

**TOXIC CHEMICALS AND CHILDREN'S
ENVIRONMENTAL HEALTH**

FIELD HEARING
BEFORE THE
SUBCOMMITTEE ON SUPERFUND,
TOXICS AND ENVIRONMENTAL HEALTH
OF THE
COMMITTEE ON
ENVIRONMENT AND PUBLIC WORKS
UNITED STATES SENATE

ONE HUNDRED ELEVENTH CONGRESS

SECOND SESSION

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OCTOBER 26, 2010—NEWARK, NJ
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ONE HUNDRED ELEVENTH CONGRESS
SECOND SESSION

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TUESDAY, OCTOBER 26, 2010

U.S. SENATE,
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS,
SUBCOMMITTEE ON SUPERFUND, TOXICS
AND ENVIRONMENTAL HEALTH,
Newark, NJ.

CHAIRMAN LAUTENBERG: Welcome, everybody. We're glad to see everybody here. And for those who are not from New Jersey, we welcome you. We welcome you to this proud State of ours, which is known for pharmaceutical products, chemical products, manufacturing of all types, as well as being the "Garden State."

We have a mix of interesting things, but we do have great interest in our families, our children, their health, their well-being. And we've learned the hard way over the years about what happens when you have a chemical presence. Sometimes in a Superfund site water is tainted. And we learned over the years that that's a very dangerous condition and brings all kinds of horrible diseases to children living not too far away.

And so we learned from New Jersey history, at the beginning of the Industrial

Revolution. The waterfalls of Paterson was a key place for that. It took the water from the river and it put it through to the factories that could energize their functioning. And with that history came significant economic strain that it placed on America's developments for being able to create jobs and get things done.

But along with that came, through the Industrial Revolution, to the point in time when it was decided that we could improve health by making medicines and chemicals and other things that were supposed to be beneficial. Then we found out over the years that some of it, "some of it," was very negative for pediatric development.

So I'm proud to be here as a Chairman of the Subcommittee of the Superfund of the -- I keep calling it the Superfund Committee -- the Environment Committee. And so we are going to start trying to get something done. And I welcome you for joining us on this hearing on "Toxic Chemicals and Children's Environmental Health."

And, first, I want to say to Dr. William Owen, President of the University of Medicine and Dentistry, to thank you, Dr. Owen, for hosting us today. This is a place of high energy and high quality, and I know that your interest and the faculty and the students at the University of Medicine and Dentistry are always interested in ways of improving health and making a very significant contribution to this city and surrounding, where very often healthcare is not always available. And our children need attention. And I know how hard you and

your colleagues work to try to provide that.

I'm joined today by two distinguished panels of witnesses that share our mission; that has guided my career in the Senate, to insure that our children are born healthy and stay healthy. It has often been innovation by the chemical industry that's allowed healthier lives for our children. Chemicals play an important role in everyday American life helping to purify our water, kill harmful bacteria in our food and prevent germs from spreading around our homes, schools and workplaces. But we have to do everything possible to insure that a healthy life is not interrupted by an exposure to a hazardous chemical that could and should have been tested and taken off the market, but it was not.

We're here today because the risk of doing nothing to better shield our children from dangerous chemicals has become far too great. When our government is constrained by ineffective, outdated laws, the harm to our children from toxic exposure grows more and more apparent.

Studies have shown that as much as five percent of childhood cancers, ten percent of neurobehavioral disorders, and 30 percent of childhood asthma cases are associated with hazardous

chemicals. The threat of pediatric cancer is one of the most ominous that a parent can face. Chemicals are everywhere, even already well inside our bodies. As the Center for Disease Control and Prevention recently told this Subcommittee, that most Americans are walking around with hundreds of industrial chemicals coursing through their bodies.

But how safe are these chemicals?

The answer is that we don't know. The fact was made all too clear in Dr. Sanjay Gupta's year-long CNN investigation called "Toxic America." And I will take a moment a little bit later to introduce Dr. Gupta and produce Lisa Jackson and others here. Lisa is the Chairperson of EPA, an incredibly important job. And Dr. Gupta has established himself as a person with extremely deep knowledge about things. Very serious researcher, serious clinician.

But, again, we'll have even nicer things to say, Dr. Gupta, in a few minutes.

This special investigation showed in stark detail the dangerous link between toxic chemicals and public health in our communities. It helped wake America up to how our broken regulatory system affects everyday American lives. And we deeply appreciate Dr. Gupta's being here. He's a

very, very busy man, and traveled to faraway places to help people. And I'm so pleased that he was able to find time to join us. And we'll, in a moment, be discussing his findings.

Simply put, the law that governs the safety of chemicals, the Toxic Substances Control Act, known also as "TSCA," fails to give us the tools we need to test chemicals. And this is a 34-year-old law and program, and the anniversary is this month. Thirty-four years ago that TSCA was established. But the results of its establishment are far from laudatory. Since then, the law has allowed the Environmental Protection Agency (EPA) to require testing of only 200 of more than 84,000 chemicals on its inventory. Imagine, 200.

In other words, the Government has been able to require testing, has been able to require -- it's sound complicated, but there is no law that permits EPA casual investigation of these things, very much restricted and a pitiful result is that we've inspected so few of more than 84,000 chemicals.

The Government has been able to require testing of less than one percent of registered chemicals. What's more, under TSCA, EPA

has banned only five substances in 34 years. With the Government unable to require adequate testing in the lab, our children have become test subjects themselves in an noncontrolled experiment. And, you know, the analogy often brought is it's in areas of the coal mine. We don't want that with our kids. We don't want our kids to fall ill and to test the air out there. That's not the way a family or any of us want to see us functioning.

We're seeing the results of that experiment. The United States has experienced a surge in childhood cancers, birth defects, and hormonal problems. The President's Cancer Panel, whose members were appointed by President Bush, issued a report in May that found that chemical exposure is an established factor in genetic, immune and in endocrine dysfunction, that can lead to cancer and other diseases.

This summer, a colleague of ours in the interest in children's health, an outstanding leader, Dr. Phillip Landrigan, Professor of Pediatrics at Mt. Sinai Medical Center, published a study that indicated there are links between chemicals in the environment and the recent rise in autism in children. Some of you may have read about

Dr. Landrigan's research in a recent New York Times column by Nicholas Kristof.

Here in New Jersey, we have one of the highest autism rates in the country. One of every 94 children in New Jersey has autism. The fact is, children are not simply smaller versions of adults, their bodies are different, and that makes them especially vulnerable when they encounter dangerous substances. And children should not, as I said before, be used as guinea pigs. So we've got to update the law and use it to do more to protect them. And that's why I introduced a Bill recently to require chemical manufacturers to prove that their products are safe before those substances end up on our store shelves, in our homes, in our children's bodies. They're present in things as simple as glassware, upholstery, carpets, drapes, air sprays, beddings; all kinds of products. And there's no getting away from routine contact with these products because so many of them are made with chemical ingredients. We already regulate pesticides and pharmaceuticals this way, and it's just common sense that we do the same for chemicals that our children may be exposed to.

The good news is that there is now

widespread agreement on the need to strengthen our country's laws. And a dear friend from New Jersey, EPA Administrator Lisa Jackson, who we're honored to have with us today with her special knowledge, she supports our efforts to reform TSCA. We'll be hearing from her later. Administrator Jackson and her EPA colleagues know that they cannot protect our children with one hand tied behind their backs. And as this Subcommittee heard a few months ago, the companies that make and use chemicals also want changes to the current law because the status quo doesn't work for them either.

We welcome the participation of the industry, which is a major component of American manufacturing, especially here in New Jersey, where the chemical industry employs more than 70,000 people. The bottom line is that many of the chemicals we use and the products in our daily lives, perhaps even most of them, are safe, but our current law does not allow EPA scientists to draw the bright line between chemicals that are safe and chemicals that are toxic. And we've got to change this. We simply cannot stand by and permit our children to continue to be exposed to chemicals that damage their health or shorten their lives.

So I look forward to working with my colleagues and the Obama Administration to enact my Bill, which will create strong, effective and pragmatic regulation of chemicals. And together we'll put common sense back into our environmental laws, better protect the health of all Americans, especially our children, and it, two, as a secondary, but less important factor, we will reduce the cost of illnesses and the pain that families go through when their child can't do the things that every child likes to do. But love doesn't deteriorate. And the fact is that we have an obligation to do something about it positively.

And I'm hopeful that colleagues in the Senate, regardless of party, will join in and give us the help that we need to get it through. We've talked to a couple of major chemical companies, and they have agreed. They're not endorsing, but they have agreed that this is a worthwhile venture. And we appreciate their cooperation and we look forward to having them here at another time.

I would like now to introduce the first Panel. And that Panel consists of Administrator Lisa Jackson. Administrator Jackson did an outstanding job as head of New Jersey's

Department of Environmental Protection. And she's rededicated EPA to its core mission of protecting human health and the environment. She's done a wonderful job. And I'll tell you, when you hear Ms. Jackson, and the logic and the knowledge that she brings to subjects -- and I want to tell you, don't get in her way when she's out to do something that's positive and good. And I've seen them beat on her. And I've seen her just sit there steady and have them melt away because her discourse is so refine and intelligent.

So, Administrator Jackson, welcome.

And please begin your testimony. We look forward to hearing you.

ADMINISTRATOR JACKSON: Well, thank you so much, Mr. Chairman. And let me just begin by saying that any Committee you serve on is aptly subtitled "the Superfund Committee" because of your strong support and unwavering support for that vital law and its implementation, especially here in this beloved State of New Jersey.

Thanks for inviting me to testify on an issue that is not only an issue that is one of my main priorities at EPA, but it's also one that has serious impacts on our health and the health of our

children, the risk from toxic chemicals. And before I read the rest of my prepared statement, I'd like to acknowledge you for your leadership over the years on this issue, your dedication to the health of our children, and our grandchildren. It is clear that your legislation would move chemical safety in a very positive way for all Americans.

Also, kudos to UMDNJ and to EOHSI.

The work that happens in this state-of-the-art facility in which we sit is, quite simply, lifesaving. It is as lifesaving in its research as it is in the clinicians who are trained here. And I would especially like to thank the University for its work on establishing the risks between chemical exposure and breast cancer in this Breast Cancer Awareness Month.

Everything from our cars to the cell phones we all have in our pockets are constructed with plastics and with chemical additives. Chemicals are literally found everywhere, both in our economy and our products, as well as in our environment and our bodies. A child born in America today will grow up exposed to more chemicals than a child from any other generation in our history.

In 2005, one study found 287 different

chemicals in the umbilical cord blood of ten newborn babies, chemicals from pesticides, fast-food packaging, coal and gasoline emissions and trash incineration. Our kids are getting steady infusions of industrial chemicals before we even give them solid food.

Now, some chemicals may be risk free at the levels that they're found in our bodies and our environment. But the public is understandably concerned. They want and deserve assurance that chemicals have been assessed using the best available science and that unacceptable risks haven't been ignored. And right now, as you stated, Senator, we are failing to get this job done.

EPA's oversight of the 21st Century chemical industry is based on the 1976 Toxic Substances Control Act, or "TSCA." It was an important step forward at the time, in 1976. It was part of a number of environmental wins from the 1970s. But over the years TSCA has fallen behind the industry it was designed to regulate. It's become an inadequate tool for providing the protection against chemical risks that the public rightfully expects.

Manufacturers of existing chemicals aren't required to develop data on toxicity and

exposure that is needed to assess potential risks and to demonstrate to EPA and the public that chemicals can meet risk based safety standards.

EPA has tools to require the industry to conduct testing, but those tools are inefficient and ineffective. There are troubling gaps in the available data on widely used chemicals, chemicals that are in commerce today. Companies are claiming much of the data they do submit is confidential business information, and the full data set is not available for rigorous scientific review.

On new chemicals, companies have no legal obligation to develop new information, only to supply data that may already exist. And as with existing chemicals, the burden of proof falls on the Government, on EPA.

Manufacturers are required to show that sufficient data exists to fully assess a chemical's risk. If EPA has adequate data on known risk, then the law creates obstacles to quick and effective action.

Since 1976, EPA has issued regulation to control only five, five existing chemicals determined to present an unreasonable risk. Five from a total universe of almost 80,000 chemicals that

have been in commerce since that time.

For instance, in 1989, after years of study, EPA issued rules phasing out most uses of asbestos, an exhaustively studied substance that has taken an enormous toll on our health. The Court overturned EPA's rules because it had failed to clear the many hurdles for action under the law, under TSCA.

Today's new science, advances in toxicology and analytical chemistry, is revealing new pathways of exposures. There are subtle and troubling effects of chemicals on hormone systems, human reproduction, intellectual development, cognition and on the incidence of cancer. The President's Cancer Panel of the National Cancer Institute said in a recent report that the body of evidence linking environment exposure to cancers is growing. This includes breast cancer, where about 1.3 million women will be diagnosed with breast cancer annually worldwide, and about 465,000 will die from the disease.

As you know, this is Breast Cancer Awareness month, and in the span of this one month almost 40,000 women will die from this disease. One in eight women will be diagnosed with breast cancer

over their lifetime. And this risk, too, has increased steadily over the years.

One of the potential reasons for this is the presence of toxic chemicals in the environment and in the products that we, as women and girls -- and let's not forget young men and boys and men, who are not immune from this disease -- products we come into contact with every day.

The Breast Cancer Fund published a report this year on the linkage between breast cancer and toxic chemicals. One of their main policy recommendations is to reform the law, reform TSCA, to address chemicals of concern before they get on the market. This report strongly endorses the Bill that you introduced, Senator.

As a mother, as a woman, and as the head of the EPA, I strongly agree that we need a new law to properly address risk from chemicals. This call for change in our chemical management laws is rising from all quarters; a broad coalition of environmental advocates, unions, medical professions, and public health groups, including grassroots organizations from across the country, have come together to make the case for stronger chemicals regulation.

Industry, too, has called for action.

Chemical producers are worried, not only about facing an inconsistent patchwork of state laws, but believe they can only thrive if the public is confident that their products will meet rigorous safety standards.

It's not often that the chemical industry, the Federal Government, states, and the environmental community agree that the current system is not workable and have similar visions of how the new system should be shaped. There are certainly differences of opinion and important details to be worked out, but the common ground that exists makes me optimistic that Congress can put a new law in place that has broad support from all the major stakeholders.

EPA will do its part to make a new law reality. We announced last year a series of Obama Administration principles on how to craft a reformed law, a reformed TSCA. The Bill introduced by you, Senator Lautenberg, meshes very well with those principles. Assuring chemical safety in a rapidly changing world and restoring public confidence that EPA is protecting the American people is a top priority for me, my leadership team, and this Administration.

Again, thank you for allowing me to testify, and thank you for your hard work on this issue.

CHAIRMAN LAUTENBERG: Thank you, Madam Administrator. Always want to hear from you. And when we hear what you have to say so candidly, we're encouraged by the fact that voices like yours will be heard and that we'll move along. And I don't find as hostile a group from the industry as we heard sometime ago, because I think they're facing up to the fact that they, in their own good conscience, really want to do the right thing. And we're going to encourage that. Thank you very much. And I have some questions I'd like to ask you.

What might be the health consequences for children if we fail to change a regulatory system that currently leaves out so many untested, potentially dangerous chemicals on the market? What might entail thereafter?

ADMINISTRATOR JACKSON: Well, Senator, as you said in your opening statement, children are not little adults. They inhale more per body weight. Their brains and nervous systems are developing. The very systems of their body are developing at critical points when they are being exposed. And so there is

TESTIMONY OF
LISA JACKSON
ADMINISTRATOR
U.S. ENVIRONMENTAL PROTECTION AGENCY

BEFORE THE
SUBCOMMITTEE ON SUPERFUND, TOXICS, AND ENVIRONMENTAL
HEALTH
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
UNITED STATES SENATE

Newark, New Jersey
October 26, 2010

Good morning Senator Lautenberg. Thank you for the opportunity to be with you today to discuss the reform of chemicals management in the United States. I am pleased to be able to testify about the science on the environmental health effects from children's exposure to toxic chemicals. Ensuring chemical safety in a rapidly changing world, restoring public confidence that EPA is protecting the American people, and promoting our global leadership in chemicals management is one of my top priorities for the Agency.

I want to personally thank you, Chairman Lautenberg, as well as members of your Committee for your leadership on this very important issue and your efforts to bring about comprehensive reform of the Toxic Substances Control Act (TSCA). As you well know, the time has come to bring TSCA into the 21st Century and give the American people the protection from harmful chemicals they expect.

