Successful Research Strategies

9 STEPS

in RESEARCH PROCESS

of HIGH Quality Research

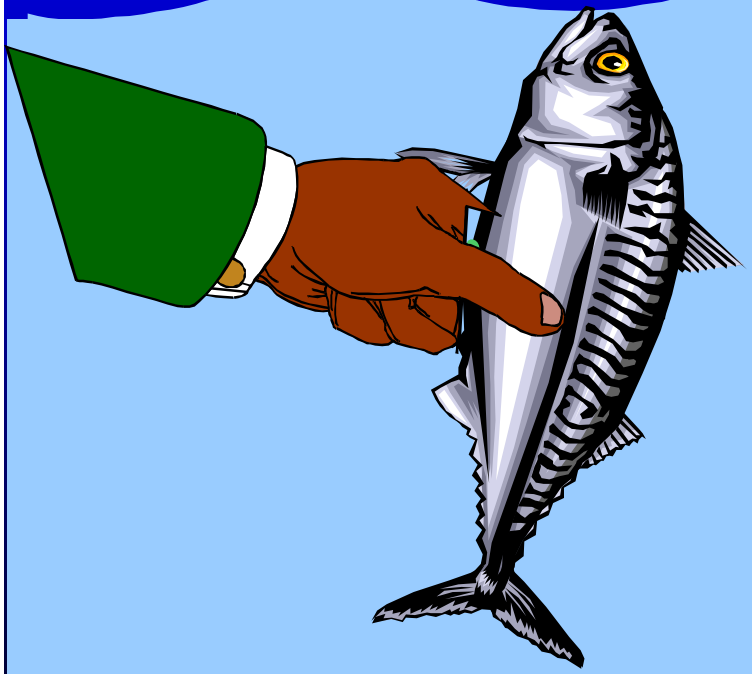
CHULA

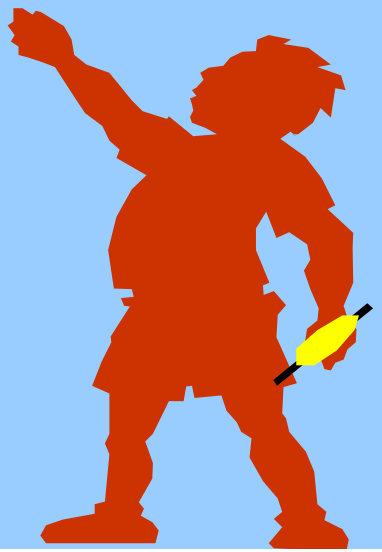
SCOPE

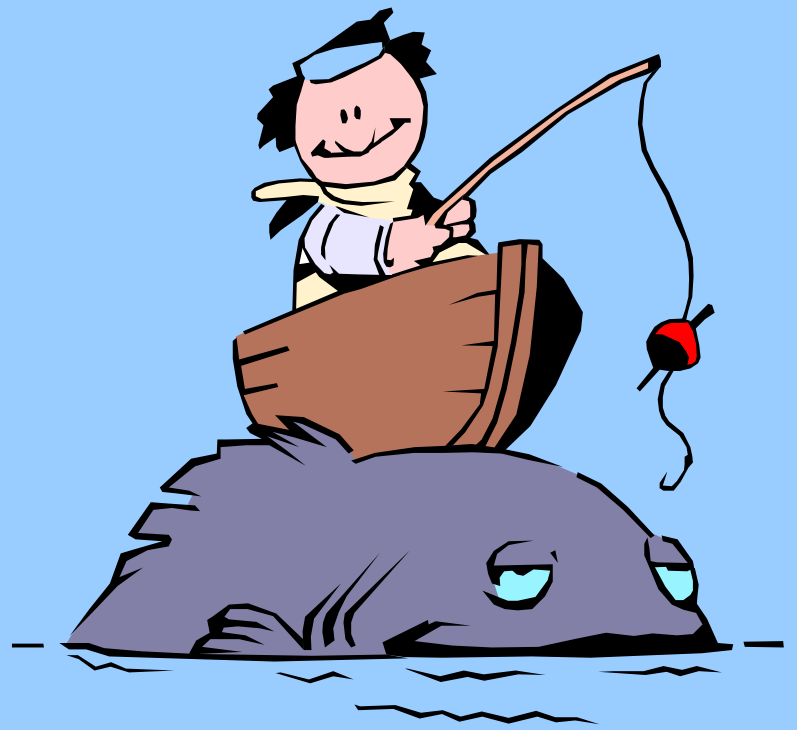
- WHY ?
- HOW ?

Give you 1 fish, You eat all within 1 day

Teach you how to catch fish, you can eat fishes everyday



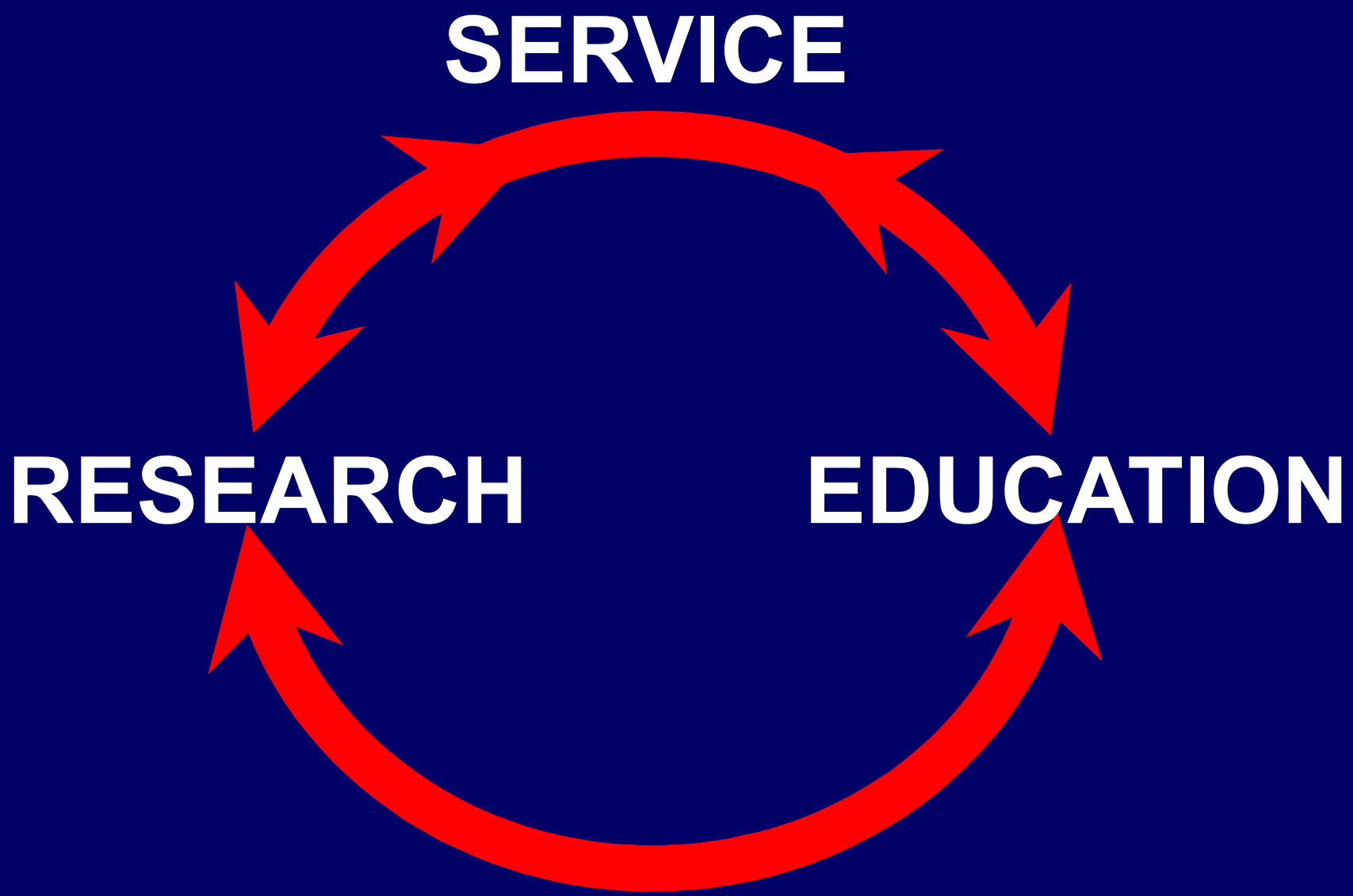




RESEARCH PROCESS

- Sequences of stages
- Provides general framework to follow
- When implementing research study

Step 1 : How to get RESEARCH TOPIC?

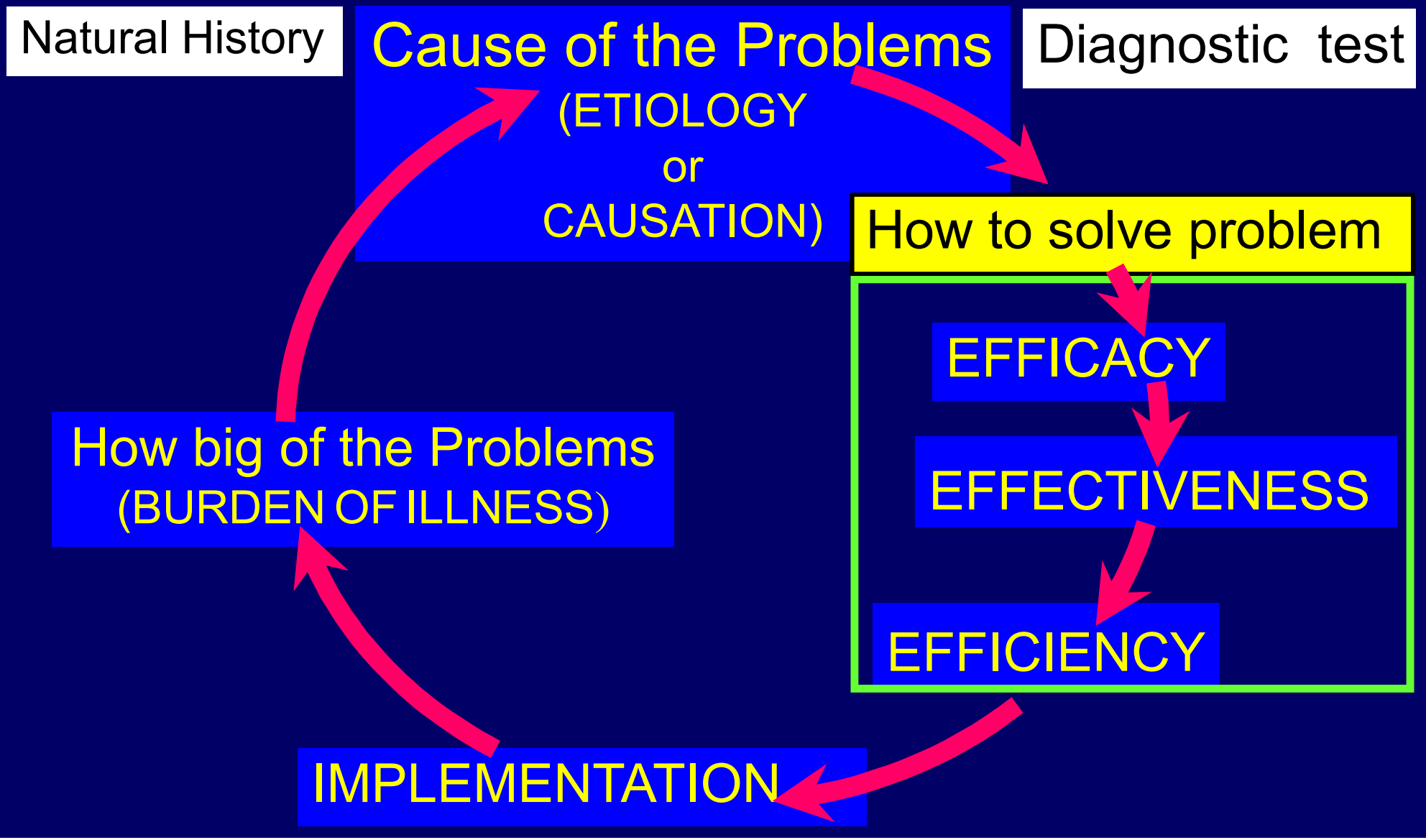


Research

is

A Way of Life !!

Step 2 : What aspect of that “TOPIC”?



Step 3 : Required RESEARCH?

SOURCE

DOCUMENTS
REPORTS

TEXT
JOURNALS

CRITICAL
APPRAISAL

EXPERTS
ระดมสมอง
ประชาพิจารณ์

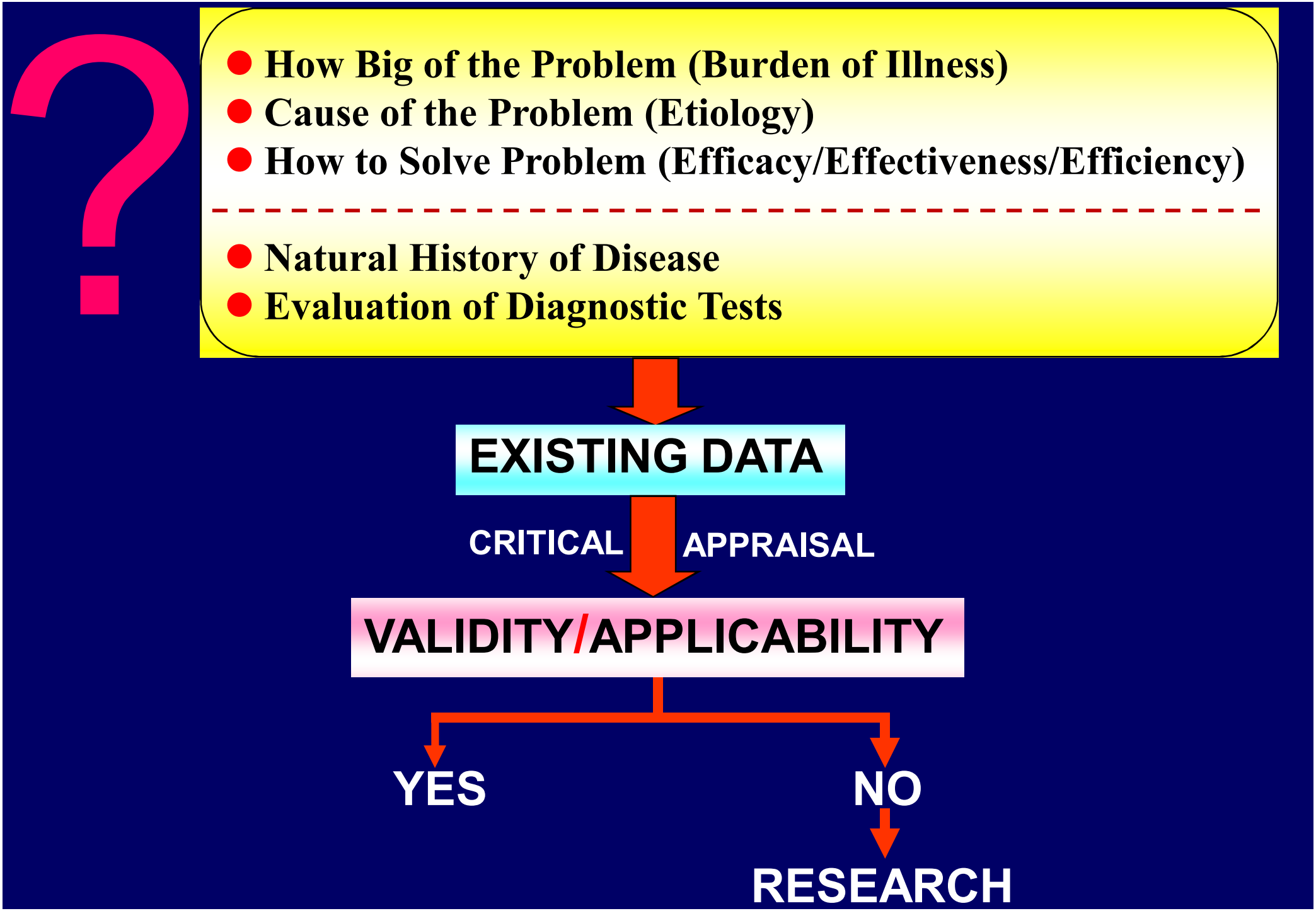
REVIEW
ANALYSIS
SYNTHESIS

VALID?

APPLICABLE?

FURTHER STUDIES?

RESEARCH


How Big of the Problem (Burden of Illness)
Cause of the Problem (Etiology)
How to Solve Problem (Efficacy/Effectiveness/Efficiency)
Natural History of Disease
Evaluation of Diagnostic Tests
EXISTING DATA
CRITICAL APPRAISAL
VALIDITY/APPLICABILITY
YES
NO
RESEARCH

CHULA

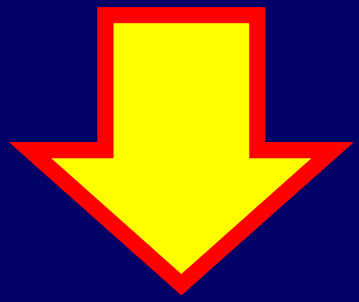
LEVEL OF SCIENTIFIC WORK

ORIGINAL

DO IT BETTER

ME TOO !

