This course was developed as a part of the VLIR-UOS Cross-Cutting projects:

- Statistics: 2011-2016, 2017.
- Statistics: 2017.
- Statistics for development : 2018-2022.
- The >eR-BioStat ITP: 2024-2026.

The >eR-Biostat initiative

Making R based education materials in statistics accessible for all

Short course in Hanoi:
Introduction to inference using R:
Continuous variable in (one population)

Developed by

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(Hasselt Univesrsity, Belgium

LAST UPDATE: 05/2024

Visit us on Facebook ER-BioStat

GitHub https://github.com/eR-Biostat

twitter @erbiostat

Course structure

- 10:00-12:00
  - Introduction: steps in data analysis
  - Analysis of numerical data: point estimators and interval estimates
  - Visualization tool
  - Interval estimates.
  - Reporting.
  - Inference for numerical data for one population
- 12:00-14:00: Lunch break
- 14:00-15:30
  - Inference for numerical data for one/two population(s)
  - Reporting.
- 15:30-15:45 Break.
- 15:45-16:30
  - Inference for numerical data for one/two population(s)
  - Questions and discussion.

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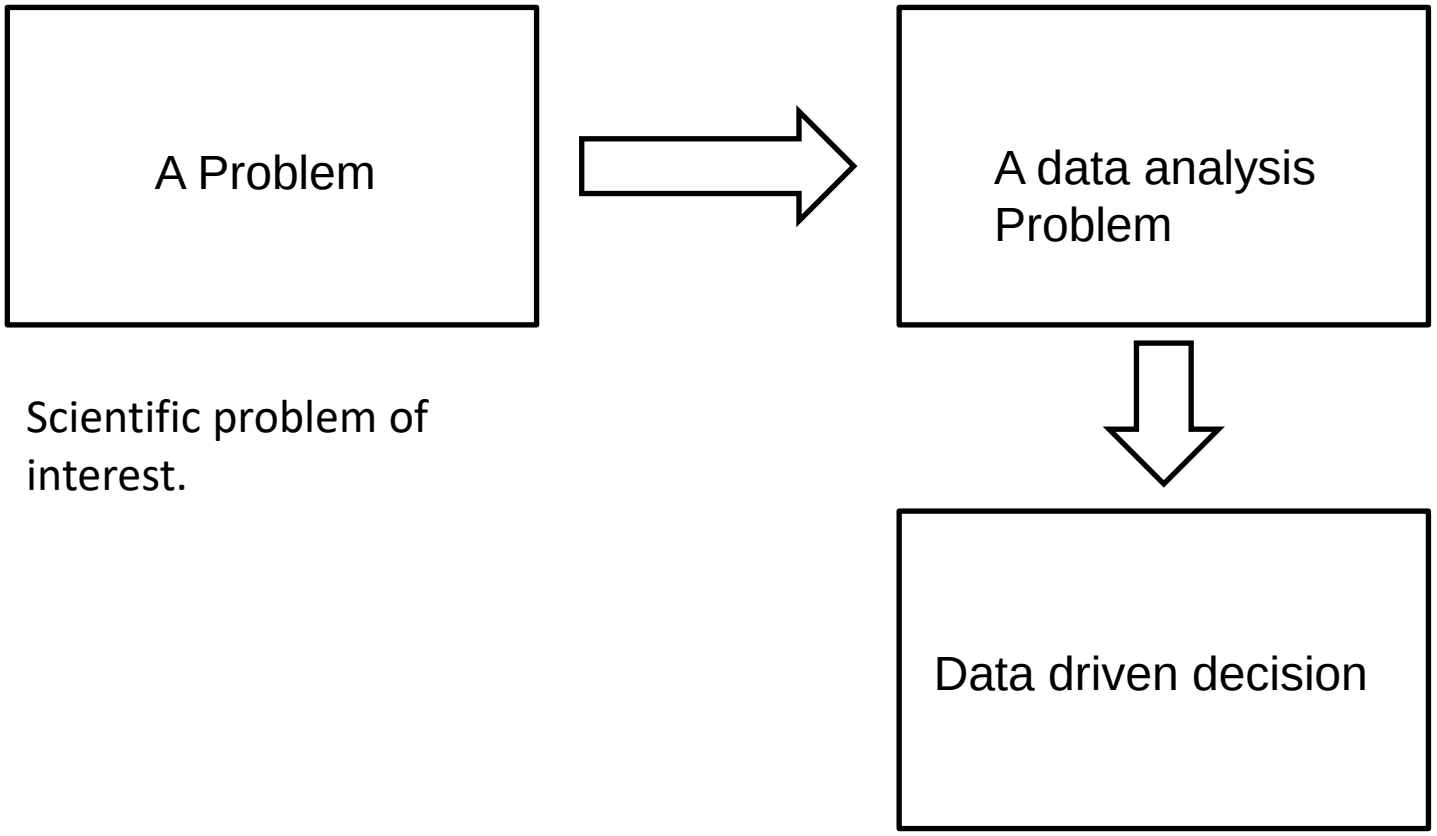
Steps in data analysis

