

**EVALUATION OF EPA ACTIVITIES
RELATED TO CHILDREN'S HEALTH PROTECTION**

Prepared for:

United States Environmental Protection Agency
Office of Children's Health Protection

Prepared by:

Industrial Economics, Incorporated
2067 Massachusetts Avenue
Cambridge, MA 02140

and

Abt Associates
480 Montgomery Lane
Bethesda, MD 20814

September 19, 2003

TABLE OF CONTENTS

INDEX OF EXHIBITS	i
EXECUTIVE SUMMARY	ES-1
INTRODUCTION	1
STRUCTURE OF ANALYSIS	3
ORGANIZATION OF THE REPORT	4
REGULATORY PROGRAM REVIEW	5
ANALYSIS OF EPA RULEMAKINGS	5
CRITICAL EVALUATION OF MAJOR REGULATORY IMPACT ANALYSES	9
INTERVIEWS WITH EPA RULEWRITERS	12
SUMMARY OF FINDINGS OF REGULATORY PROGRAM REVIEW	13
RESEARCH AND SCIENCE POLICY	14
RESEARCH	14
CUMULATIVE AND SIMULTANEOUS EXPOSURE POLICY	17
SUMMARY OF FINDINGS ON RESEARCH AND SCIENCE POLICY	20
OUTREACH	21
PUBLIC OUTREACH	21
ENVIRONMENTAL EDUCATION GRANTS	24
INFORMATION FOR HEALTH CARE PROVIDERS	25
COMMUNITY RIGHT-TO-KNOW	27
SUMMARY OF FINDINGS ON OUTREACH	28
BUDGETARY ANALYSIS	30
FUNDING	30
TRACKING CHILDREN’S ENVIRONMENTAL HEALTH.	32
CONCLUSIONS	38
REGULATORY PROGRAM REVIEW	38
RESEARCH AND SCIENCE POLICY	38
OUTREACH	39
BUDGETARY ANALYSIS	40
NEXT STEPS.	41
APPENDIX A: METHODOLOGY MEMORANDA	A-1
APPENDIX B: REGULATORY IMPACT ANALYSIS MATERIALS	B-1
APPENDIX C: CUMULATIVE EXPOSURE MATERIALS	C-1
APPENDIX D: HEALTH CARE PROVIDER MATERIALS	D-1

INDEX OF EXHIBITS

EXHIBIT 1: Organization of Analysis	3
EXHIBIT 2: Regulatory Actions By Regulatory Area	6
EXHIBIT 3: Health or Safety Based Actions by Regulatory Area	7
EXHIBIT 4: Health or Safety Based Actions that are Economically Significant or Have a Disproportionate Impact on Children	8
EXHIBIT 5: Percentage of Health or Safety Based Actions Including Discussions of EO 13045 and Evaluations of Children’s Health	9
EXHIBIT 6: Summary of Children’s Health Impacts Discussed in the Major Regulatory Impact Analyses	10
EXHIBIT 7: Number and Percent of Children’s Health STAR Projects 1993-2001	15
EXHIBIT 8: Total Children’s Health STAR Funding and Centers for Excellence Funding	16
EXHIBIT 9: Children’s Health STAR Funding as Percentage of Total Funding	17
EXHIBIT 10: Cumulative and Simultaneous Exposure: Overview of Major Accomplishments and Current Progress	18
EXHIBIT 11: Number of Children’s Health Cumulative Exposure NCEA Research Activities	20
EXHIBIT 12: Number of Children’s Health Outreach Titles in NEPIS	22
EXHIBIT 13: Children’s Health Topics as a Percentage of All EPA Outreach Titles in NEPIS	23
EXHIBIT 14: Number of Children’s Health Outreach Documents in NEPIS by Subject and Foreign Language Availability	23
EXHIBIT 15: Children’s Health Environmental Education Grants as a Percentage of Total Environmental Education Grants	25
EXHIBIT 16: Summary of EPA’s Efforts to Provide Information to Health Care Providers	26
EXHIBIT 17: Children’s Health Budget as a Percentage of EPA’s Budget	31
EXHIBIT 18: Total Pounds of TEACH and VCCEP Chemicals Released	36
EXHIBIT 19: Risk-Related Results to Children of TEACH and VCCEP Chemicals	37

EXECUTIVE SUMMARY

The U.S. Environmental Protection Agency (EPA) has long recognized that children require special protection from environmental hazards. In 1996, EPA developed the National Agenda to Protect Children's Health from Environmental Threats (National Agenda) and in 1997 created the Office of Children's Health Protection (OCHP). OCHP advocates the consideration of children's environmental health risks across EPA activities identified in the National Agenda and also works to promote consideration of children's health risks within all levels of government and across the non-government sector.

In addition to these ongoing internal EPA activities, Executive Order 13045--Protection of Children from Environmental Health Risks and Safety Risks (EO 13045)--was issued in 1997 and implemented by EPA in April 1998. EO 13045 requires that all federal agencies evaluate health and safety risks to children and consider the effects of rulemaking actions on children. For rules meeting the criteria for EO 13045 (i.e., rules that concern an environmental health or safety risk, are economically significant, and may disproportionately impact children), agencies must explain why the chosen regulatory action is preferable to other reasonable alternatives.

A number of stakeholders, including Congress, EPA management, other agencies, and the general public, are interested in learning how well EPA is addressing children's health concerns. Accordingly, OCHP has conducted a review of progress in this area, focusing on the elements of the National Agenda and compliance with EO 13045.

SCOPE OF THE REVIEW

Based on a review of existing reports and assessments as well as a series of interviews with key EPA officials, OCHP identified five major categories of analysis around which to organize the review: (1) Regulatory Program Review; (2) Research and Science Policy; (3) Outreach; (4) Budgetary Analysis; and (5) Tracking Children's Environmental Health. These measures are not a comprehensive accounting of all EPA activities related to children's health; rather, they provide an indication of EPA's progress. When developing the suite of measures for this analysis, publicly available databases or tracking systems were selected in order to facilitate future OCHP efforts to track progress.

Regulatory Program Review

To assess the responsiveness of EPA regulatory actions to the higher risks faced by children, the analysis focused on EPA's formal considerations of children's health risks in the regulatory content of the

Federal Register.¹ This quantitative analysis was augmented with a qualitative review of a subset of relevant Regulatory Impact Analyses (RIAs) and targeted interviews of EPA personnel to better understand how EPA conducted evaluations of children's health risk and how EO 13045 affected these efforts.

The analysis revealed that EO 13045 is applicable in only a very small number of the regulatory actions promulgated. However, a high percentage of health or safety based rulemakings consider EO 13045, and a substantial number of rules include evaluations of children's health, even when not required by EO 13045. The examination of the *Federal Register* notices did not reveal any cases where children's health should have been examined but was overlooked.

The results of the analysis of relevant RIAs and interviews with EPA rulewriters support the more quantitative findings. EO 13045 itself did not have a substantial impact on whether or how an evaluation of children's health was conducted, because existing laws or requirements to address sensitive populations generally compelled the rulewriters to consider the potential impacts on children.

Research and Science Policy

EPA has already made progress in achieving the National Agenda goal to "develop a scientific research strategy focused on the gaps in knowledge regarding child-specific susceptibility and exposure to environmental pollutants." The 1999 EPA *Strategy for Research on Environmental Risks to Children*² outlines multiple objectives, children's risk topics, research questions, and research priorities that are to be addressed in research plans developed by EPA. OCHP was one of several EPA offices to assist the Office of Research and Development in developing the *Strategy*. The Research and Science Policy category of this analysis measures success in implementation of the *Strategy*.

The analysis found that EPA increased the amount and percentage of research funding related to children's concerns in the Science to Achieve Results (STAR) program from 1995 through 1999, with a decrease in 2000 and a slight increase again in 2001. While these trends suggest a response to the National Agenda and EO 13045, the short time period represented warrants continued monitoring to assess more meaningful, longer-term trends. Over the period 1997-1999, EPA also funded other relevant research that expands the base of knowledge in the area of human health risk assessment generally, and, to a lesser extent, targeted gaps in cumulative/simultaneous exposure of children to environmental pollutants.

Outreach

EPA's progress in creating and disseminating children's health outreach to key audiences – parents,

¹ This effort extends a previous OCHP analysis, "Analysis of EPA Implementation of Executive Order 13045," September 30, 2001.

² Viewed at <http://www.epa.gov/nceawww1/risk2kids.htm>.

teachers, caretakers, and health care providers – was assessed using a series of qualitative and quantitative metrics in four areas: (1) information available through the National Environmental Publications Internet Site (NEPIS); (2) funding disbursed to the Environmental Education grants program; (3) materials and activities aimed at children's health care providers; and (4) initiatives related to community-right-to-know.

The analysis found that the number of EPA's children's health outreach publications in NEPIS peaked in 1998, and has decreased since then. However, the proportion of children's health publications in NEPIS after 1998 is still greater than the proportion in the years prior to 1998. Environmental education grant amounts awarded to projects educating the public in environmental exposure and health risks to children also peaked in 1998 and have dropped off since. EPA continues to initiate and maintain programs aimed at educating health care professionals in children's environmental health issues. While metrics are not available for all the programs, available data indicate that these programs are well-focused and meet their stated objective.

Budgetary Analysis

The National Agenda specifies that funding be allocated as is necessary to "address children's environmental health as a top priority among relative environmental risks." This analysis employs the proportion of the EPA's total budget devoted to children's health across FY2001-2003 as a quantitative measure of EPA priority placed upon this issue (amounts for 2003 are projected).

For fiscal years 1999 - 2003, the data show an approximately two-fold increase in both the proportion and the total amount of money committed (\$32,419, 900 to \$67,580,100) from EPA's total budget (\$7.6 billion) dedicated to children's health between 1999 and 2000. After 2000, the proportion of the total budget dedicated to children's health remains relatively steady.

Tracking Children's Environmental Health

EPA has published two reports on trends in environmental factors related to the health and well-being of children in the United States. *America's Children and the Environment: A First View of Available Measures* was published in December 2000, and *America's Children and the Environment: Measures of Contaminants, Body Burdens, and Illnesses* was published in February 2003. The 2003 edition of the report finds that there is a continued decline in the number of children with elevated blood lead levels, a reduction in children's exposure to second hand smoke, and decreases in exposures to air pollution and contaminants in drinking water. However, the report also finds that there is still much work to be done, as asthma rates are increasing, many children continue to have elevated blood lead levels, the potential for mercury exposure in the womb is of growing concern, and there is a disproportionate impact of childhood diseases on low-income and minority children.

EPA has also examined the relative risk posed by releases of selected chemicals reported to TRI. Using Risk-Screening Environmental Indicators (RSEI), a computer-based screening tool, EPA assessed

the relative impacts of releases of toxic chemicals by combining estimates of toxicity, exposure level, and the exposed population. This information was used to analyze potential risks to children's health from TRI releases. Overall, while total pounds of these chemicals emitted over the period increased, children's risk-related impacts from these chemicals, as estimated by the RSEI tool, decreased over the time period of this analysis.

NEXT STEPS

The report contains a discussion of appropriate next steps the Agency could consider to better understand the degree to which children's health risks are being considered in Agency decisions. These include:

- Conduct a focused and structured qualitative analysis of each of the five categories of analysis in order to supplement and enrich understanding of the more quantitative measures;
- Conduct a formal assessment of the quality of children's health evaluations conducted as part of Regulatory Impact Analysis and other rulemaking actions, to determine how thoroughly these risks are considered;
- Track the outputs and outcomes described in its *Strategy for Research on Environmental Risks to Children (1999)* in order to better assess progress in science policy;
- Evaluate the effectiveness of information contained in public outreach efforts; and
- Develop a central database for outreach activities that could augment interoffice collaboration and sharing of various outreach approaches and successes. Such a database could be used to track continued efforts in disseminating community right-to-know information gleaned from Toxic Release Inventory (TRI) data.

INTRODUCTION

The Environmental Protection Agency (EPA) has long recognized that children require special protection from environmental hazards. In 1996, EPA developed a National Agenda to Protect Children's Health from Environmental Threats (National Agenda) and in 1997 created an Office of Children's Health Protection (OCHP). OCHP advocates the consideration of children's environmental health risks across EPA activities identified in the National Agenda and also works to promote consideration of children's health risks within all levels of government and throughout the non-governmental sector. The elements of the National Agenda include the following (an abbreviated title for each element is noted in parentheses and is used throughout this report):

- □ Ensure that all standards set by EPA are protective of any heightened risks faced by children (analysis of EPA rulemaking; evaluation of major regulatory impact analysis, interviews with EPA rulewriters);
- □ Develop a scientific research strategy focused on the gaps in knowledge regarding child-specific susceptibility and exposure to environmental pollutants (research);
- □ Develop new, comprehensive policies to address cumulative and simultaneous exposures faced by children (cumulative and simultaneous exposure);
- □ Encourage parental responsibility for protecting their children from environmental health threats by providing them with basic safety information (public, environmental education grants);
- □ Encourage and expand educational efforts with health care providers and environmental professionals so they can identify, prevent, and reduce environmental health threats to children (health care providers);
- □ Expand community right-to-know allowing families to make informed choices regarding environmental exposures to their children (community right-to-know); and
- □ Provide the necessary funding to address children's environmental health as a top priority among relative environmental health risks (funding).

