

Chapter 1—Introduction

Chapter 15	Human Milk Intake—presents data on human milk consumption for infants at various life stages.
Chapter 16	Activity Factors—presents data on activity patterns for the general population and various demographic groups.
Chapter 17	Consumer Products—provides information on frequency, duration, and amounts of consumer products used.
Chapter 18	Life Expectancy—presents data on the projected length of a lifetime, based on age and demographic factors.
Chapter 19	Building Characteristics—presents information on both residential and commercial building characteristics necessary to assess exposure to indoor air pollutants.

Figure 1-3 provides a schematic diagram that shows the linkages of a select number of exposure pathways with the exposure factors presented in this handbook and the corresponding exposure routes. Figure 1-4 provides a roadmap to assist users of this handbook in locating recommended values and confidence ratings for the various exposure factors presented in these chapters.

1.13. REFERENCES FOR CHAPTER 1

American Academy of Pediatrics. (1997). Child health issues for the second session of the 106th Congress. Washington, DC: Department of Federal Affairs.

Breyse, PN; Buckley, TJ; Williams, D; Beck, CM; Jo, SJ; Merriman, B; Kanchanaraks, S; Swartz, LJ; Callahan, KA; Butz, AM; Rand, CS; Diette, GB; Krishnan, JA; Moseley, AM; Curtin-Brosnan, J; Durkin, NB; Eggleston, PA. (2005). Indoor exposures to air pollutants and allergens in the homes of asthmatic children in inner-city Baltimore. *Environ Res* 98: 167-176. <http://dx.doi.org/10.1016/j.envres.2004.07.018>.

Brown, RC; Barone, S, Jr; Kimmel, CA. (2008). Children's health risk assessment: Incorporating a lifestage approach into the risk assessment process. *Birth Defects Res B Dev Reprod Toxicol* 83: 511-521. <http://dx.doi.org/10.1002/bdrb.20172>.

Clewell, HJ; Gentry, PR; Covington, TR;

Sarangapani, R; Teeguarden, JG. (2004). Evaluation of the potential impact of age- and gender-specific pharmacokinetic differences on tissue dosimetry. *Toxicol Sci* 79: 381-393. <http://dx.doi.org/10.1093/toxsci/kfh109>.

Curwin, BD; Hein, MJ; Sanderson, WT; Striley, C; Heederik, D; Kromhout, H; Reynolds, SJ; Alavanja, MC. (2007). Pesticide dose estimates for children of Iowa farmers and non-farmers. *Environ Res* 105: 307-315. <http://dx.doi.org/10.1016/j.envres.2007.06.001>.

Eskenazi, B; Bradman, A; Castorina, R. (1999). Exposures of children to organophosphate pesticides and their potential adverse health effects. *Environ Health Perspect* 3: 409-419.

Foos, B; Marty, M; Schwartz, J; Bennett, W; Moya, J; Jarabek, AM; Salmon, AG. (2008). Focusing on children's inhalation dosimetry and health effects for risk assessment: An introduction. *J Toxicol Environ Health A* 71: 149-165. <http://dx.doi.org/10.1080/15287390701597871>.

Garry, VF. (2004). Pesticides and children. *Toxicol Appl Pharmacol* 198: 152-163. <http://dx.doi.org/10.1016/j.taap.2003.11.027>.

Georgopoulos, PG. (2008). A multiscale approach for assessing the interactions of environmental and biological systems in a holistic health risk assessment framework. *Water, Air, and Soil Pollution: Focus* 8: 3-21. <http://dx.doi.org/10.1007/s11267-007-9137-7>.

Georgopoulos, PG; Liou, PJ. (2006). From a theoretical framework of human exposure and dose assessment to computational system implementation: The Modeling ENvironment for TOtal Risk Studies (MENTOR). *J Toxicol Environ Health B Crit Rev* 9: 457-483. <http://dx.doi.org/10.1080/10937400600755929>.

Gilbert, RO. (1987). Statistical methods for environmental pollution monitoring. New York, NY: Van Nostrand Reinhold.

Ginsberg, G; Hattis, D; Miller, R; Sonawane, B. (2004). Pediatric pharmacokinetic data: Implications for environmental risk assessment for children. *Pediatrics* 113: 973-983.

