Chemical Hazard Data Commons White Paper Survey Results

Compilation of results from a web survey in review of the first draft of "Toward Safer Products: Accelerating Change with a Chemical Hazard Data Commons"

Feb 28, 2014

We circulated both an initial draft of the white paper and a survey to 76 people. We received 56 responses, nearly a 75% response rate. We received 16 responses through the survey instrument, 35 sent email commentaries and 23 submitted Word documents with track changes (The total of the commentaries adds up to more than 56 because some respondents submitted through two or all three methods). This document is a compilation of the survey responses. Names and organizations are withheld as we did not request permission to publicly circulate names and company affiliations in affiliation with this report. Some of these comments are reflected in the current version of the White Paper and the accompanying Working Papers while others remain to be addressed in future working group activities. Content based comments that were sent in by other means than the survey are compiled in a separate document

The White Paper, the Working Documents, the other content based results and more information about the Project are available along with this document in the Chemical Hazard Data Commons github repository at:
https://github.com/healthybuildingnetwork/chemical-data-commons

1. **Describe yourself:** *[all open text fields]*
    a. **Name**
    b. **Organizations**: Mixture of government agencies, private industry, non profits, academics, assessors and consultants
    c. **Position**: not pulled from survey
    d. What **kinds of work** do you do that involves using or creating chemical hazard information?
        i. chem management systems
        ii. product environmental compliance
        iii. chemical lifecycle research
        iv. building material research
        v. Hazard and alternatives assessment of industrial chemicals
        vi. exposure and risk assessment & management
        vii. public health-related informatics
        viii. database development
        ix. student
        x. product certification
        xi. GreenScreen development
    e. What is your level of **expertise**/training/education in chemical and toxicological issues?: Wide range of professionals and lay users
    f. **Wish list:** Name one (or more if you wish) things the Data Commons might provide which would most help your work.
        i. Many cited aggregated data on hazard and alternatives to link disparate sources.

Some emphasized need for solution orientation.
   ii. Lower cost of hazard assessments
   iii. open taxonomies for chemical ID
   iv. trustworthy and authoritative
   v. regulatory lists, exposure and structural activity analysis
   vi. Go to source for hazard data to apply to assessments, marketplace for completed hazard assessments.

2. **Potential Participants in the Data Commons:** On page 8 we describe potential participants and activities they do that requires chemical hazard information.
   a. Which of the Potential Participant activities listed starting on page 8 do you identify with? Check all the activities in which you participate:*[checkbox - allow more than one]*
      i. Designers, developers and owners changing specifications: 2
      ii. Non-profits developing voluntary screening programs:7
      iii. Retailers establishing sustainable product specifications for purchasing: 1
      iv. Government agencies developing voluntary and regulatory programs: 7
      v. Academic institutions, industry collaboratives or government agencies: 6 researching alternatives
      vi. Academic institutions or government agencies doing public health research: 3
      vii. Unions researching chemicals in use in the workplace: 4
      viii. Manufacturers evaluating products and possible reformulations: 5
      ix. Assessment organizations helping manufacturers to inventory their supply chain and assess ingredient hazards: 5
   b. Are there **other potential participant groups** and/or activities that the Data Commons could support and should engage?
      i. Manufacturer: evaluating process and other indirect chemistries and exposures
      ii. Green chemistry innovation centers or businesses: hazardous chemicals without good, safe alternatives are unfilled market opportunities.
      iii. Institutional Purchasers.....government, schools, hospitals,
      iv. Government agencies and other organizations developing, doing, and funding research, e.g, on emissions of chemicals from certain types of household products/furnishings under reasonably foreseeable exposure scenarios. non regulatory government agencies
      v. Consumers: Consumer Apps such as Tox Fox in Germany that help identify cosmetics without endocrine disruptors)
      vi. OSH professionals
      vii. European & other international partners
      viii. Chemical manufacturers: While not natural partners, they can be successfully engaged with the correct incentives (e.g., GC3 plasticizer project).
      ix. Consultants and/or NGOs that support the rest
      x. Educators

