July 21 - 24, 2021 | Garki Hospital Abuja | Resource Person

Research Methodology Boot Camp

with Epi Info Training

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PhD Public Health (Epidemiology)

Target Audience Clinical Researchers, Post-Part 1 Residents, and Others

Important Information

- Limited slots are available on a first come, first served basis
- Laptop running Windows 10 required
- Organized as morning lecture sessions and afternoon hands on coaching sessions

Highlights

- Research Methodology
- Research Design
- Data Management
- Sample Size Calculations
- Test Statistics
- Interpretation of Results
- Report Writing
- Hands-on training sessions
- Statistical consulting sessions

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Regression Analysis

Regression analysis

> For example, you might be interested in what influences a person's salary. In order to find it out, you could take the highest level of education, the weekly working hours and the age of a person.

Regression analysis

- You could investigate whether these 3 variables have an influence on a person's salary.
- If so, you can predict a person's salary by using the highest education level, the weekly working hours and the age of a person.

Regression analysis

Dependent variable

- The variable to be inferred is called the dependent variable (criterion).

Independent variables

- The variables used for prediction are called independent variables (predictors).

Regression analysis

A regression analysis pursues two goals:

1. Measuring the influence of one or more variables on another variable
2. Predicting a variable by one or more other variables.

- The regression analysis thus provides information about how the value of the dependent variable changes if one of the independent variables is changed.

Regression analysis

Measurement of the influence of one or more variables on another variable

- What influences children's ability to concentrate?
- Do the educational level of the parents and the place of residence affect the future educational attainments of children?

Regression analysis

Prediction of a variable by one or more other variables

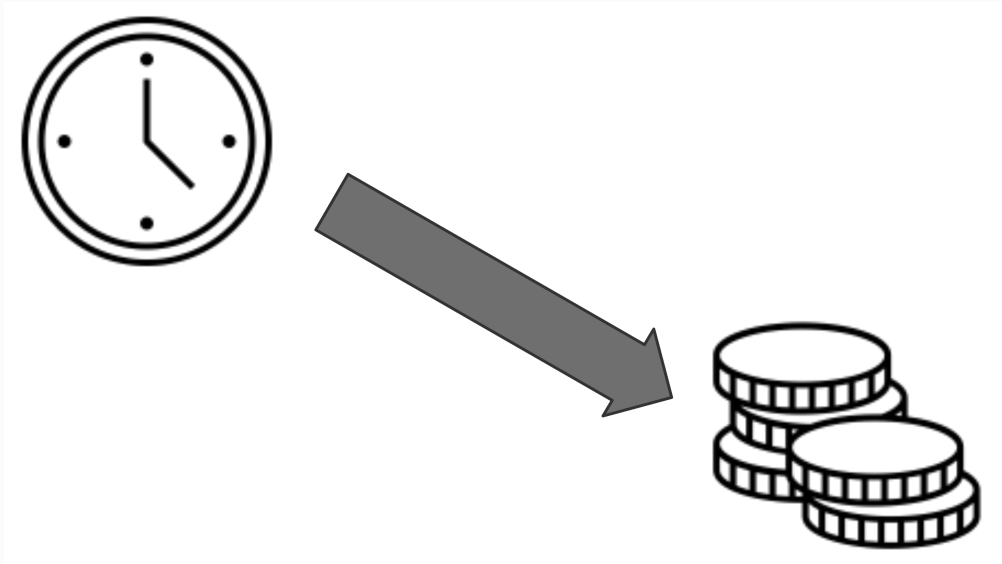
- How long does a patient stay in the hospital?
- What product is a person most likely to buy from an online store?

