MEDICAL UNIVERSITY OF VIENNA

ZPH Science Lunch (Guest Lecture)

"Research Impacts after International Agency for Research on Cancer (IARC) Classification of Silica Dust as a Known Carcinogen: Global Perspective"

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Date & Time: **Thursday, June 20, 2024 | 12:00 – 13:00 CEST (10:00 UTC/GMT; 6:00 a.m. EDT)**

HYBRID EVENT:
Venue: Center for Public Health, Seminar room 3, 1st floor
Meeting LINK (WEBEX):
https://meduniwien.webex.com/meduniwien/j.php?MTID=mdd47421b06849bca4e5b2859cc58d41f

Hosted by Medical University of Vienna, Center for Public Health
Address: Kinderspitalgasse 15, 1090 Vienna (Austria)

Abstract:

The International Agency for Research on Cancer (IARC) examined the animal and human evidence for the carcinogenicity of crystalline silica (quartz dust) three times--1986, 1997, and 2012. After the 1997 evaluation IARC judged silica dust to be a type 1 or known human carcinogen. In this talk we will briefly review the published epidemiology evidence for cancer among workers exposed to silica and among patients diagnosed with silicosis since 1997. We will also address very current global evidence focusing on workers who mine coal containing high levels of quartz, on African workers with siicotuberculosis, children and their parents involved with artisanal gold mining, railroad workers exposed to silica gravel or ballast, and the severe acute silicosis risk among countertop workers from many countries. Lastly, younger clinicians need to be aware of the importance of future research undertakings, including improving exposure assessments, understanding if there are biochemical or surface chemistries to distinguish silica malignancies from 'garden variety' lung tumours, expanding silica linkages to other diseases such as autoimmune ailments, other nonlung cancers (such as gastric, kidney and skin neoplasms), and chronic lung diseases. There is a need for health studies of the interactions of silica with smoking, asbestos, mercury, countertop binders, radiation and coal, and all of this research needs to be applied so prevention can be made a much higher priority.

David F. Goldsmith, MSPH, PhD **(more information at www.OccupationalEpi.com)**

Dr. David F. Goldsmith is an occupational and environmental epidemiologist with an academic appointment at George Washington University. He has over 35 years experience in occupational, environmental, and public health. Dr. Goldsmith received his MSPH and PhD in epidemiology from University of North Carolina Chapel Hill in 1977 and 1983, respectively. Dr. Goldsmith's current research interests include silica dust health effects including cancer, silicosis, tuberculosis, autoimmune disease, and kidney ailments, the interaction between smoking and inhaled hazards, countertop exposures and acute silicosis, urban pesticide exposures, fracking hazards, repatriated Indian cultural artifacts, breast and ovarian cancers, and other chronic health effects linked with workplace and environmental exposures, and risk assessment and risk communication. He coordinated a student-focused project designed to reduce the number of children

involved in small scale gold mining. He testified at the Occupational Safety and Health Administration (OSHA) silica dust hearings in 2014. He received a Fulbright academic award in 2014, where he was Visiting Research Chair in STEM, Department of Community Health Sciences at the University of Manitoba, Faculty of Medicine in Winnipeg, Canada. He received a second Fulbright award as Visiting Professor in the Department of Environmental Science at the Ateneo de Manila University in the Philippines in 2017. His teaching addresses military veterans and environmental health exposures. He was President of Workplace Health Without Borders-US Branch. Dr. Goldsmith now serves as the Principal Epidemiologist for the Railroad Union Health Study at the Association of Occupational and Environmental Clinics.

Dr. Goldsmith has consulted for U.S. Environmental Protection Agency, the National Institute for Occupational Safety and Health/Centers for Disease Control & Prevention (CDC), International Agency for Research on Cancer (IARC), the National Cancer Institute, U.S. Surgeon General's Office on Smoking and Health, California EPA and Air Resources Board, Consumer Product Safety Commission, U.S. Agency for International Development, Washington DC Departments of Health and Environment, and OSHA. Dr. Goldsmith has chaired grant review panels for the EPA, NIOSH/CDC, and for USAID. He has been a study section member for grants submitted to the NCI, CDC, the National Institute for Environmental Health Sciences, NIH, and the EPA. He has been a peer reviewer for many journals, including the American Journal of Industrial Medicine, Archives of Occupational and Environmental Health, and American Journal of Epidemiology. He has served in a professional capacity in France, Israel, Uzbekistan, Canada, Philippines, and Japan. Dr. Goldsmith served on the Gulf War panel of the U.S. Institute of Medicine focusing on pesticides and solvents. He was member of IARC Working Group for the Monograph on Silica and Other Nonfibrous Particulates, held in Lyon, France in 1986. For 12 years he was an Associate Editor for the Archives of Environmental and Occupational Health. He has published extensively in the peer-reviewed literature.

