

Children's Health Protection Advisory Committee

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December 30, 2013

Administrator McCarthy
United States Environmental Protection Agency
1200 Pennsylvania Ave, NW
Washington, DC 20460

RE: Prevention of Harmful Preconception and Prenatal Exposures

Dear Administrator McCarthy:

The Children's Health Protection Advisory Committee (CHPAC) applauds the EPA for its continuing efforts to provide individuals, communities, health professionals, industry, and government entities at all levels with the information and tools necessary to protect children and future generations from environmental health threats. CHPAC takes this opportunity to respond to the EPA Office of Children's Health Protection's request for messages, recommendations for communication, and research priorities related to prevention of harmful preconception and prenatal exposures.

CHPAC has developed several examples of science-based health messages for the Agency to use in informing individuals, healthcare providers, and communities about the importance of preventing harmful environmental exposures prior to conception and during the prenatal period (See Appendix A. Preparing for the Nine Months that Last a Lifetime). CHPAC encourages EPA to work with healthcare communications specialists, translators and experts in graphic design to enhance content, readability, effectiveness, and appeal of these messages prior to public dissemination. CHPAC considers this set of prenatal messages to represent a sample of messages that can be used in addition to EPA's existing prenatal messaging on air pollution¹ and mercury in fish.² CHPAC encourages EPA to leverage existing resources and invest sufficient resources to fully develop these and additional messages on other environmental exposures such as workplace exposures and exposures especially relevant to pregnant teenagers. CHPAC recognizes that these messages will be effective only if framed in the context of the social determinants of health³ experienced by the

¹ Promoting Good Prenatal Health: Air Pollution and Pregnancy. Office of Children's Health Protection EPA-100-F-09-020 January 2010. Available at:

[http://yosemite.epa.gov/ochp/ochpweb.nsf/%20content/OCHP_Prenatal_FS_7_10.htm/\\$File/OCHP_Prenatal_FS_7_10.pdf?Open&preview](http://yosemite.epa.gov/ochp/ochpweb.nsf/%20content/OCHP_Prenatal_FS_7_10.htm/$File/OCHP_Prenatal_FS_7_10.pdf?Open&preview).

² Consumption Advice: Joint Federal Advisory for Mercury in Fish. EPA Office of Water. March 2012. Available at: <http://water.epa.gov/scitech/swguidance/fishshellfish/outreach/factsheet.cfm#consumers>.

³ See CHPAC Letter of November 14, 2013, available at: <http://yosemite.epa.gov/ochp/ochpweb.nsf/content/chpac-sdh-letter-nov-2013.htm>.

intended recipients. Examples of social and contextual factors that affect prenatal health and that should be considered in communicating these messages include: social support from family and friends, access to and selection of nutritious foods, exercise, sleep, access to healthy homes, communities, and workplaces, access to good medical care, employment and income, options for public transportation, neighborhood crime, and other sources of life stress.

As requested, CHPAC also provides EPA with recommendations on how best to i) effectively communicate these messages with communities, and in particular, those experiencing or at risk of experiencing health disparities in birth outcomes due to environmental exposures, ii) share these messages and underlying science with the healthcare community, iii) partner with other organizations to disseminate these messages, and iv) evaluate the effectiveness of its messaging efforts. These recommendations build on those provided by CHPAC to the EPA in November, 2011.⁴ Finally, we offer recommendations on research priorities to be included in the EPA Office of Research and Development's (ORD) children's health research roadmap that will increase understanding of the scope of preconception and prenatal environmental exposures that can be harmful, the communities most at risk, and effective exposure prevention strategies.