In addition to these ongoing internal EPA activities, Executive Order 13045 – Protection of Children from Environmental Health Risks and Safety Risks (EO 13045) – was issued in 1997 and implemented by EPA in April 1998. EO 13045 requires that all federal agencies evaluate health and safety risks to children and consider the effects of rulemaking actions on children. For rules meeting the criteria for EO 13045 (i.e., those that concern an environmental health or safety risk, are economically significant, and may disproportionately impact children), agencies must explain why the chosen regulatory action is

preferable to other reasonable alternatives.

A number of stakeholders, including Congress, EPA management, other agencies, and the general public, are interested in learning how well EPA is addressing children's health concerns. Accordingly, OCHP has conducted a review of progress in this area, focusing on the elements of the National Agenda and compliance with EO 13045. Among the key findings of the review, as detailed in this report, are the following:

- Only a very small number of rules issued since 1998 (fewer than one percent) actually met all the criteria and triggered the provisions of EO 13045;
- When EO 13045 did apply, EPA rulemakers completed children's health risk-based analyses and incorporated the results into the regulatory actions;
- EPA achieved a significant milestone in responding to the National Agenda through the publication of the 1999 *Strategy for Research on Environmental Risks to Children*;
- EPA has devoted significant resources to funding for scientific research on children's health, prior to the publication of the formal strategy, with a particularly large influx of resources when the Centers for Excellence were initially funded in 1998;
- EPA has published two reports on America's Children and the Environment, which present the most current quantitative information available on trends in levels of environmental contaminants in air, water, food, and soil; concentrations of contaminants measured in the bodies of children and women; and childhood illnesses that may be influenced by exposure to environmental contaminants;
- A sharp rise in the number of children's health related publications in the National Environmental Publications Internet Site (NEPIS) and a rise in the proportion of NEPIS publications related to children's health occurred in 1998 with a gradual decrease detected thereafter;
- EPA environmental education grant amounts awarded to projects dealing with children's health, as well as the proportion of children's health grant amounts, increased between 1997 and 1998, with a decline and leveling off between 1999 and 2001;
- EPA has been successful in providing information to health care professionals regarding environmental health threats to children;
- For fiscal years 1999 - 2003 the data show an approximately two-fold increase in

both the proportion and the total amount of money committed (\$32,419, 900 to \$67,580,100) from EPA's total budget (\$7.6 billion) dedicated to children's health between 1999 and 2000. After 2000, the proportion of the total budget dedicated to children's health remains relatively steady.

- Using the Risk-Screening Environmental Indicators model (RSEI) to evaluate potential outcomes, the risk index (comprising toxicity, exposure, and population considerations) for chemicals that disproportionately affect children has decreased over the modeled time period (1988 - 1999).

STRUCTURE OF ANALYSIS

Based on a review of existing reports and assessments as well as a series of interviews with key EPA officials (see Appendix A for detailed methodology discussion), OCHP identified five major categories of analysis around which to organize the review. Exhibit 1 shows the five categories, how they relate to the agenda items, and the quantitative and qualitative measures chosen to report on progress of each. These measures are not a comprehensive accounting of all EPA activities related to children's health. Rather, they provide an indication of EPA's progress in addressing these issues.

EXHIBIT 1 ORGANIZATION OF ANALYSIS			
Category of Analysis	National Agenda Item	Quantitative Measure(s)	Qualitative Measure(s)
Regulatory Program Review	Analysis of EPA Rulemakings	Compliance with EO 13045	
	Evaluation of Major Regulatory Impact Analyses		Summary of children's health impacts in major regulatory impact analysis
	Interviews with EPA Rulewriters		Results of interviews with EPA Rulewriters
Research and Science Policy	Research	Extramural research through the Science To Achieve Results (STAR) Program	
	Cumulative and Simultaneous Exposure Policy		Summary and overview of major accomplishments and current progress
Outreach	Public	Agency outreach publications	
	Environmental Education Grants	Environmental education grants	

EXHIBIT 1 ORGANIZATION OF ANALYSIS			
Category of Analysis	National Agenda Item	Quantitative Measure(s)	Qualitative Measure(s)
	Health Care Providers		Summary and overview of major accomplishments and current progress
	Community Right-to-Know		Summary and overview of special initiatives under Emergency Planning and Community Right-to-Know Act (EPCRA)/Toxic Release Inventory (TRI) related to children's health
Budgetary Analysis	Funding	Agency budget devoted to children's health	
Overall Children's Health Status		Trends in children's exposures/risks from environmental factors	

ORGANIZATION OF THE REPORT

The following sections of the report discuss each category of analysis, presenting the data collected and the specific metrics used to track both qualitative and quantitative progress. The last section of the report presents conclusions and recommendations for additional steps that could improve the Agency's understanding of how well it is addressing children's health issues.

REGULATORY PROGRAM REVIEW

To assess the responsiveness of the EPA's regulatory program to the potentially higher risks faced by children, the analysis focused on the Agency's formal considerations of children's health risks in the *Federal Register*³. This quantitative analysis was augmented with a qualitative review of a subset of relevant regulatory efforts and targeted interviews of EPA personnel to better understand how EPA conducted evaluations of children's health and how EO 13045 affected these efforts.

ANALYSIS OF EPA RULEMAKINGS

Background and Methods

The analysis first identified the number of EPA rulemaking actions (rules and proposed rules) that met the criteria for EO 13045, from April 1998 (the date when requirements under EO 13045 went into effect) through July 2002. This Order requires that all federal agencies evaluate health and safety risks to children and consider the effects of rulemaking actions on children for rules that are determined to be health- or safety-based, economically significant under EO 12866,⁴ and that may pose a disproportionate impact to children. In addition, the analysis examined the degree to which rulemaking actions included consideration of children's health concerns, even if the actions did not meet the specific criteria for EO 13045.

The analysis focused on the following quantitative metrics of performance:

- Regulatory actions by regulatory area (Exhibit 2);
- Health- or safety-based actions by regulatory area (Exhibit 3);
- Number of actions that meet criteria for EO 13045 (Exhibit 4); and
- Percentage of health-based actions that discuss EO 13045 or include an evaluation of the impact on children (Exhibit 5).

Results

Between April 1998 and July 2002, 4,825 EPA regulatory actions were published in the *Federal Register*. Exhibit 2 sorts these actions out by regulatory topic area. Sixty-five percent of the rules are air-

³ This effort extends a previous OCHP analysis, "Analysis of EPA Implementation of Executive Order 13045," September 30, 2001.

⁴ Viewed at http://www.archives.gov/federal_register/executive_orders/pdf/12866.pdf

related while pesticide and waste-related actions each account for roughly 14 percent of the total regulatory actions.

EXHIBIT 2 REGULATORY ACTIONS BY REGULATORY AREA		
Regulatory Topic Area	Total Number of Actions	Percent of All Actions
Air	3,133	65%
Pesticides	660	14%
Waste	652	14%
Water	252	5%
Toxics	112	2%
Other	16	<1%
TOTAL	4,825	100%
Source: EPA's <i>Federal Register</i> Website, www.epa.gov/fedrgstr		

Of the 4,825 actions published, only 25 percent, or 1,180 rules, were determined to be health- or safety-based. The analysis relied on EPA's Rule Writer's Guide to Executive Order 13045 to guide this characterization⁵. While the guidance does not provide a specific definition of health- or safety-based rules, it does note that rules based on technology performance, sampling methodologies or test procedures, ecological standards not based on human health, rules implementing specific standards specified in statutes, and individual State program approval decisions are not considered health- or safety-based. Exhibit 3 presents the breakdown of health- or safety-based regulatory actions by regulatory area.

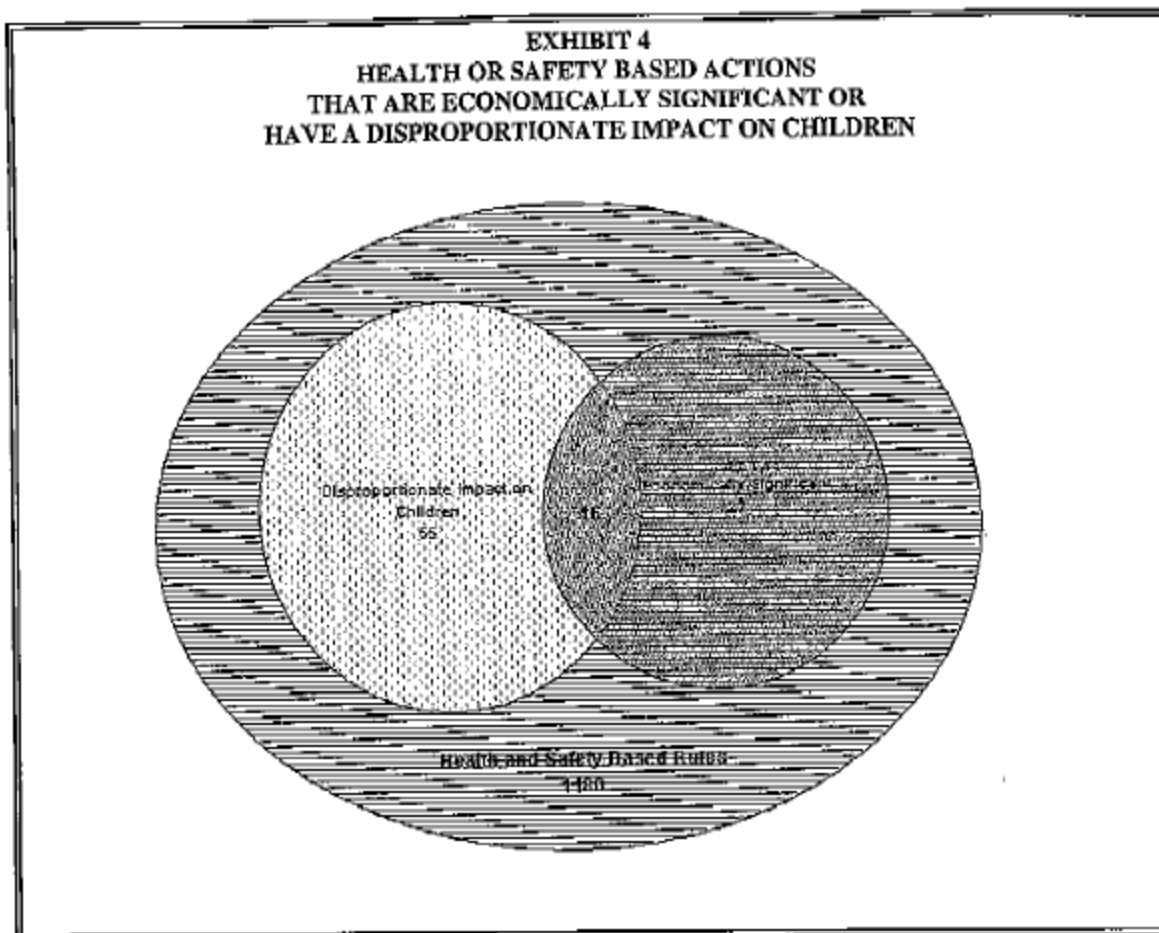
Sixty-five percent of the regulatory actions identified in the *Federal Register* over the analysis period are air-related, yet according to Exhibit 3, only seven percent (226 out of 3,133) of these air-related actions are considered health- or safety-based. On the other hand, nearly 80 percent (527 out of 660) of pesticide actions are categorized as health- or safety-based, representing nearly half of all health- or safety-based actions identified. The total number of waste-related regulatory actions was nearly equivalent to the number of pesticide-related actions (652 compared to 660), however, only 47 percent of the waste-related actions are health- or safety-based. Water, toxic, and other related regulatory actions made up approximately eight percent of the total number of actions considered in the analysis and ten percent of the total number of health- and safety-based actions.

⁵ "EPA's Rule Writer's Guide to Executive Order 13045, Guidance for Considering Risks to Children During the Establishment of Public Health-Based and Risk-Based Standards." Office of Policy, Regulatory Management Division. October 1998. Page 6.

EXHIBIT 3			
HEALTH OR SAFETY BASED ACTIONS BY REGULATORY AREA			
Regulatory Topic Area	Total Number of Actions	Number of Health or Safety Based Actions	Percent Health or Safety Based Actions
Air	3,133	226	7%
Pesticides	660	527	80%
Waste	652	305	47%
Water	252	73	29%
Toxics	112	49	44%
Other	16	0	0%
Total	4,825	1,180	25%
Source: EPA's <i>Federal Register</i> Website, www.epa.gov/fedrgstr .			

In reviewing these results it is important to remember that state actions are not, for purposes of this review, defined as health- or safety-based. Accordingly, 1,832, or 58 percent, of the air-related actions, which are related to State Implementation Plans and 173, or 27 percent, of the waste regulations, which are concerned with state hazardous waste programs, were deemed not based on health or safety issues.

