

**Packaging, Pesticides, Policy, and Parity:
Community-Based Approaches to Reducing Chemical Exposures through Food, and the
Effectiveness of Current Policy**

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Abstract

Background: Endocrine-disrupting chemicals (EDCs) are synthetic chemicals that interfere with the endocrine (hormone) system. EDCs are ubiquitous in the U.S. population, and have been linked to neurological, developmental, and metabolic disorders, various cancers, damaging effects on both male and female reproductive systems, and higher incidences of birth defects. A major pathway for human exposure to EDCs is food—through both packaging materials and pesticides. There is emerging evidence that low-income communities, communities of color, and families with limited food security have higher exposures to these chemicals. This project seeks to better understand possibilities for community-level interventions to combat these exposures and potential solutions to decrease chemical exposures through food.

Methods: This research began with an extensive literature review of studies on four EDCs: bisphenol-A, phthalates, perfluorinated compounds, and pesticides. Additionally, it included background research on chemicals regulation and food policy. This project utilized a mixed-methods approach including document analysis and semi-structured interviews with community experts on food policy, chemicals policy, or reproductive health; and participant research in community meetings and advocacy trainings around food justice.

Results: This research identified several suggestions for community-level interventions for the problem of EDCs in food. Among these are policy recommendations, advocacy programs, intervention in school lunches, physician involvement, and WIC and SNAP (CalFresh) programs as a means for limiting exposures through education and outreach. Community interviews revealed that many organizations are doing work on important related issues (hunger, nutrition, health) as a primary need, while rarely focusing on food quality. While the importance of other food issues has put intervention on the relatively new problem of EDCs on a back burner, many advocates expressed their interest in and the importance of learning more about and building partnerships around this work.

Conclusion: Literature reviews, community interviews, and participant observation all suggest that there are opportunities for new policy, advocacy, organizing, and education efforts around this problem by community organizations, policymakers, and public programs, as well as food, environmental and reproductive justice advocates. This research reveals possibilities in both research and advocacy to better bridge the food justice movement with the environmental health and justice movements.

Introduction

Endocrine-disrupting chemicals (EDCs) are substances that can cause problems with the endocrine (hormone) system in humans and other animals. In humans, these chemicals disrupt the endocrine system through hormone mimicry and blocking, altering the carrier proteins in a way that disrupts hormone delivery, interfering with hormone production, or either decreasing or increasing the number of hormone receptors in certain organs.¹

Synthetic EDCs have been linked to neurological, developmental, and metabolic disorders, various cancers, damaging effects on both male and female reproductive systems, and higher incidences of birth defects—as well as other negative, long-term health effects. These chemicals are widespread in our environment and bodies. The CDC found the chemical BPA to be ubiquitous in the U.S. population.² We now have the capacity to measure 212 industrial chemicals in the human body—in blood, urine, breast milk, and amniotic fluid.³

Because research on the effects of synthetic endocrine-disrupting chemicals is relatively new, scientists can't conclude with certainty the exact consequences of many of these chemicals. There is no way to prove, for example, that exposure to a chemical at a particular time resulted in a certain health effect. However, we do have the knowledge of population-wide data to support the case for the various disruptions that EDCs cause. We know that 40 to 50 percent of pregnancies now end in spontaneous abortion (this statistic includes instances in which a woman does not yet know she's pregnant) and one in 12 couples are struggling with infertility.⁴ One in 8 women will develop invasive breast cancer in her lifetime.⁵ The rate at which these numbers have gone up has paralleled the increase in the use of EDCs.⁶ There are many ways that EDCs enter the human body, but the major pathway by which most humans are exposed is through food. Packaging materials are often made with EDCs, and pesticides contaminate the food supply. This research is focused around BPA, phthalates, PFCs, and pesticides with endocrine-disrupting properties, but there are many other chemicals that can be transferred through food.

Environmental justice comes into this equation because of the disparate exposure to these types of chemicals via the pathway of food. There is emerging evidence that low-income communities, communities of color, and families with limited food security have higher exposures to these chemicals. Some studies have also found that women of reproductive age and children (the populations that may be most impacted by EDC exposure, because of their effects on development) are more exposed to certain chemicals. This research looks at the various ways of using community intervention approaches to alleviate chemical body burdens from the pathway of food, especially extreme exposures due to disparity.

