



## An introduction to the R Epidemics Consortium

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Thibaut Jombart

8th October 2018

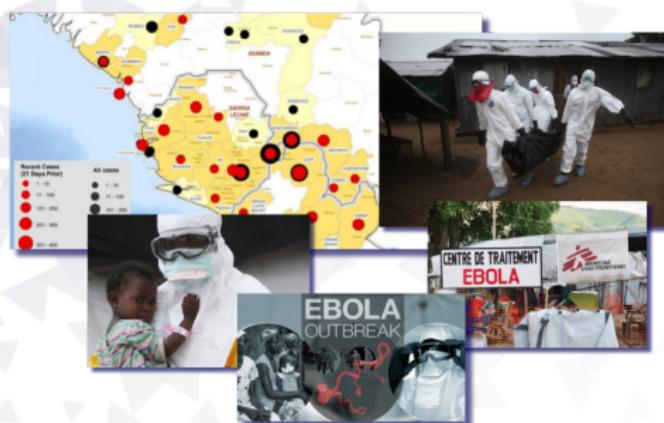
London School of Hygiene and Tropical Medicine  
Imperial College London

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?**

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# Lessons learnt from the Ebola response



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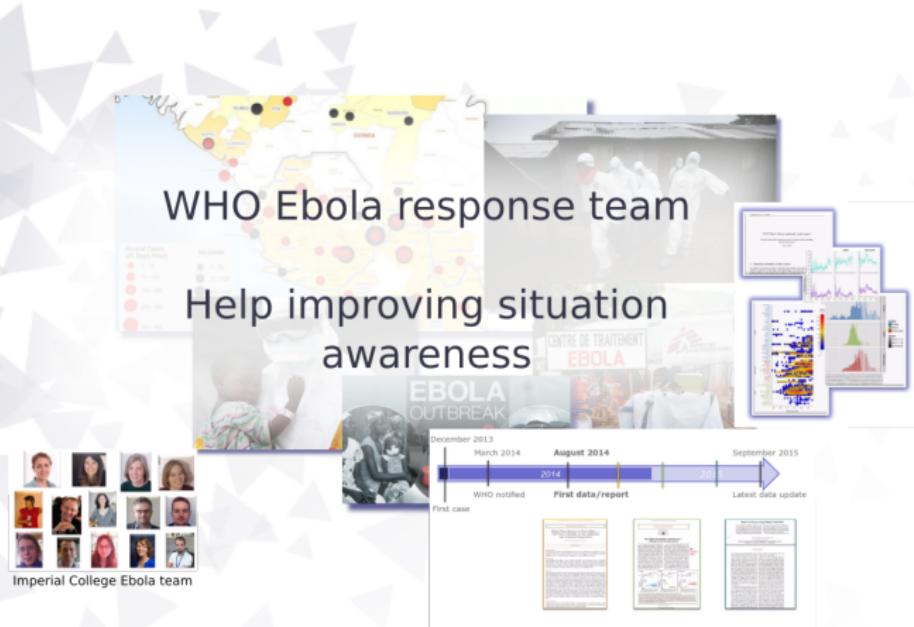


# Lessons learnt from the Ebola response

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 "CENTRE DE TRAITEMENT EBOLA" (Treatment Center).
- A timeline showing the progression of the outbreak: December 2013 (First case), March 2014 (WHO notified), August 2014 (First data/report), and September 2015 (Latest data update).
- A grid of documents titled "EBOLA OUTBREAK" with dates from December 2013 to September 2015.
- A photograph of a person in a white lab coat and mask.
- A photograph of a group of people in a meeting.
- A photograph of a person in a red patterned dress.
- A grid of 16 small portraits labeled "Imperial College Ebola team".
- A central text overlay: "WHO Ebola response team" and "Help improving situation awareness".

# Lessons learnt from the Ebola response



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

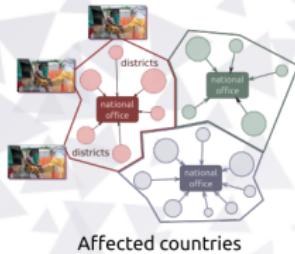
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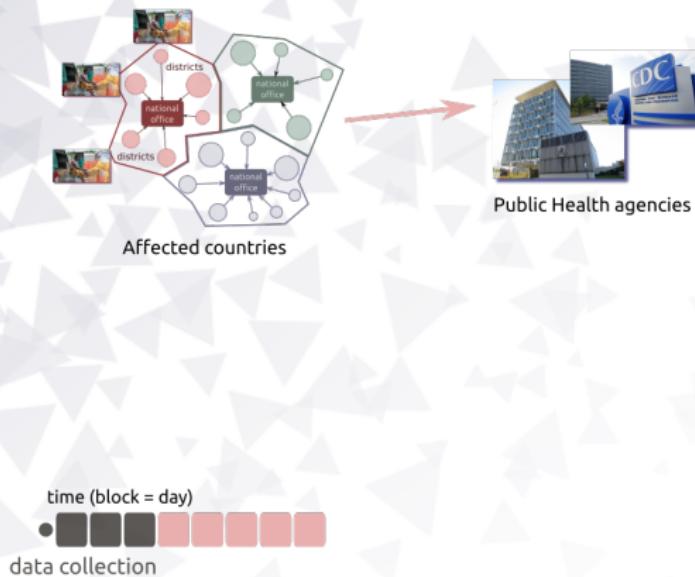


