

The >eR-Biostat initiative
Making R based education materials in
statistics accessible for all

We  a community: the >eR-Biostat initiative

Ziv Shkedy

Hasselt University, Belgium & Gondar University, Ethiopia

4th PhD week in Gondar University, Ethiopia
28/08/2017-31/08/2017



Visit us on
Facebook

ER-BioStat

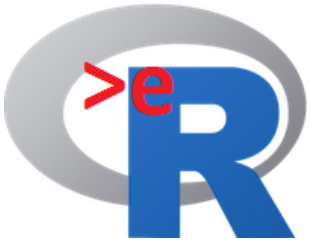
Email: erbiostat@gmail.com



<https://github.com/eR-Biostat>



@erbiostat



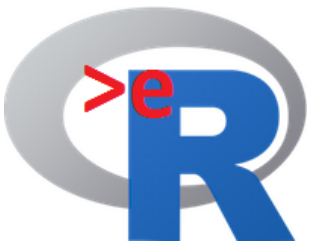
The >eR-Biostat Initiative

- >eR-Biostat = E-learning system using R (biostatistics)
- Leading team:
 - Ziv Shkedy (Hasselt University, Belgium).
 - Khangelani Zuma (HSRC, South Africa).
 - Legesse Debusho (University of South Africa, UNISA).
 - Adetayo Kasim (Durham University, UK).
 - Tadesse Awoke (Gondar University).
 - Kassahun Alemu (Gondar University).



The >eR-Biostat Initiative

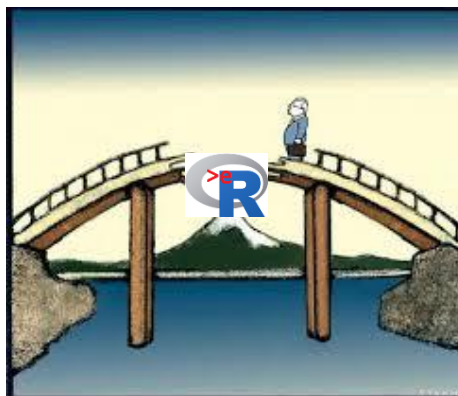
- The >eR-Biostat Initiative aims to:
 - Develop accessible course materials in biostatistics/statistics.
 - Focus on **all education levels**: undergraduate & master programs.
 - Bring students and teachers costs to minimum by providing free, high quality and applied course materials.
 - Increase usage of R.



We  a community

- Building a bridge between two communities:

Academic staff and students in the south.



Development of
E- learning capacity
using R.

Academic staff in the north.



The >eR-Biostat Initiative: general idea

- The main idea:
 - Development of online, publically available and free materials at all education levels.
 - All materials available to download without password.
- Focus on all education levels:
 - **Introductory courses:** for all students (statisticians and non statisticians).
 - **Undergraduate courses:** for undergraduate/master students in statistics.
 - **Core courses:** for students at a master level in biostatistics/statistics.



A typical course structure

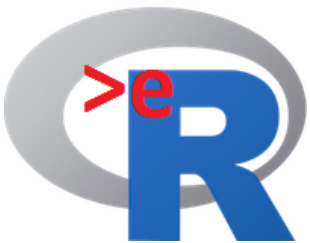
- Applied approach: link with software so students can implement the methods from the class.
- Focus on R.
- A typical course materials:
 - Slides.
 - Set of R program for all the examples in the slides.
 - Datasets (if not included in R).
 - Home works assignments.
 - Example of Exams.
 - YouTube tutorials.

All available
online in a
GitHub page.



Courses and time line

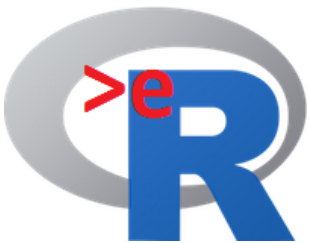
- **Introductory courses:**
 - Introduction to R. **online**
 - Introduction to statistical modeling using R.
 - Introduction to Regression models using R.
 - Introduction to ANOVA models using R.
 - Introduction to logistic regression using R.
- } **online**
- Developed for non statisticians with basic knowledge of statistics and R.
 - Aim:
 - Develop skills in data analysis using R.



