



An introduction to the R Epidemics Consortium

Thibaut Jombart

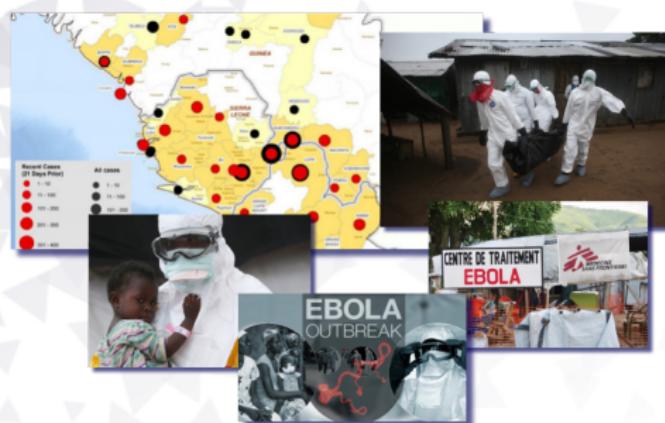
19th November 2018

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

WHO Ebola response team

Help improving situation awareness

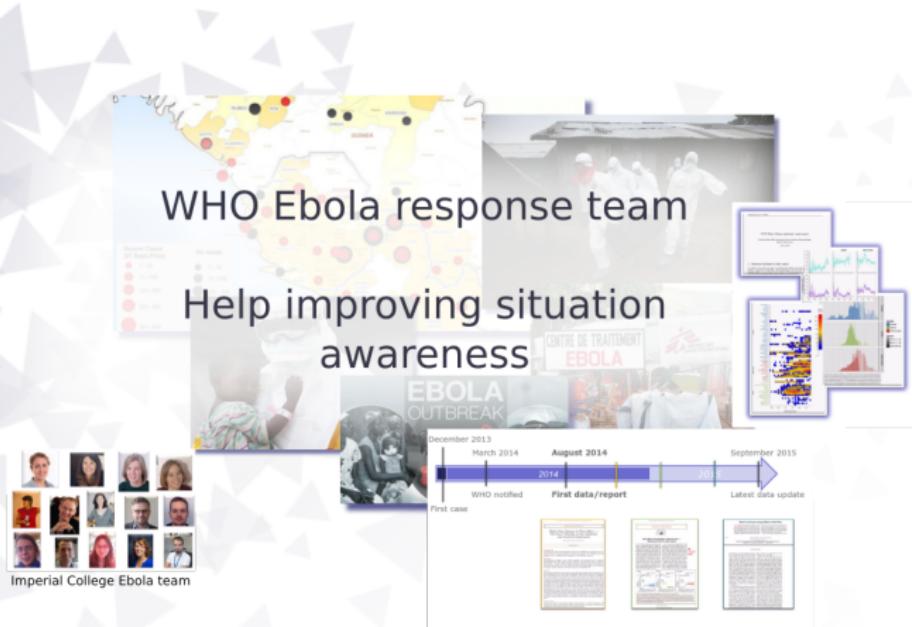
Imperial College Ebola team

Timeline: December 2013, First case; March 2014, WHO notified; August 2014, First data/report; September 2015, Latest data update.

Centre de Traitement EBOLA

EBOLA OUTBREAK

Lessons learnt from the Ebola response



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

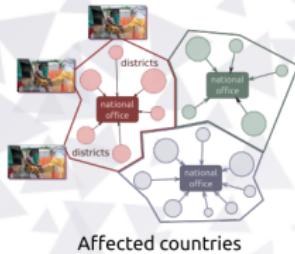
Informing the response in 'real time'?



Informing the response in 'real time'?

