Children's Health Protection Advisory Committee

Chair:

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

RE: CHPAC Fish Advisory Recommendations

Dear Administrator McCarthy:

Thank you for the opportunity to comment on the Draft Updated Advice by FDA and EPA: "Fish: What Pregnant Women and Parents Should Know." CHPAC supports the continued update of fish advisories including the added emphasis on the health benefits of fish consumption in advisory messaging.

CHPAC commends EPA on its recent efforts to achieve long-term reductions in mercury loading to U.S. waterways through the Mercury and Air Toxics Standards, proposed effluent limitation guidelines and standards for steam electric power plants, and by supporting the U.S. government in signing the Minamata Convention on Mercury.[1-3] We hope these pollution source reduction efforts will translate into lower methylmercury concentrations in fish.

Fish are a nutrient rich and culturally important food but are also the primary source of methylmercury exposure in the U.S. population.[4,5] Notably, EPA recently estimated that 2.14% of U.S. women of child-bearing age have blood levels of methylmercury above the EPA reference dose (5.8 µg/L).[5] Thus, more than one million women of child-bearing age in the U.S. exceed the EPA level,[6] potentially placing their unborn children at risk of adverse neurodevelopmental effects.

[1] U.S. EPA. "EPA Mercury and Air Toxics Standard". 2012. http://www.epa.gov/mats/index.html.
[2] U.S. EPA. "Draft Regulation: Effluent Limitations Guidelines and Standards for Steam Electric Power Generating Point Source Category". 2009. *EPA-HQ-OW-2009-0819*. http://yosemite.epa.gov/opei/rulegate.nsf/byRIN/2040-AF14#1.
[3] U.S. EPA. "Minamata Convention on Mercury". 2013. http://www2.epa.gov/international-cooperation/minamata-convention-mercury.
[4] National Research Council. "Toxicological Effects of Methylmercury". 2000. *National Academies Press*. http://www.nap.edu/catalog/9899/toxicological-effects-of-methylmercury.
[5] U.S. EPA. "Trends in Blood Mercury Concentrations and Fish Consumption among U.S. Women of Childbearing Age. Final Report." July 2013. *NHANES, 1999-2010*. EPA-823-R-13-002.
[6] U.S. Census Bureau. "American Community Survey. 2013 Estimate of U.S. Women Aged 15-44: Table of Age and Sex (S0101) 3-year estimate". 2013. http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_13_3YR_S0101&prodType=table.

Moreover, the burden of methylmercury exposure is likely to be greater among high fish-consuming sub-groups.[7]

CHPAC offers the following recommendations and comments on the combined FDA and EPA draft advice.

Charge 1: Should orange roughy and marlin be added to the "do not eat" list for pregnant women, breastfeeding women, and young children?

CHPAC reviewed the available published data on orange roughy and marlin[8-17] and the updated FDA dataset on mercury content in fish which showed that 63% of orange roughy samples (surveyed 2002-2009) and 44% percent of the marlin samples (surveyed 1992-96) contained more than 0.50 ppm mercury.[18] As a result of this broader data review, **CHPAC recommends that EPA:**

a) Include both orange roughy and marlin in the advisory in the "do not eat" group because of their high mercury and low omega-3 fatty acids content.

Further, CHPAC is concerned that consumers will assume that other fish species high in mercury, but not specifically named in the advisory, are safe for pregnant women to eat 2-3 times per week. Some of these fish, such as grouper and fresh and frozen tuna, have higher

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[7] Karimia R, Silbernagel S, Fishera N. S, Melikerba J R. "Elevated blood Hg at Recommended Seafood Consumption Rates in Adult Seafood Consumers". 2014. *International J. Hygiene Environ. Health*. 217:758-764.

[8] Health Canada, Bureau of Chemical Safety. "Human Health Risk Assessment of Mercury in Fish and Health Benefits of Fish Consumption: Appendix II: Summary data for those fish species for which samples contained total mercury at levels greater than 0.2 ppm on average". 2007. *ISBN*: 978-0-662-47023-6. http://www.hc-sc.gc.ca/fn-an/pubs/mercur/merc_fish_poisson-eng.php#appb.

[9] Unninayar CS, Ito BM. "Status Report: Mercury in the Pacific Blue Marlin *Makaira nigricans*". 1975. *NOAA, National Marine Fisheries Service: Southwest Fisheries Center*. Administrative Report No 2H.

