Quantitative Assessment of Risk to Infants from Environmental Contaminants in Human Milk

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Overview

- What are polychlorinated biphenyls (PCBs), and why are we concerned about them?
- The nursing infant exposure pathway
- Selection of method to predict PCB levels in human milk
- Quantifying risk to infants
- Applications in Oregon and cross-cutting collaboration

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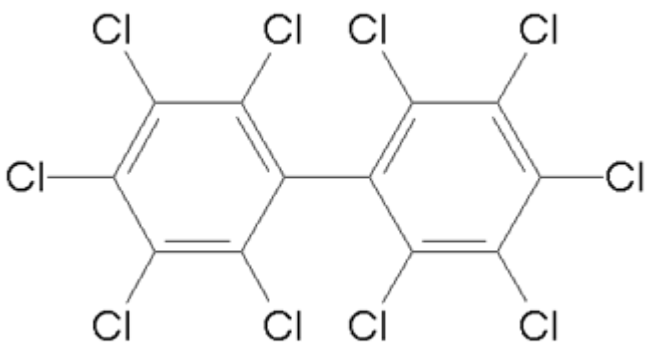
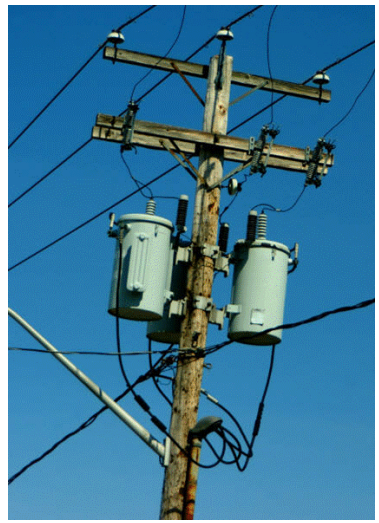
Polychlorinated Biphenyls (PCBs) – A Fat-Soluble Environmental Contaminant





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Portland Harbor Fish Advisory

- Based on polychlorinated biphenyls (PCBs)
- Specific warnings for pregnant and nursing women
- Based on qualitative information
- Why not quantify?

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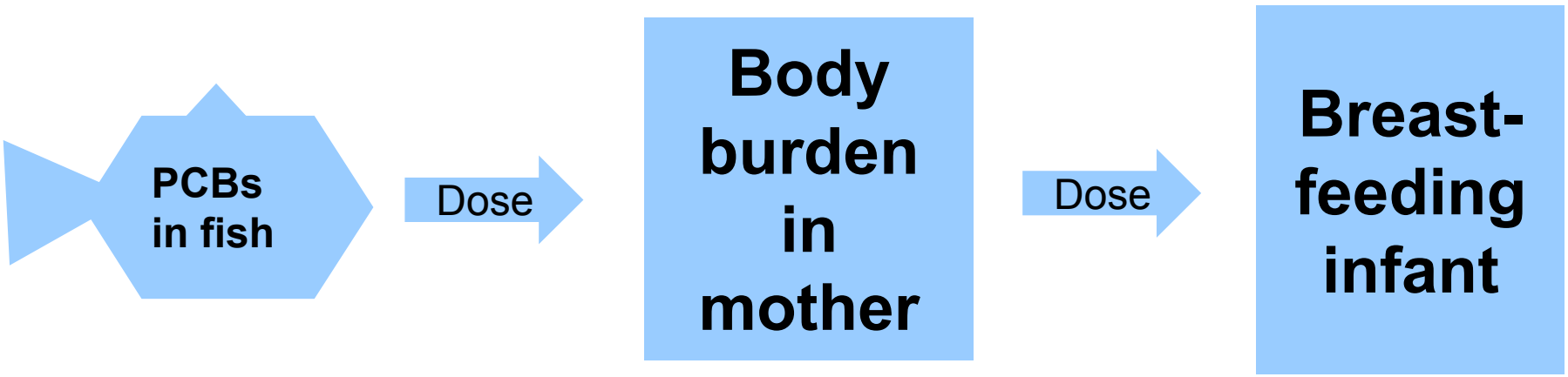
Conceptual Model



