



An introduction to the R Epidemics Consortium

Thibaut Jombart

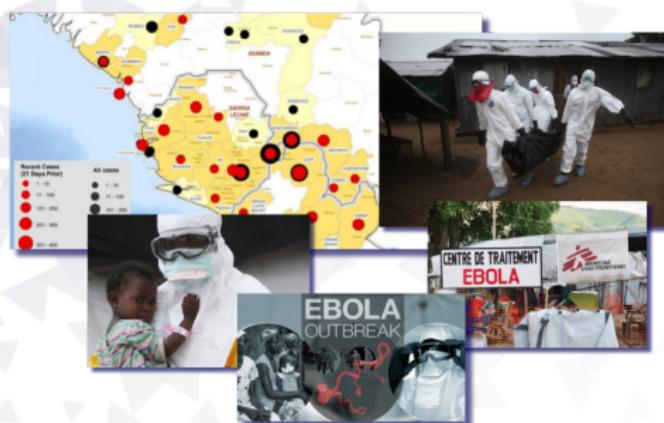
10th December 2018

London School of Hygiene and Tropical Medicine
Imperial College London

The background of the slide features a large number of small, light-gray triangles of various sizes scattered across the entire area, creating a subtle geometric pattern.

Where do we come from?

Lessons learnt from the Ebola response



Lessons learnt from the Ebola response

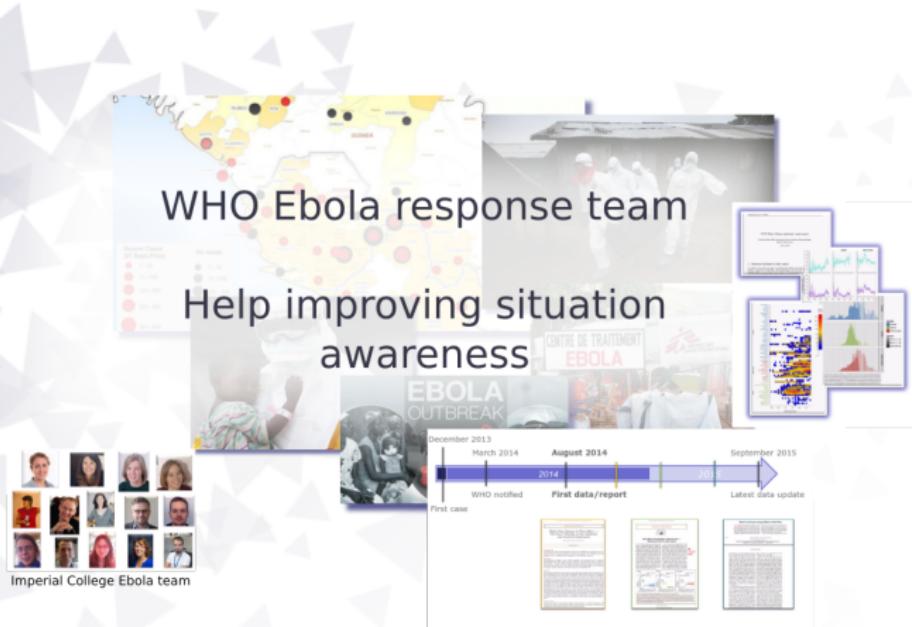


Lessons learnt from the Ebola response

The image is a collage of various elements related to the Ebola response:

- A map of West Africa (Guinea, Sierra Leone, and Liberia) showing the locations of Ebola cases.
- A photograph of the "WHO Ebola response team" in protective gear.
- A photograph of a medical facility labeled "CENTRE DE TRAITEMENT EBOLA".
- A graphic titled "Help improving situation awareness" with a timeline from December 2013 to September 2015, marking the "First case", "WHO notified" (March 2014), "First data/report" (August 2014), and "Latest data update".
- A grid of three documents titled "Ebola Situation Report" for December 2013, March 2014, and August 2014.
- A photograph of a person in a patterned dress sitting at a table.
- A photograph of a person in a white lab coat.
- A photograph of a group of people in a meeting.
- A small grid of 16 portraits labeled "Imperial College Ebola team".