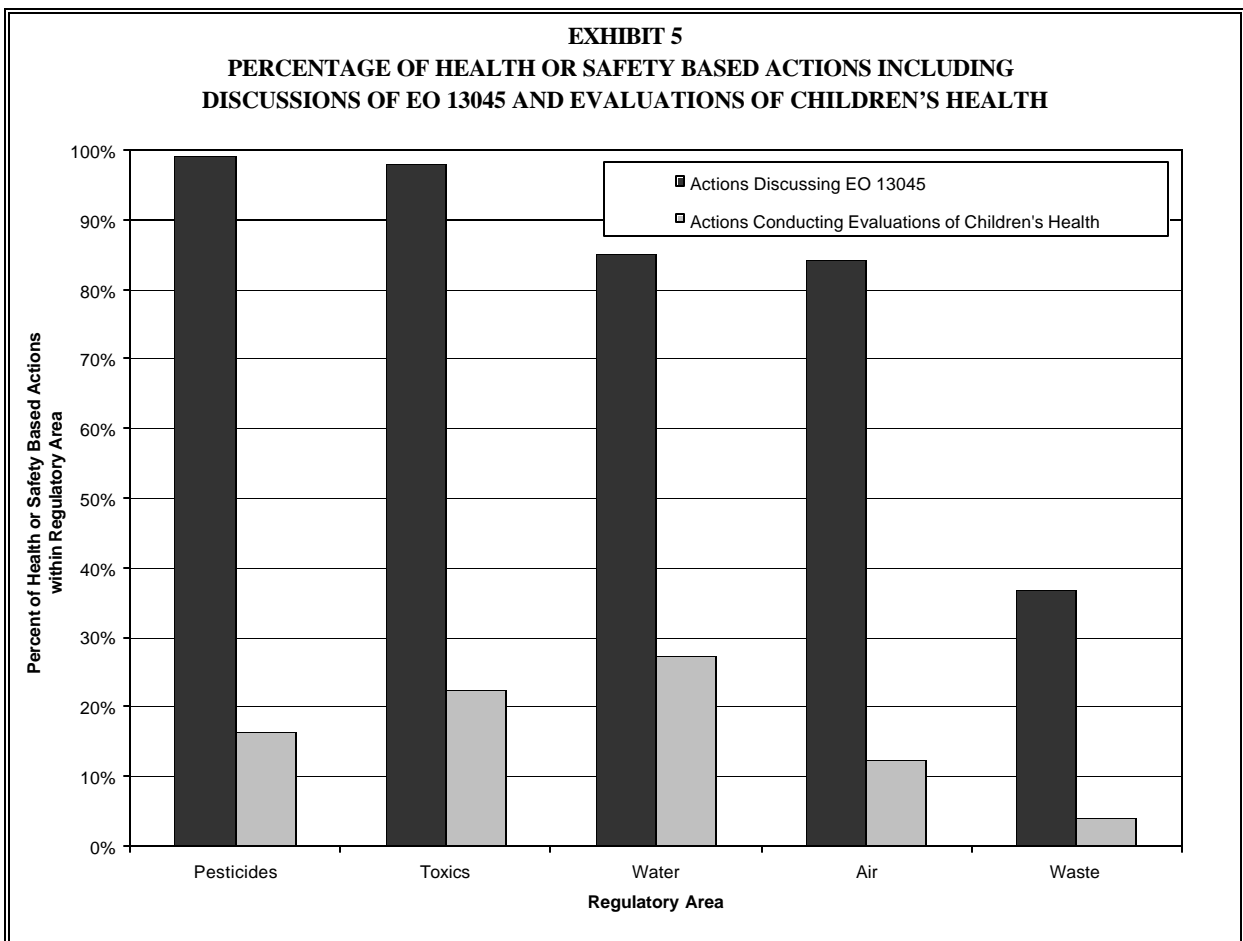
EO 13045 is only applicable to those health- or safety-based actions that are economically significant as defined by EO 12866 and to those actions where rulewriters indicated the regulatory action may have a disproportionate impact on children's health. As Exhibit 4 shows, of the 1,180 health or safety based actions, 27 are economically significant and 55 have a disproportionate impact on children. Sixteen regulatory actions meet all four criteria for EO 13045. Each of these includes a discussion of EO 13045 and an evaluation of the impact on children's health. These sixteen actions are discussed in more detail in a later section of this report entitled "Critical Evaluation of Major Regulatory Impact Analyses" and in Appendix B.



Each health or safety-based action should include a discussion of the potential relevance of EO 13045, regardless of whether the action meets the remaining criteria for EO 13045.⁶ Of the 1,180 health or safety based actions examined, 934, or 79 percent, discussed or made reference to EO 13045. As Exhibit 5 shows, the analysis revealed that nearly 100 percent of health- or safety-based pesticide and toxics rules discuss EO 13045 and nearly 85 percent of relevant air and water regulations include a discussion. A significantly smaller portion of health- or safety-based waste rules include a discussion of EO 13045. The results with regard to the waste regulations are affected by the inclusion of all actions related to the National Oil and Hazardous Substances Pollution Contingency Plan, National Priorities List (NPL) as health- or safety-based standards. There are 221 NPL actions in this category, which account for 73 percent of all health- or safety-based waste actions; few of these include a discussion of EO 13045. If these NPL actions are removed from the list of waste-related health- or safety-based actions, then 80 of the remaining 84 health- or safety-based waste rules, or 95 percent, include a discussion of EO 13045.

⁶ Ibid, Attachment A.

**EXHIBIT 5
PERCENTAGE OF HEALTH OR SAFETY BASED ACTIONS INCLUDING
DISCUSSIONS OF EO 13045 AND EVALUATIONS OF CHILDREN'S HEALTH**



A total of 158 health- or safety-based actions, representing over 13 percent, include an evaluation of the impacts on children. Over 20 percent of health- or safety-based toxics and water rules include such an evaluation. Evaluations were conducted in over 10 percent of both pesticide and air rules based on health or safety. As with the discussions of EO 13045, evaluations are included in a smaller percentage of the health- or safety-based waste actions, but the percentage increases if NPL actions are not categorized as health- or safety-based. In addition, the analysis did not uncover any specific instances of rules that failed to include an evaluation of children's health when such an evaluation was required.

CRITICAL EVALUATION OF MAJOR REGULATORY IMPACT ANALYSES

Background and Methods

EPA reviewed in more detail the 16 regulatory actions that met the four EO 13045 applicability criteria. For purposes of this analysis, proposed and final regulatory actions were combined, yielding a total of 11 distinct regulations. The regulatory impact analyses (RIAs) conducted as part of these actions were

assessed to determine the following:

- ☐ How did the consideration of children change the analyses (e.g., was a lower reference dose used?) and/or how would the RIA results differ in the absence of special consideration of children's health risk?
- ☐ Did the regulatory action consider children as the most sensitive subpopulation or did the action consider a more sensitive subpopulation?

Results

Appendix B includes detailed summaries of these rules and Exhibit 6 below includes a brief description of each of the eleven distinct rules.

EXHIBIT 6 SUMMARY OF CHILDREN'S HEALTH IMPACTS DISCUSSED IN MAJOR REGULATORY IMPACT ANALYSES	
Regulation	Impacts on Children
Control of Air Pollution from New Motor Vehicles: Tier 2 Motor Vehicle Emissions Standards and Gasoline Sulfur Control Requirements (1999)	The reduction of NOx, particulate matter, and other pollutants will result in an estimated 7,900 fewer cases of acute bronchitis, 87,200 fewer cases of lower respiratory symptoms, and 86,600 fewer cases of upper respiratory symptoms in asthmatic children.
Control of Emissions of Air Pollution from Highway Heavy-Duty Engines (2000)	The regulation will result in reduced ozone emissions, associated with harmful respiratory effects, that most severely affect people with compromised respiratory systems, children, and outdoor workers.
The Proposed Ground Water Rule (2000)	The occurrence of illness due to waterborne pathogens is significantly higher in children than adults. Estimates indicate that this proposed rule will result in 26,566 fewer viral illnesses per year in children under 16 years old.
Final Rule to Modify Reporting of Persistent Bioaccumulative Toxic Chemicals Under EPCRA Section 313 (1999)	Studies have demonstrated that children and fetuses are at the greatest risk to Persistent and Bioaccumulative Toxic (PBT) exposure. By adding chemicals and/or lowering the reporting thresholds for certain PBT chemicals on the Toxics Reporting Inventory (TRI), the regulation enables citizens to access chemical release data and allows them to make better decisions in lowering their exposure to chemicals in their community.

EXHIBIT 6	
SUMMARY OF CHILDREN'S HEALTH IMPACTS DISCUSSED IN MAJOR REGULATORY IMPACT ANALYSES	
Regulation	Impacts on Children
Final Rule to Modify Reporting of Lead and Lead Compounds Under EPCRA Section 313 (2000)	By lowering the reporting thresholds for lead, a PBT chemical, the public will have increased access to chemical release data that may assist them in decreasing their (and their children's) exposure to lead and lead compounds, to which children are at greatest risk.
Heavy-Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements (2000)	This national program will reduce the adverse health effects associated with air pollution (e.g. asthma in children) by providing more stringent rules for diesel engines, thus reducing emissions of ozone precursors.
The Radionuclides National Primary Drinking Water Regulations, Final Report (2000)	In setting these levels, the lifetime radiogenic cancer risks associated with the current and final maximum contaminant levels (MCLs) were evaluated based on age-specific and organ-specific cancer risk models that explicitly consider children's higher per unit dose risks.
The Proposed Metal Products and Machinery Rule (2000)	The benefits of reducing lead levels in fish tissue and drinking water in this regulation were calculated on a dose-response basis. This method accounted for the susceptibility of children who are exposed to lead during development. This analysis considered several measures of children's health benefits from reduced lead exposure up to the age of six years.
The Proposed Revisions to the National Pollutant Discharge Elimination System Regulations and the Effluent Guidelines for Concentrated Animal Feeding Operations (2001)	This study evaluated the environmental health or safety effects of pollutants from concentrated animal feeding operations (CAFOs) on children.
Toxic Substances Control Act Section 403: Lead-Based Paint Hazard Standards (2000)	This analysis focuses almost exclusively on assessing the exposure and risk of lead hazards to young children. The standards were selected and designed to protect children from lead in residential paint, dust, and soil.
Air Quality Index Reporting (1998)	The proposed Pollutant Standard Index (PSI) categories take into consideration the increased health risk to children that may result from exposure to ozone.

Each of these actions complied with EO 13045 by discussing the specific impacts on children. For example, the Tier 2 Motor Vehicle Emissions Standards rule recognized that the regulated pollutants are believed to have a disproportionate effect on children. The Proposed Ground Water Rule noted that the action will likely result in 25,566 fewer viral illnesses in children. In some instances the role of children dominates the risk analysis, as in the Heavy-Duty Engine and Vehicle Standards Requirements, which note

that “although adults, children and even plants are subject to the negative effects associated with ozone exposure, children are especially susceptible.”

In some cases, the analyses explicitly considered the risks to children and set standards in order to protect children. For example, in the Economic Analysis of Radionuclides National Primary Drinking Water Regulations, the Agency set Maximum Contaminant Levels using risk models that explicitly consider children’s higher risk per unit dose. In the Toxic Substances Control Act (TSCA) Lead-based Standards Rule, the impact analysis focused exclusively on assessing the risk to young children. The Economic and Benefit Analysis of the Proposed Metal Products and Machinery Rule contained an assessment methodology that specifically accounted for the susceptibility of children who are exposed to lead during development. Because of data gaps, some rules, such as the Rule on Effluent Guidelines for Concentrated Animal Feeding Operations (CAFOs), were unable to set standards directly related to the impact on children. Despite this, for those rules that meet the criteria of EO 13045, it is clear that EPA rulemakers are taking children’s health concerns seriously by incorporating results of analyses appropriately into regulatory actions.

INTERVIEW WITH EPA RULEWRITERS

Background and Methods

In order to supplement the information gathered from the review of RIAs, the analysis included a series of interviews with EPA rulewriters. The interviews sought additional information about how the Executive Order was applied and what impact it had upon the methodology or content of the children’s health analysis. The list of potential interviewees included the EPA staff listed as the contacts for the rules that met all of the EO 13045 criteria, and contacts for four other rules that met all of the EO 13045 criteria except for the potential for disproportionate impact on children. These four rules contained evaluations of children’s health even though they were not formally subject to EO 13045. Of these potential interviewees, 14 were identified as final candidates for interviews. The interviews focused on determining how EPA conducted the evaluation, how the evaluation affected the final rule, and the role played by EO 13045.

In a separate effort, fifteen⁷ rulewriters received email questionnaires, asking:

- whether EO 13045 influenced the decision to conduct an evaluation of children’s health; and
- whether EO 13045, or any guidance associated with it, influenced the methodology or content of the children’s health evaluation.

⁷The analysis randomly identified fifteen rulewriters who had conducted an evaluation of children’s health issues, for inclusion in the email survey.