Ginsberg, G; Hattis, D; Sonawane, B; Russ, A; Banati, P; Kozlak, M; Smolenski, S; Goble, R. (2002). Evaluation of child/adult

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- pharmacokinetic differences from a database derived from the therapeutic drug literature. *Toxicol Sci* 66: 185-200.
- Ginsberg, GL; Foos, BP; Firestone, MP. (2005). Review and analysis of inhalation dosimetry methods for application to children's risk assessment [Review]. *J Toxicol Environ Health A* 68: 573-615. <http://dx.doi.org/10.1080/15287390590921793>.
- Gulson, BL; Pounds, JG; Mushak, P; Thomas, BJ; Gray, B; Korsch, MJ. (1999). Estimation of cumulative lead releases (lead flux) from the maternal skeleton during pregnancy and lactation. *J Lab Clin Med* 134: 631-640.
- Gurunathan, S; Robson, M; Freeman, N; Buckley, B; Roy, A; Meyer, R; Bukowski, J; Lioy, PJ. (1998). Accumulation of chlorpyrifos on residential surfaces and toys accessible to children. *Environ Health Perspect* 106: 9-16.
- Landrigan, PJ; Sonawane, B; Butler, RN; Trasande, L; Callan, R; Droller, D. (2005). Early environmental origins of neurodegenerative disease in later life. *Environ Health Perspect* 113: 1230-1233. <http://dx.doi.org/10.1289/ehp.7571>.
- Lewis, RG; Fortune, CR; Willis, RD; Camann, DE; Antley, JT. (1999). Distribution of pesticides and polycyclic aromatic hydrocarbons in house dust as a function of particle size. *Environ Health Perspect* 107: 721-726.
- Lioy, P; Leaderer, B; Graham, J; Lebre, E; Sheldon, L; Needham, L; Pellizzari, E; Lebowitz, M. (2005). The Major Themes from the Plenary Panel Session of the International Society of Exposure Analysis--2004 Annual Meeting on: The Application of Exposure Assessment to Environmental Health Science and Public Policy--What has been Accomplished and What Needs to Happen before Our 25th Anniversary in 2014. *J Expo Anal Environ Epidemiol* 15: 121. <http://dx.doi.org/10.1038/sj.jea.7500417>.
- Lipscomb, JC. (2006). Use of physiologically based pharmacokinetic models to quantify the impact of human age and interindividual differences in physiology and biochemistry pertinent to risk (Final Report). (EPA/600/R06/014A). Cincinnati, OH: U.S. Environmental Protection Agency.
- Makri, A; Goveia, M; Balbus, J; Parkin, R. (2004). Children's susceptibility to chemicals: A review by developmental stage [Review]. *J Toxicol Environ Health B Crit Rev* 7: 417-435.
- <http://dx.doi.org/10.1080/10937400490512465>.
- Moya, J; Bearer, CF; Etzel, RA. (2004). Children's behavior and physiology and how it affects exposure to environmental contaminants. *Pediatrics* 113: 996-1006.
- Myers, GJ; Davidson, PW. (2000). Does methylmercury have a role in causing developmental disabilities in children? *Environ Health Perspect* 108: 413-420.
- Nishioka, MG; Burkholder, HM; Brinkman, MC; Lewis, RG. (1999). Distribution of 2,4-dichlorophenoxyacetic acid in floor dust throughout homes following homeowner and commercial lawn applications: Quantitative effects of children, pets, and shoes. *Environ Sci Technol* 33: 1359-1365.
- NRC (National Research Council). (1983). Risk assessment in the federal government: Managing the process. Washington, DC: National Academies Press. http://www.nap.edu/openbook.php?record_id=366&page=R1.
- NRC (National Research Council). (1991). Human exposure assessment for airborne pollutants: advances and opportunities. Washington, DC: National Academy of Sciences. http://books.nap.edu/openbook.php?record_id=1544.
- NRC (National Research Council). (2006). Human biomonitoring for environmental chemicals. Washington, D.C.: The National Academies Press. http://www.nap.edu/catalog.php?record_id=11700.
- NRC (National Research Council). (2009). Science and decisions: Advancing risk assessment. Washington, DC: National Academies Press. <http://www.nap.edu/catalog/12209.html>.
- Ott, WR. (2007). Exposure analysis: A receptor-oriented science. In W Ott; AC Steinemann; LA Wallace (Eds.), *Exposure analysis* (pp. 3-32). Boca Raton, FL: CRC Press.
- Price, PS; Chaisson, CF; Koontz, M; Wilkes, C; Ryan, B; Macintosh, D; Georgopoulos, P. (2003a). Construction of a comprehensive chemical exposure framework using person oriented modeling. Annandale, VA: The LifeLine Group. http://www.thelifelinegroup.org/lifeline/documents/comprehensive_chemical_exposure_framework.pdf.
- Price, PS; Conolly, RB; Chaisson, CF; Gross, EA; Young, JS; Mathis, ET; Tedder, DR.

