CMED 305 course Orientation
&
Introduction to Research

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Introduction to Course

Course Objectives

The overall objectives of this course are to enable students understand & learn the basic elements of research, its design and conduct an epidemiological research study to answer a specific research question of interest.

Learning Methods for the course

- Course Units: ~ 6 academic credits

<u>Learning methods over the academic year include</u>

- lectures (~ 28 contact hours),
- tutorials (~ 30 contact hours), &
- research group works with supervisor (~ 32 hours).

- **<u>Self</u>** initiative and learning is needed from students for a good outcome

Course Concepts taught in lectures & tutorials

- How to formulate a research question and development of a study protocol
- Designing of an epidemiological study
- Ethics in research and avoiding plagiarism
- Biostatistics concepts and skills in data management & analysis
- Data interpretation, presentation of study findings

Focus on the entire process of concepts taught in lectures & tutorials to link with a research topic.

Research Supervisor

- The Research Supervisor, who is a faculty or expert in the research & specific topic of interest, will help you to choose research topic, formulate the research question and also supervising towards:

  -the development of protocol,

  -monitor the conduct of study,

  -using appropriate scientific & ethical methods

Supervisor Selection

- Based on your topic of interest
- Initiated during the first week of classes and will be completed within 2 weeks.
- Important points for selection of supervisor are:
  - -- availability,
  - – time commitment,
  - – conforming to schedule, and
  - – communication methods.
  - – *Change in topic and supervisor is time constrained and usually leads to incomplete work, missing deadlines which will affect the final grades. Hence careful selection of topic and supervisor is important.*

Formation of Research Group

- 4-6 students per group.
- Males and females will make separate groups.
- The supervisor - supervisee relationship needs to be strengthened with mutually accepted expectations on both sides.
- The supervisor provides quality time, while students are expected to observe discipline, give respect and express maximum learning attitude.

Source of data for research study

- **Preference should be given for primary data**

  -- From Community (general population)
  -- From outpatients and inpatients of any hospital
  -- From the schools and colleges
  -- From Government organizations and Industries

- For secondary data

  -- From Medical records,
  Registries of Cancer and Diabetes etc.,

Now due to Covid19 online data collection could be done

Course Manual

- All information in details is present in Manual
- Responsibilities of supervisors and students
- Guidelines to develop protocol
- Guidelines for collaboration within and outside KSU
- Assessment Methods
- Evaluation forms that will be used by supervisors and for oral presentations.

Submission Dates and Deadlines

Title of document / Form	Dates
Supervisor Agreement Form & Supervisor's Research activity form	February 14,2021
Study title, question, objectives, hypothesis, and study design	March 14, 2020
Protocol Submission for Ethical Review Committee	May 1st week,2021

Assessment & Marks Distribution

I. Examinations (40%)

1. Midterm: 15% (May, 2021)
2. Final exam: 25%(December,2021)

II. Continuous Assessment (60%)

1. Research Project (40%):
   - For Research proposal presentations (5%)
   - For Results of research project (5%)
   - For Final manuscript by supervisor (10%); & CM unit review committee (15%);
   - For Oral Presentation by assigned evaluators (5%);
2. Other items(20%):
   - Quizzes – in Research methodology(10%) & Biostatistics(10%)

Introduction to Research
Why do we need research?

Session Objectives

- What is Research ? & Epidemiological research ?
- Why is research important ?
- How to start a research project ?
- What is a criteria of a research project ?
- What is the outline of a research protocol ?

Learning objectives:

At the end of this session, students will be able to:

1. Recognize benefits of engaging medical students in health research.
2. Define what is ' Research' & ‘Epidemiological research’
3. List the major characteristics of research.
4. Describe the main components of a research process.

What is “Research”

- Research is an Endeavour to discover answers to intellectual and practical problems through the application of scientific method.

- Research is the systematic process of collecting and analyzing information (data) in order to increase our understanding of the phenomenon about which we are concerned or interested.