CHPAC recommends that the EPA:

1. Disseminate to the public the environmental reproductive health messages prepared by CHPAC⁵ using the communication strategies outlined in recommendations 2-4 below.
2. Communicate effectively with the public, especially communities experiencing or at risk of experiencing health disparities in environmental reproductive outcomes, through use of effective partnerships and existing networks.
3. Connect with the larger healthcare community to disseminate environmental reproductive health messages.
4. Partner with state and federal agencies, as well as community-based and other organizations to disseminate environmental reproductive health messages.
5. Evaluate the effectiveness of EPA messaging on environmental reproductive health.
6. Designate the following as priorities in the EPA ORD's children's health research roadmap:
 - a. Research on the health effects of prenatal and preconception exposures.
 - b. Research on the interactions of environmental exposures, socioeconomic factors, and characteristics of sensitive populations with poor birth outcomes, and incorporation of these types of data into mapping tools such as EJView.⁶
 - c. Research the effectiveness of commonly recommended exposure reduction measures.
 - d. Research on translation of scientific findings into actionable information for policy efforts as well as individual prevention and reduction of exposures to harmful environmental chemicals.
 - e. Research the effectiveness of different methods employed to induce individuals to make behavioral changes in order to reduce their environmental exposures.

⁴ See CHPAC Letter of November 17, 2011, available at:

http://yosemite2.epa.gov/ochp/ochpweb.nsf/content/CHPAC_Prenatal_Letter.htm.

⁵ Disseminate after working with healthcare communications specialists, translators and experts in graphic design to enhance content, readability, effectiveness, and appeal of these messages.

⁶ EJView is a mapping tool developed by EPA, available at:

<http://www.epa.gov/environmentaljustice/mapping.html>.

These recommendations are presented in more detail below.

1. **CHPAC recommends that EPA disseminate to the public, the environmental reproductive health messages prepared by CHPAC⁵ in the document “*Preparing for the Nine Months that Last a Lifetime*,” using the communication strategies outlined in recommendations 2-4 below.**

At EPA's request, CHPAC developed several science-based health messages to be shared with the public on the prevention and reduction of harmful environmental exposures prior to conception and during the prenatal period (See Appendix A. *Preparing for the Nine Months that Last a Lifetime*). It is important that factual and easy to understand messages related to environmental exposures are available to communities, especially for individuals of reproductive age, and CHPAC recommends that EPA disseminate these environmental reproductive health messages to the public in an effective and timely manner.

Information on the importance of environmental exposures during the preconception and prenatal stages for health is available.⁴ For example, the Program on Reproductive Health and the Environment at the University of California San Francisco generated a report titled *Shaping our Legacy: Reproductive Health and the Environment*,⁷ that summarized the scientific findings from the 2007 Summit on Environmental Challenges to Reproductive Health and Fertility. A description of reproductive health is provided in the report and specific language on early exposures and related child development is included. In this letter, we use the definition of environmental reproductive health provided in the report:⁷

Reproductive health refers to the health and healthy functioning of the female and male reproductive systems during all stages of life. Reproductive health means that women and men are capable of conceiving, that a woman is able to maintain a pregnancy to full term and to breastfeed, and that the baby is born healthy and properly developed. Reproductive health also means that children will not develop diseases or disabilities later in life that are caused by exposures they experienced in the womb or during infancy, early childhood or adolescence, and that they will be able to conceive and bear healthy and properly developed children.

Environmental reproductive health is a collaborative, interdisciplinary effort to understand and reduce the harm that chemical exposures cause to fertility, pregnancy, development, growth and health throughout life. This field includes the work of scientists, researchers, clinicians, policymakers, health-affected groups, community and advocacy groups, and the media.

⁴ See CHPAC Letter of November 17, 2011, available at:
http://yosemite2.epa.gov/ochp/ochpweb.nsf/content/CHPAC_Prenatal_Letter.htm.

⁵ Disseminate after working with healthcare communications specialists, translators and experts in graphic design to enhance content, readability, effectiveness, and appeal of these messages.

⁷ *Shaping our Legacy: Reproductive Health and the Environment*. Program on Reproductive Health and the Environment. University of California, San Francisco, 2008.
<http://www.prhe.ucsf.edu/prhe/pubs/shapingourlegacy.pdf>.

In creating these environmental reproductive health messages, we reviewed available messages from government websites, healthcare and environmental health organizations, and the scientific literature. We prioritized environmental reproductive health issues and chose four main topics based on considerations of the degree and extent of the exposures, the nature of the health hazards, the ease of exposure prevention, and the strength of scientific evidence that prevention of exposure can decrease harmful health effects. Each message is written in a simple and straightforward manner, avoiding scientific terms and complex concepts. We recognize that the messages will require further editing to tailor them for use with populations with different literacy levels, cultural settings, and informational needs.

