

Term	Definition
Acyclic	In causal diagrams, no variable can be an ancestor or descendant of itself: no feedback loops allowed.
Adjustment Set	Variables conditioned to block all backdoor paths between treatment (A) and outcome (Y).
Ancestor (Parent)	A node affecting others downstream in the causal chain, a parent directly precedes its child in time.
Arrow	Represents direct causation in a causal diagram, pointing from cause to effect.
Average Treatment Effect (ATE)	The difference in expected outcomes between treated and untreated units across a specified population. Synonym for Marginal Effect.
Backdoor Path	Path that, if not blocked, may associate the treatment and outcome without causality.
Causal Contrast	The difference in expected outcomes under different treatment levels.
Causal Contrast Scale	The metric on which a causal contrast is estimated, e.g. difference in means or risk ratio.
Causal Diagram (Causal DAG)	A graph representing causal relationships to evaluate an identification problem; must be acyclic, and describe all confounding, measured and unmeasured for the target population.
Causal Estimand	The causal contrast of interest in a study; specifies the intervention, outcome, contrast scale, and target population; stated before analysis.
Causal Path	Asserts a change in the parent node will induce a change in its child.
Censoring	Incomplete data in longitudinal studies because relevant events are not observed, do not occur, or there is sample attrition. Includes right, left, and interval censoring, with the potential for bias if related to outcomes and not correctly handled.
Collider/"Immortality"	A variable where two causal paths meet head-to-head, may induce non-causal associations between its parents.
Conditional Average Treatment Effect (CATE)	The treatment effect for specific subgroups, defined by measured characteristics.
Conditioning	Adjustment for variables in analysis to distinguish causal effects from associations.
Confounding	Treatment and outcome are associated independently of causality or are disassociated in the presence of causality.
Confounder	A variable or set of variables that, when conditioned upon, reduce or eliminate confounding; whether a variable is a confounder is relative to the causal question and a conditioning strategy.
Counterfactual or Potential outcomes	Hypothetical outcomes under different treatment conditions to be contrasted, only one may be realised for each observed unit.
d-separation	Backdoor paths are blocked, indicating conditional independence.
Descendant (Child)	A node causally influenced by a prior node (Parent). A child is a parent's direct descendant.
Effect-Measure Modifier/Effect-Modifier	A variable that affects the magnitude or direction of a causal effect.
Estimator	Algorithm to compute a statistical estimand from data.
External Validity/Target Validity	The generalisability of study findings to the prespecified target population; assumes internal validity.
Heterogeneous Treatment Effects	Variation in treatment effects across subgroups or contexts.
Identification Problem	Estimating causal effects accurately by adjusting for confounding.
Incident Exposure Effect	Describes the effect of initiating a new treatment.
Indirect Effect (Mediated Effect)	The effect portion transmitted through a mediator in the causal pathway.
Instrumental Variable	Associated with treatment but affecting the outcome only through the treatment, used for estimating causal effects amidst confounding.
Intention-to-Treat Effect	The effect of treatment assignment, analysed based on initial treatment assignment, reflecting real-world effectiveness but possibly obscuring mechanisms.
Internal Validity	The extent to which causal associations in the study population are accurately identified.
Inverse Probability of Censoring Weights (IPCW)	Adjust for bias from attrition in longitudinal studies.
Inverse Probability of Treatment Weights (IPTW)	Creates a pseudo-population to obtain treatment balance across conditions.
Longitudinal Study/Panel Study	A research design that repeatedly tracks and measures the same units over time.
Loss-to-follow-up	Participant attrition.
Marginal Effect	Synonym for Average Treatment Effect.
Measurement Error Bias	Bias introduced when measurements of variables are inaccurately recorded, either through correlated or direct measurement errors, or when uncorrelated errors mask the true effects.
Mediator	A variable through which a treatment affects an outcome.
Node	Represents a variable in a causal diagram.
Observational Study	Research in which treatment assignment is not controlled by the investigator.
Path	Association between variables in a causal diagram.
Per-Protocol Effect	The causal effect under full-treatment adherence.
Prevalent Exposure Effect	Describes the effect of current or ongoing exposures.
Propensity Score	The probability of receiving a treatment based on observed characteristics used for confounding adjustment in observational studies.
Randomised Treatment Assignment	Assigns treatments by chance.
Randomised Controlled Trial (RCT)	Uses random treatment assignment to balance confounders across the treatments to be compared.
Reverse Causation	Cause and effect are mistakenly conflated in analysis.
Sample Weights	Adjusts sample data to better represent the target population in analysis.
Selection Bias	Systematic errors from non-representative study participation or attrition, affecting generalisability.
Sequentially ordered causal diagram	Diagrams where nodes and arrows align with temporal sequence.
Statistical Estimand	The parameter of interest in a statistical model, not necessarily causal.
Statistical Estimate	The value obtained for a statistical estimand from data analysis.
Statistical Model	Describes covariance between variables; without structural assumptions, statistical models do not identify causal effects.
Structural Model	Assumptions about causal relationships encoded in diagrams, essential for identifying causality from statistical associations.
Study Population	The population from which data are collected, also called the "sample population."
Target Population	The broader population to which study results are intended to apply.
Target Trial	An observational study that attempts to emulate an idealised experiment by pre-specifying a causal estimand, eligibility criteria, and appropriate sequential ordering of the data to obtain an incident exposure effect.
Time-Varying Confounding	Confounding that changes over time, complicating causal effect estimation with standard methods.