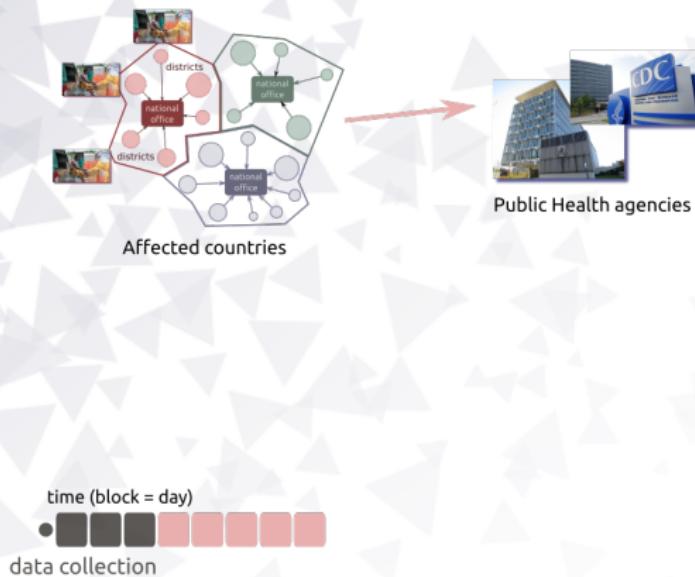


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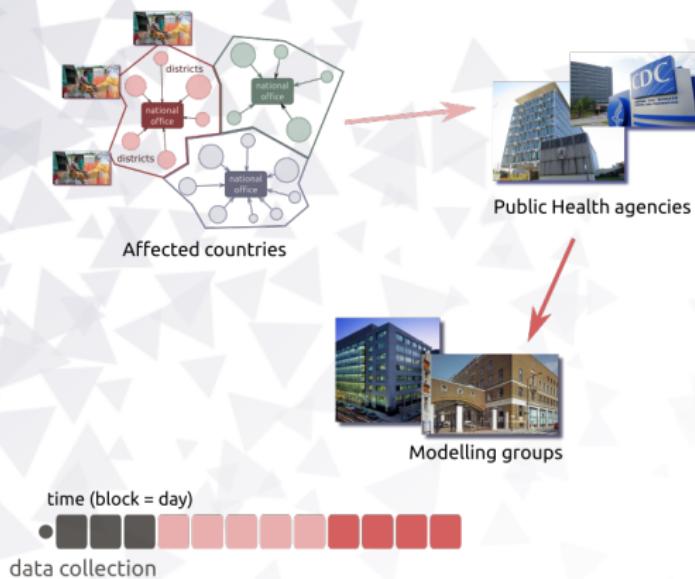