While chemicals have improved our lives in many ways, there are still significant scientific gaps in our understanding of the health risks of many chemicals. That's why, increasingly, the public is demanding that the government provide an assurance about the long term safety of these chemicals.

The Toxic Substances Control Act (TSCA), which was enacted in 1976, gives EPA jurisdiction over chemicals produced and used in the United States. TSCA is the only major environmental statute that has not been reauthorized. The TSCA Inventory currently contains over 84,000 chemicals, few of which have been studied for their risks to children. Unlike the laws applicable to drugs and pesticides, TSCA does not have a mandatory program where EPA must conduct a review to determine the safety of existing chemicals. In addition, TSCA places legal and procedural requirements on EPA before the Agency can request the generation and submission of health and environmental effects data on existing chemicals.

TSCA was an important step forward at the time. But over the years, not only has TSCA fallen behind the industry it is intended to regulate, it has also proven an inadequate tool for providing the protection against chemical risks that the public rightfully expects.

Ensuring that our children are protected from exposure to environmental threats is central to EPA's work. Children face greater threats from environmental pollutants than adults due to differences in their physiology, activity patterns and development. And not all children are the same: we continue to see disparities in exposures and health outcomes among the poor, African American, Latino, Native American and other ethnic minorities.¹

Children eat, drink and breathe more per pound than adults. When food, water, or air is polluted, children are exposed to more of the pollution than adults. For example, an average infant 3 months to less than 6 months old consumes approximately 2.5 times more water than an adult on a per pound basis.²

Children can have greater exposure to chemicals through behaviors that are unique to childhood, such as crawling, putting objects in their mouths, and eating nonfood items.

Children also have unique exposures, for example, through the umbilical cord and through

¹ America's Children and the Environment. U.S. Environmental Protection Agency.
<http://www.epagov/envirohealth/children/index.htm>

² Child data: 2008 Child-Specific Exposure Factors Handbook -
<http://cfpub.epa.gov/ncea/CFM/recordisplay.cfm?deid=199243#Download>
Adult data: 1997 Exposure Factors Handbook - <http://www.epa.gov/ncea/efh/pdfs/efh-chapter03.pdf>

breast milk. Their bodies are rapidly developing. Exposure to toxic chemicals during critical windows of development can lead to disease or other serious effects on organ systems.³

Children's rapid development during pregnancy and childhood may also increase their vulnerabilities to toxicants. For example, the nervous system begins to rapidly develop in the embryo only days after conception and continues to develop through puberty. Depending upon the toxicant, early exposures may have serious consequences throughout a child's life.

When TSCA was enacted, it grandfathered in, without any evaluation, all chemicals in commerce that existed in 1976. Further compounding this problem, the statute never provided adequate authority for EPA to reevaluate existing chemicals as new concerns arose or science was updated, and failed to grant EPA full and complete authority to compel companies to provide toxicity data. As a result, in the 34 years since TSCA was passed, EPA has only been able to require testing on around 200 of the 84,000 chemicals listed on the TSCA Inventory, and has regulated or banned five of these chemicals under TSCA authority.

It has also proven difficult in some cases to take action to limit or ban chemicals found to cause unreasonable risks to human health or the environment. Even if EPA has substantial data and wants to protect the public against known risks, the law creates obstacles to quick and effective regulatory action. For example, in 1989, after years of study and nearly unanimous scientific opinion about the risk, EPA issued a rule phasing out most uses of asbestos in products. Yet, a federal court overturned most of this action because the rule had failed to comply with the requirements of TSCA.

Today, advances in toxicology and analytical chemistry are revealing new pathways of exposure. There are subtle and troubling effects of many chemicals on hormone systems, human reproduction, intellectual development and cognition, particularly in young children.

³ Barr DB, Bishop A, Needham LL. 2007. Concentrations of xenobiotic chemicals in the maternal-fetal unit. *Reproductive Toxicology* 23(3): 260-6.

It is clear that in order to properly protect public health and the environment, TSCA must be updated and strengthened, including providing the appropriate tools to protect the American people from exposure to harmful chemicals.

Last September, I announced a set of principles that articulate the Administration's goals for updating TSCA that would enable EPA to expeditiously target chemicals of concern and promptly assess and regulate new and existing chemicals.⁴ I also announced that while the legislative reform process is underway, EPA intends to take steps to enhance its current chemical management program.⁵ As part of this effort, EPA has developed a number of action plans that communicate the Agency's initial review of readily available use, exposure, and hazard information on a select number of chemicals, outline the Agency's concerns with the chemicals, and identify the steps EPA is considering to address those concerns. We are also taking steps to increase the public's access to chemical information that is provided to the Agency. This has included greater web access to a wider range of chemical information and implementing a series of steps to reduce claims of confidentiality, while recognizing that there can be legitimate business needs to protect information on chemicals.

As previously mentioned, the Administration has released a set of principles for TSCA reform that I would like to briefly highlight:

First, chemicals should be reviewed against safety standards that are based on sound science and reflect risk-based criteria protective of human health and the environment. EPA should have the clear authority to establish safety standards based on risk assessments, while recognizing the need to assess and manage risk in the face of uncertainty.

Second, the responsibility for providing adequate health and safety information should rest on industry. Manufacturers must develop and submit the hazard, use, and exposure data demonstrating that new and existing chemicals are safe. If industry doesn't provide the information, EPA should have the necessary tools to quickly and efficiently require testing,

⁴ <http://www.epa.gov/opptintr/existingchemicals/pubs/principles.pdf> and attached as an appendix.

⁵ <http://www.epa.gov/oppt/existingchemicals/pubs/Existing.Chem.Fact.sheet.pdf>

or obtain other information from manufacturers that are relevant to determining the safety of chemicals, without the delays and obstacles currently in place, or excessive claims of confidential business information.

Third, EPA should have clear authority to take risk management actions when chemicals do not meet the safety standard, with flexibility to take into account a range of considerations, including children's health, economic costs, social benefits, and equity concerns. Both EPA and industry must include special consideration for exposures and effects on groups with higher vulnerabilities – particularly children. For example, children ingest chemicals at a higher ratio relative to their body weight than adults, and are more susceptible to long-term damage and developmental problems.

Fourth, EPA should have clear authority to set priorities for conducting safety reviews on existing chemicals based on relevant risk and exposure considerations. In all cases, EPA and chemical producers must act on priority chemicals in a timely manner, with firm deadlines to maintain accountability. This will not only assure prompt protection of health and the environment, but provide business with the certainty that it needs for planning and investment.

Fifth, we must encourage innovation in green chemistry, and support research, education, recognition, and other strategies that will lead us down the road to safer and more sustainable chemicals and processes. All of this must happen with the utmost transparency and concern for the public's right to know.

Finally, implementation of the law should be adequately and consistently funded, in order to meet the goal of assuring the safety of chemicals, and to maintain public confidence that EPA is meeting that goal. To that end, manufacturers of chemicals should support the costs of Agency implementation, including the review of information provided by manufacturers.

Mr. Chairman, TSCA needs to move toward the vision embodied in these principles. We should require that all chemicals be reviewed against a safety standard based on sound

science and that reflects risk based criteria protective of human health and the environment, including the health of children and other vulnerable populations. We should squarely place the burden on industry to provide data to demonstrate that chemicals are safe. Legislative reform should give EPA significantly greater authority to require any data necessary to assess the safety of chemicals and to quickly take action on chemicals which cause harm. The substantial increase in information available on toxic chemicals would vastly improve the understanding of chemical risks and greatly enable government and the public to make better informed decisions about the chemicals that are in the products we use daily. These key elements represent a significant change in the approach the U.S. has historically taken in regulating chemicals and would substantially update and modernize TSCA.

Further, legislative reform of TSCA should address a number of other areas the Administration believes are important in modernizing this nation's chemicals management efforts, such as encouraging the development and use of green chemistry and adoption of safer alternatives. It should impose stricter requirements for assertion of confidentiality claims while allowing the sharing of critical data – with appropriate safeguards – with state governments also regulating chemicals.

Mr. Chairman, we are most appreciative of your efforts to help us bring TSCA into the 21st Century and we look forward to continuing to work with you and your Committee as you move forward. I would be happy to answer any questions you may have.

APPENDIX: Essential Principles for Reform of Chemicals Management Legislation

The U.S. Environmental Protection Agency (EPA) is committed to working with the Congress, members of the public, the environmental community, and the chemical industry to reauthorize the Toxic Substances Control Act (TSCA). The Administration believes it is important to work together to quickly modernize and strengthen the tools available in TSCA to increase confidence that chemicals used in commerce, which are vital to our Nation's economy, are safe and do not endanger the public health and welfare of consumers, workers, and especially sensitive sub-populations such as children, or the environment.

The following Essential Principles for Reform of Chemicals Management Legislation (Principles) are provided to help inform efforts underway in this Congress to reauthorize and significantly strengthen the effectiveness of TSCA. These Principles present Administration goals for updated legislation that will give EPA the mechanisms and authorities to expeditiously target chemicals of concern and promptly assess and regulate new and existing chemicals.

Principle No. 1: Chemicals Should Be Reviewed Against Safety Standards That Are Based on Sound Science and Reflect Risk-based Criteria Protective of Human Health and the Environment.

EPA should have clear authority to establish safety standards that are based on scientific risk assessments. Sound science should be the basis for the assessment of chemical risks, while recognizing the need to assess and manage risk in the face of uncertainty.

Principle No. 2: Manufacturers Should Provide EPA With the Necessary Information to Conclude That New and Existing Chemicals Are Safe and Do Not Endanger Public Health or the Environment.

Manufacturers should be required to provide sufficient hazard, exposure, and use data for a chemical to support a determination by the Agency that the chemical meets the safety

standard. Exposure and hazard assessments from manufacturers should be required to include a thorough review of the chemical's risks to sensitive subpopulations.

Where manufacturers do not submit sufficient information, EPA should have the necessary authority and tools, such as data call in, to quickly and efficiently require testing or obtain other information from manufacturers that is relevant to determining the safety of chemicals. EPA should also be provided the necessary authority to efficiently follow up on chemicals which have been previously assessed (e.g., requiring additional data or testing, or taking action to reduce risk) if there is a change which may affect safety, such as increased production volume, new uses or new information on potential hazards or exposures. EPA's authority to require submission of use and exposure information should extend to downstream processors and users of chemicals.

Principle No. 3: Risk Management Decisions Should Take into Account Sensitive Subpopulations, Cost, Availability of Substitutes and Other Relevant Considerations

EPA should have clear authority to take risk management actions when chemicals do not meet the safety standard, with flexibility to take into account a range of considerations, including children's health, economic costs, social benefits, and equity concerns.

Principle No. 4: Manufacturers and EPA Should Assess and Act on Priority Chemicals, Both Existing and New, in a Timely Manner

EPA should have authority to set priorities for conducting safety reviews on existing chemicals based on relevant risk and exposure considerations. Clear, enforceable and practicable deadlines applicable to the Agency and industry should be set for completion of chemical reviews, in particular those that might impact sensitive sub-populations

Principle No. 5: Green Chemistry Should Be Encouraged and Provisions Assuring Transparency and Public Access to Information Should Be Strengthened

The design of safer and more sustainable chemicals, processes, and products should be encouraged and supported through research, education, recognition, and other means. The goal of these efforts should be to increase the design, manufacture, and use of lower risk, more energy efficient and sustainable chemical products and processes.

TSCA reform should include stricter requirements for a manufacturer's claim of Confidential Business Information (CBI). Manufacturers should be required to substantiate their claims of confidentiality. Data relevant to health and safety should not be claimed or otherwise treated as CBI. EPA should be able to negotiate with other governments (local, state, and foreign) on appropriate sharing of CBI with the necessary protections, when necessary to protect public health and safety.

Principle No. 6: EPA Should Be Given a Sustained Source of Funding for Implementation

Implementation of the law should be adequately and consistently funded, in order to meet the goal of assuring the safety of chemicals, and to maintain public confidence that EPA is meeting that goal. To that end, manufacturers of chemicals should support the costs of Agency implementation, including the review of information provided by manufacturers.

**Questions for the Record, Questions for Administrator Jackson
TSCA Field Hearing**

Questions from:
Senator Barbara Boxer

I. The Benefits of Strengthening the Public's Right to Know About Dangerous Chemicals

A. Does the Agency support greater public transparency on chemical risk management decisions?

Response: EPA is committed to providing the public with greater access to chemical information and over the last 18 months has taken a number of significant actions to increase transparency. These efforts include new policies to limit claims for confidentiality on critical health and safety data, increased and easier web access to a wide range of chemical-specific information (including the Chemical Access Data Tool, a searchable data base), and working with the U.S. chemical industry to reduce confidentiality claims that are overly broad or no longer needed to protect business needs. These actions will also provide the public with a greater understanding of the chemicals on which EPA is taking action.

Also, as the Administration's principles for legislative reform indicate, provisions assuring transparency and public access to information should be strengthened. Specifically, TSCA reform should include stricter requirements for a manufacturer's claim of Confidential Business Information (CBI) and manufacturers should be required to substantiate their claims of confidentiality. Also, data relevant to health and safety should not be claimed or otherwise treated as CBI. Finally, EPA should be able to negotiate with other governments (local, state, and foreign) on appropriate sharing of CBI with the necessary protections, when necessary to protect public health and safety.

B. If so, what are the potential benefits to consumers, responsible chemical manufactures, protections for the health of pregnant women and children and others that the Agency foresees from such transparency?

Response: A substantial increase in information available on toxic chemicals could provide the public with a greater understanding of the chemicals on which EPA is taking action, and help enable State, tribal and local governments and the public to make better informed decisions about the chemicals that are in the products consumers use daily. Manufacturers have an important interest in ensuring public confidence both in the regulation of chemicals and in the safety of their products, as well as continuing innovation in the development and use of safer alternatives. As part of EPA's efforts to increase the public's access to chemical information, EPA has taken a series of significant steps over the past 18 months to empower the public with greater access to critical information on the chemicals manufactured and used in this country. Additional information on these actions can be found at: <http://www.epa.gov/oppt/existingchemicals/pubs/transparency.html>.

2. The Benefits of Straightforward Safety Information from Chemical Manufacturers

- A. Does the Agency support manufacturers providing straightforward information that demonstrates their chemicals are safe when used by families, in schools and workplaces and in other settings in our country?

Response: Yes, as stated in the Administration principles on TSCA Reform, EPA believes the responsibility to provide adequate health and safety information should rest on industry. EPA believes manufacturers should be required to develop and submit the hazard, use, and exposure data demonstrating that new and existing chemicals are safe. If industry doesn't provide the information, EPA believes it should have the necessary tools to quickly and efficiently require testing, or obtain other information from manufacturers that are relevant to determining the safety of chemicals.

- B. If so, what are the potential benefits to consumers, responsible chemical manufactures, protections for the health of pregnant women and children and others that the Agency foresees from such straightforward information?

Response: A substantial increase in information available on toxic chemicals could improve the understanding of chemical risks and greatly enable government and the public to make better informed decisions about the chemicals that are in the products consumers use daily. Manufacturers have an important interest in ensuring public confidence both in the regulation of chemicals and in the safety of their products, as well as continuing innovation in the development and use of safer alternatives.

- C. The European Union is currently implementing its modernization of safeguards that are designed to protect public health from dangerous chemicals, including requiring chemical manufacturers and downstream users of such chemicals to provide information on such chemicals.

- I. Is the Agency fully briefed the E.U. activities?

Response: Yes. In fact, EPA and the European Chemicals Agency (ECHA) recently signed a Statement of Intent designed to enhance technical implementation of each country's chemicals management programs by sharing information, approaches, and experience.

- II. Will the Agency have access to the information that the E.U. is collecting?

Response: According to the EU's Registration Evaluation and Authorization of Chemicals (REACH) Regulation, the European Community's regulation on chemicals and their safe use, much of the information that ECHA receives will be publicly available. There is also a mechanism under REACH for the disclosure of confidential information. EPA will explore how the Agency can utilize this mechanism.

- III. If EPA will have such access, will the Agency be able to use that information, and to share information relevant to protecting human health and environmental quality with state and local governments and individuals who work to protect public health?

Response: EPA will be able to use the information provided by ECHA or otherwise available under REACH. EPA's ability to share the information with state and local governments and other individuals will have to be determined on a case-by-case basis, depending on whether the information is claimed confidential, and the application of U.S. confidentiality laws to any such claims.