Lessons learnt from the Ebola response



Most **tools** for outbreak response analysis **were missing**.

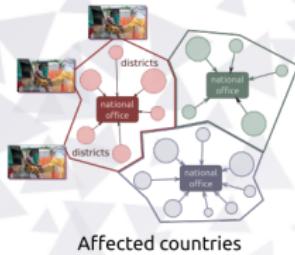
Informing the response in 'real time'?



Informing the response in 'real time'?



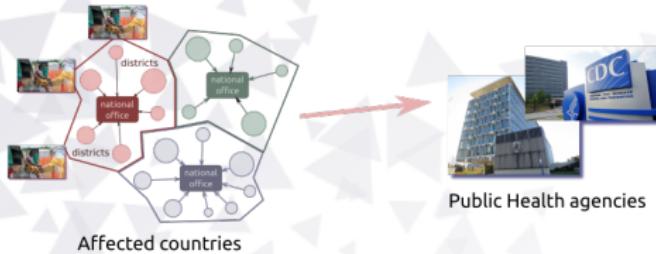
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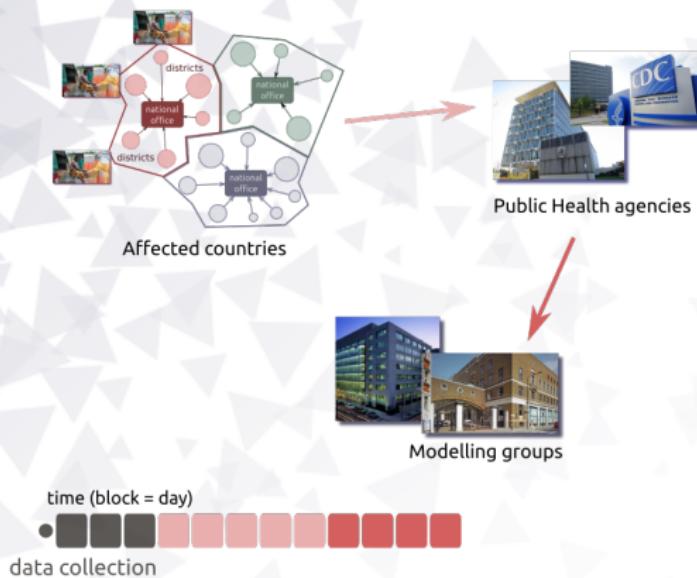
Affected countries