3. Obstacles to access to hazard information: On page 10 we describe a series of obstacles the Data Commons could help address.
   a. Indicate how big a problem each is for your work: *[check off options: major problem, minor problem, or not relevant to my work - allow only one check off per item]*
      i. scattered sources that are hard to search together: Major 15, Minor 1
      ii. expense for accessing proprietary data: Major 13, Minor 3
      iii. lack of aggregated summary information and tools for less skilled user Major 10,

minor 4, not relevant 2

iv. chemical identification Major 10, minor 6

v. lack of functional use characterization. Major 9 minor 6

b. What other major obstacles do you experience?

i. Language: I believe there is also an important language problem for non English speakers. On the other hand usefull European information sources are only in German, Danish, Swedish, etc.

ii. Easy and comprehensive way to search the published literature, other documents, and Web site content.

iii. Collecting data from suppliers and CBI as an obstacle to disclosing hazardous chemicals

iv. Knowing what Chemicals are IN given products

v. 0) Functional use is frequently misunderstood and oversimplified. Chemicals in formulations often interact in unpredictable ways that significantly affect product performance. True "drop-in replacements" are the exception rather than the rule. 1) The overall level of chemical and health hazard education is poor among many small to medium businesses. This makes it difficult to gain traction on the issue of hazardous/safer chemicals. 2) Businesses often don't see the connection between the chemicals they use and the environmental problems created by emissions/exposures.

vi. Chemical data are getting LESS specific (SDS vs older MSDS), and more CBI is being declared, making assessments much more difficult.

vii. Lack of access to data due to CBI.

viii. data gaps, evaluating animal studies (determining which are robust, key, biased, etc.), conflicting information and studies. knowing when you have enough information to say something is really safer. when to trust analog info/read-across.

4. **Examples of the Data Commons**: On p. 12 we listed a set of example use cases.

a. Which (if any) do you identify with? Check all the cases in which you participate. *[check box, allow more than one*)

i. Manufacturer looking to prioritize where to start addressing toxics in their products: 6

ii. Assessor doing a full assessment of a product: 8.

iii. Product designer seeking to develop healthier products: 4

iv. Government agency or NGO or academic seeking chemicals to prioritize for policy actions: 8

v. Academic or public health researcher generating socially useful data: 2

vi. Chemical researcher seeking opportunities/needs for new development: 3

b. Is there more (or less) that a Data Commons could provide to help with this activity?

i. scorecard hazards

ii. exposure assessments

iii. list alternatives

iv. pervasiveness/ volume of use in market & are alternatives available

v. risk analysis

vi. barriers to adoption of safer alternatives

vii. Identify emerging chemicals with poor data on hazard

viii. help synthesis chemists see patterns for functional class to fill data gaps and design alternatives.

ix. help manufacturers foresee types of exposures associated with the manufacture,

usage, and disposal or recycling of a product and its components

c. Describe another use case that you hope the Data Commons would support.
    i. Integration with other IT systems/infrastructure!!
    ii. Case studies or information exchanges on trials/experiments with safer alternatives in common hazardous chemical applications.
    iii. Government working groups assessing substances and alternatives (Eg ECHA RAC and SEAC Committees)
    iv. Educators - Teaching about all this paper discusses
    v. Consultants - Providing advisory services to one or more of the organizations listed for one or more of the uses listed
    vi. Developers of protocols, selection tools, scorecards and certifications used to encourage disclosure of ingredients and hazard and selection of products that avoid chemicals of concern