- (2003b). Modeling interindividual variation in physiological factors used in PBPK models of humans. *Crit Rev Toxicol* 33: 469-503.
<http://dx.doi.org/10.1080/10408440390242324>.
- Selevan, SG; Kimmel, CA; Mendola, P. (2000). Identifying critical windows of exposure for children's health. *Environ Health Perspect* 108: 451-455.
- Sheldon, LS; Cohen Hubal, EA. (2009). Exposure as part of a systems approach for assessing risk. *Environ Health Perspect* 117: 119-1194.
<http://dx.doi.org/10.1289/ehp.0800407>.
- Thompson, CM; Johns, DO; Sonawane, B; Barton, HA; Hattis, D; Tardiff, R; Krishnan, K. (2009). Database for physiologically based pharmacokinetic (PBPK) modeling: physiological data for healthy and health-impaired elderly. *J Toxicol Environ Health B Crit Rev* 12: 1-24.
<http://dx.doi.org/10.1080/10937400802545060>.
- U.S. EPA (U.S. Environmental Protection Agency). Methods for assessing exposure to chemical substances, volumes 113 (1983-1989). (EPA-560/5-85-001 to EPA-560/5-85-009, EPA-560/5-85-014 to EPA-560/5-85-017). Washington, DC.
- U.S. EPA (U.S. Environmental Protection Agency). (1985). Development of statistical distributions or ranges of standard factors used in exposure assessments. (EPA600885010).
<http://www.ntis.gov/search/product.aspx?A=BBR=PB85242667>.
- U.S. EPA (U.S. Environmental Protection Agency). (1986a). Guidelines for the health risk assessment of chemical mixtures [EPA Report] (pp. 34014-34025). (EPA/630/R-98/002). Washington, DC.
<http://cfpub.epa.gov/ncea/cfm/recorddisplay.cfm?deid=22567>.
- U.S. EPA (U.S. Environmental Protection Agency). (1986b). Standard scenarios for estimating exposure to chemical substances during use of consumer products: Volume I.
- U.S. EPA (U.S. Environmental Protection Agency). (1986c). Standard scenarios for estimating exposure to chemical substances during use of consumer products: Volume II.
- U.S. EPA (U.S. Environmental Protection Agency). (1987a). The risk assessment guidelines of 1986 [EPA Report]. (EPA/600/8-87/045). Washington, DC: U.S. Environmental Protection Agency, Office of Health and Environmental Assessment.
<http://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=30001GOF.txt>.
- U.S. EPA (U.S. Environmental Protection Agency). (1987b). Selection criteria for mathematical models used in exposure assessments: Surface water models. (EPA/600/8-87/042). Washington, DC.
- U.S. EPA (U.S. Environmental Protection Agency). (1988). Selection criteria for mathematical models used in exposure assessments: Ground-water models. (EPA600888075).
<http://www.ntis.gov/search/product.aspx?A=BBR=PB88248752>.
- U.S. EPA (U.S. Environmental Protection Agency). (1989a). Exposure factors handbook. (EPA/600/8-89/043). Washington, DC: U.S. Environmental Protection Agency, Office of Health and Environmental Assessment.
<http://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=30001I91.txt>.
- U.S. EPA (U.S. Environmental Protection Agency). (1989b). Risk assessment guidance for superfund: Volume 1: Human health evaluation manual (part A): Interim final [EPA Report]. (EPA/540/1-89/002). Washington, DC: U.S. Environmental Protection Agency, Office of Emergency and Remedial Response.
<http://www.epa.gov/oswer/riskassessment/ragsa/index.htm>.
- U.S. EPA (U.S. Environmental Protection Agency). (1990). Methodology for assessing health risks associated with indirect exposure to combustor emissions. (EPA 600/6-90/003). Washington, DC.
- U.S. EPA (U.S. Environmental Protection Agency). (1991a). Risk assessment guidance for superfund: Volume I - human health evaluation manual (part B, development of risk-based preliminary remediation goals): Interim [EPA Report]. (EPA/540/R-92/003). Washington, DC.
<http://www.epa.gov/oswer/riskassessment/ragsb/index.htm>.
- U.S. EPA (U.S. Environmental Protection Agency). (1991b). Risk assessment guidance for superfund: Volume I - human health evaluation manual (part C, risk evaluation and remedial alternatives): Interim, appendix C: Short-term toxicity values (pp. 49-56). (OSWER Dir 9285.7-01CFS). Washington, DC.

