지역사회 유병 조사

한양대학교 의과대학 예방의학교실

최보율

지역사회유병조사

- Key Word
  - 지역사회 (community)
  - 유병 (prevalence)
  - 조사 (survey)

지역사회 (community)

- 한 지역의 일정한 범위 안에서 성립하여 있는 인류의 공동생활체, 국가, 사회 (이희승 국어사전)
- A body of people organized into political, municipal, or social unit (Oxford dictionary)
- A group of inhabitants living in a somewhat localized area under the same general regulations & having common interests & organization (C. L. Anderson)

- Global community ↔ village ↔ internet 상 virtual community
- Interest group, occupation, school ; population

유병 (Prevalence)

- The number of events, e.g., instances of a given disease or other condition, in a given population at a designated time.

- 유병률의 종류
  - 시점 유병률 (Prevalence, point)
  - 기간 유병률 (Prevalence, period)
  - 연간 유병률 (Prevalence, annual)
  - 평생 유별률 (Prevalence, lifetime)

- 유병의 대상
  - 질병 (morbidity) ; morbidity survey
  - 건강과 관련된 상태 (health-related event); health survey

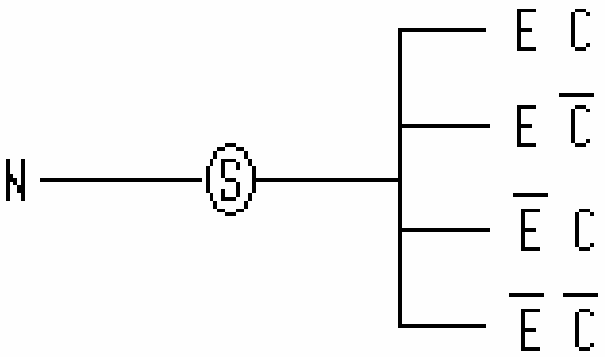
조사 (Survey)

- An investigation in which information is systematically collected but in which the experimental method is not used.

- 조사 방법
  - Face-to-face inquiry (interview)
  - Self-completed questionnaires
  - Telephone survey
  - Postal survey
  - Observation
  - Examination

유병연구 (단면연구; Prevalence Study, Cross-sectional Study)

- A study that examines the relationship between diseases (or other health-related characteristics) and other variables of interest as they exist in a defined population at one particular time.



- The presence or absence of disease and the presence or absence of the other variables are determined in each member of the study population or in a representative sample at one particular time.

- Notation

  N; target population

  C; prevalent cases

  D; Incident cases or deaths

  C or D; Non cases or survivors

  E; Subjects with the study factor

  E; Subjects without the study factor

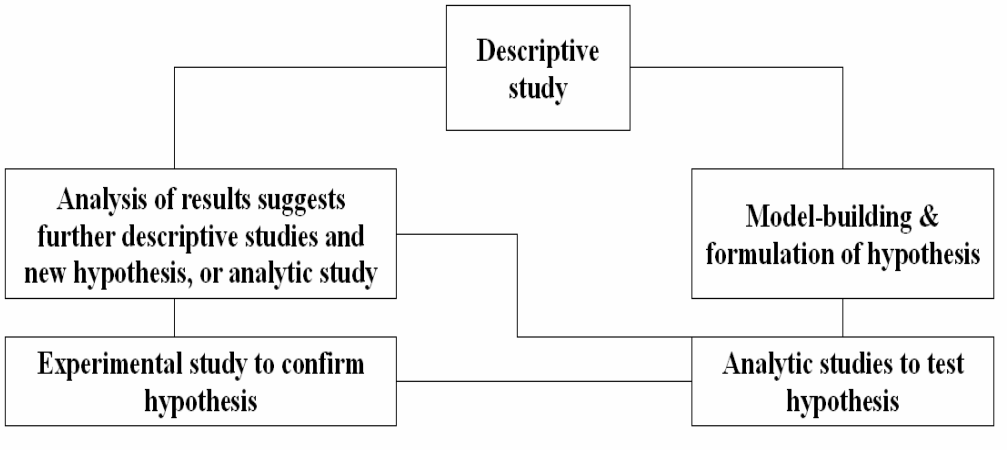
Morbidity Survey, Health Survey

- Morbidity Survey
  - 대상 ; disease
  - A method for estimating the prevalence and/or incidence of disease or diseases in a population. A morbidity survey is usually designed simply to ascertain the facts as to disease distribution and not to test a hypothesis.