5. **Data Groups needed in the Data Commons:** Starting on p 13, we described a variety of different types of data used in chemical hazard assessment that we anticipate being part of the Data Commons and some major obstacles to finding and using the information.
    a. For any of the types you use, tell us the biggest challenges, if any, you have in finding and using this kind of data or sharing data of this sort that you produce. *[open text]*
        i. Authoritative Hazard Listings:
            1. regulatory only approach in industry
            2. Not difficult (use Pharos)
            3. Want decision dates
            4. Need more on neurotoxicants & endocrine disruptors
            5. different formats, broken URLs, tough navigation,
            6. chemical IDs (or lack therof)
            7. keeping up with changes
            8. use of groups without listing members
            9. criteria sometimes hard to find, vary in their rigor
            10. listings based on combined different health endpoints
        ii. Chemical Hazard Assessments
            1. need comprehensive, free, and easy access to global information from peer reviewed journals and other types of trustworthy resources. many are challenging to find and navigate
            2. need context with hazard assessments
            3. if chemical is new or isn't of major concern, there usually isn't much information from any of normal resources.
            4. scattered, inaccessible or proprietary
            5. not enough greenscreens or other assessments, need biz model to incentivize sharing
            6. tracking new assessments
            7. need transparency for criteria and data and quality and data gaps and potential bias
            8. comparing is difficult without transparency or harmonization
        iii. Alternatives Assessments
            1. very few available, need more public AAs
            2. specific uses make finding alternatives difficult
            3. need functional use interactions & formulation issues
            4. Need design alternatives in addition to chemical drop in alternatives

5. need characterization of tradeoffs
6. need to know the data and methodology used in an AA

iv. Related Substance Studies
1. Important.
2. Often overlooked
3. hard to find
4. Didn't understand diff between this and LC info (please clarify)
5. Multiple possible synthesis routes, plus different raw materials thus different extraction/growing issues
6. Transformation products requires diverse expertise (e.g. manufacturing, toxicology, chemistry) to identify feasible and relevant ones.

v. Restricted Substance Listings
1. data formats and chemical IDs
2. too scattered, need aggregation
3. usually not forward looking, least common denominator
4. categories vs specific CAS substances. Check a CASRN and miss a category that would include it.

vi. Scientific studies (of a health endpoint or environmental fate)
1. Lack of access to journals outside of academic ettings and other places with subscriptions to high priced journals.
2. important endpoints like endocrine activity and repro- or dev-tox are inscrutable to non-experts.
3. Industry too concerned with regulator requirements & bottom line
4. Physical Form - Study does not always specify the physical characteristics of substance being evaluated (e.g. crystalline vs amorphous or nano-scale
5. Does not specify the test method or guideline used
6. Time consuming to do a "comprehensive" review
7. Not standard definition/process to determine if a review was sufficiently "comprehensive"
8. Available IF you have academic access

vii. Physical characteristics
1. available on Toxnet, NIOSH and MSDS - though variable
2. challenging to know if studies from one form are relevant to another

viii. Life cycle information
1. hard to find, very weak and scattered
2. Need chemical synthesis & degradation pathways
3. a stretch for this project?

ix. Hazard Based Substance Identifiers
1. synonyms, trade names generics, mulitple meanings for a CASRN, mixtures & groups make this hard

x. Functional Use Categorization
1. difficult to find (tho Ewell said "Hard to find if using the Schifano/Tichner definition but readily available if using functional use (performance) definition"
2. no standardization
3. key to AA

b. What other data types would be useful to address in the Data Commons and what obstacles do have in finding that data?
    i. Enabling integration or connectors to enterprise IT infrastructure will drive implementation ROI.
    ii. Emerging chemicals - staying ahead of the curve. We're always lagging.
    iii. Access to reasonably foreseeable usage and exposure scenarios associated with the manufacture, usage, and disposal or recycling of a product and its components.
    iv. Chemical structure (related to ID issue);
    v. Production volume / use data (many uses of chemicals are only known to industry insiders) (needs good linking to regulatory databases; beyond that, major CBI/access issue). TSCA, MA TURA, WA product info, IMERC, etc. should be straightforward to find, but it's all in different schemes and databases.
    vi. Way to share useful data labeled CBI (confidential business information) as it relates to hazard assessment or supports knowledge for safer alternatives without compromising proprietary advantages

