We Are In the Midst of a Silent Epidemic...

As many as one in six children in America has a neurodevelopmental disability including autism, IQ loss, learning or behavioral problems, attention deficit/hyperactivity disorder and speech or cognitive delays. A large and growing body of research indicates that early life exposures to toxic brain drain chemicals—encountered in water, food, air, soil and consumer products—can contribute to these health and developmental problems.

Even at very low levels, brain drain chemicals can have lifelong health consequences when encountered during the first 1,000 days of development—in utero to age two. Vulnerable populations, especially low-income communities, are at even greater risk of exposure. The burden of toxic chemicals compounds the other health and psychosocial disadvantages that these populations face.

While toxic chemicals are not the sole cause for lifelong learning and developmental deficits, they are among the most preventable. It is within our reach to protect the learning capacity and growth potential for millions of children and reduce both community and individual expenditures on special education, social services and specialized health care. Estimates of these soaring costs include:

- Special education for the estimated 20 million children struggling with a developmental brain disorder costs $130 billion per year.
- The average medical expenditures for individuals with an autism spectrum disorder exceed those without the disorder by $4,100–$6,200 per year.
- A 2006 study reported that the economic costs associated with autism in the U.S. are approximately $35 billion dollars per year.
The Three Part Solution

Healthy Babies Bright Futures is a new alliance of nonprofit organizations, scientists and donors that is designing and implementing outcomes-based programs to measurably reduce babies’ exposures to toxic chemicals in the first 1,000 days of development.

Healthy Babies Bright Futures brings together the strongest and latest science, data analysis, critical thinking, performance measurement, campaign talent, communications skills and commitment to collaboration. We deploy those assets across three programs.

**BRIGHT CITIES**
works with municipalities to adopt policies and programs that will help protect residents by reducing their exposures to brain drain chemicals. The program launched in 2016. In 2017, the first cohort of cities will take at least two actions and new cities will be added and complete assessments.

**BRIGHT CHOICES**
manages and supports strategic campaigns that result in measurable protections from exposures to neurotoxic chemicals. Bright Choices is in the midst of a highly successful campaign to eliminate the unnecessary use of toxic flame retardants in furniture, children’s products and electronics. In addition, Bright Choices is co-launching a campaign to reduce exposures to phthalates in dairy products.

**SCIENCE INTO ACTION**
is tackling the tragedy of lead poisoning that is burdening many of our most vulnerable children, while also spearheading testing programs and creating actionable summations of the latest science on brain drain chemicals, including science that powers HBBF programs.

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WHY CITIES?
Cities are expanding their role in protecting citizen health. Bright Cities is helping them take action to protect the vulnerable developing brains of their city’s youngest residents from dangerous brain drain chemicals. Local governments provide services at the intersection of exposure sources and policy solutions: water quality, air quality, healthy food, early childhood education, public health and many others. America’s swiftly urbanizing population also indicates a need for city action.

The Bright Cities program is designed for the specific functions and unique characteristics of cities. The program consists of assessment, strategic and tactical development, public engagement and implementation phases. Informed by the early assessment work, each community commits to a set of actions in a negotiated, publicly supported agreement to protect their residents and sets performance measures to quantify reductions in exposures to neurotoxic chemicals.

In 2016, Bright Cities was launched in four cities and the program completed its assessments for each city. In 2017, each of the first four cities will implement at least two actions and additional municipalities will join the program and complete their initial assessments.

EXAMPLES OF ACTIONS:

FACILITIES AND BUILT ENVIRONMENT
- Restricting the use of toxic pesticides on lawns, parks and pets.
- Implementing integrated pest management in public housing and public buildings.

PUBLIC HEALTH
- Increasing screening of blood lead levels in pregnant women and infants.
- Bolstering policies to reduce exposures to mercury and PCBs in locally caught fish and shellfish.

AIR QUALITY
- Reducing emissions through no-idle policies, diesel engine retrofits and other common sense programs in high traffic areas.
- Reducing emissions from wood stoves, to include requiring EPA certified models.

WATER QUALITY
- Reducing lead, arsenic and perchlorate levels in drinking water.
- Replacing lead water distribution system mains and service lines.
PROCUREMENT
- Avoiding purchase of products containing neurotoxic chemicals including mercury, flame retardants, pesticides, phthalates, lead and arsenic.
- Setting performance measures to quantify reductions in exposures to these chemicals.

EARLY CHILDHOOD EDUCATION
- Keeping dangerous chemicals off the menu and out of the water supply in childcare centers.
- Educating childcare providers on hand-washing, dust reduction and other practices that reduce exposures.

FOOD
- Testing soil in community gardens and playgrounds located on public land and remediating as needed.
- Educating the public about safer food options.

HBBF provides considerable resources to communities to achieve the goals of the program:
- Expert testimony/briefings.
- Policy and strategy assistance.
- Funding resources.
- Written materials including fact sheets, talking points and draft policy documents.
- Media assistance (local and national).
- Cohort networking and best practices information.
- Networking with allied local, state and national NGOs.
- Fundraising support for more resource-intensive city activities.
- Assistance with measurement and analysis of activities.
- Assistance with public education.

The first four cities to join the Bright Cities program include Dearborn, MI; Minneapolis, MN; Seattle, WA; and Salt Lake City, UT.
Bright Choices creates, convenes and supports strategic, winning campaigns that reduce exposures to targeted chemicals harmful to the developing brain. These collaborative campaigns integrate peer-reviewed science; leverage relationships with retailers and manufacturers; pass state, local and federal policy strategies; and engage communities to produce measurable protections for pregnant women, infants and small children.

**TACKLING TOXIC FLAME RETARDANTS**

Building on years of effort by individual organizations, Bright Choices' Integrated Flame Retardant Campaign brings disparate campaigns together to leverage collective resources and develop focused and unified strategies to reduce exposures to toxic flame retardants (FRs). These coordinated efforts have achieved major victories and changed the practices of entire market sectors.