Literature Review

In the beginning stages of research, I put together a collection of the most relevant studies and articles concerning the accumulation of the chemicals BPA, phthalates, PFCs, and pesticides

¹ Ted Schettler et al., *Generations at Risk: Reproductive Health and the Environment*, 1st ed. (The MIT Press, 1999).

² “CDC - National Report on Human Exposure to Environmental Chemicals - NER”, n.d., <http://www.cdc.gov/exposurereport/>.

³ Ibid.

⁴ Schettler et al., *Generations at Risk*.

⁵ “U.S. Breast Cancer Statistics,” *BreastCancer.org*, March 14, 2012, http://www.breastcancer.org/symptoms/understand_bc/statistics.jsp.

⁶ Schettler et al., *Generations at Risk*.

through food, placing special importance on studies sampling children and pregnant women, and using study designs that included biomonitoring or dietary intervention. Repeatedly, studies confirmed that not only are these chemicals present in food, but that the main source of exposure to BPA, phthalates, PFCs, and pesticides is through food. One European study found that up to 98% of our phthalate exposure is from food sources.⁷ Studies also examined chemical exposures across demographic areas, and found that there are different levels in certain chemicals. The CDC reports, citing Calafat et al., “in the participants of NHANES 2003- 2004, prevalent exposure to bisphenol A in the U.S. population was demonstrated with children, females, and lower income strata having slightly higher urinary levels.”⁸ Another study on PFCs reported that different chemicals varied widely across race and gender, suggesting the need for more research on the disparate exposures of PFCs.⁹ Widely, researchers called for more research on children, pregnant women, and lower income strata, as well as demographic data (race, age, gender, geography, etc.) combined with biomonitoring data to look at potential disparities in exposure of different populations.

Attached is a short literature review on the incidence of dietary exposure to BPA, phthalates, PFCs, and pesticides. It examines trends in the current literature and the new research that is called for on the subject (Appendix 1).

Methodology

This research began with an extensive literature review on dietary exposures to four chemicals: bisphenol-A, phthalates, PFCs, and pesticides with endocrine-disrupting properties (see above & Appendix 1). I used a mixed-methods approach including document analysis of current food and chemicals policy, and eight semi-structured interviews conducted in July 2012 with local (Los Angeles) experts in the food justice and policy, chemicals policy, and reproductive health arenas. I interviewed community organizations and leaders, NGOs, and individuals working in areas related to food policy specifically—there were fewer interviewees with any expertise on chemicals or reproductive health. Contacts were made through a search for major groups doing work on food policy, advocacy, and service in Los Angeles currently, as well as through a snowball sampling method.

I included questions on current outreach and advocacy around food justice, hunger, and nutrition issues, specifically those that might most affect young children, pregnant women, or low-income groups. Questions on how these efforts might reduce chemical exposures in food were also included, and some background information on current chemicals regulation and biomonitoring studies were given to some interviewees. Subjects were asked about their familiarity with the incidence of chemical exposures through food, and if they do any work on this issue specifically.

Interviews were recorded, transcribed, and analyzed for patterns using qualitative analysis coding. An Index of Interviewees with brief descriptions of each subject and organization is attached (Appendix 2).

⁷ Matthias Wormuth et al., “What Are the Sources of Exposure to Eight Frequently Used Phthalic Acid Esters in Europeans?,” *Risk Analysis* 26, no. 3 (2006): 803–824.

⁸ Antonia M Calafat et al., “Exposure of the U.S. Population to Bisphenol A and 4-tertiary-octylphenol: 2003-2004,” *Environmental Health Perspectives* 116, no. 1 (January 2008): 39–44; “CDC - National Report on Human Exposure to Environmental Chemicals - NER.”

⁹ Antonia M. Calafat et al., “Perfluorochemicals in Pooled Serum Samples from United States Residents in 2001 and 2002,” *Environ. Sci. Technol.* 40, no. 7 (2006): 2128–2134.

From my analysis of current food and chemicals regulations, I constructed a Policy Map of Food and Chemicals Regulatory Mechanisms (Appendix 3).

Finally, I conducted participant research in community meetings and advocacy workshops, including Hunger Action LA meetings, and Parent Advocacy Workshop planning and events through the Urban and Environmental Policy Institute.