time (block = day)
• data collection

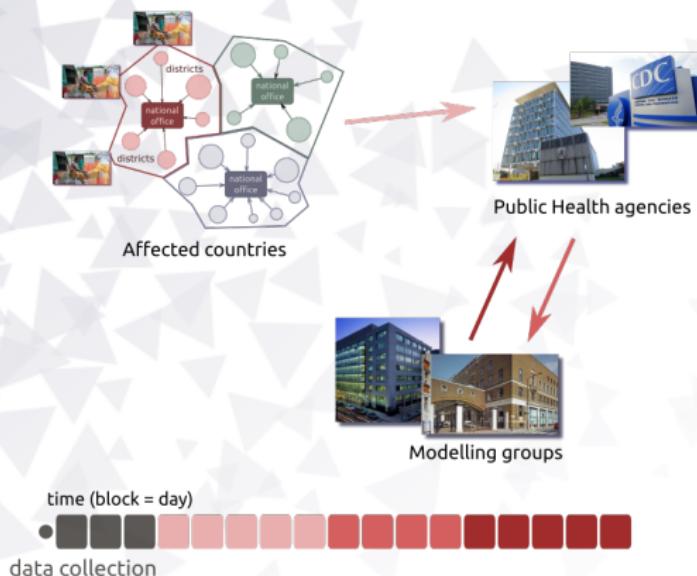
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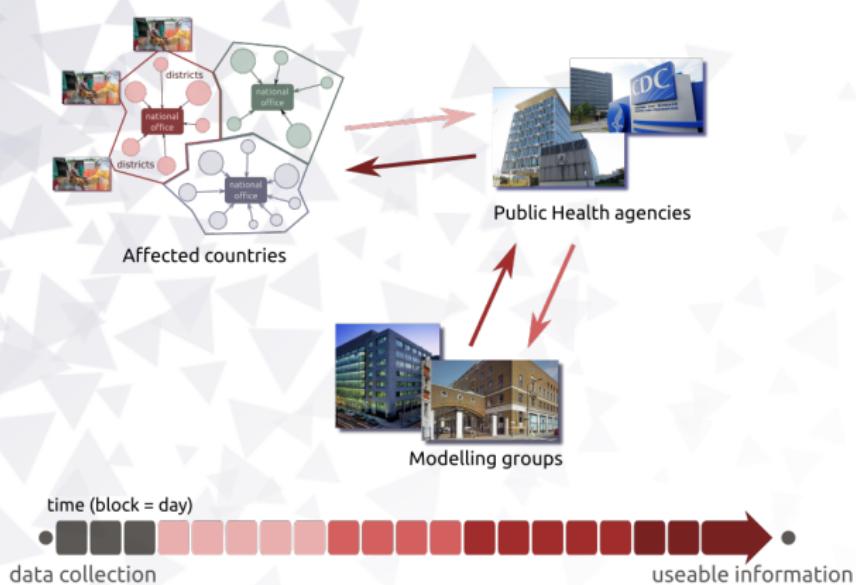
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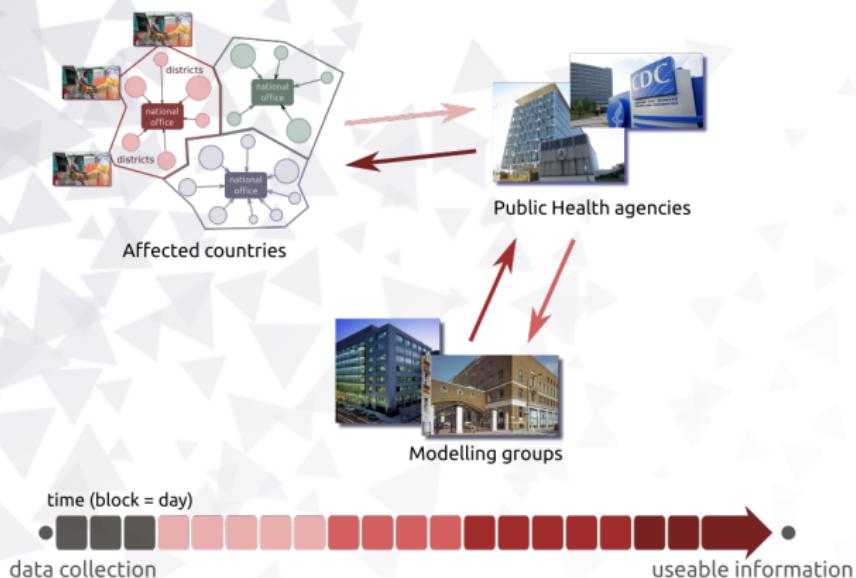
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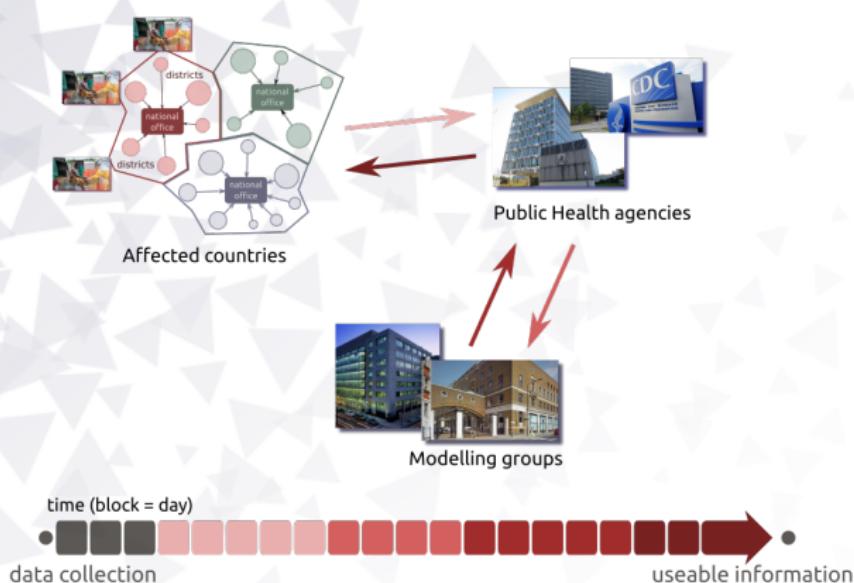


Informing the response in 'real time' ?