3. High Costs and Inefficiencies of Current Chemical Regulation Authorities

- A. What administrative burdens and costs, including costs borne by U.S. taxpayers, does the Corrosion Proof Fittings v. EPA court decision raise to EPA's ability to restrict the production and use of chemicals that present risks to public health?

Response: EPA has previously stated that the agency believes it has proven difficult in some cases to exercise the full scope of its discretion to limit or ban chemicals found to cause unreasonable risks to human health or the environment. Even if EPA has substantial data and wants to protect the public against known risks, EPA believes TSCA creates obstacles to quick and effective regulatory actions. The chief significance of the Corrosion Proof Fittings case consists of the court's interpretation of the analytical requirements to issue a chemical control rule under section 6 of TSCA. Since section 6 is the most significant mechanism to mitigate risk under TSCA, the court's interpretation has programmatic ramifications that extend well beyond the case's immediate impact on the Agency's ability to regulate asbestos. Specifically, the court reviewed EPA's cost-benefit analysis in light of the statutory requirement under TSCA section 6 that EPA seek the least burdensome regulation..

Senator James M. Inhofe

1. During the hearing, you discussed some of the benefits of TSCA reform, which you said would in some cases be felt immediately. Has EPA examined the potential negative economic impacts of reform from the increased burden of minimum data requirements, costs and difficulties of product and chemical replacement, and unintended consequences associated with replacement chemicals?

Response: EPA has not done an economic analysis of proposed legislation. We believe, however, that an appropriate balance can be achieved between the economic impacts and the need to ensure the American public that the chemicals they and their families are exposed to are safe. In fact, a credible Federal program will increase consumer confidence and encourage firms that innovate to produce safer products.

2. In your written testimony, you complain that "TSCA does not have a mandatory program where EPA must conduct a review to determine the safety of existing chemicals." Yet if EPA had a mandatory program for every chemical in commercial use, would you agree that such a program could impose serious economic impacts, massive administrative burdens, without providing meaningful public health benefits or environmental gains?

Response: EPA recognizes that prioritization will be an important element of a reformed chemicals management program. Conducting a comprehensive safety assessment on all

chemicals listed on the TSCA inventory would be challenging, even with increased resources. It will be necessary for new legislation to provide EPA with sustained resources and flexibility in determining what factors should be considered in prioritizing chemicals for review and to take into account a range of considerations, including children's health, economic costs, social benefits, and equity concerns.

3. During your tenure you have said that evaluating the safety of chemicals should be based on risk, meaning a combination of the toxicity of a chemical and exposure. Given that statement, why is the agency spending its limited resources on BP A, a chemical with very low exposure to humans?

Response: In January, 2010, the U.S. Food and Drug Administration (FDA) announced that it has some concerns about the potential human health impacts of bisphenol A (BPA) and has additional studies underway to more fully understand those concerns. While these studies are underway, EPA is focusing its efforts on the environmental concerns associated with the potential effects of BPA in aquatic species. This may include testing or monitoring data in the vicinity of landfills, manufacturing facilities, or similar locations to determine the potential for BPA to enter the environment at levels of potential concern for human and environmental exposures. On March 29, 2010, EPA released an action plan on BPA that outlines a range of actions that EPA is considering to address these potential environmental concerns. The action plan can be found at <http://www.epa.gov/opptintr/existingchemicals/pubs/actionplans/bpa.html>.

4. Considering EPA has acknowledged it (probably) lacks the resources necessary to study chemicals already scheduled for new assessments, why has the agency now chosen to seek nominations for new risk studies for the agency's IRIS database? What is the projected timetable for assessing newly nominated chemicals when the agency cannot complete the currently scheduled risk assessments?

Response: The Federal Register notice that EPA published on October 18, 2010 requesting nominations from the public for substances to be considered for an assessment or reassessment in the IRIS Program is an important outreach to the public that is conducted by the Agency on a regular basis. It illustrates EPA's commitment to public participation and EPA's responsiveness to the needs of the public in helping to shape the IRIS agenda. While there are approximately 70 assessments currently underway in the IRIS program, any nominations that are submitted as a result of this public outreach will be evaluated for inclusion in the 2011 agenda. The chemical assessment nominations selected will go into the IRIS assessment queue or pipeline as other assessments are completed and posted on the IRIS Web site. This past fiscal year ten completed assessments were posted on IRIS. It is essential to plan for the development of IRIS assessments several years in advance to ensure a continuous pipeline of assessments in the IRIS program.

5. EPA is currently "holding" four pending IRIS assessments and "reviewing" two published assessments in part because of questions of scientific integrity. In the event that the agency's chemical workload increases significantly over time, how would it ensure that it utilizes the best available science?

Response: On June 15, 2010 EPA issued the press release, 'EPA Places Four IRIS Assessments on Hold Pending Review' referring to the assessments for methanol, MTBE, ETBE and acrylonitrile. The release stated, "EPA is holding these assessments due to a report from the National Toxicology Program (NTP) that outlines a recent review of a research study completed by the Ramazzini Institute, a lab in Italy that conducts animal testing to evaluate the potential cancer-causing effects of chemicals. The report discusses findings from a recent assessment by NTP pathologists of an animal study on methanol. NTP's report recommends that further pathology reviews be carried out to resolve differences of opinion between NTP scientists and the Ramazzini Institute in the diagnoses of certain cancers reported in the study. Out of an abundance of caution and to ensure the agency's chemical assessments are grounded in the soundest possible science, EPA undertook a thorough review of all ongoing and previous chemical assessments to determine which, if any, relied substantially on cancer testing from the Ramazzini Institute."

It is anticipated that the number and type of health assessments for chemical contaminants will increase with time as indicated. The Agency will continue to evaluate relevant data prior to its use in IRIS health assessments to ensure the highest degree of scientific integrity. The IRIS Program relies on the expertise of scientists from within the program and across the Agency to evaluate the available scientific literature and conducts rigorous expert peer reviews to obtain an independent evaluation of the scientific work of the Agency.
<http://yosemite.epa.gov/opa/admpress.nsf/03dd877d6f1726c28525735900404443/b64d44f06a56d5b285257742007c5002!OpenDocument>.

6. Proponents of TSCA reform point to EPA's experience with asbestos as justification for advancing TSCA reform legislation. The U.S. Fifth Circuit Court of Appeals in the *Corrosion Proof Fittings v. Environmental Protection Agency* did not hold that asbestos could not be regulated under TSCA. Do you agree with that interpretation of the court's ruling?
 - A. Is it correct that the court also did not overturn EPA's total ban on asbestos, that it simply issued an order to vacate and remand the rule to EPA for further review?
 - B. The court found that EPA failed to give proper notice of methodology in adopting analogous exposure estimates during the final weeks of the rulemaking process after public comment was concluded, and that EPA denied cross-examination of some of its witnesses. Do you believe that giving proper notice for an informed comment period and allowing cross-examination of witnesses is important protocol for EPA to follow?
 - C. Do you agree that the decision did not prohibit EPA from going back and attempting to correct the errors in the rule-making that the court identified?
 - D. Is it your view that EPA's decision not to re-propose the asbestos rule was an agency policy decision, and not one ordered by the court?

Response: While the court in the Corrosion Proof Fittings case did not order EPA not to re-propose an across-the-board ban of asbestos, EPA believes the court's reasoning altered the legal landscape regarding the type and quantity of analysis necessary to support a rulemaking under section 6 of TSCA. The chief significance of the Corrosion Proof Fittings case consists of the court's interpretation of the analytical requirements to issue a chemical

control rule under section 6. Since section 6 is the most significant mechanism to mitigate risk under TSCA, the court's interpretation has programmatic ramifications that extend well beyond the case's immediate impact on the Agency's ability to regulate asbestos.

Specifically, the court reviewed EPA's cost-benefit analysis in light of the statutory requirement under TSCA section 6 that EPA seek the least burdensome regulation. Asbestos remains subject to TSCA jurisdiction. The rule, however, was vacated in substantial part on the court's finding that "before it [EPA] impose a ban on a product, it first evaluate and then reject the less burdensome alternatives laid out for it by Congress" overturning those portions of the rule to which the vacatur applied. Other portions of the rule were not vacated and remain in effect, including the ban on new uses of asbestos.

The court also faulted the Agency on two purely procedural issues: the adequacy of public notice of the rulemaking and the availability of witness cross-examination in hearings associated with the rulemaking. EPA is committed to following all necessary procedural requirements associated with regulatory actions such as those mandated in the Administrative Procedure Act and various Executive Orders. Likewise, in the case of administrative hearings, EPA agrees that parties to a proceeding must be afforded the full range of procedural rights specified under governing law.

a need for more research to understand all the linkages. But everything we know tells us that everything from effects on IQ to effects, potentially toxic effects with end points like cancer or other diseases that we're just beginning to understand, are possible for our children.

And that's not said to scare us, but to make us aware that we know less than we should. And if we don't know, we need to do something to insure we get additional information, but also regulate in a manner that protects the most vulnerable among us.

CHAIRMAN LAUTENBERG: How long might it take -- assuming that we get good response from colleagues, and that we can establish a Bill or a law, how long might it take before we begin to see a positive influence from these changes? Is that something we can speculate on for a little time because the fact is that children are at risk. And the days when I was born, and I was born after the century was founded, after the country was established. Surprise for some.

But the fact of the matter is, that when the days of counting fingers and toes and saying you've got a healthy baby are largely passed. And

there is the period of time that it takes to evaluate the health of a child, sometimes as long as a year or two even.

So if we could get something started, start looking at these companies, would it take lots of years for it to begin to be felt, or has the exposure period, can it be cut so sharply that it would make a difference and get these things done before they turn into a problem?

ADMINISTRATOR JACKSON: You know, I think there's several opportunities. I don't know that we'll ever be able to ease the burden on a family that's asking the "why" question now. But as you point out, and as you know, being the superb public policy maker you are, one of the benefits of this law is that it would send a clear signal to industry that the burden has now shifted to them to insure that the products that we use, the chemicals they bring in or manufacture, are safe, simply safe. And that, I think, would be a sea change that would have impacts in the private sector quite quickly. And we absolutely must get started. There's also an opportunity, your Bill does some of this, to prioritize the chemicals that we believe are either most prevalent or most likely to be at risk,

the ones that are the biggest question marks.

And so while, you know, to be honest, to go through 80,000 chemicals will take a while. My belief is that the benefits will start to be felt almost immediately upon passage of a law because the private sector will understand how important it is for them to have a safe --

CHAIRMAN LAUTENBERG: Let me put something to you in a little different way. Is it possible that as we discover what kinds of threats some of these chemicals bring, is it possible that we can, therefore -- and, Dr. Sanjay Gupta may want to give us a nod on this -- is it possible that antidotes can be found for those who have already been exposed, and through the knowledge that we get in a review of a particular product, say, hey, look, here's something that counteracts or can counteract that which has been in use and already present in the body?

ADMINISTRATOR JACKSON: Well, I'm not a clinician, so I will defer to Dr. Gupta and others who might be able to speak to that. I do think that the knowledge is not acceptable. When you learn about a chemical, you also learn and establish the connection in terms of what it can do to adults and

to children. Then that is a valuable information that will help us in designing interventions. And certainly that's happened with some of the more well-known interventions like lead poisoning and others, but I'll defer to the folks who know.

CHAIRMAN LAUTENBERG: Dr. Gupta, do you want to comment?

DR. GUPTA: I think it's safe to say a couple things. First of all, when you talk about observations over time --

CHAIRMAN LAUTENBERG: That's my distinguished Congressional fellow, representative, Donald. I'm sorry.

CONGRESSMAN PAYNE: Payne.

CHAIRMAN LAUTENBERG: Talk about forgetfulness.

DR. GUPTA: I think I would just say a couple things quickly. One is, when you talk about observational studies. If you have this concern about exposures to certain toxic chemicals causing problems, some of the ones you mentioned, some of the ones Administrator Jackson mentioned, neurodegenerative problems, cancer, there was an article today in The New York Times about obesity even possibly being linked to this.

When you start to withdraw some of those chemicals and the rates of those diseases go down, you do have some answers. As far as interventions go, what you're describing is exactly how science moves. The more that we learn about something, the more able and likely we are to develop some sort of target within whatever disease process it is. So we never know exactly where that learning is going to come from, but this is certainly part of that whole process.

CHAIRMAN LAUTENBERG: Thank you.

And my recollection of Dr. Donald Payne, with whom I've served such a long time, and who is so devoted to not only the people in his direct district, but he's traveled the world over in helping people, particularly in Africa and Asia as well, to try and gain some footing on better health and better standards.

So, Donald, Congressman Payne, I'm sorry that we didn't say hello sooner.

Ms. Jackson, the exposure to toxic chemicals has been linked to a wide range of diseases, lower IQ's, birth defects, and yet opponents of Government regulation often point to the economic concerns. Are there ways that chemical

safety reform might actually save money for businesses and individuals?

ADMINISTRATOR JACKSON: Absolutely, sir. For individuals, this is about healthcare costs, the ones we can count in dollars and cents and, of course, the ones you mentioned earlier, the emotional and other tolls that it takes on a family in dealing with any illness, whether it's a child or an adult. And what we find, the reason industry is interested in continuing this conversation and see it come to fruition in the form of a new law is that the innovation and ingenuity so evident here in New Jersey, so evident in our chemical industry and our pharmaceutical industry, needs certainty, needs to know what the rules of the road will be in terms of chemicals, not only in this country, but in a global economy.

There are other nations. Western Europe is increasingly concerned about the risk from toxic chemicals and taking actions to deal with them. We are behind. But we can catch up and once again give our industries a world standard that would allow them to make money because they would have certainty. There are places we disagree, but I think that is the impetus that brings the private sector and the public

sector and the public to this table.

CHAIRMAN LAUTENBERG: We know that there is awareness that there are inherently safer materials that can very efficiently substitute for those that have fairly high toxicity. So they ought to be able to save money and ought to be able to save risk. Because today individuals are suing these chemical companies, and it's a costly thing for them, and it also produces very little benefit to our people.

Last month, Ms. Jackson, Canada added the chemical known as BPA to its list of toxic chemicals because of that chemical's ability to disrupt childhood development. That gives Canada the power to take steps to start limiting exposure to BPA.

Do our chemicals safety laws allow you to be as aggressive as Canada might be in protecting children from chemicals like BPA? And how dangerous is BPA?

ADMINISTRATOR JACKSON: Well, there is some potentially very serious impacts from BPA. Certainly not all of the science is there, but Canada felt they had enough to act. And in this country it's important for people to understand that, in the

alphabet soup of agencies, BPA is mainly found, their concerns are in products like baby bottles or cans that are coming into contact with food. And so the regulatory jurisdiction is primarily with the FDA, the Food and Drug Administration.

EPA has outlined some important areas where we believe we have a role to play with respect to BPA. And that means working to identify and deploy alternatives, listing BPA on the "Chemicals of Concern" list that puts the manufacturers on notice that this is a chemical that's likely to see additional regulations in the future. That's an authority EPA has never used before, because we're committed to using the TSCA we have, the law we have, as well as we can and effectively as we can, realizing that it is a flawed law.

We'll do environmental toxicity testing because BPA is showing up in our environment and having impacts in our larger environment, and in our, as well as in our bodies. And I think, just to end where I was before, I do think that we are disadvantaged with the current law that we have, as opposed to, not only other countries, but some other states, who are beginning to take actions on their own in order to protect their citizens. That, too,

creates a very unlevel playing field for industry, in addition to the risk of legal action that you mentioned.

CHAIRMAN LAUTENBERG: Thank you.

One last thing. The New York Times recently reported that China has been stealing secrets from American chemical companies. As we try to reform TSCA in a way that provides the public with information on the safety of chemicals, while protecting information that's critical to the American chemical industry, protection of their products and so forth.

Do we put our companies at a disadvantage, do you see, if we go ahead and bring the information public and bring it to the public need?

ADMINISTRATOR JACKSON: Well, I think the larger question is also how do we balance the advantage of letting our scientists and our public know.

CHAIRMAN LAUTENBERG: Hear, hear.

ADMINISTRATOR JACKSON: Know, just the Right-to-Know. And I shouldn't, have to even mention that in front of someone who shows such leadership issues, sir. But the Right-to-Know. We

have to balance that with what I think are some legitimate, but fairly narrow concerns about our competitiveness. And I don't think they're not real. I think the industry is right to certainly point them out.

