Lecture 21: Toxic Chemicals

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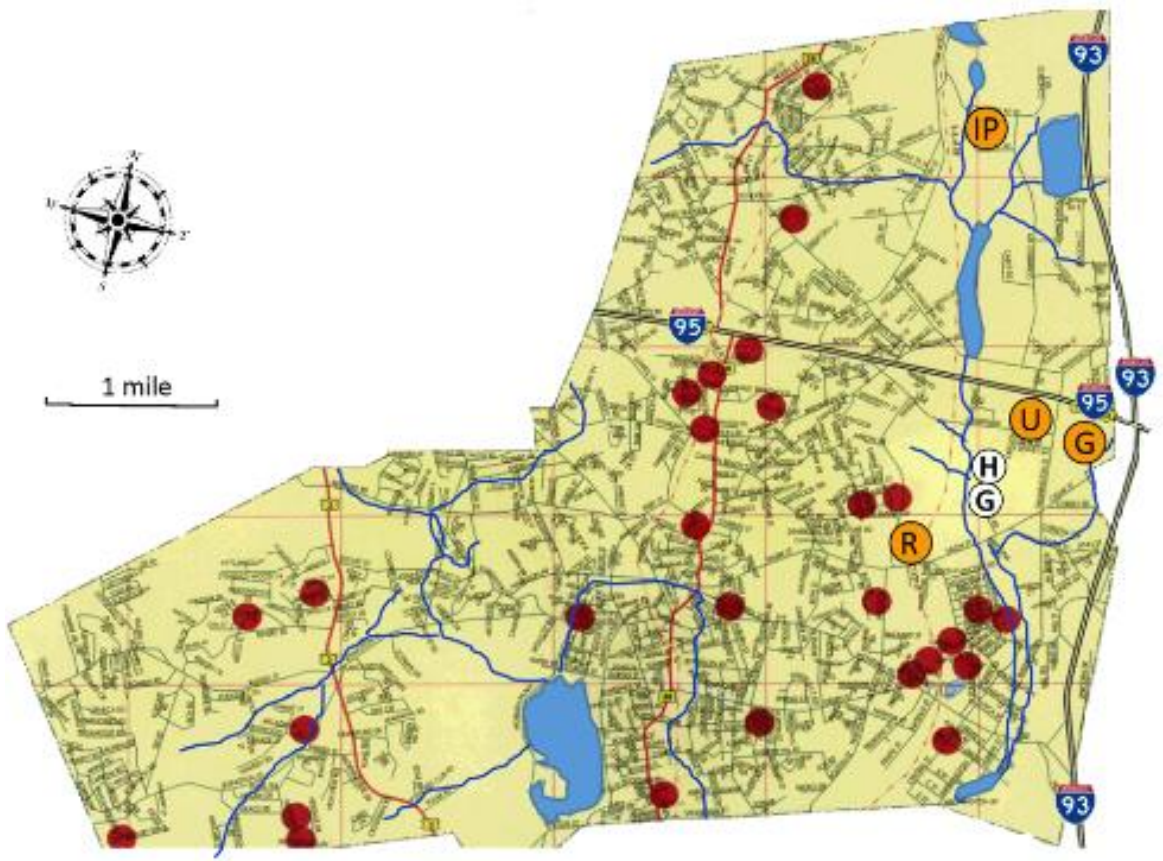
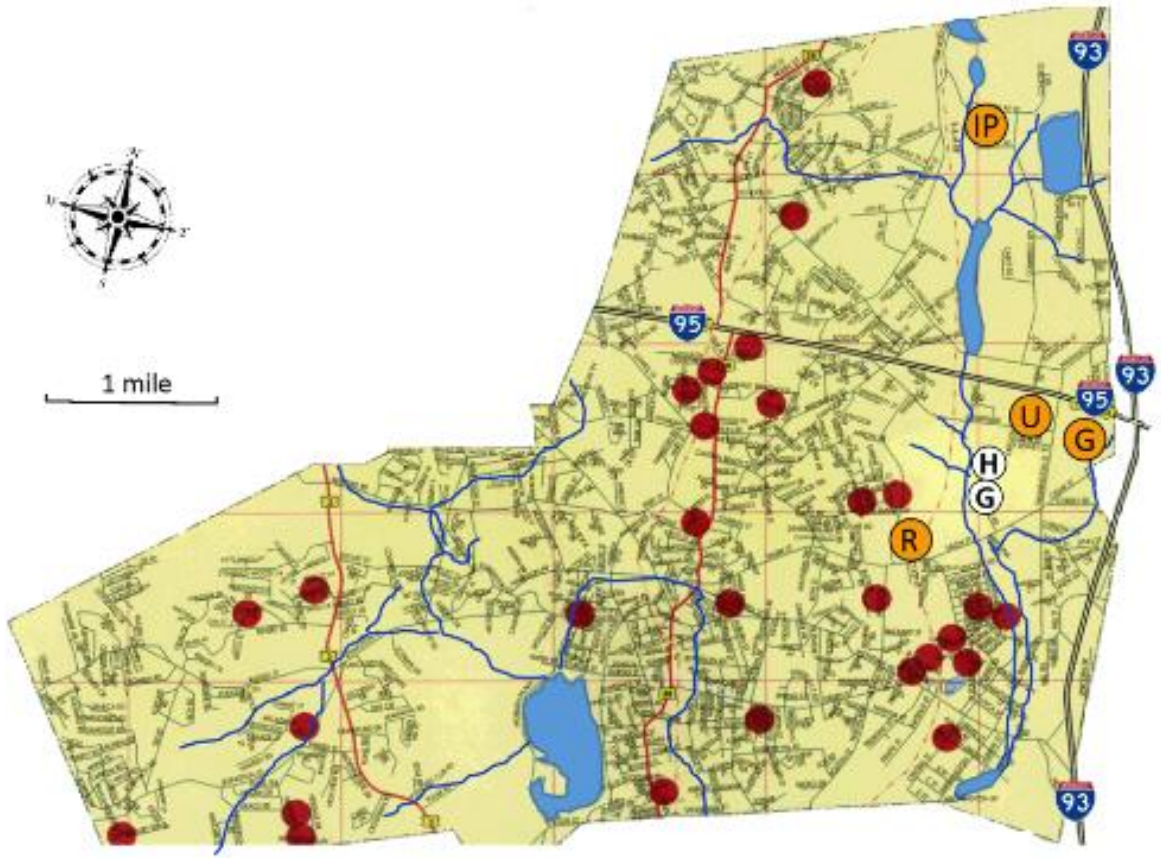
Econ 4075

Woburn, MA: 1960s-1980s



- From 1964-1979, drinking water for the town of Woburn was drawn from Wells G and H (shown at right)
- Over that same period, an apparent child leukemia cluster forms (red dots); 28 children were diagnosed, of whom many died.
- In 1979, water samples drawn by the state showed that both wells were heavily contaminated with **trichloroethylene (TCE)**
  - Both wells immediately shut down.