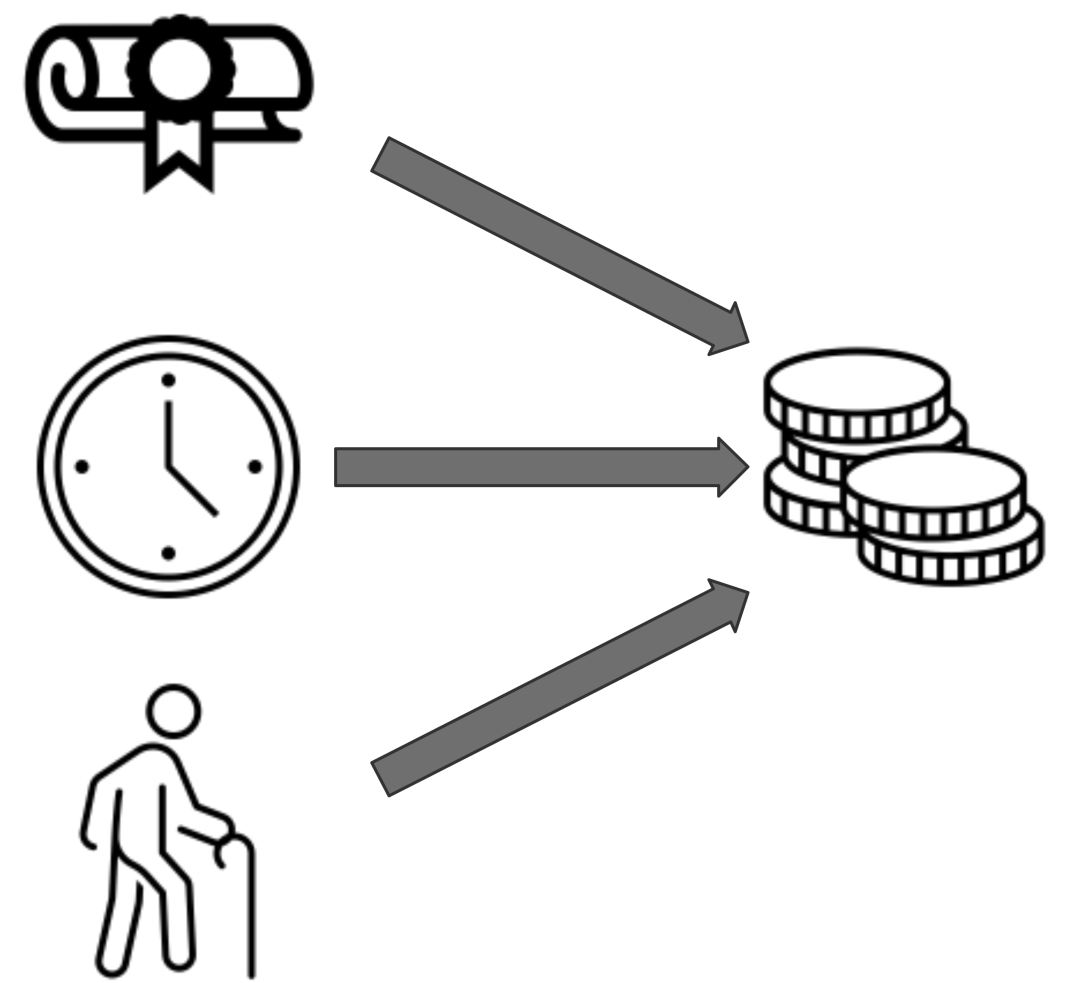
Types of regression analysis

		Scale of measurement	
	number of independent variables	**dependent variable**	**independent variable**
Simple linear regression	one	scale	scale, ordinal, nominal
Multiple linear regression	multiple	scale	scale, ordinal, nominal
Logistic regression	multiple	ordinal, nominal	scale, ordinal, nominal

Simple linear regression

- Does the **weekly working time** have an influence on the ***salary*** of employees?



