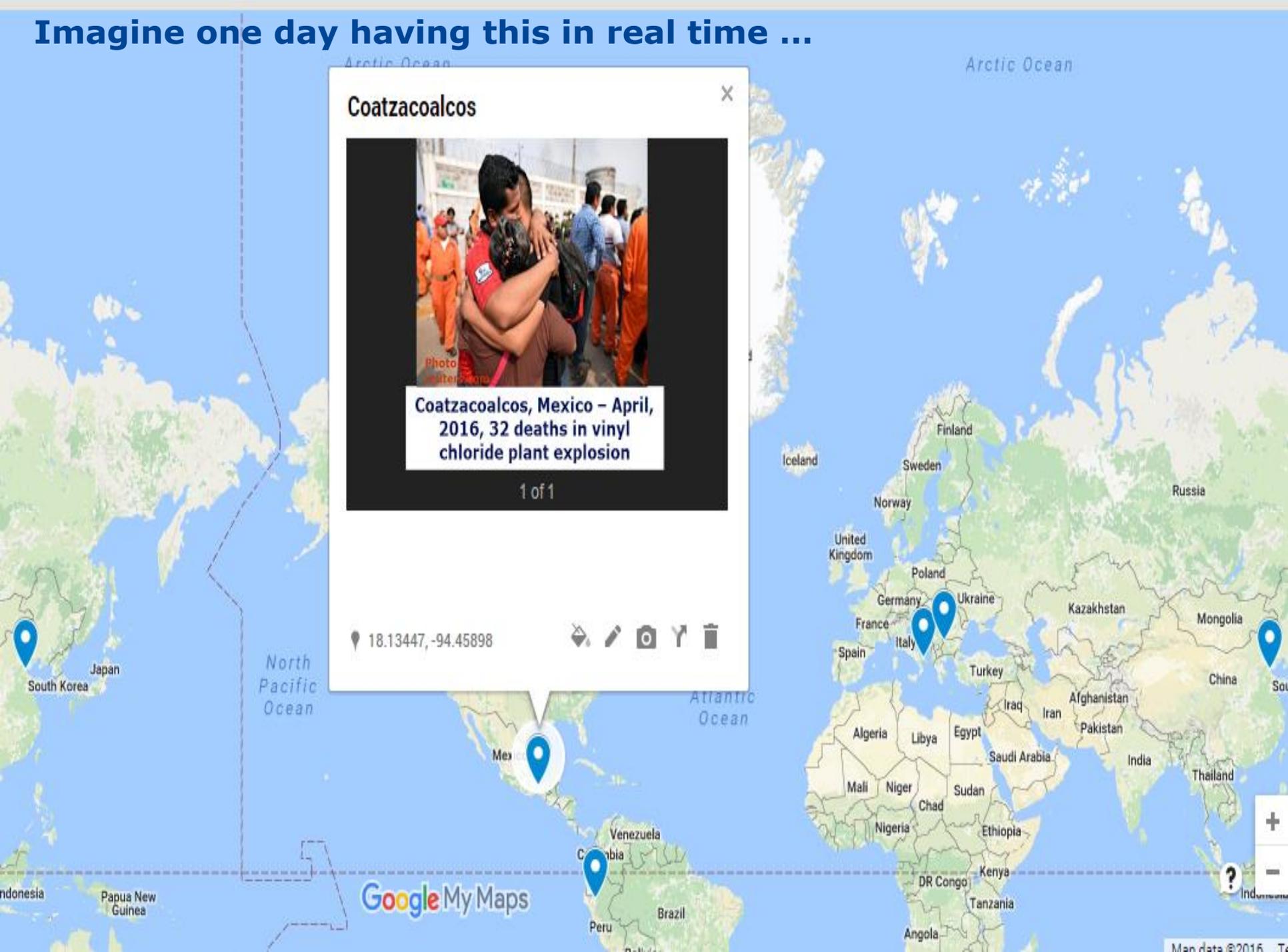


Photo
wikipedia

Coatzacoalcos, Mexico – April, 2016, 32 deaths in vinyl chloride plant explosion

1 of 1

📍 18.13447, -94.45898



Google My Maps

Your thoughts?

Thank you for your kind attention!