STATE-OF-THE-ART



REVIEW

ANALYSIS

SYNTHESIS

FURTHER STUDIES

Step 4 : Research Question (s) should be Identified & Definded Cleary

BASIC TECHNIQUE OF RESEARCH

Planned approach to a clearly defined problem

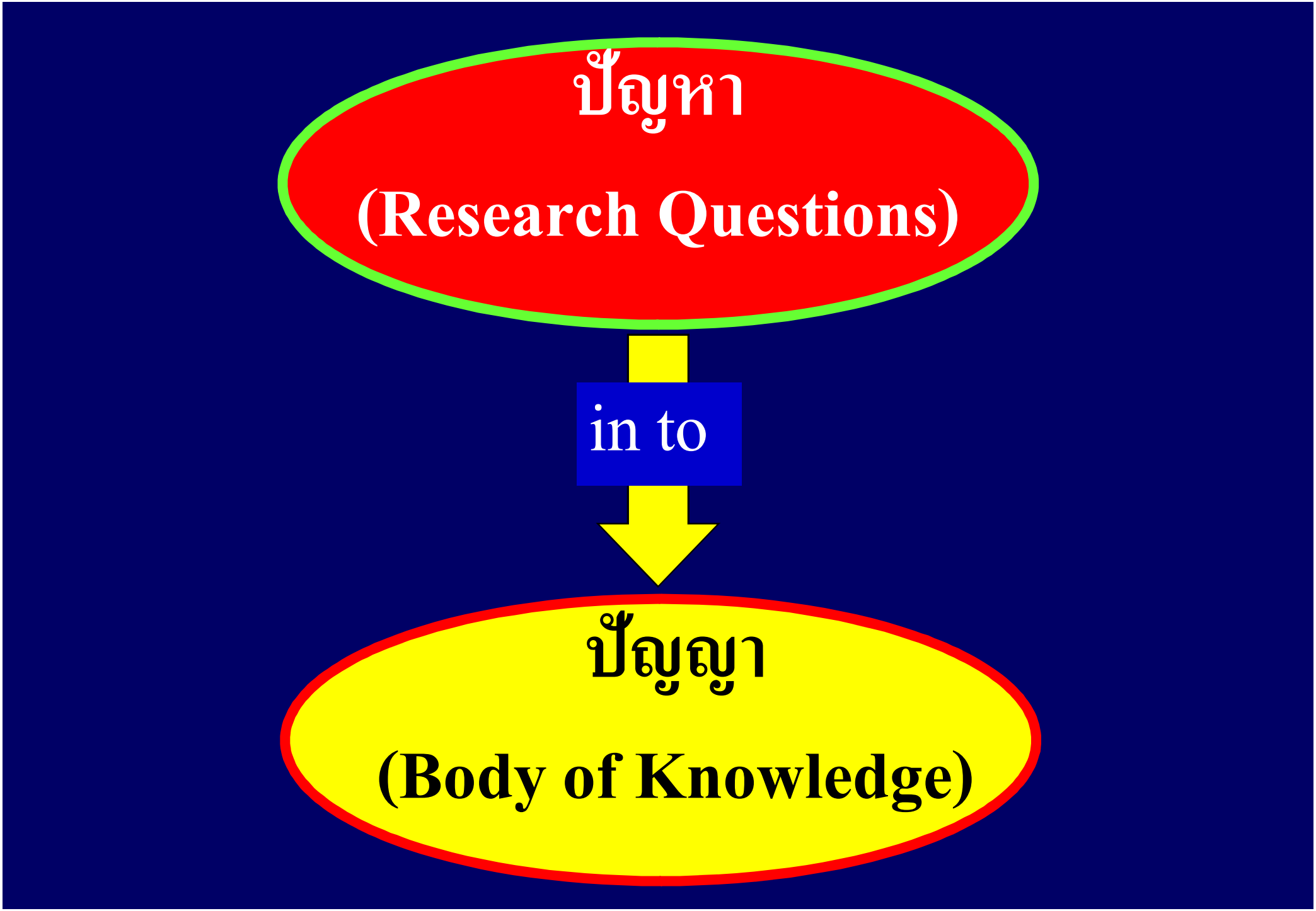
PROBLEM

↓

Identify & Define Cleary

↓

- The statement of Objective
- Hypotheses
- Definition of key variables
- Measuring the variable


ปัญหา
(Research Questions)
in to
ปัญญา
(Body of Knowledge)

THE QUESTION ?

- PLANNING depends on the question
- Only **1 major question**

PRIMARY QUESTION

- Carefully selected
- Cleary defined
- Stated in advance

- Investigators' most interested
- Sample size of the study is based
- Framed in the form of testing Hy

- Limited in number of **SECONDARY QUESTION**
  - A subgroup Hy (# Subjects is usually too small to prove or disprove a Hy)

4 Steps in RESEARCH PROCESS

Step 1: How can you get "research topic" ?

Step 2: What "aspect" of that research topic ?

- How big of the Problem (Burden of Illness)
- Cause of the Problem (Etiology)
- Efficacy/Effectiveness of Therapy
- Natural history of disease
- Diagnostic test

Step 3: Required Research (State-of-the-art) ?

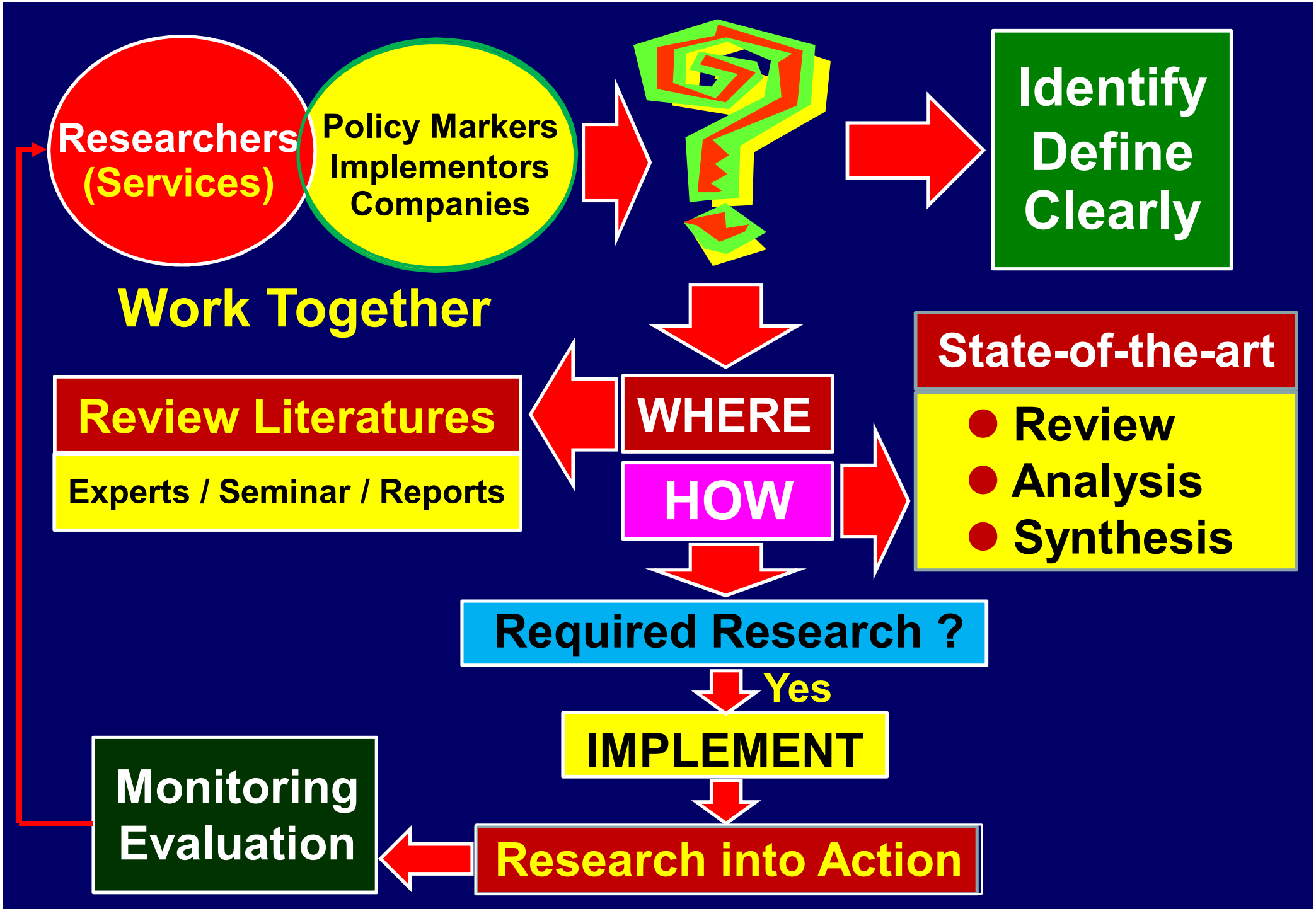
Step 4: Research Question should be identified & defined clearly

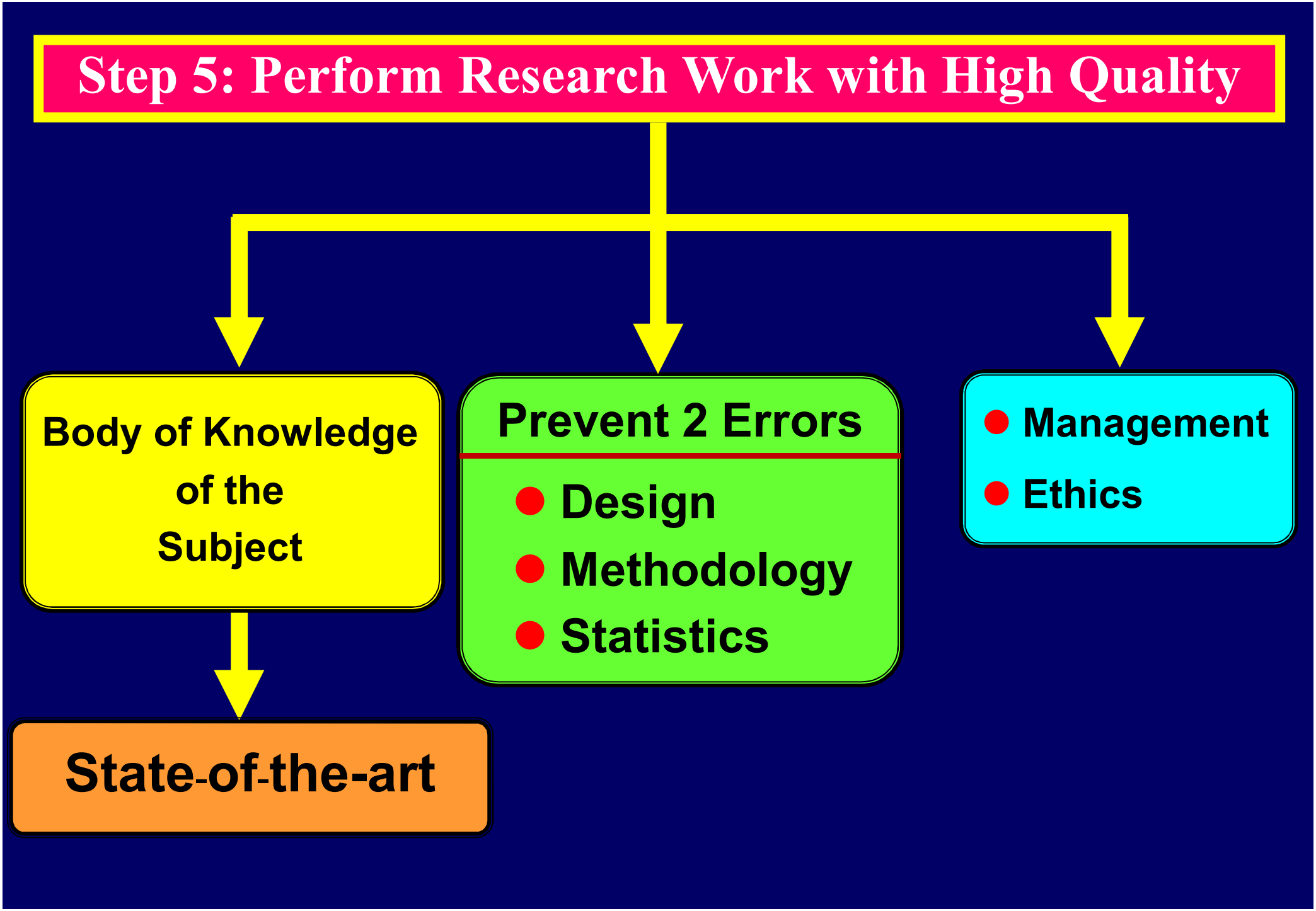
WORKING STEPS

- PREPARE
- WORK
- FINISH
- PRESENT
- PUBLISH

WORKING STEPS

- PREPARE
- **WORK**
- FINISH
- PRESENT
- PUBLISH


Researchers (Services)
Policy Markers Implementors Companies
Work Together
Identify Define Clearly
State-of-the-art
Review
Analysis
Synthesis
WHERE
HOW
Review Literatures
Experts / Seminar / Reports
Required Research ?
Yes
IMPLEMENT
Research into Action
Monitoring Evaluation

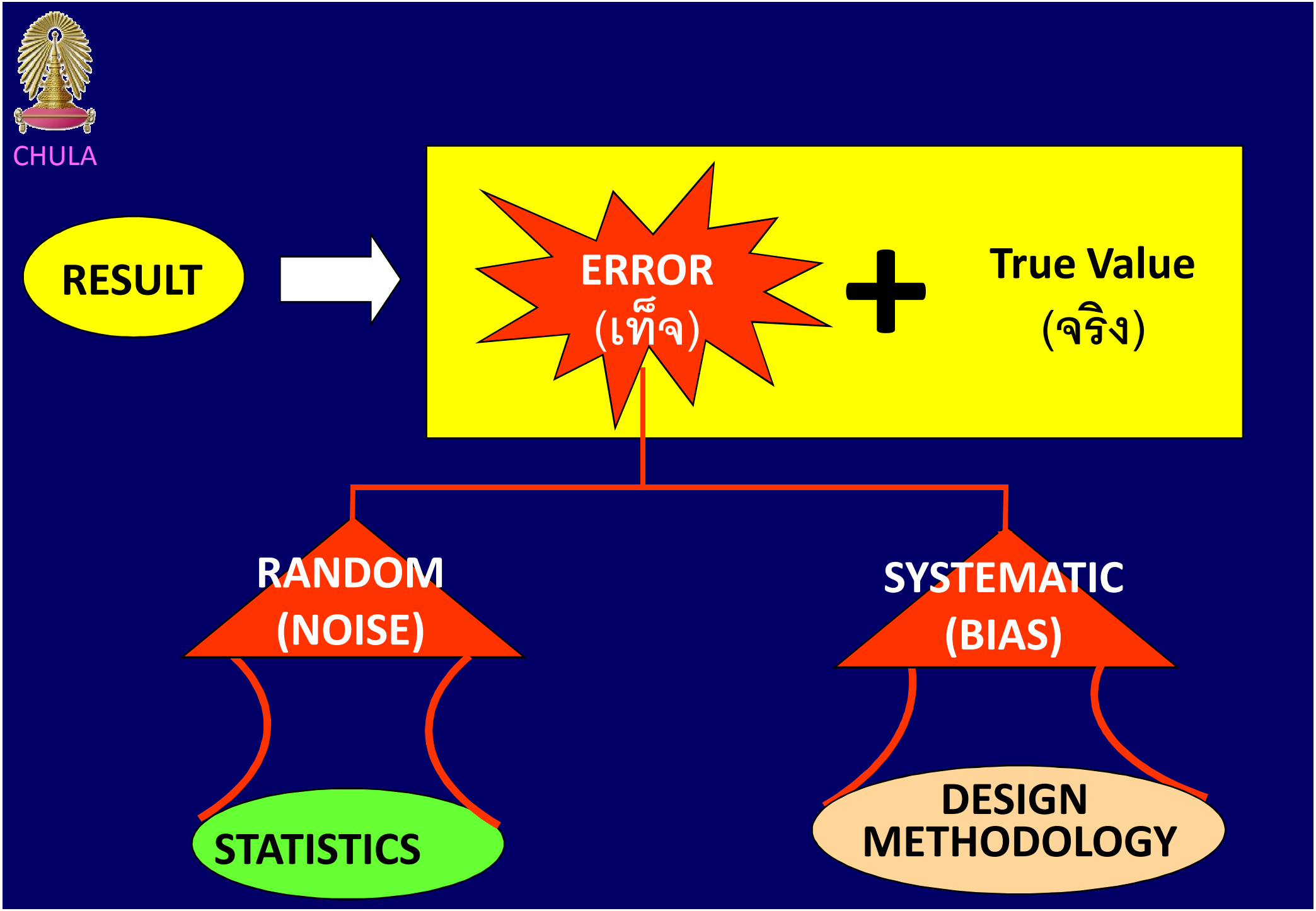

Step 5: Perform Research Work with High Quality
Body of Knowledge of the Subject
State-of-the-art
Prevent 2 Errors
Design
Methodology
Statistics
Management
Ethics

RESEARCH ?