Courses and time line

- Undergraduate courses:
 - Linear regression using R.
 - Basic concepts in exploratory data analysis and statistical computing using R.
 - Basic concepts of statistical inference using R (I).
 - Basic concepts of statistical inference using R (II)-available as online course only.
- Developed for undergraduate/master students in statistics.
- Aim:
 - Develop skills in data analysis using R.
 - Advance usage of the R software.
 - New methodology for EDA.
 - Basic programming in R.

online



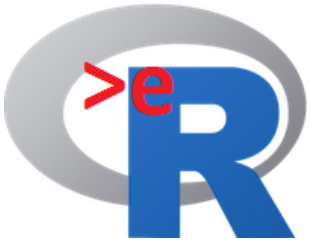
Courses and time line

- Core (I):

- Linear models.
- GLM.
- Non Parametric.
- Analysis of categorical data:
 - Analysis of binary data. **online**
 - Log-linear models.

Will be available
online during
2017/2018.

- Developed for master students in statistics.
- Aim:
 - Complete courses at a master level.



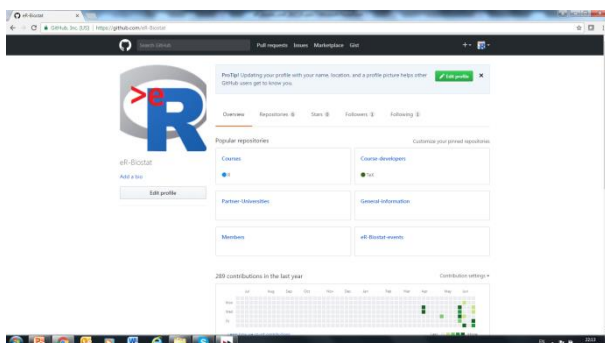
Courses and time line

- Core (II):
 - Longitudinal data analysis.
 - Multivariate analysis.
 - Bayesian analysis.
 - Resampling based methods.
 - Survival analysis.
 - More...



We  a community

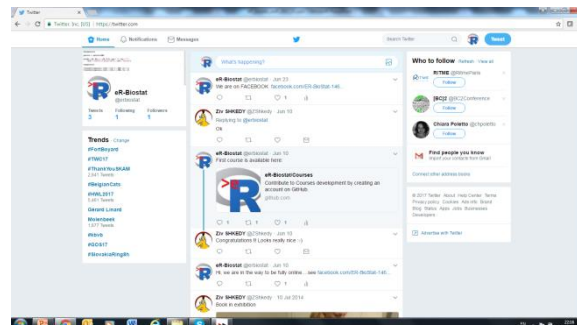
The community online:



<https://github.com/eR-Biostat>



ER-BioStat



@erbiostat

- GitHub page with course materials .
- Information about activities.

- Communication teachers/students in the south.
- Information about course materials.
- Information about activities.



Example of a course: An introduction to R

- Online course materials :

The screenshot shows the GitHub repository page for 'eR-Biostat/Courses'. The commit history table is as follows:

| Commit | Message | Time |
|--------------------------------|---|----------------------------------|
| eR-Biostat committed on GitHub | Update README.md | Latest commit 7cd0cac 3 days ago |
| Core -1 | Update README.md | 3 days ago |
| Introductory Courses | Delete eR-Biostat_Statistical_Computing_2017_V1.pdf | 5 days ago |
| README.md | Update README.md | 8 days ago |

A red circle highlights the 'Introductory Courses' commit. A red arrow points from this circle to the following list of bullet points:

- **An introduction to R:**
- **A part of the introductory courses.**
- **Train students to use R in data analysis.**
- **The students are not expected to study anything new in statistics.**

The README.md content visible in the screenshot includes the following text:

The >eR-Biostat initiative

Making R based education materials assessable for all

The E-learning system, developed as a part of the >eR-Biostat initiative, offers free online course materials for master students in biostatistics/statistics in developing countries. For each course, the materials are publicly available and consist of several types of course materials:



Example of a course: An introduction to R

- A part of the introductory courses:

Courses/Introductory Co X

GitHub, Inc. [US] | <https://github.com/eR-Biostat/Courses/tree/master/Introductory%20Courses>

eR-Biostat committed on GitHub Delete eR-Biostat_Statistical_Computing_2017_V1.pdf Latest commit 1911728 a day ago

| File | Commit Message | Time |
|---|---|------------|
| Basic concepts in exploratory data analysis ... | Delete eR-Biostat_Statistical_Computing_2017_V1.pdf | a day ago |
| Introduction to R | Update README.md | 4 days ago |
| Introduction to statistical modeling using R | Update README.md | 2 days ago |
| README.md | Update README.md | 2 days ago |