time (block = day)
• data collection

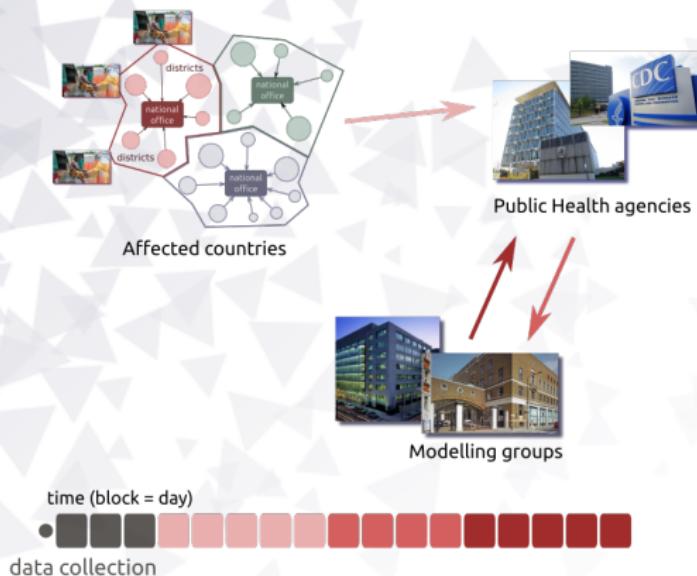
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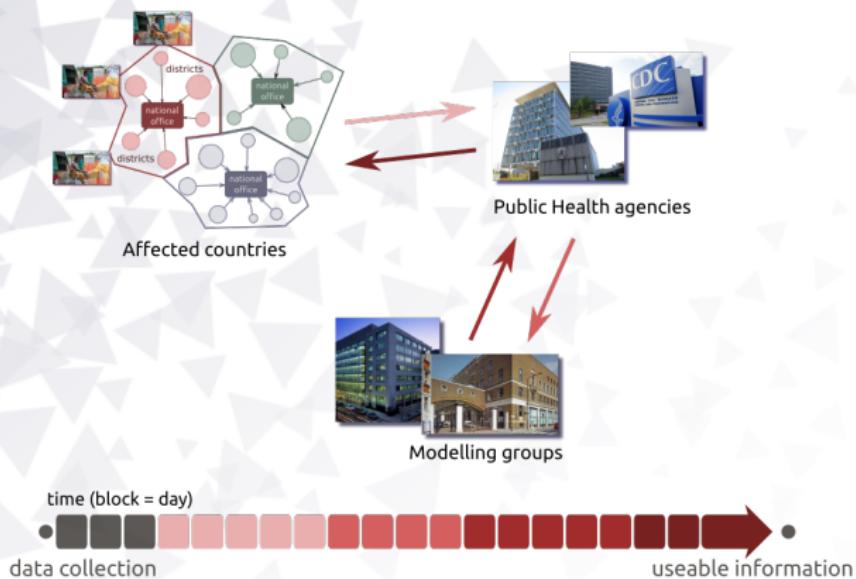
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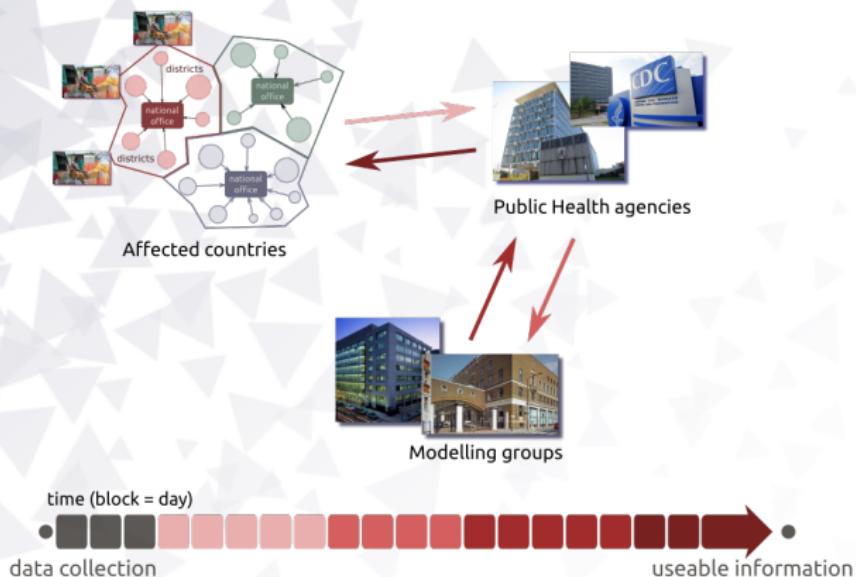
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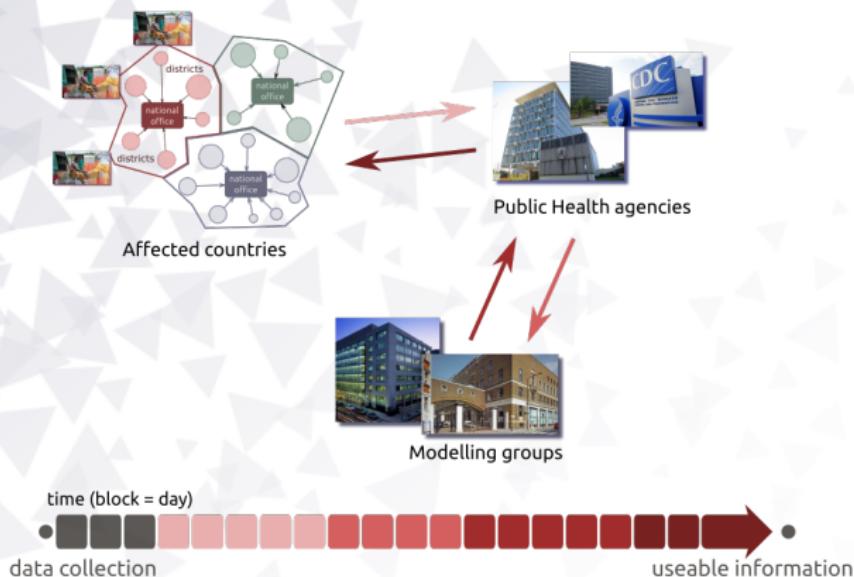