What I think we need to do is realize that in the past many in the private sector, many industries have an unfortunate record of claiming a broad array of information as confidential, even their address. They've misused the confidentiality that was in the law intended to help them remain competitive and they've used it in a way that has unfortunately meant that the only people who are disadvantaged are the public, who cannot see the information, and our scientists, who would like to be able to see it.

So I think it's a consideration for a new law, and one that's valid, but I don't think we should weigh it so heavily as to disadvantage ourselves or, as you said, tie our hands behind our back and try to deal with this issue.

CHAIRMAN LAUTENBERG: Yeah. I think we ought to make a commitment to the companies that are operating in our country that we're not going to relent on protecting the patent rights or the

discovery rights at all of products that we develop.

On the other hand, is it fair to say that if a product without theft, or without involvement in developing a disguise for package for a product made in America, that we will insist that if a product is made, whether it's made in China or France or anyplace, that can help our children have healthier lives, we are going to try to bring that product here, if we don't have something here that is as beneficial.

Our mission is take care of our kids, that's what we want to do. And we don't want our companies to be disadvantaged in that process.

And I thank you very much, Ms. Jackson, and your able assistant, who came from my staff. I thought he was well-trained. And I think Ms. Jackson has him attending night school. But he's learning very quickly. Thank you.

ADMINISTRATOR JACKSON: Well, Senator, thanks for allowing me to be here. And let me commend you on the extraordinary panel you've put together next. Thank you.

CHAIRMAN LAUTENBERG: Thank you.

Now, the second panel. Dr. Gupta, are we going to be able to -- I think it's better if the

next panelists please come up here to this desk. If you can make a leap.

Ms. Lisa Huguenin and Dr. Steven Marcus, Dr. Frederica Perera, if you could all join us at the front desk, please.

Well, I want to welcome you, second Panel. And though our Ranking Member, Senator Inhofe, of the full Committee and the Subcommittee, wanted to be here, but he apologizes that he couldn't be. And I mentioned before the distinguished panel that we have here. And I'll start with Dr. Sanjay Gupta. He's Chief Medical Correspondent at CNN.

Dr. Gupta has become an icon for concern, concern with a voice that is being listened to by millions across the world. And he has gone through the trial and travail of being in places in the world where he can do some good for the health of the people living there, particularly focused on children. And he had a program on "Toxic America" that was astounding, it was just wonderful to see, and I think got the attention of people across this country of ours.

Dr. Gupta was in Atlanta, Georgia yesterday, recently in Haiti. And more than one time in Haiti. And the war zone and doing what he could

to help repair the damage that soldiers sustained and trying to protect them in whatever way possible. And we're honored and deeply appreciative that you took the time to be with us today.

Ms. Lisa Huguenin. Ms. Huguenin has a Ph.D. from Rutgers, and the University of Medicine and Dentistry of New Jersey, and is the mother of an eight-year-old son, who I'm sure she'll talk about.

Dr. Steven Marcus, Executive and Medical Director of the New Jersey Poison Information and Education System, and a Professor here at UMDNJ. We thank you for being here.

Dr. Frederica Perera. She's the Director of the Columbia Center for Children's Environmental Health, a prolific researcher.

And each one of you brings a special quality to this hearing of ours, and I am grateful to you. And I would ask Senator -- Senator Gupta, how about that.

DR. GUPTA: That was quick.

CHAIRMAN LAUTENBERG: Well, you don't live in my area anyway. Anyway, Dr. Gupta, we welcome you. And, once again, thank you for being here with us. Please give us your testimony and tell us what you think.

DR. GUPTA: Thank you very much, Mr. Chairman. Well, it's an honor to be here. And I want to start off by saying, I am particularly honored because I think I care so deeply about the same things that you care about. And it's part of the reason I just was excited to be able to come here and share some of my thoughts.

As you mentioned, I am a practicing neurosurgeon. I'm also a reporter. But I'm also a father of three young girls. And I can tell you the topic of toxic chemicals and the interplay with children's health is very important to me for all of those reasons.

While I'm not a toxicologist by training, nor a chemist, as a reporter I was part of this year-long investigation into this exact issue. And I have to tell you, as someone who has studied the scientific method his entire life, what I found was pretty eye-opening for me in lots of different ways.

At the start, for example, in one of our specials, we showed this old ad for the pesticide DDT. Now, in the late 1940s, the ad used to play in the houseware sections of department stores. And the part of the ad used to say that this is "harmless to

animals and humans." In fact, you had a cheerful housewife sort of spraying the chemical all around the house, under the couch, into the kids' rooms, next to the barbecue. She even would spray the dog in certain situations. At the time, DDT was seen as this great convenience, a safe way to get rid of those annoying bugs, as the ad said.

Now, of course we know better and DDT is banned in this country. I bring it up as a way of pointing out that, as science moves forward, we get a better understanding of risks. We often find out that chemicals we thought were harmless are not as safe as imagined. And one of the best examples I think everybody here knows about is lead.

Back in the 1970s, the Centers for Disease Control sent a pair of young investigators to El Paso. The CDC wanted them to look into a simple issue, whether the tons of lead coming from the smelters were causing harm to children in the area.

Now, at the time, the way people really thought about lead poisoning, best I can understand, was that it was an all-or-nothing sort of thing. Either you were lead-poisoned or you were not. Dr. Phillip Landrigan, who you mentioned, Mr. Chairman, and his colleague Stephen Gehlbach

found children close to the smelter were lead-poisoned. That's what they expected to see. They had vomiting. They had muscle weakness. They had convulsions. They had terrible symptoms of lead poisoning.

But what they found, something else, was slightly unexpected. Children further, away exposed to much smaller levels of lead, were affected, as well. Now, their symptoms weren't so obvious, that their parents took their children to the doctor, but we know that lead exposure has a profound, life-long effect on these kids, leading to all sorts of neurodegenerative problems, a whole range of damage to the brain and the nervous system.

And it comes back to the same point. If those adults now, who were children at the time, had only known then what they know now. We all know that no amount of lead is completely safe.

I, like you, am not here to say that all chemicals are bad in all circumstances. You can even make a case that DDT, for example, had a significant role in preventing malaria in poor, tropical countries, where malaria killed a lot of children at the time.

But I think the stories of DDT and

lead show us that what we don't know can really hurt us. And there's a lot that we don't know. That was one of the most eye-opening things, I think, as we conducted this year-long investigation. You mentioned it already, but out of the roughly 80,000 chemicals in commerce today, there's only been required testing of 200 and restrictions on just five.

I think for the average person that hears this, that knows knowing nothing about the chemical industry, those are mind boggling figures. As a dad and as a doctor, I was surprised to learn this. I assumed that the Government, that watched our organizations, I assumed that they signed off on the safety of these chemicals before they were introduced.

And time and again, when we talk to experts, really all over the country, from all different walks of our society, we started to hear the same phrase; that the chemicals in this country are "innocent until proven guilty," and the only way that they're ultimately proven guilty is by health effects turning up in people who have been exposed often years, if not decades later. As you said, Mr. Chairman, that kind of makes us all guinea pigs.

Something else struck me during my research, as well. And that is that babies in this country are born "pre-polluted." I have a five-year-old, a three-year-old, and a one-year-old. And I was in the midst of making this documentary when one of my children was born. I learned that children are being exposed in the womb. A study of umbilical cord blood, as you mentioned, found 287 chemicals; lead, mercury, flame retardants, pesticides, dioxins, even PCBs.

Mr. Chairman, those were banned in 1979, which I think makes a point that you were asking about earlier. Research does tell us that exposures at certain levels to these chemicals can be dangerous. And I'm sure Dr. Perera is going to have a lot more to say on this, she's done some truly remarkable work in this area, looking at how a pregnant woman's exposure to airborne pollutants can affect her child - even years later.

Now, what is difficult. It's not easy to tease out how much this chemical exposure in utero poses to newborns as they enter the world. That's a significant question. There are alarming statistics about the increase in certain diseases, such as leukemia, brain tumors, asthma, autism, as you

mentioned. But proving cause and effect is going to be difficult, if not impossible.

In science, we expect absolute proof, it's a scientific method to which I was referring, but we don't always have it. The problem is 30 years from now a devastating health problem may emerge, just as we saw with lead.

As you know, Mr. Chairman, and you alluded to this, but the European Union has adopted a different standard to evaluate chemicals. We investigated this, as well. It has the acronym REACH. And the best way to describe it is more of a precautionary approach. No longer are chemicals innocent until proven guilty. The burden of showing a chemical is safe shifts in some ways from the regulator to the producer.

Now, there's concerns always when something like this is introduced about adopting a precautionary principle, concerns about a company's bottom line, concerns about stifling innovation. So we investigated that, as well. We talked to people from overseas. We talked to people from the green chemistry industry right here in this country, people who have years of experience trying to figure out how to make the same products in less toxic ways.

They told us, they seem to believe that the opposite would occur, in fact, if the precautionary principle were adopted. These green chemists seemed to say that it would spark innovation and that the industry would come up with new ways to try and create these products with fewer hazardous chemicals and emerge as profitable as ever. Just simply getting rid of the cost of disposing of a lot of the waste associated with the production of these products could be a significant cost savings.

Now, as Congress moves forward, we need to remember our children, my children, your children, your grandchildren are vulnerable to toxic chemicals. You asked about this specifically. And you're not. Children are not just small adults. They have a faster metabolism. They take in - pound for pound - more air, more water, and more food than adults. Let me expand on that a little bit more, some practical things.

Infants and toddlers spend a lot of time on the ground where dust accumulates. We know from a lot of research that we did that this dust contains all sorts of potentially toxic chemicals like flame retardants, for example, shed from our televisions and our other appliances. Young

children, because they're so close to the ground, they breathe in this dust.

I know, as a father, that kids like to put their hands in their mouths. Again, another potential significant route of exposure. Their immune systems are still developing, as Administrator Jackson mentioned. So they are not as good at getting rid of the toxic chemicals once they enter their bodies. And that means those toxic chemicals stay in their bodies longer. And if they do cause some sort of damage, their bodies aren't as good as fixing the DNA that could potentially lead to bigger problems later on.

As a neurosurgeon, I was particularly interested in one aspect of the President's Cancer Panel saying that the blood-brain barrier in children is more porous. So we have this barrier keeping things out of our brains in most adults, but in kids it's more porous; meaning, these toxins can get into the brain and cause some of the neurodegenerative problems that we're talking about. There was also this idea that we don't have as much chemical-binding proteins in our bodies at a young age, so we can't rid ourselves of those toxins earlier.

There is an issue that comes up over

and over again. It's this idea that these toxins can accumulate in our bodies over time, they can become a product of the aggregate exposure, as opposed to single exposures. I think this is an important issue. What children are exposed to as they age, the risks of those chemicals as they get older from that increased body burden, I think is something that has to be discussed as part of this from a medical and scientific level. So we need to take into account the long-term effects of these chemicals. Again, PCBs -- I was just startled by this -- showing up in umbilical cord blood, a product that was banned in 1979.

Like you, Senator, I am very interested in this particular topic, I think personally and professionally, for sure. And I'm honored to be able to be here before you and welcome any questions you might have.

CHAIRMAN LAUTENBERG: Thank you.

Thank you, Ms. Huguenin.

DR. HUGUENIN: I am very pleased to be able to be here today to provide testimony on such an important topic. My name is Lisa Huguenin. I was born and raised here in New Jersey and currently live with my family in Franklin Township. I graduated

Testimony of

**Dr. Sanjay Gupta,
CNN Chief Medical Correspondent**

**Senate Committee on Environment and Public Works
Subcommittee on Superfund, Toxics and Environmental Health**

**Field Hearing on
Risks of Toxic Chemicals to Children's Health**

October 26, 2010

Good morning. Chairman Lautenberg, Ranking Member Inhofe and Members of the Subcommittee. My name is Doctor Sanjay Gupta. I am a practicing neurosurgeon and CNN's chief medical correspondent. I'm also a father of three young girls. As a journalist and a father, I can tell you the topic of toxic chemicals and children's health is very important to me.

While I am not a toxicologist by training, nor a chemist, as CNN's chief medical correspondent, I was part of a year-long investigation into toxic chemicals and health for two hours of special programming on CNN. It was an eye-opening experience.

At the start of our *Toxic Childhood* special, we showed an old advertisement for the pesticide DDT. In the late 1940s, the ad played in the housewares section of department stores and declared DDT "harmless to animals and humans." It shows a suburban housewife cheerfully spraying the chemical around the house. She sprays under the rugs and couch cushions. Next to the barbecue. She even sprays the dog. At the time, DDT was seen as a great convenience. A safe way to get rid of those annoying bugs. Now, of course, we know better, and DDT is banned in this country.

I bring this up as a way of pointing out that as science moves forward, we get a better understanding of risks. We often find out chemicals we thought were harmless are not as safe as we imagined. Let me give you another example – lead.

Back in the 1970s, the Centers for Disease Control and Prevention sent a pair of young investigators to El Paso, Texas. The CDC wanted them to look into whether the tons of lead coming from the stacks of a lead smelter were causing harm to children in the area. At the time, lead poisoning was considered all or nothing. Either you were sickened by lead or you were fine. Dr. Philip Landrigan and his colleague Stephen Gehlbach found children close to the smelter were, in fact, poisoned. Lead exposure caused vomiting, muscle weakness and convulsions. That was no surprise. But the CDC investigators found something else. Something unexpected. Children farther away, exposed to smaller amounts of lead, were affected, too. The symptoms weren't so obvious parents took their children to the doctor. But the lead exposure had a profound, life-long affect on these kids with lower levels of exposure. There was a loss of intelligence, disruptive behavior -- a whole range of damage to the brain and nervous system.

Now, we know no amount of lead is completely safe.

I'm not here to say all chemicals are bad in all circumstances. You can even make a even case that DDT has a role in preventing malaria in poor, tropical countries where malaria kills a lot of children.

But the stories of DDT and lead show us what we don't know really can hurt us. And there are a lot of chemicals in use that we simply don't know a lot about. Out of the roughly 80,000 chemicals in commerce, the EPA has only required testing of 200 and restricted just five. As a dad and a doctor, I was surprised to learn this. I'd always assumed government watchdogs had evaluated and signed off on the safety of the chemicals we encounter in our lives.

Time and again, experts we talked to for our special said chemicals in this country are "innocent until proven guilty." And the only way they're proven guilty is by health effects turning up in people who have been exposed, often years later. That makes us all guinea pigs.

Something else struck me during my research. Babies in this country are born "pre-polluted." They are being exposed to chemicals in the womb. One study of umbilical cord blood found 287 chemicals. These chemicals include things like lead, mercury, flame retardants, pesticides, dioxins, even PCBs, which were banned in 1979. Research tells us exposure to these chemicals can be dangerous. I'm sure Dr. Perera will have a lot more to say on that. She has done some truly remarkable work looking at how a pregnant woman's exposure to airborne pollutants can affect her child – even years later.

It's not easy to tease out exactly how much risk this chemical exposure *in utero* poses to newborns as they enter the world. There are some pretty alarming statistics about the rise in such childhood diseases as leukemia, brain tumors, asthma and, of course, autism. Proving that any particular chemical exposure resulted in any one of these conditions may well be impossible. In science, we expect absolute proof, but we don't always have it. The problem is thirty years from now a devastating health problem may emerge. That's what we saw with lead.

As you know, Mr. Chairman, the European Union has adopted a different standard to evaluate chemicals. It goes by the acronym REACH and it takes a precautionary approach. No longer are chemicals innocent until proven guilty. The burden of showing a chemical is safe has shifted from the regulator to the producer. I know there has been some concern that adopting a precautionary principle here would hurt companies' bottom lines and stifle innovation. As part of our research, we spoke with very smart folks working in "green chemistry." These are chemists with many years of experience in industry who want to find new, less toxic ways of making products. They told us just the opposite would occur if we adopted the precautionary principle here. These "green chemists" say it would spark innovation. They were confident industry would find ways to make products using fewer hazardous chemicals and emerge as profitable as ever.

As Congress moves forward on this issue, we need to remember children are especially vulnerable to toxic chemicals. Children are not simply small adults. For one thing, children have a faster metabolism. They take in – pound for pound --- more air, water and food than adults.

Infants and toddlers also spend a lot of time close to the ground, where dust accumulates. And we know from research this dust can contain toxic chemicals like flame retardants, shed from our televisions and other appliances. Young children can breathe in this dust. As a father, I also know first-hand how little kids like to put their hands in their mouths. That's another potential route of exposure.