A STUDY IN SEARCH FOR FACTS

or NEW KNOWLEDGE USING THE RELIABLE

AND VALID METHODOLOGY


CHULA
RESULT
ERROR
(เท็จ)
+
True Value
(จริง)
RANDOM
(NOISE)
SYSTEMATIC
(BIAS)
STATISTICS
DESIGN
METHODOLOGY

	IMPROVEMENT		
	YES	NO	
Drug A	10	10	20
Drug B	5	15	20

Improvement Rate

$\frac{10}{20} = 50\ \%$

$\frac{5}{20} = 25\ \%$

Drug A LOOKS TWICE AS GOOD

	IMPROVEMENT		
	YES	NO	
Drug A	500	500	1,000
Drug B	450	550	1,000

Improvement Rate

$$\frac{500}{1{,}000} = 50\ \%$$

$$\frac{450}{1{,}000} = 45\ \%$$

Drug A ONLY MARGINALLY BETTER

BUT $x^2 = 5.01$ AND $P < .05$

	IMPROVEMENT		
	YES	NO	
Drug A	10	10	20
Drug B	5	15	20

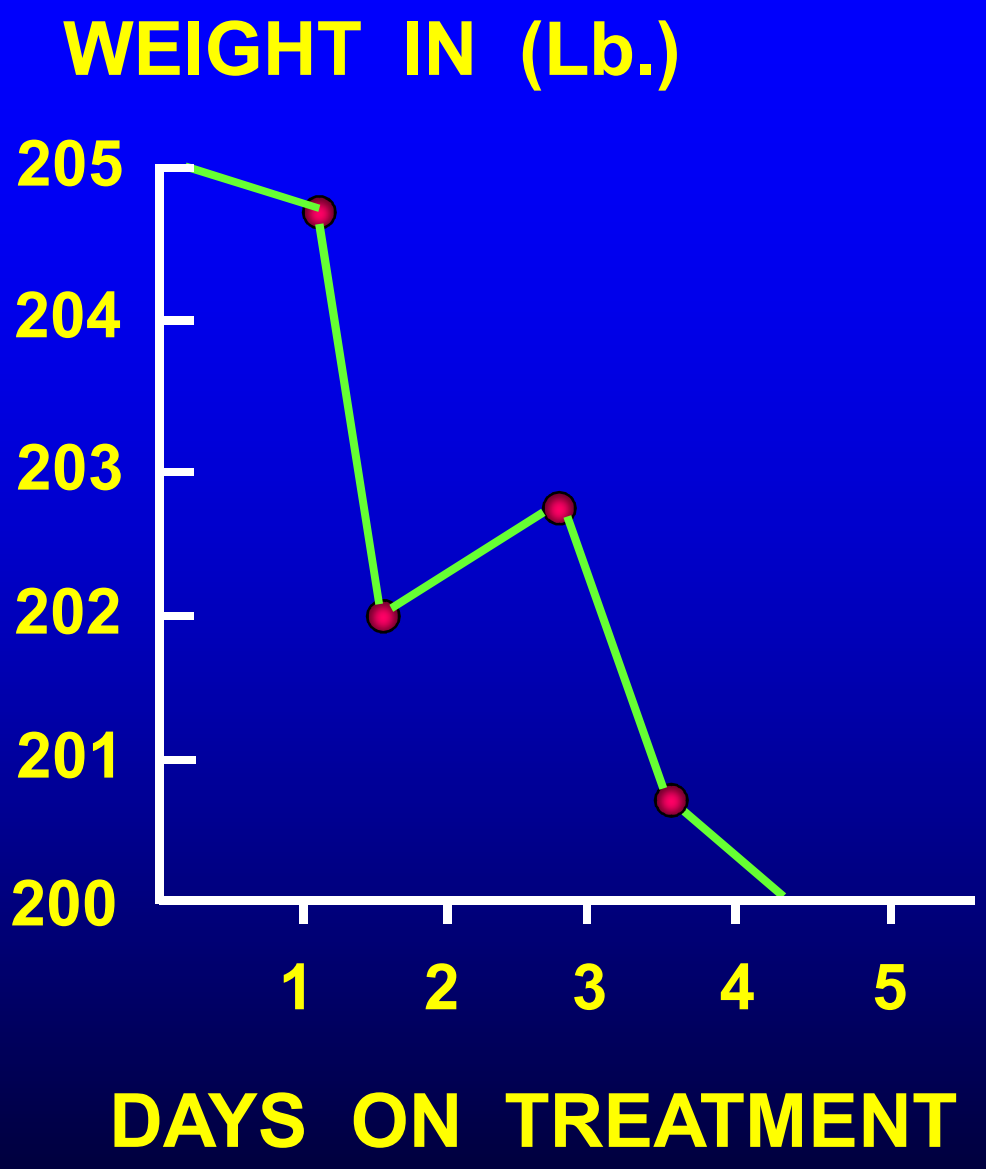
Improvement Rate

$\frac{10}{20}$ = 50 %

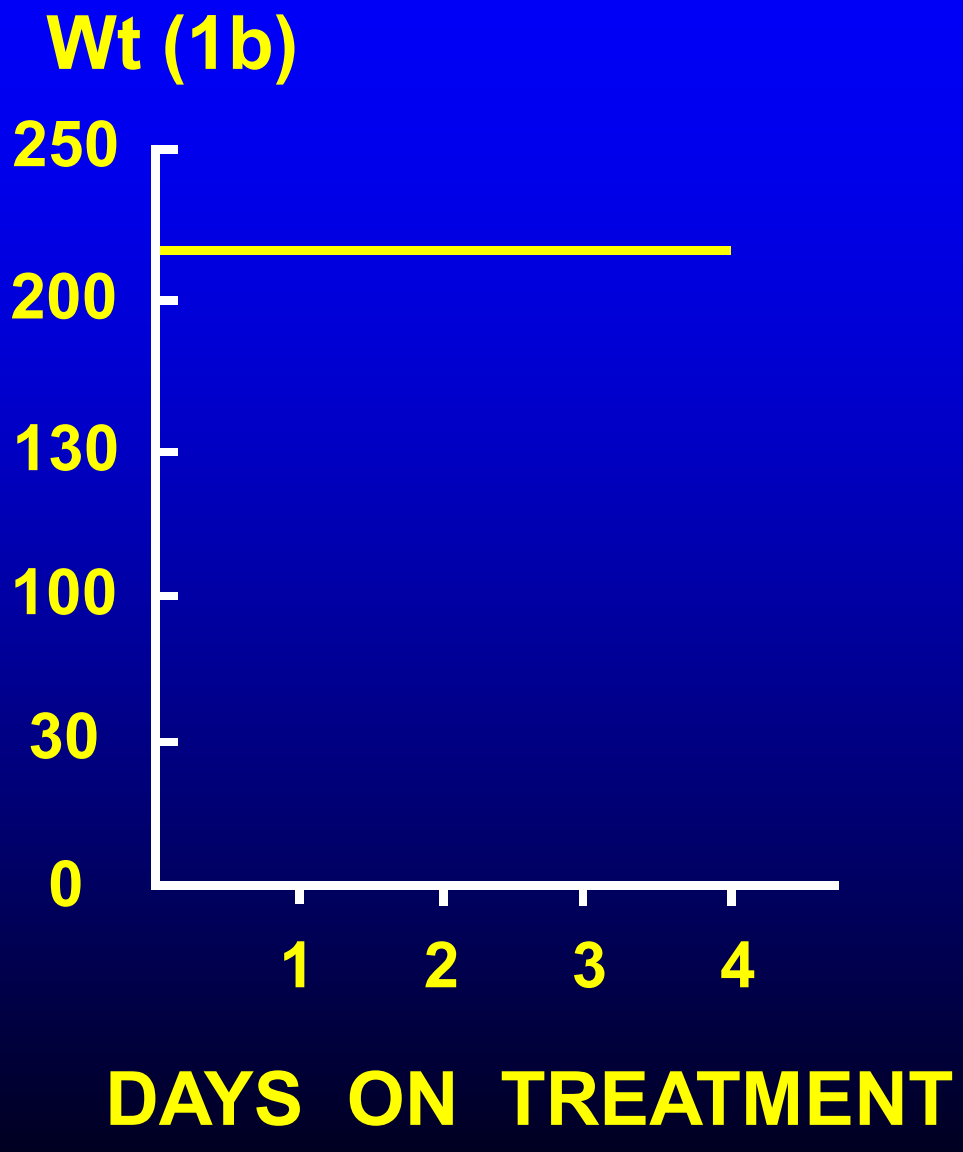
$\frac{5}{20}$ = 25 %

Drug A LOOKS TWICE AS GOOD

BUT $x^2 = 2.67$ AND $P > .05$


WEIGHT IN (Lb.)
205
204
203
202
201
200
1
2
3
4
5
DAYS ON TREATMENT

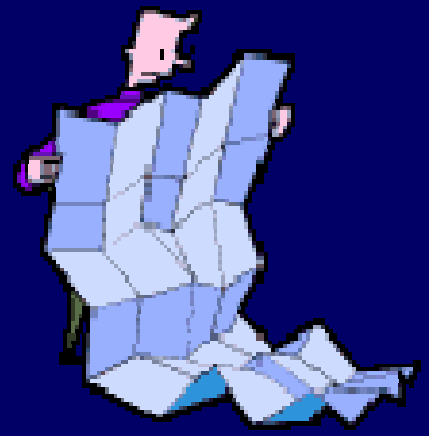
SUPPRESS THE ZERO



Research design

Research methodology

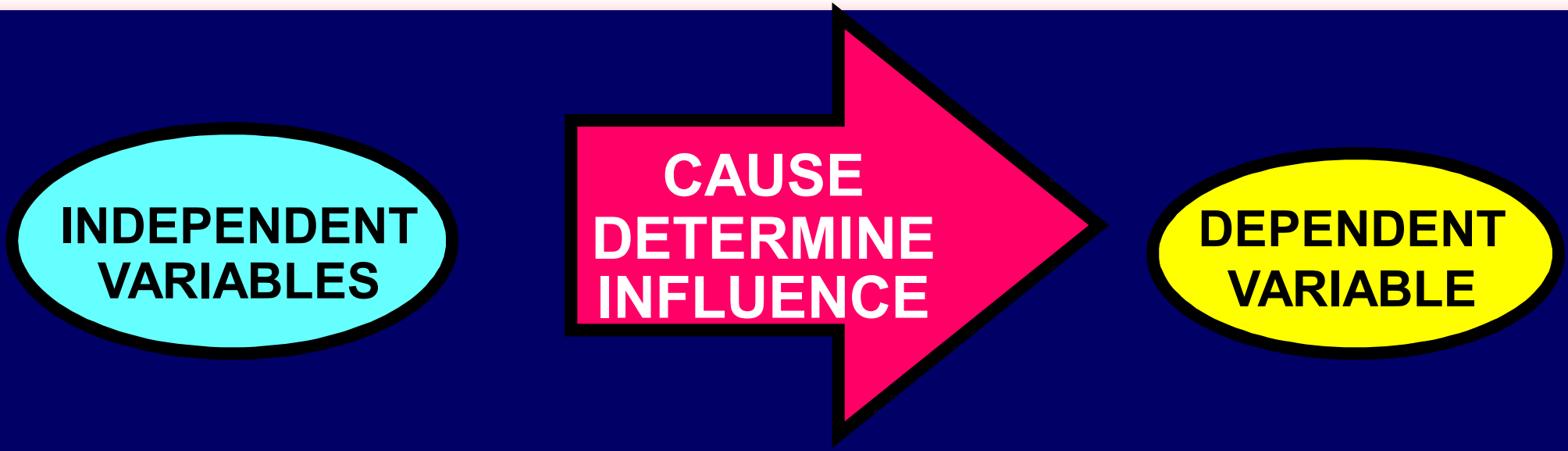
Statistics



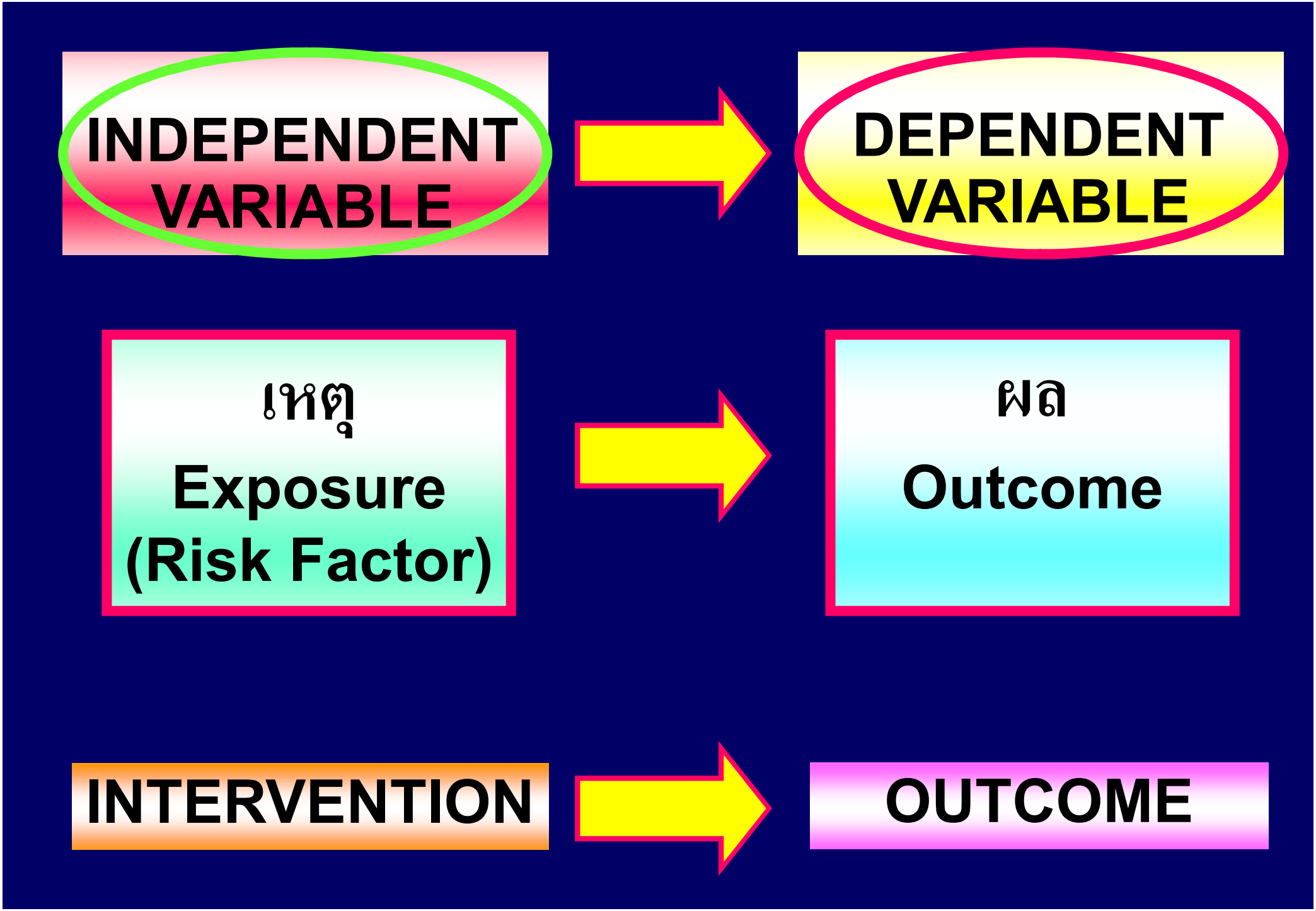
RESEARCH DESIGN

HYPOTHESIS

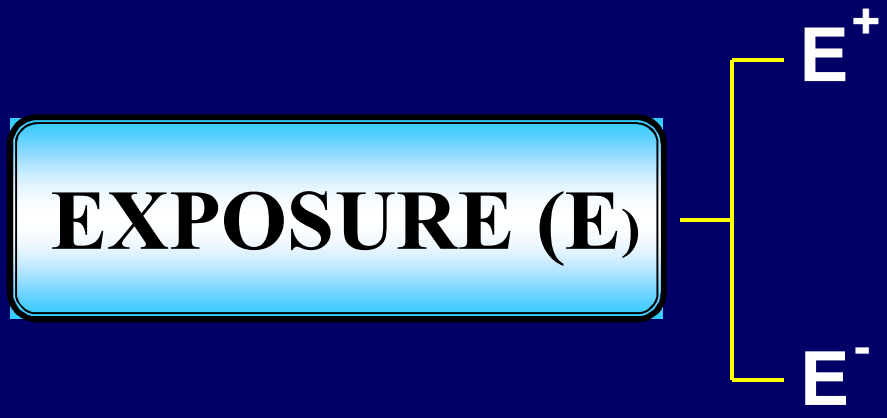
Expected Relationship between 2 (or more) Variables



- CLEAR
- VALUE-FREE
- SPECIFIC
- TESTABLE
- AVAILBLE METHODS


INDEPENDENT VARIABLE
DEPENDENT VARIABLE
เหตุ
Exposure (Risk Factor)
ผล
Outcome
INTERVENTION
OUTCOME