We titled our messaging document “*Preparing for the Nine Months that Last a Lifetime*” to emphasize the importance that prenatal and preconception exposures can play in health during all life stages: fetal, infancy, early childhood, puberty, reproduction, and adulthood. The document opens with a short section that introduces the concept of environmental exposures in everyday life and their potential effects on health. The sections address the following topics: *Preparing Home for Baby*, which includes home safety and avoidance of chemical use, especially when preparing a nursery; *Lead in Pregnancy*, which discusses lead exposure and screening during pregnancy, and prevention of exposure in the home; *Healthy Fish Consumption*, which emphasizes eating a variety of fish and provides resources on how to choose fish to reduce exposure to harmful contaminants; and *Preventing Exposure to Pesticides*, which includes sources of exposure and health effects of pesticides, and emphasizes safer pest control practices and healthy food selection.

These messages provide basic information, practical tips, and tools to be shared with communities, and are ready for EPA review. CHPAC encourages EPA to invest in the resources necessary to fully develop these messages, working with healthcare communications specialists, translators and experts in graphic design to enhance readability, effectiveness, and appeal of the messages, prior to dissemination to communities. In order to be effective, health messages must be recognized as relevant by their intended audiences. Thus, these messages need to be tailored for different communities and appropriately framed in the context of the specific mix of individual, community, and society level factors influencing health. Since the form of the message may depend on the method of dissemination, the EPA should use focus groups to explore appropriate methods for message dissemination to specific communities, including a variety of social media modalities.

We encourage the Agency to develop and disseminate additional effective messages on other important preconception and prenatal environmental exposures. For example, messages should be developed and targeted towards workplace exposures and pregnant teens using tools appropriate to the relevant populations, such as health and safety training in the workplace, and social media and information graphics, respectively. Further, we encourage the Agency to continue to refine criteria for selection of additional message topics, taking into account relevant populations at risk and their other stressors during pregnancy, such as alcohol, tobacco, and other drugs, and social and contextual factors which comprise the social determinants of health.

- 2. CHPAC recommends that EPA communicate effectively with the public, especially communities experiencing or at risk of experiencing health disparities in environmental reproductive outcomes, through use of effective partnerships and existing networks.**

Social determinants of health include a number of social and contextual factors that affect individuals, families, and communities.³ These factors can have an impact on environmental reproductive health. For example, communities with decreased access to quality healthcare and increased hazardous environmental exposures can experience disparately higher rates of adverse birth outcomes (e.g., low birth weight, developmental delays) than the population at large.

One way that health disparities can be reduced is by using a framework that ensures that individuals have access to a full range of reproductive health services and are empowered to understand their healthcare needs. For example, the Reproductive Health Framework is a service delivery model for addressing the reproductive health needs of women. The focus is providing services for historically marginalized communities through the creation of reproductive health services.⁸ Environmental reproductive health messages should be culturally relevant and made available to marginalized communities via existing frameworks.

CHPAC recommends EPA incorporate environmental reproductive health messages into reproductive justice efforts at the community level. Integration of these messages through existing networks such as those listed below can enhance outreach.

- American Indian/Alaska Native Committee of the March of Dimes Foundation West Region
- Indian Health Service, Division of Environmental Health Services, Children's Environmental Health Working Groups
- National Healthy Mothers Healthy Babies Coalition
- National Healthy Homes
- National Center for Healthy Housing
- Safer Chemicals, Healthy Families
- SisterSong Women of Color Reproductive Justice Collective
- Asian Communities for Environmental Justice
- National Women, Infants, and Children's Association

Partnering with electronic media outlets such as text4baby and the American Pregnancy Association, which provide targeted email and text messages throughout pregnancy, and with internet-based organizations like MomsRising.org, provides opportunities to insert targeted messages for at-risk populations. Local tribal/public health professionals and healthcare providers often stay connected with the populations they serve through Facebook and Twitter. These mechanisms provide an opportunity for dissemination of messages to diverse and underserved individuals in inner-city, rural, or tribal communities.