A categorized annotated bibliography of sources I used to inform my research is attached (Appendix 4).

Results

1. Interview Data

In interviewing local experts on food policy and advocacy, a picture emerged of the state of current policy and work being done on food access, hunger, and nutrition issues. I developed a sense of how the problem of EDC exposure through food is being dealt with: mainly indirectly via work by both advocacy and service groups around hunger, nutrition, and food policy in Los Angeles.

A striking tendency that became more pronounced as the project went on was how few interviewees were familiar with the problem of exposure to chemicals through food. “It’s outside of our realm,” said Frank Tamborello, of Hunger Action LA, a sentiment echoed by Ariana Olivia of California Food Policy Advocates, Eric Ares from LA Community Action Network, and others. Perhaps the interviewee most familiar with the issue of EDCs in food was David Binkle, who works on Menu and Compliance for Los Angeles Unified School District, but emphasized in his interview that he doesn’t give much credence to studies on this subject because of research bias. Few interviewees were familiar with biomonitoring, or were familiar with it only in a very general sense. The general implications of the interviews suggested that LA food policy and service groups are either not familiar with the issue of chemicals in food, or do not see it as an issue of central importance currently.

I observed several overarching trends in the community interviews and participant research I conducted. Key tensions that emerged included, first, a focus on the individual versus a focus on community health. David Binkle said, “it’s also up to individuals to [make healthy choices] and they don’t do it. Chips, soda, and candy are popular because they’re highly flavorful, and high in preservatives, additives, and are cheap.” This emphasizes the viewpoint that nutrition is somewhat up to individuals, but is also a community health and access issue.

A second tension that emerges was between the focus on hunger, food security, and food justice—versus nutrition and organics issues. Gwendolyn Flynn, from Community Health Councils, stated, “I think there are tensions between folks who are food insecure, and those of us who are promoting healthy food. So when people don’t have food at all, do we care whether or not it’s healthy or not? But that’s changed, so people are a little more cognizant of [nutrition] and understand that even when people are hungry, you can’t just feed them donuts.” Some interviewees also recognized the social tensions present when advocating for organic food among low-income or homeless populations. Eric Ares pointed out, “There is a cultural component and a privileged component that makes it hard with organic food—that involves access, financial access to this type of food. We want to promote health and nutrition, and obviously organic is way healthier than conventional, but I think people don’t always do a great job acknowledging that—the implications of cost, access, and other issues.”

The pressing issues that community organizations are dealing with right now include issues concerning hunger, access, and occasionally nutrition. Ariana Olivia said CFPA is

currently focused on “just getting [school children] familiarized with different types of vegetables and fruit, building those healthy habits.” Frank Tamborello said, “for the people we work with it's still just having enough in your budget for food. People who are housed are paying such a high percentage of their income for rent. If you don't pay your rent you get kicked out, if you don't pay your light bills your electricity gets turned off, but if you don't buy food there's really no one to make sure you buy your own food.” According to David Binkle, LAUSD Food Services is focused on getting more kids to eat and recognize healthy, nutritious foods. “Healthy to me,” he said, “means foods that are natural, with limited processing, that are good for your body, with less and less ingredients in the ingredients statement. That's opposed to something that's highly processed with a bunch of additives and preservatives that then is highly packaged and marketed.” LAUSD is very concerned with making sure kids develop healthy habits in this crucial stage of their lives. The basic needs of South LA in particular, according to Gwen Flynn, include “a need for a greater variety of establishments. There should be a greater variety of full-service markets, and there should definitely be a greater variety of restaurants. Right now there's an over-concentration of fast-food restaurants in South LA, and until recently they've been selling a lot of high caloric, unhealthy, low nutritional-value foods.” Eric Ares said that LA CAN is currently building toward more access for “fresh, natural food that we can share with our community, who otherwise don't have access to it.”