README.md

The >eR-Biostat initiative

Making R based education materials assessable for all

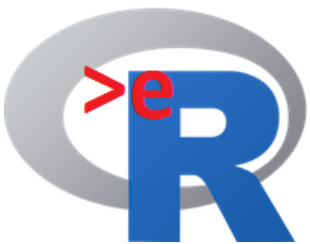
Introductory courses

This group of courses are developed at an introductory level. Only basic level knowledge of statistics is required. The courses DO NOT aim to teach the student new topics in statistics but to train the students to use R in data analysis.

Available courses in this group:

- Introduction to R (<https://github.com/eR-Biostat/Courses/tree/master/Introductory%20Courses/Introduction%20to%20R>).
- Basic concepts in exploratory data analysis and computational statistics in R (<https://github.com/eR-Biostat/Courses/tree/master/Introductory%20Courses/Basic%20concepts%20in%20exploratory%20data%20analysis%20and%20computational%20statistics>).
- Introduction to statistical modeling using R (will be available online in 2018).

EN 22:37 24/06/2017



Example of a course: An introduction to R

- Online course materials :

GitHub, Inc. [US] | <https://github.com/eR-Biostat/Courses/tree/master/Introductory%20Courses/Introduction%20to%20R>

This repository Search Pull requests Issues Marketplace Gist

eR-Biostat / Courses Watch 0 Star 0 Fork 0

Code Issues 0 Pull requests 0 Projects 0 Wiki Settings Insights

Branch: master Courses / Introductory Courses / Introduction to R / Create new file Upload files Find file History

eR-Biostat committed on GitHub Update README.md Latest commit ec9cfc4 4 days ago

| File | Commit Message | Time |
|------------|----------------------|-------------|
| Data | Create README.md | 15 days ago |
| R programs | Add files via upload | 15 days ago |
| Slides | Add files via upload | 15 days ago |
| README.md | Update README.md | 4 days ago |

README.md

The >eR-Biostat initiative

Introduction to R

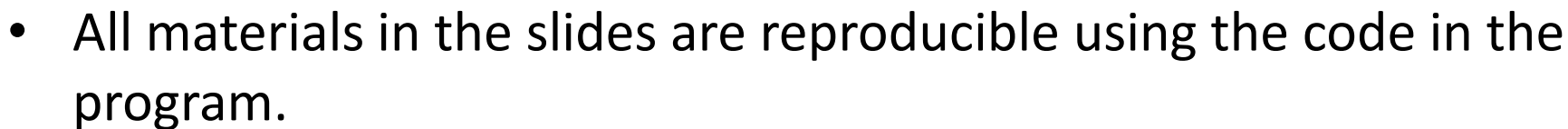
This course is an introductory course to R and can be given as a two-days workshop or as a course of 3-4 classes (3 hours per class). All topics in the course are presented at a basic level and do not intend to introduce new materials. Only a limited knowledge in R is required. Topics covered in the course include:

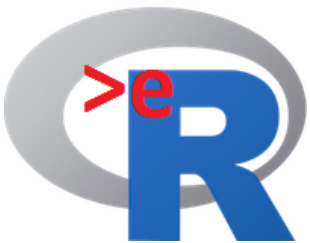
- Two sample t-test.
- Basic plots

• Datasets, if not a part of R, are available online as well.



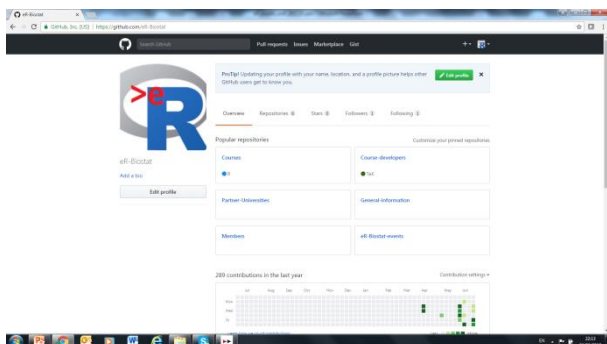
Example of a Slide





Usage of courses materials

The community online:



<https://github.com/eR-Biostat>

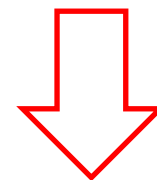
- GitHub page with course materials .
- Information about activities.