Tailoring health messages for specific diverse populations has also proven to be an effective means of communication. For instance, health messages communicated via community highway billboards in Indian Health Service unit areas and electronic signage in tribal health clinics and inner-city community health centers are more effective when they are personalized with images of local people or places. Other approaches include engaging youth in local service

³ See CHPAC Letter of November 14, 2013, available at: <http://yosemite.epa.gov/ochp/ochpweb.nsf/content/chpac-sdh-letter-nov-2013.htm>.

⁸ Asian Communities for Reproductive Justice. 2005. A New Vision for Advancing our Movement for Reproductive Health, Reproductive Rights, and Reproductive Justice. Available at: <http://strongfamiliesmovement.org/assets/docs/ACRJ-A-New-Vision.pdf>.

projects that adapt and personalize scripted messages developed by EPA through partnerships with Bureau of Indian Affairs, local schools, tribal colleges, and historically black colleges and universities. Local service projects such as these introduce an extra benefit to the community, empowering the participants, and improving the likelihood that the message will reach the target population and be relevant to the community.

3. CHPAC recommends that EPA connect with the larger health care community to disseminate environmental reproductive health messages.

This can be accomplished by:

- a) Establishing relationships with professional medical, nursing, and public health organizations.

Professional organizations are an important part of a healthcare provider's acquisition and maintenance of knowledge throughout his/her career. Professional medical and nursing organizations publish journals and sponsor continuing education courses that keep providers updated on recent therapeutic findings and recommendations; they track individual provider progress towards re-certification; and they hold annual meetings where providers share clinical findings and network with each other.

The EPA should reach out to a broad range of professional healthcare provider organizations serving teens, young adults, and individuals of child-bearing age, to discuss the importance of environmental reproductive health for healthy pregnancies and to encourage information sharing and partnerships designed to effectively disseminate environmental reproductive health messages. The scope of professional organizations that the EPA should reach out to includes school health practitioners serving teens and young adults, occupational and other health practitioners serving men and women of childbearing age, prenatal health practitioners, and neonatal and pediatric health practitioners.

Therefore, outreach to organizations such as those listed below can play an important role in the dissemination of health messages.

American Academy of Pediatrics	National Association of Pediatric Nurse Practitioners	Midwives Alliance of North America
American Academy of Family Physicians	American Public Health Association	National Association of Neonatal Nurses
American Congress of Obstetricians/Gynecologists	Pediatric Environmental Health Specialty Units	National Association of School Nurses, Inc.
American Association of Nurse Practitioners	BirthWorks	Society of Pediatric Nurses
American College of Nurse-Midwives	Childbirth and Postpartum Professional Association	American Association of Clinical Toxicologists
American Nurses Association	Doulas of North America International	American Association of Poison Control Centers
Association of Schools and Programs of Public Health	American College of Occupational and Environmental Medicine	American College of Medical Toxicologists
National Association of Nurse Practitioner Faculties	International Center for Traditional Childbearing	American College Health Association
Alliance of Nurses for Healthy Environments		

There are numerous subspecialty organizations within the broader groups, and organizations that target special interests of these professionals such as the environment and health disparities, that should also be included. Organizations can be approached about including environmental reproductive health information on their websites such as the messages themselves or links to the EPA website that contain the messages. The health messages should be distributed at informational booths at organizational annual meetings. The Pediatric Environmental Health Specialty Units (PEHSUs) should be supported to offer additional presentations at local, regional, and national meetings, which would introduce providers to the topic of environmental reproductive health and to the messages. In addition, organizations can be urged to publish opinions or guidelines relating to environmental reproductive health. The EPA should work with the organizations to craft the opinion or guideline, and point organization staff to the appropriate scientific literature and other background data relating to the issues.

