

# Environmental Toxicology & Public Health

---

**Bolaji Olagbegi**

*Research for Environmental Agencies & Organizations:  
A Directed Study Course with Professor Richard Reibstein*

# Overview

---

Over 80,000 chemicals are registered under TSCA (Toxics Control Substance Act), few have undergone mandatory testing before entering the market, and this lack of effective oversight contributes to the problem that many products, ranging from diapers to strawberries, carry chemicals with unknown side effects. The resulting abundance of unregulated substances poses escalated risk to human health, due to persistent exposure. In parallel with the rising threats to human health is the concern that clinicians are not adequately prepared to accurately identify or proficiently treat diseases stemming from environmental influences such as pesticides and flame retardants. To evaluate this concern, a questionnaire was drafted, aimed to broadly assess the knowledge of medical providers regarding possible environmental causes of human health conditions.

# Methodology

---

- Conducted research on existing studies on environmental toxicants concerning public health
- This led to the formulation of our chief focus: Are medical practitioners knowledgeable about the effects toxicants have on public health?
- Drafted a preliminary questionnaire and invited prominent healthcare professionals to comment and provide feedback

# Questionnaire

---

Are you familiar with the purpose of environmental history forms?

Yes  No

Do you use environmental history forms to examine patient exposure in the home or workplace?

Yes  No

Most health care providers recognize the effects of environmental toxins in their practice

Yes  No

Do healthcare providers recognize the relationship between environmental toxicants and symptoms associated with exposures such as:

	Likely	Possibly	Not likely
Asthmagens (Isocyanates, Chlorine, Quats, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cosmetics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Household dust	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flame retardants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Formaldehyde	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Contaminants in water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lead	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nail Polish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pesticides	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Phthalates	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hair Products	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sealants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tobacco smoke	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mold	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

What symptoms suggesting toxicant exposure would prompt you to administer blood or urine tests?

---



---

If you conduct, what findings in an environmental history form prompt blood or urine tests?

---

# Questionnaire

---

- In what settings were you taught about toxics in the workplace? (check all that apply)
- Medical school
  - Residency
  - Certification program
  - Occupational training
  - Voluntary workshop
  - Not taught

In what settings were you taught about toxics in consumer goods? (check all that apply)

- Medical school
- Residency
- Post medical school education
- Occupational training
- Voluntary workshops
- Not taught

Do you know toxicology specialists to refer patients to?

Yes  Maybe  No

Do you consider environmental exposures when diagnosing patients?

Yes  Depends  No

Explain reasoning:

# Questionnaire

---

Yes  Depends  No

Explain reasoning:

Do you think there is an increase of toxicants in the average body to be concerned about?

Yes  No

Is the medical community paying sufficient attention to environmental toxic exposure?

Yes  No

Explain reasoning:

Does your practice inform patients of environmental exposures from consumer goods and the workplace?

Yes  No

Would your practice provide patients with environmental health information if given the necessary resources?

Yes  No

What would be your preferred method to learn more about this subject? *(check all that apply)*

- Newsletter
- Workshop
- Lecture
- Conference
- Certification program
- Online

# Prominent Feedback

- Linda Birnbaum, PhD, DABT, A.T.S (Director, National Institute of Environment Health Sciences; Director, National Toxicology Program)
- Jeanne Conry, MD, PhD (Past President, American College of Obstetricians and Gynecologists; Assistant Physician and Chief, The Permanente Medical Group)
- Ted Schettler, MD, MPH (Science Director, Science and Environmental Health Network)
- Mark Miller, MD, MPH (Director, University of California San Francisco Pediatric Environmental Health Specialty Unit)
- Bruce Lanphear, MD, MPH (Clinician Scientist, Child & Family Research Institute; Investigator, BC Children's Hospital; Professor of Health Sciences, Simon Fraser University)
- Russ Hauser, MD, ScD, MPH (Frederick Lee Hisaw Professor of Reproductive Physiology; Professor of Environmental and Occupational Epidemiology, Harvard T.H Chan School of Public Health; Professor of Obstetrics, Gynecology and Reproductive Biology, Harvard Medical School)

# Key Considerations

---

- Identify audience- directed for all healthcare professionals, occupational or daily occurrences
- Shorten length and favor simple answer structures
- Understand that most healthcare professionals are not adequately taught- how does this conclusion benefit me
- Symptoms suggest poisoning- raise issue of environmental monitoring and history forms to encourage preventative measures
- Environmental History forms generate a lot of information that doctors may not know how to interpret
- Need higher quality research and better education

# Toxicant Case Studies *A deeper look at commonplace chemicals*

- **Organophosphates:** A class of pesticides which act through phosphorylation of the acetylcholinesterase enzyme at nerve endings
  - Exposure: Food contamination, during application- inhalation and dermal
  - Symptoms: Fatigue, headaches, nausea, depression, miosis, muscle twitching
- **Heavy Metals (e.g. Cadmium, Mercury, & Lead):** Metallic chemical elements with interrupt the absorption, metabolism, and utilization of essential minerals
  - Exposure: Cigarette smoke, electronics, coating pigments, water/food contamination, soil, ammunition, volcano eruptions
  - Symptoms: Bone defects, fatigue, anxiety, nervous system disorders, chronic pain, impaired motor skills
- **BPA (Bisphenol A):** An industrial chemical used in the manufacturing of resins and plastics
  - Exposure: Dental sealants, metal products, polycarbonate plastics
  - Symptoms: Vitamin D deficiency, weight gain, reproductive dysfunction

# A Wider Scope

---

This type of inhibiting regulation is not common in other developed or OECD (Organisation for Economic Co-Operation and Development) countries. In fact, largely due to its inaction concerning toxicants, the United States in 2010 rose 20 places and was ranked number 61 on the Environmental Performance Index (EPI).