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- http://www.epa.gov/oswer/riskassessment/ra_gsc/index.htm.
- U.S. EPA (U.S. Environmental Protection Agency). (1992a). Dermal exposure assessment: Principles and applications (interim report). (EPA/600/8-91/011B). Washington, DC: U.S. Environmental Protection Agency, Office of Health and Environmental Assessment, Exposure Assessment Group. <http://cfpub.epa.gov/ncea/cfm/recorddisplay.cfm?deid=12188>.
- U.S. EPA (U.S. Environmental Protection Agency). (1992b). EPA's approach for assessing the risks associated with chronic exposure to carcinogens: Background document 2. <http://www.epa.gov/iris/carcino.htm>.
- U.S. EPA (U.S. Environmental Protection Agency). (1992c). Guidelines for exposure assessment. (EPA/600/Z-92/001). Washington, DC: U.S. Environmental Protection Agency, Risk Assessment Forum. <http://cfpub.epa.gov/ncea/cfm/recorddisplay.cfm?deid=15263>.
- U.S. EPA (U.S. Environmental Protection Agency). (1993). Reference Dose (RfD): Description and Use in Health Risk Assessments Background Document 1A, March 15, 1993. Integrated Risk Information System. <http://www.epa.gov/IRIS/rfd.htm>.
- U.S. EPA (U.S. Environmental Protection Agency). (1994). Methods for derivation of inhalation reference concentrations and application of inhalation dosimetry. (EPA/600/8-90/066F). Research Triangle Park, NC: U.S. Environmental Protection Agency, Office of Research and Development, Office of Health and Environmental Assessment, Environmental Criteria and Assessment Office. <http://cfpub.epa.gov/ncea/cfm/recorddisplay.cfm?deid=71993>.
- U.S. EPA (U.S. Environmental Protection Agency). (1996a). Series 875 occupational and residential exposure test guidelines: Final guidelines. (EPA/712-C96/261). Washington, DC.
- U.S. EPA (U.S. Environmental Protection Agency). (1996b). Soil screening guidance: Technical background document. (EPA/540/R95/128). Washington, DC.
- U.S. EPA (U.S. Environmental Protection Agency). (1997a). Exposure factors handbook (final report). (EPA/600/P-95/002Fa-c). Washington, DC: U.S. Environmental Protection Agency, Office of Research and Development, National Center for Environmental Assessment. <http://cfpub.epa.gov/ncea/cfm/recorddisplay.cfm?deid=12464>.
- U.S. EPA (U.S. Environmental Protection Agency). (1997b). Guiding principles for Monte Carlo analysis. (EPA/630/R-97/001). Washington, DC. <http://www.epa.gov/raf/publications/guiding-monte-carlo-analysis.htm>.
- U.S. EPA (U.S. Environmental Protection Agency). (1997c). Policy for use of probabilistic analysis in risk assessment. Washington, DC. <http://www.epa.gov/OSA/spc/pdfs/probpol.pdf>.
- U.S. EPA (U.S. Environmental Protection Agency). (1998). Series 875 - Occupational and residential exposure test guidelines: Group B - Postapplication exposure monitoring test guidelines. Washington, DC: U.S. Environmental Protection Agency. <http://www.epa.gov/scipoly/sap/meetings/1998/march/front.pdf>.
- U.S. EPA (U.S. Environmental Protection Agency). (1999). Sociodemographic data used for identifying potentially highly exposed populations. (EPA/600/R-99/060). Washington, DC. <http://cfpub.epa.gov/ncea/cfm/recorddisplay.cfm?deid=22562>.
- U.S. EPA (U.S. Environmental Protection Agency). (2000a). Options for development of parametric probability distributions for exposure factors. (EPA/600/R-00/058). Washington, DC: U.S. Environmental Protection Agency. <http://www.epa.gov/ncea/pdfs/paramprob4ef/chap1.pdf>.
- U.S. EPA (U.S. Environmental Protection Agency). (2000b). Summary report of the technical workshop on issues associated with considering developmental changes in behavior and anatomy when assessing exposure to children. (EPA/630/R-00/005). Washington, DC.
- U.S. EPA (U.S. Environmental Protection Agency). (2000c). Supplementary guidance for conducting health risk assessment of chemical mixtures [EPA Report]. (EPA/630/R-00/002). <http://cfpub.epa.gov/ncea/cfm/recorddisplay.cfm?deid=20533>.
- U.S. EPA (U.S. Environmental Protection Agency). (2001a). General principles for performing

