Data Structure in Geography

https://www.youtube.com/watch?v=QaehRjdlLf0

https://www.youtube.com/watch?v=DQLkdS7omcg

https://www.youtube.com/watch?v=P7VuzxSMI34

https://www.youtube.com/watch?v=vplDKsIDhZk

https://www.youtube.com/watch?v=caUiRsg5M6k

Quantitative Techniques in Geography

- https://tnou.ac.in/NAAC/SSR/C1/1.1.5/MGEOSE-21.pdf

QUALITATIVE RESEARCH TECHNIQUES IN GEOGRAPHY

- https://www.questionpro.com/blog/qualitative-research-methods/

What is Hypothesis?

A set of assumption to be proved or disproved is called hypothesis.

For researcher hypothesis is a formal question that he intends to resolve.

Hypothesis is considered as an intelligent guess or prediction that gives directional to the researcher to answer the research question.

Hypothesis or Hypotheses are defined as the predictive statement or explanation, capable of being tested by scientific methods that show the relationship between two or more independent to some dependent variables in a specified population.

A hypothesis is an assumption about relations between variables. It is a tentative explanation of the research problem or a guess about the research outcome.

Criteria for Hypothesis construction

Hypothesis is never formulated in the form of question. Bailey(1982), Becker(1989), Selltiz et al (1976), and Sarantakos (1998) have pointed out a number of standerds to be met in formulating a hypothesis:

1. It should be empirically testable, whether it is write or wrong.

2. It should be specific and precise.

3. The statement in the hypothesis should not be contradictory.

4. It should specify variables between which the relationship is to be established.

5. It should descried one issue only.

A hypothesis can be formed either in descriptive or relational form. A hypothesis can also be formed in the directional, non directional or null form.

Characteristics of Hypothesis

Hypothesis should be clear and precise.

Should be capable of being tested. Research programmes have bogged down due to untestable hypothesis.

Hypothesis state relationship between variables, if it be a relational Hypothesis.

Should be limited in scope and must be specific. Narrower hypothesis are generally more testable and a researcher should developed such hypothesis.

Hypothesis should be stated as possible in most simple terms so that it is easily understandable by all concern. But on must remember this simplicity of hypothesis has nothing to do with its significance.

Hypothesis should be consistent with most known facts i.e., it must be a substantial body with the established facts.

Should be amenable to testing within a reasonable time.

Hypothesis must explain the facts that give rise to the need for explanation.

Using the hypothesis and other known and accepted generalizations one should be able to explain the original problem Condition.

Types of Hypothesis

1. Null Hypothesis

2. Alternative Hypothesis

Null hypothesis is reverse of research hypothesis. It is a hypothesis of no relationship. It is denoted by (Ho). Can include =, ≤ or ≥ sign in mathematical representation. We test the null hypothesis (statement) to accept or reject the alternative hypothesis.

Alternative Hypothesis

Hypothesis which is substitute of null hypothesis is called alternative hypothesis.

Alternative hypothesis is that which state opposite of the null hypothesis. It is denoted by (Ha).

Can include ≠, < or > in mathematical representation.

Null hypothesis is accepted when Alternative hypothesis is rejected. Null hypothesis is rejected when Alternative hypothesis is accepted.

In statistical test of null hypothesis, acceptance of Ho (null hypothesis) means rejection of the Alternative Hypothesis; and rejection of Ho means similarly acceptance of alternative hypothesis.

Suppose we want to test the hypothesis that the population mean (μ) is equal to the hypothesised mean (μ_{Ho}) =100.

Then null hypothesis is that the population mean is equal to the hypothesised mean 100

Symbolically it can be expressed as: Ho: $\mu = \mu_{Ho} = 100$

If sample results do not support this null hypothesis, we should conclude that alternative hypothesis is true. Rejecting null hypothesis is known as alternative hypothesis.

For Ho: $\mu = \mu_{Ho} = 100$, we may consider the alternative hypotheses as follows...

The level of significance:

In a statistical test the probability of error in the result is called level of significance.