SCIENTIFIC METHOD

Scientific method is the systematic collection of data (facts) and their theoretical treatment through proper observation, experimentation and interpretation.

Epidemiology

- The study of the distribution and determinants of health in humans

- It is the science of the occurrence of disease in human populations

… distribution and determinants…

- **Distribution**
- **‘What’ (the disease), plus ‘when’ + ‘where’ + ‘who’**

or the disease described by TIME + PLACE + POPULATION

- **Determinants**

The ‘Why’

= the ‘causes’, or risk factors

… distribution and determinants…

- **Distribution**

  What, when, where, who

  - **Descriptive studies**

- **Determinants**

  ‘Why’

What is associated with/ caused by

  - **Analytic studies**
  - **Interventive studies**

Population

- “a group sharing certain common characteristics”
- Do not have to be people (most often are)
- Does need to be clearly defined and specified

Pace of Change in Medicine

- Changing patterns of diseases
- Demographic transition & longevity
- Variation in patient population and clinical care in various geographical regions differs for many reasons

GLOBAL Public Health Challenges

Acute to Chronic Conditions

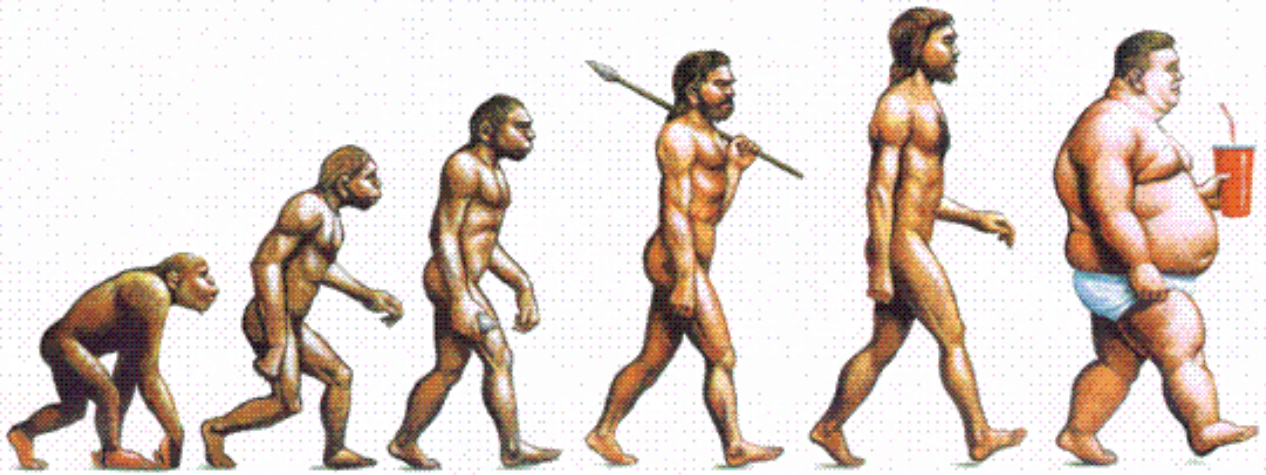
Aging Population

Health Disparities

Emerging and Re-emerging infectious Diseases

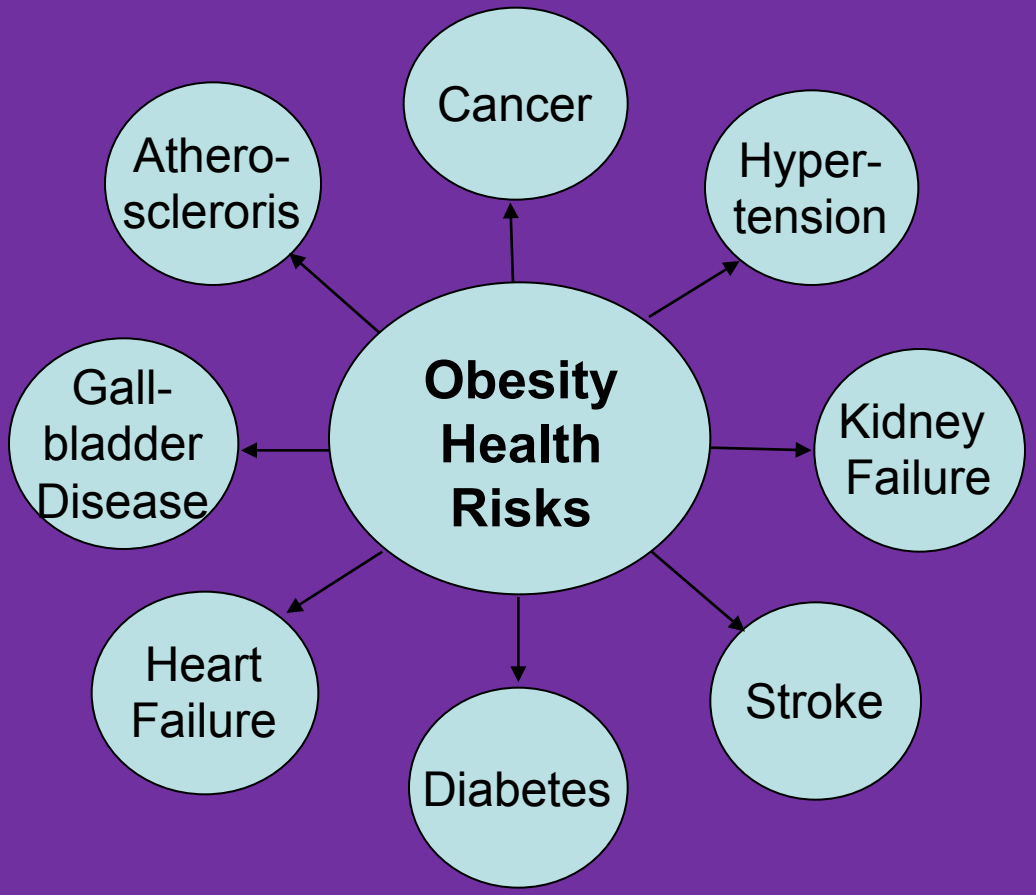
Emerging Non communicable diseases

The shape of things to come

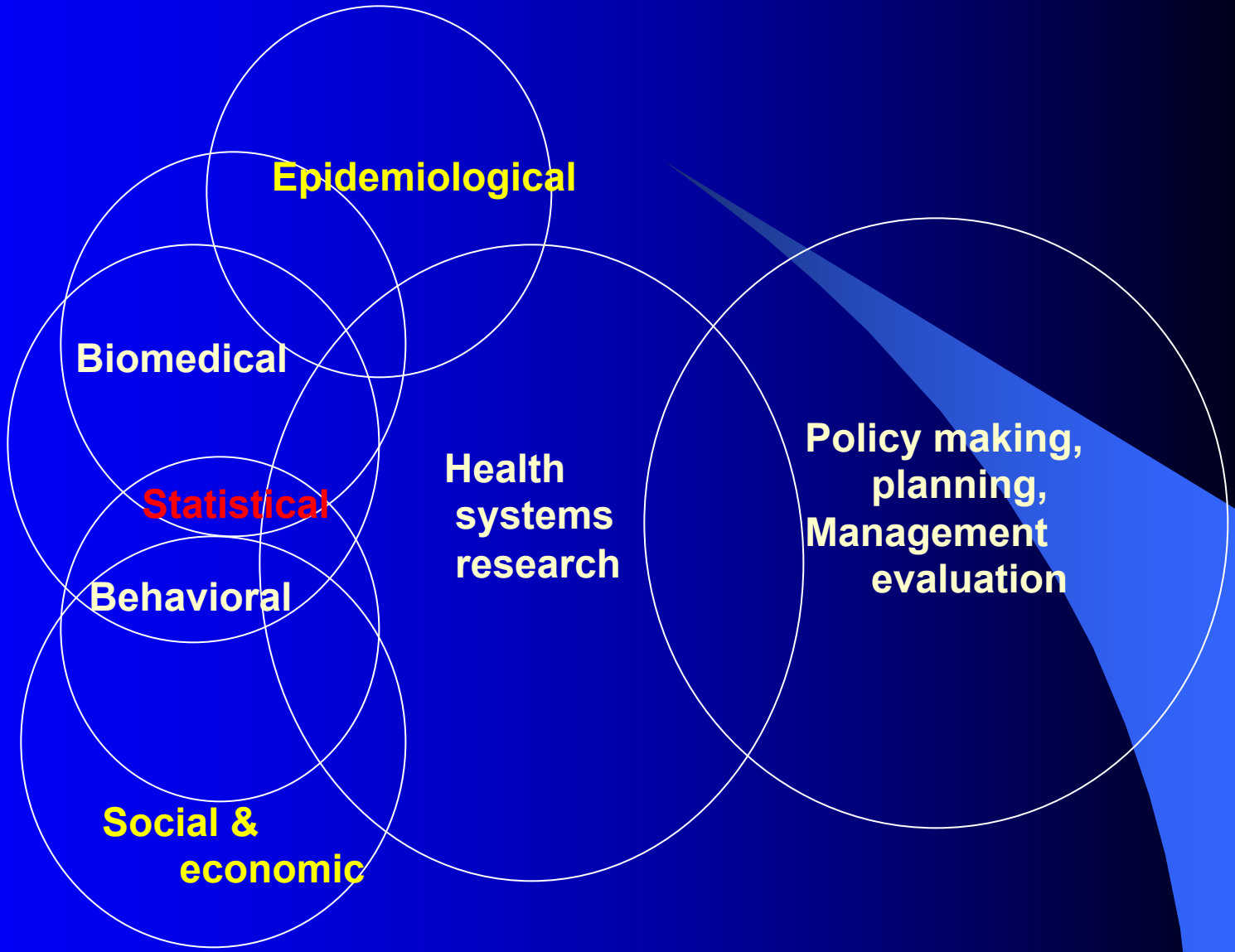


The Economist, Dec 13-19, 2003

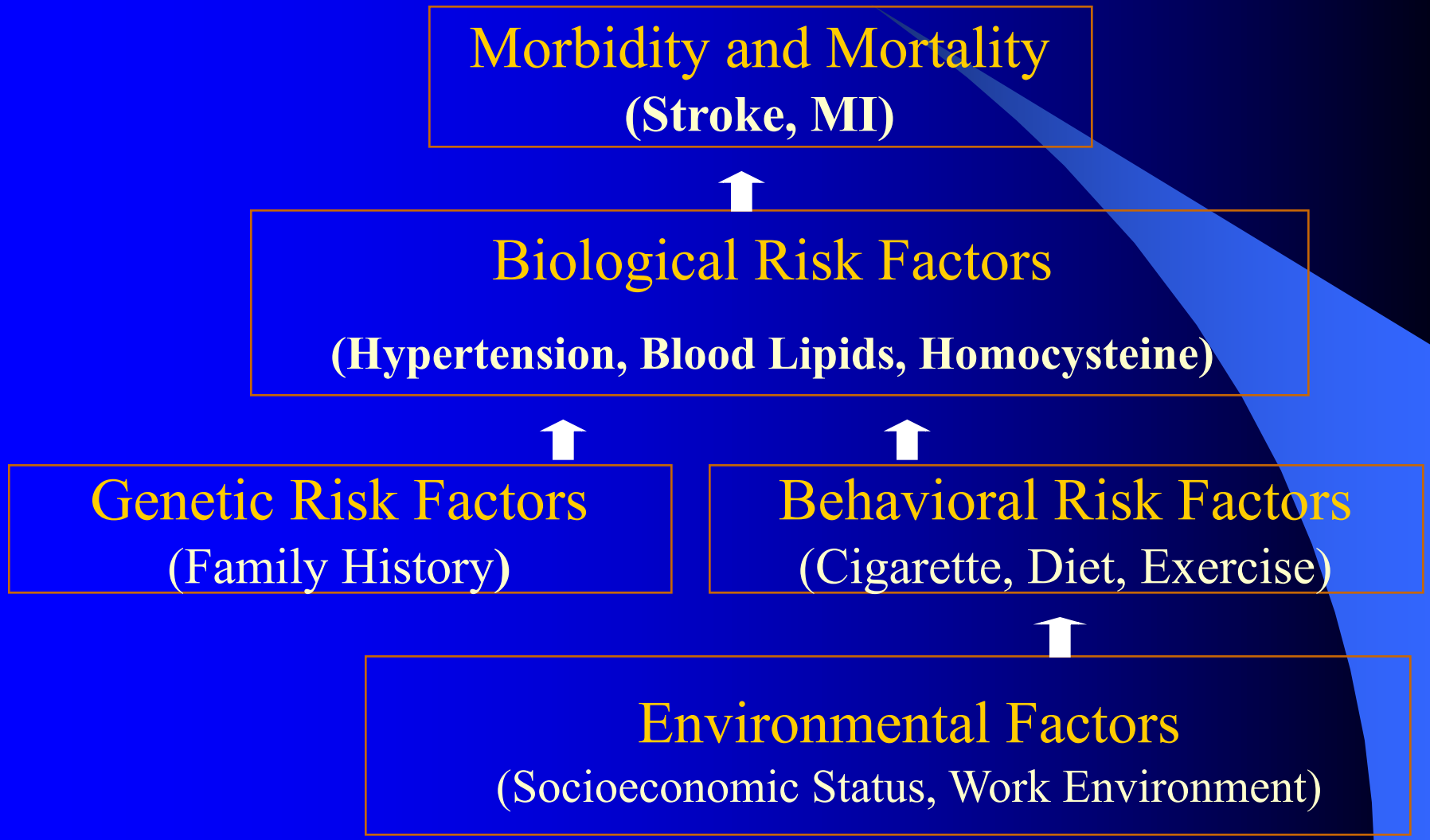
Obesity: A Worldwide Issue



MODEL OF THE RELATIONSHIP BETWEEN DIFFERENT TYPES OF RESEARCH



Causal model of risk factors for CVD



‘How To Do’ Research

- Start with defining the question
- Write down a clear aim
- Divide the problem into smaller, answerable questions

‘How To Do’ Research

- Develop hypotheses
- Decide what data is needed to test the hypotheses
- Refine the above and check the line of thought

Good Research

- CLEAR
  - Essential for both the problem and the answer
- ACCURATE
  - Exactness and precision come from hard work and responsible effort
- RELIABLE
  - If repeated will the answer be the same?