- Health Survey
  - 대상 ; health-related event
  - A survey designed to provide information on the health status of a population. It may be descriptive, exploratory, or explanatory.

지역사회 유병 조사의 목적

- 특정 시기의 지역사회 주민의 건강 혹은 질병 수준을 파악함(morbidity or health survey)
  - 예; 국민건강영양조사
- 특정 지역사회의 보건 문제의 원인 규명(field investigation)
  - 초기에는 exploration ; descriptive study
  - 가설 설정 후 가설 검정을 위한 분석 연구 (analytic study)
    - Case-control study
    - Cohort study
  - 나아가 실험 연구(experimental study)



유병 (prevalence) 조사

- 유병조사의 대상
  - Disease or diseases
  - Health-related events
  - Risk factors

- 조사 설계
  - 단면 조사 (cross-sectional study)
  - 같은 대상자를 두 번 cross sectional study를 하면 변화를 알 수 있고, 이로부터 발생률(incidence) 추정이 가능

조사의 단계 (JH Abramson)

1. 사전 준비 단계
   - Clarifying the purpose
   - Formulating the topic
2. 조사 설계
3. 자료 수집을 위한 준비
4. 자료 수집
5. 자료 처리와 결과 도출
6. 결과에 대한 해석
7. 보고서 작성

Preliminary Step

- 연구과제 선정 ; 안규리교수, 정우경 교수

연구 목표

- 연구 목표는 실질적이어야 하며 가능한 조작적 용어(operational term)로 작성하여야 함

1. 연구 수행 목적에 타당하여야 함
2. 목표는 명확한 용어로 기술하여야 함
3. 측정 가능한 용어로 기술하여야 함

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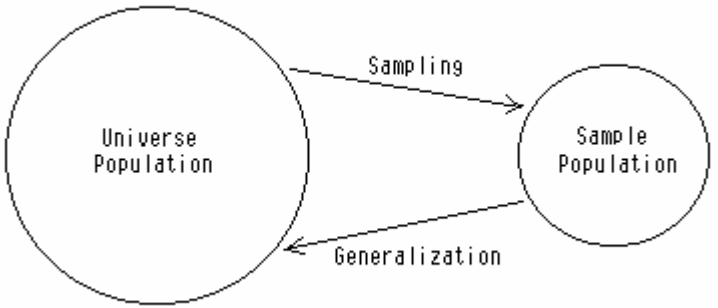
연구 설계

1. 연구 가설 구명에 적합하여야 한다.
2. 과거의 연구 방법보다 개선된 방법이어야 한다.
3. 실험 연구 혹은 관찰 연구, 기술 연구 혹은 분석 연구인지 구체화하여야 한다.

연구 대상

- External validity; A study is externally valid or generalizable if it can produce unbiased inferences regarding a target population.
- Target population; The collection of individuals, items, measurements, etc., about which we want to make inferences.
- Study population; The group selected for investigation.



- 표본 추출 방법
  - 확률적 표본 추출 vs. 비확률적 표본 추출
- 표본 수
  - 과거의 경험을 바탕으로 수식에 의한 산출
- 표본 추출 과정
  - Sampling Fraction, Sampling Frame, Sampling Unit

참여 (Coverage)

- A measure of the extent to which the services rendered cover the potential need for these services in a community.

$$\text{Coverage rate of a survey} = \frac{S}{T} \times 100(\%)$$

S = No. of subjects who were actually surveyed.