Woburn, MA: 1960s-1980s

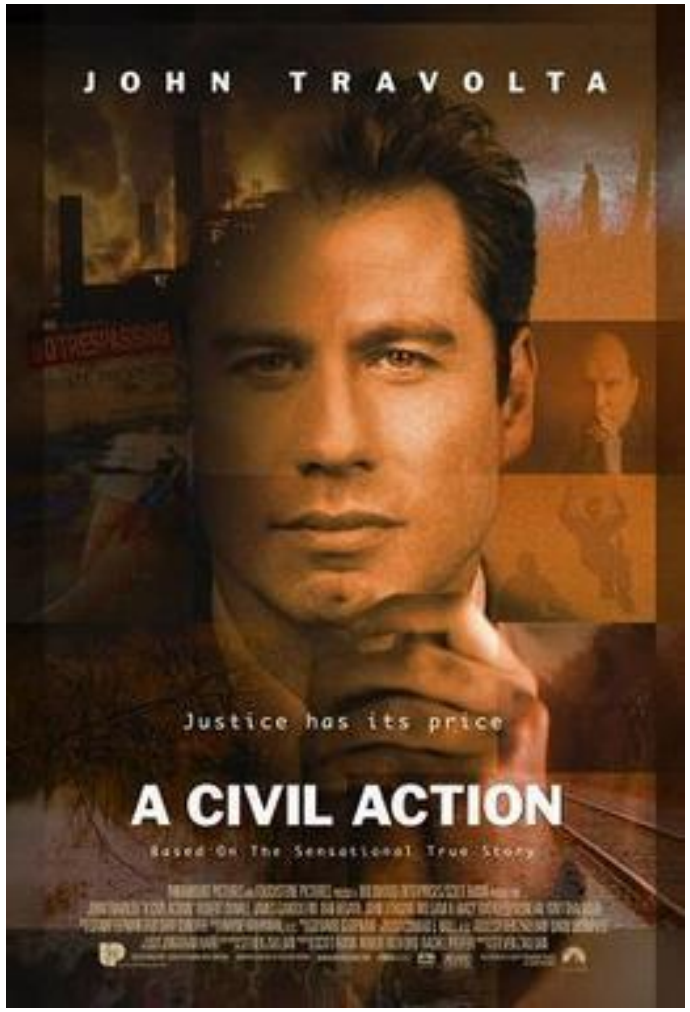


- Where did this TCE come from?
  - Industrial facilities (located at points R, U, IP, and G at right) were dumping waste directly onto their land.
  - Many workers handling chemicals at these facilities also developed cancers.
  - Watershed modelling suggestive that this is source of water pollution

- In 1982, a group of families, led by one victim's mother, Anne Anderson, filed suit against these facilities seeking compensatory and punitive damages.
  - *Anderson v. Cryovac, Inc. (805 F. 2d 1)*

Woburn, MA: 1960s-1980s

- In sum, the tort lawsuit worked through the courts from 1982-1990.
- Initial hopes to “make an example of industry” in court did not come to fruition.
  - By 1986, plaintiffs had settled out of court with 2 defendant facilities for a modest $10m.
  - The third facility was found not liable, a finding upheld on appeals.
- The plaintiffs’ expenses to build their scientific case ultimately reached around $6m
  - The plaintiff’s lawyer eventually declared bankruptcy due to the case, but on the plus side, became immortalized by John Travolta in a 1998 film.



Takeaways from this incident?

- ***Causally* proving harm to human health or the environment from chemical exposure can be HARD.**

- Industry knows the fact above, and it can create poor incentives.
  - Industry has $$$, lawyers, lobbyists to protect its interests
  - Parties damaged by chemical exposure typically do not.

- Government knows the fact above, but in the American setting, regulation on chemical use only possible with causal proof of harm.

Roadmap

- Context: the US chemical industry and use
- Mitigating damages: liability versus regulation
- Information provision
- Overview: federal regulation of chemicals
- Shapira & Zingales, 2023
- Wrapping up

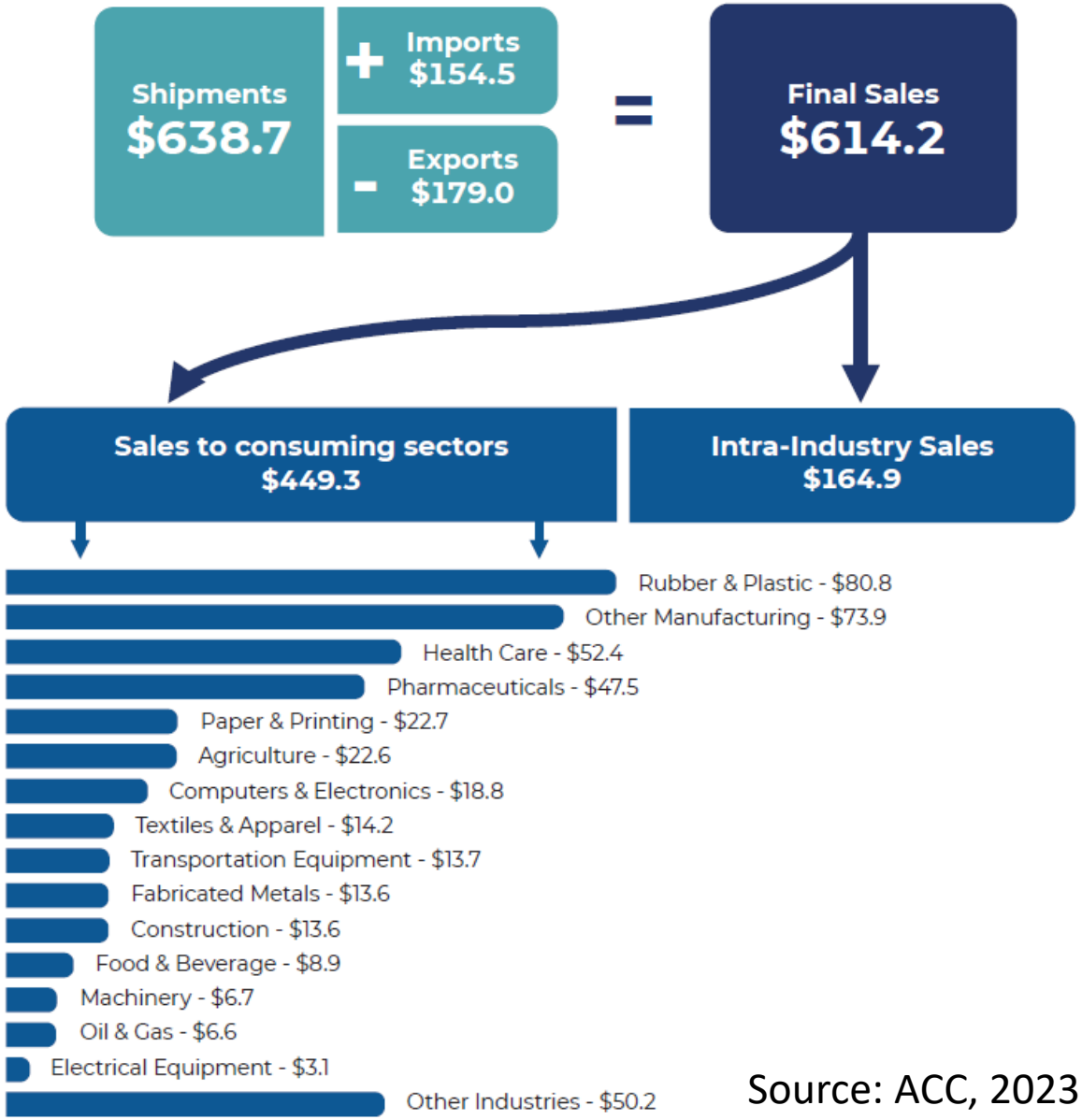
The US chemical industry

- Second largest producer globally, behind China.
  - Sales of chemicals in 2022: $614 billion (~2% of US GDP).