Results

At the time this analysis was completed, only eight of the 14 EPA staff have scheduled and conducted interviews. Similarly, only three of the 15 rule writers contacted by email have responded. This response rate notwithstanding, a few key points emerge from the effort. Respondents indicate that EO 13045 had little influence on the decision to conduct an evaluation or on the assessment itself. In those actions that met the criteria for EO 13045, rulemakers stated that they would have conducted an evaluation of children's health regardless of EO 13045, either because of an existing statutory requirement or because safety factors to protect sensitive populations were included in the risk assessments. One rulewriter also noted that while the guidance documents for EO 13045 were too general to guide modeling or technical aspects of the evaluation, they did affect the types of information that were collected and how they were presented in the *Federal Register*.

SUMMARY OF FINDINGS ON REGULATORY PROGRAM REVIEW

The analysis of EPA's regulatory programs revealed that EO 13045 is applicable in only a very small number of the regulatory actions promulgated. However, a high percentage of health-based rulemakings are considering EO 13045 and a substantial number of rules include evaluations of children's health, even when not required by EO 13045. The examination of the *Federal Register* notices did not reveal any cases of rules that failed to consider children's health when an evaluation was required.

The analysis of relevant RIAs and interviews with EPA rulewriters support the findings from the *Federal Register* review. EO 13045 did not have a substantial impact on whether or how an evaluation of children's health was conducted, since existing requirements or provisions to address sensitive populations generally compelled the rule writers to consider the potential impacts on children.

RESEARCH AND SCIENCE POLICY

EPA has already achieved the National Agenda goal, “develop a scientific research strategy focused on the gaps in knowledge regarding child-specific susceptibility and exposure to environmental pollutants,” with the publication of the 1999 EPA *Strategy for Research on Environmental Risks to Children*.⁸ The *Strategy* outlines multiple objectives, children’s risk topics, research questions, and research priorities that are to be addressed in research plans developed by EPA. OCHP was one of several EPA offices to assist the Office of Research and Development (ORD) in developing the *Strategy* for achieving certain desired outcomes and outputs. This section of the analysis measures implementation of the *Strategy*.

RESEARCH

Background and Methods

The National Center for Environmental Research's (NCER's) Science To Achieve Results (STAR) program provides research grants and graduate fellowships in numerous environmental science and engineering disciplines. The program funds research from the nation's top scientists, focusing on the health effects of particulate matter, drinking water, water quality, global change, ecosystem assessment and restoration, human health risk assessment, endocrine disrupting chemicals, pollution prevention and new technologies, children's health, and socio-economics. Furthermore, in 1998, EPA, in conjunction with the National Institute of Environmental Health Sciences (NIEHS) and the Center for Disease Control (CDC), established eight Centers of Excellence in Children's Environmental Health and Disease Prevention Research. In 2001, four additional Centers were established. These Centers conduct basic and applied research and prevention efforts, the aim of which is a better understanding of the causes of environmentally-induced disease among children.

This analysis evaluated extramural projects pertaining to children’s health, using NCER’s STAR Project Database. This database contains information on the STAR program, including those projects funded under the Centers of Excellence.

To measure the extent to which EPA has promoted efforts to develop a scientific research strategy focused on children’s environmental health, the following metrics were quantified, using the STAR database:

- STAR children’s health projects as a percentage of total STAR projects started each year;
- STAR children’s health award amounts as a percentage of total STAR award amounts given out each year; and

⁸ Viewed at <http://www.epa.gov/nceawww1/risk2kids.htm>.

- □ Centers for Excellence award amounts as a percentage of total STAR award amounts given out each year.

Results

Exhibits 7, 8, and 9 present the results of the review of the STAR database. Exhibit 7 presents the number of children’s health STAR projects over the period 1993-2001, as well as the proportion of all STAR projects that children’s health projects comprise. Exhibit 8 summarizes STAR children’s health award amounts given out each year. The bars in this exhibit show the amount of funding for (1) Center for Excellence projects, (2) other STAR projects and (3) the sum of these. The Centers for Excellence fund multiple-year projects, and it is important to note that this exhibit presents the funding as being issued in a lump sum in the first year, rather than annualized over the term of the project. For example, the peak in funding and numbers of projects that occurs in 1998 (Exhibits 7 and 8) coincides with the establishment of the Centers for Excellence in Children's Environmental Health and Disease Prevention Research. The subsequent decline in 1999 and 2000 reflects that many of the Centers projects awarded in 1998 were for three year periods. The increase in 2001 is most likely due to the renewal of some of the 1998 Center projects and the establishment of the four additional Centers of Excellence.

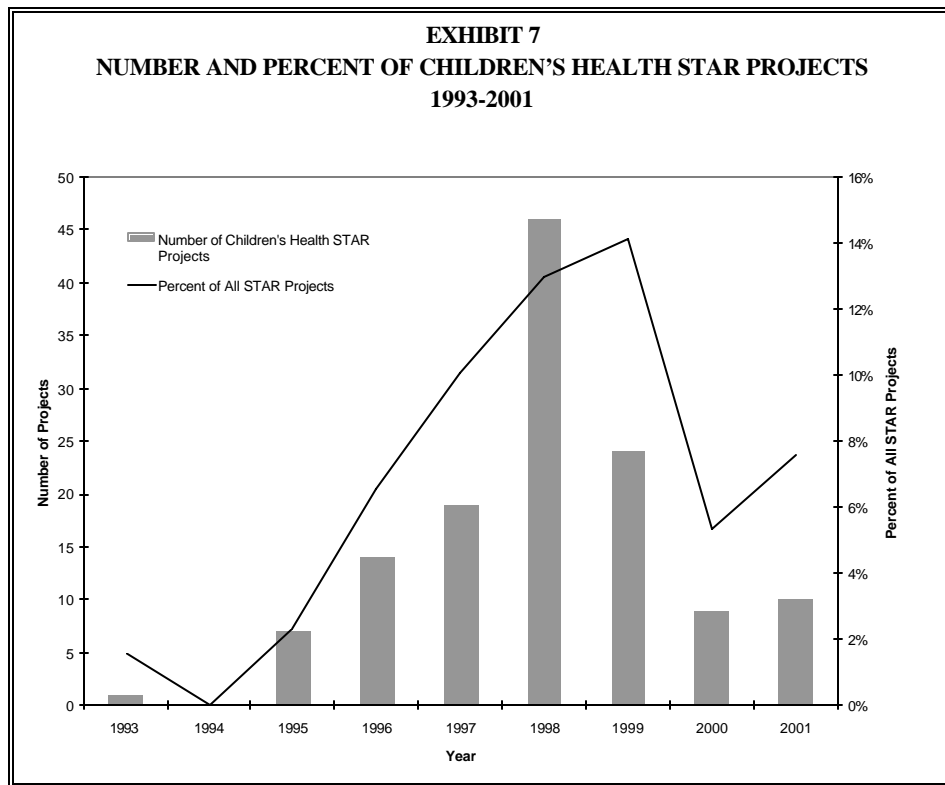


EXHIBIT 8
TOTAL CHILDREN'S HEALTH STAR FUNDING AND CENTERS FOR EXCELLENCE FUNDING

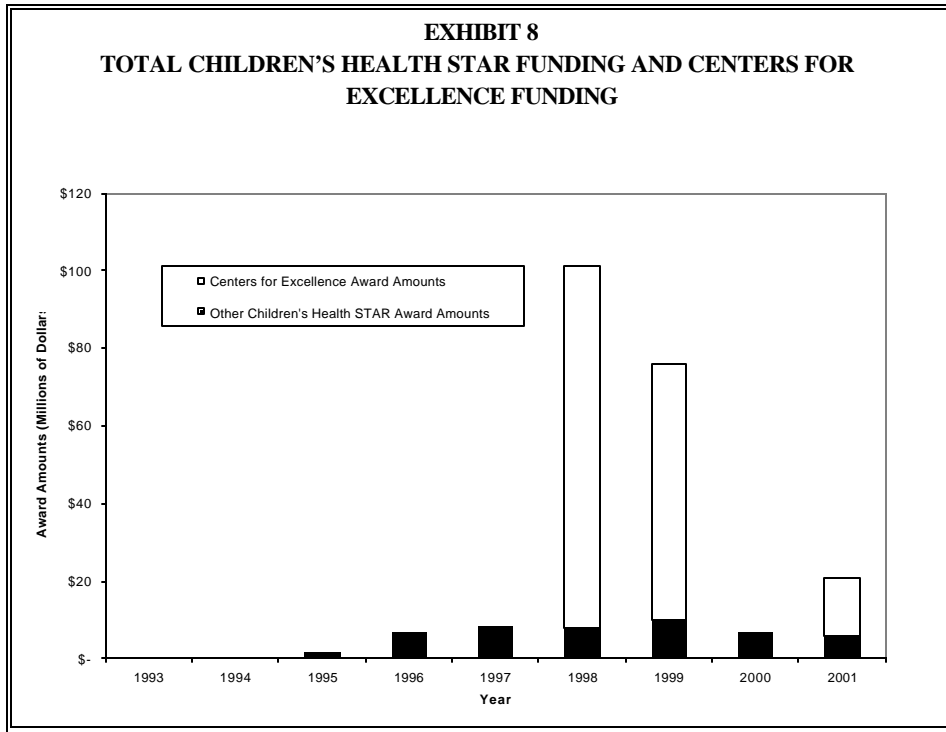
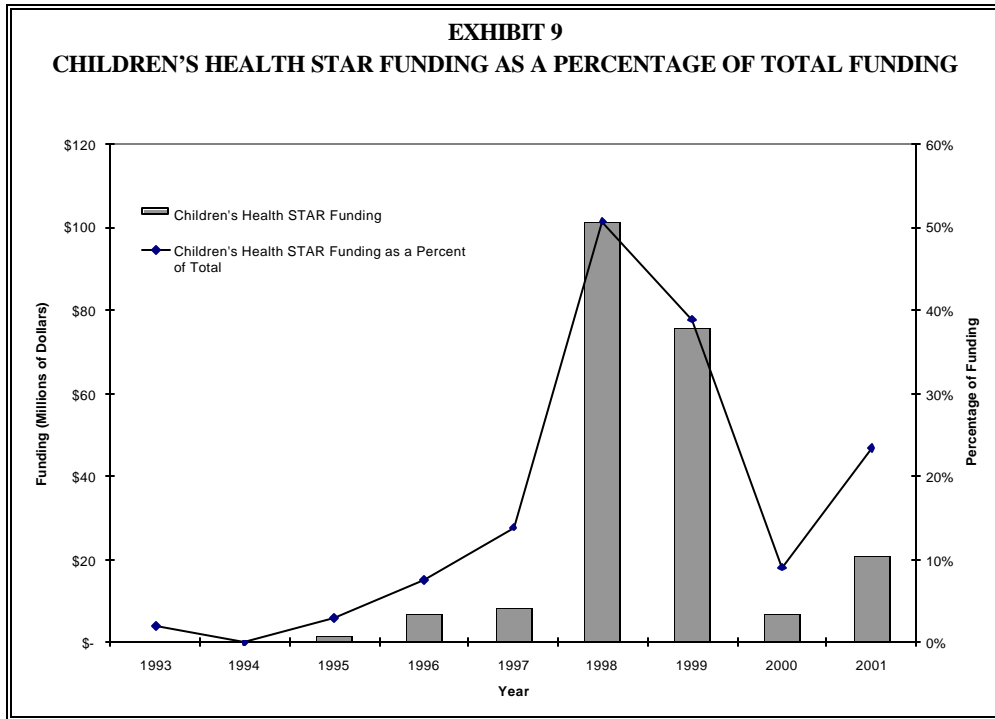


Exhibit 9 displays the total dollar funding of STAR children's health projects as a percentage of overall STAR project funding. This exhibit shows that in 1998, the children's health projects accounted for more than 50 percent of overall STAR-funded projects, in dollar terms, although they made up less than 15 percent of the total number of projects (as shown in Exhibit 7).



CUMULATIVE AND SIMULTANEOUS EXPOSURE POLICY

Background and Methods

To support analysts in the consideration of children's health and environmental exposures, EPA has been developing a number of analytical tools, policies, references and guidance documents that address issues critical to evaluating impacts on children's health. This analysis presents a qualitative discussion of EPA's recent efforts to address cumulative and simultaneous exposures faced by children. It includes an overview of major accomplishments and current progress of these Agency efforts, and a count of internal agency children's exposure projects over the last six years, as recorded in EPA's National Center for Environmental Assessment (NCEA) Science Inventory database.

Results

Appendix C contains a summary of the key projects recently completed or currently underway at EPA that are directly related or support exposure assessment for cumulative/simultaneous exposures. Exhibit 10 below presents a brief description of these activities.

