Keynote

K-01 OCCUPATIONAL CANCER EPIDEMIOLOGY – FROM HAZARD IDENTIFICATION TO CANCER PREVENTION

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Introduction Occupational cancer epidemiology has been a core activity of the International Agency for Research on Cancer (IARC), the World Health Organization’s specialized cancer agency, for more than 50 years. The aim of today’s Occupational Cancer Epidemiology Team at IARC is to conduct studies worldwide and to synthesize evidence contributing to the prevention of occupation-related cancers among workers and their offspring.

Material and Methods International collaborations are needed to establish large-scale studies examining occupational exposures and risks that cannot otherwise be adequately studied, and both community-based and industry-based studies are useful to identify and quantify risks.

Results The Occupational Cancer Epidemiology Team gathers scientists and early career scientists from various Branches at IARC, as well as international experts and collaborators. The specific objectives are to 1) identify occupational carcinogens; 2) characterize effects of known and suspected occupational carcinogens, including exposure-response and joint effects with other exposures (e.g. tobacco smoking); 3) estimate the cancer burden due to occupational exposures, based on high-quality data and standard methodology; 4) enhance the development of exposure and risk assessment tools and registries in low- and middle-income countries, so that carcinogenic hazards or risks associated with work in these countries can be identified; 5) encourage epidemiological studies and cancer registers to collect and record occupational data in a standardized manner; 6) build capacity and facilitate knowledge exchange in occupational cancer epidemiology, including in under-researched settings, via close collaborations with local partners and by hosting internships at IARC; and 7) develop a long-term strategy for occupational cancer research at IARC, including standard operating procedures and recommendations adaptable to different settings for future studies.

Conclusions The Occupational Cancer Epidemiology Team’s on-going key programmes and projects are presented on https://www.iarc.who.int/teams-oce/

K-320 BAD ACTORS AND GOOD ACTIONS: THE UTILITY OF CAUSAL INFERENCE FOR EXPOSURE MIXTURES

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This presentation will explore the essential role of occupational epidemiology in global health. Our field provides critical perspectives – relevant not only for the identification of health hazards at work but in global health more broadly – on the identification of risk factors for disease in populations, the weighing of evidence for causality, and the design and implementation of public health interventions. This presentation is informed by analyses of recent health crises including the COVID-19 pandemic, the epidemic of ‘deaths of despair’ in the U.S. and the increasing toll of heat illnesses on a warming planet.

In addition to study design and data analytic methods, occupational epidemiologists are trained to understand the physical and social environments in which work is conducted as well as the biological processes that link exposure to disease, and how all this impact population health. This multi-disciplinary training enables occupational epidemiologists to identify hazards and interventions that may be overlooked by other disciplines. Occupational epidemiologists learn that economic and political forces have powerful effects on the work environment, and this shapes their perspective on how evidence is weighed in public health

from colleagues such as ‘did you consider your exposure in a mixtures analysis?’ The emphasis on ‘mixtures analyses’ suggests that the traditional epidemiologic toolbox is at risk when we transition from one exposure to multiple exposures.

However, I propose that what is often most at risk is the study question itself. Many new methods have arisen to address statistical issues of exposure mixtures, but innovation solely in the realm of statistical analysis can have unintended consequences:

1) methods that overcome statistical issues can obscure causal inferential issues about whether the study question is even answerable and
2) models can force researchers to ask questions that emphasize convenience over relevance.

Should we abandon the search for further sophistication? No. Instead, analysis of exposure mixtures needs a framework that puts methods into perspective and provides guidance on the answerability of questions about mixtures. Causal inference provides one such framework.

I argue that the principles of this field can 1) help guide us toward answerable and relevant questions about health effects of exposure mixtures; 2) assist in the triangulation of statistical evidence and 3) provide analytic tools to harness recent statistical innovations without sacrificing the relevance of a study question. I highlight some recent and developing examples in which causal inference has provided an effective framework for harnessing novel statistical methods to answer questions of crucial public health importance.