- A 2020 report from the National Academies of Science finds value added is much higher: 25% of US GDP depends directly on downstream use of chemicals.

- An economy without industrial chemicals would be largely unrecognizable.

Figure 2.2 - U.S. Business of Chemistry Flow Chart, 2022 (in billions)



Source: ACC, 2023

Chemical toxicity, exposure, and risk

- Not all chemicals generate risk to human health or the environment.

- As a general framework, risk is the product of *hazard* and *exposure.*
  - The *hazard* of a chemical is its inherent ability to cause an adverse effect on health (e.g., cancer, birth defects, skin rash).
  - *Exposure* is how a person comes into contact with a chemical (e.g., inhalation, ingestion, dermal) and can be described in terms of its magnitude (how much), frequency (how often), and duration (how long).

- So health risk is greater when chemical exposure or/and hazard is large.

Chemical toxicity is relative…

Effects from toxic exposure may be *acute* or *chronic*.

Acute toxicity effects occurs from a single dose and are short-term in nature. Could be “minor” things like a rash, eye/throat irritation, dizziness. Or “major” things like fetal loss, unconsciousness, or even death.

Chronic toxicity effects are long-term in nature and may take years to show up after repeated exposures. Think things like asthma, cancer, or organ damage.

Acute toxicity — Life-threatening one-time doses

SUBSTANCE	FOUND IN	Lethal dose (LD50 mg/kg)	CATEGORY
Water	... Water	90000	Practically non-toxic
Sucrose	Table sugar	30000	
Monosodium glutamate	Flavor enhancer, soy, cheese	16000	
Ethanol	Alcoholic beverages	7000	
Glyphosate	Herbicide (RoundUp)	5600	
Aluminum hydroxide	Antacid, vaccine adjuvant	>5000	
Fructose	Fruits, component of sucrose	4000	Slightly toxic
Spinosad	Organic insecticide	3700	
Sodium chloride	Table salt	3000	
Eugenol	Clove oil, organic pesticide	2700	
Paracetamol (acetaminophen)	Tylenol, Panadol	2400	
Vanillin	Vanilla bean, vanilla sugar	1600	
Hydrogen peroxide 70%	Bleach, disinfectant	1000	
Theobromine	Chocolate, tea, guarana	950	
Copper sulfate	Organic fungicide	300	Moderately toxic
Chlorpyrifos	Organophosphate insecticide	230	
Caffeine	Natural pesticide, coffee plant	190	
Lead	Batteries, cables, paints	155*	
DDT	Restricted insecticide	100	
Rotenone	Restricted organic pesticide	60	
Vitamin D3	Supplements, fish, mushrooms	37	Highly toxic
Nicotine	Natural pesticide, tobacco	10	
Mycotoxin T2	Plant pathogen, moldy grain	5	
Aflatoxin	Soil fungus, moldy foods	5	
Hydrogen cyanide	Fruit pits, bitter cassava	4	
Botulinum toxin	Botox, Clostridium botulinium	0.001	

Chemicals exposure varies by use

- Who might be exposed to chemicals? Where might this occur?

Chemicals exposure varies by use

- Who might be exposed to chemicals? Where might this occur?

- **Workers** (in manufacturing, processing, agriculture, and more…)
  - *Ex*: construction workers could have occupational inhalation exposure to asbestos, may lead to mesothelioma
  - *Ex*: commercial dishwashers could have occupational dermal exposure to 1,4 dioxane, with high enough frequency could lead to liver and kidney damage.
- **Occupational bystanders**
  - *Ex*: office workers at an industrial facility may inhale fugitive chemical emissions.
- **General population**
  - *Ex*: communities along industrial fencelines may be exposed to toxic air or water releases
  - *Ex*: pregnant woman using lotion containing phthalates could expose themselves, their fetus, and *their potential grandchildren* to reproductive, neurological, or obesity effects

Worker chemical exposure, in theory…

Consider the standard firm profit max problem*:

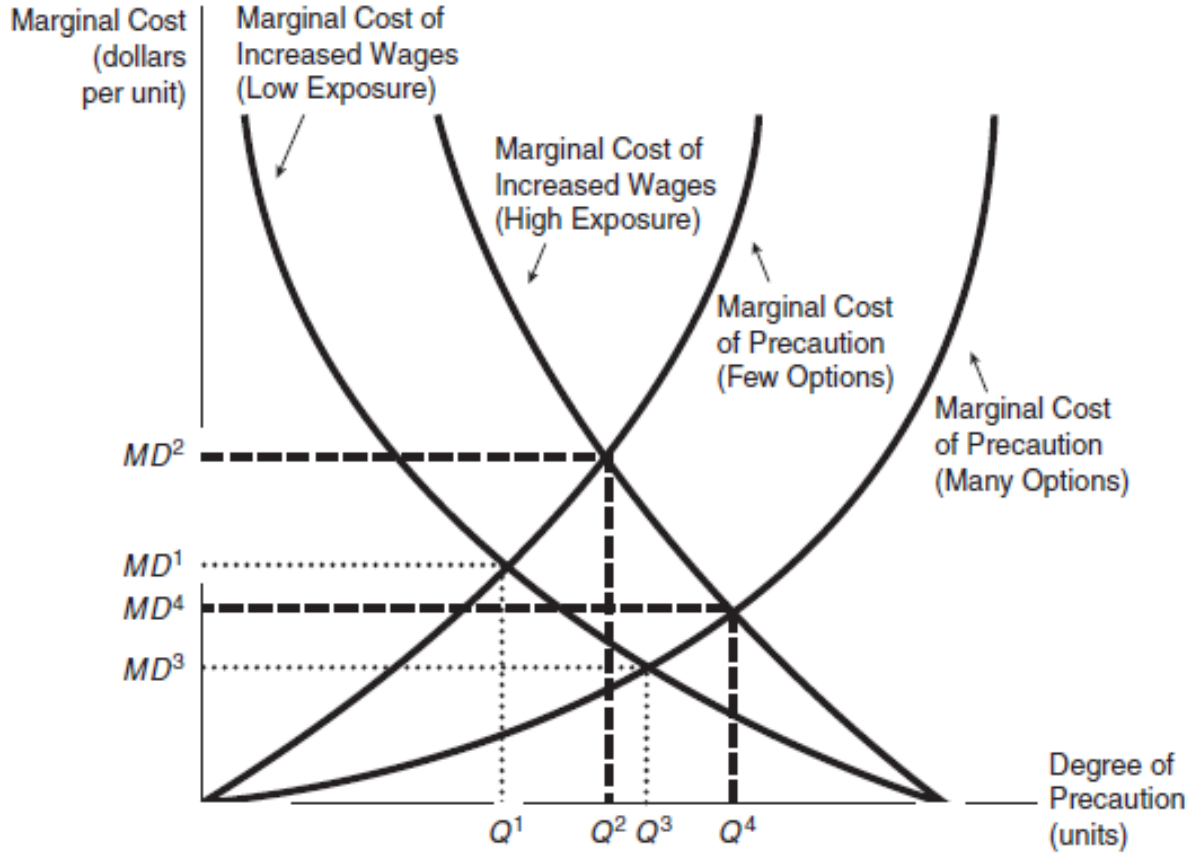
The firm uses a toxic chemical in its production process, resulting in worker exposure (costly to the worker).

Since the firm and workers have perfect information, the firm can respond in two ways:

1. reduce risk through protective measures.
2. pay workers a compensating risk premium.