- aggregate exposure and risk assessments. Washington, DC. <http://www.epa.gov/pesticides/trac/science/aggregate.pdf>.
- U.S. EPA (U.S. Environmental Protection Agency). (2001b). Risk Assessment Guidance for Superfund (RAGS), Vol. I - Human health evaluation manual, Part D: Standardized planning, reporting and review of Superfund risk assessments. (OSWER9285747). Washington, DC. <http://www.epa.gov/oswer/riskassessment/ragsd/index.htm>.
- U.S. EPA (U.S. Environmental Protection Agency). (2001c). Risk assessment guidance for superfund: Volume III - part A, process for conducting probabilistic risk assessment. (EPA 540-R-02-002). Washington, DC: U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response. <http://www.epa.gov/oswer/riskassessment/rags3adt/index.htm>.
- U.S. EPA (U.S. Environmental Protection Agency). (2002). Overview of the EPA quality system for environmental data and technology. (EPA/240/R-02/003). <http://www.epa.gov/QUALITY/qs-docs/overview-final.pdf>.
- U.S. EPA (U.S. Environmental Protection Agency). (2003a). Exposure and human health reassessment of 2,3,7,8 tetrachlorodibenzo-p dioxin (TCDD) and related compounds [NAS review draft]. (EPA/600/P-00/001). Washington, DC: U.S. Environmental Protection Agency, National Center for Environmental Assessment. <http://www.epa.gov/nceawww1/pdfs/dioxin/nas-review/>.
- U.S. EPA (U.S. Environmental Protection Agency). (2003b). Framework for cumulative risk assessment. (EPA/630/P-02/001F). Washington, DC: U.S. Environmental Protection Agency, Risk Assessment Forum. <http://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=30004TJH.txt>.
- U.S. EPA (U.S. Environmental Protection Agency). (2003c). Human health research strategy. (EPA/600/R-02/050). Washington, DC. <http://www.epa.gov/ORD/htm/researchstrategies.htm#rs01>.
- U.S. EPA (U.S. Environmental Protection Agency). (2003d). A summary of general assessment factors for evaluating the quality of scientific and technical information. Washington, DC. <http://www.epa.gov/spc/assess.htm>.
- U.S. EPA (U.S. Environmental Protection Agency). (2004a). Example exposure scenarios. (EPA 600/R03/036). Washington, DC. <http://cfpub.epa.gov/ncea/cfm/recorddisplay.cfm?deid=85843>.
- U.S. EPA (U.S. Environmental Protection Agency). (2004b). Risk Assessment Guidance for Superfund (RAGS), Volume I: Human health evaluation manual, (part E: Supplemental guidance for dermal risk assessment): Final. (EPA/540/R/99/005). Washington, DC. <http://www.epa.gov/oswer/riskassessment/ragsd/index.htm>.
- U.S. EPA (U.S. Environmental Protection Agency). (2005a). Aging and toxic response: Issues relevant to risk assessment. (EPA/600/P03/004A). Washington, DC.
- U.S. EPA (U.S. Environmental Protection Agency). (2005b). Guidance on selecting age groups for monitoring and assessing childhood exposures to environmental contaminants (final). (EPA/630/P-03/003F). Washington, DC: U.S. Environmental Protection Agency, Risk Assessment Forum. <http://www.epa.gov/raf/publications/guidance-on-selecting-age-groups.htm>.
- U.S. EPA (U.S. Environmental Protection Agency). (2005c). Guidelines for carcinogen risk assessment. (EPA/630/P-03/001F). Washington, DC. <http://www.epa.gov/cancerguidelines/>.
- U.S. EPA (U.S. Environmental Protection Agency). (2005d). Human health risk assessment protocol for hazardous waste combustion facilities. (EPA530-R-05-006). Washington, DC: US Environmental Protection Agency, Office of Solid Waste and Emergency Response (OSWER). http://www.epa.gov/earth1r6/6pd/rcra_c/protocol/protocol.htm.
- U.S. EPA (U.S. Environmental Protection Agency). (2005e). Supplemental guidance for assessing susceptibility from early-life exposure to carcinogens. (EPA/630/R-03/003F). Washington, DC: U.S. Environmental Protection Agency, Risk Assessment Forum. <http://www.epa.gov/cancerguidelines/guidelines-carcinogen-supplement.htm>.
- U.S. EPA (U.S. Environmental Protection Agency). (2006a). Approaches for the application of physiologically based pharmacokinetic (PBPK) models and supporting data in risk