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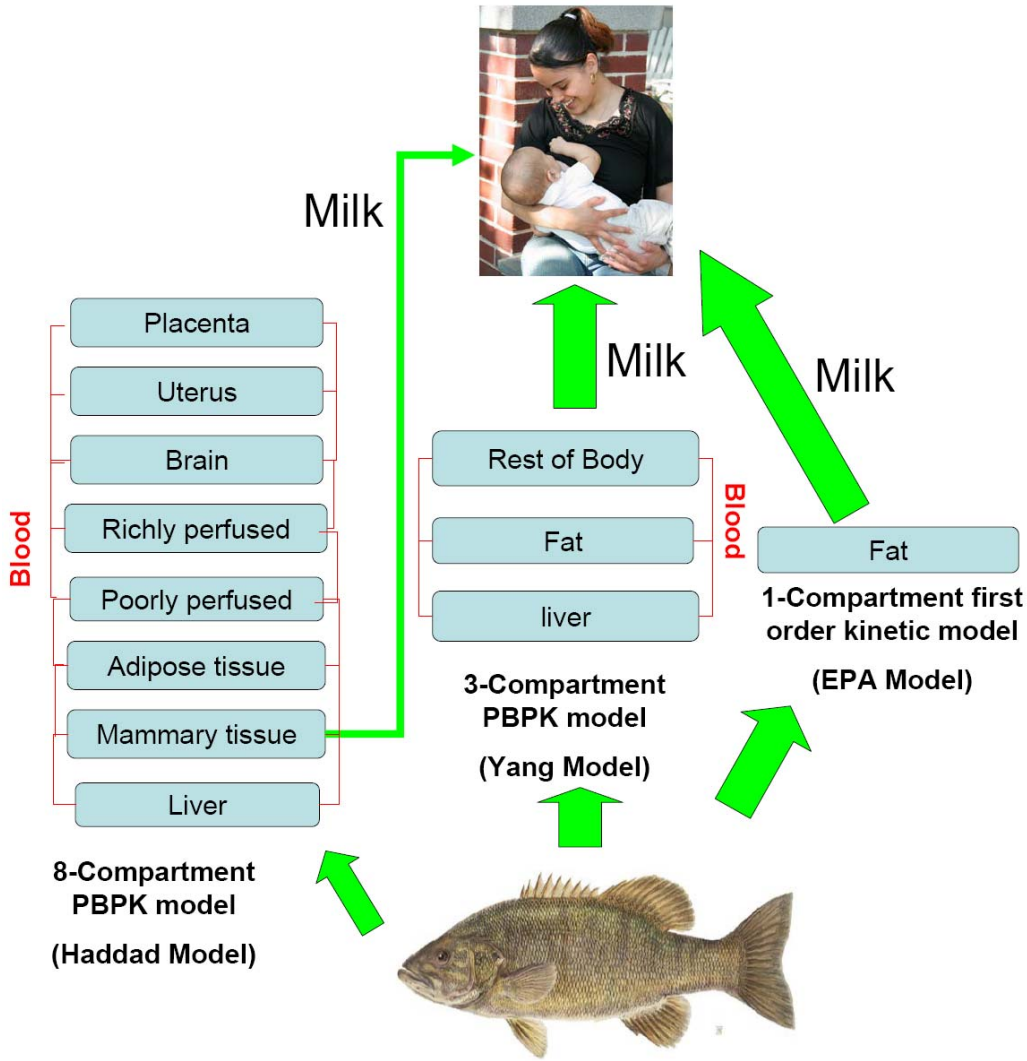
Method Selection (PCB-153)



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Comparison of 3 Models

- 8 Actual mother-infant pairs selected from larger study (N=75). Criteria for selection included:
  - Observed data for each study parameter
  - Breastfed for at least 11 months
  - Equal number male and female infants
  - Good spread of milk concentrations across the range
- Haddad model was validated against observed data from this study