6. **Section 2) Facilitating Decision Making with Assessment Summaries** This section (p.16) describes a number of proposals to improve access to summary information about chemical hazards.
    a. Rate the importance of each proposal as: No opinion (not my area), Huh? (I don't understand the proposal), Unnecessary (not needed), Redundant (already well handled by others), Low (nice when we can get to it), Medium (useful but not urgent), High (urgently needed), I'll Help (urgent and I'm ready to help make this one happen) *[options: No opinion, Huh?, Unnecessary, Redundant, Low, Medium, High, I'll Help]*
        i. Develop a shared vocabulary for describing endpoint specific and chemical summary level hazard information. (p. 19) Help 3, High 7, Medium 4, Low 0, Redundant 1(Liz H) (help Charlotte Brody, Meg Schwarzman, Akos)
        ii. Develop standards for publishing accessible authoritative hazard lists (p. 20) Help 2, High 7, Medium 5, low 1 (help Brian Penttila, Akos)
        iii. Develop scraping tools for pulling data from non API-compatible authoritative hazard agency websites (p. 20) Help 1, High 6, Medium 6, low 1, No opinion 1 (help Akos)
        iv. Continue harmonization efforts between key assessment organizations (p.21), Help 0, High 10, Medium 5, low 1
        v. Build a Chemical Hazard Assessment Exchange for chemical assessments with API access for other related systems. (p.21) Help 1, High 6, Medium 6, low 2 (help Akos)
        vi. Develop a life cycle chemistry repository for process chemistry and transformation products. (p.23) Help 1 (akos), High 4, Medium 7, low 2, Unnecessary 1(Liz H) (help Akos)
        vii. Link policy databases and Restricted Substance Listings (RSLs) to facilitate comprehensive view of a chemical's policy status. (p.24) Help 0, High 11, Medium 4, low 2
        viii. Create descriptive wiki pages and facilitated discussion areas to support crowd sourced development of educational and policy resources. (p. 24) Help 1, High 5, Medium 5, low 3 (help Brian Penttila)
    b. Comment on any of these proposals
        i. Life-cycle is important, but should be subordinated to the mission of

reducing/eliminating hazardous chemical emissions.

ii. Wiki: How will it be useful rather than just hosting arguments among people with a stake in the results?

iii. Wiki: government organization are unlikely to be able to participate

iv. "Building a Chemical Hazard Assessment Exchange" - this idea needs to be fleshed out in much more detail if it is to be successful. What is the value proposition for the assessors to engage? What is the financial model that would compensate Assessors enough to incentivize them to lease chemical dossiers to the Data Commons? How would the accounting and crediting system work to ensure Assessors that they are recouping their investment?

v. Subsport has some elements. Collaborate?

vi. some of shared vocab could be adopted from GHS. Think it would be best to keep it simple to begin with - not take on the nearly impossible tasks, or things that will be specific to specific users?

c. What is missing? Add your own proposals.

i. First-order "work" of promoting/facilitating/establishing an expectation of B2B chemical inventory sharing. Awareness is the starting point and many industrial customers don't know to ask what is in their products.

ii. Need some measure of validity of assessment summaries, and ability to vet sources of these summaries.

7. **Section 3) Speeding & Improving Assessment through Data Sharing** - This section (p.25) describes proposals to improve access to and sharing of the underlying hazard data needed to do assessments.

a. Rate the importance of each proposal as No opinion, Huh? (I don't get the proposal), Unnecessary (not needed), Redundant (already well handled by others), Low (nice when we can get to it), Medium (useful but not urgent), High (urgently needed), I'll Help (urgent and I'm ready to help make this one happen) *[options: No opinion, Huh?, Unnecessary, Redundant, Low, Medium, High, I'll Help]*

i. Develop a function to search for a chemical or group across multiple databases. (p.27) High 13, Medium 1, redundant 2 (Brian Pentilla & James Ewell),

ii. Target full chemical hazard assessments, authoritative hazard listings, threshold listings, alternatives assessments, published endpoint studies, study assessments, modelling and analog studies, feedstocks and process chemistry, functional use categorization, physical properties, residuals, transformation products and biomonitoring studies. (p. 27) High 12, Medium 3, Huh? 1

iii. Support efforts to develop standardized templates and XML dictionaries for communicating structured information between computer systems (p.31) Help 1, High 8, Medium 4 No opinion 3 (help Akos)

b. Comment on any of these proposals

i. Brian Martin would like to engage on data structure - perhaps in conjunction with their IT partners. Annie will contact Tom

ii. Second goal is a great capabilities wish list but very ambitious. What is the timeframe that HBN thinks such a tool could be realistically built?