[10] Shomura RS, Williams F. "Proceedings of the International Billfish Symposium, Kailua-Kona, Hawaii, 9-12 August 1972. Part 2. Review and contributed papers". *NOAA ccTechnical Report*. 1974. NMFS SSRF-675.

[11] Shultz CD, Crear D. "The distribution of total and organic mercury in seven tissues of the Pacific blue marlin, *Makaira nigricans"*.1976. *Pacific Science*. Vol. 30 (2): 101-107.

[12] Cai Y, et al. "Bioaccumulation of mercury in pelagic fishes from the northern Gulf of Mexico". 2007. *Can, J. Fish Aquat. Sci*. 64: 458-469.

[13] Dabeka RW, et al. "Levels of total mercury in predatory fish sold in Canada in 2005". 2005. *Food Additives and Contaminants.* 28 (6): 740-743.

[14] Hightower JM, Brown DL. "Mercury concentrations in fish jerky snack food: marlin, ahi, and salmon". 2011. *Environ. Health* 10:90-94. http://www.ehjournal.net/content/10/1/90.

[15] Van den Broek WLF, Tracey D M. "Concentration and distribution of mercury in flesh of orange roughy (Hoplostethus atlanticus)". 1981. *New Zealand Journal of Marine and Freshwater Research*. 15(3):255-260.

[16] Julshamn K, Mage A, Tyssebotn IMB, Sæthre LJ. "Concentrations of mercury and other toxic elements in orange roughy, Hoplostethus atlanticus, from the Mid-Atlantic Ridge". 2011. *Bulletin of Environmental Contamination and Toxicology*. 87(1):70-3.

[17] Cronin M, Davies IM, Newton A, Pirie JM, Topping G, Swan S. "Trace metal concentrations in deep sea fish from the North Atlantic". 1998. *Marine Environmental Research.* 45 (3): 225-238.

[18] U.S. FDA. "Mercury Concentrations in Fish: FDA Monitoring Program (1990-2010)". 2014. http://www.fda.gov/Food/FoodborneIllnessContaminants/Metals/ucm191007.htm.

mercury levels than albacore tuna which the advisory specifically[19] limits to one serving a week (6 oz). To improve the clarity of the guidance, **CHPAC recommends that EPA:**

b) Consider adopting a tiered consumption guide (e.g., green, yellow, and red lights) such as those used by many states. This would allow EPA to provide specific guidance for a broader number of species available in US markets. Several examples of state advisory messaging are attached (see Appendix 1).
c) Specifically provide guidance about consumption of various species of fresh, frozen, and packaged tuna (e.g., in cans and pouches) in the advisory, not just in the supplemental Q & A, because tuna comprises a significant proportion of fish that Americans consume.[20]

Charge 2: Based on currently available studies, is the draft advice on young children's fish consumption appropriate?

In our review of currently available literature (see Appendix 2), the highest quality studies report no consistent adverse neurodevelopmental effects in children, and several report a net benefit in neurodevelopment associated with post-natal fish consumption.[21-25] The body of evidence is limited, however, and does not adequately investigate the balance between the risks and benefits of post-natal fish consumption. In addition, we found worrisome evidence that consumers may respond to advisories by reducing total consumption of fish instead of switching to lower mercury fish, leading to a net reduction in the health benefits of eating fish.[26] In light of these concerns and the limitations of the current evidence base, **CHPAC recommends that EPA:**

a) Continue to include young children in this advisory as a public health protective measure because of uncertainties about the risks posed by eating high mercury fish.

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[19] U.S. FDA. "A Quantitative Assessment of the Net Effects on Fetal Neurodevelopment from Eating Commercial Fish (As Measured by IQ and also by Early Age Verbal Development in Children)". 2014 May.
[20] U.S. FDA. "A Quantitative Assessment of the Net Effects on Fetal Neurodevelopment from Eating Commercial Fish (As Measured by IQ and also by Early Age Verbal Development in Children)". 2014 May. http://www.fda.gov/downloads/Food/FoodborneIllnessContaminants/Metals/UCM396785.pdf.
[21] Surkan PJ, Wypij D, Trachtenberg F, Daniel DB, Barregard L, McKinlay S, Bellinger DC. "Neuropsychological function in school-age children with low mercury exposures". 2009 Aug. *Environ Res*: 109(6):728-33.
[22] Cao Y, Chen A, Jones RL, Radcliffe J, Caldwell KL, Dietrich KN, Rogan WJ. "Does background postnatal methyl mercury exposure in toddlers affect cognition and behavior?". *Neurotoxicology*. 2010 Jan. 31(1):1-9.
[23] Myers, GJ, Thurston SW, Pearson AT, Davidson PW, Cox C, Shamlaye CF, Cernichiari E, Clarkson TW. "Postnatal exposure to methyl mercury from fish consumption: a review and new data from the Seychelles Child Development Study". 2009 May. *Neurotoxicology*. 30(3):338-49.
[24] Debes F, Budtz-Jørgensen E, Weihe P, White R.F, Grandjean P. "Impact of prenatal methylmercury exposure on neurobehavioral function at age 14 years". 2006 Sep-Oct. *NeurotoxicolTeratol*. 28(5):536-47.
[25] Plusquellec P, Muckle G, Dewailly E, Ayotte P, Bégin G, Desrosiers C, Després C, Saint-Amour D, Poitras K. "The relation of environmental contaminants exposure to behavioral indicators in Inuit preschoolers in Arctic Quebec". 2010 Jan. *Neurotoxicology*. 31(1):17-25.
[26] Teisl M, et al. "Awake at the switch: improving fish consumption advisories for at risk women". 2011. *Science of the Total Environment*. 409:3257-3266.