T = No. of subjects in which the survey should have been rendered

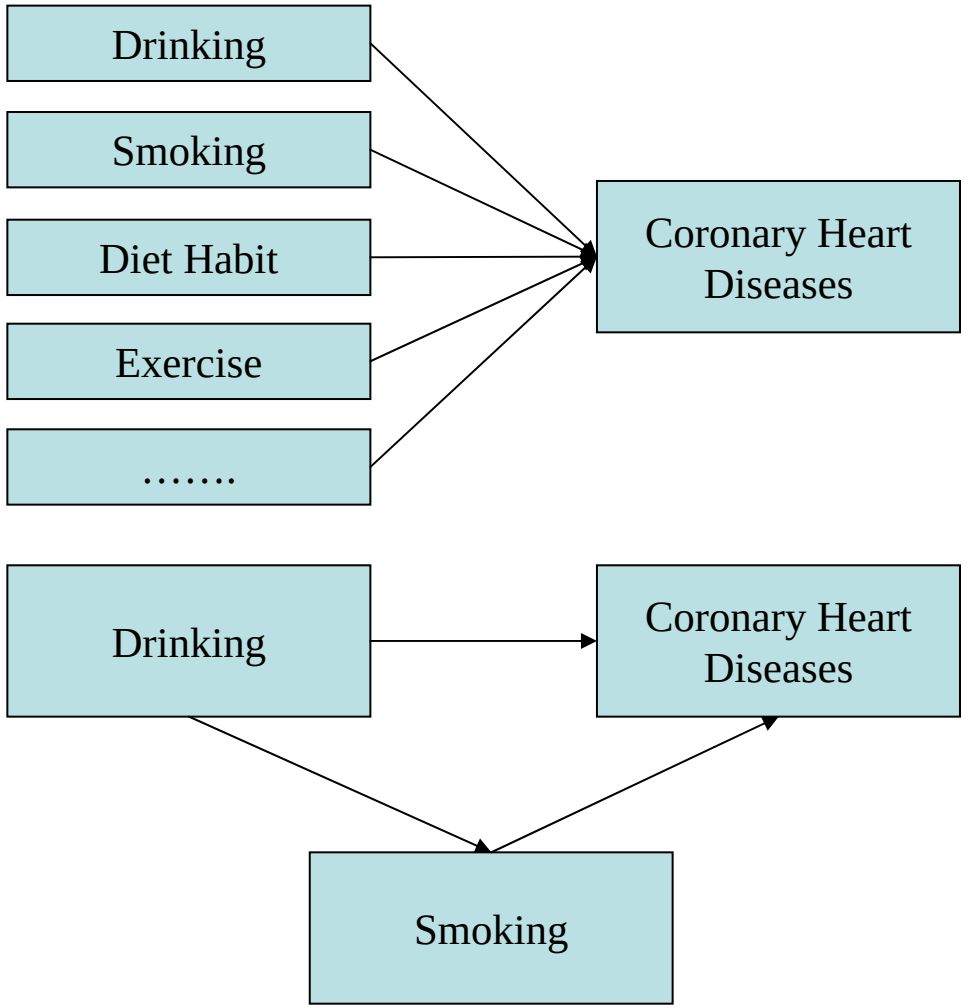
- Inclusion and Exclusion Criteria

- Coverage rate and Representativeness

조사 변수의 선정

- 조사 변수는 연구 목적에 따라 적절하게 선정한다.