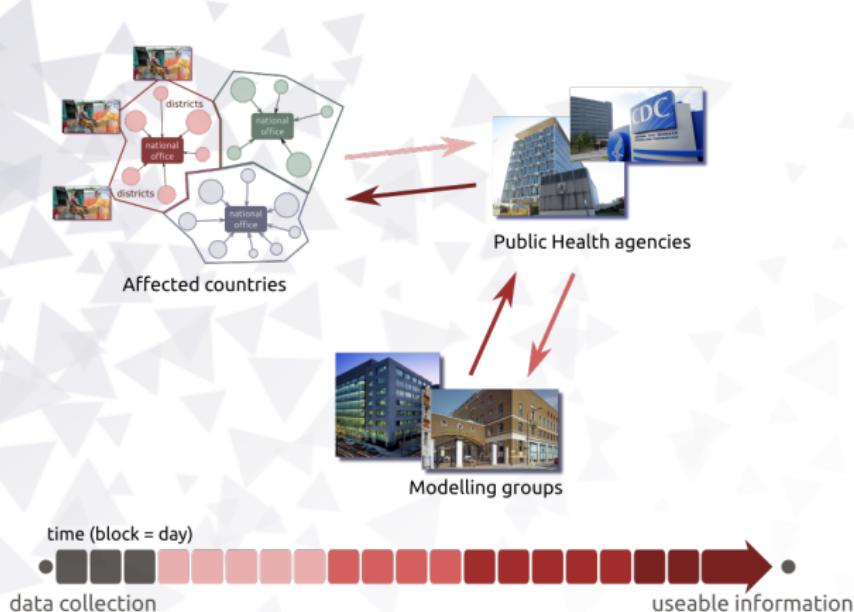
- good **tools** will shorten only some delays

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?



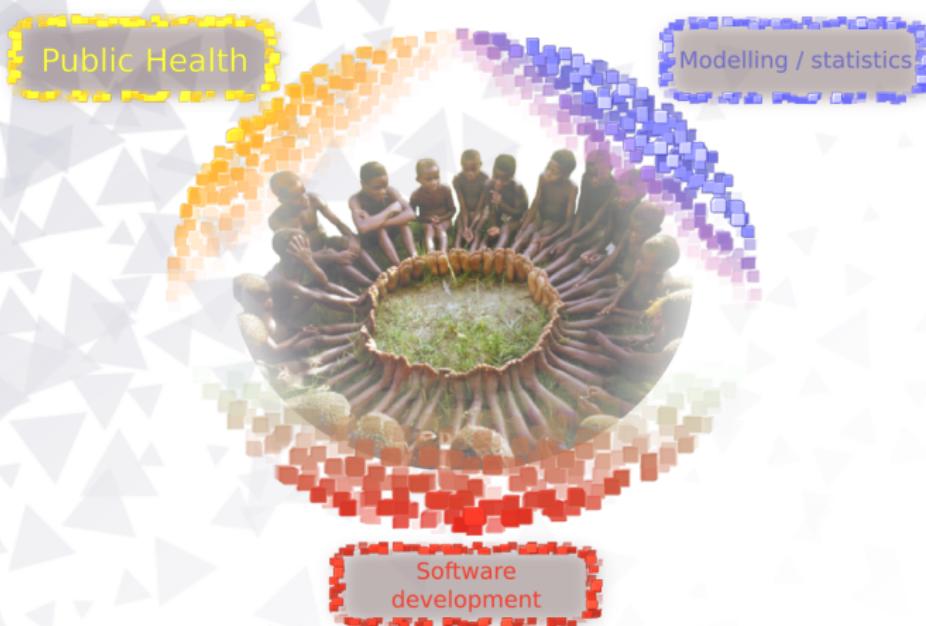
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Who do we need to develop outbreak analytics tools?