Informing the response in 'real time' ?



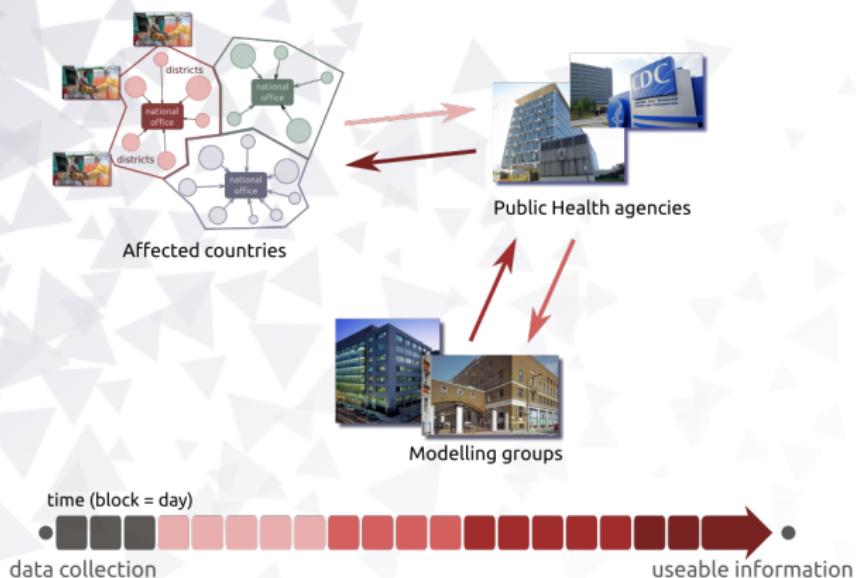
- good **tools** will shorten only some delays

Informing the response in 'real time' ?



- good **tools** will shorten only some delays
- potential for **embedding analysts** in response teams

Informing the response in 'real time' ?



- good **tools** will shorten only some delays
- potential for **embedding analysts** in response teams
- two-way road: lots to learn from the field for analysts

Who do we need to develop outbreak analytics tools?



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How do we bring these people together?

From a hack to a pack



Hackout 3, summer 2016, Berkeley

From a hack to a pack



Hackout 3, summer 2016, Berkeley



A word cloud representing the themes and technologies discussed during the hackathon, including:

- functional incubation
- userfriendly secure dictionary
- systems testing automated continuous
- rppt efficiency collection series
- parsing secured bias number repository
- outbreaks fast
- code integration gui
- reporting vhl
- unit data peak
- situation anonymised
- epidem contact delay
- epiastin compiled time
- contact epinfo interface tree
- symptoms outbreaker fellow
- linelist tracing shiny
- automation cdc
- epicontacts edco
- incidence rates
- cleaning bayesian site report
- dashboard ggplot clusters reliable
- parallel contacttracing
- parameters epidemics genomics
- epidemics distribution
- incubation
- exposure period
- reproductive number
- reproducible package
- reproduction
- logistics
- mutations
- line lists
- exposure period
- estimation
- censoring
- transmission
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- distribution