- 조사 변수의 종류
  1. 종속변수
  2. 독립변수
  3. 외부변수 (예; 혼란변수)



조사 변수의 선정

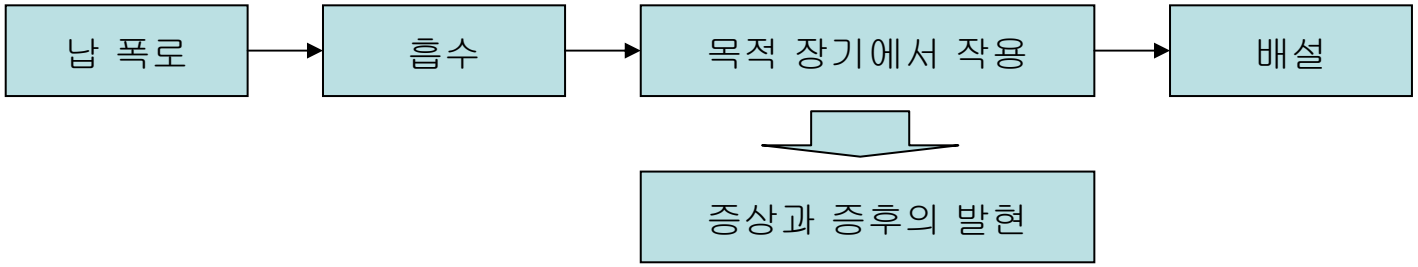
- Universal variables
  - Variables which are so often of relevance in investigations of groups or populations, that their inclusion should always be considered.
  - Age, sex, occupation, education, income, marital status, etc.

- 조사 변수의 수
  - 'as many as necessary and as few as possible'

정의와 측정

- 일정한 규칙에 따라 대상 혹은 사상에 수치를 부여하는 과정 (Kerlinger, 1973)
- 측정을 위해서는 명확한 정의가 있어야 함
  - 정의; '논리적인 절차 규칙에 따라 사물, 속성, 관계 등의 본질을 규정하거나 개념, 말, 기호 등의 내용 또는 의미를 확정하는 일'

- 예; lead poisoning
  - 개념적 정의; 납이 인체에 흡수 되어 신체적 기능을 저하하는 것
  - Lead poisoning의 구성



- 증상; anemia, abdominal colic, foot drop
- 기준; blood 60μgm/dl 이상, urine 150 μgm/dl 이상

사례 정의

- 어떤 사람이 특정 질환 이환 여부를 확인하기 위해서는 진단 기준에 적합하여야 함
- 일반적으로 사례 정의는 임상 증상, 실험실 진단 기준 혹은 두 가지 기준을 종합하여 판단함

Shigellosis

Clinical description

An illness of variable severity characterized by diarrhea, fever, nausea, cramps, and tenesmus. Asymptomatic infections may occur.

Laboratory criteria for diagnosis

- Isolation of *Shigella* from a clinical specimen

Case classification

Probable: a clinically compatible case that is epidemiologically linked to a confirmed case

Confirmed: a case that is laboratory confirmed

급성호흡기증후군 환자사례정의

가) 의심환자(Suspect Case)

◦ 증상 발생 10일 이내에 급성호흡기증후군 감염위험지역(*)을 방문한 여행력이 있으면서

◦ 다음의 증상을 보이는 경우

(1) 발열(38도 이상)이 있으면서

(2) 호흡기 증상이나 증후(기침, 빈호흡, 호흡곤란, 저산소증) 중 하나 이상을 보이는 경우

※ 본인이 감염위험지역에 대한 여행력이 없더라도 감염위험지역 여행 후 호흡기 질환이 발병한 사람과 밀접한 접촉력이 있는 경우도 포함

나) 추정환자(Probable Case)

◦ 의심환자(Suspect case) 이면서

- 흉부 방사선소견상 폐렴 소견이 있거나
- 호흡곤란증후군(Respiratory Distress Syndrome) 소견을 보이는 경우

◦ 부검 후 조직검사상 원인불명의 호흡곤란증후군을 보이면서 설명되지 않는 호흡기 질환으로 사망한 환자

Revised Council of State and Territorial Epidemiologist surveillance case definition for severe respiratory syndrome(SARS), December 2003