CHULA



CHULA

CLINICAL TRIAL OF NEW ANTIHISTAMINE in PREVENTION AND TREATMENT of THE COMMON COLD

	OUTCOME	
	CURED	IMPROVED
ANTIHISTAMIN	13.4	68.2
PLACEBO	13.9	64.7

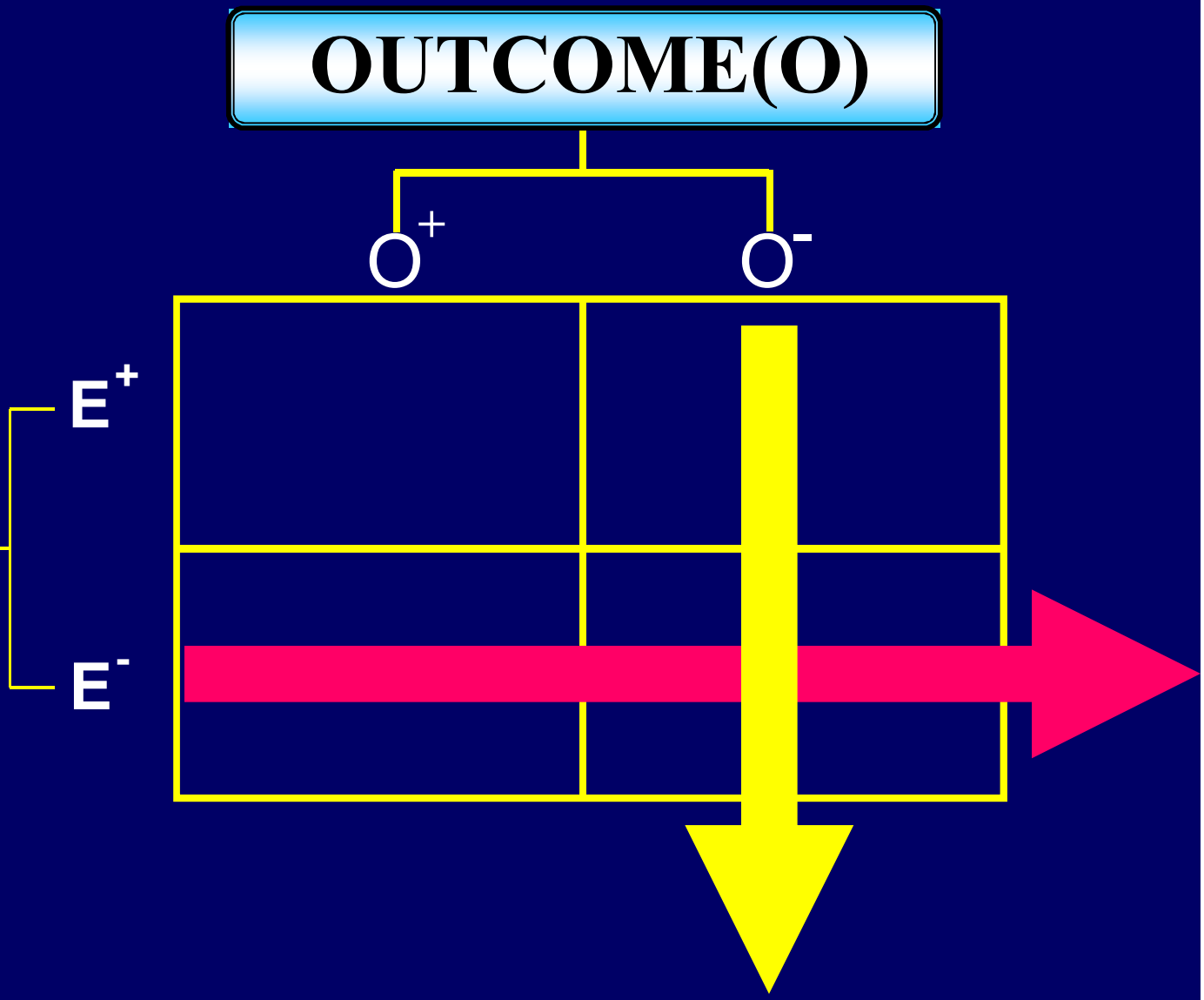
- RESULTS ON SECOND DAY FOLLOWING TREATMENT

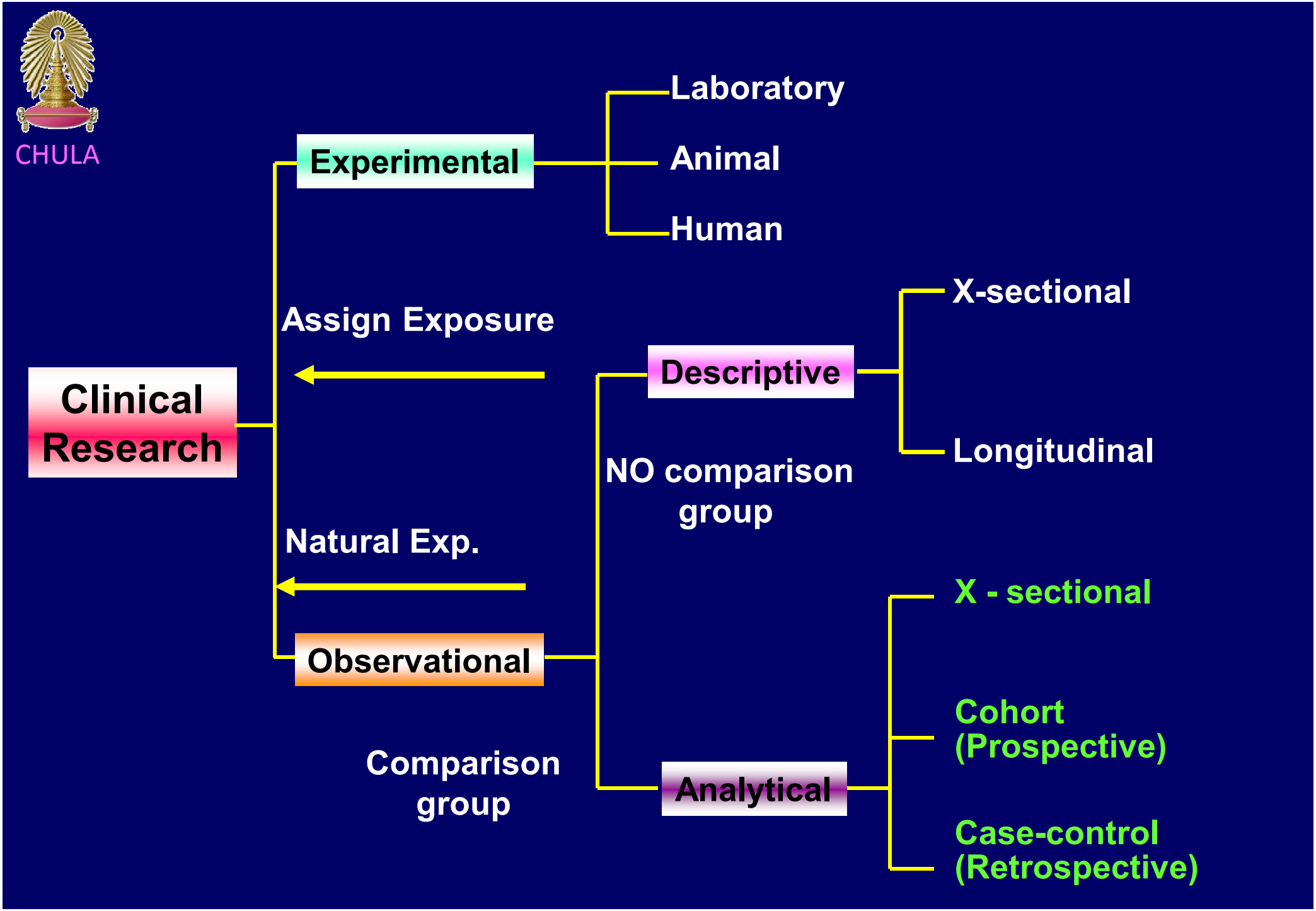
CHULA

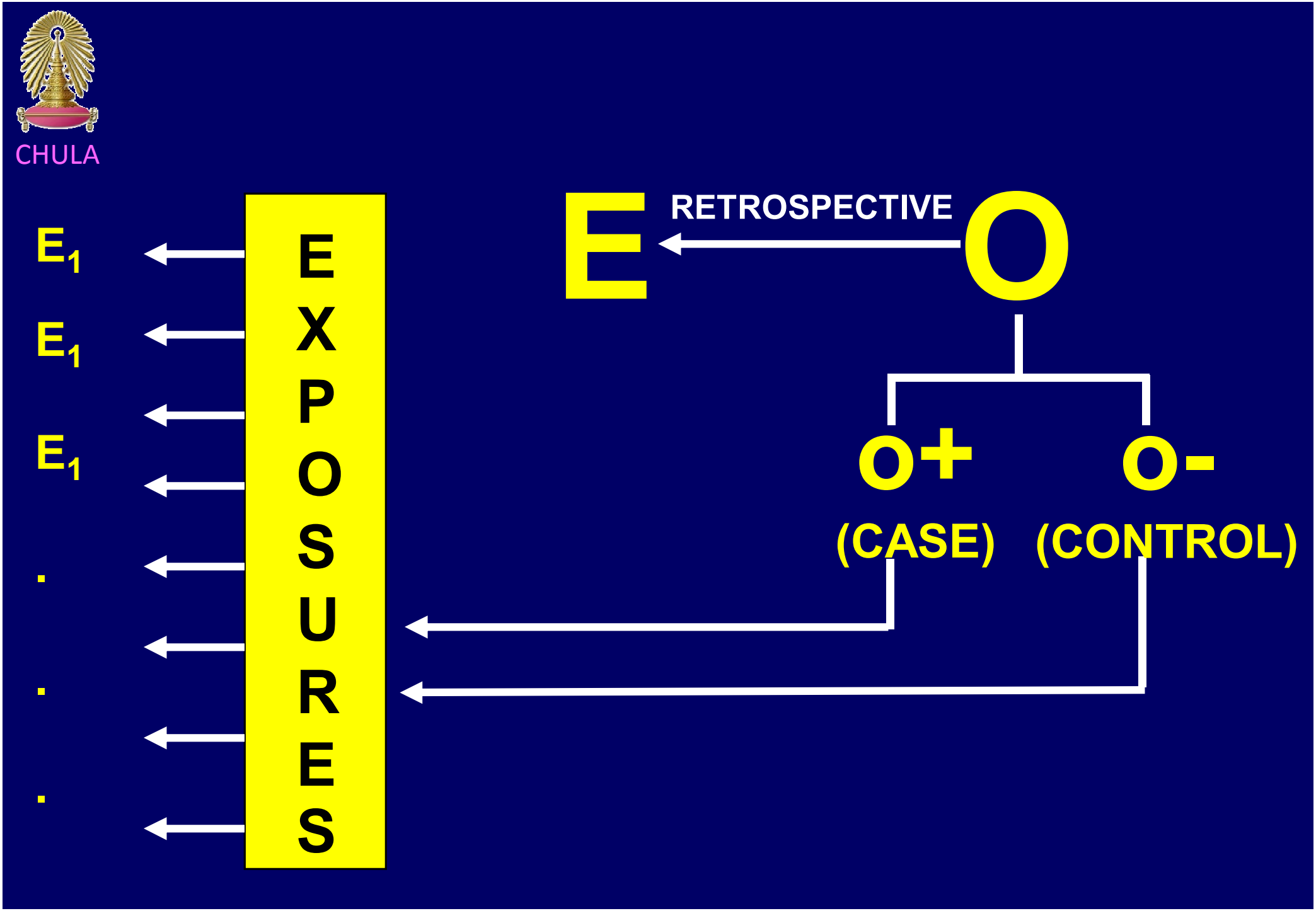
Assign Natural Exp.

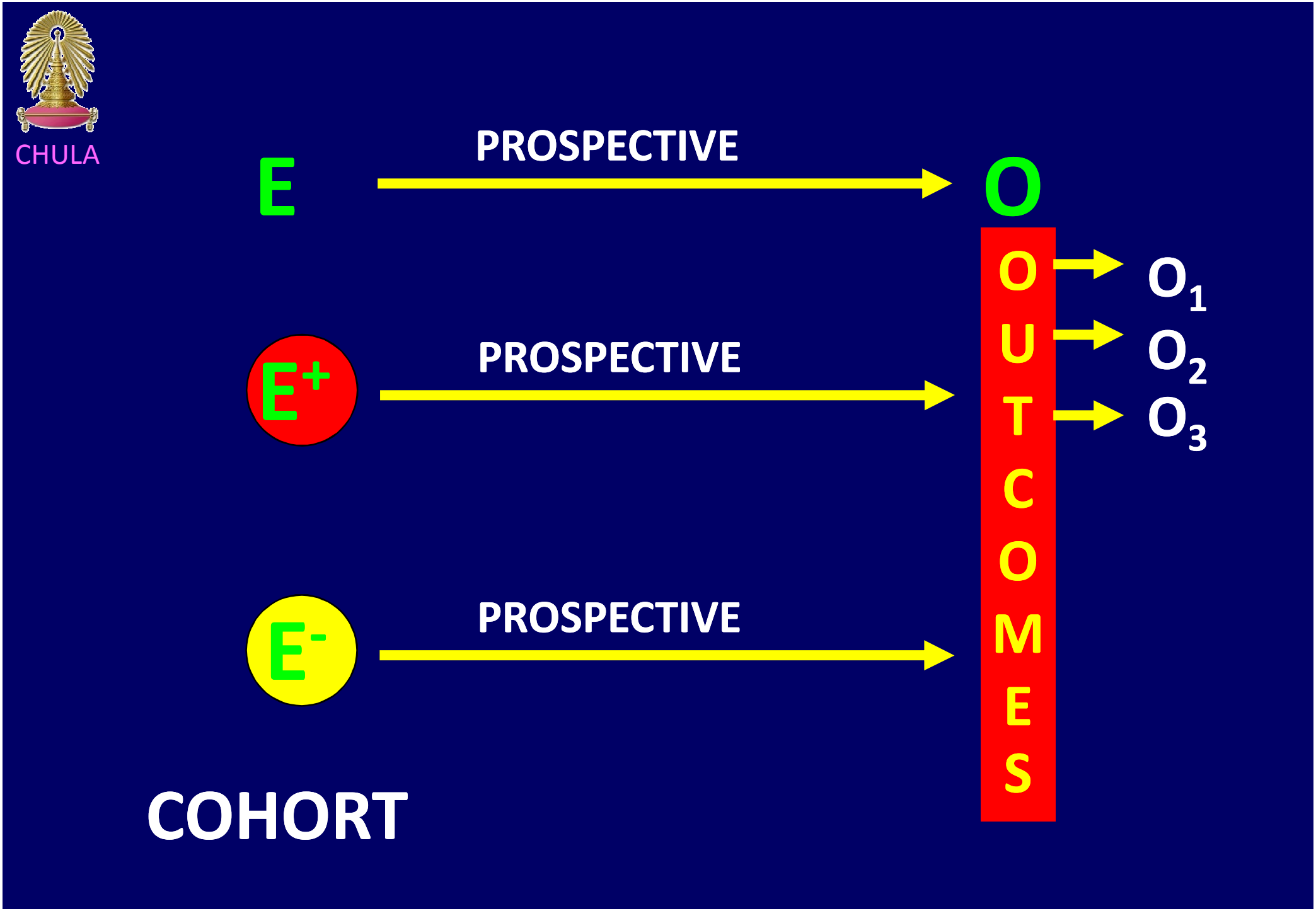
EXPOSURE (E)

Intervention (Manoeuvre)