PEHSUs are funded by the Agency for Toxic Substances and Disease Registry and the EPA to serve as regional go-to resources for clinical expertise in pediatric environmental health. PEHSUs respond to telephone inquiries from healthcare providers, concerned individuals, and public health agencies regarding health effects of environmental exposures. They provide numerous presentations to doctors and nurses, medical and nursing trainees, and public health and environmental organizations that include updates on the current science regarding health effects of environmental exposures, clinical guidelines for screening and treatment of environmental exposures, and health messages for patients. PEHSUs recognize the importance and relevance of prenatal exposures to pediatric health and beyond, and many are now incorporating information about prenatal exposures⁹ into their outreach efforts. Adding clinical expertise on prenatal and preconception health would expand the outreach potential of the PEHSUs.

Consideration should be given to providing resources to include obstetricians in the PEHSU network of physicians in order to provide not only consultation on pregnant patients exposed to hazardous substances but education to their professional colleagues. Along with interdisciplinary collaboration with PEHSUs, influence and innovation from individuals within the specialty will be more likely to change the field of obstetrics and gynecology to include environmental reproductive health as one of the basic competencies. It is unlikely that current PEHSUs, consisting of pediatricians, occupational medicine physicians, and toxicologists will be able to gain a foothold in a field in which they have no experience or historical collaboration. Incorporating obstetricians into the PEHSU model would help build the capacity of prenatal healthcare providers to provide useful information on preconception and prenatal exposures at the community level and during the individual patient encounter in the exam room.

b) Establishing relationships with insurance carriers.

In the past decade, health insurance carriers have played a larger role in measuring health outcomes. For example, reimbursement may be tied to clinical outcomes such as blood glucose levels in diabetics or flu vaccination rates. Therefore, health insurance companies may be interested in becoming informed about potential adverse health outcomes related to preconception and prenatal environmental exposures, and the clinician's role in preventing or reducing exposures via health messaging. Insurance companies should be encouraged to add

⁹ Sathyanarayana S, Focareta J, Dailey T, Buchanan S. 2012. *Environmental exposures: how to counsel preconception and prenatal patients in the clinical setting*. Am J Obstet Gynecol; 207(6): 463–470.

the delivery of environmental reproductive health messages to quality assessments of individual clinicians and their practice groups or larger healthcare organizations.

c) Establishing relationships with Federally Qualified Health Centers (FQHCs). FQHCs provide low-cost healthcare to 20 million patients in the United States per year, and their infrastructure is organized by the National Association of Community Health Centers. The EPA should reach out to this group in a similar manner as to the medical professional organizations about posting messages on their website or links to the EPA website, present at their annual meetings and work with them to create clinical guidelines or recommendations that include environmental reproductive health messages. Similarly, the Indian Health Service has a separate infrastructure for healthcare providers that should be tapped for message dissemination.

d) Establishing relationships with professional organizations that represent minority healthcare and public health professionals.

There are numerous organizations representing minority healthcare providers that should be contacted about disseminating the environmental reproductive health messages. These include:

- National Medical Association
- Asian American Physicians Association
- National Alaska Native American Indian Nurses Association
- Asian American/Pacific Islander Nurses Association
- National Association of Hispanic Nurses
- National Black Nurses Association
- National Hispanic Medical Association

4. CHPAC recommends that EPA partner with state and federal agencies, as well as community-based and other organizations to disseminate environmental reproductive health messages.

EPA should identify other federal agencies that currently communicate health information (e.g., via a survey of website content) and leverage opportunities for inter-agency collaboration, resulting in improved health communication. This will also allow these messages to be provided in the context of other social determinants of health during pregnancy.

- For example, the Office of Women's Health (OWH) within the Department of Health and Human Services has an area on its website devoted to providing information on healthy pregnancies, with a section entitled "Before you get pregnant—Information for all women."¹⁰ This is a prime example of an opportunity for fruitful inter-agency collaboration and synergy on prenatal health messaging efforts, where EPA can provide environmental reproductive health content for OWH's messaging efforts, and OWH can provide additional content on prenatal health for EPA to include in its messaging efforts (e.g., through links on the EPA website).
- Another example of an opportunity for fruitful inter-agency collaboration is illustrated by OWH's efforts to encourage mothers to breastfeed their babies, especially among the

¹⁰ See <http://www.womenshealth.gov/pregnancy/before-you-get-pregnant/index.html>.