BOX. Revised Council of State and Territorial Epidemiologists surveillance case definition for severe acute respiratory syndrome (SARS), December 2003

Clinical Criteria

Early illness

- Presence of two or more of the following features: fever (might be subjective), chills, rigors, myalgia, headache, diarrhea, sore throat, or rhinorrhea

Mild-to-moderate respiratory illness

- Temperature of >100.4° F (>38° C)* **and**
- One or more clinical findings of lower respiratory illness (e.g., cough, shortness of breath, or difficulty breathing)

Severe respiratory illness

- Meets clinical criteria of mild-to-moderate respiratory illness **and**
- One or more of the following findings:
  - — Radiographic evidence of pneumonia, **or**
  - — Acute respiratory distress syndrome, **or**
  - — Autopsy findings consistent with pneumonia or acute respiratory distress syndrome without an identifiable cause

Epidemiologic Criteria

Possible exposure to SARS-associated coronavirus (SARS-CoV)

One or more of the following exposures in the 10 days before onset of symptoms:

- Travel to a foreign or domestic location with documented or suspected recent transmission of SARS-CoV† or
- Close contact§ with a person with mild-to-moderate or severe respiratory illness and history of travel in the 10 days before onset of symptoms to a foreign or domestic location with documented or suspected recent transmission of SARS-CoV†

Likely exposure to SARS-CoV

One or more of the following exposures in the 10 days before onset of symptoms:

- Close contact§ with a person with confirmed SARS-CoV disease or
- Close contact§ with a person with mild-to-moderate or severe respiratory illness for whom a chain of transmission can be linked to a confirmed case of SARS-CoV disease in the 10 days before onset of symptoms

Laboratory Criteria

Tests to detect SARS-CoV are being refined and their performance characteristics assessed¶; therefore, criteria for laboratory diagnosis of SARS-CoV are changing. The following are general criteria for laboratory confirmation of SARS-CoV:

- Detection of serum antibody to SARS-CoV by a test validated by CDC (e.g., enzyme immunoassay), or
- Isolation in cell culture of SARS-CoV from a clinical specimen, or
- Detection of SARS-CoV RNA by a reverse transcription polymerase chain reaction test validated by CDC and with subsequent confirmation in a reference laboratory (e.g., CDC).

Information about the current criteria for laboratory diagnosis of SARS-CoV is available at http://www.cdc.gov/ncidod/sars/labdiagnosis.htm.

Exclusion Criteria

A case may be excluded as a SARS report under investigation (SARS RUI), including as a CDC-defined probable SARS-CoV case, if any of the following apply:

- An alternative diagnosis can explain the illness fully**, **or**
- Antibody to SARS-CoV is undetectable in a serum specimen obtained >28 days after onset of illness††, **or**
- The case was reported on the basis of contact with a person who was excluded subsequently as a case of SARS-CoV disease; then the reported case also is excluded, provided other epidemiologic or laboratory criteria are not present.

Case Classification

SARS RUI

Reports in persons from areas where SARS is not known to be active

- SARS RUI-1: Cases compatible with SARS in groups likely to be first affected by SARS-CoV§§ if SARS-CoV is introduced from a person without clear epidemiologic links to known cases of SARS-CoV disease or places with known ongoing transmission of SARS-CoV

BOX. (*Continued*) Revised Council of State and Territorial Epidemiologists surveillance case definition for severe acute respiratory syndrome (SARS), December 2003

Reports in persons from areas where SARS activity is occurring

- SARS RUI-2: Cases meeting the clinical criteria for mild-to-moderate illness and the epidemiologic criteria for possible exposure (spring 2003 CDC definition for suspect cases¶¶)
- SARS RUI-3: Cases meeting the clinical criteria for severe illness and the epidemiologic criteria for possible exposure (spring 2003 CDC definition for probable cases¶¶)
- SARS RUI-4: Cases meeting the clinical criteria for early or mild-to-moderate illness and the epidemiologic criteria for likely exposure to SARS-CoV