As shown in figure, cost-minimizing equilibrium yields the optimal combination

*But in reality, what is the market failure here?



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A law & econ digression: liability versus regulation

Consider the following: institutions can address health damages from chemical exposure in a few different ways

- *Ex-post (*after the damage occurs) via liability through the judicial system
- *Ex-ante* (before the damage occurs) via assignment of property rights
- *Ex-ante* via regulation through legislative system

In classic theory (e.g. Coase, 1960), any of these methods will attain the social optimum.*

Why?

*(assuming no transaction costs or limits to bargaining, and full information on cost and damage functions). See Behrer et al (2021) for extended model.

A law & econ digression: liability versus regulation

Consider the following: one can address health damages from chemical exposure in a few ways

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In classic theory (e.g. Coase, 1960), any of these methods will attain the social optimum.*

Okay… back in the real world, what are some disadvantages of each approach?

*(assuming no transaction costs or limits to bargaining, and full information on cost and damage functions). See Behrer et al (2021) for extended model.

A law & econ digression: liability versus regulation

Liability	Property rights	Regulation
Polluting firms may make decisions based on short-run timelines.	Bargaining becomes unrealistically difficult when many parties are harmed.	Gov't may (or may not) have less information about risk than polluters; hard to set optimal policy with limited info
Polluting firms might be incapable of paying for the full magnitude of harm done (though insurance can mitigate)	How to initially allocate the rights?	Enforcement and administration of a regulation is often costly.
Victims might not file suit for harm done for reasons of ignorance, expected cost, or death before trial.		

In the US, we regulate chemical safety, but simply complying with a regulation doesn't necessarily relieve a party of liability… see Kolstad et al (1990) for argument that this is optimal policy.

Some examples of litigation over chemical liability

- **Philip Morris (Tobacco Products):** in 2002, were ordered to pay punitive damages of $28 billion to a single smoker for lung cancer she suffered. Appeals dragged on for 9 years, by which point this was lowered to $28 million. The victim didn't live to see the end of the trial.
- **Owens Corning (Asbestos Insulation):** in 1998, settled over 176,000 tort lawsuits for $1.2 billion. Lawsuits continued, ultimately resulting in their bankruptcy and creation of a personal injury trust.
- **Johnson and Johnson (Baby Powder):** currently facing 50,000+ tort lawsuits alleging cancer that resulted from use of its talc-based baby powder. Expected liability is $10 billion +.
- **Bayer (via Monsanto):** ongoing lawsuits alleging cancers resulting from glyphosate (Roundup) exposure. So far 100,000 lawsuits have been settled for around $11 billion. 40,000+ cases ongoing.

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Recall: market failures justify regulation.

Which of these apply in the chemicals context?

- Externalities?
- Market Power?
- Information Asymmetry?

We'll now briefly discuss some policies to mitigate information issues.

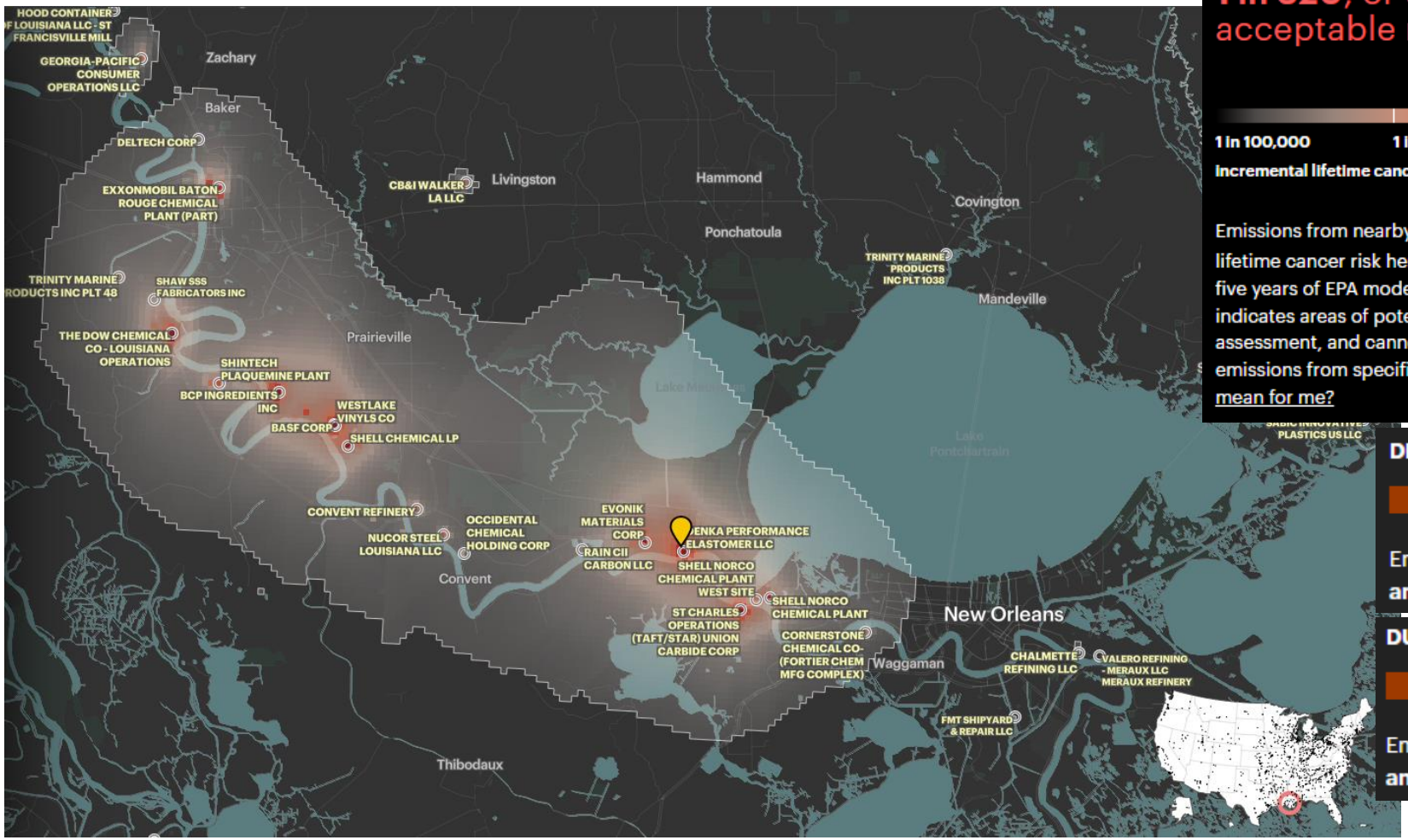
The Toxic Releases Inventory (TRI)

- The Emergency Planning and Community Right to Know Act created the Toxic Releases Inventory (TRI) program in 1983.

- Facilities that release any of roughly 800 highly toxic chemicals to air, water, or land, are required to report to this program every year.

- The data's release does engender economic responses:
  - Property values: Mastromonaco (2015), Moulton et al (2023)
  - Stock market returns: Hamilton (1995), Konar and Cohen (2001)
  - Emission reductions: Hamilton (1999), Konar and Cohen (1997)
  - Worker chemical exposure: Finger and Gamper-Rabindran (2013)

TRI data on air releases highlight risk contributers



This location has an estimated excess lifetime cancer risk from industrial sources of about **1 in 320**, or 32 times the EPA's acceptable risk.