Our advocacy and campaigning which focused on the furniture and children’s product market resulted in the successful removal of millions of pounds of toxic FR chemicals from homes. We’ve continued our work using similar effective and unified approaches in other market sectors including electronics and building insulation—areas in which the science is the strongest and the resulting potential benefit to people is the greatest. Numerous peer-reviewed studies show that removing toxic FRs from everyday products leads to a measurable decrease of those chemicals in our bodies. By radically transforming the products of everyday life, we directly impact and improve children’s health and the health of communities well into the future.

**PHTHALATES FOCUS**

Phthalates are a class of chemicals known to disrupt the endocrine system and harm development. A major source of exposure to phthalates is in food, particularly dairy products. This campaign targets key product manufacturers while simultaneously engaging with policy makers to enact restrictions on this class of chemicals in food. The campaign will ask manufacturers to identify the source of phthalate contamination and commit to eliminating, or severely reducing, the levels of these chemicals. HBBF provides strategic planning and scientific expertise to develop and implement the campaign, working as an important partner alongside ten other high profile organizations.

**HIGHLIGHTS OF OUR VICTORIES**

**TOXIC FLAME RETARDANTS (FRs)**

*Furniture:*
- Largely removed toxic FRs from the roughly $100 billion residential furniture market.
- Shifted a substantial portion of the office furniture market to be free of toxic FRs and secured commitments from five states to purchase toxic FR free office furniture.
- Passed regulatory standards allowing for fire safety without the use of FRs.
Children’s Products:

- Pressured car seat manufacturers to achieve fire safety without the use of toxic FRs resulting in the development of the first toxic FR free infant car seat.
- Secured commitment from a major retailer (Buy Buy Baby) to eliminate toxic FRs from children’s products on their store shelves.
- 95% of the nap mat market is now toxic FR free and most of the children’s foam product market is now toxic FR free.

Electronics:

- Secured commitment from Best Buy to adopt a restricted substances list including toxic FRs.
- Introduced state policy requiring TV manufacturers to report on the presence of toxic FRs.

Nationally/Internationally:

- Prevented regressive federal and international regulatory standards which would have potentially jeopardized previous victories.
- Set the stage for global elimination of the most toxic FRs via an international treaty focusing on banning persistent organic pollutants.

PHTHALATES

- Launching a new, unprecedented campaign to eliminate phthalates in dairy products alongside ten organizations throughout the country.

BRIGHT CHOICES IN 2017:

TOXIC FLAME RETARDANTS

Bright Choices will continue its efforts to eliminate toxic flame retardants in children’s products, including nap mats and car seats, as well as decrease or eliminate exposures from televisions and other electronics, building insulation and upholstered home and office furniture through policy, procurement, market pressures and international treaties.

Goal Highlights:

- Five major retailers eliminate toxic FRs in children’s products and electronics.
- At least three car seat manufacturers produce safe, cost competitive and toxic chemical free car seats.
- Three more electronics retailers pledge to eliminate toxic FRs in consumer electronics.
- Attempts to require the unnecessary use of toxic FRs in furniture are thwarted.
- Ban on the most toxic FRs is adopted by an international treaty.

CHILDCARES

Bright Choices is in early development of a campaign that would work to reduce multiple exposures to neurotoxic chemicals in childcare environments. Utilizing a similar template as the Integrated Flame Retardant Campaign, we are engaging organizations already active in this sector to better leverage and focus our work, identify gaps and opportunities and develop coordinated strategies to maximize exposure reductions.

PHTHALATES

Bright Choices will provide scientific and strategic support to the campaign to eliminate phthalates in dairy products.

ARSENIC

Bright Choices is researching arsenic in infant rice cereal and apple juice to prepare for a future campaign.
Children five and younger lose an estimated 40 million IQ points from exposure to just a handful of the many neurotoxic chemicals that pollute the environment. Yet actions to protect children from these toxins can lag scientific understanding by a decade or more. HBBF has set out to close that gap.

Science into Action is HBBF’s linchpin program through which we convert basic scientific findings into the active, core content fueling our work to protect children from neurotoxic chemicals. Our work focuses on windows of vulnerability that have no equivalent in adult life, when exposures to minute amounts of toxic chemicals cause a “silent epidemic” of lifelong impairment. HBBF is responding to urgent calls to action from the many scientists whose life work has uncovered the measurable impacts of chemicals on children’s ability to learn and thrive.

“The effects on brain development may often be silent, but they are serious and demand a loud response.”

- DR. PHILIPPE GRANDJEAN
HARVARD SCHOOL OF PUBLIC HEALTH

SCIENCE INTO ACTION TACKLES THIS ISSUE HEAD-ON THROUGH SIX BASIC ACTION AREAS:

**PROJECT TENDR (TARGETING ENVIRONMENTAL & NEURODEVELOPMENTAL RISKS)**

Dozens of leading scientists, doctors and policy experts have worked together to craft a consensus on the state of science and effective solutions to the problem of chemicals that are neurotoxic. The work promises game-changing momentum in the fight against brain drain chemicals. HBBF provides communications support for this important project.

**DIGITAL TOOLS TO EMPOWER FAMILIES**

The Science into Action program converts basic science into engaging and interactive tools young families can use to reduce their exposures to neurotoxic chemicals. We optimize tools to capture actions that will create the greatest exposure reductions. HBBF tools include an interactive online guide to safe products for the first 1,000 days of development and a lead in water testing kit used by many hundreds of families nationwide.

**LEAD IN HOMES INITIATIVE**

HBBF is working with hundreds of families in 10 cities nationwide to develop a pilot of innovative online tools to help families reduce exposures to lead in their homes. The findings and momentum from this project will help spark broad policy change that eliminates lead from homes, drinking water and other key sources nationwide.