iii. Lots of good work out there that never reaches beyond certain audiences. How do we collaborate on an international basis to solve these problems collectively. Many EU research programs are unknown to US researchers.

iv. Need a way to provide access to underlying studies. Google scholar may have an interesting overlap in linking to indexed scholarly knowledge pertaining to

chemicals. Published academic research will generally be preferable to industry studies, but the paywalls present a barrier to that research. Maybe possibility for partnerships with the big publishers for structured abstracts of these papers to provide indexable and searchable information pertinent to hazard.

v. Important and useful. How would you get a sense of the quality or completeness of information, bias, etc

vi. that second one is a very large set of "targets"

c. What is missing? Add your own proposals. *[open text]*

8. **Section 4) Getting Hazard Right through Managing Chemical IDs** This section (p.32) describes proposals for addressing the challenges of identifying chemicals from a hazard perspective.
    a. Rate the importance of each proposal as No opinion, Huh? (I don't get the proposal), Unnecessary (not needed), Redundant (already well handled by others), Low (nice when we can get to it), Medium (useful but not urgent), High (urgently needed), I'll Help (urgent and I'm ready to help make this one happen) *[options: No opinion, Huh?, Unnecessary, Redundant, Low, Medium, High, I'll Help]*
        i. Create a Substance Hazard Identification Number (SHIN) registry to cross reference the major identification systems and provide identifiers for the substances and groups not addressed by the other systems. (p.38) Help 1, High 8, medium 2, redundant 1, low 1, Huh? 1, No opinion 1 (help Akos)
        ii. Create a curated crowdsourcing system for resolving system challenges (p.41) Help 1, High 7, medium 3, redundant 0, low 2, no opinion 2 (help Akos)
    b. Comment on any of these proposals
        i. I'm skeptical (Brian Penttila) that a new ID scheme will win broad acceptance. I'm comfortable with using a CAS number with additional descriptors. CAS number is sufficient in many cases, so are you just introducing a new barrier to entry for users? Perhaps you could convince me if you could quantify the scale of the problem. Sure, particle size is important, etc. With what frequency do these types of issues occur? Is it better handled by a CAS number + structure + descriptors? Databases need unique identifiers, but maybe that should not be an issue for users?? I would start with educating users on limitations of CAS numbers and then illustrate cases where users have to look beyond CAS number.
        ii. So much work is CAS-number based. Can we actually shift to the SHIN? It would be wonderful....
        iii. Would be good to list all of the classes that have presented a problem for accurate hazard assessments. It might be cheaper to structure a fix for these classes specifically than to create a new identification system? Or is that what is being proposed. It is hard to tell.
        iv. Cross referencing with other identifications systems is important and necessary. Addressing mixtures and other nonspecific substances is also important
        v. I really appreciate the thought given to the underlying taxonomy necessary to make sense of available information. Keeping this open and well maintained is key.
        vi. This sounds like a LOT of work. I would recommend leveraging existing systems and expertise wherever possible
        vii. I'm still not sure that this will, in the end, be do-able or will be enough of an improvement over CAS or other existing identifiers to be worth the very substantial effort. There is no perfect identifier and the vast majority of information linked or

scraped will use an existing identifier.