SARS-CoV disease

- Probable case of SARS-CoV disease: meets the clinical criteria for severe respiratory illness and the epidemiologic criteria for likely exposure to SARS-CoV
- Confirmed case of SARS-CoV disease: clinically compatible illness (i.e., early, mild-to-moderate, or severe) that is laboratory confirmed

* A measured documented temperature of >100.4° F (>38° C) is expected. However, clinical judgment may allow a small proportion of patients without a documented fever to meet this criterion. Factors that might be considered include patient's self-report of fever, use of antipyretics, presence of immunocompromising conditions or therapies, lack of access to health care, or inability to obtain a measured temperature. Initial case classification based on reported information might change, and reclassification might be required.

† Types of locations specified will vary (e.g., country, airport, city, building, or floor of building). The last date a location may be a criterion for exposure is 10 days (one incubation period) after removal of that location from CDC travel alert status. The patient's travel should have occurred on or before the last date the travel alert was in place. Transit through a foreign airport meets the epidemiologic criteria for possible exposure in a location for which a CDC travel advisory is in effect. Information about CDC travel alerts and advisories and assistance in determining appropriate dates are available at http://www.cdc.gov/ncidod/sars/travel.htm.

§ Close contact is defined as having cared for or lived with a person with SARS or having a high likelihood of direct contact with respiratory secretions and/or body fluids of a person with SARS (during encounters with the patient or through contact with materials contaminated by the patient) either during the period the person was clinically ill or within 10 days of resolution of symptoms. Examples of close contact include kissing or embracing, sharing eating or drinking utensils, close (i.e., <3 feet) conversation, physical examination, and any other direct physical contact between persons. Close contact does not include activities such as walking by a person or sitting across a waiting room or office for a brief time.

¶ The identification of the etiologic agent of SARS (i.e., SARS-CoV) led to the rapid development of enzyme immunoassays and immunofluorescence assays for serologic diagnosis and reverse transcription polymerase chain reaction assays for detection of SARS-CoV RNA in clinical samples. These assays can be very sensitive and specific for detecting antibody and RNA, respectively, in the later stages of SARS-CoV disease. However, both are less sensitive for detecting infection early in illness. The majority of patients in the early stages of SARS-CoV disease have a low titer of virus in respiratory and other secretions and require time to mount an antibody response. SARS-CoV antibody tests might be positive as early as 8–10 days after onset of illness and often by 14 days after onset of illness, but sometimes not until 28 days after onset of illness. Information about the current criteria for laboratory diagnosis of SARS-CoV is available at http://www.cdc.gov/ncidod/sars/labdiagnosis.htm.

** Factors that may be considered in assigning alternate diagnoses include the strength of the epidemiologic exposure criteria for SARS-CoV disease, the specificity of the alternate diagnostic test, and the compatibility of the clinical presentation and course of illness with the alternative diagnosis.

†† Current data indicate that >95% of patients with SARS-CoV disease mount an antibody response to SARS-CoV. However, health officials may choose not to exclude a case on the basis of lack of a serologic response if reasonable concern exists that an antibody response could not be mounted.

§§ Consensus guidance is in development between CDC and CSTE on which groups are most likely to be affected first by SARS-CoV if it reemerges. SARS-CoV disease should be considered at a minimum in the differential diagnoses for persons requiring hospitalization for pneumonia confirmed radiographically or acute respiratory distress syndrome without identifiable etiology and who have one of the following risk factors in the 10 days before the onset of illness:

- Travel to mainland China, Hong Kong, or Taiwan, or close contact with an ill person with a history of recent travel to one of these areas, or
- Employment in an occupation associated with a risk for SARS-CoV exposure (e.g., health-care worker with direct patient contact or worker in a laboratory that contains live SARS-CoV), or
- Part of a cluster of cases of atypical pneumonia without an alternative diagnosis.