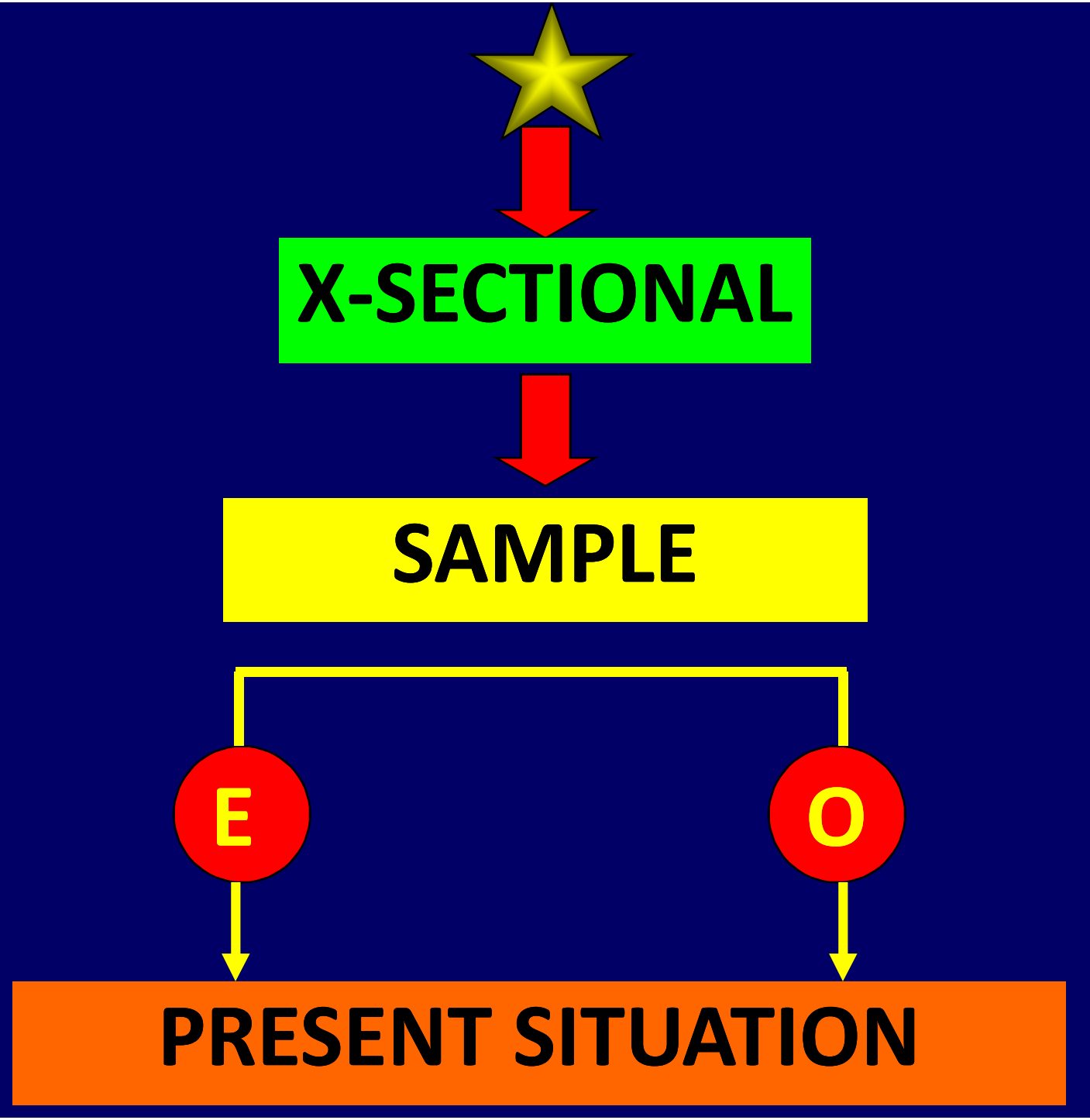


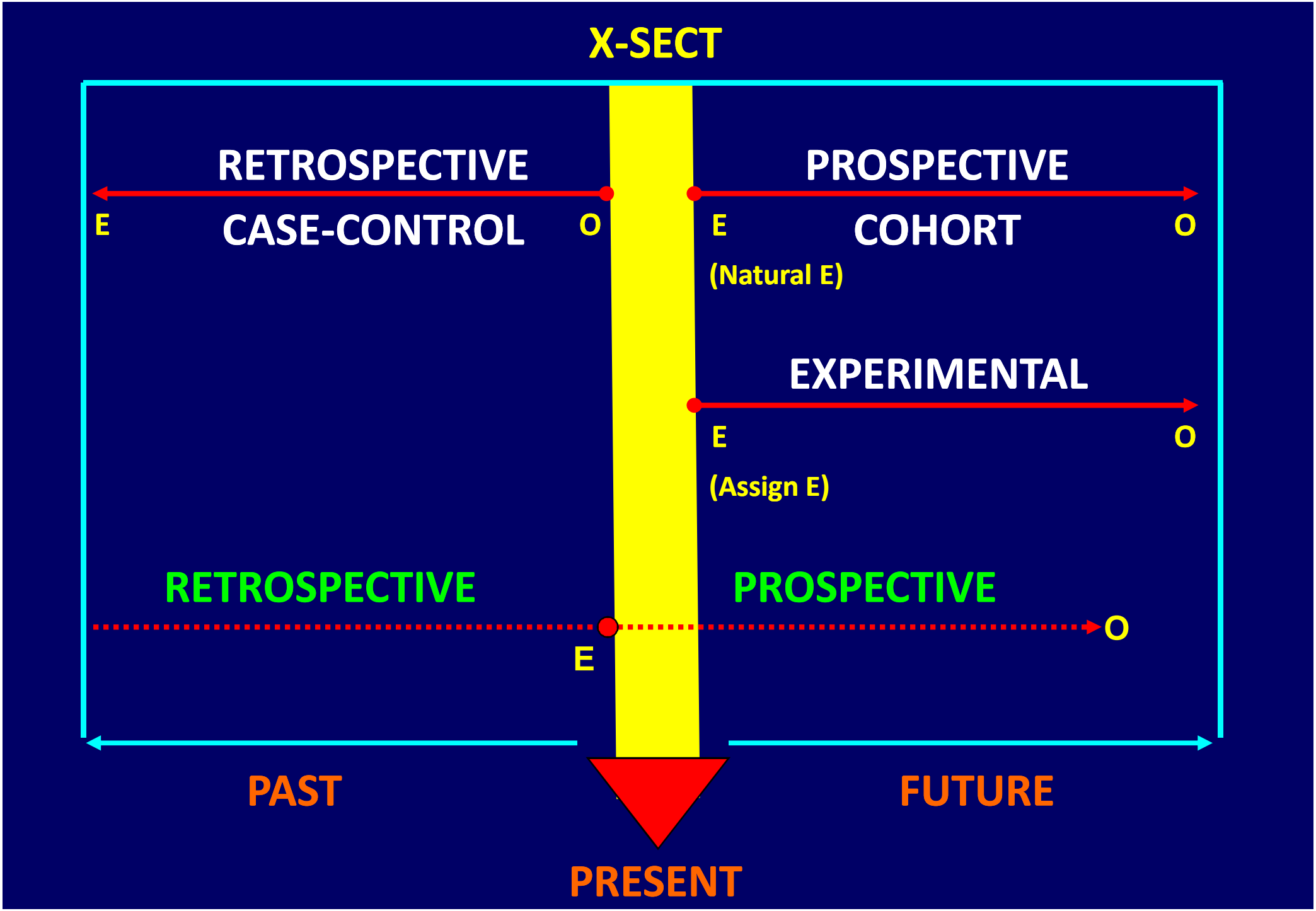

CHULA
Clinical Research
Experimental
Laboratory
Animal
Human
Assign Exposure
Natural Exp.
Observational
Comparison group
Descriptive
NO comparison group
X-sectional
Longitudinal
Analytical
X - sectional
Cohort (Prospective)
Case-control (Retrospective)


CHULA
E1
E1
E1
.
.
.
EXPOSURES
E
RETROSPECTIVE
O
O+
O-
(CASE)
(CONTROL)


CHULA
E
PROSPECTIVE
O
O
U
T
C
O
M
E
S
O_1
O_2
O_3
E^+
PROSPECTIVE
E^-
PROSPECTIVE
COHORT

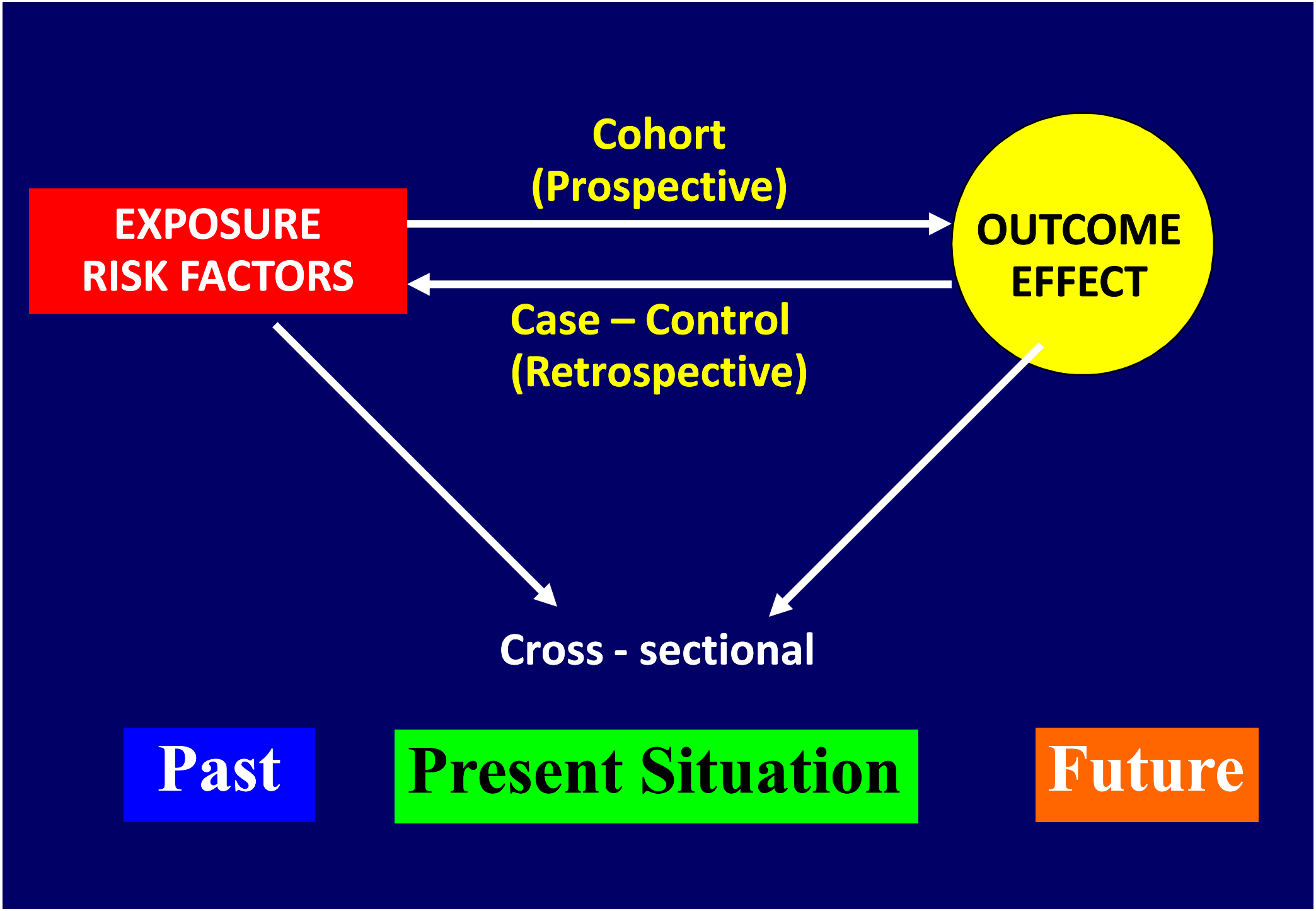
CHULA

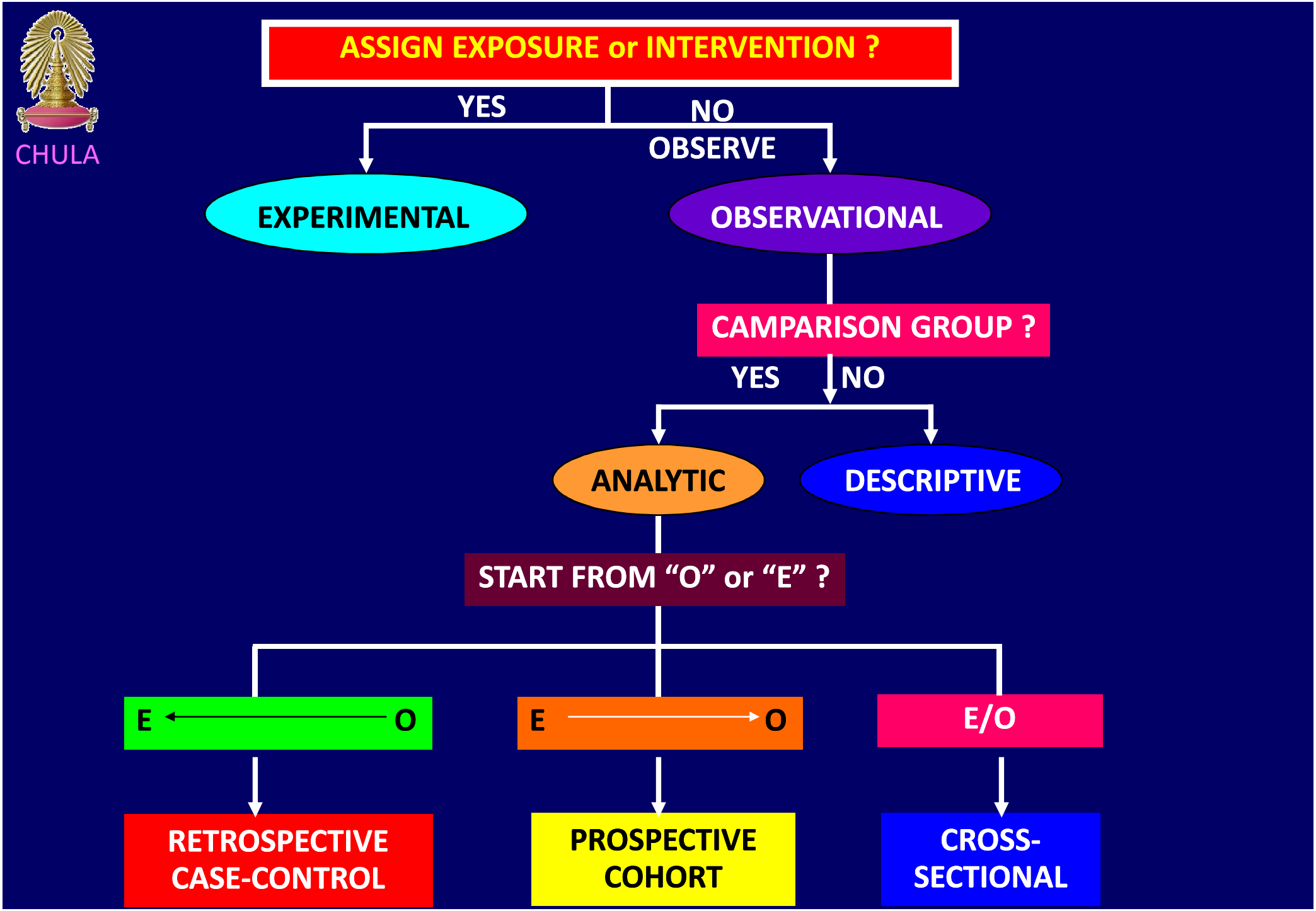



X-SECT
RETROSPECTIVE
CASE-CONTROL
E
O
PROSPECTIVE
COHORT
E
(Natural E)
O
EXPERIMENTAL
E
(Assign E)
O
RETROSPECTIVE
PROSPECTIVE
E
O
PAST
FUTURE
PRESENT

CHULA

		OUTCOME	
		O^+ (Case)	O^- (Control)
EXPOSURE	E^+		
	E^-		


Cohort
(Prospective)
EXPOSURE
RISK FACTORS
OUTCOME
EFFECT
Case – Control
(Retrospective)
Cross - sectional
Past
Present Situation
Future


CHULA
ASSIGN EXPOSURE or INTERVENTION ?
YES
NO
OBSERVE
EXPERIMENTAL
OBSERVATIONAL
CAMPARISON GROUP ?
YES
NO
ANALYTIC
DESCRIPTIVE
START FROM "O" or "E" ?
E
O
E
O
E/O
RETROSPECTIVE CASE-CONTROL
PROSPECTIVE COHORT
CROSS-SECTIONAL

CHULA

Based on Target

- การวิจัยพื้นฐาน (Basic Research)
- การวิจัยประยุกต์ (Applied Research)

Based on Topic

- Literature Research
- Clinical Research
- Laboratory Research
- Animal Research
- Community Research
- Operational Research

