

Information Behaviors at the Edge of Reason: the Role of Uncertainty, Science, and Culture on Environmental Policy



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Goals

- Explore information behaviors during the process of transforming scientific evidence into environmental policy.
- Identify where cultural values might be embedded into the process.

DEHP Case Study

- Diethylhexyl phthalate (DEHP) is a widely used plasticizer that has been banned in children's toys.
- Potential health effects are being explored by scientists and policy makers in the European Union and the United States.

Date	Event
1999	European Commission adopted (COM(1999)706) "Community strategy for endocrine disruptors".
May 2009	Draft recommendation that four phthalates (DEHP, DBP, BBP and DIBP) should be added to the list of priority substances that should be reviewed.
Nov 2011	Endocrine disruptor expert advisory group formed.
June 2012	Proposal to restrict phthalates deemed unjustified. European Commission organized conference titled: "Endocrine disruptors: current challenges in science and policy" conference.
July 2012	Public consultation launched on SEAC (Committee for Socio-economic Analysis)'s draft opinion on restricting phthalates.
Nov 2012	Denmark publishes a national ban on the import and sale of products containing any of the four phthalates DEHP, DBP, BBP and DIBP at a concentration greater than 0.1% by weight.
May 2013	Denmark postpones the phthalates ban by 2 years.
Oct 2013	Scientists claim that the endocrine disruptor framework "is based on virtually complete ignorance of all well-established and taught principles of pharmacology and toxicology" (Dietrich et al., 2013).

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Method

Process used to transform scientific evidence into public policy



- Select three scientific reviews
 - EU_08: European Union Risk Assessment Report, bis(2-ethylhexyl)phthalate (DEHP) (2008), CAS No: 117-81-7, EINECS No: 204-211-0 (Vol. 80). European Chemicals Bureau: Institute for Health and Consumer Protection.
 - US_06: NTP-CERHR Monograph on the Potential Human Reproductive and Developmental Effects of Di(2-Ethylhexyl) Phthalate (DEHP) (2006). NIH Publication No 06 - 4476.
 - US_09: Carlisle, J., et al. (2009). *Toxicological Profile for Di-(2-Ethylhexyl) Phthalate (DEHP)*. California: California Environmental Protection Agency.
- Collect cited studies
- Compare and contrast review conclusions and citing practices
- Analyze overlapping cited studies and report any differences

Results

Overall findings: All three reviews found (a) there is insufficient evidence to determine if DEHP is harmful to humans and (b) there is sufficient evidence to establish that DEHP is a developmental and reproductive toxicant in animals.

Analysis of shared citations: The level of detail for excluding articles differed between EU and US reviews. The quality of study designs were open to interpretation:

Example	EU	US
1	"unclear"	"unreliable" "not useful"
2	"not statistically significant"	"not appropriate"
3	not clear	transparent

Scope of the study: EU study was more comprehensive, while the US study focused only on reproductive and developmental effects. We did look for a national US risk assessment in the Integrated Risk Assessment System (IRIS) but a general assessment at the national level has not been yet been conducted (brief notes from a cancer risk assessment were available, but the complete assessment was not available).

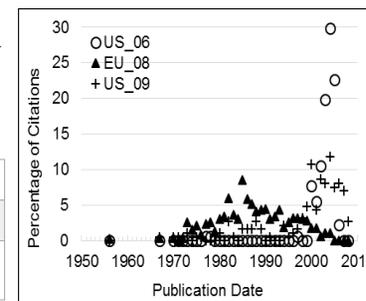
Results

Overlapping cited studies: The narrative for the same cited articles differed between reviews.

EU	US	Reason
"The <u>LOAEL</u> for effects of DEHP on the serum concentration of testosterone in very young rats is <u>100 mg/kg and day</u> "	"They identified 1 mg/kg bw/ day as a NOAEL in their experiments and <u>10 mg/kg bw/ day as a LOAEL</u> "	Data drawn from different experiments reported in the same article
"the concentration of DEHP was <u>0.8-11.8 mg/kg</u> "	"from <u>346 to 11,800 ng/g</u> "	Data drawn from different places (narrative vs tables)

Citation Differences: The US reviews used a greater proportion of journal articles and more recent citations.

	EU 2008	US 2006	US 2009
Total citations	923	195	192
Percent journals cited	50.5%	92.8%	96.8%



Conclusions

- All three scientific reviews arrived at the same conclusion.
- Reviews showed differences with respect to
 - evaluating study design adequacy of the cited studies, and
 - selecting results to include from an article.
- US reviews cited a greater proportion of journal articles.
- The scope of the reviews differed. The scope of a review is typically determined by elected or appointed individuals, and provides a mechanism by which culture is injected into the process of transforming scientific evidence into public policy.

References Cited Dietrich, D., et al; (2013). Open letter to the European commission: scientifically unfounded precaution drives European commission's recommendations on EDC regulation, while defying common sense, well-established science, and risk assessment principles. *Arch Toxicol*, 87(9), 1739-1741.