1 in 100,000 | 1 in 10,000 | 1 in 1,000 | 1 in 50

Incremental lifetime cancer risk

Emissions from nearby facilities add an estimated **1 in 320** excess lifetime cancer risk here , according to a ProPublica analysis of five years of EPA modeling. Our map is a screening tool that indicates areas of potential concern. It is not a site-specific risk assessment, and cannot be used to tie individual cancer cases to emissions from specific industrial facilities. So, what does this mean for me?

DENKA PERFORMANCE ELASTOMER LLC

Contributes about **93.2%** of the estimated excess cancer risk here

Emits **Chloroprene, Dichloro-2-butene, 1,4-, Butadiene, 1,3- and 6 more carcinogens.**

DUPONT PONTCHARTRAIN WORKS

Contributes about **6.0%** of the estimated excess cancer risk here

Emits **Chloroprene, Dichloro-2-butene, 1,4-, Butadiene, 1,3- and 11 more carcinogens.**

Source: https://projects.propublica.org/toxmap/

Is consumer product labelling effective?

- Several state and federal institutions set guidelines for product labelling.
- Warnings and labelling can empower individuals to make informed decisions about chemical exposure taking into account their own risk tolerance.
- The nature of label or warning matters: undifferentiated and abundant warnings lead to consumers ignoring them: it's bad policy to cry wolf over a puppy.

CALIFORNIA PROPOSITION 65 WARNING

WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

For more information: www.P65warnings.ca.gov

AN ALL-NATURAL BANANA

INGREDIENTS: WATER (75%), **SUGARS (12%)** (GLUCOSE (48%), FRUCTOSE (40%), SUCROSE (2%), MALTOSE (<1%)), STARCH (5%), FIBRE E460 (3%), **AMINO ACIDS (<1%)** (GLUTAMIC ACID (19%), ASPARTIC ACID (16%), HISTIDINE (11%), LEUCINE (7%), LYSINE (5%), PHENYLALANINE (4%), ARGININE (4%), VALINE (4%), ALANINE (4%), SERINE (4%), GLYCINE (3%), THREONINE (3%), ISOLEUCINE (3%), PROLINE (3%), TRYPTOPHAN (1%), CYSTINE (1%), TYROSINE (1%), METHIONINE (1%)), **FATTY ACIDS (1%)** (PALMITIC ACID (30%), OMEGA-6 FATTY ACID: LINOLEIC ACID (14%), OMEGA-3 FATTY ACID: LINOLENIC ACID (8%), OLEIC ACID (7%), PALMITOLEIC ACID (3%), STEARIC ACID (2%), LAURIC ACID (1%), MYRISTIC ACID (1%), CAPRIC ACID (<1%)), ASH (<1%), PHYTOSTEROLS, E515, OXALIC ACID, E300, E306 (TOCOPHEROL), PHYLLOQUINONE, THIAMIN, **COLOURS** (YELLOW-ORANGE E101 (RIBOFLAVIN), YELLOW-BROWN E160a), **FLAVOURS** (3-METHYLBUT-1-YL ETHANOATE, 2-METHYLBUTYL ETHANOATE, 2-METHYLPROPAN-1-OL, 3-METHYLBUTYL-1-OL, 2-HYDROXY-3-METHYLETHYL BUTANOATE, 3-METHYLBUTANAL, ETHYL HEXANOATE, ETHYL BUTANOATE, PENTYL ACETATE), 1510, NATURAL RIPENING AGENT (ETHENE GAS).

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The US chemical regulatory environment

Federal regulation of chemicals in the US is a tangled web of jurisdiction. A summary:

Where is the chemical found?	Who has authority to regulate?	Which statute?
In drinking water	EPA	SDWA
In surface/ambient water	EPA	CWA
In the air	EPA	CAA
As an active ingredient in pesticides	**EPA**	**FIFRA**
In consumer products	CPSC	CPSA
In food/drugs/cosmetics	FDA	several
In the workplace	OSHA	OSHA
At (hazardous) waste sites	EPA (+ATSDR)	RCRA (+CERCLA)
Anywhere in commerce, excluding pesticides, tobacco, specified nuclear material, firearms and ammunition, food, food additives, drugs, and cosmetics	**EPA**	**TSCA**

Federal Insecticide, Fungicide, and Rodenticide Act

Since 1972, all pesticides must be registered with the EPA before sale, use, or distribution.

Applicants must demonstrate that the pesticide "will not generally cause unreasonable adverse effects on the environment." **Applicants pay for the required testing.**

- Unlike in other environmental statutes, EPA has interpreted "unreasonable" to mean **instances where the economic, social, and environmental costs outweigh the benefits of use** (i.e. crop yield and downstream economic effects)". The courts have generally upheld this interpretation.

- Applicants also demonstrate the pesticide prevents unreasonable human dietary risk from residues in or on any food product.

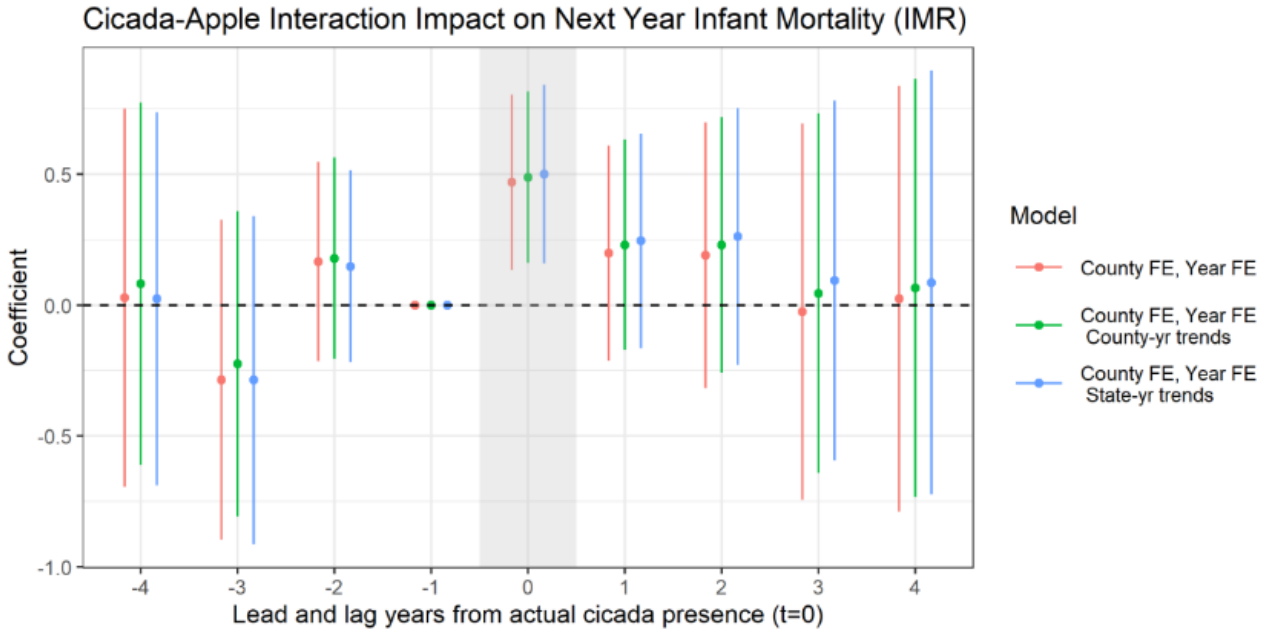
- FIFRA also requires registered pesticides to **display labels clearly showing ingredients, warning or precautionary statements**, and **directions for use** (amongst others).