Children are more also susceptible because their immune systems are still developing. Kids are simply not as good at getting rid of toxic chemicals. That means toxic chemicals stay in their bodies longer. Also, their growing bodies are not as good at repairing damage from exposures to toxic chemicals.

There's something else. As the president's cancer panel noted in its report this year, the blood-brain barrier in children is more porous than adults, potentially exposing their developing brains to more of the harmful chemicals we all encounter in our daily lives. And, the report also noted, children have lower levels of some chemical-binding proteins "allowing more of a toxic agent to reach various organs."

Finally, we know our exposure to many chemicals accumulates over time – what's known as body burden. So what children are exposed to now can build as they age, and their risks of harm from these chemicals could rise with their body burden. So we need to take into account the long-term risks of chemical. After all, children – and the rest of us – are still being exposed to PCBs, which the government calls "probable carcinogens," and PCBs have been banned for more than 30 years.

I appreciate the committee's work looking into toxic chemicals and children's health and welcome any questions you might have.

Rutgers University and UMDNJ and I have a Ph.D. in Environmental Science and Human Exposure Assessment. But I am here today, not as a scientist, but as a mother, a concerned mother.

My story begins like a fairy tale. I met my husband while at Rutgers, and it was pretty much love at first sight. We married and moved into a lovely house on the Delaware and Raritan Canal and got a dog. A few years later we welcomed our son, Harrison, a fun loving and beautiful boy, with a fantastic smile. Harrison took his first steps at just after a year old. And his first word, bubble, was about 14 months of age. Although he wasn't a chatter box, he had about 40 or 50 words in his vocabulary, words which at about 18 months of age, began to disappear. Gone was his ability to hold a crayon and scribble. Gone was his amazing ability to kick a soccer ball and jump. Gone was his ability to say mommy and daddy. It was heart wrenching. Our son was losing skills right before our very eyes and we were helpless.

It took a little time, but Harrison was eventually diagnosed with autism at about two years of age and my world changed. My husband and I channeled our grief and our despair and did

everything we could to help our son. However, despite all our efforts, things continued to get worse. My son was experiencing severe gastrointestinal issues and was constantly sick. He began to self limit his diet and eventually stopped eating, falling rapidly from the growth charts. After seeing many specialists, we wound up here at UMDNJ's Pediatric Center for Rare and Complex Disease, where we got some answers. Not only did Harrison have autism, but he also had other problems, as well. These included, asthma, non IgE mediated food allergies, and autoimmune issues. To this day, he is unable to eat most food and gets most of his nutrition from a formula prescribed by his doctor.

Studies have shown that the conditions that my son is suffering from are increasing in prevalence. Autism alone is now occurring in one in every 94 children here in New Jersey. The number of our friends and family who have children diagnosed with autism or some related developmental delay is frightening. Autism and asthma have had many studies on them conducted regarding their prevalence and also linking them to exposure issues. Immune disorders and food allergies are also being studied in this regard as well.

The emotions I was feeling at that time are impossible to put into words. I was a person knowledgeable about the environment and exposure and I was scared that something in my son's environment could be causing this to happen. I was worried about the soap that I used to bathe him, the shampoo that I had used for his cradle cap, and the sealants that we had put on his teeth. I had worried about the fact that we had resealed our deck and that Harrison had chewed on a Thomas the Tank Engine toy that had been later recalled for lead. I worried because my father and my husband's father both worked in the chemical industry here in Newark and I wondered if "take home" exposures that my husband and I may have been exposed to when we were children somehow had affected us. I also worried that my parents' exposures prior to even us being born somehow was also affecting us.

Because of my background, I was obviously sensitive to human exposure and took great care and pride in making our home environmentally friendly and safe. Our well water is tested annually, we have a whole house water filtration system and air cleaning system. And I use environmentally friendly cleaners and paint with no

VOCs.

However, even though I make every effort to keep my home safe, I have no way of knowing if the household products that I use or the toys that my son plays with are really safe because the chemicals that make them up are not rigorously tested and there is little or no information regarding them. And if I, a person well educated in the field of human exposure to chemicals, cannot be confident that I am keeping my family safe, than neither can the average person.

I will always wonder if something in the environment contributed to Harrison's various health and developmental disorders. It is time to stop field testing chemicals on one of our most vulnerable populations, children. Please let us provide safe items for our children so another parent doesn't have to have the same concerns. And more importantly, another child's health and development is not compromised. Please enact the Safe Chemicals Act and reform TSCA. There is no longer time to waste. Every passing moment means that another child may have to suffer like Harrison.

Thank you.

CHAIRMAN LAUTENBERG: Thank you very much, Dr. Huguenin.

Now, going on to Dr. Marcus. We ask you to please give us your testimony.

Testimony for the Field hearing on Toxic Chemicals and Children's Environmental Health

October 26, 2010

By Lisa Ann Huguenin

I am very pleased to be able to be here today to provide testimony on such an important topic. My name is Lisa Huguenin. I was born and raised in New Jersey and currently live with my family in Franklin Township. I graduated Rutgers University and UMDNJ with a PhD in Environmental Science and Human Exposure Assessment. However, I stand before you today not as a scientist, but more importantly as a mother, a concerned mother.

My story begins like a fairy tale. I met my husband while at Rutgers, and it was pretty much love at first sight. We married and moved into a lovely house along the Delaware and Raritan Canal. A few years later we welcomed our son, Harrison, a fun loving and beautiful boy with a fantastic smile. Harrison took his first steps just after he turned a year old and said his first word, bubble, at about 14 months of age. Although not a chatter box, he had about 40 or 50 words in his vocabulary, words that at about 18 months of age started to disappear. Gone was his ability to hold a crayon and scribble. Gone was his amazing ability to kick a soccer ball and jump. Gone was his ability to say mommy and daddy. It was heart wrenching. Our son was losing skills before our very eyes and we were helpless.

It took a little time, but Harrison was eventually diagnosed with autism at about 2 years of age and my world changed. My husband and I channeled our grief and despair and started doing everything we could to help our child. However, despite all our efforts, things continued to get even worse. My son was experiencing severe gastrointestinal issues and was constantly sick. He began to self limit his diet and eventually stopped eating, falling rapidly off the growth charts. After seeing many specialists we ended up here at UMDNJ's Pediatric Center for Rare and Complex Disease, where we got some answers. Not only did Harrison have autism, he also had many other problems including asthma, non IgE mediated food allergy and autoimmune issues. To this day he is unable to eat most food and gets most of his nutrition from a formula prescribed by his doctor.

Studies have shown that all of the conditions my son is suffering from are increasing in prevalence. Autism alone is now occurring in 1 out of every 94 children in NJ. The number of our friends and family who have children diagnosed with autism or some related developmental delay is frightening. Not only is the autism rate a number for me

personally, it's a reality that I am able to see firsthand. Autism and asthma have had many studies conducted regarding their prevalence and also studies linking them to environmental exposures. Immune disorders and food allergy are being studied in this regard as well.

The emotions I was feeling at that time are impossible to put into words. I was a person knowledgeable about the environment and exposure and I was scared that something in my child's environment could have been causing this to happen. I worried about the soap I used to bathe my son, the shampoo I used for his cradle cap, and the sealants we put on his teeth. I worried about the fact that we recently resealed our deck and that Harrison chewed on a Thomas the Tank engine toy that eventually was recalled for lead. I worried because my father and my husband's father both worked in the chemical industry here in Newark and wondered if "take home" exposures that my husband and I may have been exposed to, when we were children, were somehow involved. I worried that maybe our parents exposures prior to our being born somehow affected us.

Because of my background, I was obviously extremely sensitive to human exposure and took great care and pride in making our home environmentally friendly and safe. Our well water is tested annually and we have whole house water and air filtration systems. I use environmentally friendly cleaners and paint with no VOCs.

However, even though I make every effort to keep my house safe, I have no way of knowing if the house hold products that I use or the toys my son plays with are really "safe" because the chemicals that make them up are not rigorously tested and there is little or no information regarding them. And if I, a person "well educated" in the field of human exposure to chemicals cannot be confident that I am keeping my family safe than neither can the average person.

I will always wonder if something in the environment contributed to Harrison's various health and developmental disorders. It is time to stop "field testing" chemicals on one of our most vulnerable populations, children. Please let us provide safe items for our children so another parent does not have to have the same concerns. And more importantly another child's health and development is not compromised. Please enact the Safe Chemicals Act and reform TSCA. There is no longer time to waste. Every passing moment means that another child may have to suffer like Harrison.

Thank you.

DR. MARCUS: Thank you, Senator Lautenberg. I feel some of my thunder has already been stolen. I will move on anyhow. I'm a pediatrician --

CHAIRMAN LAUTENBERG: You want that thunder to be good and loud.

DR. MARCUS: Well, let's deal with that. I have some answers to some of the questions that you asked, as well. But I would like to welcome you as a faculty member of New Jersey Medical School, and the Medical School family here. My particular role is the Medical Director of the Regional Poison Center.

You started talking about lead poisoning a moment ago. Lead is the "poster boy" for environmental toxins. People that know that I deal with lead poisoning, and I've treated lead poisoning in kids for the last 40 years, it's been my passion all my adult life, say to me, "Well, there's no lead poisoning anymore." I respond to them and say,

"That's nuts."

New Jersey State Senator Rice in attendance here today has been very helpful at helping move rules and regulations in the State of New Jersey. The emphasis that has to be made is primary prevention. Once a child gets lead poisoning it's too late. Once I see that child, that child is doomed. We have evidence now to suggest that there are epigenetic changes in that child already that will go on for at least two to three generations.

There are no antidotes. You asked before whether research will ever produce an antidote. We can't count on antidotes. We need to count on primary prevention. If we don't prevent diseases, if we don't prevent exposures to these chemicals and toxicants, we're doomed. We cannot depend on industry coming up with antidotes. They just don't exist. In my clinical practice of toxicology, there are less than a handful LESS of proven antidotes. So that that is not the goal.

Yes, I think we need more testing. The problem with testing is we don't know how to test. We don't know what to test. We live in a soup of environmental chemicals, as you said. We have a fish tank in

the Poison Center, and that's always been a subject of great dispute within the institution, with all toxic fish. The reason I mention it is that I control the environment in that toxic fish tank. I control what goes in there. I control what comes out of there through various manipulations of the chemicals. Those fish don't know what's going on. They are like our children. They are living in the soup that I produce. I hope I produce a nice soup for my fish. We have to find a way to control the ``soup" that our children are exposed to, that's a soup that can be quite dangerous.

When we test an individual chemical, we tend not to test it in that soup. We test it alone. We may test it with one or two other chemicals. But we rarely test them together. So that we really do have a problem with what we are going to test and what we're not going to test. There are new products coming out on the market all the time. It's difficult to know in the combination of those products what's going to affect us and not.

Science, as you said, is uncovering all kinds of interesting things. I was at a King Tut

exhibit recently and discovered that in ancient times there were
no cancers

in children. My daughter is a pediatric oncologist at NIH and she sees hundreds of children with cancers. They didn't exist thousands of years ago. And if you actually look at the timeline, they've only started existing for the last two, 200-300 years. I don't know what that really means. Does it mean that our environment is causing childhood cancers? It's tough to know.

I want to talk briefly on two other issues. One is risk communication, and the other is the future of people like myself doing pediatric medical toxicology. As far as risk communication, the public is really confused. They don't know how to deal with it. They often call the Poison Center, and many times they call after they've already been scared out of their minds and have found somebody who is treating them with X, Y, Z regimen.

The majority of those are relatively safe, the dietary, manipulation, or what have you. Sometimes these people fall into the hands of someone I call an unscrupulous practitioner, who will chelate them or do all sorts of other things. So we do have to develop a way to communicate the risk to the public. I thank Congress

for helping support the Poison Center movement. We are the recipients of about \$30 million a year. You were a cosigner of the original legislation which still lived and enhanced national ????

But that's just a small portion of what's really needed if we're going to keep the public informed. A couple of blocks from here is a Poison Center, I'd love to have you there and visit and see what kind of calls we take so you'll understand the fears of the public.

The other subject I would like to mention is the whole field of medical toxicology. I am a clinician. I am a dinosaur. Pediatricians are not going into medical toxicology. They're going into more glamorous fields. With health reform I'm hoping that we're going to change that and have more professionals taking programs, developing the expertise, where they can actually deal, clinically, with the children such as Dr. Hugnenin's and are better equipped to actually respond to those needs.

I thank you very much. I'm looking forward to your efforts and hope that we can do something to prevent illness in children and hopefully adults, too.

CHAIRMAN LAUTENBERG: Thank you very much. I was hoping that we can find places where we

Testimony October 26, 2060

Steven M Marcus, MD
Executive and Medical Director, New Jersey Poison Information & Education System
Professor, Department of Preventive Medicine and Community Health and Associate Professor,
Department of Pediatrics
New Jersey Medical School, University of Medicine and Dentistry of New Jersey

Good morning and thank you for the opportunity to speak to you. My name is Steven Marcus, I am a pediatrician and medical toxicologist by training and experience. I have been on the faculty of New Jersey Medical School of the University of Medicine and Dentistry since August of 1972. I welcome you to our campus and thank you for this opportunity to address you.

My current appointment at the New Jersey Medical School is in the Department of Preventive Medicine and Community Health and Pediatrics. I am currently both the Executive and Medical Director of the regional drug and poison control center for the state of New Jersey, New Jersey Poison Information and Education System (NJPIES).

There is growing information suggesting that the environment has an important role in the health of every American citizen. There is animal work showing that exposures may alter our genetic disposition and cause effects generations detached from those exposed. Anthropological/paleontological evidence suggest that childhood cancers may be a modern phenomenon suggesting a link to environmental toxinsⁱⁱⁱ. I do not want to underplay the importance of these issues, they are indeed both important and frightening. However, I believe that there is another, unappreciated issue related to the effect of toxins (including trace elements and substances I trace concentrations) on children. The program that I am responsible for is involved with prevention of and response to childhood exposures (and adults of course) to toxic substances and chemicals. Poison centers and their medical toxicologists are involved on a daily basis responding to questions about exposures to a variety of toxic substances.

I mentioned previously that I am the medical and executive director of NJPIES, one of 60 regional poison control centers, let me explain the importance of these centers. Poison centers respond to the needs of the US citizens in every state and territory of the country 24 hrs a day, 7 days a week, 365 days a year. Nationally, there are over 4 million exposures reported to poison centers with over 50% of the victims of these exposures occurring in children under 5 years of age. To put that into perspective, once every 15 seconds a child in this country is reported to be exposed to some potential toxin. Poison centers in the United States respond to questions about exposures to medications, household products, industrial chemicals, environmental contaminants (including substances in trace quantities), any of which can have immediate, even life-threatening effects, as well as potential long term effects on the health of the exposed children. The responses from such poison centers can provide relief to the caller, if the exposure is not expected to cause any harm, or can be a chance to initiate therapy for an exposure prior to the victim reaching an emergency room. Not only do poison centers provide potentially life-saving treatment advice, but these poison center telephone consultations have been shown by several investigators, including my group, to save vast sums of health care dollars. In fact, it is estimated that

for every \$1 invested in our services there is better than a \$7 saving in health care costs. In NJ alone, we demonstrated a cost savings, conservatively, of over \$10 million each year for an investment of less than \$4 million. A more realistic estimate places the cost savings at well over \$40 million each year in NJ alone.

The poison center movement is grateful to Congress for passing legislation, in 2001, which enabled poison centers to attain some degree of financial stabilization and enhancement of their programs. Administered by the US Department of Health and Human Services' Health Resources Service Administration (HRSA), poison centers now receive nearly \$30 million in federal funding. Among the things federal funding provide, the result of an initiative started in NJ, is the provision of a single toll free telephone number entrée into the system. Today, a citizen anywhere in the United States only needs to remember one telephone number, 1-800-222-1222, to reach a regional poison center responsible for his/her geographic region. That poison center will be a regionally designated, certified center. The calls will be answered by a health care professional, a nurse, pharmacist or a physician equipped to respond to calls related to chemical substances, radiologicals, medications, etc.

In 2004, HRSA funded a study by the Institute of Medicineⁱⁱⁱ to look at the future of the nation's poison centers. One of the resultant suggestions was for federal support of a national poison center system, then estimated at costing approximately \$150 million. Unfortunately, while the current level of federal funding represents a significant portion of our total funding, the nonfederal support is not stable. Many regional poison centers are at risk of closing, leaving their catchment population vulnerable and without the valuable service provided by poison centers. While the nation is experiencing increased deaths from unintentional drug overdoses, and increased emergency room visits for childhood exposures to various medications and substances, poison centers are fighting for their survival. Funding shortfalls threatens the existence of more than 50% of the existing poison centers.

