



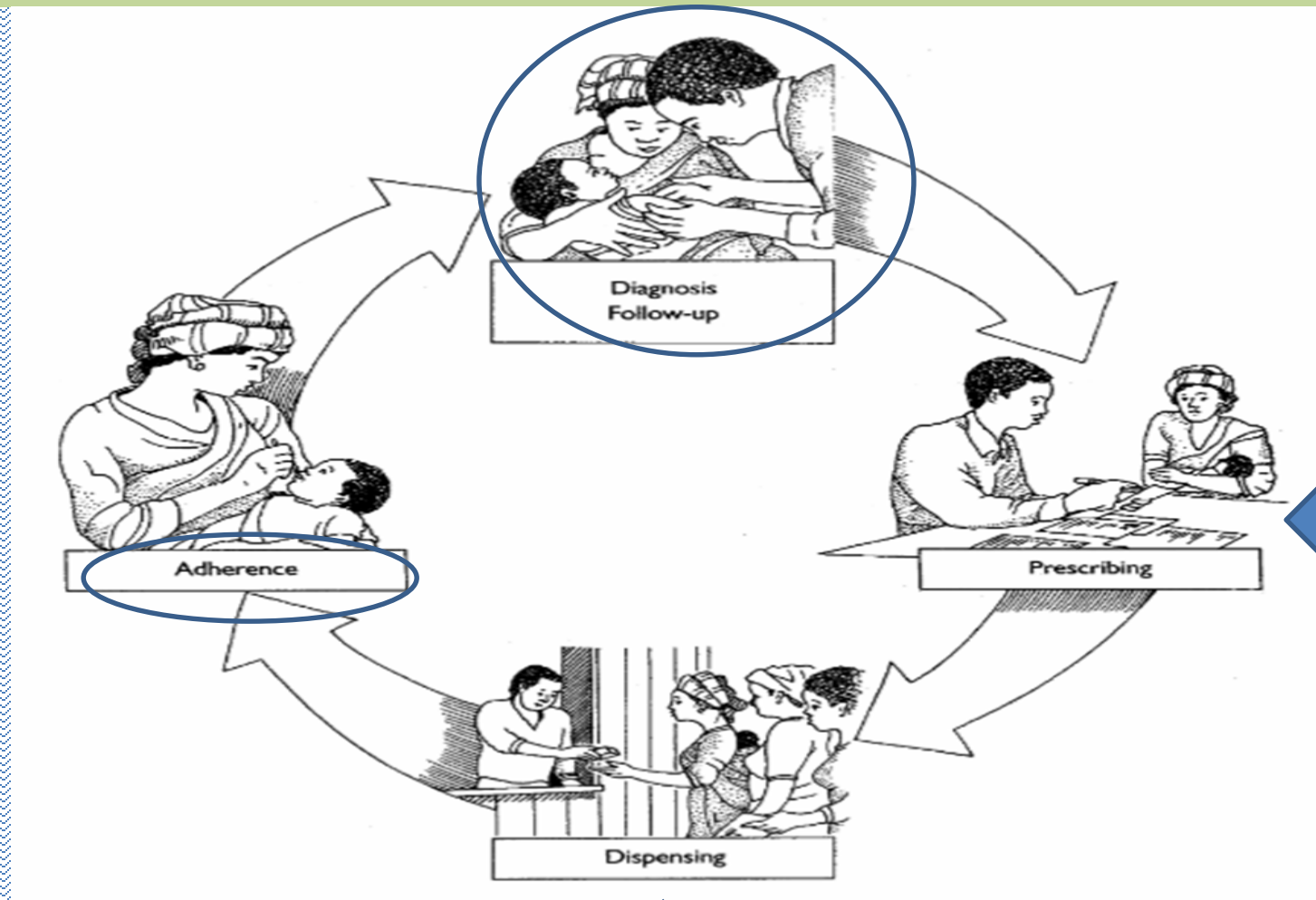
University Of Peshawar

RATIONAL USE OF DRUGS

Chapter 1 Clinical Pharmacy II

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PhD Clinical Pharmacy

Drug Use Process



Importance of RDU

- **Factors that have led sudden realization for rational drug use are.**
- Drug explosion
- Efforts to prevent the development of resistance
- Growing awareness
- Increased cost of the treatment
- Consumer protection Act.

Irrational Use

- The examples of irrational use are
- Under-prescribing
- Incorrect prescribing
- Extravagant prescribing
- Over-prescribing
- Multiple prescribing
- Prescribing of drugs with unproven/doubtful efficacy

Definition

- Right Drug
 - Patient
 - Time
 - Dose
 - Route
 - Economical

How RDU is possible

- **Step I Patient Problem**

- Identify pt problem
- Detailed history
- Drug history
- CC

- **Step II Diagnosis**

- A prerequisite to RDU

How RDU is possible

- **Step III Therapeutic Objective**
 - Therapeutic objective of RA?
- **Step IV Select Treatment**
 - Life style modification
 - Drug selection (safety, efficacy, cost, ease of adm)

How RDU is possible

- **Step V Start treatment**
- **Step VI results of Treatment**
- **Step VII Conclusion of therapy**