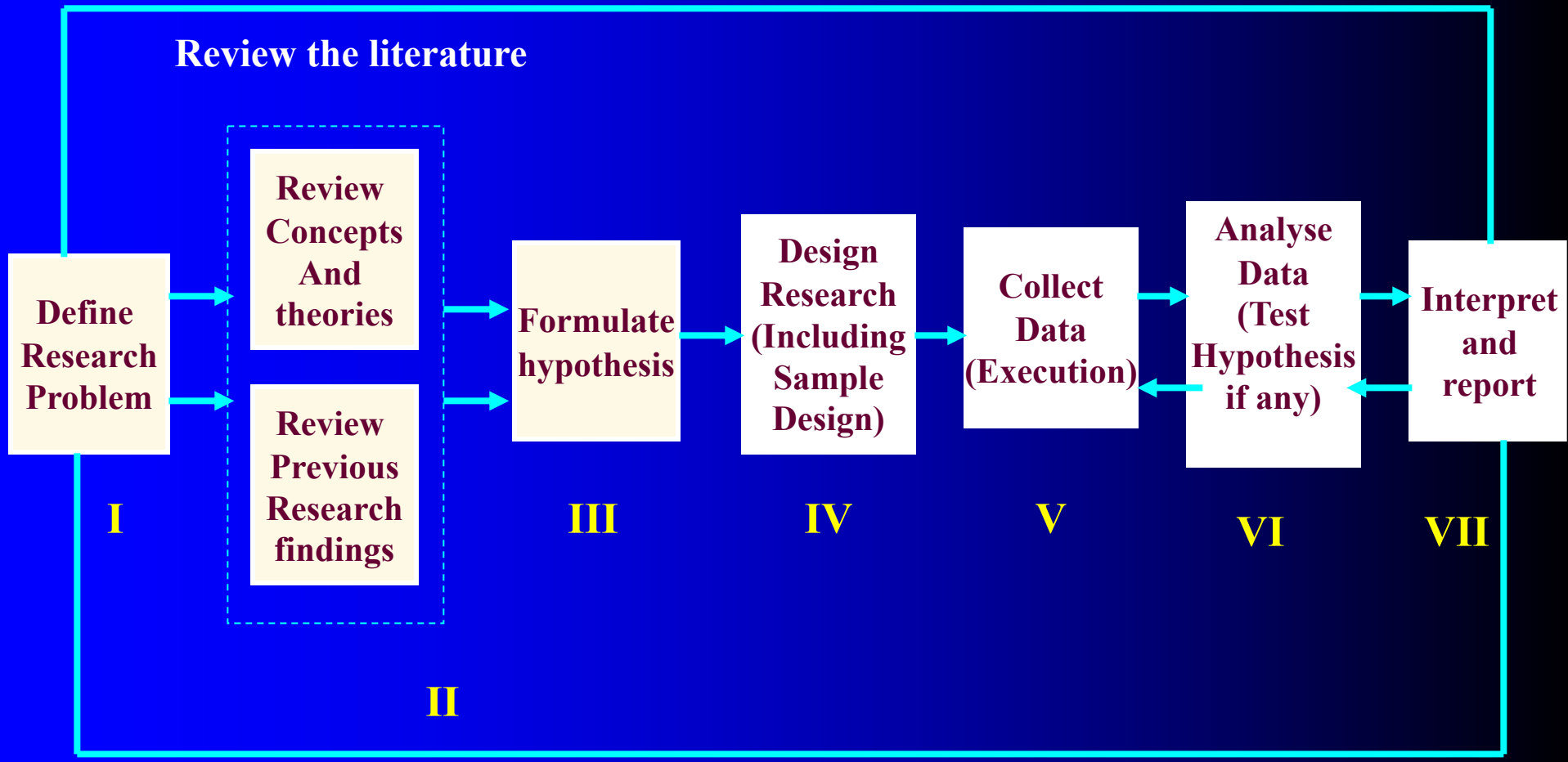
CRITERIA OF A GOOD RESEARCH

- Purpose clearly defined.
- Research process detailed.
- Research design thoroughly planned.
- High ethical standards applied.
- Limitations openly revealed.
- Adequate analysis for decision maker’s needs.
- Findings presented unambiguously.
- Conclusions justified.

Getting Started

- Learn your subject
- Read, Read, Read
- Start general and then focus
- Begin with the problem

RESEARCH PROCESS



THERE ARE ONLY A HANDFUL OF WAYS TO DO A STUDY PROPELY BUT A THOUSAND WAYS TO DO IT WRONG ---

Sackett (1986)

Protocol Development

1. Research Question
2. Hypotheses
3. Objectives
4. Background
5. Design
6. Subjects
7. Variables
8. Data Collection
9. Quality control
10. Data Management
11. Sample size
12. Plan of Analysis
13. Ethical issues
14. Budget
15. Report results
16. Institution capacity
17. Administration
18. Work Plan

References

- Stephen B Hulley. Designing Clinical Research. Chapter 1 . Getting Started: The Anatomy and Physiology of Clinical Research . Pages 3-15. 3rd Edition . Wolters Kluwer Health Lippincott Williams and Wilkins 2007

- Daniel P Schuster & William J Powers. Translational and Experimental Clinical Research. Introduction: The value of Translational and Experimental Clinical Research. Pages: xv-xxi Lippincott Williams and Wilkins 2005