In addition to acute crisis response, poison centers provide important surveillance functionality. They are the "front line" for natural and manmade exposure of all types. There are many examples of poison centers discovering clusters of exposures and bringing them to the attention of local, state and national agencies. I remember clearly the call we received from a physician in NJ who had a family in his office stating that they moved into a condominium development in NJ and when the contractor pulled up the floor boards discovered a lake of a silvery liquid, mercury. The physician had no idea who to call for help, so he reached out to the poison center. This call resulted in an investigation and elimination of mercury exposure for the inhabitants of the building. Other clusters discovered included poisonous puffer fish off the coast of Florida, contaminated drugs in Philadelphia, and water contamination in a school in northern New Jersey.

There is currently great interest in the safety of our food supply. A week doesn't seem to go by without something in the news about contaminated food. Poison centers are involved in responding to calls about possible spoiled food, food poisoning outbreaks, etc. I remember getting calls at our poison center one Friday night related to exposures in a catering hall in southern New Jersey. When calls continued to be handled the following day concerning people exposed in the same catering establishment, local health departments and ultimately the state health department became involved;

the caterer shut down until adequately sanitized and the outbreak abated. The nation's poison centers have been intimately involved in many of the recent food borne outbreaks from contaminated spinach to peanut butter.

When we look at who will provide clinical services to individuals exposed to toxic chemicals and medications, we turn to a group of physicians such as myself, medical toxicologists. First established as a subspecialty in the late 1970s, the discipline was comprised of physicians trained in internal medicine, pediatrics or preventive medicine. This group of individuals established the American Board of Medical Toxicology, complete with fellowship programs and a formal board certification procedure. Originally, more than 50% of the boarded medical toxicologists were pediatricians. Over the past 20 or so years, the discipline has transformed into that of more of a subspecialty of Emergency Medicine with decreasing involvement of pediatricians. This has occurred because there are inadequate funds to train new medical toxicologists, particular those interested in the pediatric age group. A large percentage of current medical toxicology trainees are forced to work in an emergency room to earn funds to support him/herself through the fellowship. The graduates of pediatric residency programs who desire to take medical toxicology fellowships are mostly unable to work in emergency rooms, unless in addition to their basic pediatric training they took fellowships in pediatric emergency medicine and can find positions in pediatric emergency rooms to support their medical toxicology fellowship years. That would produce a medical toxicologist trained specifically in pediatrics but the process would take at least 7 years of training post medical school and a financial commitment not required of any other specialist. That very few pediatric-trained individuals are applying for medical toxicology fellowships is not, therefore, unexpected. Without training pediatricians as medical toxicologists the gap between the basic science of pediatric toxicology, including that which has been discussed in relationship to what congress is studying as part of the possible revision of the toxic substance legislation you called this meeting to discuss, will widen further. If we fail to train pediatricians to research and to respond to the effects of toxins, and other substances, on children's health, we are doing a disservice to current and future populations.

There is also another impediment to adding new residency or fellowship positions, that is, the Medicare "cap." Under current rules, no new residency or fellowship program can be funded utilizing Medicare reimbursement funds at any US hospital. An interesting case in point is our own NJ Medical School and our own University Hospital. Our residency/fellowship number has reached the Medicare cap. NJ Medical School's Department of Preventive Medicine and Community Health was successful in receiving a grant from HRSA to fund an approved residency program in Preventive Medicine outside of the Medicare gap. Residents from that program will spend time at NJPIES. If any resident in that program should become interested and wish to obtain further training in medical toxicology he/she will have to find a program which is funded or find a way to fund him/herself. We, currently, have no medical toxicology fellowship because we have no way to fund such a fellowship. Sadly, a graduate from a residency in Preventive Medicine would not be able to support his/herself through the rigors of 2 more years of fellowship. We must find a way to fund medical toxicology fellowship programs that pediatricians and preventive medicine residency graduates can succeed in.

There are actions which can and should be taken now. They will help respond to the risk of exposure to chemical substances of all nature, medications, spoiled food, etc.

1. Find a way to "shore up" the funding of existing poison centers
2. Supply funds to allow enhanced surveillance activities of poison centers
3. Supply funds to train medical toxicologists outside of the Medicare cap and encourage pediatricians to seek such training.

I invite you to tour our poison center at the termination of the meeting. See for yourself what an operating poison center currently can do and what a stable financial backbone will enable a poison center to offer in the future.

Thank you again for the opportunity to address you today.

ⁱ David AB, Zimmerman MR. Cancer: an old disease, a new disease or something in between? *Nature Reviews* (2010) 10:729-733

ⁱⁱ Capasso LJ Antiquity of Cancer. *Int J Cancer*. (2005) 113:2-12

ⁱⁱⁱ Committee on Poison Prevention and Control. Institute of Medicine. Consensus Report: Forging a Poison Prevention and Control System. The National Academies Press. April 2004.



The New Jersey Poison Information & Education System
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Designated regional poison center by New Jersey Department of Health and Senior Services and the American Association of Poison Control Centers

December 23, 2010

Senator Barbara Boxer
Senator James M. Inhofe
Senator Frank Lautenberg

Heather Majors
Senate Committee on Environment and Public Works
410 Dirksen Senate office Building
Washington, D.C. 20510

Dear Senator Inhofe:

Thank you for your thoughtful questions in regard to my testimony to the subcommittee of October 26, 2010. I will attempt to respond to each of your questions. After you receive my explanations, feel free to reach out to me for further information/clarification. I would be happy to meet personally with you or any of your staff to discuss these issues further. The health and welfare of our children and, through them, future generations are our most important concern.

Question 1: Do you think that your ideas for supplying funding for poison centers and medical training will be more successful at improving and protecting children's health than federal bans of individual chemicals.

If a chemical is determined to be a risk to the health of anyone and can be eliminated, of course it should be banned. The problem is that there are too many chemicals that fall through the cracks either because they are not tested at all, tested incorrectly, or cannot clearly be related to a health problem. I did comment during my testimony, that the population is more often exposed to a "soup" of various chemicals while the chemicals are studied for toxicity individually. Thus a chemical which may test out safe for use when tested alone, can end up as toxic when mixed with another chemical. It is probably overkill to use the example of bleach and ammonia, but perhaps you can understand this situation when you think of the fact that a chlorine bleach will test out safe by itself, as will household ammonia, but when combined produce a toxic gas.

We will never be safe if all we depend upon is a ban if and when a substance is stated to be a health risk. The example I use to explain this is our drug classification system. We schedule some drugs making them illegal to possess and use. That works for a while, then someone finds a way to tweak the molecule and bingo a new drug appears which for some time is "legal" until it is then classified. We are always playing "catch up," with this technique.

I did not suggest that funding training for medical toxicologists or for support of poison centers should replace federal banning of substances proven to be hazardous to health. I suggested that there is a grave need for supplying funds to train medical toxicologists if we are to have individuals trained in the diagnosis, and treatment of individuals poisoned by chemicals. What I have seen over the past 20 years, is a change in the background of individuals in medicine who decide to pursue a career in toxicology. Whereas 20 years ago many such individuals were first trained in pediatrics then medical toxicology, in 2010, most are initially trained in emergency medicine. I do not want to denigrate the ability of those



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individuals, it is just that their basic approach is not necessarily directed at children and they may look at environmental problems from a different perspective. We need to find a way to encourage pediatricians to pursue training and practice in toxicology. The fallout from training "pediatric toxicologists," is the probability that the knowledge and experiences will "trickle down" to the pediatricians in practice, making them more sensitive to look at exposed children in a different light. As to my suggestion for increased support of poison centers, these centers have shown over the years to efficiently use existing health care resources to enhance the efficiency and improve outcomes in treating exposed individuals. The savings in health care costs alone produced by poison centers is unparalleled in its success. Various governmental and academic reports including the Institute of Medicine Report^{vi, vii, iv} suggests a savings of over a billion dollars for a federal current investment of under \$30 million. Poison centers also serve as important providers of public health education to help citizens avoid exposure to toxic substances.

Of great importance is the fact that only poison centers, with their sophisticated system of data collection and supervision, provides real time, active surveillance for outbreaks of possible new diseases and chemical exposures. There is no existing system that even comes close to the real time surveillance provided by poison centers.^{v, vi, vii} This surveillance function places poison centers in a key position to also protect the public health of all citizens by providing early identification of natural or potential terrorist planned contamination of our natural resources, food, medications, etc. Without the poison center surveillance system we may not know what substances are causing health problems and need to be banned. Thus there needs to be a "team approach" utilizing poison center surveillance data in a cycle of public health prevention efforts which include removal of suspected toxic substances from the marketplace, using surveillance in the "cascade of prevention!"^{viii}

Question 2: How can the federal government help to encourage more non-federal investment in poison centers?

That is the multi-million dollar question. I have never understood why the various industries affected by the work of poison centers do not provide generous support for the centers. No one these days would recommend any additional tax, but if there was to be a \$10,000 usage fee for every company which has federal regulations concerning labeling of its products, there would be a generation of \$150 million, sufficient funding to support a total nationwide system of poison centers. If one looks at the number of prescriptions filled each year it would cost less than \$0.10 additional for each prescription to provide such funds, etc., in other words a user fee for those who benefit. In New Jersey we do require hospitals to provide some support for the poison center based on the fact that a call from a hospital to the poison center results in a decrease in hospital stay resulting in a net decrease in medical care cost. Since major savings from poison center activities is experienced by the health care insurance companies, they should be big supporters of the poison center movement, but are not—why, indeed it is partly lack of understanding of the critical cost saving role of the nation's poison centers, and partly, if they get the benefits at no cost already why make any contribution! Incorporation of increased funding for poison centers in future legislation regarding health care reform would be beneficial. Reverse "lobbying" on the part of Congress for support of poison center services with representatives of the pharmaceutical, chemical, home and personal product manufacturers might go a long way in improving financial support of the nation's poison center system. It should be pointed out that manufacturers generally do only what regulatory agencies require them to do. Some pharmaceutical companies now provide reasonably good surveillance of their products, specifically the "branded opioids," because of FDA requirements for such Others, not required to provide such, provide no such programs. Federal regulations that require manufacturers to develop appropriate pre and post marketing surveillance of their products would help mandate support of the poison center surveillance system and enhance the protection of the citizens. It should be pointed out that this environment of reform using technology and existing health care resources to enhance efficiency, cost savings, increased health care access and better more timely public health information, is key.

Question 3: During your testimony you mentioned that while we need to do more testing, "we don't know how to test, we don't know what to test." Could you elaborate on that statement, specifically on how Congress should

appropriate funds or provide authority for chemical testing if ‘we don’t know how to test, we don’t know what to test’?”

Good question. What I was alluding to is the fact that a suspect chemical can be seen as a single entity alone, or as a family of entities of a similar chemical structure. Kleenex is a type of tissue, not all tissues are Kleenex. So do we test every single brand of tissue or only a specific one. There are families of chemicals, drugs, etc., some of which demonstrate a family pattern of toxicity, some have unique toxicities based on something about a particular structure. Further, sometimes a person’s body changes that chemical into what we call a metabolite. That metabolite may be more or less toxic than the original, and this may be genetically determined so that in only a certain small part of the population the toxicity would be seen while in others not. This problem has shown itself in the pharmaceutical industry on many instances in the last 15 years.

The pharmaceutical/chemical manufacturer company tests a substance on a number of individuals without any disease to see if the substance is deemed safe. Often that test is performed on less than a thousand or so individuals. Then the substance is tested on perhaps an even smaller number of individuals with a specific disease. Once the substance is found to be safe and effective it gets approved and released on the market and may be used on tens of millions of individuals. When that happens, the drug may find itself in an individual who has some genetic predisposition for a problem with that substance which was not evident in the limited testing done. The same could hold true for chemical substances used for various reasons in our society. Let us go one step further, you have probably heard of the term drug interaction. That term denotes that the effect of one drug may enhance or counteract the effect of another drug. Rarely are the drugs tested in combination before they appear on the market, even if it well known that the new drug will most commonly be part of combination therapy. Once they do, an interaction may become apparent when individuals either get sick on the combination or fail to respond to the treatment regimen as expected. Of course, manufacturers understandably will object to such expanded testing, and one can’t test for all potential toxic occurrences or all potential adverse reactions or interactions. This is the extraordinary value of the poison center network, where the monitoring of real life situations, in near real time identifies these situations and can address them empirically. Clearly a cost savings and practical process and solution for all. Thus, if surveillance is good, with a robust poison center system, the problem may become apparent quickly, before a large number of individuals become sick. A very wise public health response using the resources of the poison center national network.

The situation with chemical testing may be even worse. Take for argument sake, the chemical in deodorant. That chemical can be tested in its raw form to see if it has any toxicity. It then gets combined with other chemicals, both active and inactive ingredients, and becomes the commodity sold. It is then placed on skin which was washed with soap made of other chemicals. The entire soap is then breathed in, perhaps even absorbed as well by the skin. In which form, at what stage, should it be tested? These comments assume, that we know what test to use if we do decide to test. Think about the potential combination of chemicals in the air we breathe. A robust poison center system with its inherent surveillance ability, will identify these issues.

There are acute toxicity tests, will the chemical kill you on application or inhalation? There are chronic exposure tests; will a substance affect your body function in any form at all after repeated exposure? This is perilous grounds to walk on when it comes to children, since children are undergoing development of various organ systems. Will a drug/substance have an effect on a child’s body development, brain development, etc. What will the effect of exposure today have on body function 20 years from now and do we have methodology to predict that. We now have reason to believe that there are effects on our genetic material which can occur from exposure to some chemicals which not only affect us, but can be seen 2 or more generations removed from us. For example, evidence exists showing that exposure to lead in a pregnant lab animal not only has an adverse effect on the mother and her offspring, but on the offspring of her fetuses as well, suggesting that there has been damage done to the genetic material for inheritance.

Congress should fund toxicological research to look for methodology to explore this question. We need to find a way, as I said before, to train the academic medical toxicologists of the future as well as clinicians.

In summary, what I am suggesting is that Congress should develop a comprehensive approach to dealing with the potential toxicology of chemicals, drugs, etc on human health. We need to promote the development of careers in toxicology, both clinical and research. We can develop toxicology training/education centers to turn out scientists, physician as well as bench scientists, with the background in toxicologist fully prepared to lead us in our efforts to protect and treat individuals exposed to various toxic substances. We need to develop a robust surveillance system that is able to determine signs of toxicity at an early stage, before multiple individuals become affected. The current national poison center surveillance network called the National Poison Data System (NPDS) would be the best platform I know on which to build a meaningful toxic exposure and occurrence response capability. We need an organized, easy to access reporting system for the surveillance to work. Again the existing NPDS network is the place to build this surveillance resource.

I am convinced that with a minimum of federal support, the current system of poison control with its medical toxicology backbone, sophisticated local, state and national integrated communication and reporting capability, working hand in hand with the chemical and pharmaceutical industry, with relatively modest financial support and investment from the private, as well as public sectors, can evolve into the system I dream of.

Thank you for the opportunity to testify and to respond to your questions.

Sincerely yours,

Steven M Marcus, MD

Steven M Marcus, MD
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New Jersey Poison Information & Education System
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New Jersey Medical School of the University of Medicine & Dentistry of NJ

¹ "Forging a Poison Prevention and Control System." Institute of Medicine. National Academies Press 2004.

² Miller TR, Lestina DC. "Costs of poisoning in the United States and savings from poison control centers: A benefit-cost analysis." *Annals of Emergency Medicine* (1997) 29:239-245.

³ Zaloshnja E, Miller T, Jones P, Litovitz. "The Potential Impact of Poison Control centers on Rural Hospitalization Rates for Poisoning." *Pediatrics* (2006) 118:2094-2100

⁴ Vassilev ZP, Marcus SM. "The Impact of a Poison Control Center on the Length of Hospital Stay for Patients With Poisoning." *Journal of Toxicology and Environmental Health, Part A: Current Issues*. (2007) 70:107-110.

⁵ "Nonpharmaceutical Fentanyl-Related Deaths-Multiple States, April 2005-March 2007". *Morbidity and Mortality Weekly Report*. CDC (2008) 57:793-796

⁶ "Neurological Illness Associated with eating Florida Pufferfish, 2002." *Morbidity and Mortality Weekly Report*. CDC (2002) 51:321-323.