EXHIBIT 10
CUMULATIVE AND SIMULTANEOUS EXPOSURE:
OVERVIEW OF MAJOR ACCOMPLISHMENTS AND CURRENT PROGRESS

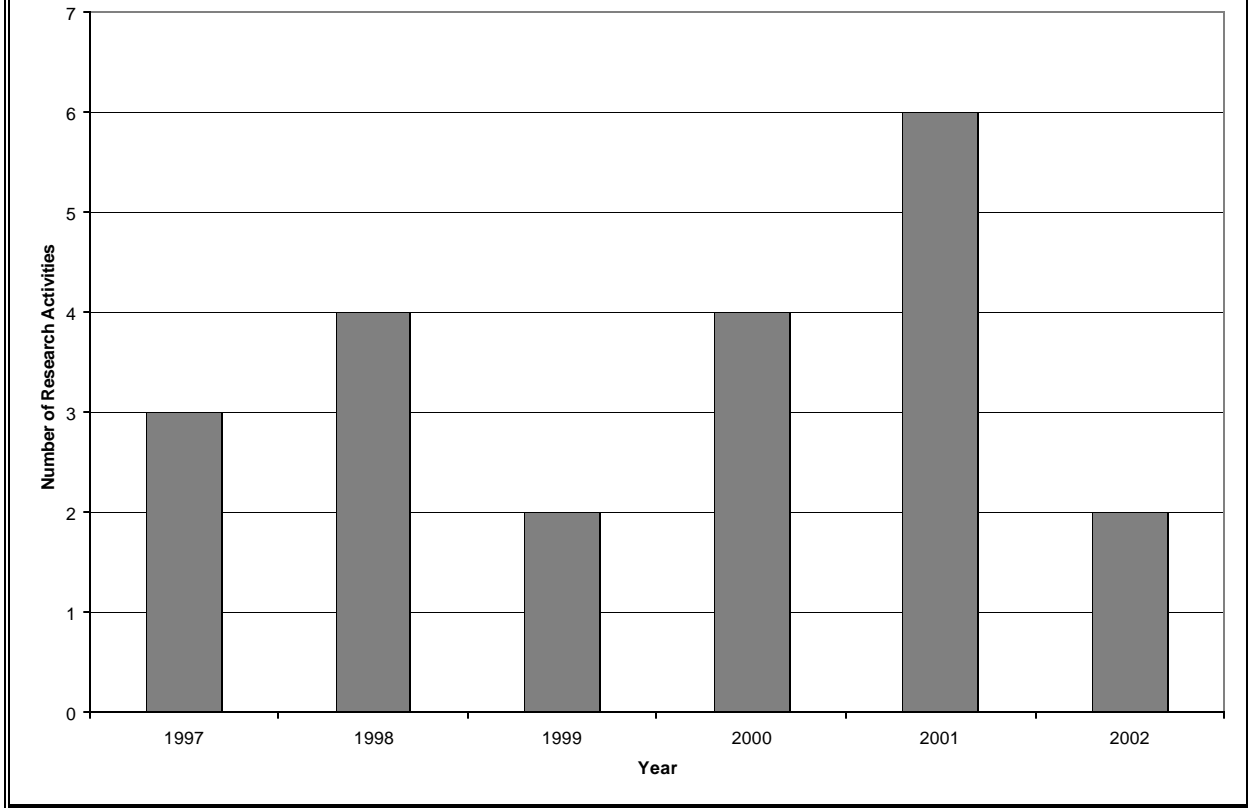
Project	Office	Summary	Relevance to Children's Health
Child-Specific Exposure Factors Handbook	National Center for Environmental Assessment (NCEA)	Consolidates all children's health-related exposure data into one document.	Clearinghouse for children's health information; aids efforts to better understand/assess exposures to children when conducting risk assessments.
Cumulative Risks of Pesticides	Office of Pollution Prevention and Toxics (OPPTS)	Cumulative risk assessment of a group of pesticides (organophosphates) that accounts for variability in potential exposures based on age and other factors.	Considers Food Quality Protection Act safety factors for protecting sensitive populations, including infants and children.
Cumulative Exposure Project	Office of Policy, Economics and Innovation (OPEI)	Uses existing data and methods to evaluate combined exposures to multiple pollutants through multiple pathways: food, water, air. Breaks out results by demographic groups.	Focus on identifying pollutants and sources with the greatest impact on specific demographic groups, one of which is children.
Draft Framework for Cumulative Risk Assessment	NCEA	Offers a simple, flexible structure for conducting and evaluating cumulative risk assessment, which serves as a foundation for development of future guidelines. In the short term, it provides a basic structure and starting principles for EPA's cumulative risk assessments. In the longer term, the report offers the basic principles around which to organize a more definitive set of guidance for Cumulative Risk Assessment.	Implications for all risk assessment work, including risks to children.
Industrial Surface Impoundment Study	Office of Solid Waste (OSW)	Cumulative risk of surface impoundments studied by looking at co-occurrence of chemicals in the wastewater.	Potential implications for children's health.
Regional Activities	Regions 3, 5, 6	Varying studies on effects of urban environmental stressors on asthma, blood lead; long term concerns for neighborhoods adjacent to industrial facilities; GIS as tool for planning and scoping cumulative risk.	Potential implications for children's health.

EXHIBIT 10			
CUMULATIVE AND SIMULTANEOUS EXPOSURE: OVERVIEW OF MAJOR ACCOMPLISHMENTS AND CURRENT PROGRESS			
Project	Office	Summary	Relevance to Children's Health
Integrated Urban Air Toxics Strategy	Office of Air and Radiation (OAR)	Cumulative risks of exposure to Hazardous Air Pollutants (HAPs) from aggregate sources; performed at neighborhood and national scale.	Potential implications for children's health.
Total Risk Integrated Methodology	OAR	Neighborhood-scale risk assessment of HAPs and criteria air pollutants.	Potential implications for children's health.
Draft Reassessment of Dioxin and Related Compounds	NCEA	Reassessment of dioxin toxicity, background exposure/body burden, and methods for assessing incremental exposure/body burden.	Fetuses, infants, and children are more sensitive to dioxin than the general population; breast milk may be a significant source of dioxin exposure for nursing infants.

A number of projects are dedicated to cumulative/simultaneous exposure, many of which will contribute to the broader body of knowledge regarding risk assessment in general. Four projects (Child-Specific Exposure Factors Handbook, Cumulative Risks of Pesticides, Cumulative Exposure Project, Draft Reassessment of Dioxin and Related Compounds) explicitly consider children's exposure and health issues. The first of these is a compilation of pertinent information related to children's health risk; the final three are actual risk assessments for various contaminants of concern for children.

Exhibit 11 depicts the number of NCEA research activities related to children's exposure since 1997, the year from which NCEA publications are included on the website. These data do not suggest an immediate reaction to the National Agenda or EO 13045. In fact, year 2002 research activities have decreased from 1997 levels.

**EXHIBIT 11
NUMBER OF CHILDREN'S HEALTH CUMULATIVE
EXPOSURE NCEA RESEARCH ACTIVITIES**



SUMMARY OF FINDINGS ON RESEARCH AND SCIENCE POLICY

The analysis indicates that EPA increased the amount and percentage of STAR research funding related to children's concerns from 1995 through 1999, with a decrease in 2000 and a slight increase again in 2001. EPA's participation in the STAR program indicates an apparent reaction to the National Agenda and EO 13045. However, the short time period represented warrants continued monitoring to assess more meaningful, long-term trends. In addition, EPA has developed a number of important tools and research projects that expands the base of knowledge in the area of human health risk assessment, while targeting gaps in cumulative/simultaneous exposure of children to environmental pollutants.

OUTREACH

This section describes and assesses EPA's progress in creating and disseminating children's health outreach to key sectors: parents, teachers, caretakers, and health care providers. A series of qualitative and quantitative metrics were employed to assess EPA progress in four areas, including 1) information available through NEPIS; 2) funding disbursed to the Environmental Education grants program; 3) materials and activities aimed at children's health care providers; and 4) initiatives related to community right-to-know.

PUBLIC OUTREACH

Background and Methods

The National Agenda directs the EPA to provide information on children's health to parents, teachers and others who interact frequently with children. Agency outreach publications on NEPIS served as a quantitative measure to evaluate EPA's progress in outreach to parents, teachers, and other caretakers. The NEPIS database contains over 9,500 full-text, online EPA publications, but is not exhaustive. Non-print publications such as videos, posters, CD-ROMS, etc. are not included in this database.

The analysis used information available on NEPIS from 1995 through 2001 to count EPA publications related to children's health that were targeted at the caretaker audience⁹. Two tiers of search criteria were used to identify outreach documents relevant to children's health. The Tier 1 set includes publications with titles that include words relating to children's life stages and physical environment, and caretaker audiences such as parents, teachers and health care professionals. The Tier 2 set includes publications with titles that include words relating to environmental problems known to have a disproportionate impact on children, such as mercury, lead, radon, and secondhand smoke¹⁰. The number and the percentage of publications with titles relating to these two Tiers contained in NEPIS per year serve as metrics for public outreach.

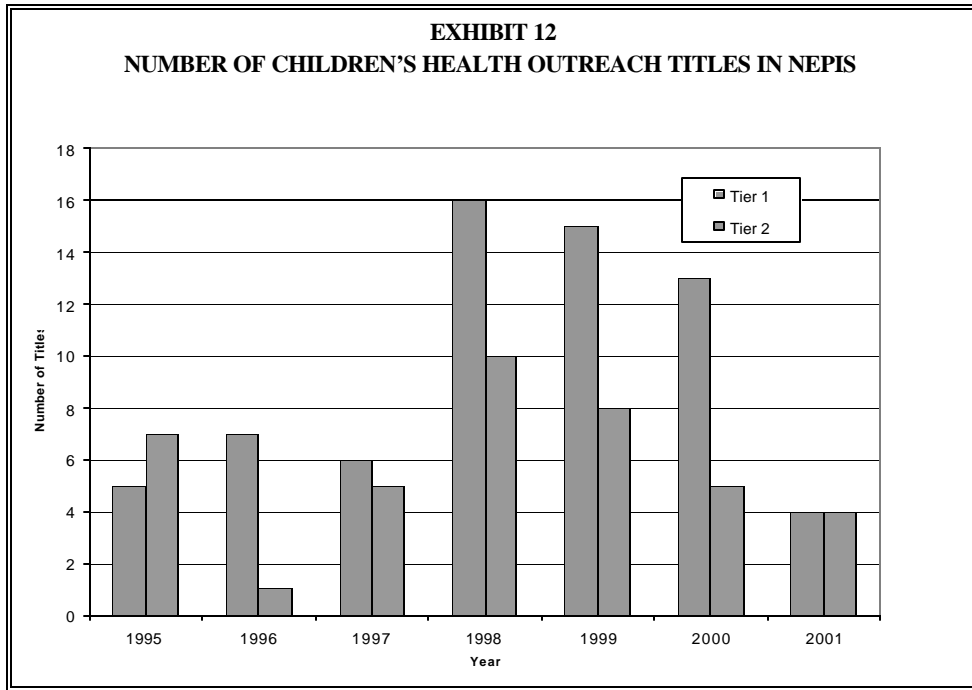
Results

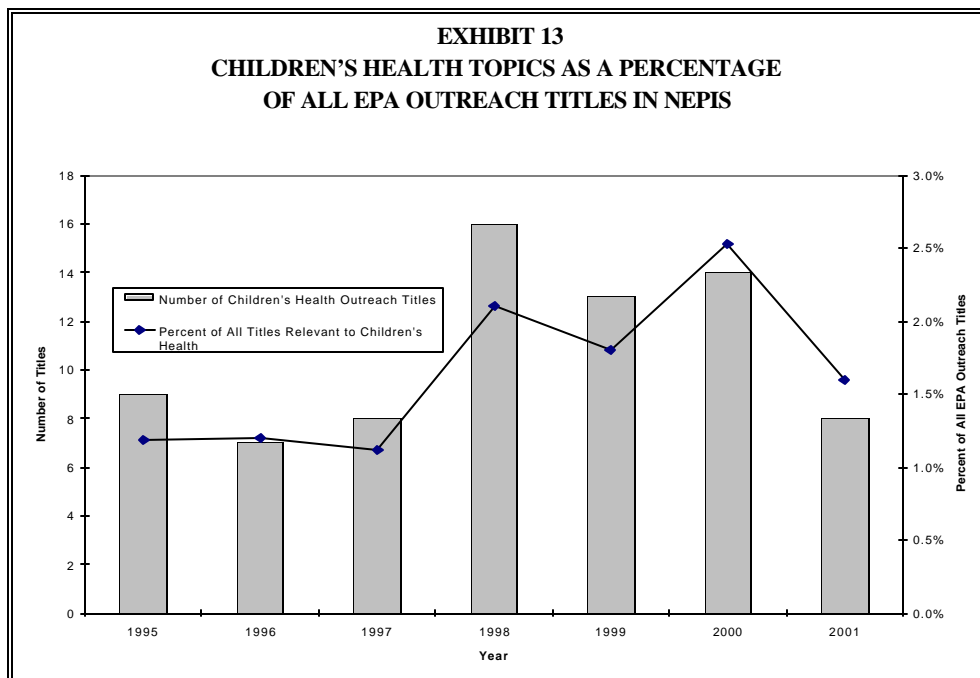
Titles of EPA outreach documents in NEPIS from 1995 to present were examined. The number of titles relating to children's health peaked in 1998 for both Tier 1 and Tier 2 search criteria (Exhibit 12). The Tier 2 category fluctuates between 1995 and 1997, while the number of Tier 1 titles remains nearly constant. The number of titles relating to children's health in both categories increase substantially in 1998,

⁹1995 was chosen as a logical starting point because that was the year in which EPA Administrator Browner announced a national policy to address children's health.