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 visualization representing the themes and technologies discussed during the Hackout 3. The words are arranged in a cluster, with larger words indicating higher frequency or importance. The words include:

- functional incubation
- userfriendly secure dictionary
- systems testing automated continuous
- rppt efficiency collection series
- secured bias outbreaks fast
- code parsing number repository
- integrated integration tools
- reporting vhl
- gui
- peak
- situation synchronised
- epidemiologist
- contact
- epiinfo
- delay
- clean time
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From a hack to a pack



Hackout 3, summer 2016, Berkeley



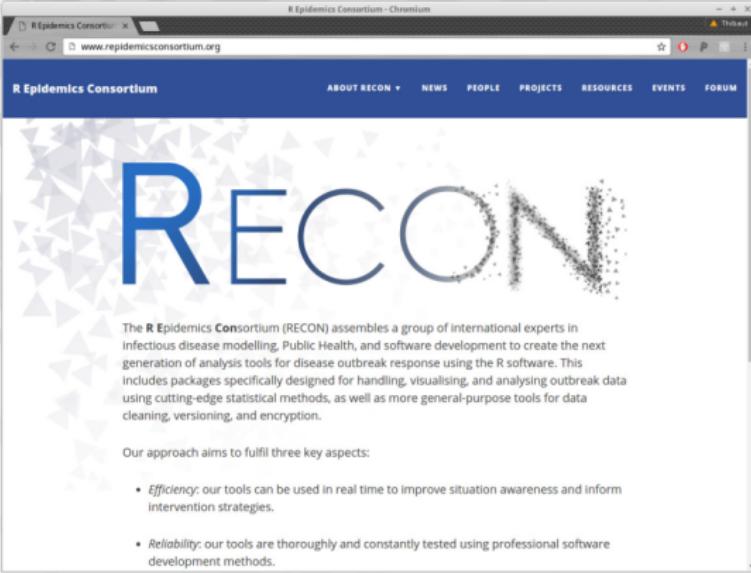
RECON
[The R Epidemics Consortium]

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 data points. 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 creation of analysis tools for outbreak response using R software, mentioning packages for handling, visualising, and analysing data. The text also notes the use of cutting-edge statistical methods and general-purpose tools for data cleaning, versioning, and encryption. A section titled "Our approach aims to fulfil three key aspects:" lists two bullet points: "Efficiency: our tools can be used in real time to improve situation awareness and inform intervention strategies." and "Reliability: our tools are thoroughly and constantly tested using professional software development methods."

RECON: the R Epidemics Consortium

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



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.

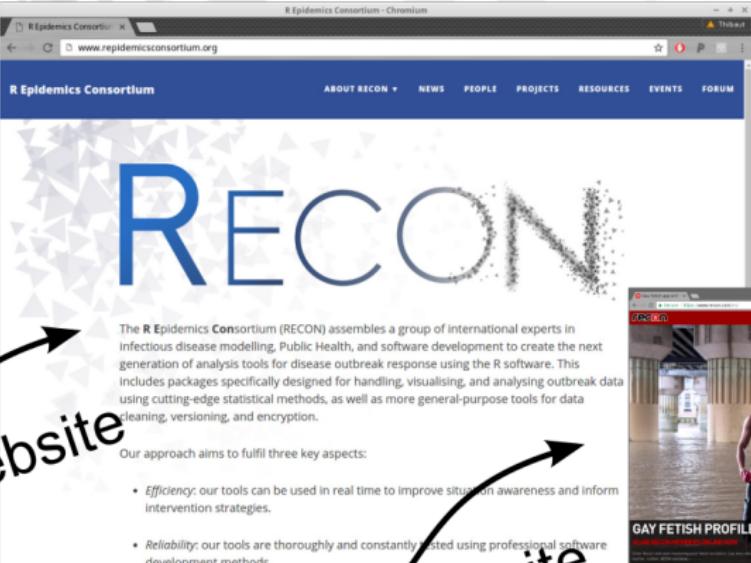
Our approach aims to fulfil three key aspects:

- *Efficiency*: our tools can be used in real time to improve situation awareness and inform intervention strategies.
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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. A bulleted list follows, detailing the approach to fulfilling three key aspects: efficiency, reliability, and transparency.