⁷ Vassilev ZP, Ayyanathan K, Bogden JD et al. "Case of Elevated Blood Lead in a South Asian Family That Has Used Sindoor for Food Coloring." *Clinical Toxicology* (2005) 43: 301-303.

⁸ Halperin W. "The Role of Surveillance in the Hierarchy of Prevention." *American Journal of Industrial Medicine* (1996) 29:321-323.

might find that in the discovery of a new chemical that we can also play with it enough to find an antidote before it takes hold. But I know that's a very unlikely chance for success. But even if we test only the new products at first we add something by way of a health opportunity to these children.

And now we'd like to hear from Dr. Frederica Perera. She's the Director of Columbia Center for Childrens Environmental Health.

DR. PERERA: Thank you, Senator Lautenberg. I'm also very honored to be here and testify before you.

The Center was founded in 1998 with joint funding from NIEHS and EPA. And our mission then was to improve the health and development of children by identifying environmental toxicants, as well as genetic, nutritional, and socioeconomic factors that could contribute.

In 1998, we already knew that these diseases had multiple causes, but that environmental contaminants like lead, mercury and PCBs could contribute. And it had also become evident over the previous several decades that the placenta was not providing an adequate barrier from toxicants for the fetus and that, due to their rapid development and

immature immune systems, that the developing fetus, infant and child were especially susceptible to environmental toxicants. There was also emerging evidence that in utero exposures could help shape life course health; in other words, help shape life and risk of disease over the entire life course, and that knowledge has gotten stronger. So this knowledge and the fact that, unlike genetic susceptibility factors, environmental exposures that were harmful are by nature preventable, prompted us to focus on the relation between early-life exposures to common environmental pollutants, things like air pollution, pesticides and endocrine disrupting chemicals, and neurodevelopmental disorders, asthma, indicators of cancer risk, and now more recently we're studying obesity and metabolic disorders in children.

In my testimony this morning, I'll just focus on endocrine disrupting chemicals, give you a few examples of what we're learning, and neurodevelopmental disorders, noting that an estimated five to 17 percent of U.S. children have been diagnosed with a learning or an attention disorder.

So I'll briefly summarize the research

at the Columbia Center for Children's Environmental Health. Since 1998, we've conducted a number of international cohort studies, two in New York City and also one in Europe and one in China, or several now in China. In the one ongoing study in New York City, begun in 1998, the participants are African American and Dominican mothers and children. And the other study in this area is our World Trade Center Cohort launch after 9/11, in which the participants are Caucasian, Asian and African American. And they come from the New York City greater metropolitan area. And they were all pregnant on 9/11. And we followed these cohorts' mothers and children from enrollment during pregnancy for six to 12 years and we're still going on with a follow-up in the New York City northern Manhattan study.

So today I would like to share with you results on just four of the chemicals that we've studied. Our Center investigators have looked at: Phthalates, bisphenol A, (BPA) for short, and Polybrominated diphenyl ethers (PBDEs) for short. As we know, these chemicals are widely found in personal care products and in the home. Phthalates are used in the production of plastics to increase flexibility of the material. Bisphenol A is used to make plastic

baby and water bottles and medical and dental devices, and also the coatings on the inside of food cans and beverage containers. PBDEs are flame retardant chemicals that are used in home furnishings, textiles, electronics, and many other products. The fourth chemical I'll mention as illustrative of the need for prevention is chlorpyrifos. It's an organophosphate insecticide which, before its phase-out for residential use in 2001, was widely used in households to control pests like cockroaches. And it's still utilized for agricultural purposes.

Now, all of these chemicals are capable of disrupting the endocrine system. Endocrine disruptors are substances that can interfere with hormone production and/or hormonal activity. They can either mimic or block natural hormones. We are still learning about the health implications of this mechanism in terms of development and reproduction, but the fact that these chemicals can alter natural hormonal pathways at such low exposure levels is a real concern.

So our data have confirmed widespread exposure to these four chemicals. In the northern Manhattan cohort we found phthalates detected in the

air. At least one phthalate was detected in 85-100 percent of the air samples that were collected during pregnancy and in urine samples from pregnant women. And we detected

BPA in the urine of 94 percent of pregnant women, 97 percent of three-year-olds, and 100 percent of five-year-olds.

We identified at least one flame retardant PBDE in 81 percent of cord blood samples from newborns in the World Trade Center Cohort. And air monitoring data from the northern Manhattan cohort showed that all of the pregnant women in this study were exposed to inhalable chlorpyrifos. Chlorpyrifos was also detected in 70 percent of the umbilical cord specimens from their newborns. So there's widespread exposure in our metropolitan area. And this is typical of areas across the country as shown by CDC.

What about the associations between these exposures and neurodevelopmental outcomes. In our northern Manhattan cohort, phthalate exposure was linked to shortened gestational age, which is a concern for health problems later in life, including poor school performance. And a study by our colleagues at Sinai have shown that prenatal phthalate exposure was associated with adverse

effects on behavior and executive functioning at four to nine years of age.

So we're currently analyzing our

cohort data regarding the association between prenatal exposure to BPA and neurobehavioral outcomes in our children. But a recent study by other investigators has reported that there were behavioral changes in girls who were prenatally exposed to BPA. And this was consistent with a number of prior laboratory based studies.

In our World Trade Center cohort, we found that children exposed to higher levels of PBDEs had significantly impaired psychomotor and mental development and lowered IQ scores for virtually all neurodevelopmental assessments conducted between one and six years of age. And the various findings that I'm giving you are consistent with a number of laboratory based experimental studies.

I'll briefly allude to the chlorpyrifos story because it shows the benefits of regulation. We had shown that, in following the children, that maternal exposure to chlorpyrifos was associated with psychomotor and mental developmental delays and attention deficit and hyperactivity problems. Importantly, the data showed that the air

and cord blood levels of this pesticide dropped dramatically after the EPA's residential ban of this insecticide in 2001. And that testifies to the immediate benefit of regulatory intervention. You asked about how soon would we see the benefits.

So to conclude I've just shared with you results that show the links between prenatal exposure to phthalates, BPA, PBDEs and chlorpyrifos and adverse effects. And the example of chlorpyrifos clearly shows the benefit of an intervention, regulatory intervention, but a preventative approach is clearly needed, as illustrated by the case of lead, where lead exposure continued for 50 years with significant adverse neurologic impacts on children before it was regulated. And where we now know from various estimates that the economic cost of lead poisoning has been huge. In New York State it's been estimated to be, not just poisoning, but environmentally attributable economic cost, \$3.66 billion in 2009 alone. And an estimate has been made that each child in the U.S., for each child in the U.S., there's been an estimated \$56,000 economic benefit in the United States because of removal of environmental lead exposure alone. These figures don't reflect the cost of suffering and the cost to

the lives of children and their families, but it does remind us strongly of the need for testing of chemicals before they're released to the environment and the timely regulation of those shown to be harmful.

Of course uncertainties in the data and inconsistencies across studies do exist, due in part to different study designs and populations studied. And findings do need to be replicated. Questions remain even today as to the safe level of lead even below the present standard of ten micrograms per deciliter. However, given the widespread exposure to chemicals such as those I have discussed, these uncertainties do not outweigh the need for a preventative approach to children's health. The public health and economic benefits of prevention are clearly great. Our data and those of many others support a preventative chemical policy to protect our youngest and most susceptible population.

CHAIRMAN LAUTENBERG: Thank you.

You've obviously alerted us to the dangers of inaction, and they're very high. And I have some questions for you. And, by the way, just to straighten out the fact that everybody sitting in front of me has the title of "doctor," including

Frederica Perera MPH, DrPH
Professor Mailman School of Public Health, Columbia University
Director of the Columbia Center for Children's Environmental Health
Testimony before the
Senate Field Hearing on Toxic Chemicals and Children's Health
10-26-10

Introduction

I am Dr. Frederica Perera, Director of the Columbia University Center for Children's Environmental Health (CCCEH), and Professor of Environmental Health Sciences at the Columbia University Mailman School of Public Health in Manhattan.

CCCEH was founded in 1998 with joint funding from the National Institute of Environmental Health Sciences and the US EPA with the mission to improve the health and development of children by identifying environmental toxicants as well as genetic, nutritional, and socioeconomic factors that increase their risk of disease. In 1998 we knew that there were ever-increasing human exposures to environmental toxicants and that rates of neurodevelopmental disorders and chronic illnesses such as childhood asthma and cancer were on the rise. While it was clear that these diseases had multiple causes, environmental exposures such as lead, mercury and polychlorinated biphenyls were known to contribute. It had also become evident over the previous decades that the placenta does not adequately protect the fetus from toxicants and that, due to their rapid development and immature defense systems, the developing fetus, infant and child are especially susceptible to environmental toxicants (Perera et al., 2006). Moreover, there was emerging evidence that the *in utero* environment could help shape health over the lifecourse. This knowledge and the fact that, unlike genetic susceptibility factors, environmental exposures are by nature preventable, prompted us to focus on the relation between early-life exposures to common environmental pollutants (air pollutants, pesticides and other chemicals) and neurodevelopmental disorders, asthma, indicators of cancer risk, and more recently, obesity and metabolic disorders in children.

In my testimony, I will focus on endocrine disrupting chemicals and neurodevelopmental disorders, noting that an estimated 5-17% of United States children have been diagnosed with a learning or attention disorder (Centers for Disease Control and Prevention 2005).

Research at the Columbia Center for Children's Environmental Health

At CCCEH, since 1998 we have conducted international studies of cohorts of mothers and children followed from pregnancy - two of which are in New York City (NYC)- and others in Poland and China. In one ongoing study begun in 1998 the participants are African American and Dominican women and children who live in Northern Manhattan and the South Bronx ("Northern Manhattan Cohort"). The other study is our World Trade Center Cohort Study in which the participants are a racially diverse (Caucasian, Asian and African American) group of women from the NYC greater metropolitan area who were pregnant on September 11, 2001 and their children. The NYC cohorts have been followed from enrollment during pregnancy for 6-12 years and follow-up in the Northern Manhattan Study is ongoing. We have conducted repeat interviews and personal air monitoring assessments to gain information on the pollutants and chemicals our study participants were exposed to during pregnancy and later in childhood. We have also measured biomarkers of exposure, preclinical effect, and susceptibility in small samples of blood and/or urine collected from the mothers and children over the course of the

study. And we have conducted clinical assessments of children's development and health as they grew older.

Today I will share with you our results on just four of the chemicals our Center investigators have studied: phthalates, bisphenol A (BPA), and polybrominated diphenyl ethers (PBDEs). Phthalates are used in production of plastics to increase flexibility of the material. BPA is used to make plastic baby and water bottles and medical and dental devices as well as coatings on the inside of food and beverage cans. PBDEs are a group of flame retardant chemicals applied to home furnishings, polyurethane foams, textiles, electronics, and many other products. Chlorpyrifos is an organophosphate insecticide which, prior to its phase-out for residential use in 2001, was commonly used within households to control pests such as cockroaches. Chlorpyrifos is still utilized for agricultural purposes.

All of these chemicals are capable of disrupting the endocrine system (Roy 2009; Heudorf et al. 2007; Oehlmann 2008; Charboneau 2008). Endocrine disruptors are substances that interfere with hormone production and/ or hormonal activity. Endocrine disruption is an important area of concern for health scientists because we are becoming increasingly aware that very low exposures to endocrine disruptors can result in altered hormone regulation and activity. We are still learning about the health implications of this mechanism for development and reproduction, but the fact that these chemicals can alter natural hormonal pathways at such low exposure levels is a real concern.

Evidence of widespread exposure

Our data confirm that these chemicals are ubiquitous in the environment. In the Northern Manhattan cohort, we detected phthalates in 85–100% of air and urine samples from pregnant women (Adibi et al. 2008). We detected BPA in the urine of 94% of pregnant women, 97% of 3 year olds and 100% of 5 year olds, with a wide range of concentrations (unpublished data).

We identified at least one PBDE in 81% of cord blood samples from newborns in the World Trade Center cohort (Herbstman et al. 2010). PBDE concentrations were unrelated to proximity to the WTC, indicating widespread "background" exposure. Nor is widespread exposure to these chemicals specific to New Yorkers: the Centers for Disease Control's 2009 National Report on Human Exposure to Environmental Chemicals shows that individuals across the country are commonly exposed to these chemicals (CDC, 2009).

The personal air monitoring data from our Northern Manhattan cohort revealed that 100% of the pregnant women in the study were exposed to inhalable chlorpyrifos (Whyatt et al. 2003). Chlorpyrifos was detected in 71% of umbilical cord specimens within the cohort (Whyatt et al., 2003).

Associations between chemical exposures and developmental outcomes

In our Northern Manhattan cohort, phthalate exposure was associated with shortened gestational age (Whyatt et al. 2009a). This is of concern as even slightly shortened gestation has been associated with health problems later in life, ranging from poor school performance (Kirkegaard et al. 2006) to depressive symptoms (Raikonen et al. 2007). Follow-up in our cohort is ongoing. A study by our colleagues at Mount Sinai found that prenatal phthalate exposure was associated with adverse effects on behavior and executive functioning at 4-9 years of age (Engel et al., 2010).

We are currently analyzing our cohort data regarding the association between prenatal concentrations of BPA and neurobehavioral outcomes in our children. A recent study by other

investigators found that prenatal BPA concentrations were associated with externalizing behaviors in 2 year old girls (Braun et al. 2009), consistent with several prior laboratory based studies that reported reduced sexual dimorphism in the brain structure and altered behavior of offspring, such as greater anxiety- like behavior and hyperactivity (McCarthy 2008) (Ryan and Vandenberg 2006) (Mizuo et al. 2004).

In our World Trade Center cohort, we found that children exposed to higher levels of PBDEs had significantly impaired psychomotor and mental development as well as lowered IQ for virtually all neurodevelopment assessments conducted between 1-6 years of age (Herbstman et al. 2010). Although these findings are among the first to link PBDE exposure with adverse neurodevelopmental effects in humans, our results are consistent with laboratory-based studies which link PBDE exposure to learning and memory deficits (Costa and Giordano 2007).

Chlorpyrifos- legislative success in progress

As a final example of our research, CCEH showed that maternal exposure to chlorpyrifos is associated with decreased birth weight and birth length (Whyatt et al., 2005). Additionally, when exposed to high levels of chlorpyrifos *in utero*, these children are more likely to have psychomotor and mental development delays by age 3, as well as attention deficit and hyperactivity problems (Rauh et al. 2006). Importantly, our data show that air and cord blood measures of chlorpyrifos decreased significantly following the Environmental Protection Agency's residential ban of this insecticide in 2001, testifying to the immediate benefit of regulatory intervention (Whyatt et al. 2009b).

Concluding Remarks

I have just shared with you some of the research of our Center and from our colleagues in the field that show the link between fetal and child exposures to phthalates, BPA, and PBDEs, and adverse developmental and neurodevelopment effects. The example of chlorpyrifos demonstrates the benefit of reducing a toxic exposure to pregnant women and the developing fetus.

However, a preventive approach is clearly needed, as illustrated by the case of lead. Lead was originally introduced to gasoline as an anti-knocking agent in the 1920s; but it was not until the early 1970s that the Environmental Protection Agency's regulation limiting lead quantity in gasoline was enforced, based on accumulating knowledge at the time that lead is a potent neurotoxin (EPA 1999). Lead was also widely used in paint and it was not until 1977 that the US Consumer Product Safety Commission banned lead paint. For 50 years, therefore, exposure to lead was widespread, with significant adverse neurologic impacts on children. The environmentally attributable economic cost of lead poisoning in New York State is estimated to be \$3.66 billion in 2000 alone (Trasande et al. 2005). Since lead exposure reduction in the 1970s, there has been an estimated \$56,000 economic benefit *per child* in the United States based on removal of environmental lead exposure alone (Grosse et al. 2002). These figures do not, of course, reflect the unquantifiable cost to the lives of children who have suffered lead poisoning. The case of lead reminds us strongly of the need for testing of chemicals before they are released to the environment and the timely regulation of those shown to be harmful.

Of course uncertainties in data and inconsistencies across studies do exist, due in part to different study designs and populations studied. Questions remain even today as to the safe level of lead (Lanphear et al., 2005). However, given the widespread exposure to chemicals such as those I have discussed, these uncertainties do not outweigh the need for a preventative

approach to children's health. The public health and economic benefits of prevention are clearly great. Our data and those of many others support a preventative chemical policy to protect our youngest and most susceptible population.