COMPONENTS OF RDU PROGRAM

1. Teaching of Basics

- Pharmacology
- Therapeutics
- Guidelines
- Problem oriented

2. Essential Drug concept

- EML
- Drug selection
- Formulary

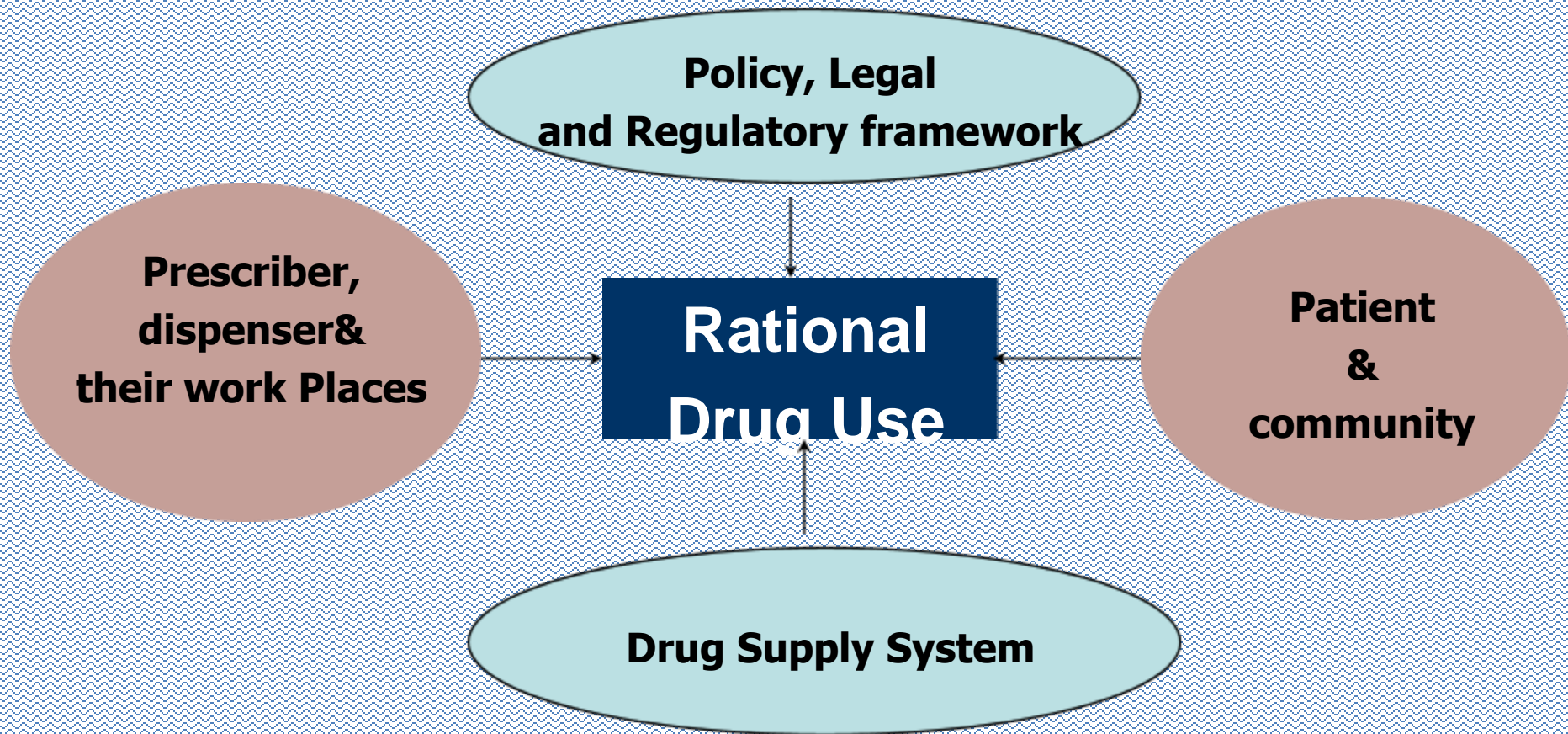
3. Drug Information

- Physician
- Public
- News letter, videos verbal
- Withstand promotional pressure