Some interviewees emphasized the health effects that come from low access to food, or limited access to nutritious food. Elizabeth Medrano, of the Healthy School Food Coalition at the UEPI, said “Over 80% of the students in LAUSD qualify for free or reduced-price meals. There is a huge amount of problems resulting from the high access to low-quality, low-nutrition foods—like obesity, high blood pressure, other disorders.” A nurse affiliated with the Hollywood Health Partnership said that she sees families that are low-income having high obesity rates, especially when you don't know when or how much you are able to eat, you eat whatever you can. The McDonalds \$1 menu, for example, is cheap, inexpensive, and fast—so people are more likely to choose it over a piece of fruit, for example. Eric Ares gave the example that “Skid Row is a very diverse population, but because of the impoverished conditions which a lot of people live under, people have situations, circumstances, diseases that nutrition plays an elevated role in no matter what.” In certain situations, he went on, “There is nothing you can do to mitigate [diabetes] because you don't have the resources.” It is very clear from the interview data that lack of access to fresh, healthy foods has significant health effects—which, as we now know, might be partially attributable to higher exposures to EDCs.

A further trend that arose through interviews was the incidence of significant demand and access issues in Los Angeles. First, the current demand for SNAP (the Supplemental Nutrition Assistance Program) was constantly mentioned: “We need to expand access to the Calfresh program,” said Frank Tamborello. Currently, SNAP (or Calfresh, in California) is extremely hard to sign up for, and there are a variety of limiting factors for those who are in need of food—including the provision that citizens formerly arrested for drug offenses receive a lifetime ban on SNAP eligibility (AB 828 would lift this ban). SNAP and WIC arose continuously as areas that could be vastly improved upon in terms of easier access, but there were other examples of demand versus access issues as well. Gwen Flynn said of the closing down of many full-service grocery stores in South LA, “It was the economy and the corporations. It certainly wasn't the demand. People really needed those markets.” Elizabeth Medrano highlighted how the problem of hunger and food insecurity spills over into school lunches. She said the Health School Food Coalition looks at “improving nutrition and quality of meals, but also improving access to school

meals. A lot of [students]—the only meal they have access to for sure is the breakfast or lunch tray at school. So it's a hunger issue as well."

There are many very damaging policies in effect right now that actively prevent food access and good nutrition, which organizations are making efforts to repeal. Gwen Flynn explained a harmful development covenant "that says when a grocery store closes down, and moves away (and usually those stores are not owned, but leased)... that there's some policy that says no other full-service market can go in when that facility closes down—that it has to be another type of retail and not a market and at one point, maybe 2004, we had 4 or 5 stores close within an 18-month period." Policies like this one, that limit the type of store or the area that full-service markets can go in, directly reduce access to fresh, uncontaminated foods. Eric Ares gave a further example: Skid Row, he said, "is an area that doesn't have access to a lot of fresh fruits and vegetables. There are two full-access grocery stores from here that are about a mile away, each, so this area has a lot of liquor stores, a lot of small stores, but not a lot of access to fresh food... Because there is a food desert, or whatever term you want to use, these folks develop diets that are based off of what is available to them. That food is often unhealthy, preserved, fattening, and high in sugar." So-called "food deserts" are examples not necessarily of direct policy, but physical situations that influence diet—in this case, expanses of city that do not feature any full-service grocery stores. Additionally, a few different interviewees stated that policy work at this time, unfortunately, is really limited by the financial crisis in California. If something is going to impose a cost to the state, it is unlikely to get through—due to the shortage of the budget currently.

Despite significant problems with current policy and influencing factors, a lot of great work is being done right now around food access and nutrition issues. Ariana Olivia explained how CFPA is focusing on nutrition, and additionally looking toward the future at organics issues. "Right now as an organization," she said, "our focus is first to get [schools] to serve vegetables. And once they serve the vegetables, then we can focus on other issues: like is it organic, is it locally grown?" Many organizations are mobilizing around getting more farmer's markets, especially in lower-income communities, and ensuring that SNAP and WIC dollars are accepted at farmer's markets (preferably through EBT). Hunger Action LA does "a program called Market Match," said Frank Tamborello, "which is based on the notion... that locally-grown food is more expensive because small farmers are taking on more of the overhead, they don't have big corporations backing them up, or the economy of the scale of a larger agricultural operation." The program is intended to make more local, organic foods available (via farmer's markets) to low-income communities. A nurse from the Hollywood Health Partnership spoke of referring people to SNAP (as well as helping them sign up), food banks, and other homeless outreach programs. A contact from First 5 LA informed me that there is language about maintaining a healthy weight for children in the organization goals, and First 5's policy goals include access to healthy foods. Organizations are approaching food access and nutrition from a myriad of creative angles, even if there is not direct focus on the issue of chemicals in food specifically at this time.