- Accessible to everybody.
- Independent usage of course materials by academic staff in the south.
- Taring workshops.



Courses materials for core courses

- For the core courses:
 - **Core (I):**
 - Linear models.
 - GLM.
 - Binary data and log nilar models.
 - Non Parametric.
 - Survival analysis.
 - **Core (II):**
 - Longitudinal data analysis.
 - Multivariate analysis.
 - Bayesian analysis.
 - Resampling based methods.
 - More...
- Online materials include:
 - Slides.
 - Set of R program for all the examples in the slides.
 - Datasets (if not included in R).
 - Home works assignments.
 - Example of Exams.



To setup the course level

Master level courses

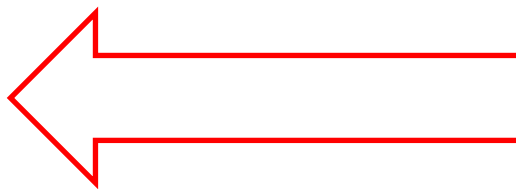
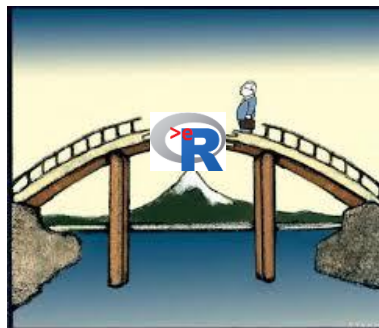


We  a community

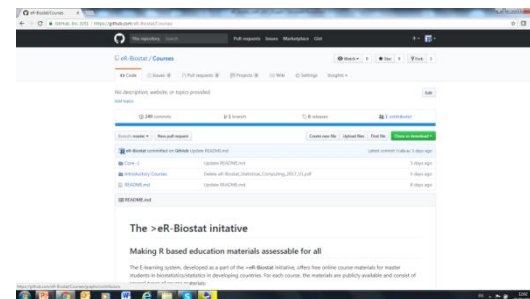
- Capacity building in statistics education (at all levels) via community building.
- Target departments, i.e. undergraduate & master programs.

Credit courses as a part of the **curriculum of the master program** in the south.

In the long run:
Independent usage
and NOT short
courses format.



>eR-Biostat courses



Introductory courses.
Linear models.
GLM.
Non Parametric.
Survival analysis.
Longitudinal data analysis.
Multivariate analysis.
Bayesian analysis.
More...

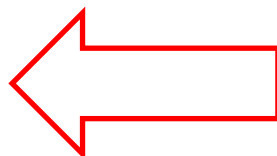
Who do we support ?

- Students in statistics: all levels.
- Students in other disciplines: all levels.
- Academic staff : all levels.
- Main concept:
 - Download and use in class.
 - No password protected.
 - Use as a complete course (i.e., a credit course within a program curriculum) or as a part of existing course.

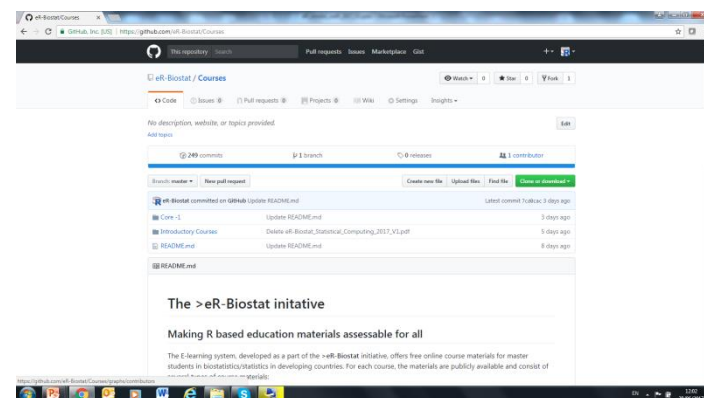


We  a community

- Partner universities in the south:
- Gondar University, Ethiopia:
 - Master in Biostatistics.
- University of South Africa (UNISA):
 - Trajectory in Biostatistics (as a part of the master).
-



GitHub



- Training events: >eR-Biostat workshops in partner universities (for both students and academic staff).



The >eR-Biostat initiative
E-learning system using R
Biostatistics

Thank you ve**R**y much !!



Visit us on
Facebook

ER-BioStat

Email: erbiostat@gmail.com



<https://github.com/eR-Biostat>



@erbiostat