CHULA

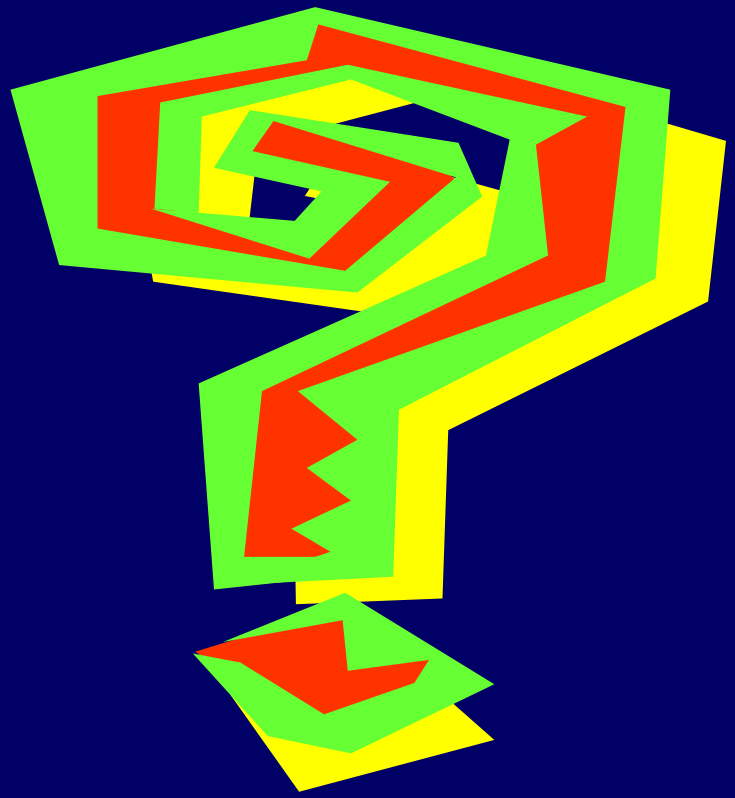
Based on Perspective

- Retrospective
- Prospective

Based on Design

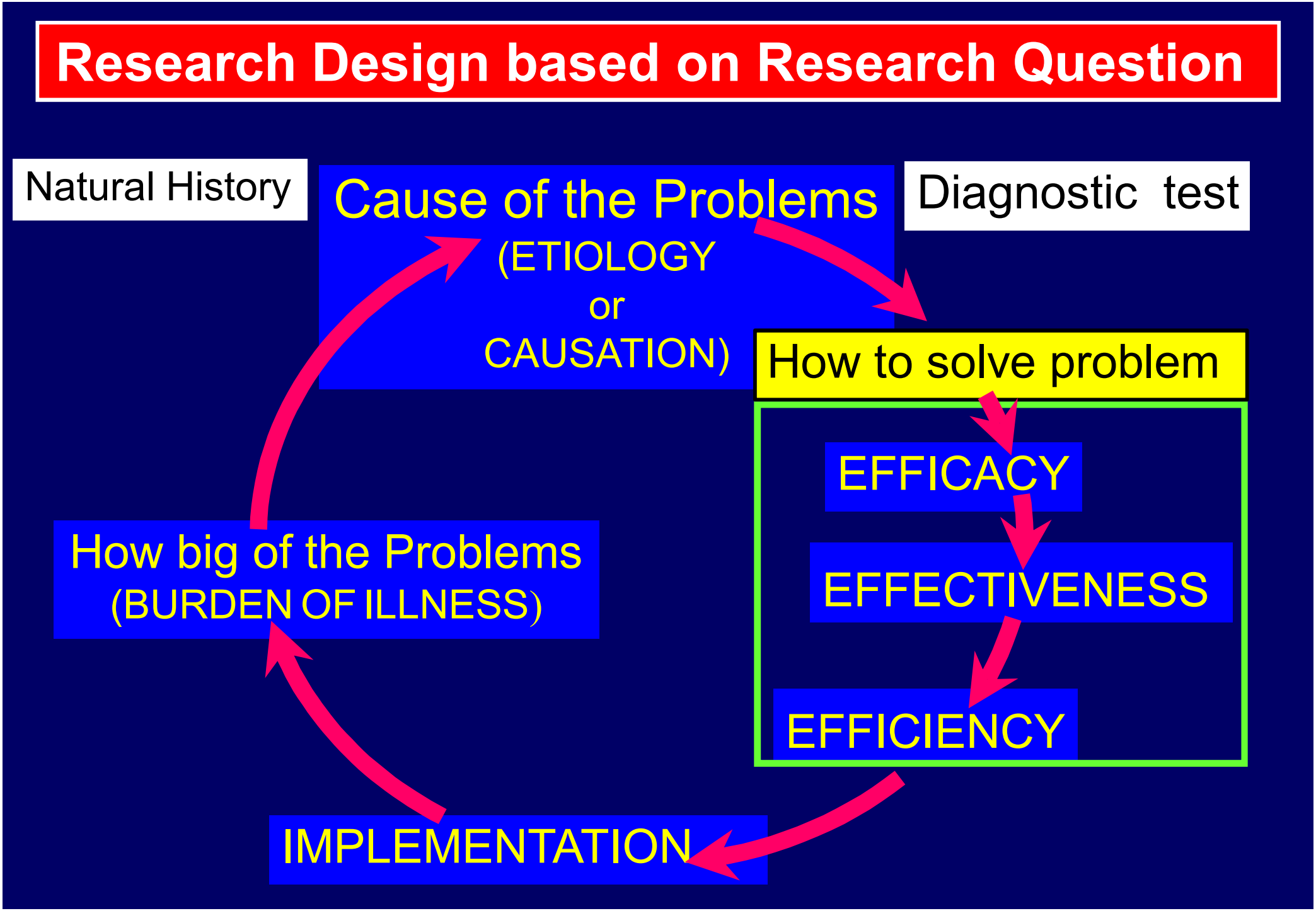
- Descriptive
- Analytic
- Experimental

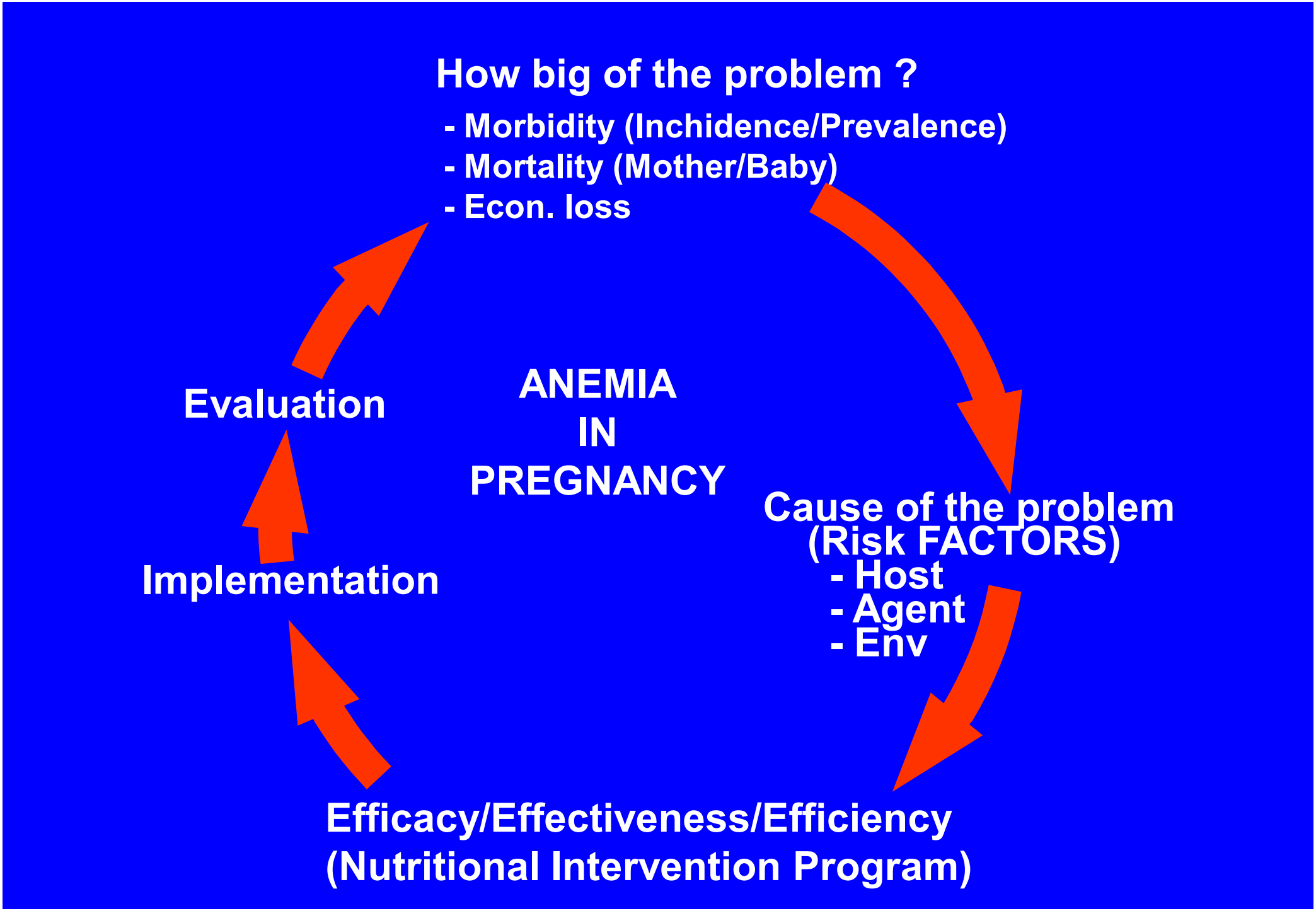
CHULA

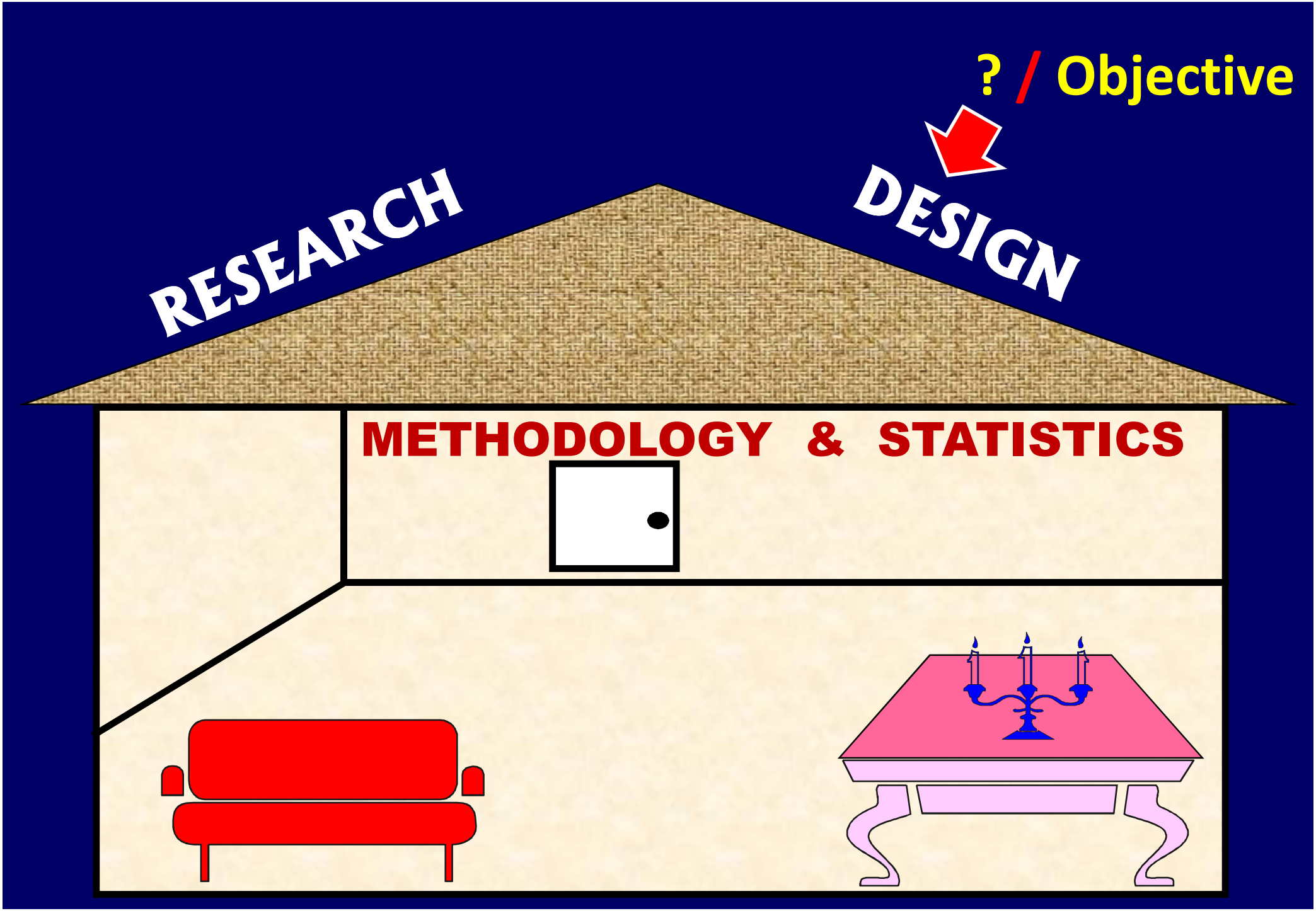


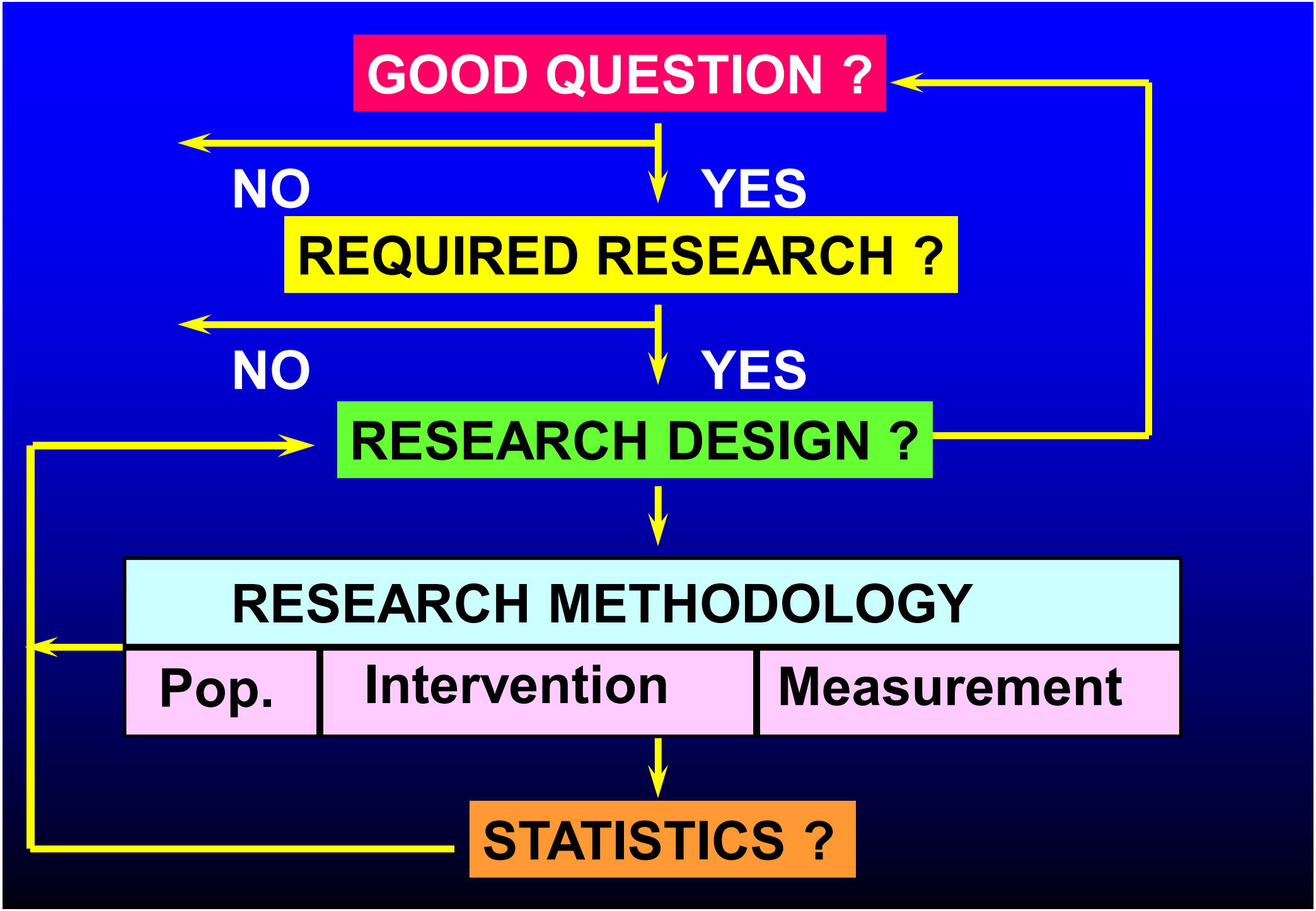
RESEARCH QUESTION (S)