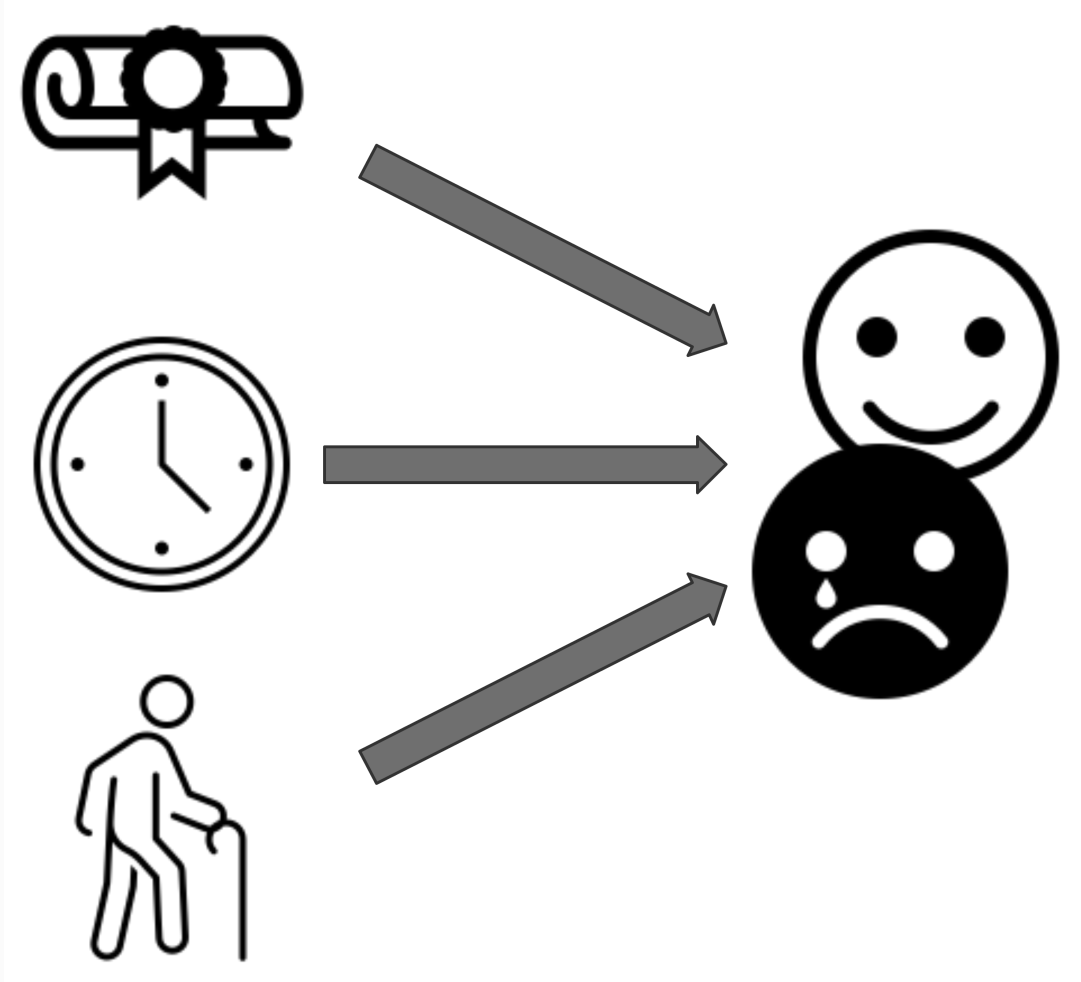


Multiple linear regression

- Do the **weekly working time**, **academic degree** and the **age** of employees have an influence on their ***salary***?

Logistic regression

- Do the **weekly working time**, **academic degree** and the **age** of employees have an influence on the probability of ***having at least one employee***?



