



Data Collection Methods

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Course: RESEARCH METHODOLOGY/BIOSTATISTICS (MA 322)

Summer-Class

Lecture 7

Date 1-09-2026

Outline



- What is data
- Definition of Data Collection.
- Types of Data
- Sources of Data
- Methods of Collecting

❑ What is data?

- Data refers to the **raw facts**, **observations**, **measurements**, or **responses collected** during a study that are used to answer a **research question** or **test a hypothesis**.

➤ Examples of Data:

- Body temperature: 37.5°C
- Blood group: O+
- WBC count: 8,000 cells/ μl
- Age of patient: 20 years.



❑ Definition of Data Collection?



- Is the **systematic process** of **gathering**, **measuring**, and **recording information** from different sources for **analysis** and **interpretation**.
- In medical laboratory sciences, **accurate data collection** is essential for **valid diagnosis**, **reliable research findings**, and **evidence-based decision-making**.



❑ Types of Data in Research Methodology?

- Data are broadly classified into two main types:

i. **Qualitative Data** (Categorical Data)

- **Subtypes:** a) Nominal data b) Ordinal data

ii. **Quantitative Data** (Numerical Data).

- **Subtypes:** a) Discrete data b) Continuous data

1. Qualitative Data (Categorical Data):

- Refers to **non-numerical information** that describes **qualities, characteristics**, or **categories** rather than **quantities**.

➤ Main Features:

- ✓ Expressed in words, labels, or categories
- ✓ Not measured using numbers
- ✓ Used to describe attributes or properties
- ✓ Cannot be analyzed using arithmetic calculations directly

❑ Subtypes of Qualitative Data



1. Nominal data:

- Is a type of qualitative (categorical) data used to classify items into distinct groups or categories without any ranking or order.

➤ Main Features:

- ✓ Categories have no logical sequence or hierarchy.
- ✓ Used only for naming or labeling.
- ✓ Cannot be arranged as higher or lower

❖ **Example:** Blood group: A, B, AB, O, Gender: Male, Female, Infection status: Positive/Negative, Type of microorganism: Bacteria, Virus, Parasite.

2. Ordinal Data (Ordered Categories)



- Is a type of qualitative data in which the categories have a clear order or ranking, but the exact differences between categories are not measurable.

➤ Main Features:

- ✓ Categories are arranged in a logical sequence
- ✓ Shows relative position (e.g., higher or lower)
- ✓ The interval between categories is not equal or known
- ✓ Cannot perform precise mathematical calculations.

❑ Examples of Ordinal Data:



- Disease severity: Mild → Moderate → Severe
- Pain scale: Low → Medium → High
- Nutritional status: Poor → Average → Good
- Staining intensity in microscopy: Weak → Moderate → Strong.

2. Quantitative Data (Numerical Data):



➤ **Definition:** Refers to data expressed in numbers that can be measured or counted and analyzed using mathematical or statistical methods.

➤ **Main Features:**

1. Represented in numerical form.
2. Can be measured or counted.
3. Suitable for statistical analysis
4. Allows calculations such as mean, median, and standard deviation

❑ Subtypes of Quantitative Data



1. Discrete Data:

- Is a type of quantitative (numerical) data that consists of countable values, usually expressed as whole numbers (integers).

➤ Main Features:

- ✓ Takes separate, distinct values.
- ✓ Cannot be divided into fractions or decimals.
- ✓ Obtained by counting rather than measuring.
- ❖ **Example:** Number of parasite eggs in a stool sample, Number of bacterial colonies on an agar plate, Number of patients in a study.

2. Continuous Data:



➤ **Definition:** Is a type of quantitative (numerical) data that can take any value within a given range, including fractions and decimal.

➤ **Main Features:**

1. Obtained by measurement, not counting.
2. Can take infinite possible values within a range.
3. Includes decimal values.
4. No gaps between values

❑ Examples of Continuous Data:

- Body temperature (e.g., 36.5°C , 37.2°C).
- Blood glucose level (e.g., 95.6 mg/dL).
- Hemoglobin concentration (e.g., 13.4 g/dL).
- Patient weight (e.g., 70.5 kg).
- Height (e.g., 165.8 cm)

❏ Sources of Data



- Refer to the origins from which data are obtained for research purposes.

➤ Main Types of Data Sources:

1. Primary Data Sources.
2. Secondary Data Sources.

1. Primary Data Sources



- Refer to data collected directly by the researcher for a specific research purpose.
- This type of data is original, firsthand, and tailored to the study objectives.

➤ **Main Features:**

- Collected directly from participants or experiments
- Specific and relevant to the research problem
- Up-to-date and accurate
- Collected using planned methods

❑ **Methods of Collecting Primary Data**



1. Observation
2. Interviews
3. Questionnaires
4. Laboratory Experiments
5. Clinical Examination

❏ **Advantages:**

- High accuracy and reliability
- Data is specific to research needs
- Greater control over data quality.

➤ **Disadvantages**

- Time-consuming
- Costly
- Requires trained personnel

❑ Secondary Data Sources:



- Refer to data that have already been collected, recorded, or published by other researchers or organizations, and are used for a new research purpose.

➤ Main Features:

- Data are not collected directly by the researcher
- Already available in records, reports, or publications
- Usually quick and easy to access
- May not be fully tailored to the current study

❑ **Common Sources of Secondary Data:**

- Hospital records (patient files, laboratory reports)
- Published research articles and journals
- Books and textbooks
- Government health statistics
- Reports from health organizations (e.g., WHO)
- Laboratory archives and databases.

Advantages:

1. Time-saving.
2. Cost-effective.
3. Useful for background research and comparisons.

Disadvantages:

1. May be outdated
2. May be incomplete or inaccurate
3. Not always specific to the research question

References



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Thanks