Research Design based on Research Question

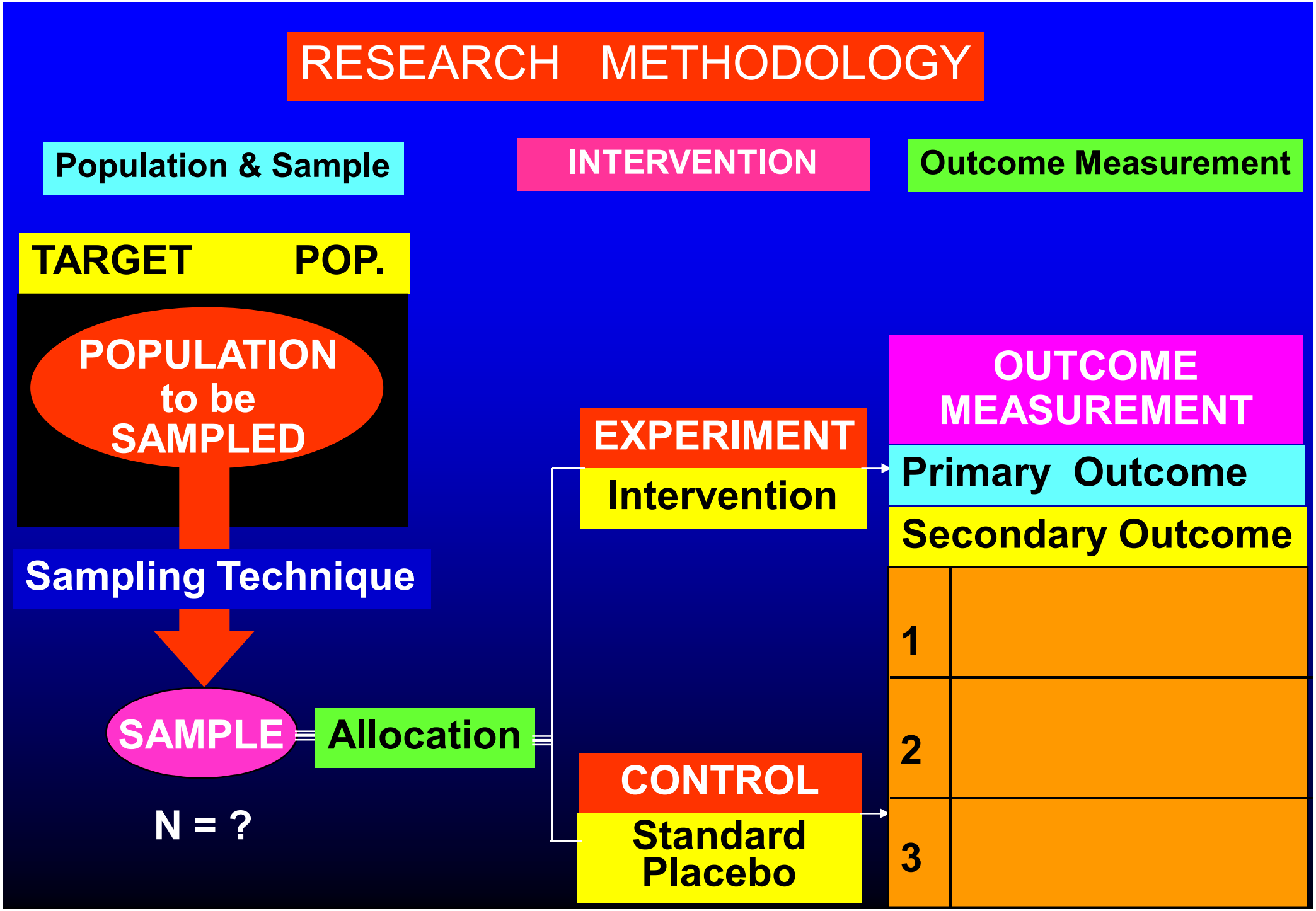


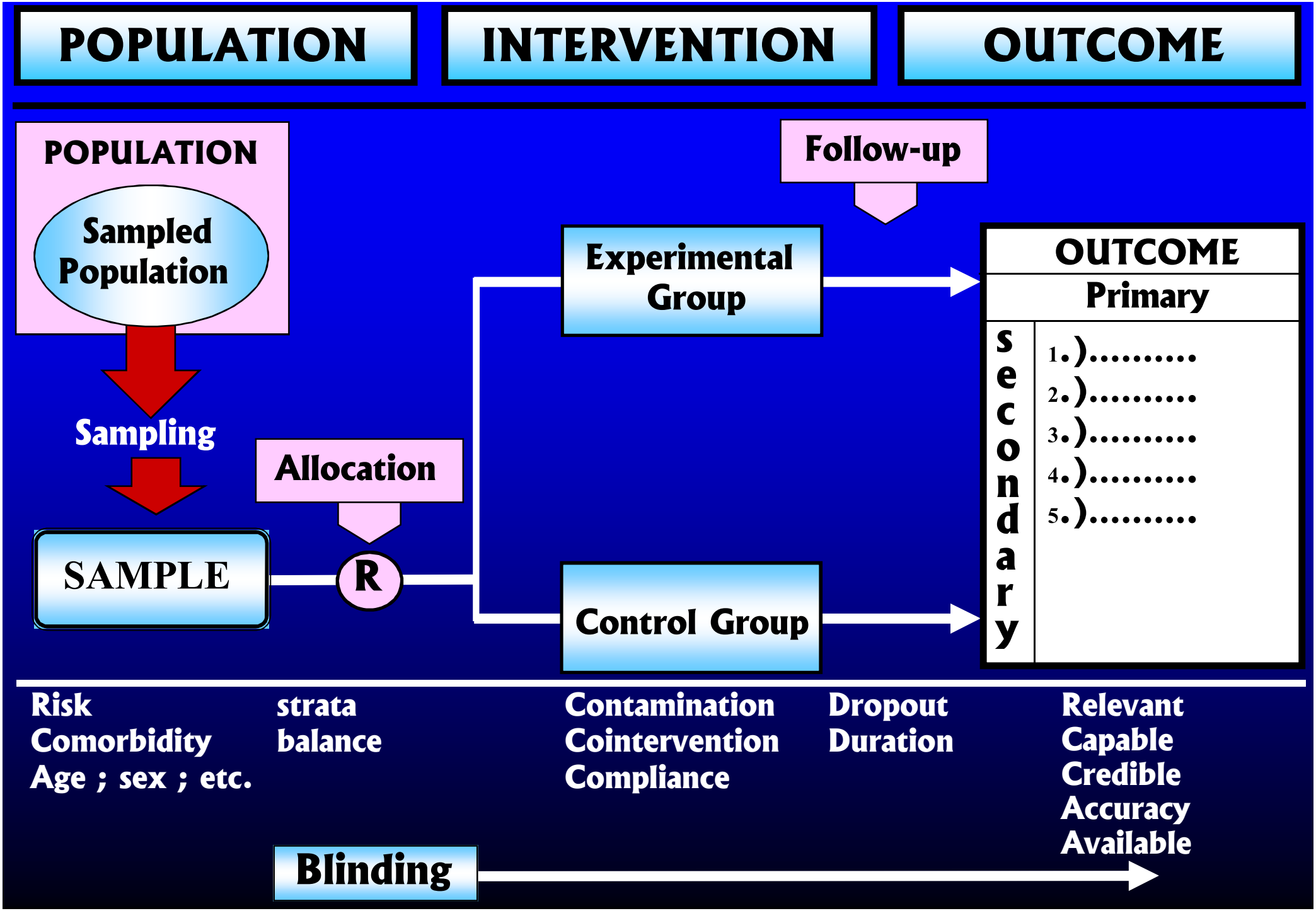

How big of the problem ?
- Morbidity (Inchidence/Prevalence)
- Mortality (Mother/Baby)
- Econ. loss
ANEMIA
IN
PREGNANCY
Cause of the problem
(Risk FACTORS)
- Host
- Agent
- Env
Efficacy/Effectiveness/Efficiency
(Nutritional Intervention Program)
Implementation
Evaluation

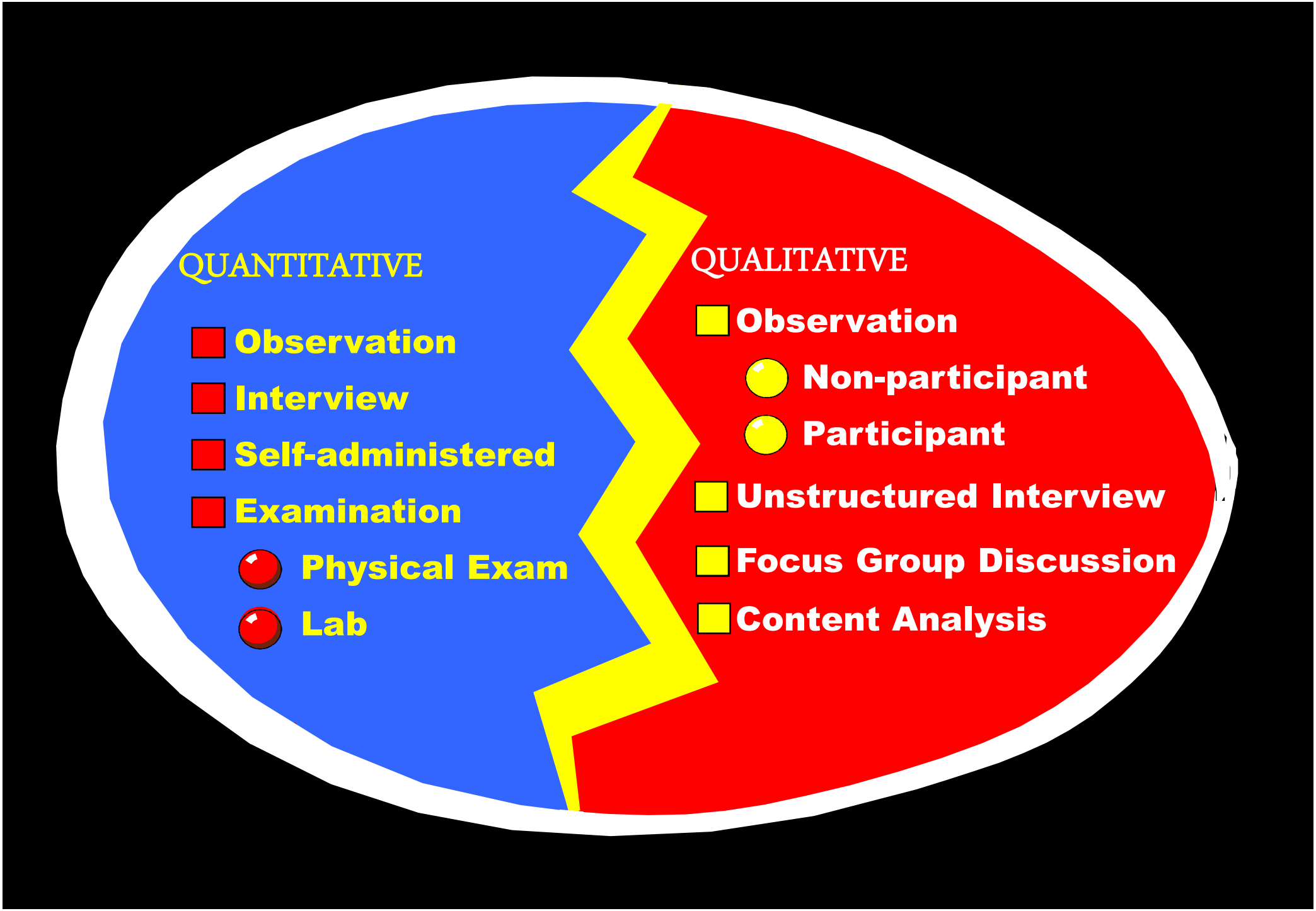

? / Objective
RESEARCH
DESIGN
METHODOLOGY & STATISTICS

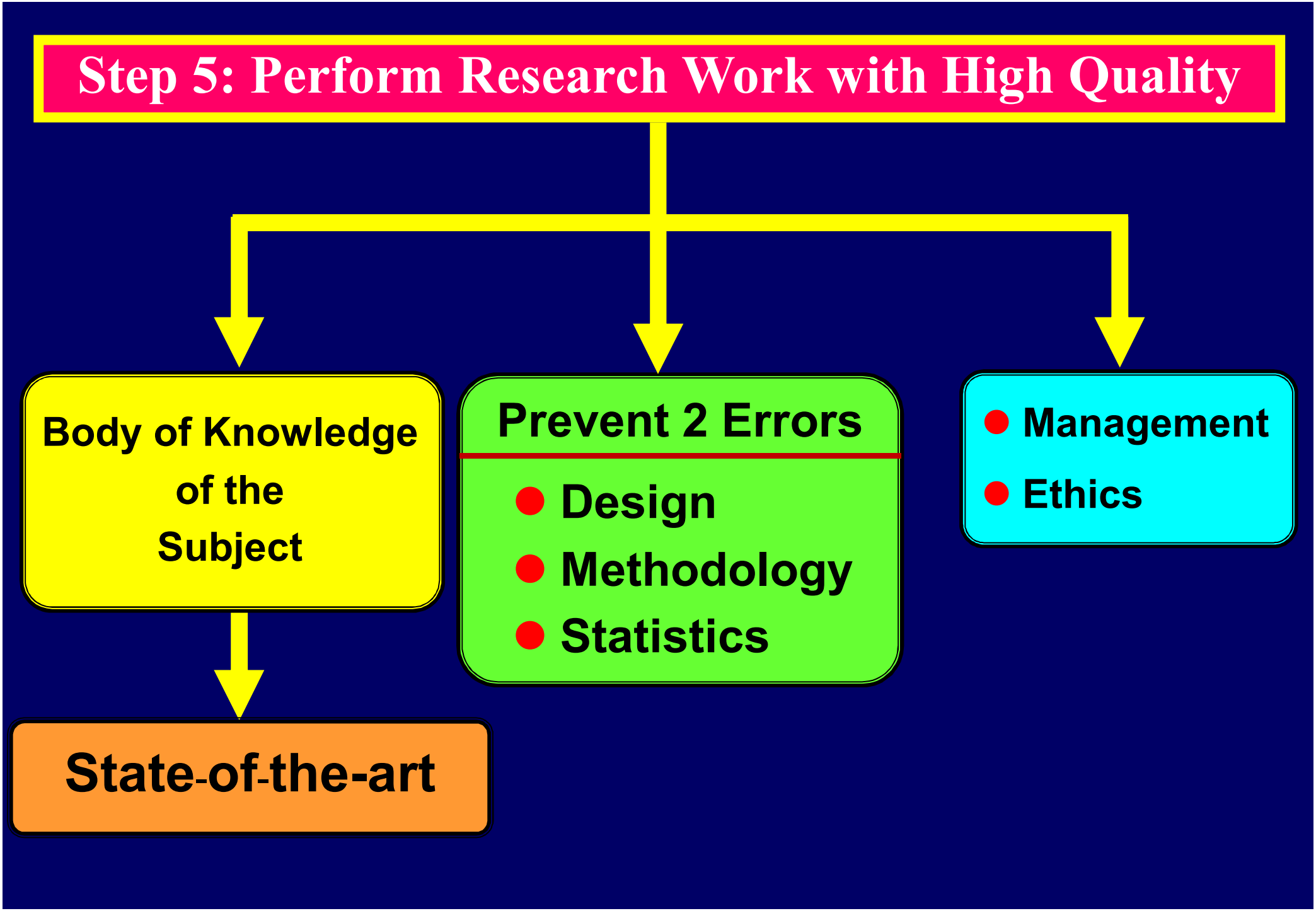

GOOD QUESTION ?
NO
YES
REQUIRED RESEARCH ?
NO
YES
RESEARCH DESIGN ?
RESEARCH METHODOLOGY
Pop.
Intervention
Measurement
STATISTICS ?

RESEARCH METHODOLOGY


RESEARCH METHODOLOGY
Population & Sample
INTERVENTION
Outcome Measurement
TARGET POP.
POPULATION to be SAMPLED
Sampling Technique
SAMPLE
Allocation
N = ?
EXPERIMENT
Intervention
CONTROL
Standard Placebo
OUTCOME MEASUREMENT
Primary Outcome
Secondary Outcome
1
2
3

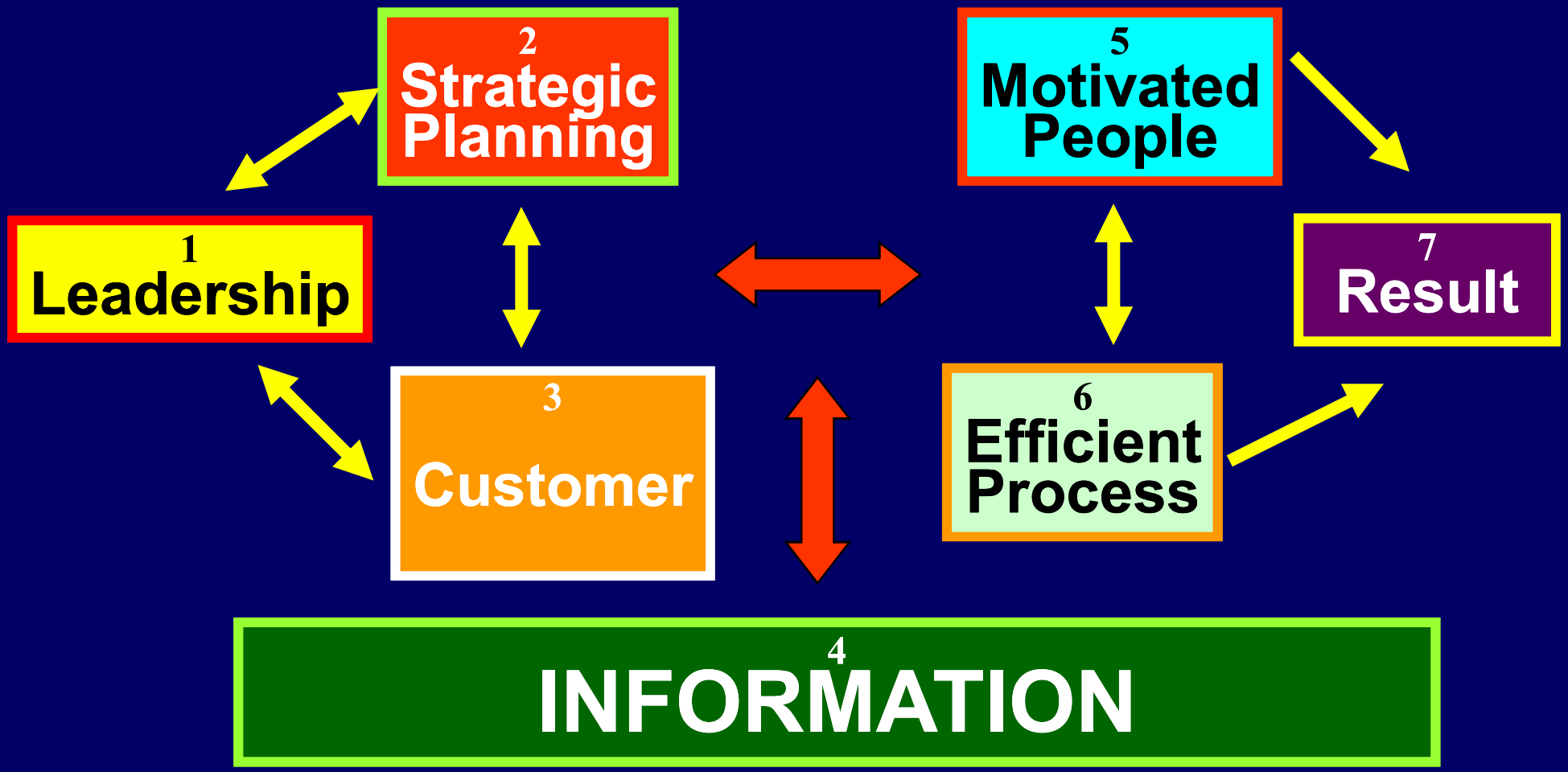

POPULATION
INTERVENTION
OUTCOME
POPULATION
Sampled Population
Sampling
SAMPLE
Allocation
R
Follow-up
Experimental Group
Control Group
OUTCOME
Primary
secondary
1.)……
2.)……
3.)……
4.)……
5.)……
Risk
Comorbidity
Age ; sex ; etc.
strata
balance
Contamination
Cointervention
Compliance
Dropout
Duration
Relevant
Capable
Credible
Accuracy
Available
Blinding


QUANTITATIVE
Observation
Interview
Self-administered
Examination
Physical Exam
Lab
QUALITATIVE
Observation
Non-participant
Participant
Unstructured Interview
Focus Group Discussion
Content Analysis


Step 5: Perform Research Work with High Quality
Body of Knowledge of the Subject
State-of-the-art
Prevent 2 Errors
Design
Methodology
Statistics
Management
Ethics

CHULA

Modern Management Framework



LEADERS

- Understanding people & involving them
- To help you do a job to reach objective
- Managers V.S. Leaders

Managers

- People who do thing right !