Our website

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.
- *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**

The first 2 years



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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



www.repidemicsconsortium.org

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- **not-for-profit, incorporated association** registered in France



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

RECON packages

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



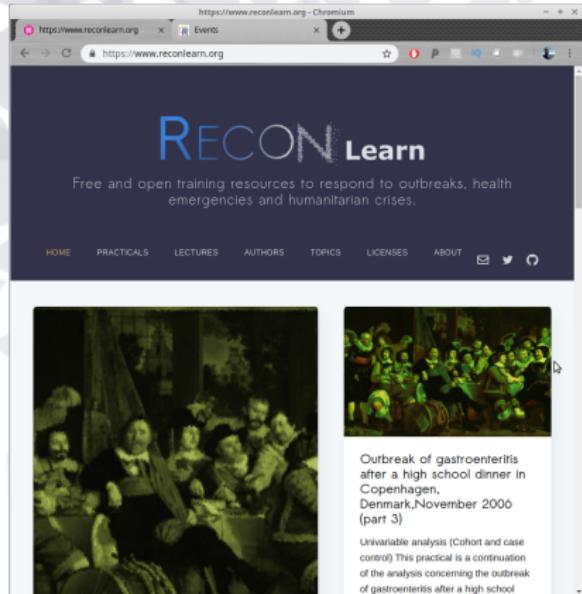
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RECON packages

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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

<https://reconlearn.org>

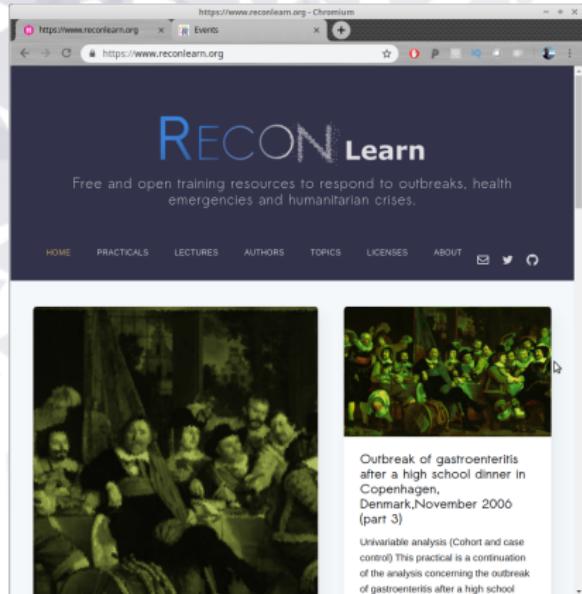
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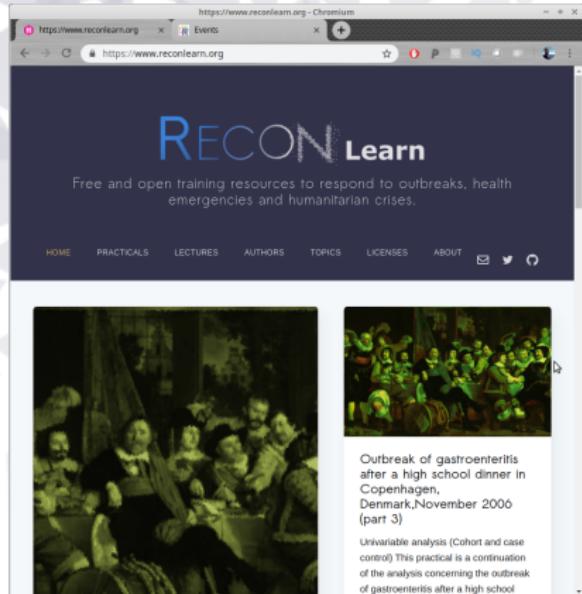
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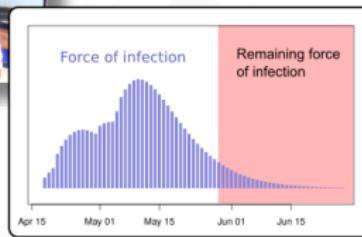
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- podcast: **Rtips** on YouTube