4. Drug use study

- Factors influencing drug use
- Monitoring prescribing practices
- Due, Dur

Many Factors Influence Use of Medicines



RATIONAL PRESCRIBING

Steps Rational Prescribing

1. Specific Diagnosis

2. Consider Pathophysiology

3. Therapeutic Objective

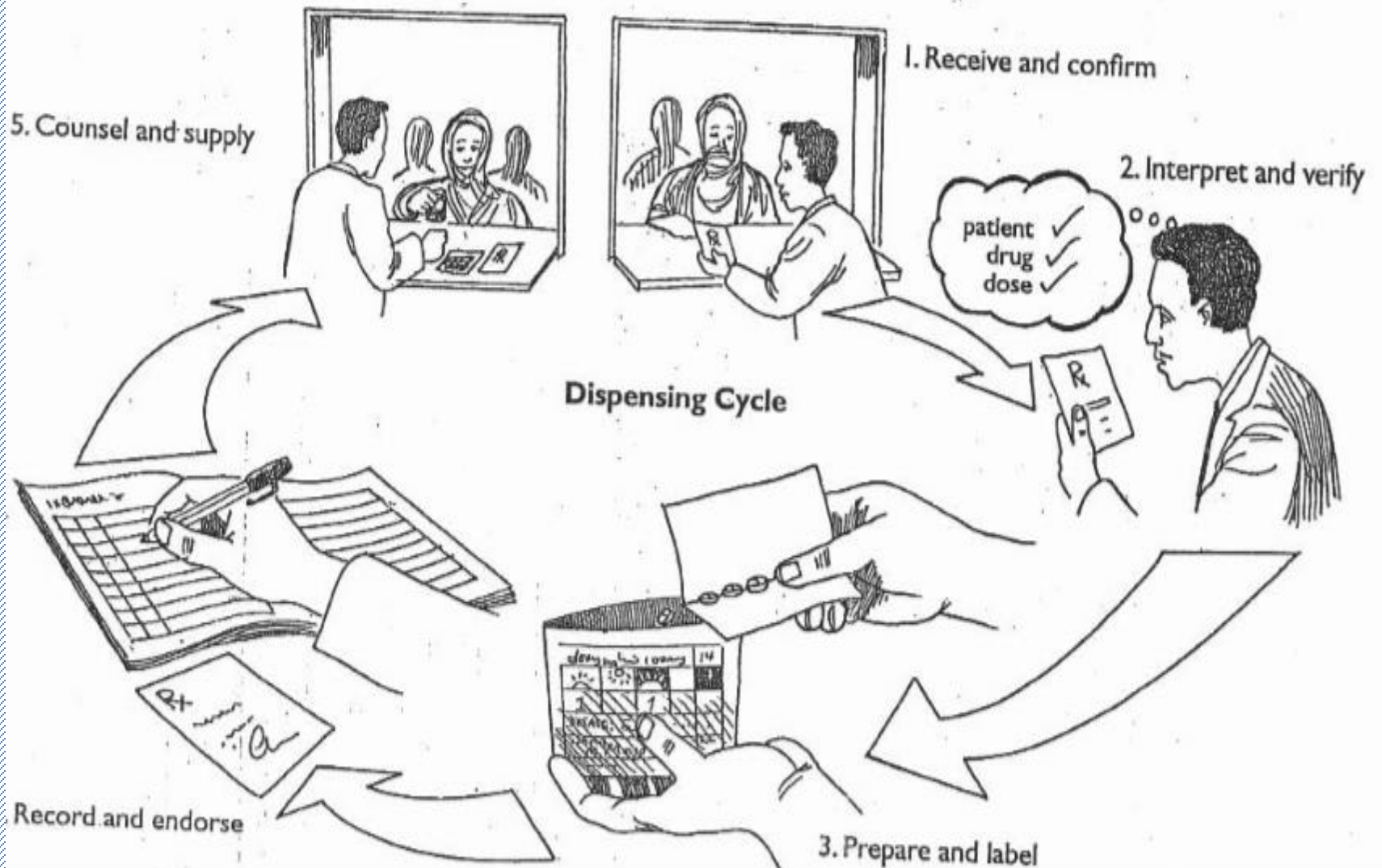
4. Drug of choice Selection

5. Dosing regimen

6. Drug action Monitoring

7. Patient education

Dispensing cycle



Dispensing Process

1. Receiving of Prescription

2. Interpretation of prescription

3. Checking of Prescription

4. Filling of prescription

5. Labelling of Prescription

6. Handling of Prescription

7. Records

Last step
Poor or
uncontrolled
dispensing can
be hazardous

Irrational Use of drugs

1

- Selection of drugs

2.

- Patients characteristics

3

- Information

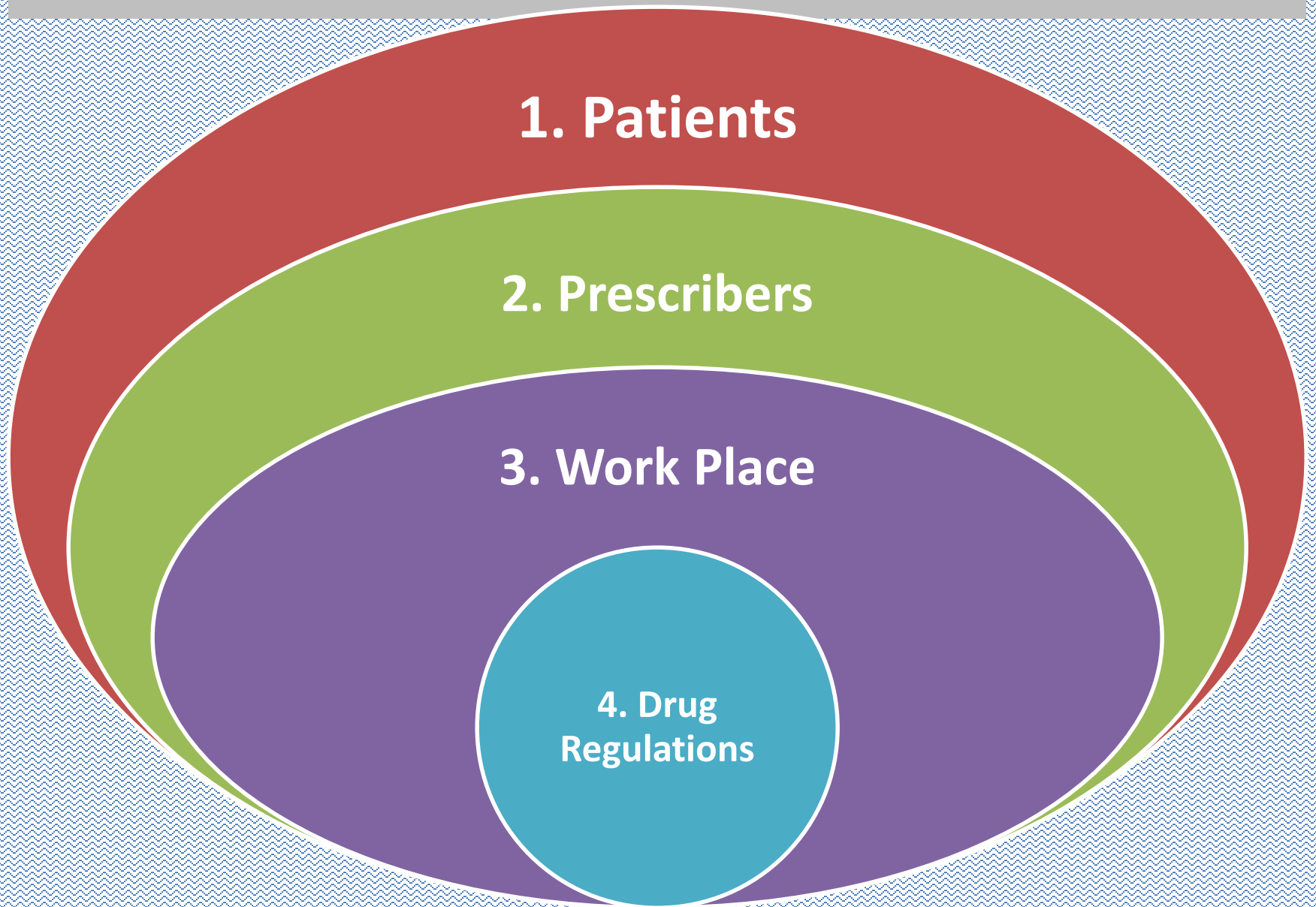
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- Incorrect prescribing