From a hack to a pack



Hackout 3, summer 2016, Berkeley

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clean compiled
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lineelist fellow
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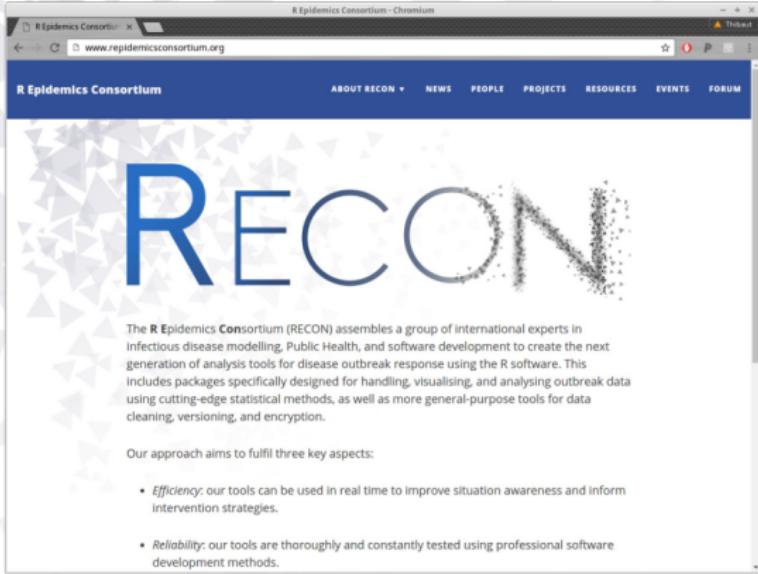
RECON
[The R Epidemics Consortium]

From a hack to a pack



RECON: the R Epidemics Consortium

A taskforce to build a new generation of outbreak response tools in .



The screenshot shows a web browser window displaying the RECON website at www.repidemcisconsortium.org. The page has a dark blue header with the RECON logo and navigation links for ABOUT RECON, NEWS, PEOPLE, PROJECTS, RESOURCES, EVENTS, and FORUM. The main content area features a large, stylized title "RECON" where the letters are composed of small dots or particles. Below the title is a paragraph describing the consortium's mission to assemble international experts for infectious disease modelling, Public Health, and software development. It highlights the use of R software and cutting-edge statistical methods. A section below states that their approach fulfills three key aspects: Efficiency, Reliability, and Transparency.

The R Epidemics Consortium (RECON) assembles a group of international experts in infectious disease modelling, Public Health, and software development to create the next generation of analysis tools for disease outbreak response using the R software. This includes packages specifically designed for handling, visualising, and analysing outbreak data using cutting-edge statistical methods, as well as more general-purpose tools for data cleaning, versioning, and encryption.

Our approach aims to fulfil three key aspects:

- *Efficiency*: our tools can be used in real time to improve situation awareness and inform intervention strategies.
- *Reliability*: our tools are thoroughly and constantly tested using professional software development methods.