c. What is missing? Add your own proposal *(incorporated above)*

9. **Section 5) Finding Alternatives through Categorizing Functional Use** This section (p.42) addresses proposals for developing functional use schema to support inter industry searching for alternative chemicals.
    a. Rate the importance of each proposal as No opinion, Huh? (I don't get the proposal), Unnecessary (not needed), Redundant (already well handled by others), Low (nice when we can get to it), Medium (useful but not urgent), High (urgently needed), I'll Help (urgent and I'm ready to help make this one happen) *[options: No opinion, Huh?, Unnecessary, Redundant, Low, Medium, High, I'll Help]*
        i. Develop functional use descriptive parameters for alternatives assessments. (p.44) High 10, Medium 5, Low 1
        ii. Create a registry of these parameters in the Data Commons Platform and collaborate with other systems to test, use and continue building the system. (p.45) High 8, medium 4, low 3
    b. Comment on any of these proposals
        i. Critical to moving forward on safer alternatives. Unfortunately, this is also difficult and many industries have highly unique descriptors of functionality driven by archaic little known test methods. This is a tough nut to crack.
        ii. Ensure that we don't only look at chemical alternatives but also design/engineered product alternatives.
        iii. Link functional uses to industries and applications, consider pure or technical grade mixtures vs. proprietary mixtures
        iv. This is also a key functionality in truly discovering alternatives, very much appreciate this effort.
        v. didn't realize that you (or Joel and Jessica) were including quantity use information under the "functional use" title. read that white paper a long time ago :) Not sure of the value of creating a detailed functional use category scheme. perhaps this is more helpful later, as more assessments are added? This info won't be in traditional databases that we are pulling from. Don't find that the info on use is something I struggle to find, or something I would trust if it were just a list of uses. The chemical quantity data is most useful. (Liz H)
    c. What is missing? Add your own proposal (no answers)
10. **Appendix 1 – Chemical Hazard Information Nodes** This section (p. 45) describes informations sources that we are currently surveying for inclusion in the Data Commons.
    a. What comments do you have about any of the sources, including challenges in using them?
        i. The massive number of sources threatens to overwhelm the user. e.g., if you searched on formaldehyde, how many returns would you get? I know you hope to aggregate information, rather than just being a portal, but even that - for any given endpoint, you would get many, many different answers. for something simple like "flash point" you might get 15 or 20 different answers, but they would probably cluster around a small range. But for something like reproductive toxicity, how do you aggregate all the studies and simplify it? I'm sure you have thought this all out, and I haven't read all

of your paper in detail, so I apologize if all is explained there.

b. What's missing? What sources would you like to see added?
    i. (EPI) Suite
    ii. EPA's ORD (Ofc of Research & Development) just unveiled a new Product/Chemical database called CPCA
    iii. RISCTOX www.istas.net/risctox
    iv. Google scholar
    v. "Development of a consumer product ingredient database for chemical exposure screening and prioritization" http://www.ncbi.nlm.nih.gov/pubmed/24374094
    vi. Don't see the chemical use databases - TURA, WA, IMERC, etc. The Household Products Database is out of date, and oft quoted, even though no longer current. Is the full TSCA database included with Chemview? probably..

11. **Additional comments** - Do you have anything more to add about the Data Commons concept or about the white paper?
    a. This is a great concept and very important work for ensuring continuous improvement and actions in the environmental/human health movement, especially around building materials. There is a lot of information here to potentially be linked together by the data commons. It's clear that you've identified the major issues and types of information to be collected by this data commons (all of which are major needs for our work!), but what is less clear is who will be building this system and where it will be located/administered, how to navigate between the various types of information (chemical ids, lifecycle info, related substances, functional uses/relationships, hazard and alternative assessments, etc).
    b. A lot to be learned from those who are trying versions of this. How is it possible that ACToR came to be so unusable? 2) What are the issues with ACCESS to data? REACH required consortia to deal with the issue of data ownership. Hazard testing is expensive and companies won't want to give it away for free; yet, they are owners of vast troves of data critical to this effort! 3) A lot of redundancy in this paper; it must more efficiently convey the goals/objectives/scope.
    c. This is huge. An incredible piece of work. Now we just need to find the resources to make it so.
    d. A huge challenge is moving toward transparency in what's actually in a product. Often the manufacturer doesn't know what chemicals a supplier added intentionally and if they didn't spec it they don't think a chemical is there but it is! There are confidential business info/proprietary issues here but could we get cutting edge companies to lead a crowdsourcing effort by divulging what's in their products.
    e. Love the idea of the GS exchange (amortizing the cost of GSs across many users)
    f. Include development of a Knowledge Base of lessons learned in data interpretation, exposure assessment, exposure and assessment assumptions used, etc?
    g. Noteworthy in the TOXNET suite of databases.are Haz-Map (http://hazmap.nlm.nih.gov/index.php) and the Household Products Database (http://householdproducts.nlm.nih.gov/). It is likely that the Household Products Database will soon include additional categories of products of interest and also DfE and other content. If interested, Mr. Henry DeLima could be contacted for the latest information about content and timing (http://householdproducts.nlm.nih.gov/about.htm . Email: HDL630@aol.com). Finally, please note that an upcoming database from US EPA is described in the following very recent publication

