



COMMENTARY



Observational Studies of Environmental Epidemiology

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Description

A subfield of epidemiology called environmental epidemiology studies how environmental exposures affect people's health. This area of study aims to comprehend how different environmental risk factors may either predispose to or protect against illness, injury, developmental anomalies, or death. These elements could exist naturally or could be added to areas where people live, work, and play. According to the World Health Organization's European Centre for Environment and Health (WHO-ECEH), environmental exposures can be avoided and account for 1.4 million deaths annually in only Europe. Chemicals, physical agents, and microbiological pathogens are examples of proximate environmental exposures that can cause health problems directly, while socioeconomic factors, climate change, and other large-scale environmental changes are examples of distal environmental exposures that can cause health problems indirectly. Air, food, water, and skin touch all result in proximate exposures. Distal exposures affect proximate exposures, which in turn affect proximate exposures, and indirectly affect ecosystems and other systems that support human health.

The creation of environmental standards, risk management initiatives, and government policy reform can all benefit from environmental epidemiology research. When an individual or subpopulation is exposed to an environmental agent, vulnerability is the culmination of all risk and protective factors that ultimately determine whether poor health outcomes are experienced. Sensitivity is the greater reactivity of an individual or subpopulation to that exposure, primarily for biological reasons. Developmental stage, pre-existing medical issues, acquired circumstances, and genetic factors can all affect one's biological sensitivity. By increasing the likelihood of exposure to harmful agents, interacting with biological factors that mediate risk, and/or causing differences in the ability to prepare for or cope with

exposures or early stages of illness, socioeconomic factors also play a critical role in altering vulnerability and sensitivity to environmentally mediated factors. The geography and environmental factors of a region may put particular populations in such areas at greater danger.

Observational studies

There are two steps the majority of environmental epidemiology studies are observational in nature, which means that researchers examine people's exposures to environmental elements without taking any action and then watch for trends to develop. This is because studying environmental influences in humans through experimentation is frequently immoral or impractical. For instance, a researcher cannot invite some of their study participants to smoke cigarettes to see whether their health outcomes are worse than those of participants who are encouraged to abstain from smoking. The studies used in environmental epidemiology most frequently are namely, cohort studies, case-control studies, and cross-sectional studies.

Cohort studies: A population, or cohort, of workers is contrasted with a control group that was not exposed to the occupational hazards under investigation in a cohort design study. The scientific community accepts this form of study the most since it most closely resembles experimental methodology and observes the full population rather than just a sample. In a prospective cohort study, a future follow-up with the same group is compared to the group that was studied at the time of the study. A cohort is first defined in the past and then followed over historical time in a historical cohort research design.

Case-control studies: Case-control studies contrast the history of exposure between cases that had the disease and cases that did not. Case-control studies, which only use the sample of employees with the condition to compare to a control, are a more cost-effective strategy than cohort studies, which use the complete population.

Cross-sectional studies: A typical cross-sectional study compares the prevalence of disease, symptoms, or physiological state at various exposure levels. Cross-sectional studies have the main benefit of allowing data collection on situations that would not often be recorded because other study designs concentrate on severe illness states. This is also the study type's largest flaw because it cannot be utilized to draw a causal inference because it uses prevalence rather than incidence.