Types of Primary Studies

From where	Descriptive Studies	Analytic Studies
Def	– describe occurrence\ frequency of an outcome\ disease\ effect - table \ graph - Develop hypothesis	– describe the potential association between exposure and outcome

Descriptive Studies

From where	Case Reports	Case Series	Descriptive Epidemiology Study
Def	• Detailed presentation of a single case or handful (number) of cases • single or group • different diagnosis • One case of unusual\ rare findings	• Experience of a group of patients with a similar diagnosis • group • similar diagnosis • Multiple cases of findings	Population-based cases with denominator عدد الأشخاص المصابين ÷ العدد الكلي
Advantage	• Generally report a new or unique finding • e.g. previous undescribed (rare) disease • e.g. unexpected link between diseases • e.g. unexpected new therapeutic effect • e.g. adverse event	• Assesses prevalent disease • Cases may be identified from a single or multiple sources • Generally report on new/unique condition • May be only realistic design for rare disorders • Useful for hypothesis generation • Informative for very rare disease with few established risk factors • Characterizes averages for disorder	
Disadvantage		• Cannot study cause\exposure and effect\outcome relationships • Cannot assess disease frequency	

Analytic Studies

From where	• Experimental Studies (Clinical trials)	Observational Studies
Def	- Test link experimentally - control - high accuracy - the best study • Treatment and/or exposures occur in a "controlled" environment • Planned research designs • Clinical trials are the most well known experimental design. Clinical trials use randomly assigned data.	- A questionnaire - Study without experiences - not planned . Non-experimental . Observational because there is no individual intervention . Treatment and/or exposures occur in a "non-controlled" environment . Individuals can be observed prospectively, retrospectively, or currently (i.e. crosssectional
Ex	– Randomized Controlled Clinical Trials (RCT) يتم الاختيار بشكل عشوائي – Community trials على مستوى Population بشكل كامل	– Group data (i.e. we don't have subject level info) • Ecologic – Individual data • Cross-sectional • Cohort • Case-control • Case-crossover

observed Studies

From where	Cross-sectional studies	Case-Control Studies	Prospective Cohort study
Def	• An "observational" design that surveys exposures and disease status at a single point in time (a cross-section of the population)  - (present)\(currently) • It measures prevalence, not incidence of disease • Example: community surveys	- Investigate it's relationship to outcomes – an "observational" design comparing exposures in disease cases vs. healthy controls from same population	- Define it's meaning with exposures - A study design where one or more samples (called cohorts) are followed prospectively and subsequent status evaluations with respect to a disease or outcome are conducted to determine which initial participants exposure characteristics (risk factors) are associated with it. As the study is conducted, outcome from participants in each cohort is measured and relationships with specific characteristics determined
Advantage **Strengths**	• Often used to study conditions that are relatively frequent with long duration of expression (nonfatal, chronic conditions) . Relatively quick to conduct . All variables are collected at one go . Multiple outcomes can be researched at once . Prevalence for all factors can be measured . Good for descriptive analysis . Can be used as a springboard for further research	– most feasible design where disease outcomes are rare – Less expensive and time consuming – Efficient for studying rare diseases – Short term study that doesn't require waiting for events to happen, as they have already occurred. – Inexpensive. – Multiple risk factors can be studied at the same time. – Quickly establishes associations between risk factors and disease. This can be especially useful with disease outbreaks, as causes can be identified with small sample sizes. – Stronger than cross-sectional studies for establishing causation.	– Exposure status determined before disease detection – Subjects selected before disease detection – Can study several\multiple outcomes for each exposure – Subjects in cohorts can be matched, which limits the influence of confounding variables – Standardization of criteria/outcome is possible – Easier and cheaper than a randomized controlled trial (RCT)
Disadvantage **Limitations**	• Not suitable for studying rare or highly fatal diseases or a disease with short duration of expression (cute disease) • Weakest observational design, (it measures prevalence, not incidence of disease). Prevalent cases are survivors • The Temporal Sequence of exposure and effect may be difficult or impossible to determine • Usually don't know when disease occurred • Rare events a problem. Quickly emerging diseases are also problem. . Cannot be used to get timeline based research . Tough to find people that fall under the exact same variables . Associations are tough to interpret . When strong feelings are involved, there could be a case of a bias . Does not help to determine cause	– Exposure measurements taken after disease occurrence – Disease status can influence selection of subjects - Control groups can be difficult to find. – Results can easily be tainted by Recall Bias, where people with the disease or condition are more likely to remember past details compared to people who don't have the disease or condition. – Is weaker than a cohort study for establishing causation. – Usually not generalizable.	Expensive and time-consuming – Inefficient for rare diseases or diseases with long latency – Loss to follow-up – Cohorts can be difficult to identify due to confounding variables – No randomization, which means that imbalances in patient characteristics could exist – Blinding/masking is difficult – Outcome of interest could take time to occur