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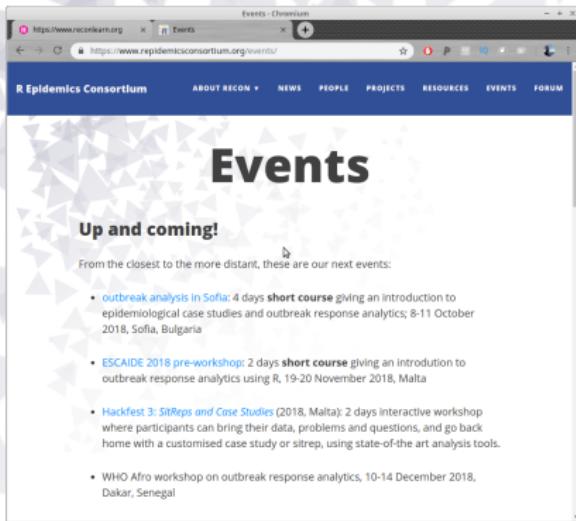
Supporting outbreak response in the field: Ebola outbreak in Likati (DRC) 2017



- 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



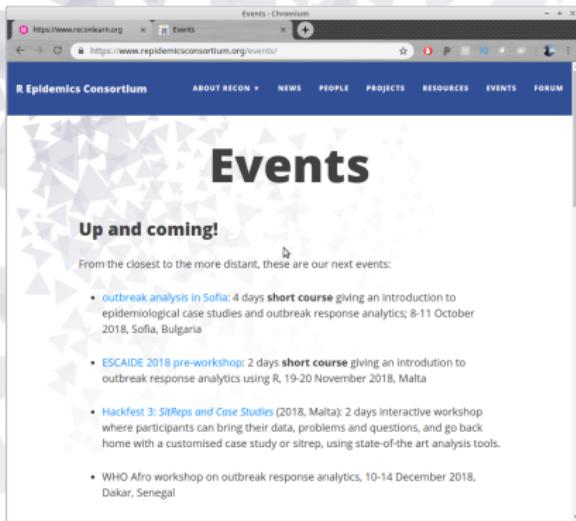
The screenshot shows a web browser window with the title 'Events - Chrome' at the top. The address bar contains the URL <https://www.reconlearn.org/events/>. Below the address bar, there is a navigation menu with links: R Epidemics Consortium, ABOUT RECON, NEWS, PEOPLE, PROJECTS, RESOURCES, EVENTS, and FORUM. The main content area has a large, bold heading 'Events'. Below it, a section titled 'Up and coming!' lists several upcoming events:

- 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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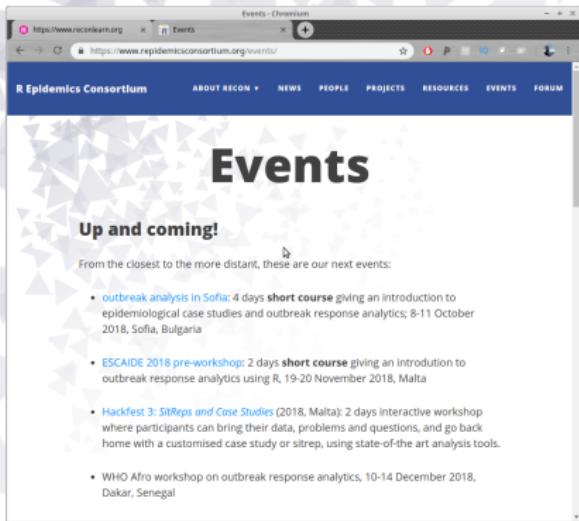
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here and now!

Report from previous training: R users are happier



Report from previous training: R users are happier



SPSS®



MATLAB

Report from previous training: R users are happier



SPSS®



MATLAB



sas

Report from previous training: users are happier



SPSS



 **MATLAB**



 **sas**



 **STATA**

Report from previous training: R users are happier



SPSS®



sas



STATA

This is your turn now!