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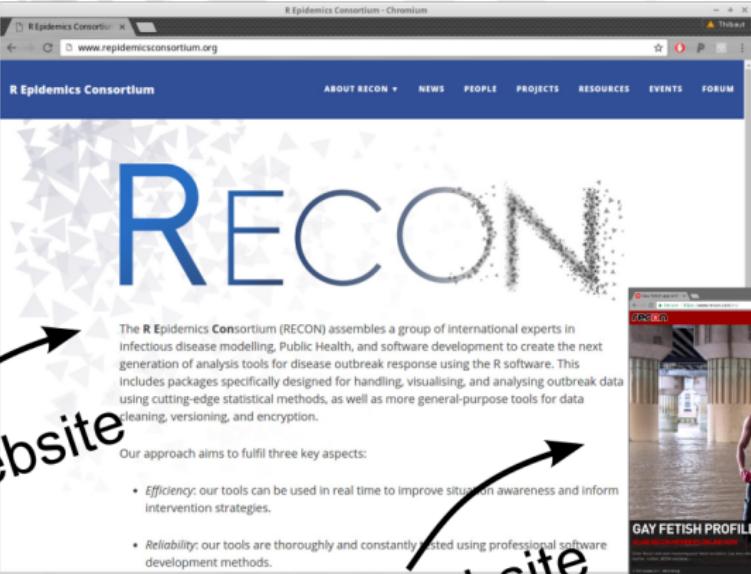
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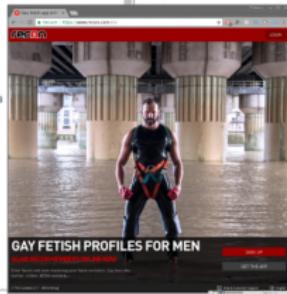
The screenshot shows the homepage of the RECON website. The title "RECON" is prominently displayed in large blue letters, with the "O" composed of a grid of smaller dots. Below the title is a paragraph of text describing the consortium's mission and expertise. A bulleted list follows, detailing the approach to fulfilling three key aspects: efficiency, reliability, and transparency.

Our website

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- *Reliability:* our tools are thoroughly and constantly tested using professional software development methods.
- *Transparency:* our tools are open source and freely available to anyone who wants to use them.



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RECON in a nutshell

The first 2 years



www.repidemicsconsortium.org

- started as informal network **6th September 2016**

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- **~ 9 packages released**, **~ 15-20 under development**
- public forum, blog, online resources

Recent changes

RECON

www.repidemicsconsortium.org

- as of 19 September 2018: non-governmental organisation

Recent changes

The logo consists of the word "RECON" in a large, bold, blue sans-serif font. The letter "O" is unique, composed of a cluster of small, dark grey triangles that radiate outwards from the center, giving it a textured, almost sparkly appearance.

RECON

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- as of 19 September 2018: **non-governmental organisation**
- **not-for-profit, incorporated association** registered in France

Recent changes



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- **activities:** software, training, deployment

RECON packages

- released (9): epicurves, contact data, transmissibility, forecasting, outbreak reconstructions



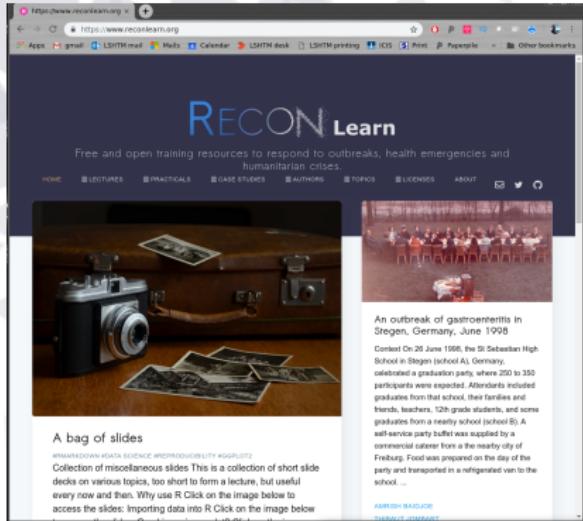
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- upcoming (~ 15-20): deployable systems (RECON deployer), population flows, outbreak clusters, reproducible data cleaning, rmarkdown workflows, GUIs
- planned (?): automated reports, mapping, outbreak simulators