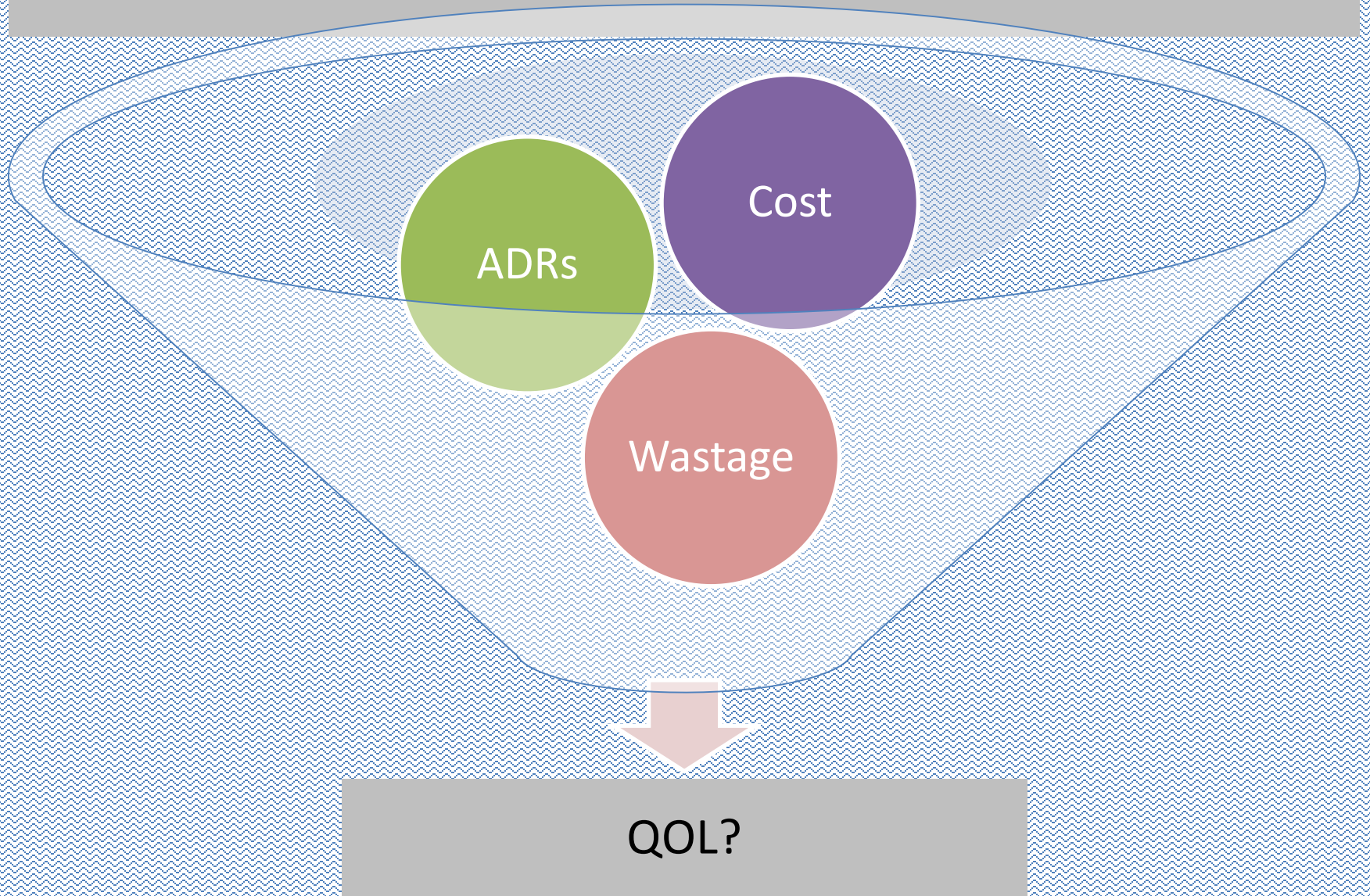
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- Expensive drugs