¹⁰The full list of these search terms can be found in ICF's September 29, 2001 memorandum to the OCHP.

and then decrease gradually in subsequent years. When the two tiers are aggregated, and duplicates removed, the same peaking trend is observed (Exhibit 13). The number of children's health publications increased slightly from 1999 to 2000, though still less than the number in 1998. Children's health publications represent a higher percentage of total NEPIS publications in 2000 than in 1998 due to a decrease in total NEPIS publications between those years.





No single health subject accounts for the majority of these outreach titles, though lead, radon and indoor air issues were prominent, as shown in Exhibit 14. Also notable in EPA's outreach efforts, 14 of these documents were made available in a foreign language, eight in Spanish and six in Asian languages.

EXHIBIT 14
NUMBER OF CHILDREN'S HEALTH OUTREACH DOCUMENTS IN NEPIS BY
SUBJECT AND FOREIGN LANGUAGE AVAILABILITY

<i>Subject</i>	
Radon	8
Asthma	6
Lead	11
Indoor Air	9
Carbon Monoxide or Secondhand Smoke	11
Sun Exposure	6
Other	26
Total	77

EXHIBIT 14	
NUMBER OF CHILDREN'S HEALTH OUTREACH DOCUMENTS IN NEPIS BY SUBJECT AND FOREIGN LANGUAGE AVAILABILITY	
<i>Foreign Language Availability</i>	
Spanish	8
Other	6
Total	14

ENVIRONMENTAL EDUCATION GRANTS

Background and Methods

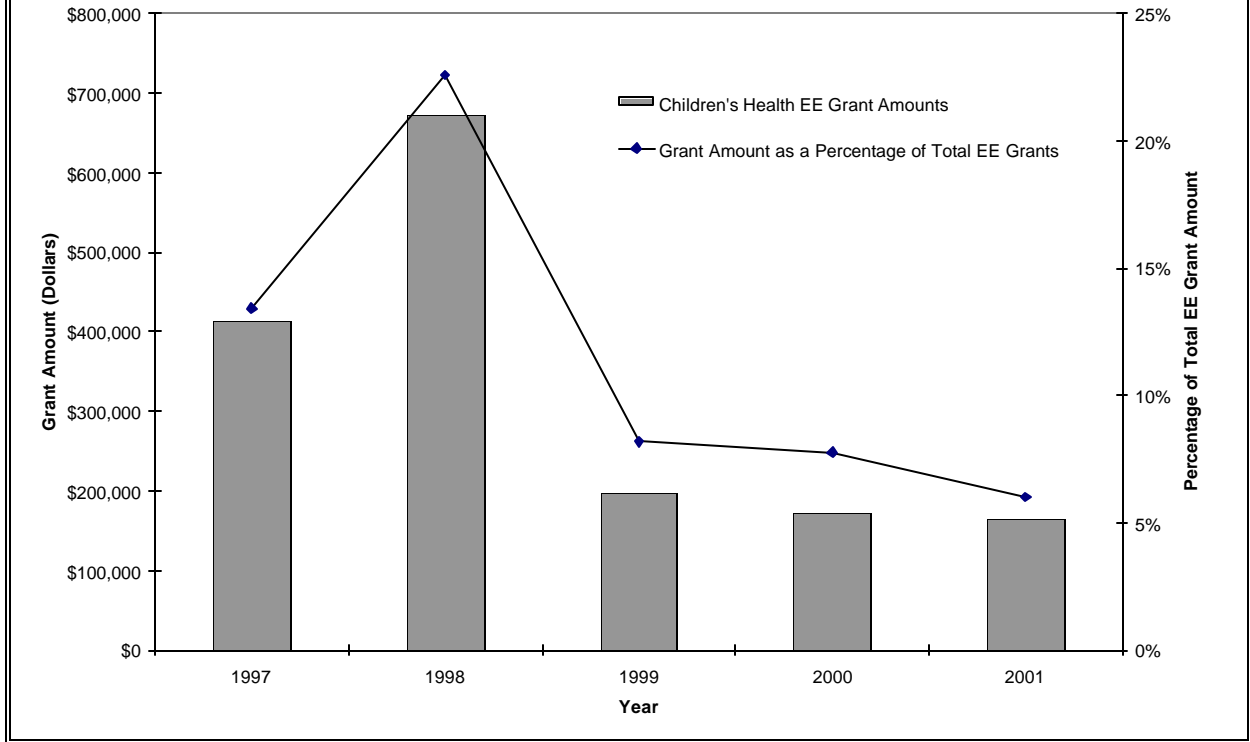
The Environmental Education grant program, administered by the Office of Environmental Education (OEE), provides another avenue for outreach by EPA. The OEE awards approximately two to three million dollars annually for environmental education efforts. Grant award data from each state were compiled for the years 1997 to 2001¹¹ and titles were screened for those relevant to educating the public about environmental exposures/risks to children. The environmental education grants each year for children's health issues, in terms of dollar value and percentage of total environmental education grant funding, were used to measure public outreach.

Results

Exhibit 15 presents the number of environmental outreach grants provided. The number of grants pertaining to children's health peaked in 1998, as did children's health grants as a percentage of total grant funding by the OEE.

¹¹OEE was started in 1992, but it was not until 1997 that detailed information was available on projects and grant amounts

EXHIBIT 15
CHILDREN'S HEALTH ENVIRONMENTAL EDUCATION GRANTS AS A PERCENTAGE OF
TOTAL ENVIRONMENTAL EDUCATION GRANTS



INFORMATION FOR HEALTH CARE PROVIDERS

Background and Methods

The National Agenda includes a goal to "encourage and expand educational efforts with health care providers and environmental professionals so they can identify, prevent and reduce environmental health threats to children." This analysis surveyed related EPA programs and initiatives to evaluate EPA efforts to provide educational opportunities for health care and environmental professionals. Metrics are specific to each project and are included when available. A qualitative summary and overview of some of the major accomplishments and ongoing efforts by EPA is contained in Exhibit 16. Appendix D provides a more detailed description of these efforts.

Results

Exhibit 16 shows that various offices within the EPA have initiated a diverse group of programs designed to increase awareness of children's environmental health risks in key professional sectors. Where included, metrics speak to the successes of these initiatives in both educating and training health care professionals.

EXHIBIT 16			
SUMMARY OF EPA'S EFFORTS TO PROVIDE INFORMATION TO HEALTH CARE PROVIDERS			
PROJECT	OFFICE	DESCRIPTION	METRICS
American Academy of Pediatrics (AAP) Handbook of Pediatric Environmental Health	Office of Children's Health Protection (OCHP), Office of Research and Development (ORD)	Handbook includes summaries of environmental health hazards to children and guidance to pediatricians for the prevention, diagnosis, and treatment of environmentally-related illnesses in children.	<ul style="list-style-type: none"> • □27,000 handbooks distributed to U.S. pediatric residents • □\$93,209 funding from OCHP (FY 1999) • □ORD also provided a financial contribution
AAP Chief Resident Workshops	OCHP	Special education sessions of the AAP for pediatric Chief Residents to heighten awareness of pediatric environmental health issues in residency training programs.	<ul style="list-style-type: none"> • 120 Chief Residents trained to date • 40 Chief Residents projected for 2003
Continuing Education Programs for Nurses in Environmental Health	OCHP	<p>Continuing education program for nurses in environmental health, developed by the American Nurses Association and the University of Maryland School of Nursing and supported by OCHP.</p> <p>OCHP also assisted in the facilitation of preconference workshops at the annual meetings of the American College of Nurse Midwives; the American Nurses Association; the Association of Women's Health, Obstetrics and Neonatal Nursing; and the American Public Health Association (to be held Nov. 2002)</p>	<ul style="list-style-type: none"> • 2.6 million nurses eligible to take courses online - e.g., a sample, 370 nurses registered for the Environmentally Healthy Schools online module (Jan. 2002) • 150,000 nurses receiving a bi-monthly newsletter with three education modules

EXHIBIT 16			
SUMMARY OF EPA'S EFFORTS TO PROVIDE INFORMATION TO HEALTH CARE PROVIDERS			
PROJECT	OFFICE	DESCRIPTION	METRICS
Pediatric Environmental Health Specialty Units (PEHSU)	OCHP, EPA regions, Office of Solid Waste (OSW), Office of Emergency and Remedial Response (OERR)	Network of PEHSUs, based at academic centers, provide education and consultation for health care professionals about children's environmental health topics.	<ul style="list-style-type: none"> • 16,000 health care providers trained by PESHUs in 2001 • 32,000 projected for 2002
Managing Asthma Triggers: Keeping Children Healthy	Office of Air and Radiation (OAR) Indoor Environments Division	Asthma education training manual developed by National Association of School Nurses and EPA.	<ul style="list-style-type: none"> • Over 3000 nurses trained 2001-2003
Secondhand Smoke Prevention	OAR Indoor Environments Division	Developed a Secondhand Smoke Speaker's Kit to provide pediatricians with information and assistance in informing, educating, and sustaining public awareness on the health effects associated with children's exposure to secondhand smoke.	<ul style="list-style-type: none"> • No metrics given; project ongoing
Pesticides and National Strategies for Health Care Providers	Office of Pollution Prevention and Toxics (OPPTS)	Aimed at incorporating pesticide information into the education and practice of health care providers. The goal is to improve the recognition, diagnosis, management, and prevention of adverse health effects from pesticide exposures.	<ul style="list-style-type: none"> • No metrics given; project ongoing

COMMUNITY RIGHT-TO-KNOW

Background and Methods

The Emergency Planning and Community Right-to-Know Act (EPCRA) was enacted in 1986 to allow public access to information regarding chemical hazards in their communities. The National Agenda re-emphasized the importance of EPCRA, directing EPA to “expand community right-to-know, allowing families to make informed choices regarding environmental exposures to their children.” In addition to providing general public information under EPCRA, EPA has also developed special programs and tools directed specifically at analyzing and providing information on impacts of environmental exposures on children.

Results

The Voluntary Children's Chemical Evaluation Project (VCCEP) has been implemented by the EPA to collect and disseminate information on the environmental release of toxicants that are particularly harmful to children.

VCCEP was implemented in 2000 to enable the public to understand the potential health risks to children associated with certain chemical exposures. Twenty-three chemicals are included in the project because biomonitoring programs indicated their presence as contaminants in human tissues and fluids (blood, breath, breast milk, urine), the food and water children eat and drink, and the air children breathe. EPA asked companies that manufacture and/or import these chemicals to volunteer to collect and/or develop health effects and exposure information on each chemical, integrate that information in a risk assessment, and assess to fully characterize the risks the chemical may pose to children.

The Risk-Screening Environmental Indicators (RSEI) model is a screening tool, developed by EPA's Office of Pollution Prevention and Toxics, that combines release data with spatial, temporal and demographic information in order to provide a more complete characterization of the risks, including risks to children. RSEI is a computer-based screening tool for the evaluation of emissions and transfers of toxic chemicals from industrial facilities that is used to assess the relative impacts of releases of toxic chemicals by combining estimates of toxicity, exposure level, and the exposed population. The RSEI model can evaluate many of the risk-related chronic human health effects associated toxic releases and can compare risk-related results for facilities, chemicals, geographic areas, and time periods. Since RSEI facilitates comparisons of the relative contribution of specific chemicals, industries, and exposure pathways to overall risk, it allows for more sophisticated prioritization and strategic planning. RSEI provides a clearer picture of the impact of toxic releases on sensitive groups such as children, the elderly, and men and women of reproductive age. Accordingly, RSEI can be used as a tool for parents and other caretakers to screen the hazards and risks to their children of emissions and transfers of toxic chemicals from industrial facilities within their community.

SUMMARY OF FINDINGS ON OUTREACH

- EPA's children's health outreach publications in NEPIS peaked in number in 1998, and have dropped off since that time, though it should be noted that children's health outreach publications in NEPIS has increased in its proportional share of all NEPIS outreach titles, compared to 1995 levels.
- Environmental education grant amounts awarded to projects pertaining to educating the public about environmental exposure and risks to children's health also peaked in 1998.

- The Agency continues to initiate and maintain programs aimed at educating healthcare professionals in children's environmental health issues. While metrics are not available for all the programs, available data indicate that these programs are well-focused and meet their stated objective.
- EPA has developed special initiatives on community right-to-know, such as VCCEP, and RSEI, which aim to expand information available to the public so that families can make informed choices regarding environmental exposures of their children.

It should be noted that these measures do not reflect all outreach activities performed by EPA. Information on distribution and efficacy of these measures, as well as information on other outreach activities, would be necessary for a more complete assessment.