**SCIENCE FUELING HBBF PROGRAMS**

The Science into Action program converts scientific findings into effective, specific solutions that will measurably reduce young families’ exposures to neurotoxins. The prioritized menus of actions we create are the foundation of HBBF programs, including our Bright Cities and Bright Choices work. We also fill key data gaps that impede progress, testing for neurotoxic chemicals in food, water and consumer products to uncover new sources of exposure.
MAKING THE ECONOMIC CASE

Compelling evidence shows that the costs of diseases caused by brain drain chemicals is a major and avoidable drag on the US economy. HBBF’s economic program creates in-depth valuation analyses authored by teams of economists and toxicologists. We make the economic case for public investments in measures to reduce exposures, through hard data on action costs and health benefits as specific as the number of IQ points saved.

TRACKING OUR EFFECTIVENESS

To quantify the efficacy of our work, Science into Action is creating tracking tools that meld exposure data, health impact severity, and the status of actions spurred by our initiatives. This proof-of-concept data helps us optimize our work for the greatest impact.

Science Into Action – Creating a Better Future

Children born today face risks unknown in previous generations. One in six will be diagnosed with a developmental disability. One in 68 will fall somewhere on the autism spectrum. More than $130 billion is needed annually to continue to provide special education for children struggling with intellectual impairment. Evidence continues to mount on the irreversible harm caused by chemical exposures.

Healthy Babies Bright Futures creates solutions. Our Science into Action program fills critical data gaps, cuts the lag from peer-reviewed paper to real-world change and fuels change for the next generation.
**HBBF INITIATIVE:**

**Lead in Homes Initiative**

Lead remains a festering problem nationwide, with half a million children currently exposed to amounts that damage brain function. HBBF is working in 10 cities and with 500 families nationwide to develop pilot tools that help families effectively reduce exposures to lead. In partnership with The Icahn School of Medicine at Mount Sinai, a national laboratory, and 10 community-based organizations, the findings and energy created will help to spur broad policy change that gets lead out of homes, drinking water and other key sources nationwide. The aim is to expand the program’s reach into additional cities over the next three years, contingent on funding.

**KEY INITIATIVE COMPONENTS:**

**PROJECT DESIGN**

- Families access an interactive online tool that contains the Lead in Homes survey and complete the survey.
- A customized test kit is sent to each family based on their responses to the survey. Test kits include sampling supplies for dust, soil and water.
- If samples indicate there is lead in the home, HBBF will provide families with no cost or low cost ideas for limiting their children’s exposure to lead. Additionally HBBF will work with community groups to identify other local resources available for families.
- Upon completion of testing and analysis, HBBF will work with partner community groups to leverage results to engage policy makers, media and other key funders and decision makers to increase knowledge and momentum on this issue.

**FULL SPECTRUM APPROACH**

The focus includes both high-risk and lower-risk families. This full spectrum approach is important: children with high lead levels (> 5ug/dL) face the greatest harm, but they account for only 14 percent of total IQ points lost across all lead-exposed children. Over 80 percent of the damage occurs in children with moderate to low exposure, a weighting that has been called lead’s “prevention paradox.” Its implication: making significant progress requires addressing the full spectrum of exposure.

By focusing on high-risk families, HBBF can help children already burdened with too much lead, and also prevent future exposures. By focusing on families at lower risk, HBBF can begin to address the full spectrum of lead’s damage.

**INNOVATIVE TOOLS**

A key component of this initiative is the Lead in Homes interactive online tool. The tool houses the initial survey families will complete to identify potential sources of lead in their homes. It will also provide families with their test kit sample results and education on no cost or low cost actions they can take to reduce lead exposures from identified sources in their homes. The aim is for the tool to be available for general public use to identify potential lead sources in their homes, order test kits and take action to reduce lead exposures. While this will take additional funding and resources, the public health potential of this tool in preventing childhood lead poisoning nationwide would be unprecedented.
INITIATIVE GOALS:

UNCOVER IMPORTANT SOURCES OF LEAD IN HOMES AND REDUCE CHILDREN’S EXPOSURES

HBBF intends to engage families and cities in a collective effort to reveal the lead “fingerprint”—the full range of lead sources—in homes throughout 10 cities nationwide and to inspire these families and decision makers to take actions that go beyond limited city programs, measurably reducing lead exposures for children who would likely be neglected by current efforts.

INCREASE AWARENESS AND FUNDING

With this data on the larger picture of lead throughout the U.S. and a strong media campaign, HBBF will work to build support and place pressure for increased funding of local, state and national programs.

DEVELOP RESOURCES TO BE AVAILABLE TO ALL FAMILIES

HBBF will use this as a pilot program that enables any family to take actions to identify lead in their homes and reduce their exposure with no cost or low cost actions. With additional funding, the aim is for any family in the country to be able to access this interactive online tool where families will be able to complete the survey, receive a test kit, send back samples, be alerted to lead in their homes and receive education on how to limit their exposures.
THE NATIONAL CALL TO ACTION ON LEAD

Healthy Babies Bright Futures partnered with the Green & Healthy Homes Initiative, the Icahn School of Medicine at Mount Sinai and the National Center for Healthy Housing to sponsor the National Lead Summit dedicated to ending childhood lead poisoning in five years. The 2016 Summit took place from December 4 to 5 in Washington, D.C. The event attracted over 250 participants from across the country including policy makers, funders, strategists and advocates. Participants helped to craft a blueprint to end lead poisoning in five years and signed a call to action.

THE CALL TO ACTION

The toxic legacy of lead poisoning has stolen the future from generations of American children. Lead damages children’s brains, erodes their intelligence, diminishes creativity, impairs language skills, shortens attention span and predisposes to hyperactive and aggressive behaviors.

Lead is a silent epidemic often going undetected until it is too late. Infants in the womb and children under the age of six are the most vulnerable. Lead is directly linked to reading and learning disabilities, increased school dropout, lower lifetime earnings and lifelong health effects. Lead poisoning is a costly, tragic and entirely preventable problem that has plagued our older communities and undermined our education, juvenile justice and health systems.

Today, we have an extraordinary opportunity to end lead poisoning in America. We have mapped the sources of lead, we know how lead reaches children, we have deep knowledge of lead’s effects on children’s health and we know how to prevent lead poisoning. We have already banned many sources of lead exposure in this country and reduced our children’s blood lead levels by over 90 percent. Now is the time to finish the job. Now is the time to end lead poisoning.