A final trend in interviews suggested that many organizations continue to be forward-looking and may be open to the idea of doing direct service or advocacy around chemical exposures in the future. A First 5 LA contact has seen some policies dealing directly with chemicals in food for 0-5 year olds—namely AB 1319, the Toxin-Free Infants and Toddlers Act, which was passed in California in 2011, and prevents products and packaging that contain BPA and are specifically for 0-3 year olds. Frank Tamborello stated that a good outcome on food and nutrition, "has to be something where you don't win on every single front but you look for the

best possible overall outcome,” emphasizing that compromise is needed, and chemical exposures are just one damaging aspect of food policy and accessibility right now. Gwen Flynn said, “As we conquer this access issue we’ll start looking at what’s in our food. [Chemicals in food] is the next frontier.” Eric said of LA CAN (an organization that has focused most on civil rights and housing issues in the past), “I would characterize our food work and our food justice work as an emerging, growing priority.” Interviews suggested that organizations are turning their sights on food and food justice, or delving deeper into it to start to look at organics and chemicals issues.

Interviewees seemed to say that a collaboration of efforts, from various angles, is necessary to address this problem. According to Gwen Flynn, “[A solution] has to be comprehensive, it has to be a combination of things: education, resources available, and sustainability.” One interviewee said that other organizations could certainly help in the area of research and data collection, in order to inform the work of other organizations on policy. If organizations work together, it seems promising that each can perform in the areas they specialize in (policy change, advocacy work, organizing, direct service) and aid each other in order to help begin a new routine where food issues are addressed comprehensively, in a way that does not disregard harmful chemical exposures.

2. Literature suggestions for intervention

A number of articles on endocrine-disrupting chemicals in food made recommendations on the subject of reducing these exposures. Many were clever, new approaches to the problems of ineffective policies, the pathway of food, and an extreme lack of public knowledge on this issue.

According to many authors, some type of public education on the scope and danger of EDCs is necessary—but there is uncertainty as to which institution this education could stem from, and how it could be transmitted to the public. The EPA, FDA, and USDA all have some part to play in either the regulation of food or chemicals, as well as other state laws and local codes and organizations.

Changing things from a policy perspective might be one of the more obvious points of intervention, but some articles made some very pointed, direct suggestions on how to change industrialized food system policies in the United States. Sutton et al. recommend specific changes to the farm bill and the Toxic Substances Control Act, as well as supporting local food and promoting understanding of the consequences of industrialized food production.¹⁰ Most articles on the subject follow the opinion of Judge Stephen Breyer in his book, *Breaking the Vicious Circle* when he states that deregulation is not the answer: “even if labels and taxes help to alleviate some major health-risk problems, those problems seem likely to continue to call for more direct government intervention.”¹¹

Some articles presented the suggestion of direct physician involvement, including providing basic education to physicians about many common EDCs, and training them to educate patients about chemical exposures. This could be a good intervention point, especially for families with children or women who are pregnant or nursing. Tricia Groff, in her article *Bisphenol A: invisible pollution* provides advice for healthcare providers seeking to inform

¹⁰ Patrice Sutton et al., “Reproductive Health And The Industrialized Food System: A Point Of Intervention For Health Policy,” *Health Affairs* 30, no. 5 (May 1, 2011): 888–897.

¹¹ Stephen G. Breyer, *Breaking the Vicious Circle: Toward Effective Risk Regulation* (Harvard University Press, 1993).

patients about the threat of BPA.¹² Sutton et al. make a strong case for the involvement of reproductive health professionals in the intervention process to prevent exposures to harmful endocrine disruptors.¹³

Several studies use school lunches as an intervention point, looking at the effects of obesity and other health effects if conventional food is replaced with organic food, or other changes are made. Changing organics restrictions and packaging standards in school cafeterias could be an excellent way of intervening in exposures directly, according to many studies. Cirillo et al., for example, tested the phthalate exposure to children received specifically through school meals.¹⁴ This is especially relevant in the current political climate, as the Obama administration has enacted new school lunch standards for better nutrition.