Guidelines for the identification, evaluation, and management of these patients are available at http://www.cdc.gov/ncidod/sars/absenceofsars.htm.

¶¶ During the 2003 SARS epidemic, CDC case definitions were the following:

Suspect case

- Meets the clinical criteria for mild-to-moderate respiratory illness and the epidemiologic criteria for possible exposure to SARS-CoV but does not meet any of the laboratory criteria and exclusion criteria or
- Unexplained acute respiratory illness that results in death of a person on whom an autopsy was not performed and that meets the epidemiologic criteria for possible exposure to SARS-CoV but does not meet any of the laboratory criteria and exclusion criteria

Probable case

- Meets the clinical criteria for severe respiratory illness and the epidemiologic criteria for possible exposure to SARS-CoV but does not meet any of the laboratory criteria and exclusion criteria.

CDC. MMWR. Revised U.S. Surveillance Case Definition for Severe Acute Respiratory Syndrome (SARS) and Update on SARS Cases – United States and Worldwide, December 2003. 2003;52:1202-1206

Research Process (JH Abramson)

1. Preliminary steps
   - Clarifying the purpose
   - Formulating the topic
2. Planning
3. Preparing for data collection
4. Collecting the data
5. Processing the data
6. Interpreting the data
7. Writing a report

조사자 훈련과 사전 조사

- Pretest
  - 조사 방법을 시험하고 현장에서의 실질적인 준비를 위하여 시행함

- Pilot Study
  - 대규모 조사의 시행상의 문제점 검토를 위하여 사전에 전체 조사 과정이 모두 포함하는 큰 규모의 조사를 시행하는 것

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자료 수집 방법

- 자료 수집 방법의 종류
  - Observation,
  - Self-administered questionnaires
  - Interviews
  - Examinations
  - The use of documentary sources; death certificates, notification and registry, hospital and clinic records, medical audit)

- 조사 방법 선정의 기준
  - 조사 변수의 특성
  - 조사 대상의 특성
  - 측정의 신뢰도와 타당도
  - 완결도와 비용

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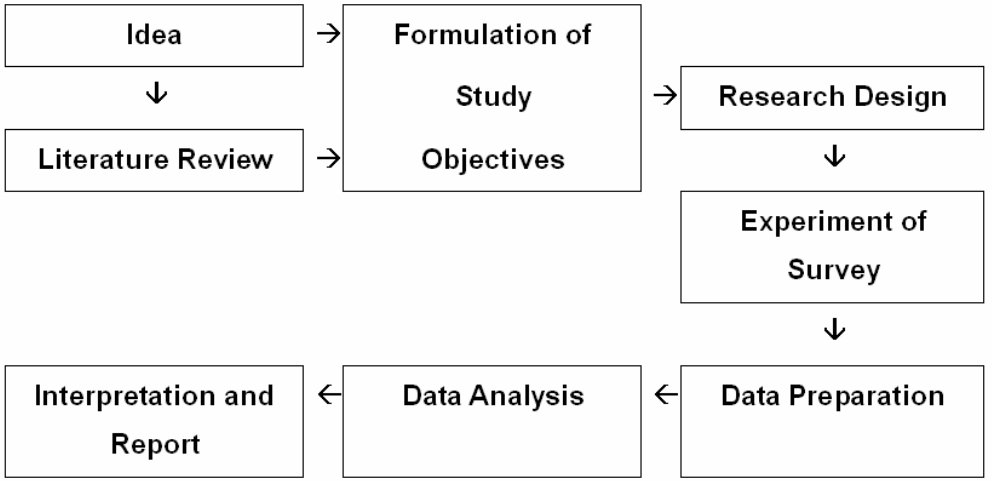

***** Questions at Research Design Phase ******

1. **Study Model**
2. **Study Design (experimental) Design**
3. **Sampling Method and Sample Size**
4. **Order of Measurement (method of measurement)**
5. **Extraneous Variables**
6. **Analysis Method**