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GLOSSARY

absorbed dose

the quantity of a toxicant that enters the human body.

adjust

manipulate the crude data to account for the effects of factors such as age, sex, smoking, and other risk factors. This helps a researcher interpret the impact of a specific exposure on disease rates without worrying about the other factors.

ambient pollution

emissions a facility releases into the atmosphere. Regulations limit the amount of ambient pollution that can be released.

average daily dose

amount of a chemical that a person takes in during an average day.

bias

in epidemiology, a systematic error in the way subjects were selected or information was gathered.

biological plausibility

any biological reason to think that the exposure may cause the disease such as a known molecular mechanism, supporting animal evidence, etc.

biomonitoring

the measurement of a biological marker of exposure inside the body on a regular basis.

cancer registries

the systematic collection of data on all diagnosed cancer and tumor cases in a population. Every US state has its own cancer registry and maintains records on patient history, diagnosis, treatment, and status.

case-control study

an observational epidemiologic study in which subjects are selected according to their disease status (for example, lung cancer [cases], no lung cancer [controls]), and then compared on their past exposures to some factor of interest (for example, cigarette smoking).

causality

a relationship between a cause or set of causes (i.e. risk factors) and an effect (i.e. health outcome) in which the effect is a direct consequence of the cause.

choropleth map

a map in which different regions are colored or shaded to represent some information about the region such as disease prevalence or population density.

cohort study

an observational epidemiologic study in which subjects are selected according to exposure status (for example, smoker, nonsmoker) and then compared on disease status (for example, lung cancer, no lung cancer)

community-based participatory research

an approach to environmental health research that features genuine participation by those affected by the research, equitable power sharing between community and researchers, and an emphasis on practical solutions.

community-based survey

health surveys of individuals in a community that are initiated and conducted by community members.

concentration

the abundance of a chemical in a total volume of a mixture (for example, in water, soil, or air).

confidence interval (CI)

a confidence interval consists of an upper limit value and a lower limit value that define a range around the point estimate. The confidence interval is interpreted as the range within which the true value of the point measure is likely to fall.

confounding

in epidemiology, the mixing of effects that occurs when a factor that is associated with the risk factor of interest is itself a risk factor for the health outcome of concern.

controls

in a case-control study, the study subjects who do not have the disease of interest.

cross-sectional study

an observational epidemiologic study in which the subjects are cross-classified on exposure and health outcome; in this study design it may not be clear that exposure preceded outcome.

crude

a statistical finding that is not adjusted for the influence of sex, age, or other risk factors that may differ between the two groups in the comparison.

cumulative risk assessment

a risk assessment that attempts to account for the combined effects of multiple chemicals, types of exposures, and risk factors such as social stressors.

dermal exposure

a major route of exposure to environmental contaminants through the skin.

disease cluster

an unusual number of disease cases located geographically close to each other in a community.

disease registry

database of cases of a disease diagnosed by a physician. Such registries are usually managed by a state or federal agency.

dose

the amount of an exposure that comes into contact with the body.

dose-response relationship

the quantitative relationship between a dose and a toxic effect (“response”), often summarized in a graph.

dot density map

the dots are not exact locations of cases but instead refer to several cases within some geographic area, like a county or a zip code. Useful for visualizing where disease is more common, but difficult to interpret without knowing the population of each area where there is a dot.

dot map

a simple map using dots to locate polluting facilities, or other sources of exposure and the homes of the diagnosed cases to help visualize patterns of pollution in a community.

ecologic bias

a limitation and potential flaw of ecologic studies where the relationship between exposure and disease at the individual level may be wildly different than at the population level. Thus a community-level correlation between an exposure and an outcome cannot be interpreted to mean that the exposure and the outcome are similarly correlated at the individual level, much less that the exposure causes the outcome.

ecologic study

an observational epidemiologic study in which all information on health outcomes, exposures, or other characteristics is at the level of the community rather than at the level of the individual.

effect measure

a measure of comparison of disease frequency; absolute comparisons look at risk or rate differences (subtraction) and relative comparisons look at risk, rate, or odds ratios (division).

effect modification

in epidemiology, a joint effect of two risk factors that is either greater than or less than the sum of their individual effects.

emissions

the amount of pollutant emitted from a power plant, your car's tailpipe, or some other source.

endocrine disruptors

chemicals that interfere in some way with the body's endocrine system (hormone system).

environmental monitoring

measurement of the concentration of a toxicant in air, water, or soil on a regular basis.

environmental standards

concentrations considered safe in a particular environmental medium (e.g., water or air). Should be interpreted according to how people come in contact with that medium. For example, Maximum Contaminant Level (MCL) standards are created by EPA to set the maximum amount of a chemical legally allowable in drinking water.

epidemiologic

of or pertaining to the methodology used to measure the relationship between a specific exposure and a health outcome in a population.

epidemiology

quantitative research methods for the study of the distribution and determinants of health outcomes in human populations.

exposure

any chemical pollutant or other stressor (for example, radiation or mold spores) that people may encounter.

exposure assessment

an applied science comprising methods to measure or estimate human contact with environmental contaminants; in a risk assessment for a chemical or site, an estimation of the exposure of the populations(s) of concern to the chemical(s) of concern.

geographic information system

a computerized system that combines a database of spatially linked information with application software for spatial analyses and mapping.

hand-to-mouth

exposure to a contaminant in soil or dust that is carried to the lips by the hands (for example, in eating or smoking).

in utero

an exposure to toxic chemicals carried by the mother, or to which the mother is exposed, that then lead to exposure of a fetus in the womb, before birth.

ingestion

a major route of exposure to environmental contaminants through eating or drinking.

inhalation

a major route of exposure to environmental contaminants through ordinary continuous breathing.

institutional review board (IRB)

a group of experts from a research institution charged with approving all research protocols to ensure that the rights of the human subjects, or research participants, are being protected throughout the study.

latency

the period between the exposure that initiates the biological changes leading to disease and the recognition of the disease (i.e. cancer).

medium (media, plural)

the environmental container of a contaminant. Generally, air, soil, or water.

micro-environment

the immediate environment of an exposure (for example, a room, yard, or workstation).

multivariate regression

a statistical method used to analyze data for a number of confounders at the same time.

odds

a statistic for describing the likelihood of an event compared to the likelihood of that event not occurring.

odds ratio

a relative comparison between the odds of an exposure among two groups (for example, comparing the odds of exposure in cases versus controls).

