

What is Referral Bias?

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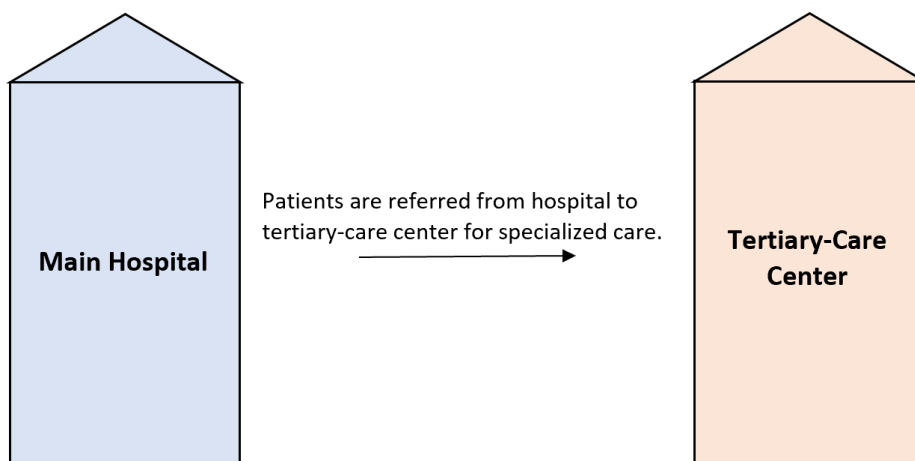
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Referral bias is a systematic error that occurs when the selection of study participants is influenced by their referral source, rather than being randomly selected. This can occur in medical research, where individuals referred by a specific physician or hospital may have different characteristics or health conditions compared to those not referred. This can lead to biased study results and affect the generalizability of the findings. Referral bias can also occur in other fields, such as education or marketing, where participants are selected based on their affiliation with a certain group or organization. It is important to identify and address referral bias in order to ensure the validity and reliability of research findings.

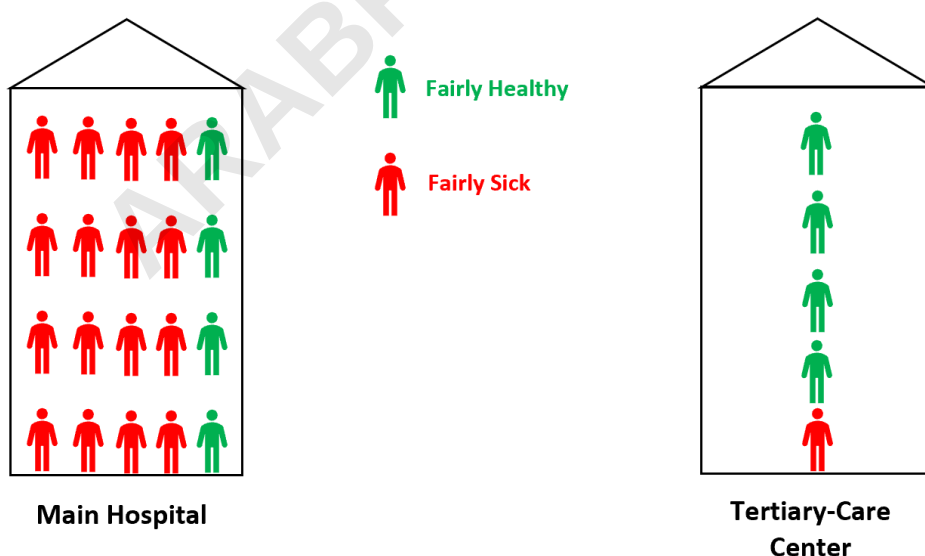
What is Referral Bias?

Referral bias is a type of bias that occurs when the types of individuals included in a study are not representative of the individuals in the overall population.

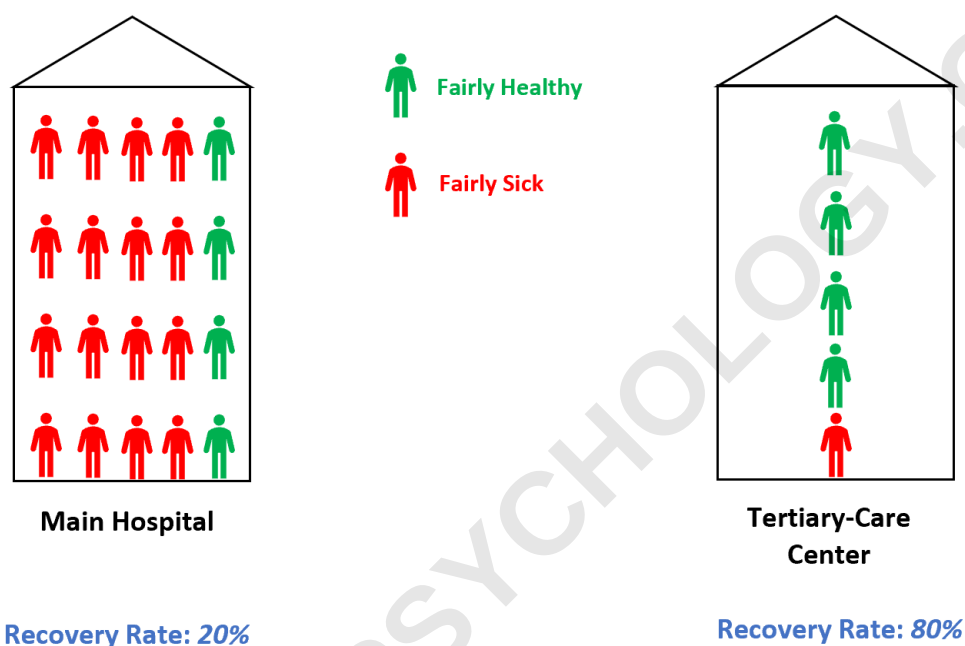
This type of bias occurs most often when researchers study the outcomes of patients in tertiary-care centers. A *tertiary-care center* is a center where patients in hospitals are referred to say they can receive specialized care for a certain medical condition or disease.



In most cases, only patients who are healthy enough to survive the relocation to a tertiary-care center are actually transferred which means the patients that are treated in these centers tend to be healthier, on average, compared to the overall population of patients who suffer from the condition.



Thus, when researchers analyze the recovery rates of these patients in tertiary-care centers it's likely that the recovery rates will be much higher compared to the overall population of patients admitted into the hospital since the individuals were healthier to start with.



As a result, researchers may inaccurately conclude that a certain disease or medical condition is less severe than it actually is because they're analyzing a sample of patients that is not representative of the population.

Also, researchers may inaccurately conclude that a certain facility is more capable of treating patients with a certain disease effectively because the recovery rate

or survival rate is extremely high.

However, these rates may only be high because the sample of patients that receive treatment in these centers are already quite healthy.

Factors that Lead to Referral Bias

In the previous example we saw that *health* was a factor that could cause referral bias.

Other factors that could also affect the likelihood of a patient to be transferred to a tertiary-care center (and thus lead to referral bias) include:

Ability of patient to pay for a specialized treatment
Distance between hospital and tertiary-care center
Combination of underlying health conditions
Means to be transferred from hospital to tertiary-care center.

Each of these factors could cause the sample of patients that receive care at a tertiary-care center to be quite different from the population of patients that actually come to the hospital, which could result in referral bias.

Refer to this research study on patients with gram-negative bloodstream infections for a real-life example of referral bias.

Nonresponse BiasUndercoverage BiasOmitted Variable BiasNeyman Bias

Refer to this tutorial for a background on the importance of representative samples in research.

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