- If EPA believes risks to workers using a pesticide are excessive, under FIFRA it can require **workplace standards or protective clothing**.

Federal Insecticide, Fungicide, and Rodenticide Act

Could more health protective pesticide regulation be economy-improving? A few thoughts:

- EPA estimates of health costs are often rudimentary due to resource constraints. Underestimates?
  - Taylor (2022) uses exogenous variation in county level application of pesticides due to cicada cycles and finds impacts to infant mortality, test scores, and HS drop out rates.
- US agricultural trade is often restricted due to partner countries' stricter pesticide restrictions.
- Largest US pesticide exposures to agricultural (often migrant) workers. EJ concern?



Notes: Event study based on Model (5) of Table 1 for level of apple production with the inclusion of cicada leads and lags. Sample limited to counties with cicada events and to observations with no leading or lagging cicada events during the period to balance the panel. Models allow for different fixed effects and geographic trends. Standard errors clustered at the state level. Solid lines show 95% confidence intervals. Normalized to the year before cicada emergence.

Toxic Substances Control Act: History

In 1976, Congress passed TSCA to address growing concerns about the use of toxic chemicals in US commerce. Its aim was to identify and control potentially dangerous chemicals.

Congress envisioned that TSCA would be implemented in tandem with other fragmented environmental statutes that deal with the release of chemicals after their creation.

Instead, **TSCA's intent is that the harmful effects of chemicals are investigated in the laboratory rather than turning up in injuries to human beings or the environment after full-scale production has begun**.

TSCA, the original

TSCA is a broad set of laws, but its key provisions are under:

- **Section 4** gives EPA authority to require ***commercial testing*** on new or existing chemical substances for their effects on the environment and human health.

- **Section 5** gives EPA authority to regulate ***new chemicals*** before their manufacture, and to regulate ***existing chemicals*** for significant new uses.

- **Section 6** gives EPA authority to regulate ***existing chemicals*** that are determined to present an unreasonable risk to the environment and human health.

- **Section 8** gives EPA authority to require commercial actors to ***collect, maintain, and submit data*** on certain chemical substances, maintain records and data concerning adverse reactions or human health impacts, and report information on substantial risks to health.

TSCA + the 2016 Lautenberg Act

Despite its intent, in hindsight, TSCA had some major shortcomings that made its implementation ineffective.

- All chemicals existing in commerce were “grandfathered in” with no safety standards required.
- Strong industry reliance on “trade secrets” exemption for data disclosure.
- Exercise of Section 4 test order authority to learn about a chemical required evidence that the chemical presented an unreasonable risk: a catch-22.
- Efforts to manage existing chemical risk were largely deemed a failure, especially after a Section 6 ban of asbestos was overturned on appeal in 1991.

In 2016, Congress amended TSCA to address these and other shortcomings. These amendments, passed with bipartisan support, are known as the Lautenberg Act.

- Both environmentalists and industry walked away with victories…

Information gathering: Sections 4 and 8

EPA is required in to compile and maintain an inventory of chemical substances that are manufactured, processed, or imported in the United States.

- As of August, 86,718 chemicals of which **42,242 are actively used**.

EPA also requires manufacturers and importers to provide information on inventory chemical production volumes and uses. This is housed in the CDR database.

Chemical manufacturers, distributers, importers and processors are required to keep records of adverse health reactions to a chemical and notify EPA immediately if they obtain information suggesting a chemical presents substantial risk.

Finally, under new Section 4 authority, EPA can issue test orders to industry for development of information on a chemical's environmental or human health impacts.

Section 5: regulation of new chemicals

If a chemical is not already listed on the TSCA inventory, it is a **new chemical** and therefore subject to Section 5.

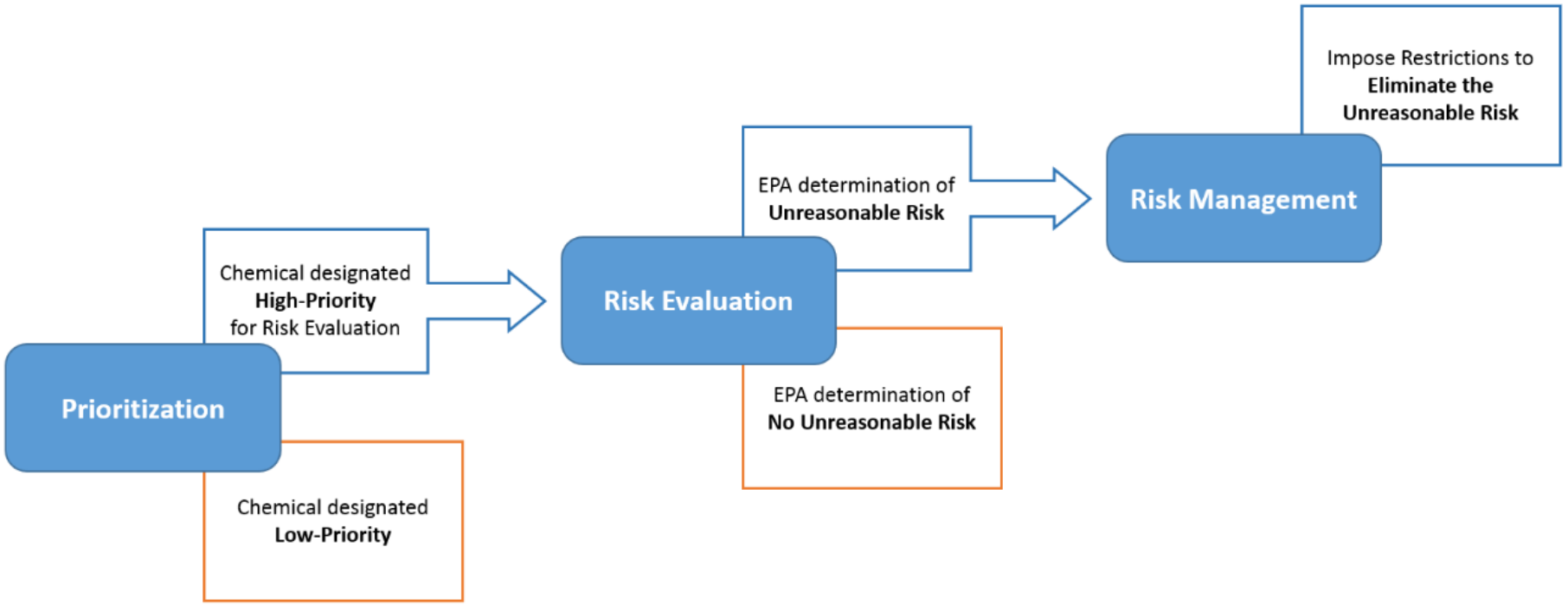
Any entity planning to manufacture or import a new chemical substance is required to provide EPA a **premanufacture notice** with available data.

- Due to the Lautenberg Act, EPA is now required to make an **affirmative risk determination** before a new chemical can proceed to market.
- If information is insufficient or implies an unreasonable risk from a chemical, EPA can require testing, prohibit or limit its use to the extent necessary to remove unreasonable risk.

Similarly, **significant new uses** of an existing chemical are subject to an EPA risk determination; the agency can prohibit or limit the use should unreasonable risk exist.

Of 1561 completed PMN/SNU since 2016, 13 (0.8%) had unreasonable risk. (430 cases withdrawn)

Section 6: regulation of existing chemicals



The Lautenberg Act revisions resulted in a significant overhaul of existing chemical regulation.