Our plan is to identify the resources, the policies and the programs that have been proven to work. Our strategy is to tackle the root causes of lead poisoning – housing with lead paint hazards, crumbling infrastructure and racial and economic inequity. Our goal is to deliver on the promise to once and for all end this terrible problem and to restore our children’s health.

Lead was pervasive in 20th-century America. It was used widely in paint, gasoline, water pipes and other consumer products. Its effects on children’s health were first recognized in 1904 and became known across the world. In 1922, many nations signed on to ending the use of lead paint in residential housing—except the United States. It took decades more before the U.S. began to acknowledge the extensive damage caused by lead.

The tide began to turn against lead in the 1970s. Two key events were the discovery by Herbert Needleman, MD and others that lead could cause silent brain injury and the realization that lead in gasoline could destroy the catalytic converters mandated on all new cars under the Clean Air Act. Lead was banned from gasoline beginning in 1976, from house paint in 1978 and its use in water pipes and solder was significantly restricted in 1986. Average blood lead levels in children under 5 in the U.S. fell from 17 micrograms per deciliter in 1976 to 4 micrograms per deciliter in the early 1990s and have continued to fall.

But as we have seen in tragic ways in all types of communities across America, lead poisoning remains a major challenge. According to the Centers for Disease Control and Prevention, an estimated 535,000 children under the age of six still have elevated blood levels. Many parents are unaware of this silent poisoning. Approximately 23 million older American homes still contain lead paint hazards and an estimated 10 million homes have lead water pipes. The burden of lead often falls most heavily upon the poorest and most vulnerable among us. Lead worsens our nation’s ongoing problems of racial and economic inequity by disproportionately impacting low-income communities.

The human, moral and business case to end lead poisoning is clear. It will lift the viability of all communities; dramatically improve the health, educational and social outcomes for future generations and will return billions of dollars annually to the American taxpayer. Studies have shown that for every dollar invested in lead poisoning prevention the public receives a return of $17 to $221. Investment in work to eradicate sources of lead will also provide good-paying skilled jobs and be a vehicle for further reinvestment in less toxic and more stable neighborhoods.
TO END LEAD POISONING IN THE UNITED STATES, WE COMMIT OURSELVES TO WORKING TOGETHER AS A NATION.

WE WILL:

- Work to increase investments from new and expanded federal, state, local and private sector funding mechanisms to address lead exposures in housing by making lead testing and hazard remediation of homes a standard practice.

- Call for the establishment of a Presidential Task Force to create, drive and implement a national strategy of interagency collaboration with the budget support to eliminate childhood lead exposures.

- Push to align and prioritize federal, state and local efforts to identify, fund and enforce existing laws and programs on sources of lead exposure.

- Support the updating of all federal lead regulations to create lead safe, health-based standards and action levels to better engage the health, health care and housing sectors and allied communities to identify and prevent lead exposure.

- Implement an enhanced national blood lead surveillance system to identify children who already have elevated blood lead levels for case management, investigation and support.

- Provide educational, social and clinical services to children exposed to lead to mitigate the harms of lead poisoning.

- Expand the well-trained, well-protected national workforce capacity for lead hazard remediation to repair and restore communities and their infrastructures.

Together, we mutually pledge to support this work and call on the nation to implement strategies to end childhood lead poisoning within five years.

NEXT STEPS:

1. **Connect key players.** Provide a point of connection and communication for the many organizations working on the different sources and solutions to lead poisoning so they can know what each other is doing, can ask each other for help when necessary and work from a common set of compelling messages.

2. **Combine critical data.** Build a searchable map-centered database that provides a consolidated, place-based estimate of lead exposure from paint, water and emissions.

3. **Respond quickly to government regulations.** Develop a rapid response team that can Respond to legislative and regulatory opportunities and challenges at the local, state and federal level, using model policies to eliminate lead poisoning at each level of government.

4. **Provide the tools to success.** Provide training and technical assistance in communications, policy and program implementation.

5. **Utilize the Lead in Homes interactive online tool.** Currently under development, this online tool will help to link and lift these four initiatives.

6. **Focus on elimination of racial and social inequalities.** Include a diverse set of organizations and leaders in all steps of the implementation phase to ensure that racial and social inequities that contribute to the lead poisoning problem are addressed.
Evidence of neurotoxicity continues to mount for a multitude of chemicals we are exposed to on a daily basis. There is increasing need for an effective means of communicating these neurotoxic effects to the public and decision makers in order for exposure-reduction policies to be put into place. One way to do this is by communicating the magnitude of the effect of exposure to neurotoxicants.

Healthy Babies Bright Futures (HBBF) is committed to making a meaningful difference in reducing exposures for women of childbearing age and their babies and young children. To support these efforts, HBBF requires a strong economic analysis of the costs associated with adverse neurodevelopmental effects from exposure. This type of evaluation is often referred to as benefits analysis. Assigning a monetary value to these adverse health effects provides a common and accessible means of describing the magnitude of the problem of exposure to toxic chemicals. Additionally, benefits analysis helps reveal the impacts of regulatory or voluntary chemical reduction initiatives aimed at decreasing exposures to the chemicals.

HBBF focuses on a set of chemicals—the “brain drain” chemicals—that are associated with neurodevelopmental effects. These chemicals include arsenic, flame retardants (such as polybrominated diphenyl ethers, or PBDEs), lead, mercury, organophosphate pesticides, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), perchlorate and phthalates. Abt Associates is demonstrating, through a series of case studies, the economic gains that can be realized by enacting programs and regulations that will reduce exposures to these chemicals. HBBF and its partners use Abt’s findings to support advocacy for meaningful, wide-scale exposure reductions, particularly for those most vulnerable to the chemicals’ effects.

THE Abt ADVANTAGE

A recognized leader in developing regulatory benefits analyses, Abt Associates Inc. can provide analyses that are credible and robust to the level of scrutiny required in a regulatory economic analysis.