Factors Responsible for Irrational use



Problems of Irrational use



Problem solutions



Rational Drug Use Chapter 1

DRUG USE INDICATORS

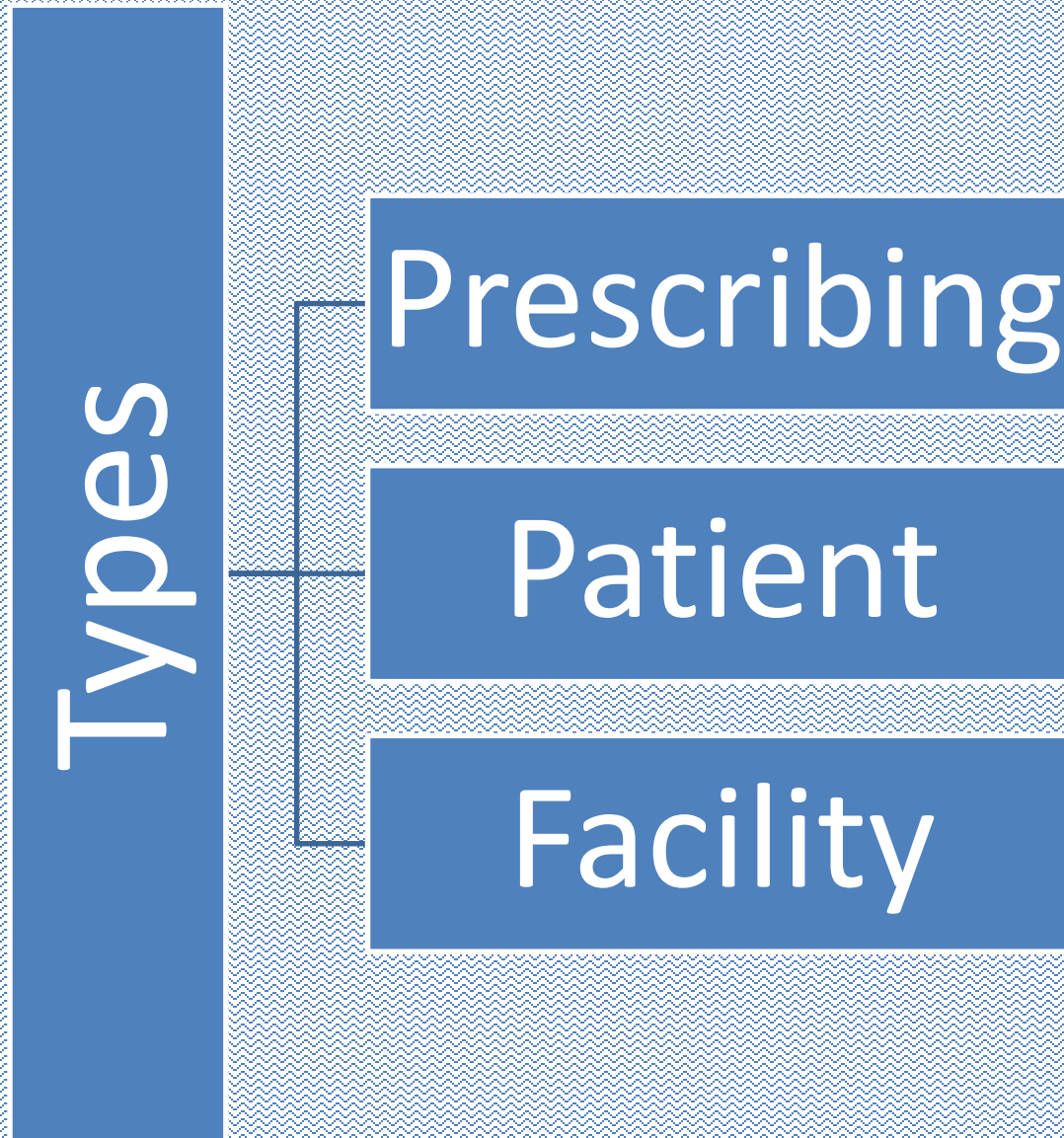
Drug use indicators

- Drug Use Indicators are sets of objective measures that can define the drug use situation in a country
- Planning
- Supervising
- 1985 Nairobi Kenya WHO conference

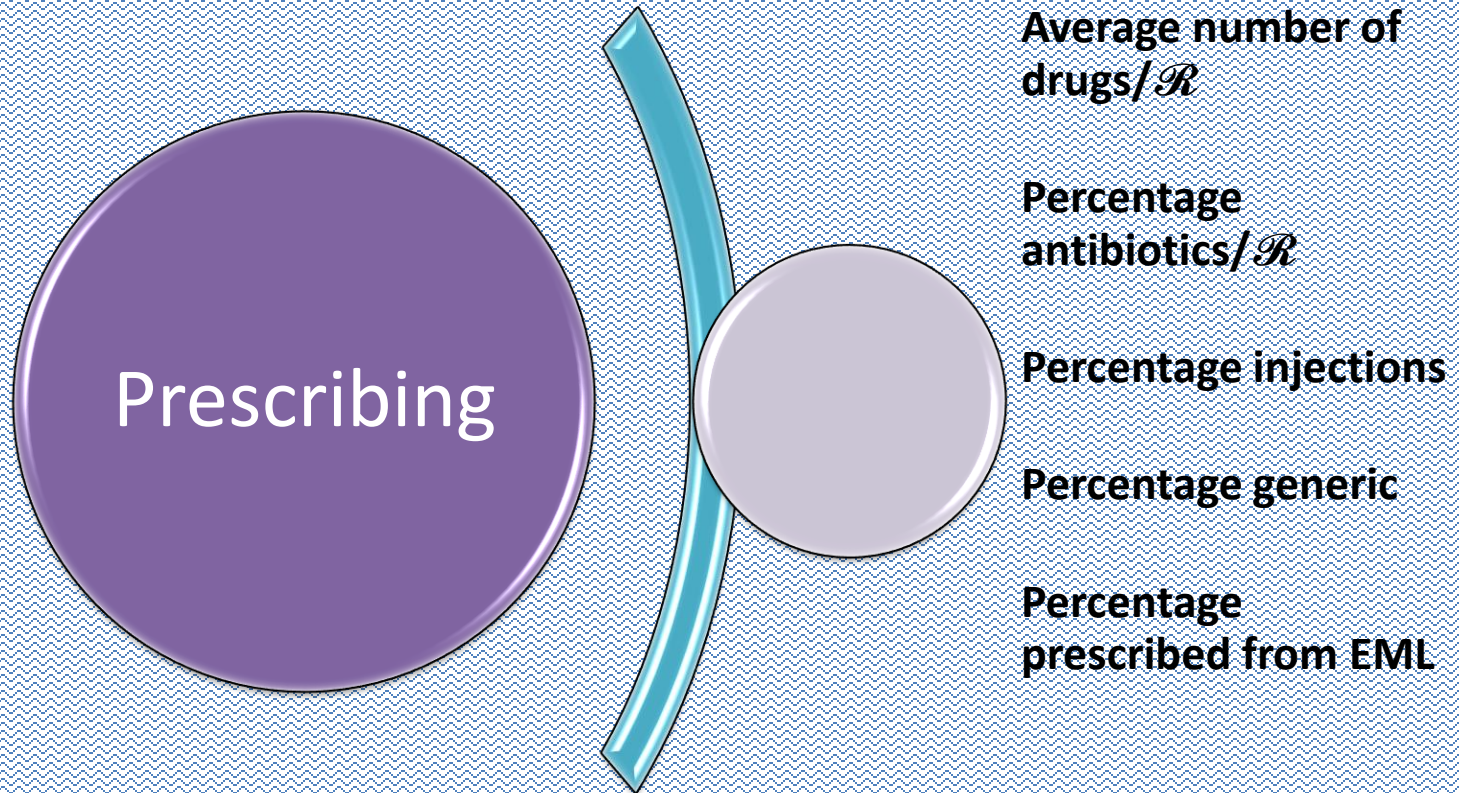
Objectives of Drug use indicators

- Describing drug use patterns
- Prescribing behavior
- Assessments of impacts of interventions

Types of Indicators



Prescribing Indicators



Prescribing Indicators

Indications	Standard Values
1. Average number of drugs per encounter	1.6 - 1.8
2. Percentage of encounters with an antibiotic prescribed	20.0 - 26.8
3. Percentage of encounters with an injection prescribed	13.4 - 24.1
4. Percentage of drugs prescribed by generic name	100.0
5. Percentage of drugs prescribed from the essential drug list or formulary	100.0