EPA has 42,000+ chemicals to assess and must now attain now statutory deadlines in evaluating and managing existing chemical risk.

This process occurs in three steps, shown at left.

Section 6: evaluating unreasonable risk

Once a high-priority chemical moves into risk evaluation, the process consists of:

1. A **scoping exercise**, where analytical approaches and methods are selected, and conditions of the chemicals use are designated.
2. A **hazard assessment**, where adverse health or environmental effects are identified.
3. An **exposure assessment**, where the likely duration, intensity, frequency, and number of exposures to a chemical under the condition(s) of use are identified.
4. **Risk characterization**, where exposure and hazard are integrated and assessed for each condition of use.
5. **Risk determination**, where EPA designates whether a particular condition of use contributes to a chemical's unreasonable risk to health or the environment.

Section 6: managing unreasonable risk

If a chemical is determined to present unreasonable risk, EPA must reduce or eliminate the risk, with no consideration of cost.

- Before Lautenberg, TSCA regulations were held to a least-burdensome, cost-benefit standard.

Since 2022 EPA has proposed risk management regulations for 5 chemicals, with 3 more due by early next year.

- Thus far, rules have included **prohibition of chemical uses** and **implementation of workplace protection plans** (inhalation exposure limits, PPE, etc) in less hazardous settings.
- Additional tools likely when chemicals present risk to general population.

One key consideration when prohibiting a chemical use, is ensuring chemical alternatives exist that avoid a **regrettable substitution**. **A regulation, say a prohibition, that replaces a toxic chemical with use of an even more toxic chemical is a bad policy.**

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Shapira and Zingales (2023)

Is Pollution Value-Maximizing? The DuPont Case

Litigation, regulation, and reputation are the key mechanisms to restrain companies from profiting by externalizing larger costs on society. **We employ a case study of a major externality, namely, DuPont's emission of a toxic chemical named *PFOA*, to study why these mechanisms can jointly fail.** By using internal company documents disclosed in trials, we show that it was ex-ante optimal from a shareholder-value perspective to pollute, even when anticipating the potential legal liability down the road. The key is the time lag: a large lag between deciding to emit the chemical and having to pay fines for it dilutes the deterrent effect of litigation. We then detail how regulation and reputation failed as well due to DuPont's ability to control the information environment. We evaluate potential ways to mitigate the information problem, such as by introducing an environmental Qui Tam or recalibrating director oversight duties.

Shapira and Zingales (2023)

Context:

- Since the 1950s DuPont used C8 (PFOA) in its production of…
- At DuPont's Washington Works facility along the WV/OH border, emissions of spent C8 were disposed by…
- As early as the 1960s, DuPont had evidence of health risks. This evidence included…
- Information about the chemical's toxicity and DuPont's awareness became public only when…

Shapira and Zingales (2023)

The paper creates a straw man argument that many economists would expect **litigation risk, regulation, and reputation risk** to prevent firms from imposing catastrophic environmental external costs onto society.

Obviously (to this economist, anyways), these mechanisms can break down due to incentives.

Profit incentive: back of the envelope calculation on DuPont's benefit-cost ratio in 1984 when the chemical's danger was raised with the Board:

- Present value of profit from continued C8 use: **$1.1 billion**
- Present value of human health impacts: **$369 million**
- Present value of expected damage liabilities conditional on litigation: **$100 million**
- Present value of abatement costs to reduce exposure: **$19 million**

Back of the envelope math -> profit-maximizing firm only abates if E[Prob(litigation)] > 19%

Shapira and Zingales (2023)

What made litigation risk a poor pollution deterrent in this case?

Shapira and Zingales (2023)

What made litigation risk a poor pollution deterrent in this case?

- Time lag between pollution decision and potential costs to DuPont.
- Divergence between private incentives of a plaintiff (+ their attorneys) and the public interest.
- Firm's ability and incentives to maintain an information asymmetry regarding the chemical.

Shapira and Zingales (2023)

What made regulation a poor pollution deterrent in this case?

Shapira and Zingales (2023)

What made regulation a poor pollution deterrent in this case?

- Old TSCA required self-reporting on potential chemical harm only if there was *substantial* evidence of risk.
  - In turn, this disincentived private research into chemical impacts.

- Regulators in WV and EPA were somewhat prone to regulatory capture due to the “revolving door problem”.

Shapira and Zingales (2023)

What made reputational risk a poor pollution deterrent in this case?

Shapira and Zingales (2023)

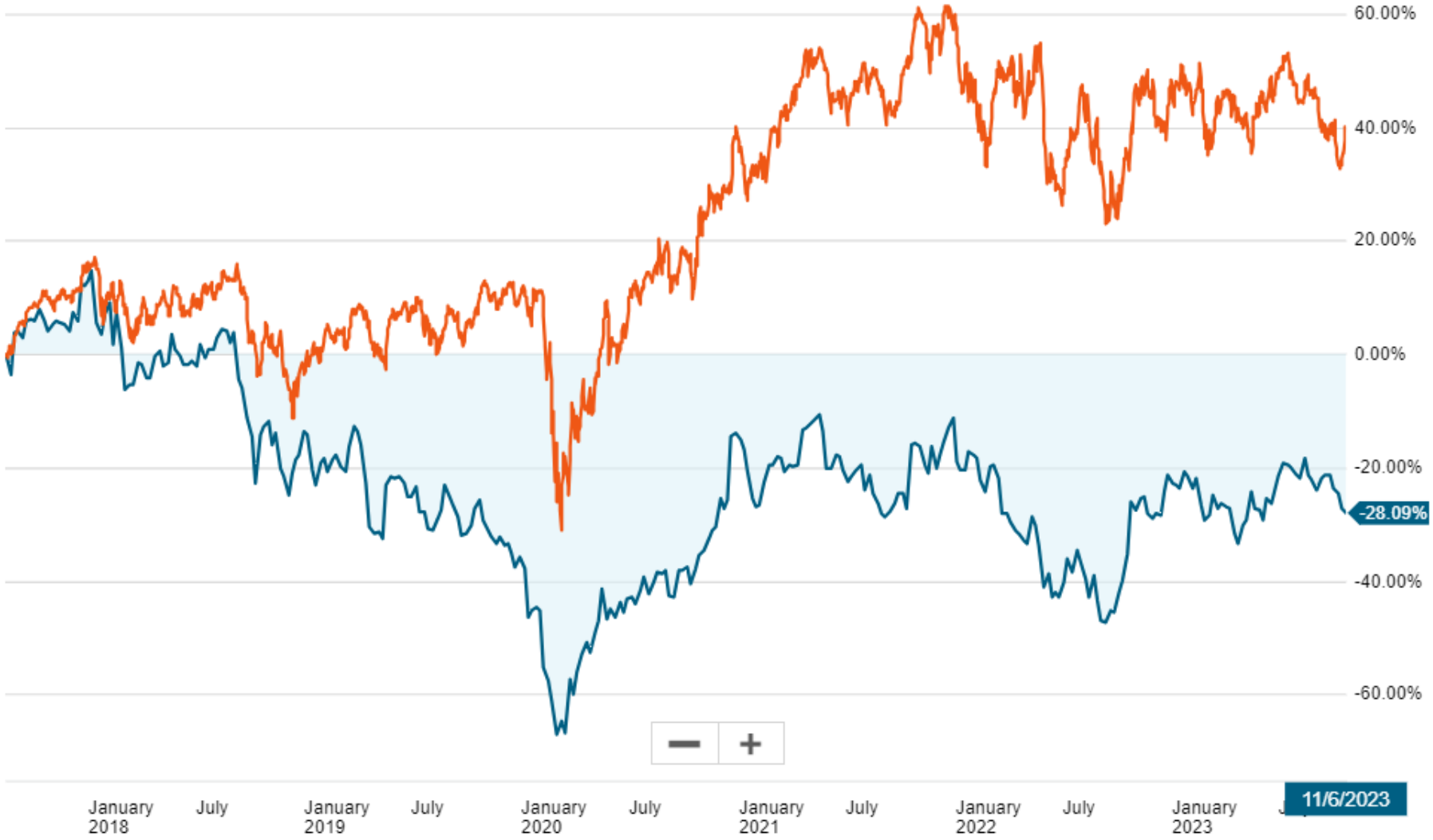
What made reputational risk a poor pollution deterrent in this case?