b) Carefully construct fish consumption advice to avoid the unintended consequence of reducing children's fish consumption by:
   - More strongly emphasizing the health benefits to children of eating fish,
   - Encouraging children's consumption of fish lower in mercury, and
   - Ensuring that the message is appropriate and accessible for low income, low literacy, and non-English speaking communities.

c) Conduct a comprehensive literature review of the mercury risk and nutritional benefits of children's fish consumption using a quality of evidence rubric.[27]

d) Support research that strengthens the evidence base to better understand the net effects of children's consumption of fish. To reduce uncertainty, studies need to better delineate the effects of mercury exposure and beneficial constituents like omega-3 fatty acids in different fish species.

Charge 3: How should advice from local advisories for those who consume fish from local streams, rivers, and lakes be integrated with this draft advice on mercury in fish?

CHPAC reviewed many state and local fish advisories to identify how they might be better integrated with the federal advisory. Although states have traditionally focused on issuing advisories on locally caught fish, some have now started to include advice on market fish. Current EPA guidance for state fish advisories[28] does not align with the joint EPA/FDA advice resulting in confusion for consumers. For example, states generally follow the EPA approach to develop fish advisories on market fish (e.g., several states already recommend avoiding orange roughy and marlin when pregnant) while the EPA/FDA joint advice does not. To help assure that fish advisories are as consistent, understandable, and influential as possible across a wide range of audiences, **CHPAC recommends that EPA:**

a) Collaborate with FDA to ensure that approaches to developing national, state, and local fish advisories provide consumers more consistent advice about local and market fish.

b) Improve the internet navigation from the federal advisory webpage to state and local advisories webpages so that consumers can more easily access advisories on locally caught and marketed fish. For example, the advisory could link to the interactive map on the EPA webpage "Advisories where you live." EPA should work with states to fix broken links and maintain accuracy of this important link to local advisories.

c) Review the effective use of color, graphics, icons, and professionally crafted messaging that states, local governments, and tribes have developed to communicate fish consumption advisories. These types of graphic enhancements, for both on-line and off-line materials, would improve understanding of the federal advisory among consumers and are essential in reaching low literacy populations and others who may not have access to electronic media.

[27] University of California, San Francisco Medical Center. "Program on Reproductive Health and the Environment: Navigation Guide". 2009. http://www.prhe.ucsf.edu/prhe/navigationguide_timeline.html.

[28] U.S. EPA. "National Guidance: Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories. Volume 2: Risk Assessment and Fish Consumption Limits - Third Edition". 2000 Nov. *EPA.* 823-B-00-008.

d) Fund and provide support for states, and other local health departments and tribes to develop and disseminate advisories, tailoring messages and community engagement activities for specific populations as needed.

In addition, CHPAC notes that other environmental contaminants can also accumulate in fish and harm the developing fetus and child such as polychlorinated biphenyl compounds (PCBs) which are known neurotoxicants. In the future, EPA should include guidance on other environmental contaminants in the advisory based on the best scientific evidence available.

Thank you for your commitment to children's health.

Sincerely,

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

Attachments
Appendix 1: Research Addressing Fish Advisory Information Dissemination
Appendix 2: Research Addressing Post Natal Fish Consumption

cc: Ruth Etzel, Director, Office of Children's Health Protection
Betsy Southerland, Director, Office of Science and Technology, Office of Water
Sharon Natanblut, U.S. Food and Drug Administration