In 2016 the TSCA was amended for the first time in over forty years by the Lautenberg Chemical Safety for the 21<sup>st</sup> Century Act which set parameters for better monitoring hazardous chemicals currently in the markets and later emerging.

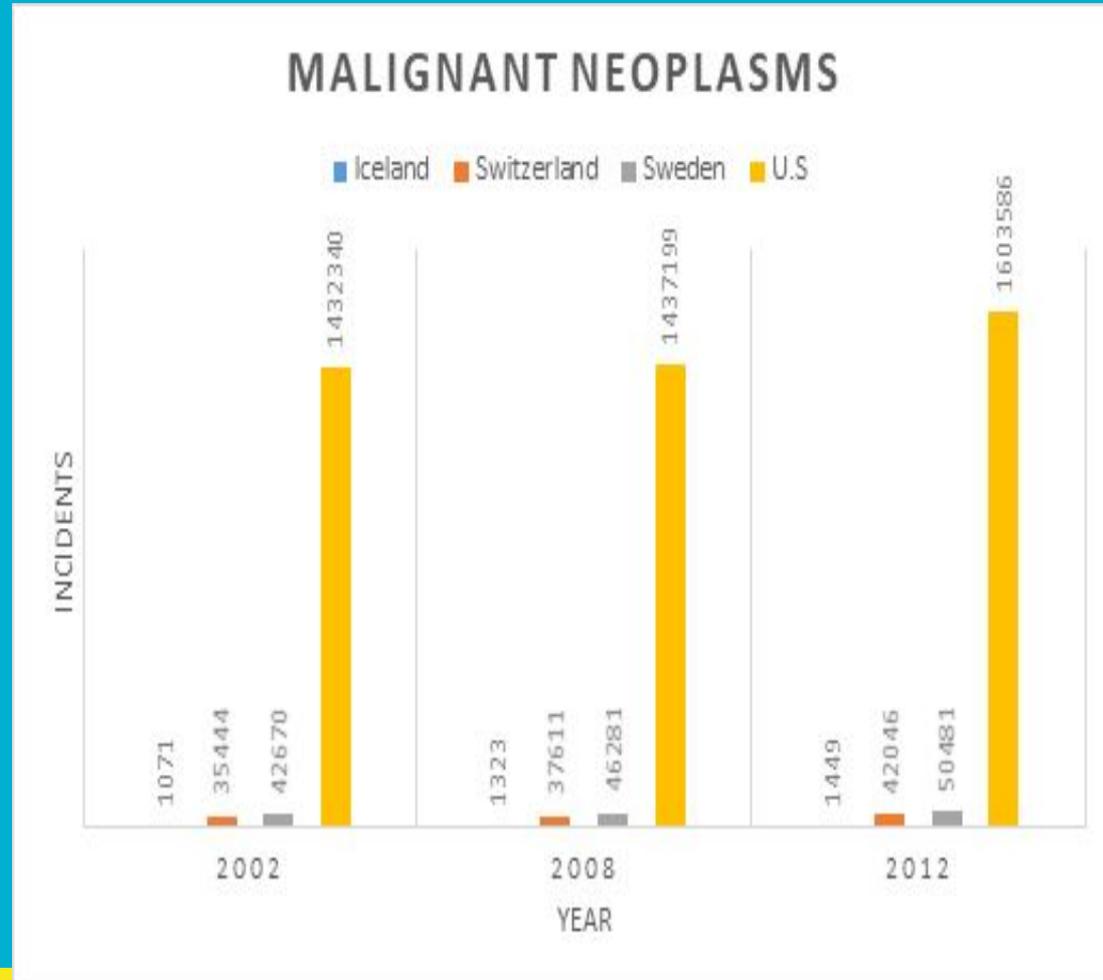
- Review a minimum of twenty chemicals within the time frame of a seven-year period.
- State compliance

# A Wider Scope

Leading the index was Iceland, Switzerland, Costa Rica and Sweden, three of which regulate under REACH, Europe's chemical regulation, as well as additional directives and legislation, ie.:

- CLP: Classification Labelling & Packaging- a statute dictating that substances must properly advertise associated risks and hazards to consumers and workers
- Biocidal Products Regulation
- Plant Protection Products Regulation

The graph to the right displays the malignant neoplasm (cancer) incidence rate in four countries, Iceland, Switzerland, Sweden, and the U.S.A.



# References

---

- <http://deannaminich.com/the-relationship-between-minerals-and-metals-natural-protection-from-heavy-metals/>
- [https://www.epa.gov/sites/production/files/documents/rmpp\\_6thed\\_ch5\\_organophosphates.pdf](https://www.epa.gov/sites/production/files/documents/rmpp_6thed_ch5_organophosphates.pdf)
- <http://www.naturallivingideas.com/heavy-metal-toxicity-signs/>
- <https://draxe.com/bpa-toxic-effects/>
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5464684/>
- <https://www.resultsrna.com/18-harmful-environmental-toxins-you-should-know-about/>
- <https://www.platinumenergysystems.ca/migraines-or-toxic-headaches/>
- <http://enviromedclinic.com/common-toxicants-symptoms/>