Abt’s work has withstood critical review by the Office of Management and Budget (OMB), the Science Advisory Board (SAB) of the U.S. Environmental Protection Agency (EPA) and the U.S. Supreme Court.

Abt’s integrated team is driven by a commitment to reducing harm from environmental toxins and has a track record of working collaboratively.

Abt’s culture encourages innovative solutions to complex problems.

Abt completed a case study focused on lead, which provides an example of the legacy of neurotoxicity that can be caused by chemicals. Lead exposures have been well studied in children, and we have overwhelming documentation that lead causes neurodevelopmental effects in this population, including IQ loss and behavioral problems. Our case study of lead assesses specific interventions that can be used to reduce exposures, including different levels of abatement for lead paint in older homes, and then quantities the economic gains from reducing adverse neurobehavioral outcomes in children associated with lead exposure.
Although regulation of lead has, on average, resulted in decreased blood lead levels in the United States, exposures to lead remain cause for concern. What is missing in the current chemical policy landscape for lead and the other chemicals with less extensive documentation of harm is the commitment of resources to further minimize these exposures in our most vulnerable populations. In future case studies for other chemicals of interest, we will mirror our approach to estimating the benefits of reducing lead exposures. One of HBBF’s goals is to apply the lessons learned from lead to other chemicals that are also associated with neurobehavioral outcomes, but have fewer data available. The general framework of our case studies is illustrated in Figure 1.

Our case studies will target high-risk exposure groups of interest to HBBF’s mission. Our first case study focuses solely on young children who live in older homes with deteriorating lead-based paint and interventions to reduce exposure. Our analysis reveals that for every $1 spent on lead paint abatement, there are up to $14 in benefits associated with IQ points saved among exposed children. Further, we found a significant cost in delaying action, estimated at $34 billion nationally for a three-year delay in remediating older homes. Our findings are helping to support advocacy by HBBF and partners to eliminate childhood lead poisoning in the next five years.

Other case studies will address infants who are fed formula made with lead-contaminated tap water, arsenic in infant cereals, phthalates in dairy foods and other case studies that investigate additional chemicals and exposure scenarios, as resources allow.

To best improve upon economic analyses already in the published literature, we are:

- Producing case studies that look at specific interventions.
- Estimating benefits that can be scaled to specific populations in cities.
- Developing the most appropriate concentration-response functions for each unique combination of chemical exposure (lead, arsenic) and adverse health effect (e.g., IQ loss, ADHD).

SOME QUESTIONS WE ADDRESS:

- Based on the extensive literature, what are the most effective lead paint remediation strategies for reducing exposure and therefore adverse health effects, while remaining cost-efficient?
- How can current modeling efforts be improved in order to capture the changes in blood lead levels from reductions in lead dust and drinking water in the most vulnerable populations?
- Which is the most appropriate model relating blood lead to IQ for different exposures and age groups?
- How can we improve upon existing monetary valuations of an IQ point to ensure that all possible benefits are quantified?
- How can we improve upon existing monetary valuations of ADHD to ensure that impacts to both the children and the caregivers are quantified?
- What are the best alternatives to feeding infants rice cereal that may contain arsenic? Can we quantify the reduction in IQ loss to children by feeding infants these alternatives?
- How can we expand our methods to less data-rich chemicals, to ensure that we protect infants and children from the adverse neurobehavioral health effects associated with them?
PARTNER ORGANIZATIONS

Alaska Community Action on Toxics
Arnhold Institute for Global Health in the Icahn School of Medicine at Mount Sinai
Baraka Community Wellness
BlueGreen Alliance
Center for Environmental Health
Children’s Environmental Health Network
Clean and Healthy New York
Clean Production Action
Clean Water Action
Collaborative on Health and the Environment (CHE)
Columbia Center for Children’s Environmental Health
Coming Clean
Commonweal
Conservation Minnesota
Cornell Douglas Foundation
Earthjustice
Ecology Center
Environmental Health Strategy Center
Environmental Working Group
Fine Fund
Forsythia Foundation
Green Science Policy Institute
Health Care Without Harm
Healthy Building Network
IPEN – a toxics free future
The John Merck Fund
Jonas Family Fund
New York Community Trust
Passport Foundation
Rick and Nancy Moskovitz Foundation
Safer Chemicals Healthy Families
Safer States
Toxic-Free Future
Urban Sustainability Directors Network
Healthy Babies Bright Futures (HBBF) was launched in 2015 as the result of an 18 month dialogue among scientists and leaders from foundations and non-profit organizations that focus on environmental health and justice. Two questions that formed the basis of that dialogue:

What does the science tell us are the greatest opportunities in the field of environmental health for measurably improving the quality of life?

What does our shared experience teach us about the most important ways we could increase the capacity and the impact of environmental health organizations?

The first of these questions is answered in HBBF’s goal:
To measurably reduce children’s exposures to neurotoxic chemicals in the first 1000 days of development.

The second question is answered in the eight standards of practice for all HBBF initiatives:
• Ground our work in the best available science and consider emerging technologies.
• Prioritize interventions that data demonstrates will have the greatest impact.
• Ensure that the most vulnerable babies are protected.
• Design programs that accelerate change.
• Measure outcomes, then adjust and improve them as needed.
• Facilitate collaboration among the field’s most effective actors.
• Bring new allies to efforts to protect babies’ health.
• Illustrate the return on investment in protecting babies from neurotoxic chemicals.

Healthy Babies Bright Futures’ commitment to these standards can be measured in an analysis of our 2016 income and expenditures:
• More than 43% of 2016 income came from new donors to the environmental health field.
• Half of the monies spent in 2016 were for communications (28%) and science (22%), much of it aimed at promoting and enhancing the work of our partners.
• One-third (33%) of 2016 expenditures were regrants and contracts to HBBF organizational partners and allies in our Bright Choices, Lead in Homes and Bright Cities programs.
Communications:
A Critical Component to Success

Healthy Babies Bright Futures considers communications to be a critical component in reducing exposure to neurotoxic chemicals. Communications with consumers—specifically women of child-bearing age, pregnant women and new moms—play a key role in prompting and sustaining behaviors that will reduce exposure to neurotoxic chemicals. Those important behavioral changes are both at the individual level—reducing exposure sources in the home—and at the collective level—advocating for change in the marketplace, government policies and funding.