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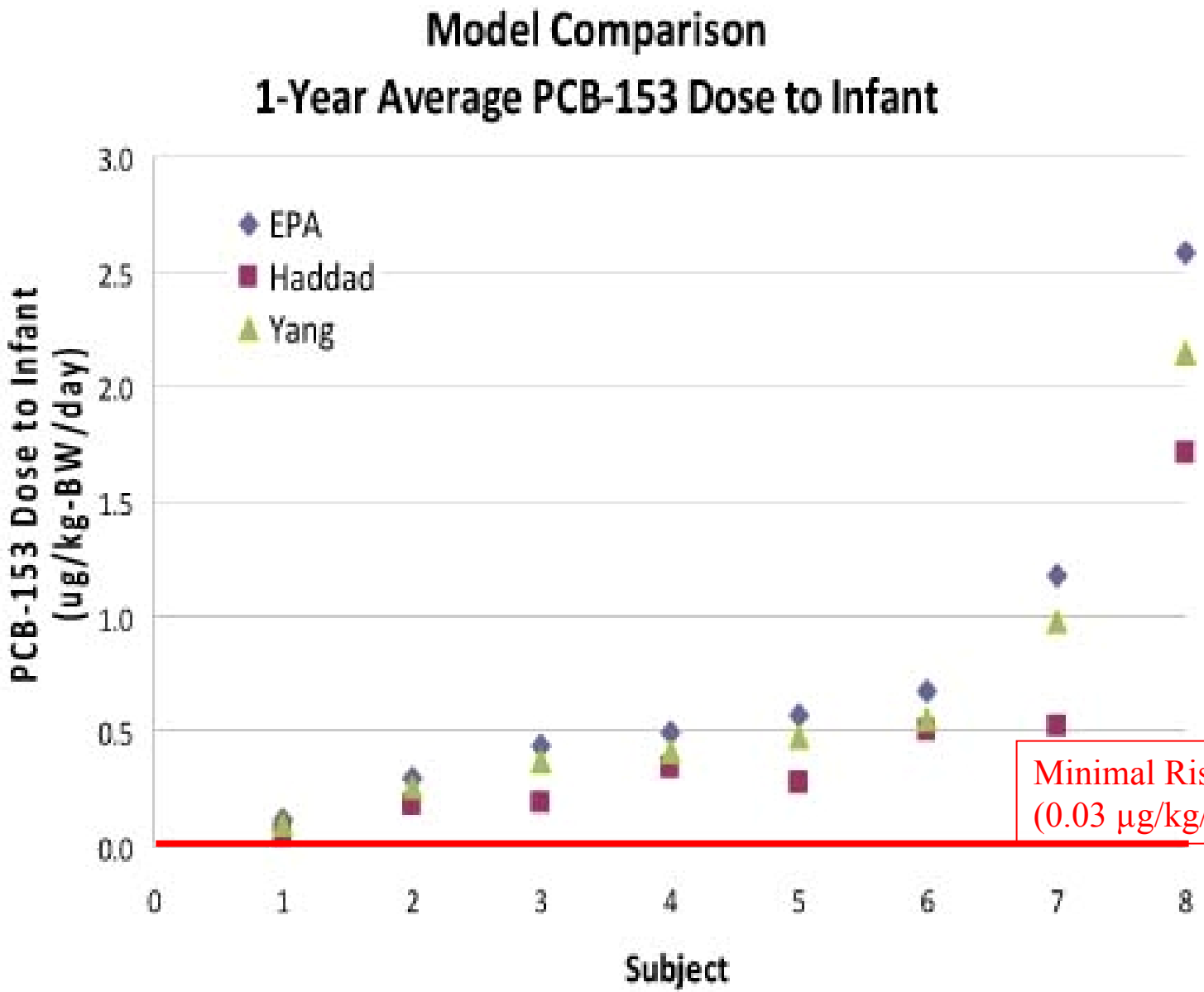
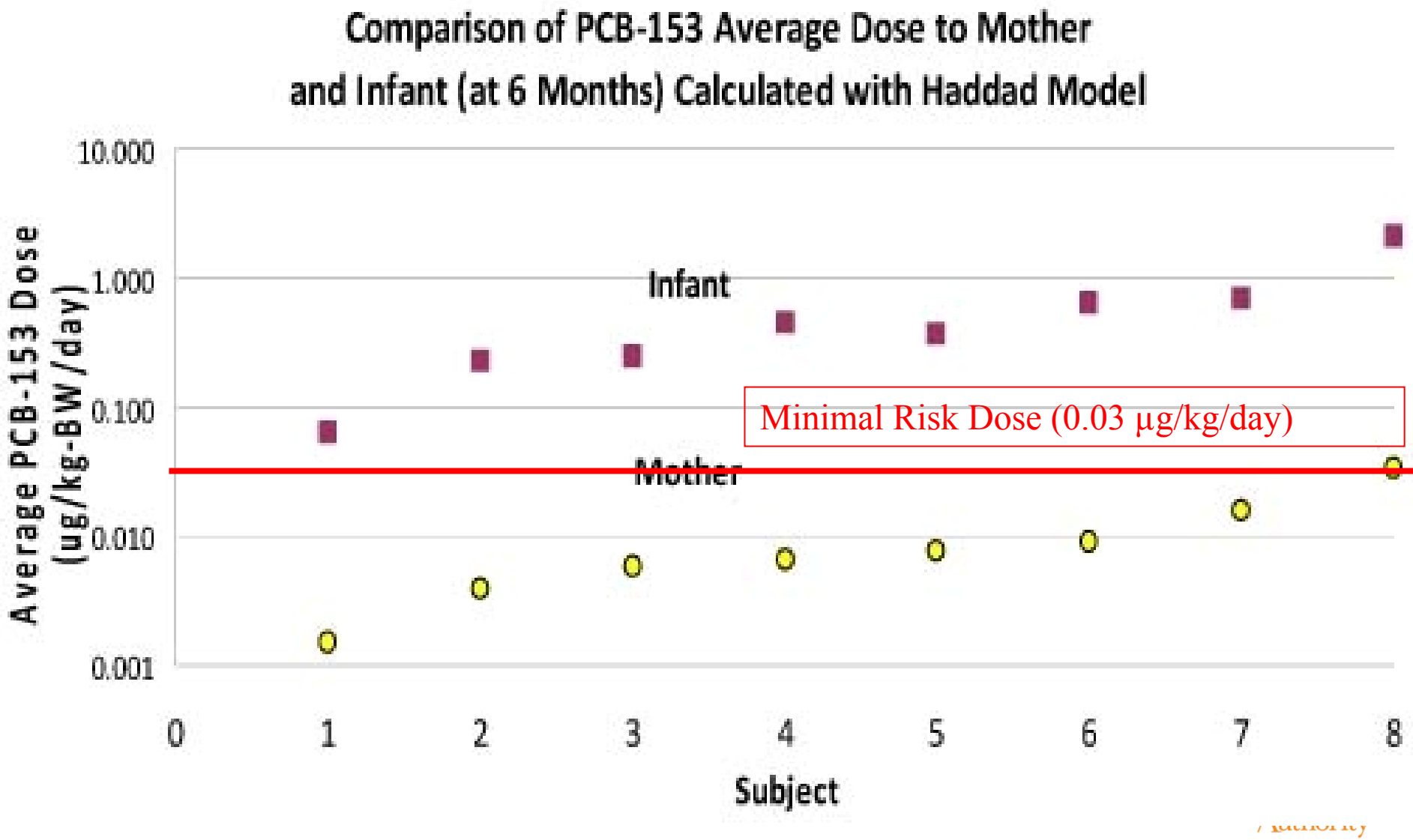
Simulated Doses to Infants Were Similar Across 3 Models



Infant Dose Compared to Maternal Dose



Oregon DEQ Human Health Risk Assessment Guidance

- Oregon Department of Environmental Quality (DEQ) has included this nursing infant exposure pathway in their updated Human Health Risk Assessment Guidance: Appendix D.
- Oregon is first state in the country to require quantitative assessment of risk to infants from contaminated human milk.
- OHA helped with model selection and crafted messaging around this guidance for nursing mothers, because…

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Breast is Still Best

- Important to communicate that calculated risks are not intended to advise women about whether or not to breastfeed.
- Benefits still outweigh the risks
- Public health messages focus on reducing maternal exposure to contaminants to optimize benefits of breastfeeding
- The earlier maternal exposure to fat-soluble contaminants is reduced, the better for the future infant.

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Project of Collaboration

- Oregon Health Authority
- Mike Poulsen, Oregon DEQ
- Clement Welsh, Agency for Toxic Substances and Disease Registry (ATSDR)
- Marcia Bailey, Environmental Protection Agency (EPA) Region 10 office staff in Seattle
- Dr. Sami Haddad, University of Montreal in Quebec
- Dr. Raymond Yang, Raymond Yang Consulting LLC.

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