The WIC or SNAP programs could also be excellent points for intervention and education to large numbers of people receiving federal benefits. This is especially useful because low-income families are at risk for a higher exposure to EDCs because their diets are often higher in fat, and there is very low availability for cheap, uncontaminated food. Intervening in the types of food that federal benefits can buy could be a key intervention point in getting less packaged, more organic food onto the market.

Many articles spoke on the benefits of community-based research, or community-based participant research (CBPR). The benefits of this model include working directly with the community to ensure that the researcher is actually getting the community information or data that they need for their unique attachment to the problem of EDCs in food (for example: education, health issues, discomfort, policy change, etc.). The community can help create studies that address their specific needs, and can give context and input to the researcher. Two studies specifically used Community-Based Research with great success, and attribute that success to good community engagement, trust, and collaboration of the real research needs of the community with the expertise of researchers.¹⁵

Discussion

In considering this issue, it is important to look at it from a variety of different angles: the problem of EDC exposures through food and the disparate exposures of vulnerable populations is at once a scientific, social, and political problem. However, the current flaws in the policy system are critical, and may contribute most to the dilemma overall. Current chemicals policy is extremely flawed, as is the regulation of chemical contamination in food.

Chemical exposures are not being prevented or reduced by current regulations. The Toxic Substances Control Act (TSCA), which in theory gives the EPA authority to regulate chemicals

¹² Tricia Groff, "Bisphenol A: invisible pollution," *Current Opinion in Pediatrics* 22, no. 4 (August 2010): 524–529.

¹³ Patrice Sutton et al., "Toxic Environmental Chemicals: The Role of Reproductive Health Professionals in Preventing Harmful Exposures," *American Journal of Obstetrics and Gynecology* (March 8, 2012), <http://www.ncbi.nlm.nih.gov/pubmed/22405527>.

¹⁴ Teresa Cirillo et al., "Children's Exposure to Di(2-ethylhexyl)phthalate and Dibutylphthalate Plasticizers from School Meals," *J. Agric. Food Chem.* 59, no. 19 (2011): 10532–10538.

¹⁵ Barbara L. Brenner and Melissa P. Manice, "Community Engagement in Children's Environmental Health Research," *Mount Sinai Journal of Medicine* 78, no. 1 (February 2011): 85–97; Barbara Brenner and Madia Galvez, "Community Interventions to Reduce Exposure to Chemicals with Endocrine-Disrupting Properties," in *Endocrine-Disrupting Chemicals: From Basic Research to Clinical Practice*, by Andrea C. Gore (Humana Press, 2007), 309–328.

and toxins in the U.S., is weak, outdated, and inadequate in protecting the population from toxic threats. There is a significant disconnect between chemicals testing and regulation. For example, despite the fact that asbestos is widely recognized as toxic and harmful, the EPA has not been able to effectively ban it under the TSCA—an inaction that proved to many the inefficacy of the act, which has not been updated since 1976.¹⁶ Time and time again, the chemical industry has been able to avoid regulation by stalling the EPA and TSCA, resulting in the startling truth that no chemical has ever been banned under this law.¹⁷ Additionally, even if other chemicals are regulated through other mechanisms (such as the Clean Water Act or Clean Air Act, also under the EPA), the synergistic action of chemicals (two chemicals combining or reacting to produce an effect not possible with one alone) is not considered in regulation. Since we all interact with tens or hundreds of chemicals on a daily basis, this still leaves humans vulnerable to health effects from the combination of chemicals. Furthermore, chemicals that *are* regulated are not regulated at a level that is safe for young children, or pregnant women. For example, although there are laws that limit mercury exposures, pregnant women are strongly advised to avoid eating certain kinds of fish, or fish in certain quantities. Sandra Steingraber, renowned biologist, author, and advocate for reproductive health points out, “...Typically, environmental regulators do not consider transplacental effects when setting limits on human exposures.”¹⁸

Some of the ineffectiveness of current regulation can be attributed to the fragmentation of agency: just as Stephen Gardiner observed of climate change, the deregulation of toxics in our world does not stem from a single, inept organization, but rather is being attacked from many directions by “many organizations not unified by a comprehensive structure of agency.”¹⁹ This matters because we do not have a working comprehensive framework for addressing toxics threats broadly, and thus no way of regulating them effectively.