Table 2 WHO/INRUD prescribing indicators in selected primary healthcare centers of the Bahawalpur district, Punjab, Pakistan

Primary Healthcare Centers ^a	Prescribing Indicators				
	Average number of medicines prescribed per patient encounter	Percent medicines prescribed by generic name	Percent encounters with an antibiotic prescribed	Percent encounters with an injection prescribed	Percent medicines prescribed from essential medicines list
1	3.4 (1.4)	81.2	64.0	38.0	98.5
2	3.6 (1.5)	85.1	63.0	32.0	87.6
3	3.4 (1.3)	83.0	87.0	21.0	89.2
4	3.2 (3.1)	43.7	40.0	18.0	90.7
5	3.2 (1.4)	88.5	56.0	30.0	100
6	1.9 (1.0)	50.0	31.0	25.0	100
7	5.0 (2.3)	60.0	30.0	9.0	80.5
8	4.3 (2.4)	76.0	28.0	28.0	100
9	2.9 (0.7)	66.7	29.0	43.0	100
10	3.4 (1.1)	82.0	61.0	27.0	87.9
Mean (SD)	3.4 (0.8)	71.6 (15.7)	48.9 (20.2)	27.1 (9.8)	93.4 (7.1)
ANOVA	$p < .0005$	$p < .0005$	$p < .0005$	$p < .0005$	$p < .0005$

^a1 = Agha pur, 2 = Jamal channar, 3 = Mubarak pur, 4 = Jhangi wali, 5 = Mithra, 6 = Chak katoora, 7 = Kud wala, 8 = Khanqah sharif, 9 = Khanu wali, 10 = Kulaab

Patient-care indicators

Indications	Standard Values
Average consultation time (minutes)	≥10
Average dispensing time (seconds)	≥90
Percent medicines actually dispensed	100
Percent medicines adequately labeled	100
Percent patients with knowledge of correct doses	100

Facility-specific indicators

Indications	Standard Values
Availability of essential medicines list or formulary to practitioners	100
Percent key medicines available	100

Table 3 WHO/INRUD patient-care and facility-specific indicators in selected primary healthcare centers of the Bahawalpur district, Punjab, Pakistan

Primary Healthcare Centers	Patient-Care Indicators			Facility-Specific Indicators			
	Average consultation time (minutes)	Average dispensing time (seconds)	Percent medicines actually dispensed	Percent medicines adequately labeled	Percent patients with knowledge of correct doses	Availability of essential medicines list to practitioners	Percent key medicines available
1	2.3 (1.5)	43.1 (34.7)	87.3	100.0	67.0	100.0	90.0
2	2.5 (1.2)	43.0 (17.1)	91.1	100.0	77.0	100.0	70.0
3	2.4 (1.0)	36.7 (10.8)	91.2	100.0	77.0	100.0	80.0
4	0.7 (0.4)	15.5 (7.7)	100.0	100.0	30.0	100.0	90.0
5	2.1 (0.8)	42.6 (16)	85.8	100.0	67.0	100.0	80.0
6	1.3 (0.6)	31.3 (14)	68.3	100.0	33.0	100.0	80.0
7	2.9 (1.4)	30.9 (10.5)	100.0	100.0	53.0	100.0	70.0
8	2.1 (1.2)	36.9 (25.8)	91.5	100.0	64.0	100.0	90.0
9	3.6 (1.1)	63.3 (50.7)	100.0	100.0	90.0	100.0	100.0
10	2.1 (1.0)	37.1 (20.6)	93.6	100.0	63.0	100.0	100.0
Mean (SD)	2.2 (0.8)	38.0 (12.1)	90.9 (9.5)	100.0	62.1 (19)	100.0	82.0 (7.9)
ANOVA	$p < .0005$	$p < .0005$	$p < .0005$	———— ^a	$p < .0005$	———— ^a	$p < .0005$

^aANOVA was not applied for these indicators as there was no variation in their values

Research Characteristics

- **Research** is creative and systematic work undertaken to increase the stock of knowledge, including knowledge of humans, culture and society, and the use of this stock of knowledge to devise new applications.
- Neutrality
- Reliability
- Validity
- Generalization

Research Design

The diagram features a dark red header bar at the top with the text "Research Design" in black. Below this, four vertical trapezoidal shapes are arranged side-by-side, each containing a research design category in white text. From left to right, the categories are: "Observational" (red trapezoid), "Experimental" (green trapezoid), "Qualitative" (purple trapezoid), and "Systematic reviews" (teal trapezoid). The trapezoids are set against a light blue background that has a white zig-zag pattern along its top and bottom edges.

Observational

Experimental

Qualitative

Systematic
reviews

Observational studies

1.
Exploratory

2.
Descriptive

3. Cohort

4. Case
control

5. Cross
sectional

Experimental design

- Randomized control trials.

Other Design

- Qualitative research
- Systematic reviews

Sampling to study the drug use

Sampling

- Population:
- Sample:
- Participants:

Sampling

- The process through which a sample is extracted from a population is called as sampling.

Sampling

- Sampling errors:
 - Systematic Errors
 - Sampling bias

Types of sampling

- Sampling techniques are broadly categorized into two major types:
 - 1) Probability sampling methods
 - 2) Non-probability sampling methods

Probability Sampling

- Random sampling
- Representative sampling
- Population must be precisely defined.
- Not used for general categories.

Probability Sampling

- **Advantages:**

- Reduces the chance of systematic errors.
- Minimize the chance of sampling biases.
- Better representative sample.
- Generalizable results

- **Disadvantages:**

- o The techniques need a lot of efforts
- o A lot of time is consumed.
- o They are expensive.

