Epidemiology Glossary

active immunity: Resistance to a disease, developed in response to an antigen (an infecting agent or a vaccine) and usually characterized, or distinguished, by the presence of antibodies produced by the host.

active surveillance: The process in which health departments (or responsible agencies) contact clinicians, laboratories, or other data sources to seek out information about disease cases.

age-adjustment: A technique used to compare populations that are quite different in age.

agent: A microorganism, chemical, type of radiation, or other factor whose presence, excessive presence, or (in deficiency diseases) relative absence can cause disease or damage to the human body.

airborne transmission: The spread of an infection by droplets or dust, with a particle spread of more than three feet through the air. It is considered to be a form of indirect transmission.

analytic epidemiology: The search for health-related causes and effects. Uses comparison groups to measure the relationship between exposures and outcomes and to test hypotheses about those relationships.

assessment: Evaluation or study. For example, a community health assessment would be a study, or evaluation, of the health of a community.

attack rate: A kind of incidence rate that measures the proportion of persons in a narrowly defined population observed for a limited period of time, such as during an epidemic.

bias: A flaw in either the study design or data analysis that leads to erroneous results.

bimodal distribution: A distribution that has two distinct modes, or peaks.

case: In epidemiology, a countable instance in the population, or study group, of a particular disease, health disorder, or condition under investigation. Sometimes, an individual with the particular disease.

case-control study: A type of observational analytic study. Two groups of individuals (*cases* of disease and non-diseased *controls*) are assembled and information is collected and compared on their exposures to the disease.

case-fatality rate: The rate of death among people who already have a condition. It is usually measured as a decimal or a percent.

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case definition: A set of standard criteria, usually based on symptoms, timing, and laboratory results, used for deciding whether a person should be counted as having a particular disease or health-related condition.

category-specific rate: A rate that applies to a particular group of people, for example, males aged 18–25.

chance: Unexpected, random, or unpredictable.

clinical disease: A disease that has been identified by its symptoms and features.

cluster: A group of cases of a disease or other health-related condition that are closely connected in time and place. The number of cases may or may not exceed the expected number; frequently the expected number is not known.

cohort: A well-defined group of people who have had a common experience or exposure and who are then followed up for the incidence of new diseases or events, as in a cohort study. A group of people born during a particular period or year is called a birth cohort.

cohort study: A type of observational analytic study. Inclusion in the study is based on exposure characteristics or membership in a group. Disease, death, or other health-related outcomes are then identified and compared.

common source outbreak: An outbreak that results when a group of people are exposed to the same harmful influence, such as an infectious agent or toxin. If the group is exposed over a relatively brief period of time, so that all cases occur within one incubation period, the common source outbreak is further classified as a point source outbreak. In some common source outbreaks, persons may be exposed over a period of days, weeks, or longer, with the exposure being either intermittent or continuous.

communicable period: The period of time during which an infected host (person) remains capable of passing along the infective agent (for example, a virus).

confidence interval: A range of values computed in such a way that it contains a specified quantity a high proportion of the time; or in other words, that the specified quantity is likely to be included in the range of values.

confounding: The distortion of the association between an exposure and a health outcome by a third factor that is related to both.

consistency: Reliability or uniformity of results or events.

contact transmission: The spread of an agent directly (person-to-person), indirectly, or by airborne droplets from less than three feet away.

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control: A comparison group of people in a case-control study who do not have the disease or condition being studied.

correlation: The degree to which two or more measurements show a tendency to vary together. A measurement of the association or relationship between variables.

crude rate: The rate calculated for an entire population.

data: Numerical information. Data is a plural term; the singular is datum.

dependent variable: A variable that may be predicted by or caused by one or more other variables, called *independent variables*. For example, if it is believed that age influences the frequency of delinquent behavior, then the frequency of delinquent behavior is the dependent variable, and age is the independent variable.

descriptive epidemiology: Gathering, organizing, and summarizing data on "person" (Who is ill?), "time" (When did they become ill?), and "place" (Where could they have been exposed to the illness?).

descriptive statistics: Quantitative, or numerical, information used to describe a set of observed cases.

determinant: Any factor that brings about change in a health condition or in other specified characteristics.

direct transmission: The immediate transfer of an agent from a reservoir to a susceptible host by direct contact or droplet spread.

disease burden: The effect of a health problem measured by financial cost, death, illness, or other indicators.

disease investigation: *See outbreak investigation*

distribution: The frequency and pattern of health-related characteristics and events in a population.

dot map or dot plot: A visual display of the specific data points of a variable that has a finite number of values, such as race or sex.

droplet spread: The direct transmission of an infectious agent by spraying of relatively large, short-ranged droplets produced by sneezing, coughing, or talking that travel only a short distance before falling to the ground.

effectiveness: The degree degree to which an intervention or program produces the intended or expected results under real world conditions.

efficacy: The degree to which an intervention or program produces the intended or expected results under ideal conditions.