HBBF models its communications to targeted consumers with a focus on these important behavioral outcomes. We do this with a research-driven approach using quantitative surveys and quantitative online message testing to ensure that our content will effectively meet and connect with our audiences and motivate action. And we will use these same research tools to assess our progress against our key objectives. Our data-driven approach to communications also extends to our website, with advanced analytics that inform and feed into on-going improvements in consumer engagement and behavior change.
HBBF’s communications strategy drives visibility and action with an integrated multi-channel approach. With a major focus on supporting, amplifying and collaborating with HBBF partner’s communications channels, HBBF’s channels—earned media, blogs, website, digital ads, social media and email—are designed to engage the right consumers, guiding them towards strategic actions that will reduce exposures for their families and their communities.

HBBF has had a reach of an estimated 1.3 million people since its digital inception in February 2016. This reach includes statistics gained from website analytics, social media reach and impressions, email distribution list and visibility from circulation within news media hits.

Taking a more focused look, specific examples of our communications approaches include our efforts around digital tools, Project TENDR and the messaging research project.

DIGITAL TOOLS

By using a combination of search engine optimization tactics, digital paid ads, social media strategies and leveraging partner relationships, HBBF generated significant online visibility and engagement through two of its digital tools used to empower families.

LEAD IN WATER TEST KIT

In less than one year, we drove thousands of visitors to our website’s lead test kits allowing them to not just order a kit but also to learn more about the toxic history of lead. We reached more than 11,000 people specific to this issue and received more than 630 order placements resulting in upwards of $33,000.

COMMUNICATIONS HUB

HBBF lends its professional communications capacity to its partners in the field by using a hands-on collaborative approach. Communications support includes assistance with strategic communications plans, messaging, digital strategies, media relations and original written content. Two examples of this include:

PROJECT TENDR

HBBF powered the robust communications effort behind the successful Project TENDR consensus statement on the impact of neurotoxic chemicals on children’s health. We modeled the HBBF definition of “partnership” by commissioning and sharing communications research with the environmental health community and by loaning our communications capacity in support of this work. A result of this communications collaboration included national press coverage including the New York Times and CNN in addition to dozens of radio interviews, editorials, and other media reports throughout the country.

COMMUNICATIONS MESSAGING RESEARCH PROJECT

We are at a critical time for the movement. We must connect with our audiences through highly relevant, compelling and motivational communications that elevate our issue on the individual, community and societal agenda; particularly, during a time in which top spots on that agenda are becoming increasingly competitive.

The 2017 HBBF communications messaging research project will answer critical questions that will help sustain and grow momentum for our cause, increasing the size and diversity of engaged audiences of consumers, stakeholders and funders. The messaging research will equip us with the information needed to craft a shared over-arching narrative that will raise the profile of our issues and reach and engage a much larger audience. This strategic narrative will serve as the foundation underlying and supporting all communications around specific advocacy/marketplace efforts, growing and deepening the support for our campaigns.
Hero professor who helped Flint families now working with nonprofit to test anyone’s water for lead

By Colby Itkowitz

The Democratic debate in Flint, Mich., Sunday night naturally focused heavily on the lead water crisis there, and both Hillary Clinton and Bernie Sanders decried the lack of government oversight that allowed children to drink toxic water.

And they know it’s not just Flint’s children who are exposed to poisonous water. There are about 96 million Americans living in areas where lead pipes carry their tap water. And the government has not properly done its part to test the water for lead levels as mandated in a 25-year-old federal law.

So until it does, a nonprofit is taking the problem into its own hands by helping people determine themselves whether their household water is lead contaminated. And it has Virginia Tech professor Marc Edwards, who helped uncover the lead crises in Washington, D.C., and Flint doing the testing.

Healthy Babies Bright Futures (HBBF) is an initiative just a little more than two years old that aims to reduce children’s exposure to chemicals that could harm their brain development. Its original mission was broad, but the Flint crisis spurred its founders to pivot to focus resources on lead in water.

In the months since Edwards offered to test Flint residents’ water for lead levels, he said he’s been inundated daily with requests from individuals and cities appealing for his help. He doesn’t have the manpower to handle the logistics of each request.

So that’s where HBBF has stepped up to provide the behind-the-scenes resources so Edwards can focus on the science. They are selling the lead water test kits to anyone who is worried about their tap water. With the kits, people can take their own water samples as instructed and send them back for Edwards to test in his lab.

Because water is so heavy to ship, the kits cost $65. But if anyone can’t afford that amount, they can purchase a kit for as little as $12. There is also an option to pay more for the kit to offset the cost for those who can’t pay the full amount. So far, the crowdsourcing method is working, said HBBF Executive Director Charlotte Brody.

“There’s no cheap or easy way to do this, and HBBF is making it easier to do it right,” Edwards said.

Many of the communities most at risk are disproportionately low-income. An Associated Press-GfK poll released Sunday night found about half of Americans do not trust the safety of their tap water. African Americans and Hispanics were more likely than whites to distrust their water.

One big issue, and a reason why HBBF and Edwards’s work is so crucial, is the evidence that the Environmental Protection Agency may have allowed improper testing of the water, and in some cases allegedly intentionally doing it wrong.
State and local utilities can sometimes “game” the results by asking residents to run their tap for a while before collecting the water, which can give an inaccurate reading, Edwards said.

Safe water experts say it’s an ethical dilemma that some government agencies reward people for not reporting problems. That’s because revealing lead water means having to replace the corroded lead pipe infrastructure, which is an expensive bite out of the budget.

Edwards said he was glad Clinton and Sanders held their debate in Flint to bring political muscle to the issue but said the reality is that partisan finger-pointing won’t fix the larger issues that need to be remedied, such as repairing the nation’s aging infrastructure and changing government agency culture where loyalty appears misplaced.