Probability Sampling

1. Random Sampling

2. Systematic Random Sampling

3. Stratified Random Sampling

4. Cluster Sampling

5. Multistage Sampling

Random Sampling

- Equal chance
 - Elements can be listed
 - Homogenous population
 - Lottery
 - Computer generated Tables.
-
- Selected participants are approached and interviewed

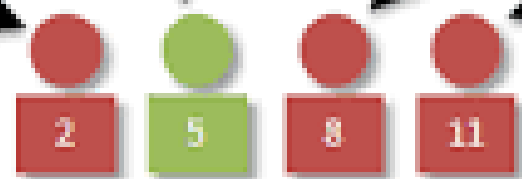
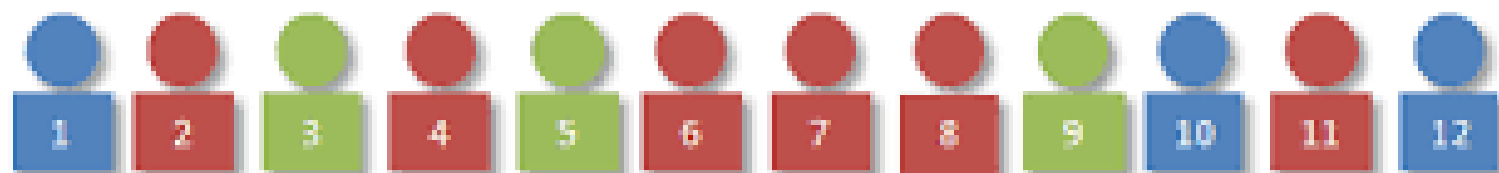


Simple Random Sampling

Systematic Random Sampling

- Homogenous Population
- Element selection is at regular interval.
- Interval in terms of time, space or order.
- Regularity and uniformity in selection makes the sampling systematic.
- Selected participant is then approached and investigated.

Population



Sample (every 3rd)

Stratified Random Sampling

- Heterogenous population
- Subgroups formation (Strata)
- The sample is selected from each stratum randomly or systematically
- Allocation of sample from Strata
- Benefits best representation of sample
- Draw backs Cost, effort, proper definition