African-American community.¹¹ In this example, OWH can share information with EPA on the communication strategies that have or have not worked when providing health-based messages to specific communities.

- Additional federal agencies to partner with include the National Institute of Occupational Safety and Health, the Occupational Safety and Health Administration, the National Institutes of Health (National Institute of Environmental Health Sciences, National Institute on Minority Health and Health Disparities, National Institute of Child Health and Development), the Centers for Disease Control and Prevention, the Food and Drug Administration, the Health Resources and Services Administration, and the Centers for Medicare and Medicaid Services.

Similarly, EPA should reach out to state and local departments of health and other agencies charged with protecting environmental and public health, and to organizations such as the National Association of County and City Health Officials, the Association of State and Territorial Health Officials, and the Association of Maternal and Child Health Programs to identify opportunities for information sharing and dissemination of environmental reproductive health messages. For instance, the Association of Maternal and Child Health Programs offers a Life Course approach to women's health and has developed the Life Course Metrics Project, which is a collaborative effort to identify and promote a standardized set of indicators that can be used to measure progress in improving maternal and child health. CHPAC encourages the Agency to work with organizations such as this one to incorporate environmental messages and exposure metrics into the life course approach.

Additional organizations that may be interested in partnering with the Agency to disseminate environmental reproductive health messages include public interest groups, community-based organizations, and other organizations that target specific population segments, ethnicities, or health issues. Such organizations may include the following:

- March of Dimes
- Children's Environmental Health Network
- University of California, San Francisco Program on Reproductive Health and the Environment
- National Environmental Education Foundation
- Healthy Homes Collaborative
- The Collaborative on Health and the Environment
- Autism groups (e.g., The Autism Society)
- American Cancer Society
- Breast cancer groups (e.g., Breast Cancer Action, Breast Cancer Fund, Zero Breast Cancer)
- Environmental justice groups (e.g., WE ACT for Environmental Justice)
- Natural Resources Defense Council
- Environmental Working Group
- The Arc for People with Intellectual and Developmental Disabilities
- National Advocates for Pregnant Women

¹¹ See <http://www.womenshealth.gov/itsonlynatural>.

5. CHPAC recommends that EPA evaluate the effectiveness of EPA's messaging on environmental reproductive health.

Metrics for Messaging Effectiveness

It is important to assess the effectiveness of strategies for prenatal environmental health messaging with appropriate metrics. Metrics can lead to a better understanding of how messaging is being disseminated and who is receiving the messages. They also allow for an ability to assess knowledge gained from particular messages. Ideally, the end goal would be to assess behavioral changes that result from messaging efforts. We have listed some specific metrics for dissemination and knowledge transfer of messaging materials below.

We would like to emphasize the inherent complexity of having appropriate metrics. While we have listed examples below, we recommend using this as a guideline to create an evaluation program using EPA-specific metrics. The metrics listed below are modeled after those developed and described by the National Institute for Environmental Health Sciences (NIEHS) for evaluation of its internal and external communication efforts that are described in the NIEHS Partnerships for Environmental Public Health Evaluation Metrics Manual. The Centers for Disease Control Systematic Review on the Effectiveness of Health Communication Campaign is another resource for evaluation of health messaging.^{12,13}

Dissemination

- Numbers of persons who received emails/newsletters/messaging
- Number of times messaging is referenced by parties or accessed on the internet
- Number of persons attending specific training sessions to learn about messaging
- For websites, traffic, number of elements accessed, trends in access over time
- Numbers of different types of groups/populations receiving messaging

Knowledge Transfer

- Quizzes, questionnaires, and surveys
- Tracking changes in behavior
- Assessment of retention of information over time
- Description of secondary transfer (relayed to trainees, used in other curricula/programs)

6. CHPAC recommends that EPA designate the following as priorities in the EPA ORD children's health research roadmap:

- Understanding the scope of preconception and prenatal environmental exposures that can be harmful*

¹² National Institute of Environmental Health Sciences. U.S. Department of Health and Human Services Partnerships for Environmental Public Health Evaluation Metrics Manual NIH Publication No. 12-7825.