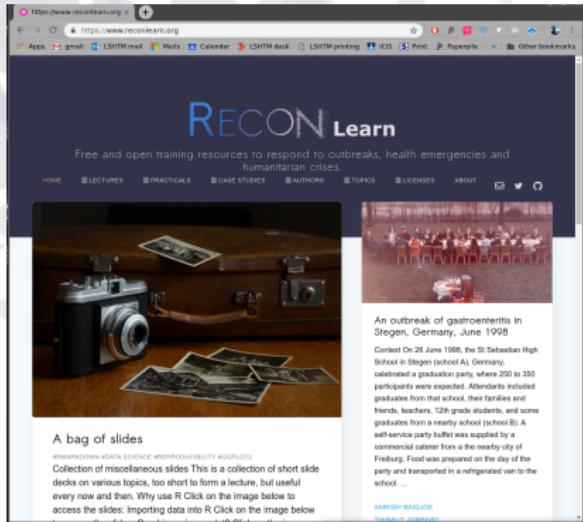
reconlearn.org: training resources for epidemics analysis



- repository for free, open training material

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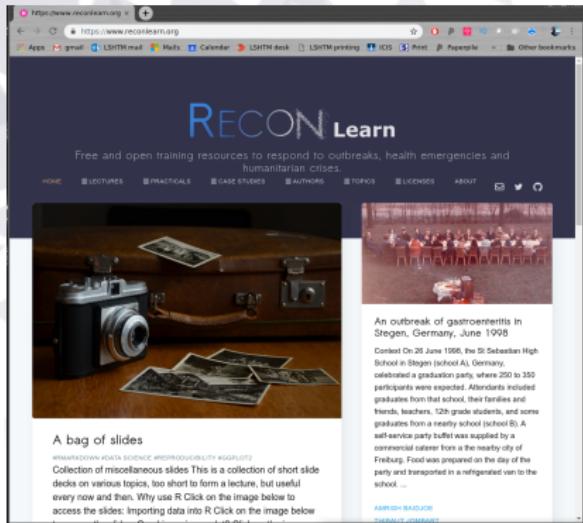
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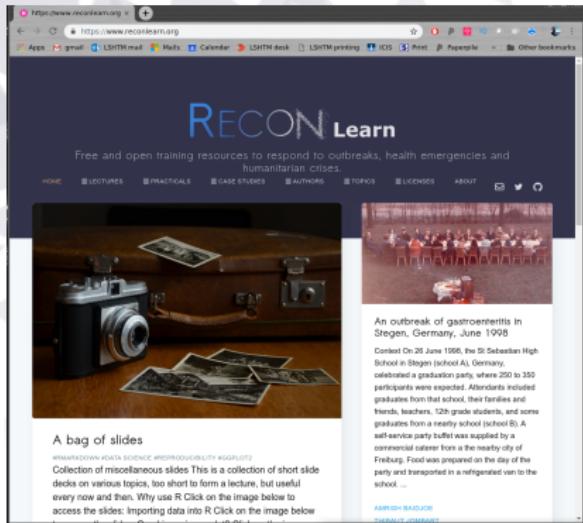
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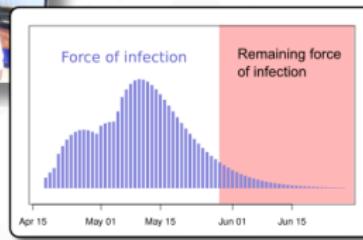
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- videos: **Rtips** on YouTube

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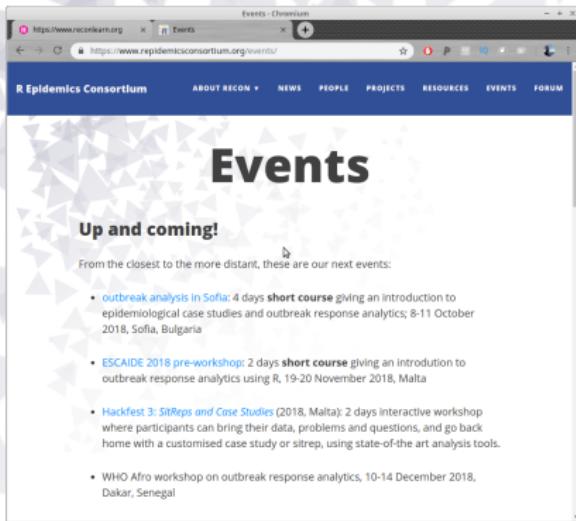
Supporting outbreak response in the field: Ebola outbreak in Likati (DRC) 2017