BUDGETARY ANALYSIS

FUNDING

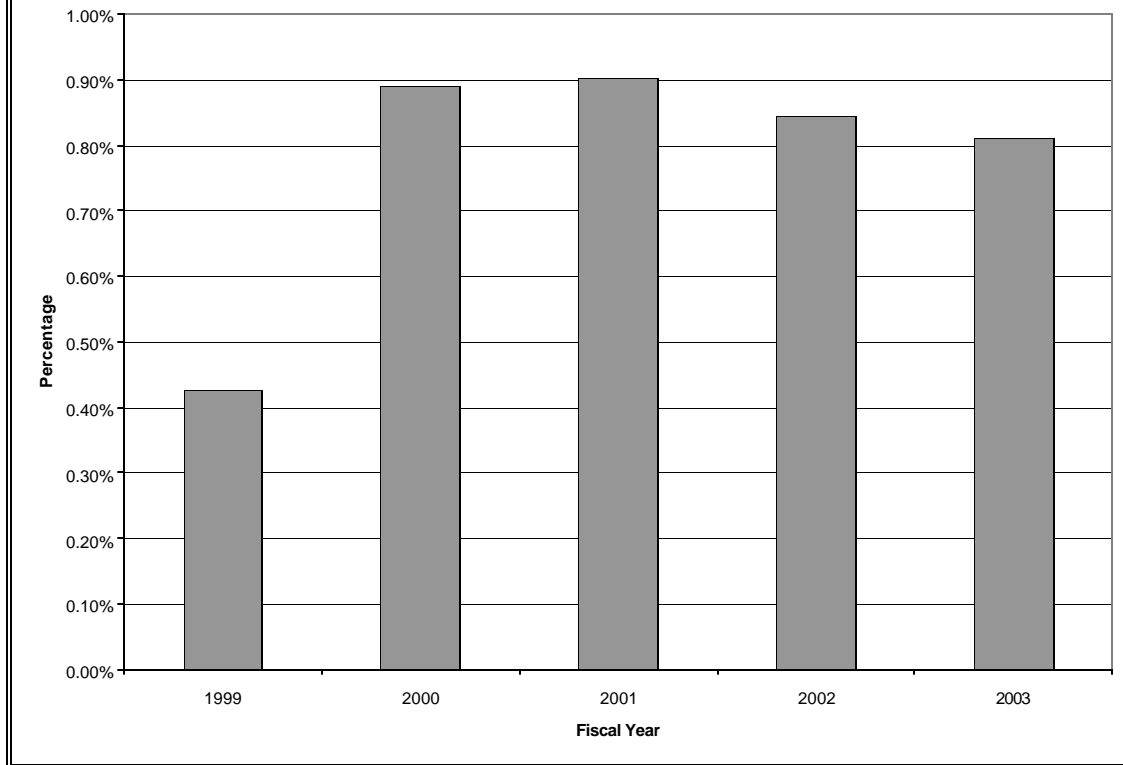
Background and Methods

The National Agenda specifies that funding be allocated as is necessary to “address children’s environmental health as a top priority among relative environmental risks.” This analysis uses the proportion of EPA’s total budget devoted to children’s health across years as a quantitative measure of the priority of children’s health issues. The analysis focused on the funding dedicated specifically to children’s health issues and did not include other components of the Agency’s budget that impact children, such as research. The data used contain dollar amounts dedicated to children’s health funding for fiscal years 1999-2003 (amounts for 2003 are projected). While funds were dedicated to children’s health before 1999, funding for children’s health was not reported separately until 1999.

Results

The data for fiscal years 1999-2003 in Exhibit 17 show an approximately two-fold increase in the total dollar amount and proportion of EPA’s total budget dedicated to children’s health between 1999 and 2000. After 2000, the amount and proportion of the total budget dedicated to children’s health remains relatively steady.

**EXHIBIT 17
CHILDREN'S HEALTH BUDGET AS A
PERCENTAGE OF EPA'S BUDGET**



Year	Children's Health Spending	Total EPA Budget
1999	\$32,419,900	\$7,600,000,000
2000	\$67,580,100	\$7,600,000,000
2001	\$71,176,2000	\$7,900,000,000
2002	\$67,634,100	\$8,000,000,000
2003	\$62,390,100	\$7,700,000,000

TRACKING CHILDREN'S ENVIRONMENTAL HEALTH

The measures described in previous sections of this report help illustrate EPA's progress on regulations, basic research and science policy, and outreach programs in support of EPA's mission to improve children's environmental health. To complement these measures, the analysis also examined measures of the desired outcome of these programs; that is, changes in children's exposures and health status over time. While it is extremely difficult, if not impossible, to attribute specific changes in children's exposures and health status to particular EPA efforts, analysis of children's health status can help policymakers and other stakeholders identify and prioritize further EPA children's health initiatives.

EPA's Office of Policy, Economics and Innovation and OCHP have published two reports on trends in environmental factors related to the health and well-being of children in the United States. *America's Children and the Environment: A First View of Available Measures* was published in December 2000, and *America's Children and the Environment: Measures of Contaminants, Body Burdens, and Illnesses* was published in February 2003 (available at www.epa.gov/envirohealth/children).

These reports bring together, in one place, the most current quantitative information available from a variety of sources to show trends over time in levels of environmental contaminants in air, water, food, and soil; concentrations of contaminants measured in the bodies of children and women; and childhood illnesses that may be influenced by exposure to environmental contaminants. These measures help EPA track and understand the potential impacts of environmental contaminants on children's health and, ultimately, to identify and evaluate ways to minimize environmental impacts on children. The measures will also inform discussions among policymakers and the public about how to improve federal data on children and the environment.

The 2003 edition of the report finds that there is a continued decline in the number of children with elevated blood lead levels, a reduction in children's exposure to second hand smoke, and decreases in exposures to air pollution and contaminants in drinking water. However, the report also finds that there is still much work to be done, as asthma rates are increasing, many children continue to have elevated blood lead levels, the potential for mercury exposure in the womb is of growing concern, and there is a disproportionate impact of childhood diseases on low-income and minority children.

Highlights of the findings of the 2003 report include:

Outdoor Air Pollutants

- In 1990, approximately 23 percent of children lived in counties in which the one-hour ozone standard was exceeded on at least one day per year. In 2001, approximately 15 percent of children lived in such counties. This value fluctuated during the intervening years, ranging from 13 to 28 percent.
- In 1996-2001, significantly more children lived in counties that exceeded the eight-hour ozone standard than in counties that exceeded the one-hour standard. In 2001,

nearly 40 percent of children lived in counties that exceeded the eight-hour standard.

- In 2000, approximately 27 percent of children lived in counties that exceeded the PM-2.5 particulate matter standard. In 2001, approximately 25 percent of children lived in such counties.
- The percentage of days that were designated as having “unhealthy” air quality (including days that were unhealthy for everyone as well as those that were unhealthy for sensitive groups) decreased between 1990 and 1999, dropping from 3 percent in 1990 to less than 1 percent in 1999. The percentage of days with “moderate” air quality remained around 20 percent between 1990 and 1999, although an upward trend is suggested by the fact that the percentage of moderate air quality days was higher in 1999 than for any other year in this analysis.
- In 2000, about 1 million children experienced an average PM-10 concentration above the annual standard, down from about 2 million in 1990.

Indoor Air Pollutants

- The percentage of homes with children under 7 in which someone smokes on a regular basis decreased from 29 percent in 1994 to 19 percent in 1999.

Drinking Water Contaminants

- The percentage of children served by public water systems that reported exceeding a Maximum Contaminant Level or violated a treatment standard decreased from 20 percent in 1993 to 8 percent in 1999. Every category of violation decreased between 1993 and 1999 except for nitrates and nitrites, which remained steady.

Pesticide Residues

- From 1994 to 2001, the percentage of food samples with detectable organophosphate pesticide residues ranged between 19 percent and 29 percent. The highest detection rates were observed during 1996 and 1997, while the lowest detection rate was observed in 2001.

Concentrations of Lead in Blood

- The median (50th percentile) concentration of lead in the blood of children 5 years old and under dropped from 15 micrograms per deciliter (µg/dL) in 1976-1980 to 2.2 µg/dL in 1999-2000, a decline of 85 percent.

- □ Concentrations of lead in children’s blood differ by race/ethnicity and family income. In 1999-2000, the median blood lead level in children ages 1-5 was 2.2 µg/dL. The median blood lead level for children living in families with incomes below the poverty level was 2.8 µg/dL and for children living in families above the poverty level it was 1.9 µg/dL. For all income levels, Black non-Hispanic children had a median blood lead level of 2.8 µg/dL. White non-Hispanic children had a median blood lead level of 2.1 µg/dL and Hispanic children had a median blood level of 2.0 µg/dL.
- □ Approximately 430,000 children ages 1-5 (about 2 percent) had a blood lead level of 10 µg/dL or greater in 1999-2000.

Concentrations of Mercury in Blood

- EPA has determined that children born to women with blood concentrations above 5.8 parts per billion are at some increased risk of adverse health effects. About 8 percent of women of child-bearing age had at least 5.8 parts per billion of mercury in their blood in 1999-2000.

Concentrations of Cotinine in Blood

- Cotinine is a marker of exposure to environmental tobacco smoke. In 1999-2000, median (50th percentile) levels of cotinine measured in children were 56 percent lower than they were in 1988-1991. Cotinine values at the 90th percentile, representing the most highly exposed 10 percent of children, declined by 18 percent between 1988-91 and 1999-2000.

Respiratory Diseases

- Between 1980 and 1995, the percentage of children with asthma doubled, rising from 3.6 percent in 1980 to 7.5 percent in 1995. A decrease in the percentage of children with asthma occurred between 1995 and 1996, but interpreting single-year changes is difficult.
- In 2001, 8.7 percent (6.3 million) of all children had asthma.
- The percentage of children with asthma differs by race/ethnicity and family income. In 1997-2000, more than 8 percent of Black non-Hispanic children living in families with incomes below the poverty level had an asthma attack in the previous 12 months. Approximately 6 percent of White non-Hispanic children and 5 percent of Hispanic children living in families with incomes below the poverty level had an asthma attack in the previous 12 months.

- Emergency room visits for asthma and other respiratory causes were 369 per 10,000 children in 1992 and 379 per 10,000 children in 1999. Hospital admissions for asthma and other respiratory causes were 55 per 10,000 children in 1980 and 66 per 10,000 children in 1999.

Childhood Cancer

- The frequency of new childhood cancer cases has been fairly stable since 1990. The age-adjusted annual incidence of cancer in children increased from 128 to 161 cases per million children between 1975 and 1998. Cancer mortality decreased from 51 to 28 deaths per million children during the 1975-1998 period.
- Leukemia was the most common cancer diagnosis for children from 1973-1998, representing about 20 percent of the total childhood cancer cases. Incidence of acute lymphoblastic leukemia was 24 cases per million in 1974-1978 and approximately 28 cases per million in 1994-1998. Incidence of acute myeloid leukemia was approximately 5 cases per million in 1974-98 and about the same in 1994-98.

Neurodevelopmental Disorders

- In 1997-2000, about 6 children out of every 1,000 (0.6 percent) were reported to have been diagnosed with mental retardation.

Another measure of children's environmental exposures is information available from the Toxics Release Inventory (TRI). Exhibit 18 shows total pounds of chemicals released for the years 1988-1999¹², for the lists of chemicals of special concern for children, in the VCCEP program as well as the Toxicity and Exposure Assessment for Children's Health (TEACH) program, a Region 5 initiative. The list of chemicals in the TEACH project were chosen through a literature search of childhood exposures to key environmental contaminants and through consensus among risk assessors in various EPA Region 5 offices. The VCCEP chemicals were chosen by EPA and industry as previously described. The RSEI model provides a unitless metric that reflects the relative risk of each chemical based upon a weighted composite of chemical toxicity, the fate and transport of the chemical in the environment after it is released, the pathway of human exposure, and the number of people (in this case, children) exposed. Exhibit 19 shows the total RSEI risk index for TEACH/VCCEP chemicals combined, showing separate data for two age groups of children. It is important to note that the RSEI risk index for the TEACH chemicals is significantly greater (more than 20 times) than the index for the VCCEP chemicals.

¹²TRI reporting began in 1988

Overall, while total pounds of TEACH chemicals emitted over the period increased, the risk-related impacts to children, as estimated by RSEI, generally decreased over the time period of this analysis.