Additional social and political motivators of deregulation include extensive pushback from companies using and profiting from these chemicals. Socially, there is a lack of knowledge about the presence and danger of many chemicals in food and other products. Finally, there are current paradigms of science, society, and regulation that make it difficult to retaliate against chemical dangers. Jason Vogel lays out this current paradigm: “(1) scientific determination of harm must precede regulatory action, (2) science has the capacity to determine harm with sufficient certainty, and (3) chemical exposure affects humans according to the assumptions of classic toxicology.”²⁰ The policy system behind chemical regulation is now so ineffective that it has, in all appearances, gone backwards. According to Sandra Steingraber, we have more damning evidence for phthalates than we did for DDT when it was restricted and eventually

¹⁶ Sarah A Vogel and Jody A. Roberts, “Why the Toxic Substances Control Act Needs an Overhaul, and How to Strengthen Oversight of Chemicals in the Interim,” *Health Affairs* 30, no. 5 (2011): 898–905.

¹⁷ NRDC, *The Chemical Industry Delay Game: How the Chemical Industry Ducks Regulation of the Most Toxic Substances*, Health Document (National Resources Defense Council, October 18, 2011), <http://www.nrdc.org/health/thedelaygame.asp>.

¹⁸ Sandra Steingraber, *Having Faith: An Ecologist's Journey To Motherhood* (Da Capo Press, 2001).

¹⁹ Stephen M. Gardiner, *A Perfect Moral Storm: The Ethical Tragedy of Climate Change* (Oxford University Press, USA, 2011).

²⁰ Jason Vogel, “Tunnel Vision: The Regulation of Endocrine Disruptors,” *Policy Sciences* 37, no. 3 (2004): 277–303.

banned in the U.S. in 1972. And “that is a difference of politics,” she says, “not a difference of science.”²¹

In looking at this problem from the perspective of community organizing, I observed something else entirely. Through my community interviews and participant observation, I learned about current efforts in the NGO and food policy world concerning food and nutrition regulation and standards. A significant amount of work is being done currently on food policy, if not the specific problem of chemical exposures through food. The organic movement and food justice movements are prompting the move toward fresher, uncontaminated food—even within organizations working with homeless or low-income populations, where the act of accessing food is still a major issue. Most interviewees seemed optimistic about future changes in both advocacy and regulation, in order to make changes in hunger, access, and nutrition issues—and even, in the future, intervention in chemical exposures through food.

Conclusion

It is clear that a combination of advocacy, education, and policy change, at some level, are required to address this problem. Much of the work being done right now on nutrition issues is focused primarily on food type and quality rather than chemical contamination, but could be bent to include chemical advocacy/education. Current efforts by community organizations may be indirectly addressing chemical exposures through the organics movement and the general trend toward fresher, more nutritious foods.

Most advocacy and service organizations I spoke with are forward looking—many interviewees mentioned that they could see their efforts moving toward limiting chemical exposures through food in the future. As Ariana Olivia, at California Food Policy Advocates said, this problem is not going to go away—it will keep coming back. Although currently it is difficult to strike a balance between hunger issues and nutrition or contamination issues, interviewees suggested that once the problems of food insecurity and hunger are addressed, there might be more space for conversation and advocacy around chemical exposures.

Literature reviews, community interviews, and participant observation all suggest that there are opportunities for new policy, advocacy, organizing, and education efforts on this problem by community organizations, policymakers, and public programs, as well as food, environmental, and reproductive justice advocates. This research reveals important gaps in both research and advocacy to better bridge the hunger and food justice movements with the environmental health and justice movements. Communities facing food insecurity are often the same communities facing disproportionate exposures to toxic chemicals—and as research emerges that EDC’s are associated with a host of adverse health outcomes, it becomes more urgent to address these gaps in both research and advocacy.

Appendices (attached)

Appendix 1: Literature Review

Appendix 2: Index of Interviewees

Appendix 3: Policy Map

Appendix 4: Annotated Bibliography on EDCs in Food, Reproductive Health, and Community Health and Intervention

²¹ Sandra Steingraber, *Living Downstream* (The People’s Picture Company Inc., 2010), <http://www.livingdownstream.com/>.