“Government is supposed to solve the problems we can’t solve for ourselves,” Brody said.

The federal government’s Lead and Copper Rule that passed in 1991 as part of the Safe Drinking Water Act already lays out the guidelines that tap water must be tested for lead levels and, if they exceed a certain level, then steps must be taken to inform the public and replace the pipes.

That there’s already a law in place that should have protected Flint’s children is what Edwards finds “so frustrating.”

“The thing that makes me so mad is that we already had the moral and ethical debate,” he said. “That’s what burns me up.”
Target Corp. introduced a sweeping new policy governing chemicals in products, a move that will push hundreds of suppliers to list ingredients in everything from fragrances to floor cleaner.

The guidelines, due to be unveiled Wednesday, include removing perfluorinated chemicals and flame retardants from textiles in the next five years, as well as eventually disclosing ingredients in all products.

Target’s new rules come amid growing consumer demand for green goods—whether it’s organic food, natural cosmetics or cleaning products—that have fewer controversial ingredients. Sales of the retailer’s Made to Matter line, which touts “cleaner” ingredients, rose 30 percent last fiscal year. The move follows a similar effort by Wal-Mart Stores Inc. in July, when the world’s largest retailer moved toward banning eight chemical groups, including formaldehyde and triclosan.

Customers “are increasingly concerned about those chemicals in the products that they use,” said Jennifer Silberman, Target’s chief sustainability officer. That’s prompted them to demand greater transparency and access to greener products, she said.

In 2015, Target began encouraging manufacturers to list ingredients and remove hundreds of what it calls “unwanted chemicals,” such as bisphenol A. The company is relying on a sustainable product index, which awards points to greener items, to judge vendors’ wares. The new policy sets a goal of full ingredient disclosure by 2020 in categories consumers encounter most closely: beauty, baby, personal care and cleaning goods. The ultimate aim is disclosure of all ingredients in all products.

Protecting Employees

The retailer also vowed to reformulate products by 2020 without certain chemicals, such as formaldehyde and phthalates. The plan encompasses substances used in the manufacturing process and in and around stores—like landscaping materials—to protect workers as well, Silberman said.

Yet, finding safer ingredients isn’t always easy or cheap. In some cases, there may be no alternative, forcing the industry to invent new ingredients. Target plans to invest as much as $5 million to develop products through green chemistry.

Retailers have plenty of reason to change. In a June report, research firm Mintel found that 66 percent of consumers it surveyed...
said it was important to use environmentally friendly cleaning products, and 63 percent believed ingredients in many cleaning products are unhealthy.

“Target’s new chemical policy commitment and goals will go a long way in driving harmful chemicals out of consumer products,” Mike Schade, of Safer Chemicals, Healthy Families, said in an e-mail.

Schade, who runs the group’s retail campaign, co-wrote a November report ranking the 11 largest U.S. retailers on their chemical-disclosure policies. Target ranked second-highest, just behind Wal-Mart. Schade said his group will update its ranking later this year.

Veena Singla, a scientist at the Natural Resources Defense Council, said Target’s plan is a move in the right direction.

“Transparency is a key element of the Target policy because you can’t address what you don’t know,” Singla said. “Identifying and removing harmful chemicals is just the first step.”
Every day, children and adults are exposed to a variety of chemicals found in common household items. Now a growing body of research suggests that many of these chemicals — which are used to make plastic more flexible, fruits and vegetables more abundant and upholstery less flammable — may also pose a threat to the developing brain.

While the link between early chemical exposure and neurodevelopment disorders in children remains a matter of scientific debate, a unique coalition of top doctors, scientists and health advocates is calling for more aggressive regulation. The goal is to protect expectant mothers, infants and children from neurotoxic chemicals by stepping up efforts to curb air pollution, remediate old lead pipes, phase out certain pesticides, ban endocrine-disrupting chemicals used in food packaging and plastics and come up with a plan for getting rid of furniture laden with fire retardants.

The scientists note that neurodevelopmental disorders are complex and have multiple genetic, social and environmental causes. But most chemicals in use today were not adequately tested for safety before being allowed on the market, said Dr. Jeanne Conry, an obstetrician gynecologist and a past president of the American College of Obstetricians and Gynecologists, which is part of the coalition.

"Before we can prescribe medicine, we have to prove it's safe," she said. "So how come with the chemical industry, we assume everything is safe and have to prove there's harm?"

On Friday the coalition endorsed a first-of-its-kind consensus statement called Project Tendr, which stands for Targeting Environmental NeuroDevelopmental Risks. The statement was published in the scientific journal Environmental Health Perspectives, and related articles are being published over the next few months in endocrinology, nursing, pediatrics and epidemiology journals.

"We as a society should be able to take protective action when scientific evidence indicates a chemical is of concern, and not wait for unequivocal proof that a chemical is causing harm to our children," the statement says.

The call to action comes just one week after President Obama signed into a law a much-debated overhaul of the nation’s 40-year-old toxic chemical rules. The update to the 1976 Toxic Substances Control Act subjects some 64,000 existing chemicals to eventual safety testing. But critics say the changes don’t go far enough, and the testing of chemicals is far too slow — just 20 chemicals at a time with a deadline of seven years per chemical. And the new law doesn’t cover pesticides used in food

Cosmetic and lotion bottles contain phthalates, a chemical that allows the plastic to be flexible. Absorption of phthalates is linked to preterm births and impaired neurodevelopment in girls.

This chart shows a list of common chemicals and their possible effects on the body. Click here to view the entire chart.
production – which critics say are one of the largest sources of childhood chemical exposures.

An official with the American Chemistry Council, which represents companies that make flame retardants, plastics and phthalates, said the new law already addresses the concerns raised by the Tendr coalition. The new rules give more authority to the Environmental Protection Agency and require the agency to take into account vulnerable populations like pregnant women, children and the elderly, she said.