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- assessment (Final Report). (EPA/600/R-05/043F). Washington, DC: U.S. Environmental Protection Agency, Office of Research and Development.
- U.S. EPA (U.S. Environmental Protection Agency). (2006b). A framework for assessing health risk of environmental exposures to children. (EPA/600/R-05/093F). Washington, DC. <http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=158363>.
- U.S. EPA (U.S. Environmental Protection Agency). (2006c). Guidance on systematic planning using the data quality objectives process: EPA QA/G-4 [EPA Report]. (EPA/240/B-06/001). Washington, DC. <http://www.epa.gov/QUALITY/qs-docs/g4-final.pdf>.
- U.S. EPA (U.S. Environmental Protection Agency). (2007a). Concepts, methods, and data sources for cumulative health risk assessment of multiple chemicals, exposures, and effects: A resource document [EPA Report]. (EPA/600/R-06/013F). Cincinnati, OH. <http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=190187>.
- U.S. EPA (U.S. Environmental Protection Agency). (2007b). Dermal exposure assessment: A summary of EPA approaches [EPA Report]. (EPA/600/R-07/040F). Washington, DC. <http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=183584>.
- U.S. EPA (U.S. Environmental Protection Agency). (2007c). Summary report of a Peer Involvement Workshop on the Development of an Exposure Factors Handbook for the Aging [EPA Report]. (EPA/600/R-07/061). Washington, DC. <http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=171923>.
- U.S. EPA (U.S. Environmental Protection Agency). (2008a). Child-specific exposure factors handbook [EPA Report]. (EPA/600/R-06/096F). Washington, DC. <http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=199243>.
- U.S. EPA (U.S. Environmental Protection Agency). (2008b). Physiological parameters database for older adults (Beta 1.1) [Database]. Washington, DC. Retrieved from <http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=201924>
- U.S. EPA (U.S. Environmental Protection Agency). (2009a). Draft technical guidelines: Standard operating procedures for residential pesticide exposure assessment: Submitted to the FIFRA Scientific Advisory Panel for review and comment, October 6-9, 2009. <http://www.biospotvictims.org/EPA-HQ-OPP-2009-0516-0002.pdf>.
- U.S. EPA (U.S. Environmental Protection Agency). (2009b). Risk assessment guidance for superfund volume I: Human health evaluation manual (Part F, supplemental guidance for inhalation risk assessment): Final. (EPA/540/-R-070/002). Washington, DC: U.S. Environmental Protection Agency, Office of Superfund Remediation and Technology Innovation. http://www.epa.gov/oswer/riskassessment/ra_gsf/index.htm.
- U.S. EPA (U.S. Environmental Protection Agency). (2010). SHEDS-multimedia: Details of SHEDS-multimedia version 3: ORD/NERLs model to estimate aggregate and cumulative exposures to chemicals. Research Triangle Park, NC. http://www.epa.gov/heasd/products/sheds_multimedia/sheds_mm.html.
- U.S. EPA (U.S. Environmental Protection Agency). (2011). Recommended use of body weight 3/4 as the default method in derivation of the oral reference dose. (EPA/100/R11/0001). Washington, DC. <http://www.epa.gov/raf/publications/interspecies-extrapolation.htm>.
- WHO (World Health Organization). (2001). Glossary of exposure assessment-related terms: A compilation. Geneva, Switzerland. http://www.who.int/ipcs/publications/methods/harmonization/en/compilation_nov2001.pdf.
- WHO (World Health Organization). (2005). Principles of characterizing and applying human exposure models. Geneva. http://whqlibdoc.who.int/publications/2005/9241563117_eng.pdf.
- WHO (World Health Organization). (2006). Principles for evaluating health risks in children associated with exposure to chemicals [WHO EHC]. (Environmental Health Criteria 237). Geneva, Switzerland. <http://www.who.int/ipcs/publications/ehc/ehc237.pdf>.
- Zartarian, VG; Ott, WR; Duan, N. (2007). Basic concepts and definitions of exposure and dose. In WR Ott; AC Steinemann; LA Wallace (Eds.), Exposure analysis (pp. 33-63). Boca Raton, FL: CRC Press.