¹³ CDC. Community Preventive Services Task Force. Systematic review on the effectiveness of health communication campaigns. 2010.

- Conduct research on the health effects of prenatal and preconception exposures to chemicals and other stressors.⁴

b. Characterizing communities most at risk

- Conduct research on the interaction of environmental exposures, socioeconomic factors and characteristics of sensitive populations with poor birth outcomes, and explore ways to incorporate these types of data into mapping tools such as EJView.⁶

c. Identifying effective exposure prevention strategies

- Conduct research to evaluate the effectiveness of commonly recommended exposure reduction measures, such as vacuuming, dusting with damp cloth, hand washing, and product substitution to reduce exposures (e.g., reductions in the levels of environmental contaminants present in blood or urine) in real world environments (e.g., the home, workplace).
- Conduct research on effective ways to get information into the healthcare setting, specifically, research on how to translate the science on environmental reproductive health into actionable information people can use to prevent or reduce their exposures to harmful environmental chemicals.
- Conduct research on the effectiveness of different methods employed to induce individuals to make behavioral changes in order to reduce their environmental exposures.

The research recommendations provided here are specifically related to enhancing EPA's ability to reduce or eliminate harmful environmental exposures prior to conception and during the prenatal period. These recommendations do not supersede, but rather augment the advice CHPAC provided to the EPA on research related to preconception and prenatal exposures and health impacts in 2011.^{4,14}

In summary, CHPAC recommends that EPA disseminate⁵ the environmental reproductive health messages provided in Appendix A (*Preparing for the Nine Months that Last a Lifetime*) in an effective and timely manner, using the communication strategies, connections, and partnerships discussed above. Particular efforts should be made to effectively share these health messages with communities experiencing health disparities in birth outcomes. As an integral part of these and future environmental reproductive health messaging efforts, CHPAC recommends that EPA assess the efficacy of its messaging using appropriate metrics. Finally, CHPAC recommends that priorities for the EPA ORD children's health research roadmap include research directed

⁴ See CHPAC Letter of November 17, 2011, available at:
http://yosemite2.epa.gov/oehp/ochpweb.nsf/content/CHPAC_Prenatal_Letter.htm.

⁵ Disseminate after working with healthcare communications specialists, translators and experts in graphic design to enhance content, readability, effectiveness, and appeal of these messages.

⁶ EJView is a mapping tool developed by EPA, available at:
<http://www.epa.gov/environmentaljustice/mapping.html>.

¹⁴ See CHPAC Letter of December 20, 2011, available at:
[http://yosemite.epa.gov/oehp/ochpweb.nsf/content/CHPAC-ORD-research-directions-letter.htm/\\$File/CHPAC-ORD-research-directions-letter.pdf](http://yosemite.epa.gov/oehp/ochpweb.nsf/content/CHPAC-ORD-research-directions-letter.htm/$File/CHPAC-ORD-research-directions-letter.pdf).

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towards understanding the scope of preconception and prenatal exposures that can be harmful, characterizing communities most at risk, and identifying effective exposure prevention strategies.

CHPAC urges the EPA to provide leadership and resources necessary to provide the public with clear, actionable information on how to protect and promote children's health across generations.

Thank you for your commitment to children's health.

Sincerely,



Pamela Shubat, Ph.D.
CHPAC Co-Chair



Sheela Sathyanarayana, M.D., M.P.H.
CHPAC Co-Chair

Attachment: Appendix A. Preparing for the Nine Months that Last a Lifetime

cc: Jim Jones, Assistant Administrator, Office of Chemical Safety and Pollution Prevention
Lek Kadeli, Acting Assistant Administrator, Office of Research and Development
Jackie Mosby, Acting Director, Office of Children's Health Protection
Janet McCabe, Acting Assistant Administrator, Office of Air and Radiation
Mathy Stanislaus, Assistant Administrator, Office of Solid Waste and Emergency Response
Nancy Stoner, Acting Assistant Administrator, Office of Water
Matthew Tejada, Director, Office of Environmental Justice
Lisa Garcia, Associate Assistant Administrator, Office of Environmental Justice