Level of significance 5% (0.05) indicates that there is the probability of 5% of error and probability of 95% to be correct.

Ho (null hypothesis) will be rejected when the sampling result or calculated value is more than the tabulated value or critical value.

Type I and type II error

In context of hypothesis testing there are two types of errors we can make.

We may reject null hypothesis when it is true or we may accept null hypothesis when it is not true.

Type I error means rejection of hypothesis which should have been accepted.

Type I error is denoted by (α)

Type II error means accepting of hypothesis which should have been rejected.

Type II error is denoted by (β)

One Tail Test and Two Tail Test

The area within bell shape standard normal curve is considered to be 1.

The acceptance or rejection of the null hypothesis that is the decision of statistical (significance) test depends on whether it is within the acceptance region or within the rejection region.

Two Tail Test: When the test of hypothesis is made on the basis of the rejection region represented on both sides of the standard normal curve then it is called two tail test.

One Tail Test: When the test of hypothesis is made on the basis of the rejection region represented on one side of the standard normal curve then it is called two tail test.

FLOW DIAGRAM FOR HYPOTHESIS TESTING

The above stated general procedure for hypothesis testing can also be depicted in the from of a flow chart for better understanding as shown in Fig. 9.4:[3]

FLOW DIAGRAM FOR HYPOTHESIS TESTING

State H_0 as well as H_a

↓

Specify the level of significance (or the value)

↓

Decide the correct sampling distribution

↓

Sample a random sample(s) and workout an appropriate value from sample data

↓

Calculate the probability that sample result would diverge as widely as it has from expectations, if H_0 were true

↓

Is this probability equal to or smaller than value in case of one-tailed test and /2 in case of two-tailed test

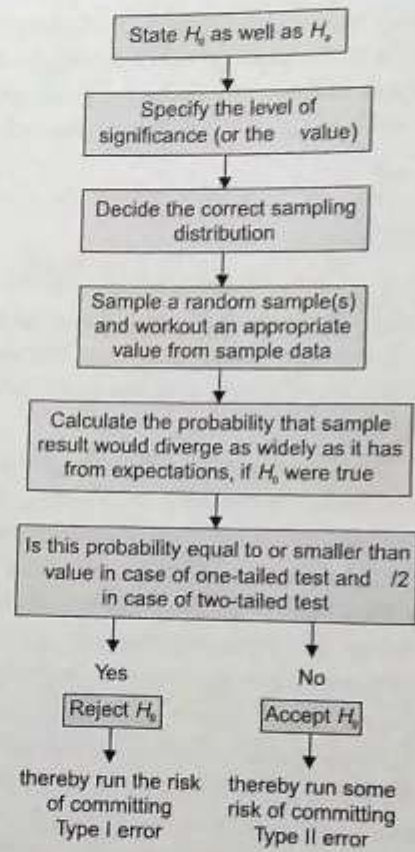| Yes	No
Reject H_0	Accept H_0
thereby run the risk of committing Type I error	thereby run some risk of committing Type II error

Fig. 9.4

[3] Based on the flow diagram in William A. Chance's *Statistical Methods for Decision Making*, Richard D. Irwin INC., Illinois, 1969, p.48.

Examples of the Null Hypothesis and alternative hypothesis

Ho: There is no difference in precipitation levels between urban and adjacent rural areas.

H1: There is an increase in precipitation levels in urban areas relative to adjacent rural areas because of the heating differences of the two surface types (the urban area heats up more and has increased convective uplift).

Examples of the Null Hypothesis

To write a null hypothesis, first start by asking a question. Rephrase that question in a form that assumes no relationship between the variables. In other words, assume a treatment has no effect. Write your hypothesis in a way that reflects this.

Sources of Data

https://freegisdata.rtwilson.com/

https://gisgeography.com/best-free-gis-data-sources-raster-vector/

https://guides.library.ucsc.edu/opensourcegis

https://libguides.tru.ca/data/geographicdata

https://researchguides.dartmouth.edu/gis/opensource

https://en.wikipedia.org/wiki/List_of_GIS_data_sources