“This new law will give Americans greater confidence that chemicals in commerce are being used safely,” the American Chemistry Council said in a statement.

The Tendr coalition includes pediatric neurologists, several minority physician associations, nurses, learning disability advocacy groups, environmental organizations, and the Endocrine Society, which has compiled several scientific statements documenting adverse health effects linked to endocrine-disrupting chemicals that mimic or disrupt the hormones in our own bodies. Dozens of scientists and health providers have signed the statement, as has Linda Birnbaum, director of the National Institute of Environmental Health Sciences and the National Toxicology Program.

The bottom line: The group wants the chemical industry to prove a chemical is safe, rather than waiting on the medical and scientific community to prove it is harmful. “We’re saying, shift the burden of proof,” Dr. Conry said.

Wading into a potentially contentious issue like regulation of chemicals is unusual for ACOG, a professional medical association for doctors who care for pregnant women. The group has been alarmed by rising rates of neurodevelopmental disorders and other health problems in children, which it linked to toxic exposures in a 2013 scientific paper.

National health surveys show that 15 percent of children had a developmental disability in 2008, up from 12.8 percent in 1996. Researchers say changes in diagnostic criteria and a greater awareness of developmental disorders including autism, attention deficit disorders, and other learning disabilities may explain some of the increase in rates, but not all of it.

The chemicals singled out by the coalition are widely used, and manufacturers and some experts say more research is needed to demonstrate they have harmful effects. They include:

**Organophosphate Pesticides:** Although health concerns led to a ban on residential use of some of these pesticides, they are still permitted on crops like fruit, vegetables, wheat, soy and corn. In one study, women who were pregnant when they lived near areas where these pesticides were in use were up to three times more likely to have a child who developed autism or other developmental disorders. Janet Collins, a senior vice president at CropLife America, which represents pesticide manufacturers, said the studies show only an association between pesticide levels and autism disorders, not a cause-and-effect relationship.

**Flame Retardants:** Recent studies have found that children exposed prenatally to higher levels of flame retardants had lower I.Q.s and higher hyperactivity scores. Similar effects have been found in animal studies. Flame retardants are used in fabric and upholstery padding, plastic casings for televisions and computers and baby products. A major source of exposure is household dust, which can accumulate with residue from treated products. American retailers and manufacturers have phased out one commonly used flame retardant, some of which still lurk in old sofas and other items; some scientists worry that they are being replaced with similar chemicals that may not be any safer.

**Lead:** The government has banned leaded gasoline and household paint, but old homes and pipes often still contain lead that gathers in dust and leaches into water. Lead is so toxic that no level of exposure is considered safe, and even low blood levels are associated with lower intelligence and attention deficits. In 2010, an estimated 535,000 children were identified with alarmingly high levels of lead.

**Phthalates:** These chemicals cross the placenta during pregnancy, and prenatal exposure has been linked in studies to problems with attention and intellectual deficits. The Consumer Product Safety Commission has banned the use of six phthalates in toys and child care products, but they are still widely used in all kinds of products, from food packaging to personal care products and building materials.

**Combustion-Related Air Pollutants** – These include nitrogen dioxide, particulate matter (a mix of small solid particles and liquid droplets) and other toxic chemicals including benzene and formaldehyde, as well as polycyclic aromatic hydrocarbons (or PAHs). Air pollutants can cross the placenta, and prenatal and early childhood exposure to some pollutants has been linked with preterm birth and low birth weight, as well as developmental delays, inattention and reduced I.Q.

Studies show almost all American women have these chemicals circulating in their bodies during pregnancy. A recent study of about 300 women found detectable levels of pesticides, flame retardants, phthalates, PCBs and other chemicals in 99 percent to 100 percent of the women tested.

Gestation is a particularly vulnerable time for the developing fetal brain, because it is growing so rapidly, said Irv Hertz-Picciotto, co-executive director of Project Tendr and director of the MIND Institute Program in Environmental Epidemiology of Autism and Neurodevelopment at the University of California, Davis.

Many chemicals of concern are endocrine disruptors, which can interfere with the activity of the body’s own hormones, like thyroid hormones, estrogen and androgens. These hormones play an important role in healthy brain development, said Heather B. Patiatsal, professor at the Center for Human Health and the Environment at North Carolina State University at Raleigh.
“The goal is not to demonize every chemical on the market,” Dr. Patisaul said. “We need to find the group that are harmful, and figure out why, and develop new chemicals that are significantly less harmful.”

How to Limit Your Exposure to Toxic Chemicals

A coalition of doctors, scientists and health advocates says you may be able to reduce your overall exposure to toxic chemicals by taking the following steps:

- Reduce pesticide exposure by choosing organic strawberries, apples, nectarines, green beans, celery and spinach.
- Choose seafood low in mercury like salmon, sardines, trout.
- Breast-feed your baby if you can; if you use formula, make sure the water is lead-free.
- When buying furniture with padding like a high chair, sofa or mattress, ask for products that are labeled free of toxic flame retardants.
- Avoid exposing the family to tobacco smoke, wood smoke from fireplaces and wood stoves, idling car exhaust, cooking fumes from stoves and grills.
- If you’re putting in a new floor, choose either phthalate-free vinyl flooring or wood, bamboo or cork.
- Avoid plastic toys, backpacks, lunch boxes and school supplies made of polyvinyl chloride (PVC) which can be a source of phthalates.
- Choose fragrance-free personal care products to avoid phthalates in fragrances.
- When using stool softeners, laxatives and other time-release capsules, look for phthalates on the list of inactive ingredients so you can avoid them.
- Use nontoxic alternatives to pesticides in your yard and on your pets.
- Screen your house for lead. If it was built before 1978, lead paint may place your family at risk. If paint is chipping or peeling, it can build up in house dust and stick to children’s hands.
- Reduce household dust that may contain lead, flame retardants, phthalates and pesticides. Take shoes off before you come into the house and use a doormat to trap dirt outside and inside the doorway. Damp mop, use a HEPA-filtered vacuum cleaner and dust with a microfiber cloth.