

Information Resources for Users of Statistics and Modeling Tools – v1.0 – 9-15-25

Exposure Assessment

Exposure Assessment Strategies

Jahn, Steven D., William H. Bullock, and Joselito S. Ignacio, eds. A strategy for assessing and managing occupational exposures. 4th Ed. Fairfax, VA: AIHA, 2015.

Accurate Decision Making

Logan, P., G. Ramachandran, J. Mulhausen and P. Hewett. (2009). Occupational exposure decisions: can limited data interpretation training help improve accuracy? *Annals of occupational hygiene*, 53(4): 311-324

Logan P., G. Ramachandran, J. Mulhausen, S. Banerjee, and P. Hewett “Desktop Study of Occupational Exposure Judgments: Do Education and Experience Influence Accuracy?” *Journal of Occupational and Environmental Hygiene*, 8:12, 746-758, 2011.

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Montgomery H., R., R Lipshitz., and B. Brehmer: *How Professionals Make Decisions*. Boca Raton, FL: CRC Press, 2005.

Nicas M: An Impractical Emphasis, *The Synergist*, Sept 2003.

Tools for Statistical Analysis

General Statistical Analysis

Making Accurate Exposure Risk Decisions Webinar <https://www.aiha.org/education/elearning/online-courses/making-accurate-exposure-risk-decisions>

AIHA Train-the-Trainer PDC: Improving IH Exposure Judgments Course <https://www.aiha.org/public-resources/aiha-academic-portal/train-the-trainer-pdc-resources>

Eun GL, Diana MC. Adoption of exposure assessment tools to assist in providing respiratory protection recommendations. *Annals of Work Exposures and Health*. 64(5):547–557, 2020.
<https://doi.org/10.1093/annweh/wxaa023>.

Censored Data Analysis

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Hewett, P., and G. Ganser. “A Comparison of Several Methods for Analyzing Censored Data”. *Ann. Occup. Hyg.*, Vol. 51, No. 7, pp. 611–632, 2007

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Huynh, T., Quick, H., Ramachandran, G., Banerjee, S., Stenzel, M., Sandler, D. P., Engel, L. S., Kwok, R. K., Blair, A., & Stewart, P. A. (2016). A Comparison of the β -Substitution Method and a Bayesian Method for Analyzing Left-Censored Data. *The Annals of occupational hygiene*, 60(1), 56–73. <https://doi.org/10.1093/annhyg/mev049>

Helsel, D. *Non Detects and Data Analysis - Statistics for Censored Environmental Data*. Hoboken, NJ: John Wiley & Sons, Inc., 2005.

Helsel, Dennis R. *Statistics for Censored Environmental Data Using Minitab and R (CourseSmart)*. Wiley, 2012.

Bayesian Analysis Applied to Exposure Data:

Jérôme L, Lawrence J, Peter K, Hugh D, France L, Frédéric C, Gautier M, Tracy K. Expostats: A Bayesian toolkit to aid the interpretation of occupational exposure measurements. *Annals of Work Exposures and Health*. 63(3):267–279, 2019. <https://doi.org/10.1093/annweh/wxy100>.

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Ramachandran G, Vincent JH. A Bayesian approach to retrospective exposure assessment. *Applied Occupational and Environmental Hygiene*, 14(8):547–557, 1999. <https://doi.org/10.1080/104732299302549>

Sottas PE, Lavoué J, Bruzzi R, David V, Nicole C, Droz PO. An empirical hierarchical Bayesian unification of occupational exposure assessment methods. *Statistics in Medicine*, 28(1):75–93, 2009. <https://doi.org/10.1002/sim.3411>

Banerjee S, Ramachandran G, Vadali M, Sahmel J. Bayesian hierarchical framework for occupational hygiene decision making. *The Annals of Occupational Hygiene*, 58(9):1079–1093, 2014. <https://doi.org/10.1093/annhyg/meu060>.

Hewett, P., Logan, P., Mulhausen, J., Ramachandran, G., & Banerjee, S. (2006). Rating Exposure Control Using Bayesian Decision Analysis. *Journal of Occupational and Environmental Hygiene*, 3(10), 568–581. <https://doi.org/10.1080/15459620600914641>

Ramachandran, G. (2001). Retrospective exposure assessment using Bayesian methods. *Annals of Occupational Hygiene*, 45(8): 651-667.

Tools for Modeling

General Exposure Modeling

Mathematical Models for Estimating Occupational Exposure to Chemicals – 2nd Edition, Keil, C., Simmons, C. and Anthony, R. editors, American Industrial Hygiene Association Publications, 2009.

A Case-Based Introduction to Modeling Occupational Inhalation Exposures to Chemicals, Keil, C. editor, American Industrial Hygiene Association, Falls Church VA 2023

Chen K, Martin LF. Proper selection and application of mathematical models for estimating occupational exposure to chemicals. *The Chemist*, 92(1):95–107, 2021.

Hewett, Paul, and Gary H. Ganser. "Models for nearly every occasion: Part I-One box models." *Journal of Occupational and Environmental Hygiene* 14.1 (2017): 49-57. [LINK](#)

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Ganser, Gary H., and Paul Hewett. "Models for nearly every occasion: Part IV—Two-box decreasing emission models." *Journal of Occupational and Environmental Hygiene* 14.11 (2017): 919-930. [LINK](#)

Foat, T., Drodge, J., Nally, J., & Parker, S. (2020). A relationship for the diffusion coefficient in eddy diffusion based indoor dispersion modelling. *Building and Environment*, 169, 106591. <https://doi.org/10.1016/j.buildenv.2019.106591>

Amiri, Z., Bayatian, M., & Mozafari, S. (2024). Numerical simulation application in occupational health studies: a review. *International Journal of Occupational Safety and Ergonomics*, 30(3), 946–967. <https://doi.org/10.1080/10803548.2024.2369423>

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IH modelling and its application quantitative exposure assessment. Section three: safety, PSM, and industrial hygiene, 2022 PSCI China supplier conference. <https://pscinitiative.org/resource?resource=1773>

AIHA-ACC FCRI Workshop #3: Making the Most of Near Field Exposure Modeling for Diverse Occupational Risk Assessment. https://www.aiha.org/assets/icons/AIHA-FCRI-Workshop-3_Presentation_Modeling.pdf

Global CEM Net Report of the Workshop no. 2 on “Source Characterization, Transport and Fate”, Intra (Italy), 20-21 June 2005. <https://www.jayjock-associates.com/app/download/7237027351/Global+CEM+Net+Workshop+2+SOURCES.pdf>

The Exposure Modeling Toolbox: Contains info on 12 computer models including IHMod, IH Skinperm, Advanced Reach Tool and others <https://www.aiha.org/public-resources/healthierworkplaces/healthier-community-resources/apps-and-tools-resource-center/aiha-risk-assessment-tools/exposure-modeling-toolbox/exposure-modeling-toolbox-download>

SDM 2.0

Using the SDM 2.0 to Assess Real-World Situations - Webinar Recording <https://www.aiha.org/events/aiha-university-webinar-using-the-sdm-2-0-to-assess-real-world-situations>

Improving Professional Judgments of Inhalation Exposure and Risk Assessments Using the Structured Deterministic Model (SDM 2.0) – Webinar Recording <https://www.aiha.org/events/aiha-university-live-online-pdc-improving-professional-judgments-of-inhalation-exposure-and-risk-assessments-using-the-structured-deterministic-model-sdm-2-0>