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efficiency: The ability of an intervention or program to produce the intended or expected results with a minimum expenditure of time and resources.

environment: The third part of the epidemiological triangle, which brings the other two parts of the triangle—the host (or, person) and the agent (or, virus)—together so that a disease occurs.

epidemic: The occurrence of more cases of a disease than expected in a given area or among a specific group of people over a particular period of time.

epidemic curve: A kind of graph, called a histogram, that shows the development of a disease outbreak or epidemic by plotting the number of cases by time of onset.

epidemiological triangle: The traditional model of infectious disease causation, which has three components: an external agent, a susceptible host, and an environment that brings the host and agent together so that disease occurs.

epidemiology: The study of the factors affecting the health and illness of populations. It serves as the foundation and logic for interventions made in the interest of public health and preventive medicine.

etiologic: Relating to the cause of a disease.

evaluation: A process that attempts to determine as systematically and objectively as possible the relevance, effectiveness, and impact of activities in the light of their objectives.

exposed group: A group whose members have been exposed to a supposed cause of disease or health condition of interest or who possess a characteristic that is a determinant of the health outcome of interest.

false-negative: A negative test result for a person who actually has the condition.

false-positive: A positive test result for a person who actually does not have the condition.

fomite: An inanimate object that can be used to transmit an infectious agent. This may be contaminated transfusion products or injections, towels or bedding, surgical instruments, or contaminated food, water, or air.

foodborne transmission: A type of disease transmission in which the infectious agent (which can be bacteria, parasites, viruses, fungi and their products, or toxic substances not of microbial origin) is passed on through food.

herd immunity: The resistance of a group to an infectious agent. This group resistance exists because a high proportion of people in the group are immune to the

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agent. Herd immunity is based on having a substantial number of people who are immune, which reduces the probability that they will come into contact with an infected person. By vaccinating large numbers of people in a population to protect them from smallpox, for example, health officials used herd immunity to control and eradicate the disease.

high-risk group: A group of persons whose risk for a particular disease, injury, or other health condition is greater than that of the rest of their community or population.

host: A person or organism that can be infected by an agent that causes disease.

hypothesis: A supposition, arrived at from observation or reflection, that leads to testable predictions. Any assumption stated in a way that will allow it to be tested and proven incorrect.

immunization: Introducing weakened or killed germs or toxins into the body so that the immune system will make protective antibodies that will destroy the disease-causing agent (for example, a virus) if it enters the body at a later time.

incidence rate: A measurement of the frequency with which a new health problem, such as an injury or case of illness, occurs in a population. In calculating incidence, the number of new cases occurring in the population during a given period of time is divided by the total population at risk during that time.

incubation period: The time from exposure to a disease to when the first signs or symptoms of the disease occur.

independent variable: A variable that may predict or cause fluctuation in an dependent variable. For example, if it is believed that age influences the frequency of delinquent behavior, age is the independent variable and the frequency of delinquent behavior is the dependent variable.

index case: The first case of a disease or health condition that is known to investigators. Identifying the index case can be helpful in determining the origin of a disease outbreak.

indirect transmission: The passing of a disease to a previously uninfected individual or group through, for example, touching a contaminated surface.

infectivity: The ability of an infectious agent to cause infection, measured as the proportion of people who become infected after being exposed to the infectious agent.

isolation: Limiting movement of or separating people who are ill with a contagious disease.

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line listing: A list, or spreadsheet, of cases containing demographic characteristics and other key descriptions.

mass screening: Large—scale screening of whole, unselected population groups.

measure of association: A quantified relationship between exposure and a particular health problem.

mean (or average): The sum of all the scores divided by the number of scores. The mean is sensitive to, or can be biased by, extreme scores.

median: The middle of a distribution. Half the scores are above the median and half are below the median. The median is preferred when the distribution of cases is highly skewed, since the median is not sensitive to extreme scores.

medical surveillance: The monitoring of potentially exposed individuals to detect early symptoms of disease.

mode: The most frequently occurring value or score in a distribution.

mode of transmission: The way or ways in which a disease is transmitted. The transmission can be direct (person-to-person) or indirect.

molecular epidemiology: A kind of epidemiologic investigation that uses molecular laboratory techniques to detect outbreaks.

morbidity: Illness.

mortality: Death.

mortality rate: A measure of the frequency of occurrence of death among a defined population during a specified time interval.

natural history of disease: The progression of a disease process in a person from the time it begins to the time it resolves, in the absence of treatment.

outbreak: Synonymous with epidemic. Sometimes *outbreak* is the preferred word, as it avoids the sensationalism associated with the word *epidemic*. It can also mean a localized, as opposed to generalized, epidemic.

outbreak investigation: The investigation of the occurence of a disease in a specific group of people.

outlier: In statistics, an observation or value that is significantly different from the rest of the scores.

p-value: The probability of obtaining a result at least as extreme as a given data point, assuming the data point was the result of chance alone.

