

TITLE: DECIDING MY HYPOTHESIS

What is a hypothesis?

The hypothesis is a statement that you will either prove or disprove through your research.

For example- Nutritional Anemia is a cause for low birth weight. You can either prove that nutritional anemia is really a cause for low birth weight or disprove that through a carefully designed research study

Why is the hypothesis important?

The hypothesis generates the research question.

How is a hypothesis generated?

We discussed this briefly in the previous chapter. To recap, a well thought out hypothesis comes out of experience (self, peers, experts, teachers), knowledge gained from different sources (journals, text books, academic meetings), or sometimes in your dreams...serendipity!

Is a hypothesis the same as a research question?

No. The hypothesis is a statement. The research question obviously is a question.

For example- Hypothesis: Nutritional Anemia is a cause for low birth weight

Research question: Is Nutritional Anemia is a cause for low birth weight?

Your research question is closely linked with your hypothesis.

Does the question come first or the hypothesis? That is sort of a chicken and egg situation. However, a question cannot arise unless there is a statement- no smoke without fire?

How do you write a good hypothesis?

A good hypothesis has to be specific and have several components.

Let us look at the example: Nutritional Anemia is a cause for low birth weight.

- Is this a good hypothesis? Can we improve this further?
- Let us look at the components. Can we define them better?

Spend a moment here. How do you define nutritional anemia? Are you interested in the whole spectrum of nutritional anemia or one specific component?

Well, you need to now define the entire spectrum of nutritional anemia. Are all of these a problem? Or do you want to focus on the most common problem of these?

How do you decide on this?

Simple

Look at what is feasible within a realistic timeframe with the resources available to you. Prioritize based on the health scenario of the country/region.

For discussion sake, let us say that we now decide "Ok, I will focus only on iron deficiency anemia"

The hypothesis now changes to

"Iron deficiency anemia is a cause for low birth weight".

Better?

Not yet.

We still need to work on the definitions.

All iron deficiency anemia or just a subset of that- mild, moderate, severe?

Food for thought? It is time to go back to the drawing board again-

Look at what is feasible within a realistic timeframe with the resources available to you.
Prioritize based on the health scenario of the country/region.

Let us say, we decided to explore the range of iron deficiency anemia. We would like to see if there is a difference between the subsets of iron deficiency anemia.

What next?

The same process is to be applied for low birth weight- Define low birth weight.

Want to include all low birth weights or only very low birth weights?

Look at what is feasible within a realistic timeframe with the resources available to you.
Prioritize based on the health scenario of the country/region.

Let us say we include all low birth weights.

How does our hypothesis look now?

“Iron deficiency anemia is a cause for low birth weight”

Better? We have defined the conditions of interest.

We have written down the association we expect between them- one leads to the other.

Missing anything?

What next?

We need to define the population(s) of interest.

Iron deficiency anemia in whom? Mother? Father? Both Parents? Other family members?

Since we are looking at a baby, let us say we are more interested in the mother.

The hypothesis now changes to

“Iron deficiency anemia among mothers is a cause for low birth weight”

What next? We need to further refine the population of interest.

Include all mothers or mothers who are giving birth for the first time?

Look at what is feasible within a realistic timeframe with the resources available to you.
Prioritize based on the health scenario of the country/region.

The hypothesis now changes to:

“Iron deficiency anemia among primi mothers is a cause for low birth weight”

Better?

Well, we have not defined one population- Low birth weight among whom? Singleton or multiple pregnancies?

Look at what is feasible within a realistic timeframe with the resources available to you.
Prioritize based on the health scenario of the country/region.

The hypothesis now changes to:

“Iron deficiency anemia among primi mothers is a cause for low birth weight among singleton babies”

Better?

Can we improve this?

Well, we need to include a time element.

When is Iron deficiency anemia among mothers important for us? Early in the life cycle? Adolescence? Post marital but Pre-pregnancy? First and second trimesters? Third trimester?

Look at what is feasible within a realistic timeframe with the resources available to you.
Prioritize based on the health scenario of the country/region.

The hypothesis now changes to:

“Iron deficiency anemia in the second and third trimesters among primi mothers is a cause for low birth weight among singleton babies”

Better?

We have defined variables of interest.

We have defined the relationship between the variables of interest.

We have defined populations of interest.

We have a defined time element. Or do we?

How about

The hypothesis now changes to:

“Iron deficiency anemia in the second and third trimesters among primi mothers is a cause for low birth weight among singleton babies born after 2005”

Well, we now introduced another time element. This may indicate a recent development-diagnostic or therapeutic, or may be based on what is feasible, or a period that can allow exploration of trends.

Do we have a better hypothesis now?

We have defined variables of interest.

We have defined the relationship between the variables of interest.

We have defined populations of interest.

We have a defined time element.

Much better? We still missed one part- the measurements. We have not stated how we measure iron deficiency anemia or low birth weight.

Let us refine our hypothesis

Iron deficiency anemia, as determined by the measurement of hemoglobin using a hemoglobinometer, in the second and third trimesters among primi mothers is a cause for low birth weight (determined by measurement of birth weight within 30 minutes after delivery) among singleton babies born after 2005

Do we have a better hypothesis now?

We have defined variables of interest.

We have defined the relationship between the variables of interest.

We have defined populations of interest.

We have a defined time element.

We have defined the process of measurement

Let us trace the journey of our hypothesis

- Nutritional Anemia is a cause for low birth weight.
- Iron deficiency anemia is a cause for low birth weight.
- Iron deficiency anemia among mothers is a cause for low birth weight.
- Iron deficiency anemia among primi mothers is a cause for low birth weight.
- Iron deficiency anemia among primi mothers is a cause for low birth weight among singleton babies.
- Iron deficiency anemia in the second and third trimesters among primi mothers is a cause for low birth weight among singleton babies.
- Iron deficiency anemia in the second and third trimesters among primi mothers is a cause for low birth weight among singleton babies born after 2005
- Iron deficiency anemia, as determined by the measurement of hemoglobin using a hemoglobinometer, in the second and third trimesters among primi mothers is a cause for low birth weight (determined by measurement of birth weight within 30 minutes after delivery) among singleton babies born after 2005

Quite a journey?

Remember- you can add to the definitions further. For example, urban mothers, rural mother, Asian Indian mothers, Caucasian mothers etc.

KEY POINT

Look at what is feasible within a realistic timeframe with the resources available to you.
Prioritize based on the health scenario of the country/region.

CREATE A SMART HYPOTHESIS

S-SPECIFIC

M-MEASURABLE

A-ACHIEVABLE

R-RELEVANT

T-TIMEBOUND