Early in his career he challenged the occupational medicine dogma by arguing that silica dust exposure and silicosis were linked to cancer. By inference, he argued that silica was a multi-potential toxin and was a cause of auto-immune disease, kidney ailments, nonsilicosis respiratory diseases, and that risk assessment methods could be used to determine safe levels of ambient silica exposure. This association was built on three foundations showing increased lung cancer after silica dust exposure, after diagnosis of silicosis, and in inhalation studies of laboratory animals. Later assessments by authoritative agencies proved that he was correct about silica's toxicity. Crystalline silica dust has been recognized since 1997 as a known human carcinogen by the IARC; later assessments by the NIOSH, the National Toxicology Program, and by OSHA (in 2016 and 2017) confirmed that change in paradigm. Below are several of his relevant publications that added new scientific contributions to this issue.

a. Goldsmith, DF, TL Guidotti, and DR Johnston. Does Occupational Exposure to Silica Cause Lung Cancer? American Journal of Industrial Medicine 3: 423-440, 1982.
b. Goldsmith, DF, DM Winn, and CM Shy, (Editors). Silica, Silicosis, and Cancer: Controversy in Occupational Medicine. Praeger: New York, 536 pages, 1986.
c. Goldsmith, DF and TL Guidotti. Combined Silica Exposure and Cigarette Smoking: A Likely Synergistic Effect. In Goldsmith, DF, DM Winn, and CM Shy, (Editors). Silica, Silicosis, and Cancer: Controversy in Occupational Medicine. Praeger: New York, pp. 451-459, 1986.
d. Goldsmith JR and DF Goldsmith. Fiberglass or Silica Exposure and Increased Nephritis or End-stage Renal Disease. American Journal of Industrial Medicine 23:873-881, 1993.
e. Goldsmith DF, RP Ruble, CO Klein. Comparative Cancer Potency for Silica from Extrapolations of Human and Animal Findings. Scandinavian Journal of Work, Environment and Health. 21: (Suppl 2) 104-107, 1995
f. Goldsmith DF, JJ Beaumont, LA Morrin, MB Schenker. Respiratory Cancer and Other Chronic Disease Mortality among Silicotics in California. American Journal of Industrial Medicine. 28:459-467, 1995
g. Steenland K and DF Goldsmith. Silica Exposure and Autoimmune Diseases. American Journal Industrial Medicine. 28:603-608, 1995.
h. Goldsmith DF. Importance of Causation for Interpreting Occupational Epidemiology Research: A Case Study of Quartz and Cancer. Occupational Medicine: State of the Art Reviews. 11:433-449, 1996.
i. Gift JS and DF Goldsmith. Respiratory Health Effects from Ambient Silica Exposure: A Benchmark Dose Analysis. Annals of Occupational Hygiene 41 (Suppl 1) 448-453, 1997
j. Goldsmith DF, JS Gift, and LD Grant (Editors). Silica Risk Assessments. Journal of Exposure Analysis and Environmental Epidemiology 7:265-395, 1997.
k. Goldsmith DF. The Link between Silica Dust Levels, Risk Assessments, and Agency Regulations. Journal of Exposure Analysis and Environmental Epidemiology 7:385-395, 1997.
l. Pan, G, Takahashi, K, Feng, Y, Liu, L, Liu, T, Zhang, S, Liu, N, Okubo, T, Goldsmith, DF. A Nested Case-control Study of Esophageal Cancer in Relation to Occupational Exposure to Silica and Other Dusts. American Journal of Industrial Medicine 35:272-280, 1999.
m. Rapiti E, A Sperati, M Miceli, F Forastiere, D Di Lallo, F Cavariani, DF Goldsmith, CA Perucci. End-stage Renal Disease among Silica-exposed Ceramic Workers. Occupational and Environmental Medicine. 56:559-561. 1999.
n. Forastiere F, Goldsmith DF, Sperati A, Rapiti E, Miceli M, Cavariani F, Perucci CA. Silicosis and Lung Function Decrements among Female Ceramic Workers in Italy. American Journal of Epidemiology 156:851-856, 2002.
o. Goldsmith DF and Barlet G. Follow-up Mortality Study of Certain U.S. Craft Railroad Workers, Ages 18-64, International Congress on Occupational Health (ICOH) meeting Dublin, Ireland, April 29-May 4. Occupational and Environmental Medicine Apr 2018, 75 (Suppl 2) A240; DOI: 10.1136/oemed-2018-ICOHabstracts.684.

p. Goldsmith DF What are we Doing About Children Mining Gold? International Congress on Occupational Health (ICOH) meeting Dublin, Ireland, April 29-May 4. Occupational and Environmental Medicine Apr 2018, 75 (Suppl 2) A240; DOI: 10.1136/oemed-2018-ICOHabstracts.684.
q. Goldsmith DF and Barlet G. Proportionate mortality study of unionized maintenance of way railroad workers. Occupational Medicine, 2021.
r. Goldsmith DF. The Role of IARC in Causation of Occupational Diseases: Case Study of the Evaluation of Crystalline Silica Dust. In Bang KM (Editor) Modern Occupational Medicine. Bentham Science Publishers, United Arab Emirates. 2022.
s. Cusack-McVeigh HM, Marshall M, Miles A, Mott J, Thomas D, Goldsmith DF. Silica Dust Exposure in the Museum and Cultural Heritage Field, International Society for Environmental Epidemiology, Santiago, Chile, August 25-28, 2024