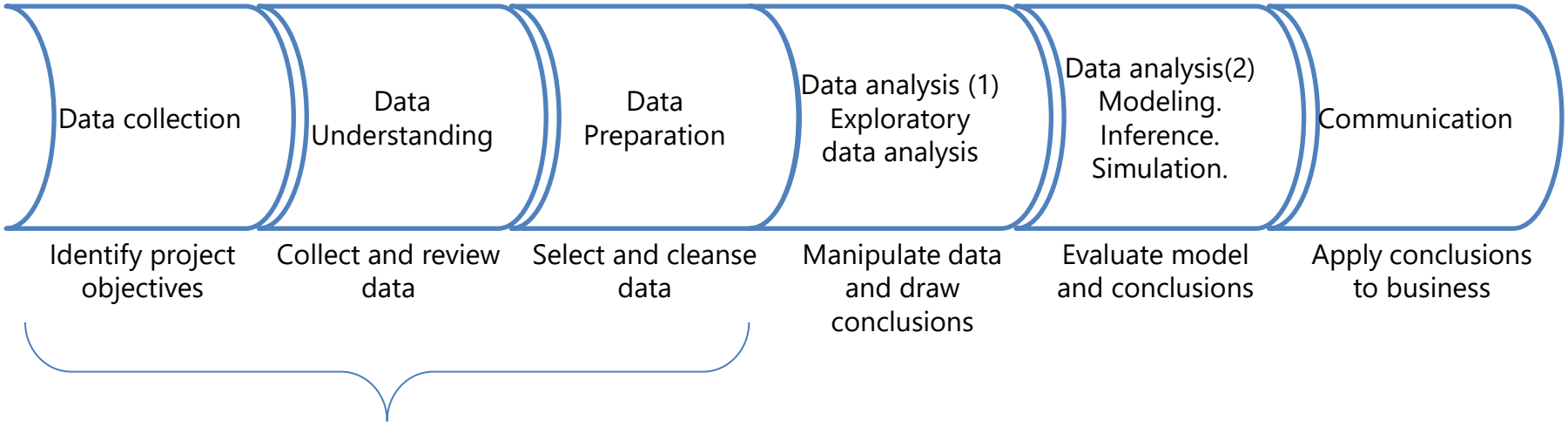
Steps in data analysis

- Data analysis approach in the course:



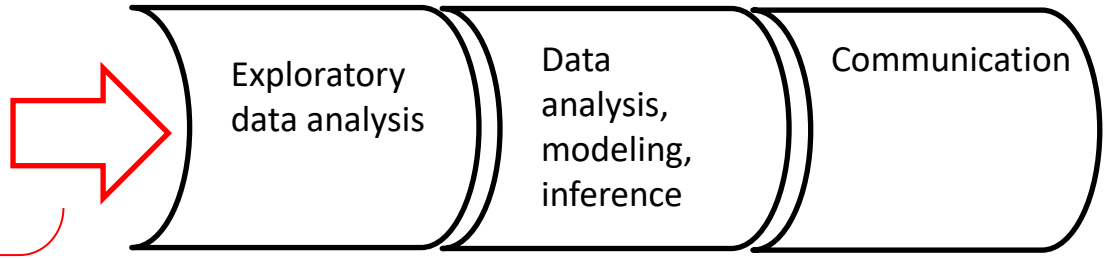
Steps in data analysis

- Steps related to data analysis:



Steps in data analysis

Estimating the mean BMI in the population.



Scientific problem of interest: how to estimate the mean BMI?

Methodology: inference for one sample:

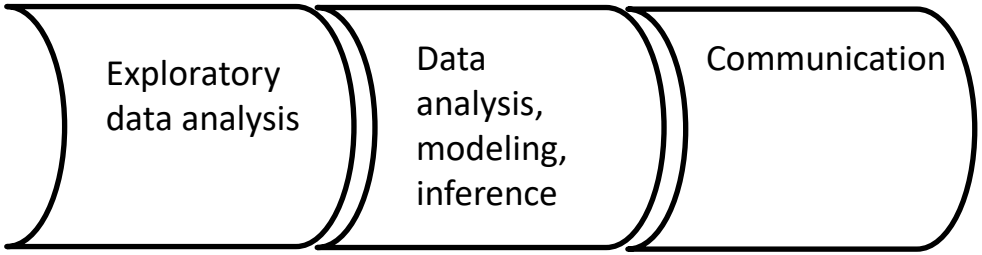
- Point estimates.
- Interval estimates.
- Hypothesis testing.

A report.

The solution

Steps in data analysis

Estimating the mean BMI in the population.



Scientific problem of interest: how to model the association ?

Methodology: inference for one sample.

Histogram, Boxplot…

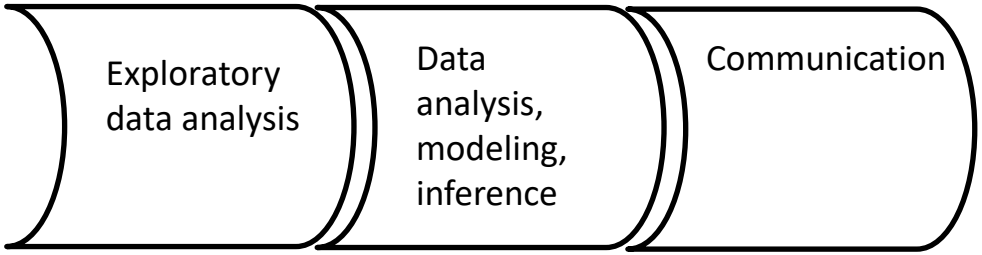
Confidence intervals and test of hypothesis.

A report.

The solution

Steps in data analysis

Estimating the mean BMI in the population.



Scientific problem of interest: how to estimate the mean BMI?

Histogram, Boxplot…

Confidence intervals and test of hypothesis.

A report.

Methodology: inference for one sample.

We “translate” the methodology to software usage

ggplot2()

z.test ()

R markdown to produce a HTML file.