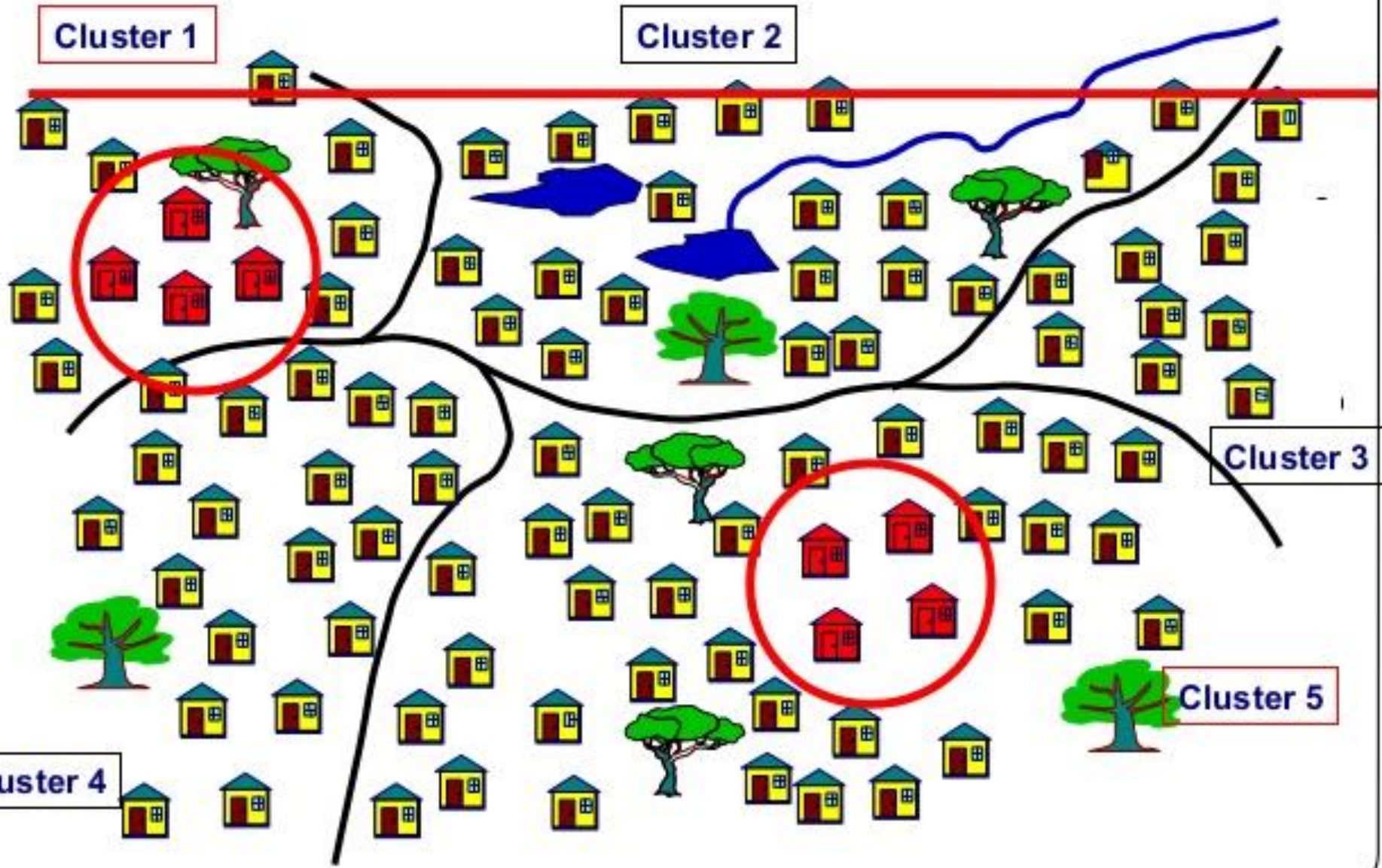
Stratified Random Sampling



Cluster Sampling

- Wide geographical area
- Cluster

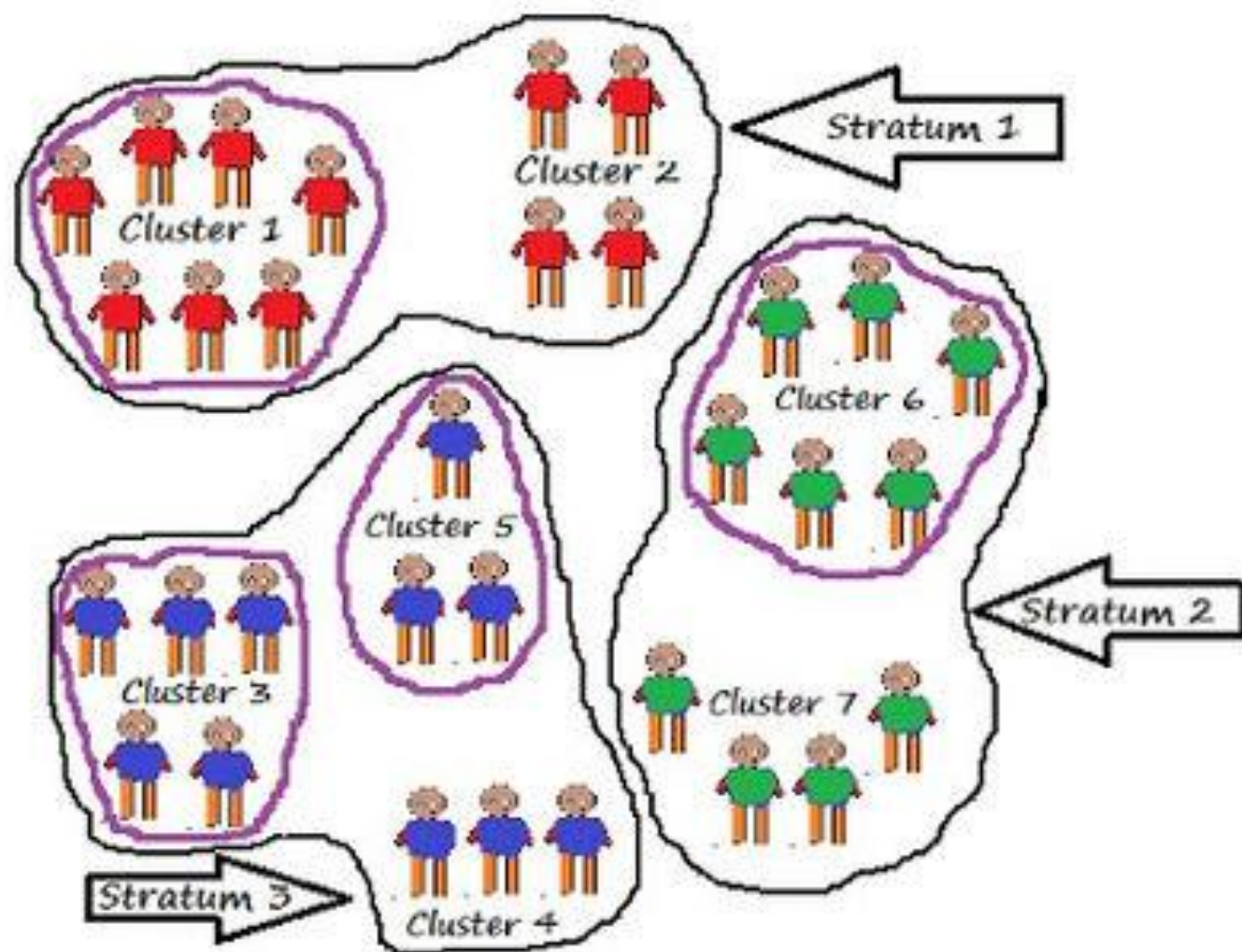
Cluster sampling



Multistage Sampling

- Two or more probability techniques are combined.

Cluster + Stratified sampling



Stratified Cluster Sampling

Non-probability sampling

- Every unit of population does not get an equal chance of participation in the investigation.
- **Advantage**
 - Less effort, cost and time
- **Disadvantage**
 - Sampling errors, bias, lack of generalization

Non-probability sampling

1. Volunteer sampling

2. Convenient sampling

3. Purposive sampling

4. Snowball sampling

5. Matched Sampling

6. Genealogy Based Sampling

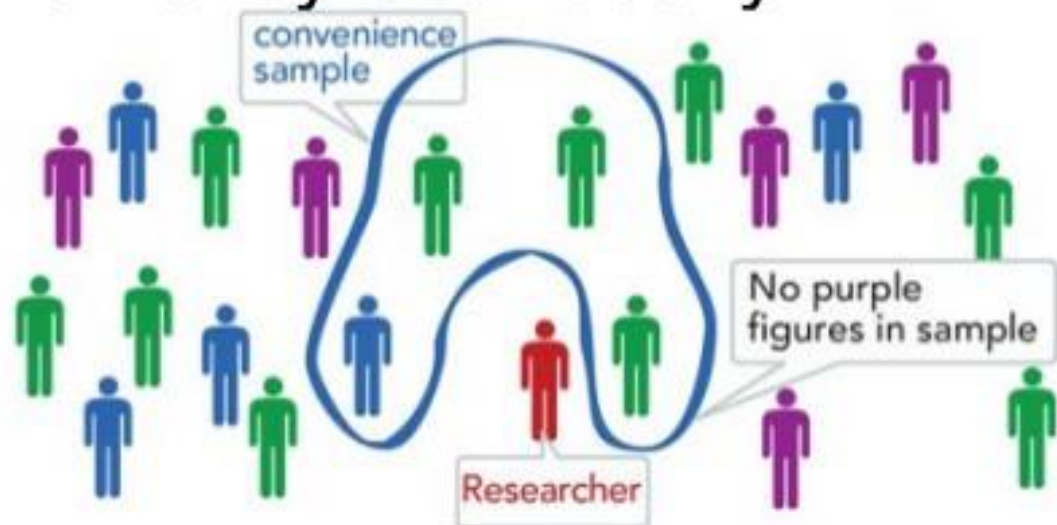
voluntary sampling

also tends to be biased/strongly
opinionated and doesn't give a
profound conclusion



Convenience Sample

select any members of the population who are conveniently and readily available



Purposive sampling



THANKS