- Ebola outbreak April-May 2017
- small scale (8 confirmed / probable cases)
- challenging settings: remote, rural area (jungle), poor WASH
- statistical analysis part of sitrep, discouraged scaling up



RECON events



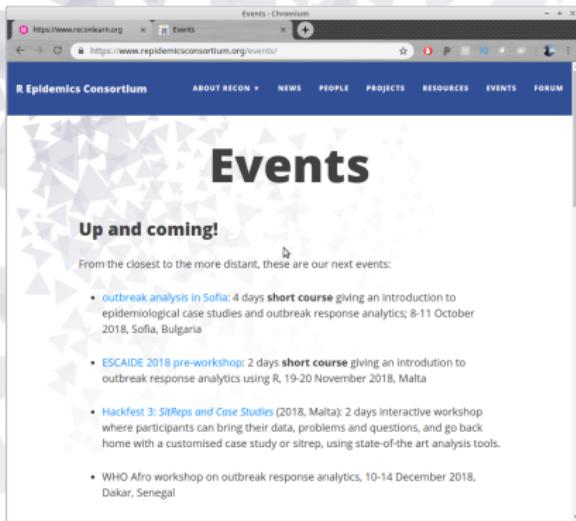
The screenshot shows a web browser window with the title 'Events - Chrome' at the top. The address bar contains the URL <https://www.reconlearn.org/events/>. Below the address bar is a navigation menu with links: R Epidemics Consortium, ABOUT RECON, NEWS, PEOPLE, PROJECTS, RESOURCES, EVENTS, and FORUM. The main content area has a large, bold heading 'Events'. Below it is a section titled 'Up and coming!' with a sub-section header 'From the closest to the more distant, these are our next events:'. A list of five upcoming events follows:

- outbreak analysis In Sofia: 4 days **short course** giving an introduction to epidemiological case studies and outbreak response analytics; 8-11 October 2018, Sofia, Bulgaria
- ESCAIDE 2018 pre-workshop: 2 days **short course** giving an introduction to outbreak response analytics using R. 19-20 November 2018, Malta
- Hackfest 3: *SitReps and Case Studies* (2018, Malta): 2 days interactive workshop where participants can bring their data, problems and questions, and go back home with a customised case study or sitrep, using state-of-the art analysis tools.
- WHO Afro workshop on outbreak response analytics, 10-14 December 2018, Dakar, Senegal

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[www.repidemicsconsortium.org/
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RECON events



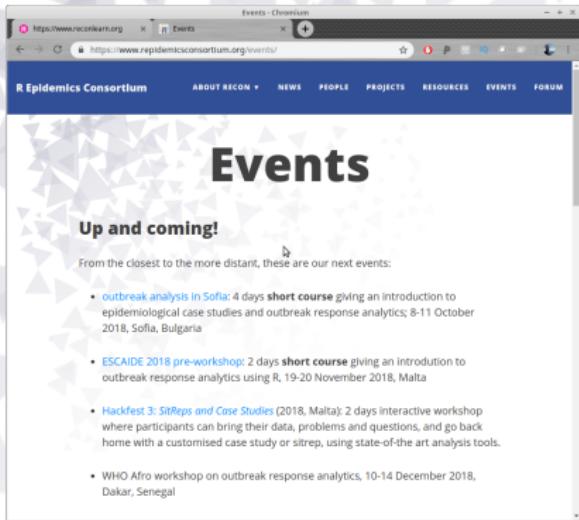
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RECON events



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here and now!

This is your turn now!



On the menu for this course