(!):http://www.ncbi.nlm.nih.gov/pubmed/24374094 "Development of a consumer product ingredient database for chemical exposure screening and prioritization." From the abstract: "Consumer products are a primary source of chemical exposures, yet little structured information is available on the chemical ingredients of these products and the concentrations at which ingredients are present. To address this data gap, we created a database of chemicals in consumer products using product Material Safety Data Sheets (MSDSs) publicly provided by a large retailer. The resulting database represents 1797 unique chemicals mapped to 8921 consumer products and a hierarchy of 353 consumer product "use categories" within a total of 15 top-level categories. We examine the utility of this database and discuss ways in which it will support (i) exposure screening and prioritization, (ii) generic or framework formulations for several indoor/consumer product exposure modeling initiatives, (iii) candidate chemical selection for monitoring near field exposure from proximal sources, and (iv) as activity tracers or ubiquitous exposure sources using "chemical space" map analyses. Chemicals present at high concentrations and across multiple consumer products and use categories that hold high exposure potential are identified. Our database is publicly available to serve regulators, retailers, manufacturers, and the public for predictive screening of chemicals in new and existing consumer products on the basis of exposure and risk.

h. I think the paper outlines a good approach to making communication between chemical information systems more interoperable. Given the global nature of the chemical industry, I think some consideration of the role of the GHS (Global Harmonization System) painstakingly developed throught the UN is warranted. In the HSDB, we are in the process of adding basic GHS label elements to the database. Most of the information required for these labels is already in HSDB, but we will create explicit fields to make it readily accessible, following the guidance of OSHA's HazCom rule. We are hoping to make our TOXNET system easier to link to. In addition, we are creating what we call consumer level summaries for our HSDB records. We have some toxicity summaries and some environmental fate summaries already, but these new summaries would be aimed more at non-researchers who need quick, easier ro comprehend information on a hazardous chemical.
i. I think this is a really well thought out and comprehensive strategy for a solution to a host of relevant and high priority challenges. I would very much like to see it happen, and look forward to collaborating on that front.
j. - Dates of assessments, and when data was scraped or gathered is important. Keeping things up to date is a constant challenge. - paper refers only to consumer product assessments and evaluations. Don't want to rule out manufacturing and service process as well? B to B products and materials? e.g., hex chrome finishes that are a concern in manufacturing but not in a finished product; solvents that are used in businesses and are no longer present in finished consumer product. - This is such a mammoth undertaking - it's good to envision big, but start with something manageable? Just the basic data aggregation and portalling alone is a significant project with lots of challenges. Things like a process chemistry repository is really really huge and difficult. - The proposal feels more manageable if I were just looking at building products or one category of consumer product. If I think about all the different products, materials and processes that we would like to use it for, that's when it starts to feel like too big a set of information to manage. - policy and regulatory - very helpful, but very difficult to scrape (no databases ready to mine), and to keep up to date. - proposal also talks about policy makers using the system. Not sure if it can be distilled to that level? at least not without a lot of labor and expertise? - Very nice

work, by the way! I can't wait!

Thank you for your time and thoughts. We look forward to working with you to develop this concept further.
END OF SURVEY