We develop software to produce the solution and to communicate the solution

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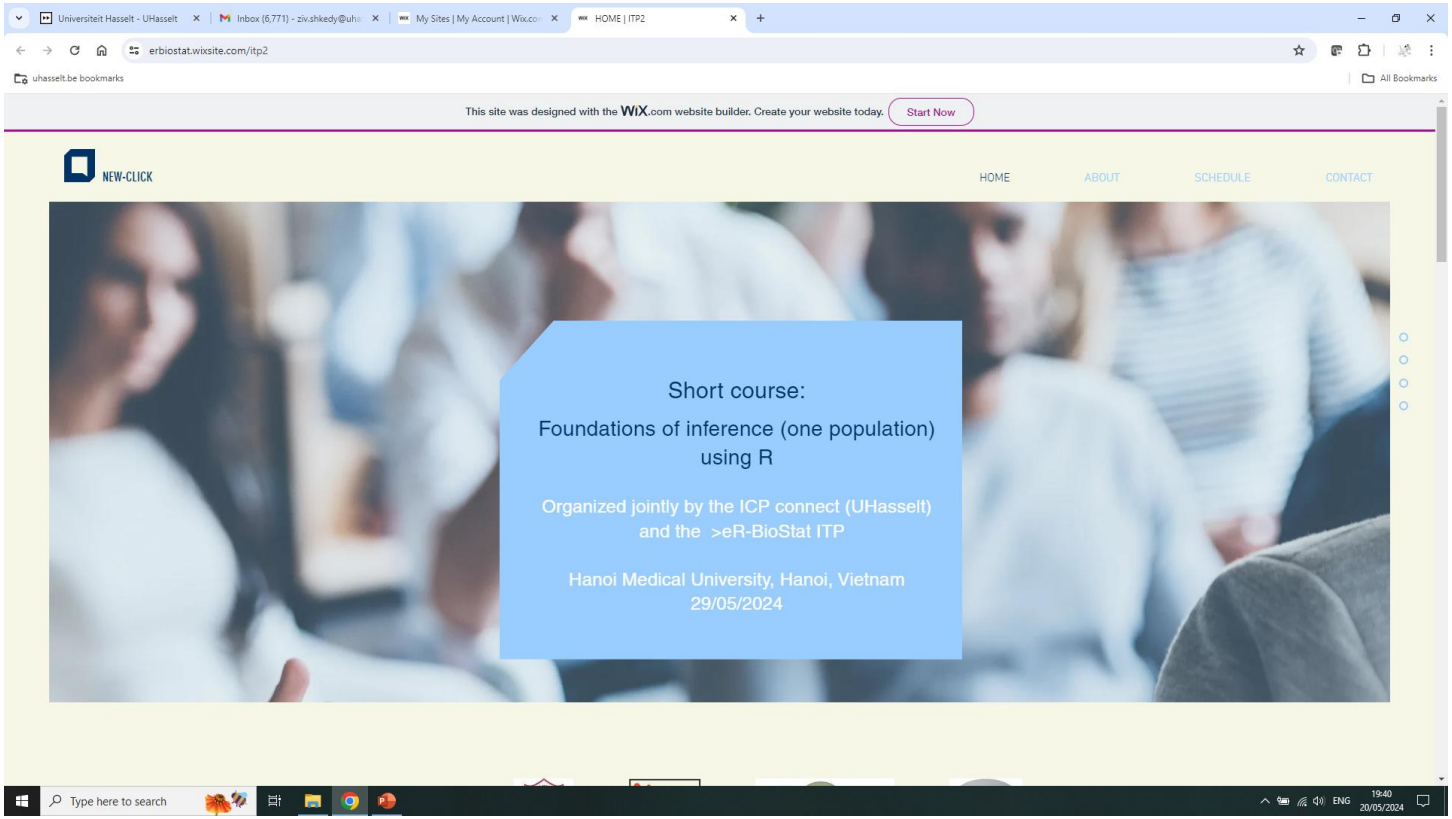
Course materials