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Questions for Dr. Perera
Questions from:
Senator James M. Inhofe

1. What other chemicals and possible background influences did you test for, besides those mentioned in your testimony, that may influence children's health and development?

In addition to the mentioned chemicals of PBDEs, BPA, chlorpyrifos (CPF), and phthalates, our Center has tested other common exposures such as polycyclic aromatic hydrocarbons, (a group of chemicals released into the air during the incomplete burning of fossil fuels such as gasoline, diesel, coal, and other organic substances), environmental tobacco smoke, and lead. In our analyses we have adjusted as appropriate for possible confounders such as smoking at home, child sex, maternal education, ethnicity, gestational age, quality of the home caretaking environment, maternal intelligence, maternal demoralization during pregnancy, and other relevant co-exposures.

2. As your studies were restricted to African-American and Dominican women and children, do you think that your cohort studies are a good representation of the US population? What was the breakdown in races in the WTC cohort study? Are different races more or less susceptible to certain development and health issues?

Our cohort study in NYC was restricted to African American and Dominican women and children because they represent the predominant ethnic groups in our community. While not representative of the entire US population, our cohort is representative of the high-risk population in our urban minority community.

The ethnic distribution of our WTC cohort was 28% Chinese, 6.4% Asian, non-Chinese, 15.2% Black, 40.4% White, and 10% other.

The rates of developmental disorders and asthma are disproportionately high in underserved, minority populations such as those in New York City (NYC). NYC has some of the highest asthma-related hospitalization and mortality rates in children and young adults in the U.S., with African-American and Latino patients accounting for over 80% of these cases. Environmental exposures tend to be disproportionately high among low-income, urban and minority populations because of the differential siting of pollution sources in low-income areas. Many of the children in our cohort, as in other urban populations, have been chronically exposed to PAHs, CPF and other pollutants throughout gestation and early childhood.

3. You mention that your data show a decrease in chlorpyrifos following the Environmental Protection Agency's residential ban of this insecticide in 2001. What was the study design used to obtain this data? Who was tested and was this done nationwide?

The study was a longitudinal cohort design. In our NYC cohort study, we monitored women's pesticide exposure through personal air monitoring during pregnancy. We also measured pesticides in newborn umbilical cord blood samples. We found that women who gave birth prior to January 1,

2001 had significantly higher chlorpyrifos concentrations in their air monitoring samples and significantly higher levels of CPF in umbilical cord blood compared to women and newborns delivered after that date. In addition, infants born prior to January 1, 2001 showed an inverse and significant association between CPF levels and birth weight and length. Infants born after that date did not show that relationship. Finally, the association between cord plasma CPF levels and reduced birth length and weight was seen primarily among the infants who were in the highest 25% of CPF exposure levels. Almost none of the newborns born after that date had such high CPF levels.

We did not conduct a nationwide study.

Dr. Huguenin.

And I was just curious. Dr. Gupta, you've spent more than a year talking to leading experts on toxic chemicals, and you're also a neurosurgeon, an award winning journalist, and you were nominated to be the Surgeon General of the United States. And I'm glad you didn't take that job, because the ability you have to communicate is unfettered. And that's the best way, with someone of your talent, your ability, your experience, and we're grateful.

But no testing requirements for most chemicals under current law. Is it fair to say that even you have had a hard time navigating which products contain dangerous levels of chemicals and which might be safe?

DR. GUPTA: Absolutely. You know, it's interesting because, first of all, the starting point, there's no clear line in the sand between what is safe and what is dangerous. That's the starting point. If you did sort of have an idea that certain chemicals were dangerous, the question then becomes how much once the exposure level would be problematic. And as we've all discussed that at different exposure levels for adults and for

children.

Let's say you're still interested, you still want to sort of investigate this a bit. Finding out what chemicals are in your flooring, are in your curtains, are in your appliances. Trying to get that information can be very difficult. And a lot of times a lot of these chemicals cross over. So, again, you're getting some cumulative exposure that may be hard to measure.

I do think, you know, in my experience when reporting on these issues, that consumers do care about this. They want this information. They want more information. But as Dr. Perera alluded to, they want information that doesn't conflict, so that just leaving them more confused. BPA was the example she gave. There have been some studies that have come out showing that if BPA levels are high in the urine, for example, you're likely to have a higher likelihood of heart disease and diabetes. There have been other studies that have shown that not to be the case.

So, you know, we need to make sure that we have better data on this. And that goes back to a little bit of this idea of testing and really looking at what the health effects are, in addition

to just how toxic some of these things are. And I think, you know, this idea that we may be exposed to the same chemical from lots of different sources, I think is perhaps what is the most difficult for people to get their arms around. Because, for example, in the operating room, we wear a level gauge on our X-ray jacket that basically tells us how much radiation we've been exposed to. I look at that, I turn that in, and they're going to tell me how much radiation I've been exposed to in any given month. We don't have something like that for our daily lives. And, you know, whether I'm using a nonstick pan or I'm playing on the carpet with my kids, I may be getting exposed to the same chemicals. And I think that's what makes it particularly challenging and hard to navigate.

CHAIRMAN LAUTENBERG: I'm curious about something. I take pride in the fact that I helped reduce the exposure of a lethal material to the population at large when in 1986 I wrote the law stop smoking in airplanes. And that migrated into every place in life. When people saw how dangerous smoking was, they said, okay, I'll avoid it. The problem is that you don't know where lead is present or mercury is present, or things of that nature. And

you can't avoid it that easily.

And also drawing on a personal experience. I had a family come in to see me, father, mother and son. And he worked in an asbestos factory. We had several in this state of ours. And some of my friends who went to high school with me in Paterson, New Jersey were made ill by very short terms of work in that, weeks, by being exposed to asbestos. And this family came in to see me. The father had mesothelioma. He worked in the factory. The son had mesothelioma. He didn't work in the factory. The wife had mesothelioma from handling his clothing, washing, and the shoes that he wore.

So we know what the dangers are. And it took such a long time to reduce the use of lead, reduce the uses of asbestos. And when you look, are there other countries that do a notably better job than we do about either introducing new chemicals or developing a safety score for those materials? Anybody know? Dr. Gupta?

DR. GUPTA: Well, I mentioned -- first of all, let me just say, what you've done for everything from smoking on airplanes to seat belts to all of your work with the safe chemical for kids has been remarkable. And I think there's probably a lot

of people who owe their function and their lives to you and what you've done because of that. And personally I like sitting on an airplane without smoke all around me. So that's nice, as well.

CHAIRMAN LAUTENBERG: Thank you.

DR. GUPTA: I talked about REACH a little bit in my prepared remarks, which is what is the acronym being used by the European Union for the way that they're looking at chemicals now. And I think it's relatively new, but I think that what they're basically trying to do there is shift the burden of the testing, which they're requiring, to the producer, rather than the regulator. And I think that does seem to make a difference ultimately in terms of how much we know about these chemicals, how safe they are, potential health effects, before they come to market.

So I think the answer is yes. And one thing, you know, you asked, as well, Administrator Jackson about, the industry response to that. And, again, this is something we investigated quite a bit as part of the documentary. It's interesting. Take something like mercury thermometers, for example, just to give you a simple example. You can't find them anymore. We used to have them everywhere, you

know, just not that long ago, mercury thermometers in households. Now they've all become these digital thermometers. And I read some study that showed that we actually purchased more thermometers now. So, in fact, by banning mercury in thermometers, you actually had innovation of a brand-new product and probably more people buying a safer product in the end. So that's an example of something that happened in this country sort of demonstrating that point.

CHAIRMAN LAUTENBERG: Dr. Huguenin, you have a had Ph.D. in Environmental Science, did your postdoctorate work at Princeton in the chemical field, come from an, as you mentioned, from a family of chemical workers.

Do you feel comfortable doing your own evaluation on whether a product is safe for you and your child, or isn't it really the place of Government, EPA scientists to evaluate the safety of these chemicals. And I know there are two sides to every view. One is the hazard, how severe is the hazard, and the other is what's the volume of that material. And no matter how good one can do on their own, there can't be a substitute. Or let me not force that on you.

Would you say that the best way to do

it is just to get it into a regular routine, have EPA or some accredited agency of my preference as EPA, but not to leave FDA out of this, and tell us what

these chemicals are about and caution people. Even if it's somewhat an overstep to say the news on the information on this particular product, while being examined, is one that could raise problems.

Now, I don't know what the marketplace would say about that. But when I see children who have been struck by a condition -- and I said to Dr. Gupta before, when I went to Haiti in February it was soon after the earthquake, and I saw children wandering around the streets, missing parents. And the houses were constructed so cheaply that they used concrete for roofing. The problem was, when the earthquake shook the ground, the buildings collapsed and down came sheets of heavy concrete and killed a lot of people. And my first impulse was to hug those children. They were beautiful children. And, you know what happens, grandfatherism is not a monopoly industry, each of us has a chance of turning professional. And I'm one of them. I have ten grandchildren. My wife has two and a third one on the way, my now wife. And we're lucky. I do have a grandson who has asthma, and we know that if it's a

bad weather day that he's subject to an attack. And when my daughter takes him to play sports, she first checks around to see where a nearby emergency clinic is. I have a granddaughter who has diabetes. And thank goodness for insulin. Just changed her appearance overnight when she took it.

So love for a child is an easy thing to develop. And my interest in doing this is less significant in extending my Senate career than it is in making sure that in some measure of gratitude I say, America is a great place and we've been lucky to be in this country, and why not make our luck a little better by being more careful.

Dr. Gupta, in your reporting you've spoken with scientists, individuals affected by toxic chemicals, lawmakers, businesses that use and make chemicals. After talking to all these groups, do you think there is a serious consensus building that we need to reform our system for regulating chemicals, or is this kind of something just for soft touch, parents or grandparents?

DR. GUPTA: Well, I think that there is an amazing amount of public response. I say that in part as a member of the media and a response to the documentary. I think there's no question there's

a big interest among the citizens of the country. I think there's also a lot of interest among the various groups involved in this. Obviously, the EPA, but also the American Chemistry Council, I think also believes in the reform of this antiquated law, 34 years, the numbers everyone has said.

We also have learned a lot over the last 30 years about how to do this better, I mentioned a small example of what Dr. Phil Landrigan was able to do. But the ability to be able to test chemicals at smaller doses and better understand our health effects I think has been pretty significant. I think, as far as points of agreement, everyone seems to agree that children are particularly vulnerable. And I think that that, whether it be the scientific, the medical or emotional appeal I think is significant in terms of getting people's interest in this.

I think another point of agreement is that everyone seems to agree that the new law, whatever it is, whenever it is, should be guided by the best available science. And, again, that best available science has changed over the last three decades.

And I think that another point of

agreement, and I think Administrator Jackson sort of mentioned this, is that the new law should allow the EPA to go back and look at grandfathered chemicals for some of the reasons that I mentioned and Administrator Jackson mentioned as well.

The disagreement: The difficulty. The rub, so to speak, is going to be over the best way to measure risk. I think that's really what it's going to be. Do you measure single risk? Do you measure aggregate risk? How do you assign responsibility? How do you assign, you know, responsibility for trying to improve the chemical's safety record, whether it be a specific company or be an organization. I think that's going to be difficult. And it's really at the heart of determining whether a particular chemical is safe.

So I think lots of agreement in that one point is probably the area where, when we were investigating, we found seemed to be the biggest area of friction.

CHAIRMAN LAUTENBERG: Thank you.

Dr. Perera, you heard the testimony of Dr. Huguenin and her worries about safety of her son's toys, the stain on her deck, the paint in her house.

What can a person do to avoid all these dangers, exposures to chemicals? Can you do it by buying only green or organic products, or do we fail if we don't have a system that gets scientists working on evaluating risks from all sources.

DR. PERERA: Well, I don't think we can shop our way out of this problem. I don't think that a very intelligent consumer has an easy time figuring out what products to use and not use. There are limitations in labeling, there are limitations in availability of products. And there are disparities in the availability of knowledge concerning the toxic chemicals in certain products. So that more disadvantaged communities tend to have, for example, higher exposure to phthalates, than others.

So this information is often not accessible, alternative products are not available. But more importantly the exposures are very pervasive, they're coming from multiple sources, as you yourself and others on the panel have pointed out. And, for example, BPA is used in the lining of almost all food cans and beverage containers. And PBDEs are widely used in electronics and home furnishings and beddings and so forth. And phthalates in multiple personal care products.

And so this is not a question of, you know, intelligent consumers taking care of the problem in their own home and in their own lives, but we need a much broader system. We need a preventive system.

CHAIRMAN LAUTENBERG: But getting the consumer aware, making them aware of what the risk might be, is an important phase, and a part of what we've done here today I hope will alert those consumers.

And I suppose, Dr. Huguenin, some have argued that requiring chemicals to be tested would be too costly for industry. Your personal experience, what are the costs that a family might bear when dealing with health effects linked to toxic chemicals, and I think you broached the subject, about what the costs are to society generally, generally. And the largest cost is the personal, the anxiety, the upset to pure love and devotion.

What is there in the cost realm that might be discouraging to establishing a routine like this? Can you think of any things?

DR. HUGUENIN: Well, I can tell you firsthand that, I mean, to raise a child that could possibly have one of the disorders that we have

discussed here today costs a lot, and it costs a lot in many ways. As you can see, my son Harrison is here today, and he's doing great, but that costs both time and money. His medical expenses over the years has cost us at least 25 percent of our annual income in our home. My husband is very lucky, he has an extremely flexible job, but even with the flexibility in his job, I am unable to work. I can't even really work part-time, which I don't mind, because I enjoy being with my son.

We've been told through various organizations and meetings that we've gone to that it costs about \$3 million to raise a child with autism, compared to I believe what they say is about 300,000 for a typical child. Both estimates seem kind of low to me, but that's just autism. I'm not sure how much it costs to raise a child who has cancer, or asthma, or other disorders. But I think, like you said, the most important thing that it could cost somebody is their life or their quality of life. So I think you know, I think it makes sense to pay up front costs for testing these products because I think it's really too much of a risk not to.

CHAIRMAN LAUTENBERG: This is an aside, but what's the cost to the individual, as well

as to the society, of lack of knowledge for a pregnant woman to do things that are good for nutrition, not to smoke, no drugs, et cetera, et cetera? How can those costs be measured in any sensible way they can?

Dr. Marcus, is there anything you'd like to add to the discussion before we close?

DR. MARCUS: Well, it's just a plea for primary prevention; that's what I do. And I don't trust industry. I mean, I hate to take an assign to that right now. The examples that we can all attest to with the pharmaceutical industry. And now granted, that may not be directly related to the chemical industry, but look at the number of drugs that were, quote, tested and then within months withdrawn from the market because they found that they didn't, they weren't as safe.

So that I think we need to have a much more oversight on what testing is and how it's done and not to leave it in somebody that's got a vested interest. Whether the EPA can have over better oversight over a company's testing, or whether it really is something that should be done by the Government. I guess I'm still a 60s leftist and believe that the Government should be the one that's

responsible for looking after us.

CHAIRMAN LAUTENBERG: I think it's fair to say that lots of companies are responsible, don't want to bring damage, don't want to, in a purely selfish way, don't want the lawsuits that might accompany, et cetera. But there are so many great chemical companies, those who helped us get rid of polio in the early days, those that helped us get rid of small pox and the other thing that pervaded life in years past.

So we have to keep working. It's a steep climb, but the top of the mountain is a beautiful sight to see. You know, one of the things that happens when you have a healthy child, free of any major health problems, it's a beautiful sight to behold, but that doesn't mean that a child like Harrison, is that his name, he's a beautiful sight to behold. And we wish you luck and well.

And I thank all of you for being here.

I would ask one more question. Are there any medical students here? Should have more.

FACULTY MEMBER: We had class. We snuck out.

CHAIRMAN LAUTENBERG: Well, I think we've got a class act here. But the fact is that

they, too, I'm sure, must be, are being made aware of the kind of influences that chemicals or unsafe materials might bring.

With that, this hearing is adjourned.

I will put a letter in the record that comes from Senator Inhofe, who, again, I indicated was the Ranking Member of the Subcommittee and the full Committee.

And I thank you all for being here, for taking the time out, for your thoughtful discussion, and wishing you good health and hard work. Thank you all very much for being here.

(The hearing concluded at 12:35 p.m.)