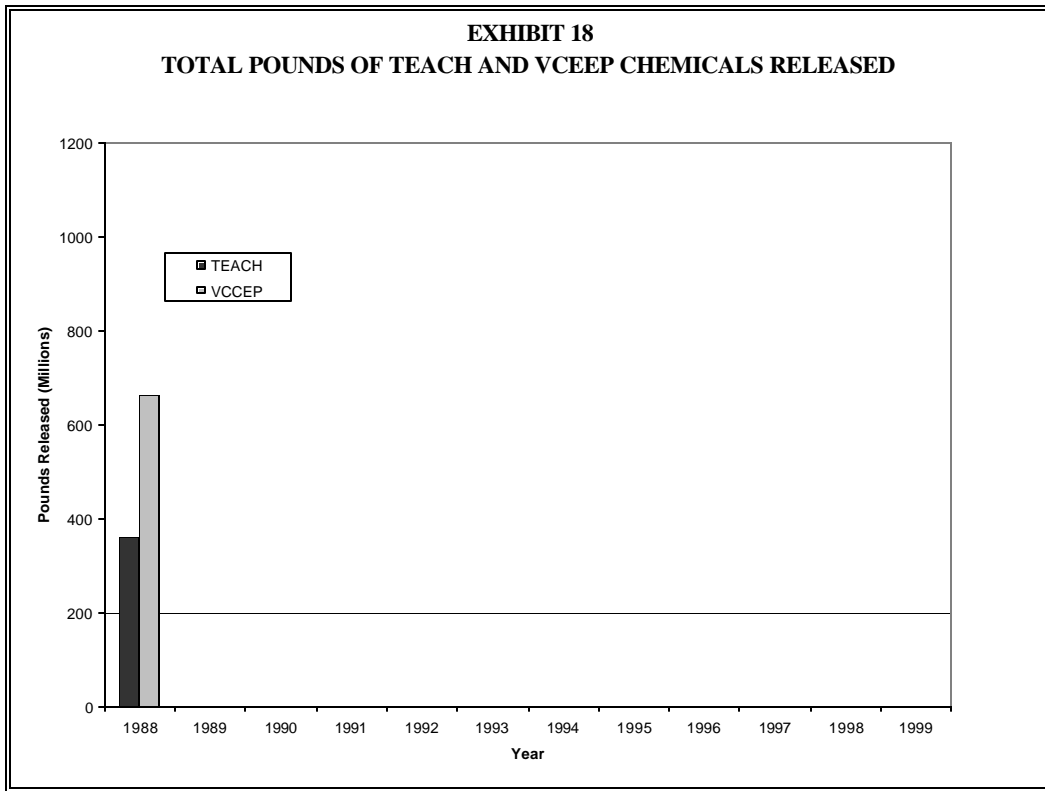
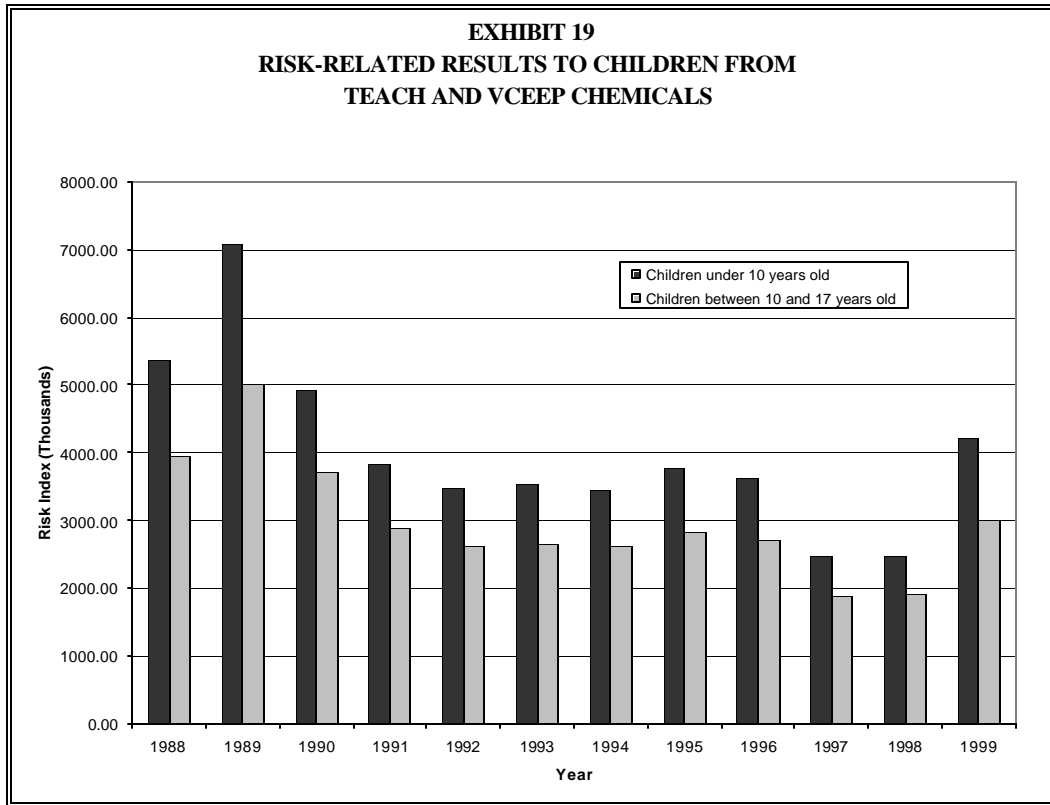


EXHIBIT 19
RISK-RELATED RESULTS TO CHILDREN FROM
TEACH AND VCEEP CHEMICALS



1 **CONCLUSIONS**

2
3 The goal of this analysis was to characterize progress that EPA is making in considering and
4 addressing the environmental risks posed to children's health. As set out in the National Agenda to
5 Protect Children's Health, EPA works to specifically consider and respond to these threats in its
6 rulemaking activities. EPA also encourages research, education, and outreach activities to educate the
7 public about these risks and about appropriate steps to reduce them.
8

9 **REGULATORY PROGRAM REVIEW**

10
11 The results of the regulatory program review showed that only a negligible number of rules (<1%)
12 actually met all the criteria and triggered the provisions of EO 13045. The analysis found that
13 approximately 20 percent of all rules were health- and safety-based, about 1.2 percent were deemed to
14 have a disproportionate effect on children, and less than one percent were economically significant. Based
15 on the information included in the Federal Register, there were no cases where an evaluation of the special
16 impact on children should have been conducted, but was not. Sixty-three percent of the rules contained
17 a discussion of the relevance of EO 13045, although EO 13045 rarely applied. While the analysis found
18 that all regulations that were required to adhere to EO 13045 did so, this finding was based on the
19 rulewriters own judgement that their regulations had a disproportionate impact on children. However, a
20 number of other regulations met three of the four criteria for EO13045 but asserted there was no
21 disproportionate impact on children.
22

23 Although EO 13045 rarely applied, nonetheless, EPA rulewriters conducted children's health
24 evaluations in nearly 12 percent of the health- or safety-based proposals. Rules that address pesticide
25 issues or relate to the setting of air quality standards for criteria air pollutants are already required to include
26 a children's health evaluation.
27

28 In-depth evaluation of rules that triggered EO 13045, as well as interviews with key EPA contacts
29 involved in drafting these rules, confirmed that EPA rulewriters considered the impacts of their actions on
30 children, and incorporated results of their analyses into the regulatory proposals. However, the review
31 team did not conduct a detailed analysis of the quality of the consideration given to children's health issues.
32 Preliminary conclusions suggest that the evaluations of children's health rely upon a range of data and that
33 guidance written for EO 13045 has not been a major source of guidance for the children's health
34 evaluations. In addition, interviewees have generally noted that the same evaluation of children's health
35 would have been conducted even in the absence of EO 13045.
36

37 **RESEARCH AND SCIENCE POLICY**

38
39 EPA achieved a significant milestone in responding to the National Agenda through the publication
40 of the 1999 *Strategy for Research on Environmental Risks to Children*. Because the *Strategy* was
41 published as a final document in 2000, it may take some time to see how research funding responds to the
42 specific needs identified in the *Strategy*. Nevertheless, this analysis found that EPA had already devoted
43 significant resources to funding scientific research on children's health, prior to the publication of the formal

44 *Strategy*, with a particularly large influx of resources when the Centers for Excellence were initially funded
45 in 1998. The analysis also found that while the multi-year projects funded with those resources presumably
46 continued, the funding of new projects dropped off in 1999, 2000 and 2001. Now that the *Strategy* has
47 been finalized, it will be worth tracking whether this pattern of punctuated, long-term funding continues, or
48 if funding accelerates, with more new projects funded each year.

49
50 Clearly, funding of extramural research does not capture the full breadth of research and analysis
51 that EPA has undertaken to support the analysis of risks to children's health. The projects summarized by
52 this report, including major achievements on methods for evaluating cumulative exposures in children, the
53 Children's Exposure Factors Handbook, and others, represent only a few of any number of efforts by
54 program offices to develop scientific approaches, perform research and develop science policy to evaluate
55 children's health. A centralized and regularly updated database of intramural research would facilitate
56 future evaluations of EPA efforts to fill research gaps related to children's health.

57 58 **OUTREACH**

59
60 A sharp rise in the number of children's health related publications in NEPIS and a rise in the
61 proportion of NEPIS publications related to children's health occurred in 1998 with a gradual decrease
62 thereafter. One explanation could be that local communities may be taking on more of the responsibility for
63 publishing children's health-related outreach documents. EPA recognizes that local agencies may be more
64 effective in reaching members of a community; thus grants are often given to organizations that can provide
65 community-specific outreach. The analysis of NEPIS would not capture publications produced under these
66 grants.

67
68 Screening children's health publications in the NEPIS database is just one measure of EPA's
69 activities in outreach to the public regarding children's health issues. The publications contained in NEPIS
70 contain only printed publications that have been scanned and converted into full-text electronic documents.
71 It is not a comprehensive database containing all of EPA's publications, nor does it contain materials
72 presented in media other than print such as videos, CDs, posters, or fliers. Information contained on EPA
73 webpages designed to provide outreach to the public is also not contained in the NEPIS database. In fact,
74 another possible explanation for the gradual decrease in children's health-related publications in NEPIS
75 could be the rise of the Internet as an increasingly available and efficient medium for information
76 dissemination to the public. Many of EPA's outreach activities to the public now include publishing
77 information and documents on the Internet, which would not be captured in the NEPIS database.

78
79 The use of environmental educational grants was another quantitative measure of EPA's activities
80 in outreach to the public regarding children's health issues. Environmental education grants are awarded
81 to projects that enhance the public's awareness, knowledge, and skills to make informed decisions that
82 affect environmental quality. Although not explicit in the focus and mission, health issues are often
83 addressed in these projects. The analysis revealed the grant amounts awarded to projects dealing with
84 children's health (and the proportion) peaked in 1998.

85
86 EPA has been successful in providing information to health care professionals regarding

87 environmental health threats to children. Further, the VCCEP special initiative demonstrates a collaborative
88 effort between EPA and private industry to provide the public more information regarding potential
89 environmental exposures to children.

90

91 **BUDGETARY ANALYSIS**

92

93 EPA's budget shows an approximately two-fold increase in funding dedicated to children's health
94 between fiscal years 1999 and 2000, both in terms of total dollar value and as a proportion of EPA's total
95 budget. Since 2000, the proportion of the total budget dedicated to children's health has remained
96 relatively steady.

97 **NEXT STEPS**

98
99 This analysis has demonstrated that EPA is making strong progress in integrating children’s health
100 concerns into their ongoing activities. To improve future evaluations and provide a more quantitative
101 assessment of progress, the review has identified a number of actions EPA could take. For example, EPA
102 could consider developing more sophisticated baselines and measures to more closely track additional
103 outputs and outcomes not addressed in this analysis.
104

105 To more thoroughly evaluate compliance with EO 13045, OCHP should conduct a more formal
106 assessment of the quality of children’s health evaluations being completed by Agency rulemakers to
107 determine if children’s health was thoroughly considered. It would be useful to conduct further analysis to
108 better understand how rulewriters determine whether the rule will have a disproportionate impact on
109 children. By looking at both cases where children were and were not thought to be disproportionately
110 affected, OCHP might be able to develop criteria that could be used by future rulewriters to make such
111 a determination.
112

113 OCHP could work with OPEI to explore incorporating a review of children’s health risks as part
114 of the regulatory review process that is being implemented throughout EPA. OCHP could periodically
115 review the Regulatory Agenda to identify upcoming regulations EPA will be promulgating that may impact
116 children’s health. With this information, OCHP can work with the program offices to ensure that children’s
117 health risks are more explicitly examined. OCHP could also make recommendations to the Assistant
118 Administrators to allocate resources in program office budgets specifically set aside to more adequately
119 address children’s health risk in upcoming rulemakings.

Non-regulatory analysis categories have, by necessity, focused on programmatic outputs more than
on the effects of these efforts. For example, this study identified changes in the number of research studies
affecting children and the number of outreach documents published by EPA. However, the analysis did
not examine the quality of these efforts or how successful they have been. These data are more difficult
and time consuming to collect, but EPA could consider beginning the long-term effort to gauge the quality
of the outcomes it is achieving as well as the steps it is taking to reach them. For example, directly tracking
the outputs and outcomes described in the 1999 EPA *Strategy for Research on Environmental Risks
to Children* may help assess implementation of the *Strategy*.

In order to obtain a more accurate picture of EPA’s public outreach efforts regarding children’s
health issues, one needs to look at additional measures that are quantifiable and can be tracked. A helpful
first step would be to track children’s health outreach activities undertaken by different offices and compile
the information into a central database. This would not only provide better quantitative measures to more
accurately portray the full picture and scope of EPA’s children’s health outreach but could also increase
interoffice collaboration and sharing of various outreach approaches and successes. However, the true
impact and significance of certain activities cannot be adequately reflected quantitatively. In many instances,
qualitative descriptions of these activities can provide a more accurate reflection of the magnitude and
significance of EPA’s efforts. The continuation and updating of the *Children’s Health Yearbooks* would
be valuable in this regard. Additionally, given the migration of outreach efforts to the Internet, OCHP could

explore how to develop measures for Internet-based outreach where no apparent means of measurement is currently available.