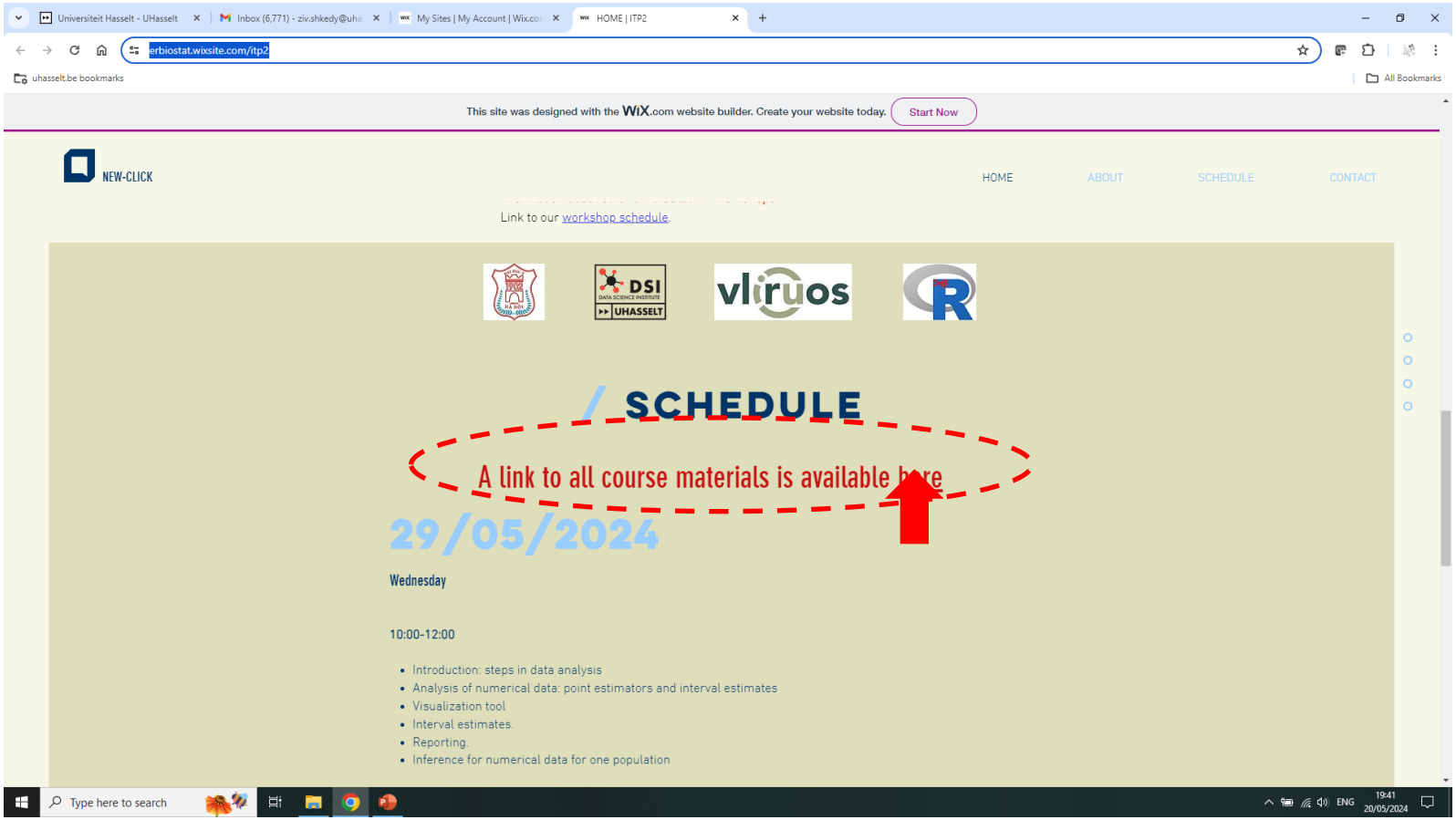
Course's website



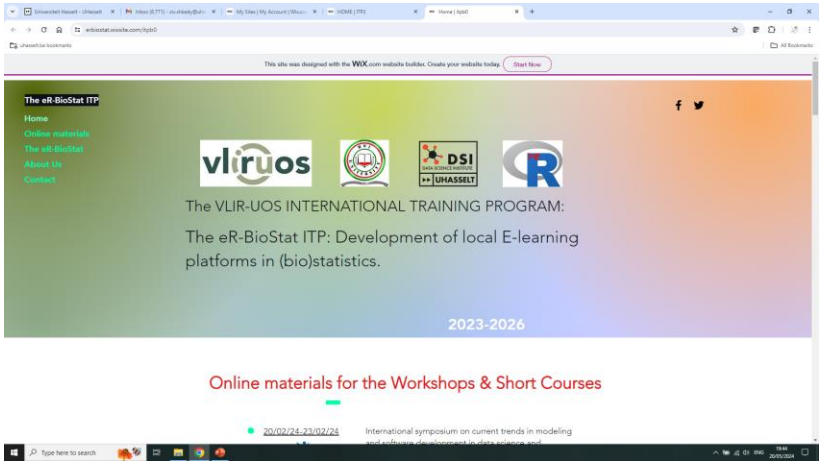
https://erbiostat.wixsite.com/itp2

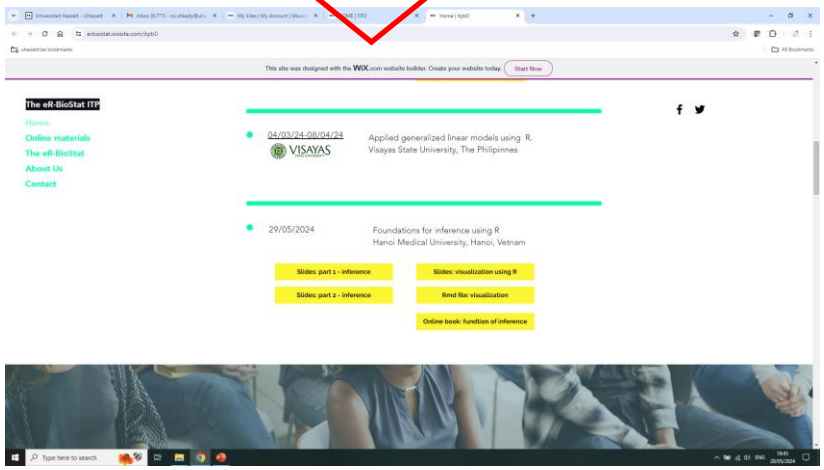
Course's website

- Link to the course materials:



Course's website

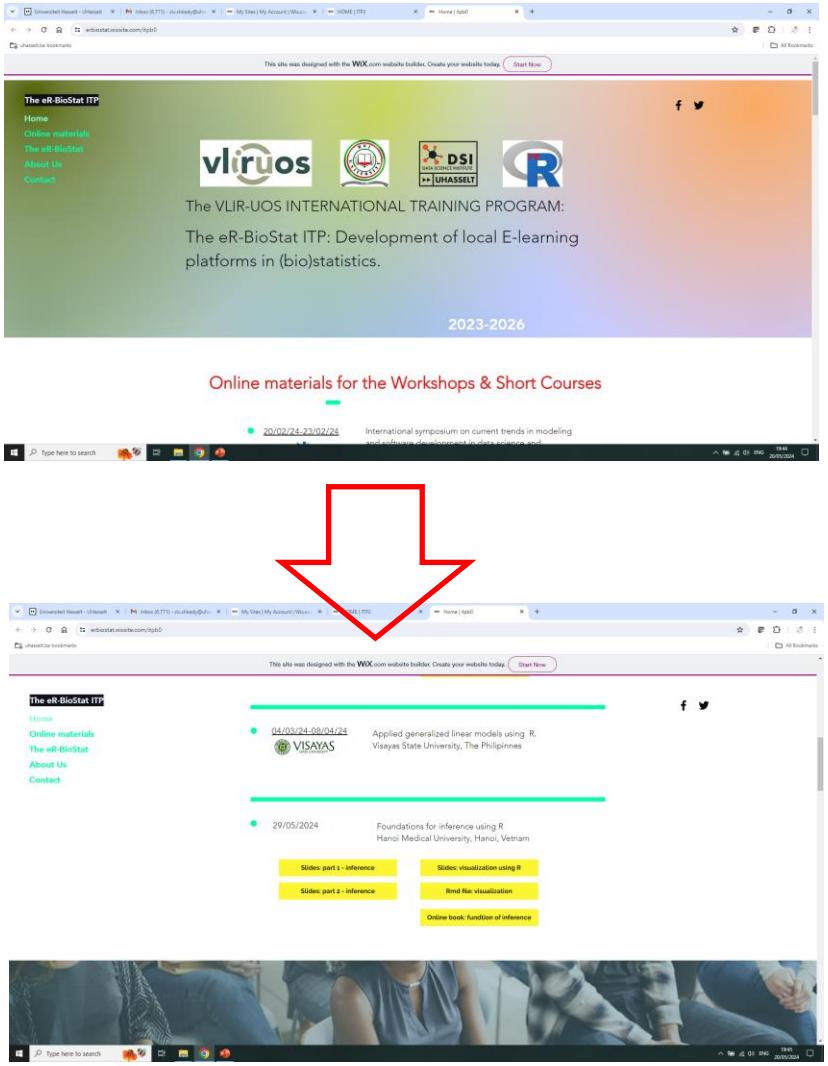




https://erbiostat.wixsite.com/itpb0

- Course materials online include:
  - Online book.
  - Slides.
  - Rmd files + programs for the examples.