- Workers and community members were disincentivized to disclose harms, as their jobs and community's economy depended on the Works.
- Best-placed toxicity academics/scientists hired on as consultants and conflicted out of making scientific claims that generate reputational fallout.
- With stockholders' focus on short-term performance, DuPont leadership knew they would likely not be around to "clean up" the long-term impacts to brand.
- DuPont was able to "spin off" its liable divisions (into Chemours) to avoid reputational damage.

Litigation and reputational risk lingers a good while…

Dupont (DD) in blue.

Chemicals index in orange.



Shapira and Zingales (2023)

The authors propose avenues to strengthen existing deterrence mechanisms:

- Increase sanctions (criminal or punitive monetary)
- Reduce time lag between pollution detection and enforcement
- Increase probability of detection
  - Qui Tam
  - Stronger laws about Director oversight
  - Broaden medical monitoring laws
- Taxing secret settlements
- Others?

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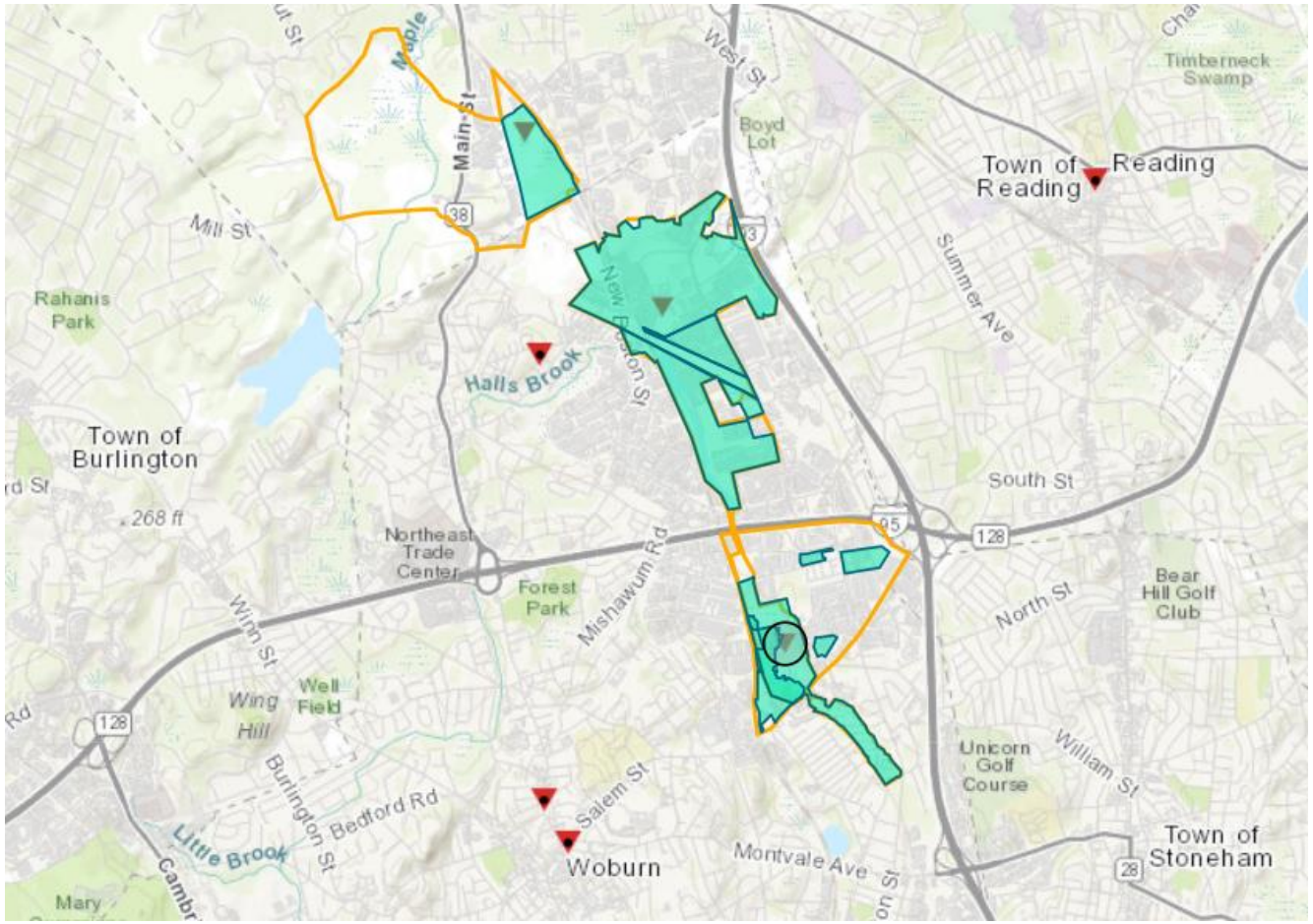
- Shapira & Zingales, 2023
- Wrapping up

Back to Woburn, MA: 1980s to present



In 1982, the US EPA added the Wells G & H site to the Superfund National Priorities List.

In 1991, after nearly a decade of careful study, EPA finalized a $69.5 million settlement with four parties found liable for the cleanup of the Wells G & H Site.

Negotiations have led to additional settlements in more recent years. Over 80 companies that operated in the area since 1853 are suspected of contributing to the pollution…

More on the Superfund program to come Wednesday with Dr. Austin.

Woburn, MA: 10/23/2023

Massachusetts Sen. Edward Markey, left, stands in support of Anne Anderson, whose son died of leukemia in 1981 and was exposed to water contaminated with the chemical trichloroethylene, or TCE. The two spoke Monday, Oct. 23, 2023, in Woburn, Mass., during an EPA press conference announcing its proposal to ban the chemical. (AP Photo/Michael Casey)

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 751

[EPA–HQ–OPPT–2020–0642; FRL–8317–01–OCSPP]

RIN 2070–AK83

Trichloroethylene (TCE); Regulation Under the Toxic Substances Control Act (TSCA)

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule.

exposures. To address the identified unreasonable risk, EPA is proposing to: prohibit all manufacture (including import), processing, and distribution in commerce of TCE and industrial and commercial use of TCE for all uses, with longer compliance timeframes and workplace controls for certain processing and industrial and commercial uses (including proposed phaseouts and time-limited exemptions); prohibit the disposal of TCE to industrial pre-treatment, industrial treatment, or publicly owned treatment works, with a time-limited exemption for cleanup projects; and establish recordkeeping and downstream notification requirements.

Next class

- Next class will cover CERCLA and RCRA.
- Beforehand: watch the Hazardous Waste documentary
- Reminder to keep making progress on Case Study #4 (due Nov 27)