Leaders

- People who do the right thing !!

(Warren Bennis)

Characteristics of Good Leader

- Integrity
- Dedication of Purpose
- Self lessness
- Knowledge
- Implacability
- Determination not to accept failure
- Skill (Conceptual, Technical, Human Relation)

"Human Relation" is VERY Important to Leadership

6 **Most Important Words:**
"I admit I made a mistake"

5 "You did a good job"

4 "What is your opinion ?

3 "If you please"

2 "Thank you"

1 "WE"

● **Least Most Important Word : "I"**

Human Resources Management (HRM)

- **EXTERNAL**
  - Funding Agencies / Sponsor
  - Monitor
  - IRB / EC
  - Policy Makers
  - Academics
- **INTERNAL** → Responsibility (WHO will do WHAT, HOW MUCH, HOW,…)
  → Credit (Percentage)
  - Principle Investigator (Not a HERO but TEAM)
  - Co-investigators
  - Research Assistants
  - Supporters (LAB, x-ray)
- **SUBJECT** (Compliance)

Principles of Leadership

- Know yourself & Seek self-improvement
- Be Technically Proficient
- Seek Responsibility & Take Responsibility for your Actions
- Make Sound & Timely Decision
- Set the Example (be a Good Role Model)
- Know your People & look out for their Well-being

Principles of Leadership

- Keep your People Informed (Effective Communication)
- Develop a sense of Responsibility in your People
- Ensure the tasks are Understood, Supervised & Accomplished
- Train your People as a Team
- Use the Full Capacities of you Organization (Develop Team Spirit)

4 Major Factors of Leaderships

1.FOLLOWER

- Different people require different styles of leadership
- Having good understanding of human nature (Needs, Emotions & Motivation)

2.LEADER

3.COMMUNICATION (2-way communication)

4.SITUATION

- All Situation are different
- Decide the best course of action & Leadership Style needed for each situation

TEAM WORK

- **T** rust (เชื่อใจซึ่งกันและกัน)
- **E** nthusiasm (กระตือรือร้น)
- **A** greement (ประคับประคอง)
- **M** utual Benefit (ผลประโยชน์ร่วมกัน)
- **W** illingness (ตั้งใจ & เต็มใจ)
- **O** pportunity (ให้โอกาสฯ)
- **R** ecognition (ยอมรับนับถือ)
- **K** nowledge Transfer (แลกเปลี่ยนความรู้)

Leadership in Knowledge Organization

- To lead people ⇨ Walk beside them !
- Best Leader ⇨ People do not notice their existence
- Next Best ⇨ People honor & praise
- Next ⇨ People fear !
- Next ⇨ People hate !!!

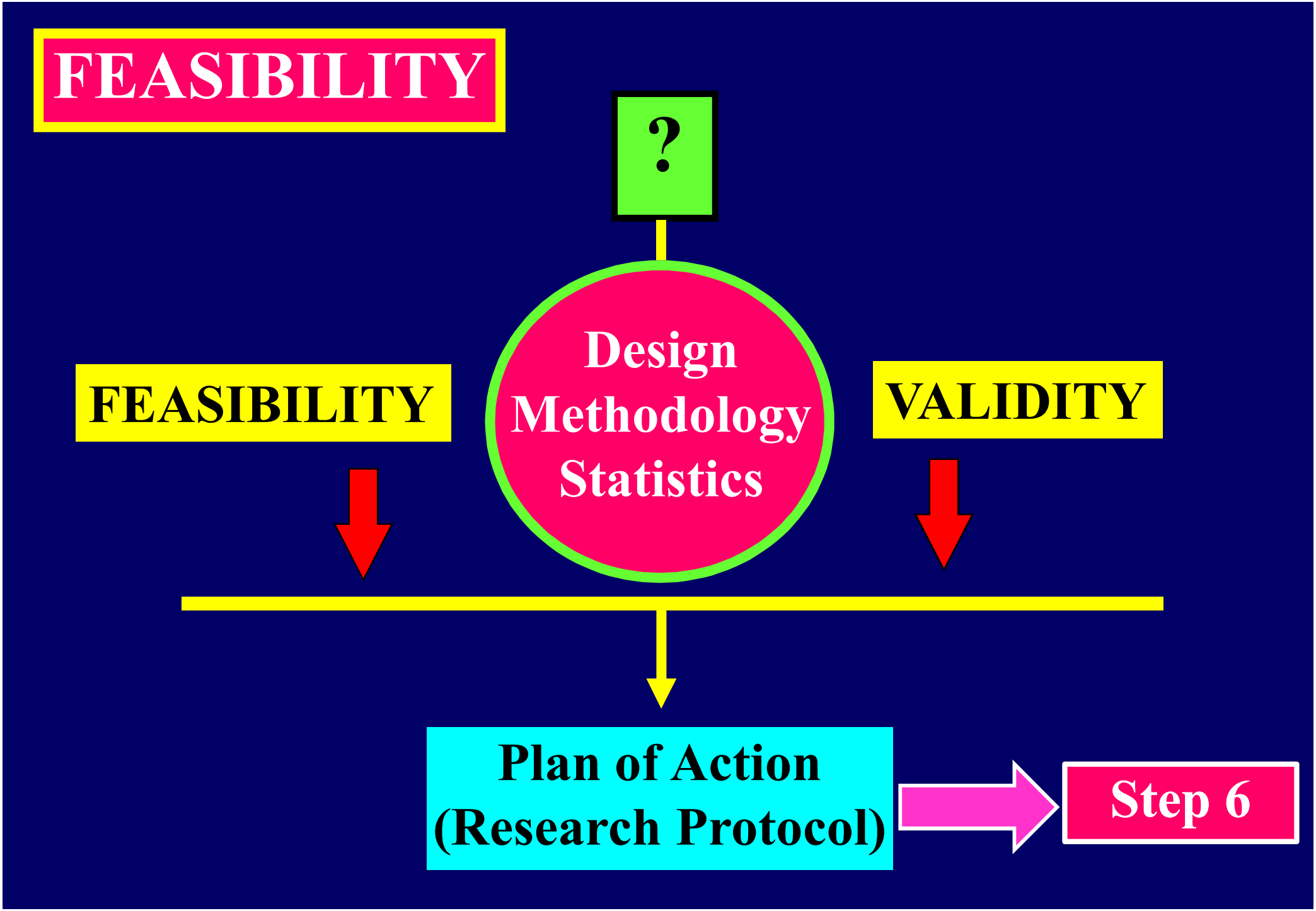
When the best leader's work is done, people say…….

"We did it ourselves"

(Lao-tsu)

ETHICS : NORM

- Scientific Design
- Competent Investigator
- Risk / Benefit Balance
- Inform Consent
- Confidentiality
- Selection of Subjects
- Compensation of Injury


FEASIBILITY
?
Design
Methodology
Statistics
FEASIBILITY
VALIDITY
Plan of Action
(Research Protocol)
Step 6

Step 6: Proposal Development

- WRITTEN AGREEMENT
- DOCUMENT TO ASSIST COMMUNICATION
- DEVELOP BEFORE THE BEGINNING OF THE TRIAL
- REMAIN ESSENTIALLY UNCHANGED

PRE-PROPOSAL

OBJECTIVES :

- Clarifies personal thoughts
- Allow initial assessment of relevance, quality and feasibility

CONTAIN (2-5 pages) :

- Title
- Research Question (s) / Objective (s)
- Hypothesis (it any)
- Rationale
- Brief Research Design & Methodology
- Limitation
- Implication
- Time schedule

RESEARCH PROTOCOL

- TITLE
- RESEARCH QUESTION (s)
- HYPOTHESIS
- OBJECTIVES
- REVIEW LITERATURES
- DESIGN ARCHITECTURE
- METHODOLOGY
  - SAMPLE SPECIFICATION
  - INTERVENTION/MANOEUVRE
  - OUTCOME MEASUREMENT
- ANALYSIS
- PILOT STUDY
- TIME TABLE
- ETHICS

WRITING RESEARCH PROPOSAL

Answer 3 Main Questions

To answer the question of **WHY**

Can use one of these headings

- Introduction
- Background
- Background & Significance of the Problem
- Rationale
- Background & Rationale
- The Problem
- Problem & Its Significance, etc.

To answer the question of **WHAT**

Objectives

General

Specific Objectives

1. .....
2. .....
3. .....

To answer the question of

HOW ?

Conceptual Framework
Research Design

METHODOLOGY

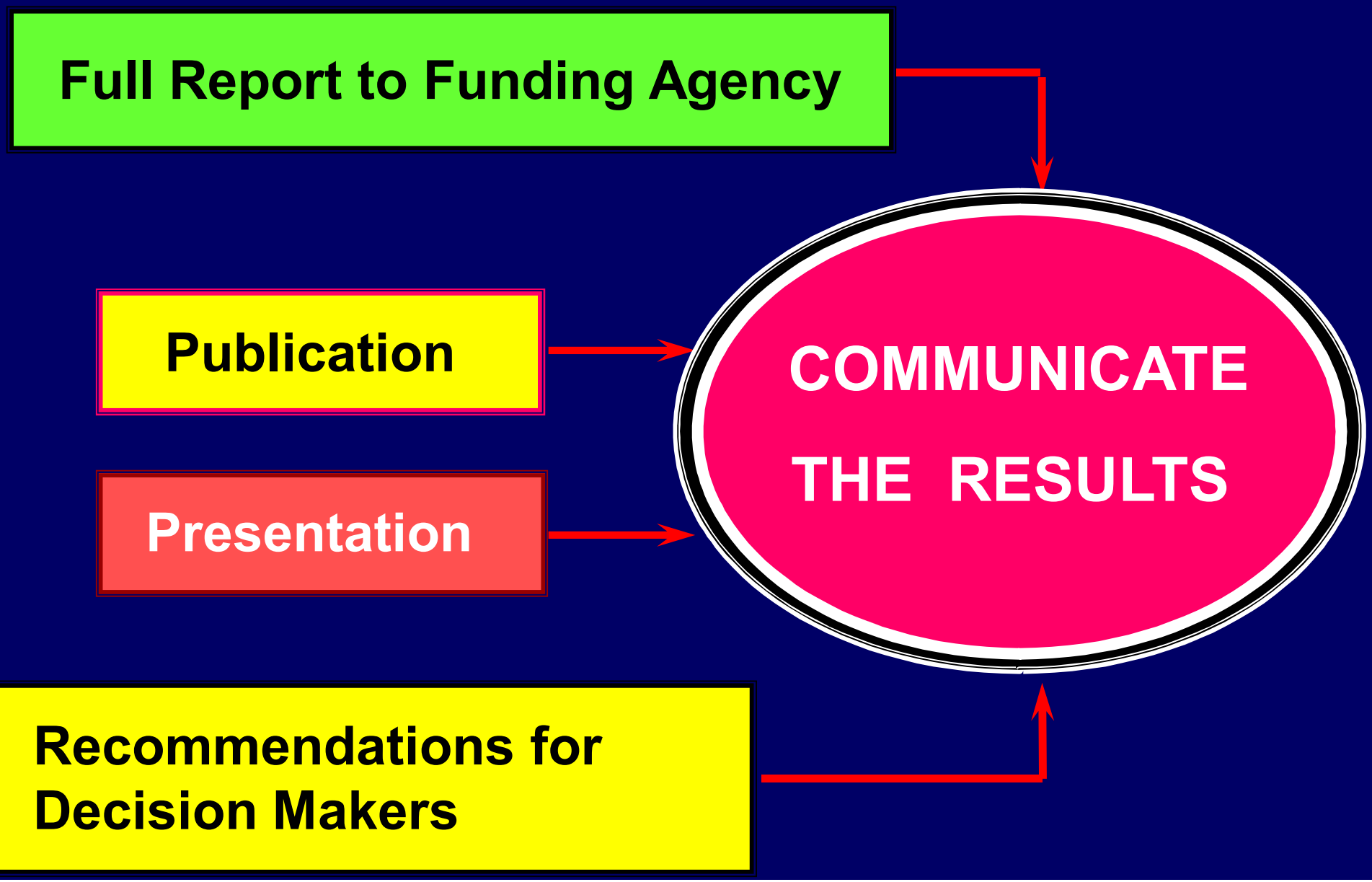
What will I use ?
How will I use it ?

Population & Sample

What will I do ?
How will I do it ?

Intervention (it any)
Outcome Measurement
Analysis

Step 7: Communicate the Results



6 QUESTIONS

- Why did you do?
- What did you do?
- How did you do?
- What did you find?
- What does it mean?
- What's new?

MAKING A PLAN FOR THE ARTICLE

INTRODUCTION

- Why did I do the work?
- What were the objectives (What did I want to find out?)

MATERIALS

- Why did I use & how did I use it?

METHODS

- Why did I do & how did I do it?

RESULTS

- What happened?

MAKING A PLAN FOR THE ARTICLE

DISCUSSION

- What does it all mean?

CONCLUSION

- What are the Implication?

ACKNOWLEDGEMENTS

- Who helped me?

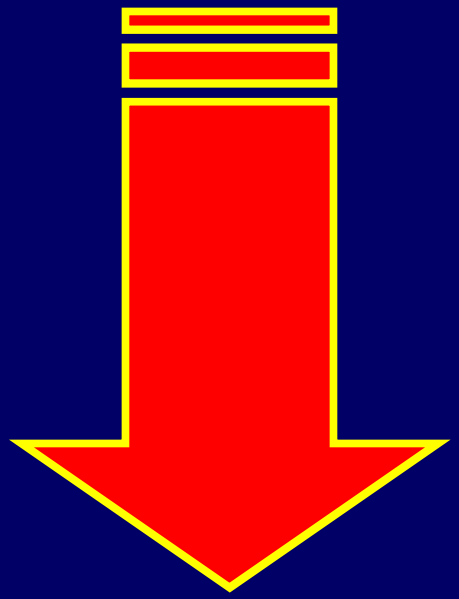
REFERENCES

- Who have I cited in the text?

Step 8: Research into Action

RESEARCH

in to



ACTION

CHULA

HEALTH POLICY
PUBLIC POLICY
SYSTEM POLICY
CLINICAL POLICY

Step 9: Intellectual Property

TiO_2 Coating

วัสดุยืดอายุการเก็บรักษาผักและผลไม้สด

Hi-Crop 80

CM. test

AM. test

Requirements

- CLEAR MIND
- RIGHT CONCEPT
- SEEK HELP
- CREATE NET WORK
- DO IT FAST
- PERSISTENCE

9 Steps of High Quality Research

9 : Intellectual Property

8 : Research into Action

7 : Communicale the Result

6 : Proposal Development

5 : Perform research work with high quality

4 : Research questions should identify & define clearly

3 : That “topic” required research or not ?

2 : What “aspect” of that research topic?

1 : How to get “Research Topic”

Successful Research Strategies

9 STEPS

in RESEARCH PROCESS

of HIGH Quality Research

Thank you