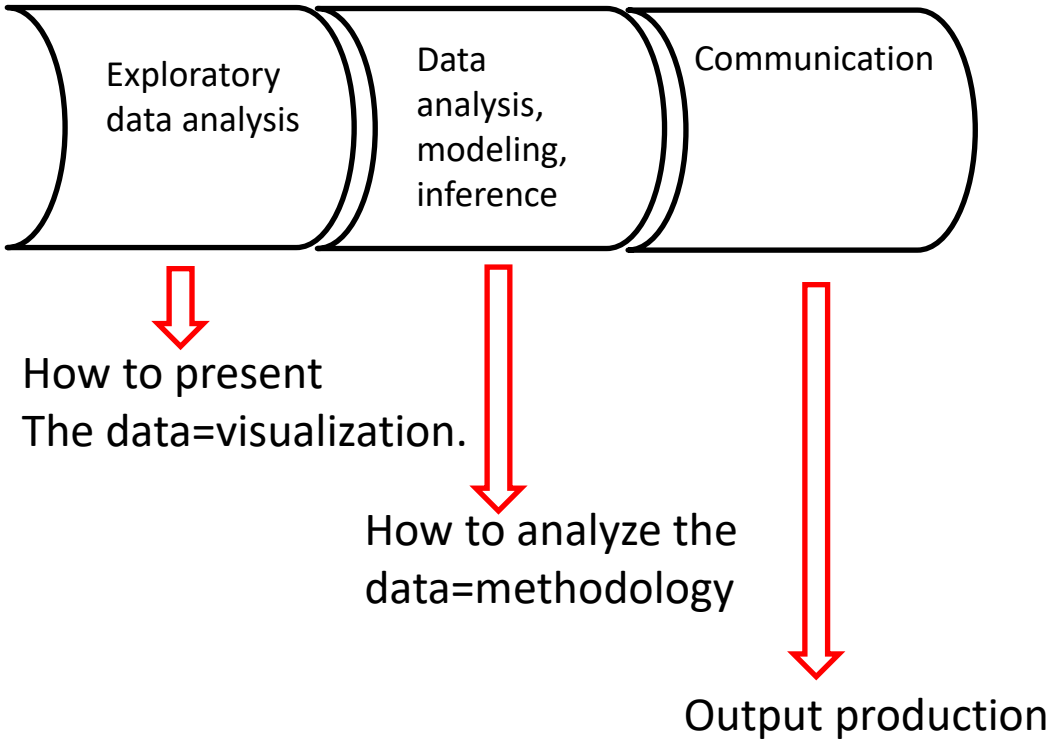
Course's website



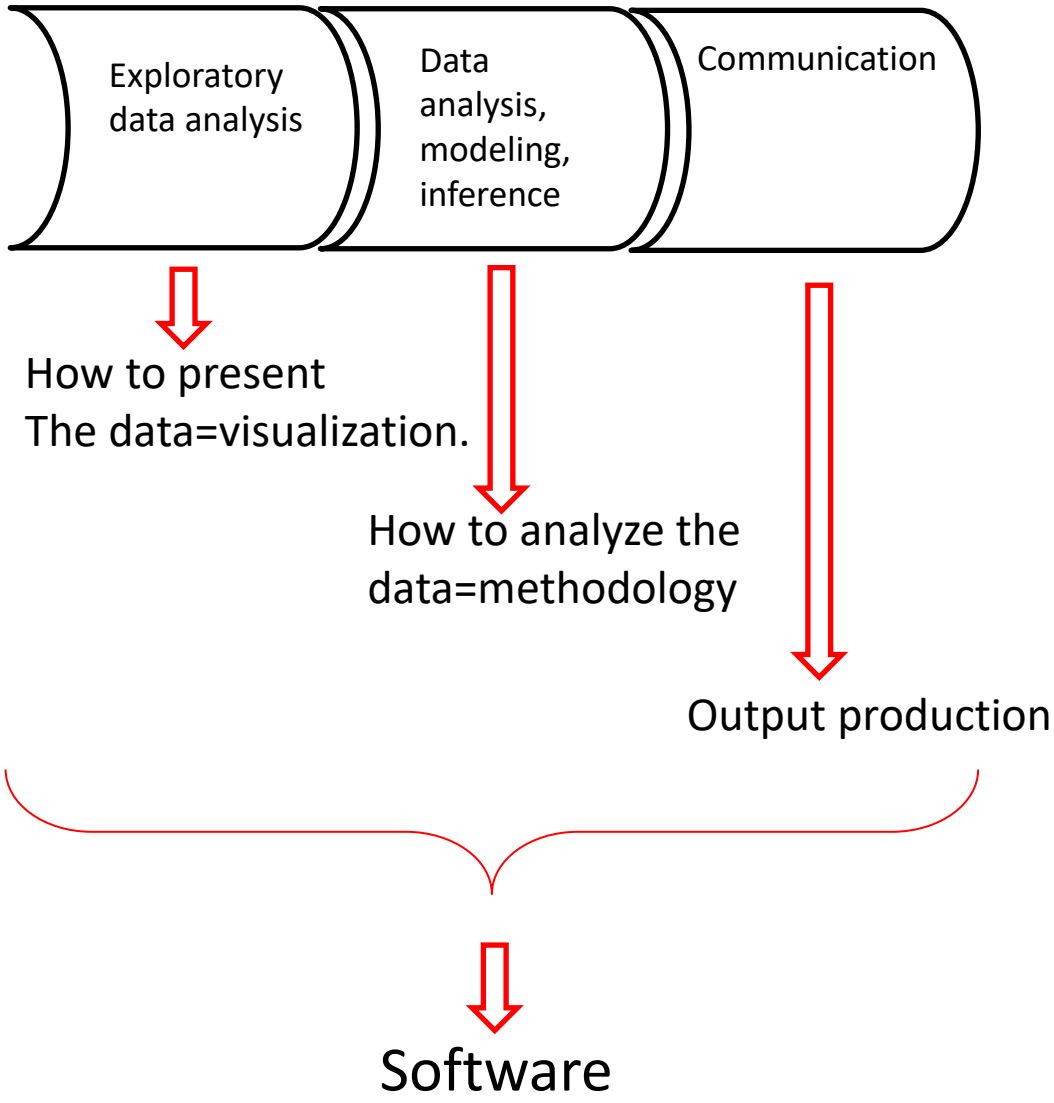
https://erbiostat.wixsite.com/itpb0

- Data analysis.
- Visualization (=how to make nice plots).
- Output production (=how to produce a nice and easy report).

Steps in data analysis



Steps in data analysis



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Software

Software

- All examples: illustrated in R.
- You need to install:
  - R.
  - R-Studio.
- R packages for the course:
  - R markdown.
  - z.test().
  - ggplot2.
  - …