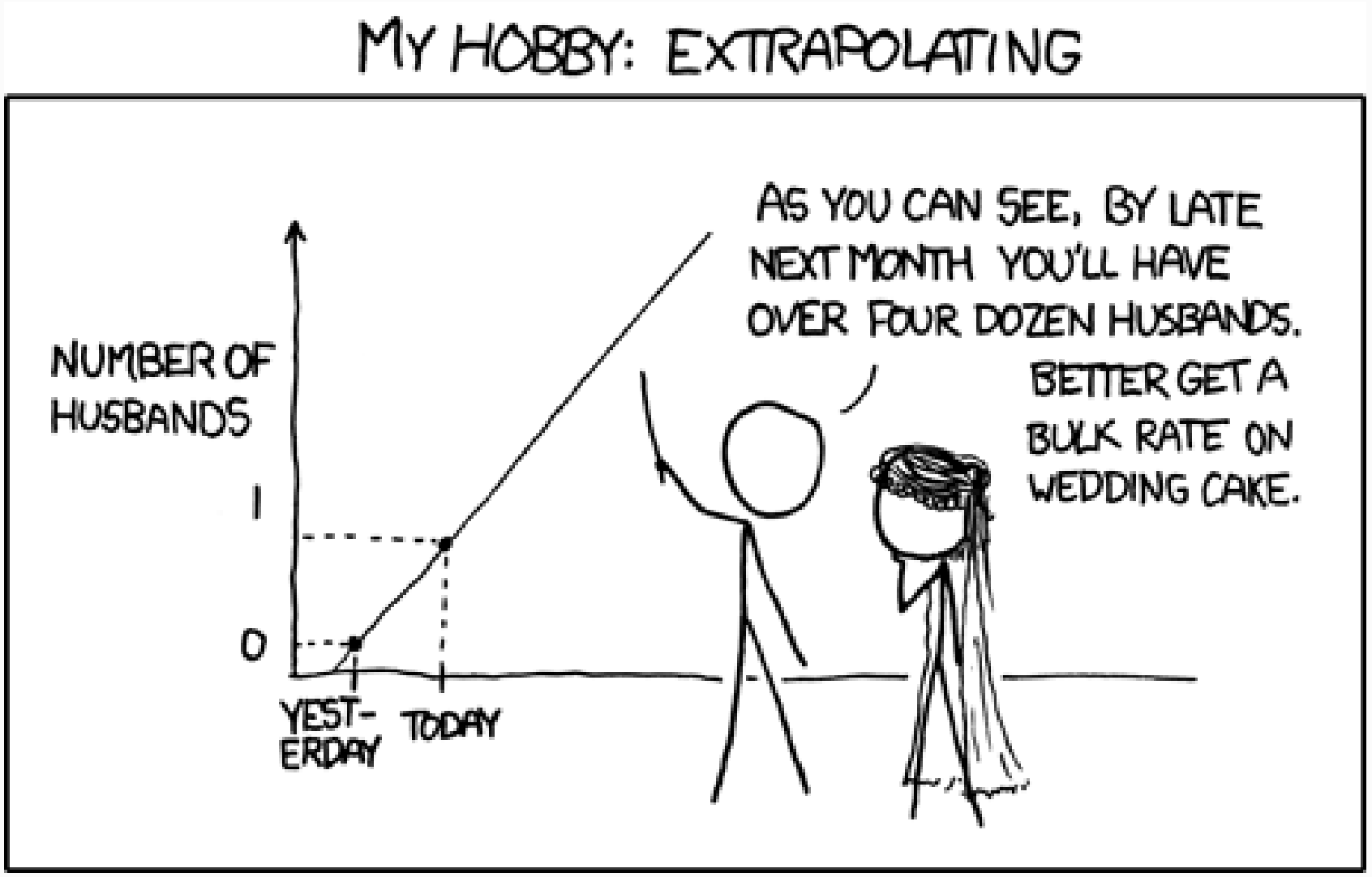
Dummy variables

- Independent variables with a categorical level of measurement (ordinal or nominal) are recoded as dummy variables for the regression analysis

	No degree	Bachelor	Master
No degree	1	0	0
Bachelor	0	1	0
Master	0	0	1

Dummy variables

- *k* new variables corresponding to each level of the categorical variable, where *k* is the number of categories.
- Each new variable is coded 0/1 corresponding to absence or presence of the value for that observation:
    - For a particular observation with bachelor degree, the corresponding dummy variables would be: *no degree* ⇒ 0; *bachelor* ⇒ 1; and *master* ⇒ 0
- *k* – 1 variables are used in the regression analysis.
- The dropped dummy variable is the reference level.


MY HOBBY: EXTRAPOLATING
NUMBER OF HUSBANDS
1
0
YEST-ERDAY
TODAY
AS YOU CAN SEE, BY LATE NEXT MONTH YOU'LL HAVE OVER FOUR DOZEN HUSBANDS.
BETTER GET A BULK RATE ON WEDDING CAKE.