(health) outcome

a condition that we would identify as disease or a subtle change in normal function that could lead to disease.

parts per billion (ppb)

a common way of expressing concentration in environmental media. If we say that a sample of soil is contaminated with 200 ppb lead, we mean that for every billion parts of soil, there are 200 parts of lead.

parts per million (ppm)

a common way of expressing concentration in environmental media. If we say that a sample of soil is contaminated with 200 ppm lead, we mean that for every million parts of soil, there are 200 parts of lead.

personal exposure monitoring

measurement of the concentration of a toxicant in an individual's personal environment (for example, air sampling in an individual's breathing zone).

point estimate

the best estimate of a health effect around which there is an uncertainty described by a confidence interval and/or p-value.

prevalence

the proportion of a population that has a disease at a given point in time.

probability

the likelihood of an event occurring. The certainty with which we can predict an outcome.

prospective cohort study

a study design in which participants are grouped on the basis of past or current exposure and are followed into the future in order to observe the outcome of interest.

PubMed

an online searchable database of virtually all scientific literature relating to health and environment that is cataloged by the National Library of Medicine (a branch of the National Institutes of Health). (<http://www.ncbi.nlm.nih.gov/pubmed/>)

p-value

the probability of obtaining the observed result and more extreme results by chance alone, given that the null hypothesis of no association is true. P-values <0.05 is the generally accepted cutoff for statistical significance but should not be the sole factor used to evaluate the meaning of a finding.

qualitative

research that is unquantifiable such as observations, interviews and descriptive information that “tells a story”.

qualitative research methods

research methods that employ open-ended (without predetermined responses) survey questions. This technique is exploratory, and the information these methods yield is descriptive, rather than numerical.

quantitative

research that looks at measurable factors and produces numerical data.

rate

one number divided by another where time is an important part of the denominator (for example, the number of new cases of disease/10,000 people in the population per a year).

ratio

a comparison of two risks or rates where the exposed group is generally the numerator.

recall bias

a type of data misclassification that can occur in an epidemiologic study when different groups remember things differently. For example, people with a disease may be more likely to remember toxic exposures or occupational exposures than healthy controls, because sick people have given much thought to possible causes of disease. This can lead to skewed results.

reference concentration

a concentration expected to have no adverse effects in people who are particularly sensitive to the chemical's effects and who are exposed over a 70-year lifetime; the reference dose has units mg/(kg*day)

reference dose (RfD)

a dose expected to have no adverse effects in people who are particularly sensitive to the chemical's effects and who are exposed over a 70-year lifetime; the reference dose has units mg/(kg*day)

relative risk

a comparison of two risks where the risk in the exposed group is generally the numerator and the risk in the unexposed group is the denominator.

retrospective cohort study

a study design, both the exposures and outcomes have already occurred in the study population before the study begins. There is no investigation of future outcomes.

risk

the probability of harm from some hazard.

risk assessment

an applied science consisting of formal procedures for evaluating and integrating scientific information on exposure and toxicity to estimate real-world public health risk of a hazard.

risk factor

a factor that has been shown to pose a risk of a specific harm.

risk management

actions taken to prevent or mitigate environmental health hazards; the process balances risks, benefits, and costs, and also considers social context.

route of exposure

route by which people contact and absorb environmental contaminants (mainly inhalation, ingestion, and dermal contact)

selection bias

an error in recruitment of subjects for a study that leads to the two groups not being very comparable and can skew the results. Often arises where cases and controls are recruited differently.

source (of an exposure)

the source of a contaminant. For example, the facility that emits air pollution or lead paint that contaminates surrounding soil.

standardized incidence ratio (SIR)

a ratio whose numerator is the *observed* (actual) number of cases of a disease in a population of interest during a given time period, and whose denominator is the number of cases that would be expected in the population if the age-specific rates of some reference population were applied to the local population; often abbreviated as “observed over expected.”

standardized rate (SR)

the rate of disease that would occur in a given location if it had the age distribution of some reference population, but its age-specific rates were unchanged.

standardized rate ratio (SRR)

the ratio of two standardized rates, both of which are standardized to the same reference population.

statistical power

The statistical power of a study to detect a genuine association, also called **study power**, is affected not only by study size, but also by the strength of the association between the exposure and disease and the disease risk among the unexposed, and/or the exposure rate among the non-diseased.

statistical significance

of a statistical association; unlikely to be due to chance alone (according to an agreed criterion).

stratified analysis

the process or result of separating a sample into several subsamples according to specified criteria such as age groups, socioeconomic status, etc. The effect of confounding variables may be controlled by stratifying the analysis of the results.

study power

see *statistical power*

surveillance

the tracking of disease or injury rates and the comparison of rates over time or across places of disease.

temporality

in assessing casual relationships, the cause (exposure) must precede the disease.

threshold

(of a dose response curve) the highest dose at which no toxic effect occurs.

toxicologist

scientists who study the effects of toxic chemicals, primarily by running experiments on animal models.

toxicology

the science of the disposition and effects in the body of toxic substances, including man-made chemicals, natural toxins, and physical hazards such as asbestos fibers and radiation.