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pandemic: An epidemic occurring over a very wide area (usually multicountry) and usually affecting a large proportion of the population.

passive immunity: Immunity conferred by an antibody produced in another host. This type of immunity can be acquired naturally by an infant from its mother or artificially by administration of an antibody-containing preparation (antiserum or immune globulin).

passive surveillance: A provider-based approach to data collection, in which health departments or the Centers for Disease Control and Prevention (CDC) depend on disease reports to be submitted by laboratories, clinicians, and the public.

pathogenicity: The ability of an agent to cause disease after infection, measured as the proportion of people who are infected by an agent and then develop the disease.

person-years: The sum of the lengths of time of experience or exposure of a group of people who have been observed for varying periods of time, in other words, the total amount of time, expressed in years, that the entire group been exposed, observed, or at risk.

point source outbreak: An outbreak that results from a exposure to the same source.

population: A group of people, objects, observations, or scores that have something in common.

population at risk: The total number of inhabitants of a given area who may contract the disease of interest.

portal of entry: A pathway into the host that gives an agent access to tissue that will allow it to multiply or act.

portal of exit: A pathway by which an agent can leave its host.

predictive value positive: The proportion of those testing positive in a screening test for a disease who truly have the disease.

predictive value negative: The proportion of those testing negative in a screening test for a disease who truly do not have the disease.

prevalence: The proportion of people in a population who have a particular disease, chronic condition, injury, or attribute at a specified point in time or over a specified period of time.

primary case: A person who acquires a disease from an exposure, for example, to contaminated food.

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program evaluation: The study of the activities and outcomes of a program or project in order to assess its effectiveness or value.

propagated outbreak: An outbreak that does not have a common source, but instead spreads from person to person.

proportion: A type of ratio in which the numerator is included in the denominator. The ratio of a part to the whole, expressed as a "decimal fraction" (e.g., 0.2), as a fraction (1/5), or, loosely, as a percentage (20%).

public health surveillance: *See surveillance.*

quarantine: Limiting movement of or separating people who are not sick but are presumed to have been exposed to a contagious disease.

rate: An expression of the relative frequency with which an event or condition occurs.

reservoir: The habitat in which an infectious agent normally lives, grows, and multiplies; reservoirs include humans, animals, and the environment.

risk factor: An aspect of personal behavior or lifestyle, an environmental exposure, or an inborn or inherited characteristic that is associated with an increased occurrence of a disease or other health-related event or condition.

sample: A selected subgroup of a population.

sample size: The size of the group being studied. "N" is used to indicate the sample size; for example, if you have a sample of 23 people, n=23.

screening: The presumptive identification of unrecognized disease or defect by the application of tests, examinations, or other procedures which can be applied rapidly.

secondary attack rate: A measure of the frequency of new cases of a disease among the contacts of known cases.

secondary case: A person who gets a disease from exposure to a person with the disease, or primary case.

selective screening: Screening of selected high-risk groups in the population.

sensitivity: The proportion of persons with a disease who are correctly identified by a screening test or case definition as having that disease.

sentinel surveillance: A surveillance system in which a pre-arranged sample of reporting sources agrees to report all cases of one or more notifiable conditions or diseases.

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shifting antigenicity: The condition when an infection-causing organism's antibody-producing characteristics change greatly, which usually causes immunity to the infection to decrease significantly.

specificity: The proportion of persons without a health condition or disease that are correctly identified as such by a screening test or case definition.

standard population: A population used to allow comparisons over time and among different parts of the population. By convention in the US, the standard population is the US population in the year 2000.

statistical significance: The degree to which a value is greater or smaller than would be expected to occur by chance. Typically, a relationship is considered statistically significant when the probability of obtaining that result by chance is less than five percent if there were, in fact, no relationship in the population being studied.

study design: The methodology that is used to investigate a particular health phenomenon or exposure-disease relationship. Studies can be descriptive or analytical.

subclinical: Without apparent symptoms.

superspreader: An individual who is much more infective than most other people with the disease.

surveillance: The collection of information on cases of disease or other conditions in a standard way to detect increases or decreases in the disease over time and differences between various geographic areas. Public health officials use the information to detect outbreaks and to plan programs to help prevent and control disease.

symptom: Any indication of disease noticed or felt by a patient.

syndromic surveillance: The collection and analysis of pre-diagnosis information that lead to an estimation of the health status of the community.

targeted intervention: A program or activity intended to improve a health condition among a specific group of people.

theory: An explanation accounting for known facts or phenomena, capable of predicting future occurrences or observations of the same kind, and capable of being tested through experiment or proven false through empirical observation.

two-by-two table: A table with only two variables, in which each variable has only two categories. Usually one variable represents a health outcome, and one represents an exposure or characteristic.

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validity: The degree to which a measurement actually measures or detects what it is intended to measure.

variable: Any measured characteristic or attribute that differs for different subjects.

virulence: The ability of an infectious agent to cause severe disease, measured as the proportion of people with the disease who become extremely ill or die.