

# Dealing with Missing Values in R

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# Introduction

# Why Should you Worry?

1. Bias inferences
- 2.

# Causes of Missing Values

# Missing Value Concepts

# Assumptions

$$f(y^o, y^m | x) = f(y^o)$$

Rubin's taxonomy of missingness;

- Missing Completely at random (MCAR)
- Missing at Random (MAR)
- Missing not at Random (MNAR)

# MCAR

- missingness can't be tied to any cause. It happened completely at random.
- $f(y^o, y^m | x) = f(y^o | x) f(y^m)$
- Solution? Just delete the missing records.

**MAR**



# MNAR

# Demonstrations

# Dataset

# Wrong Analysis

# Acceptable Analysis

# Sensitivity Analysis

**Take Home**

# Conclusion