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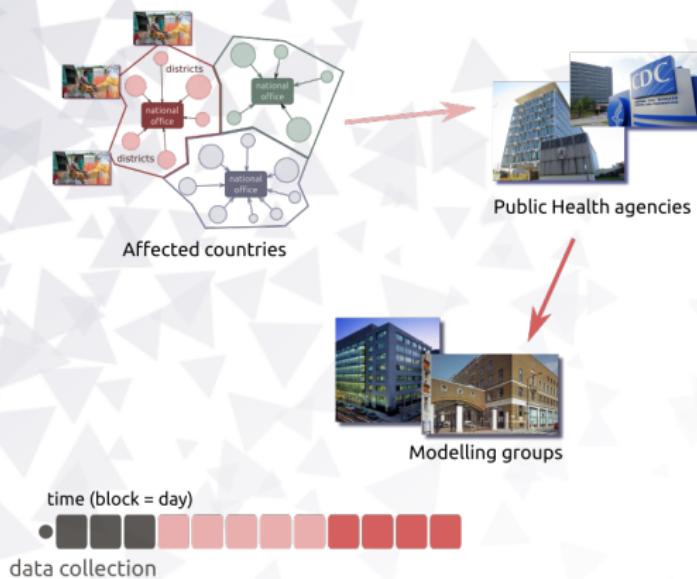


time (block = day)  
• data collection

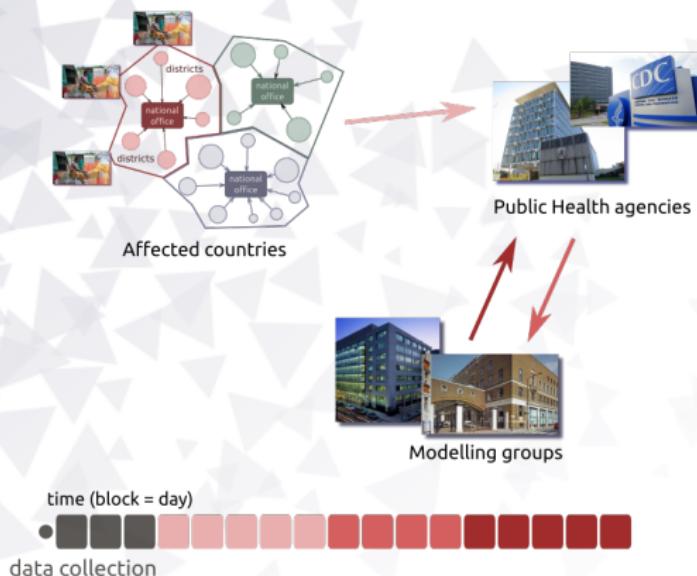
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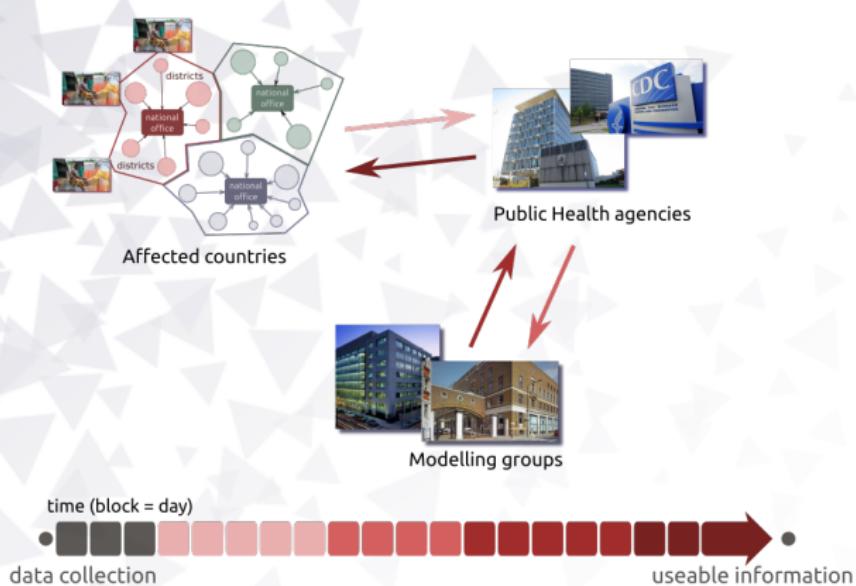
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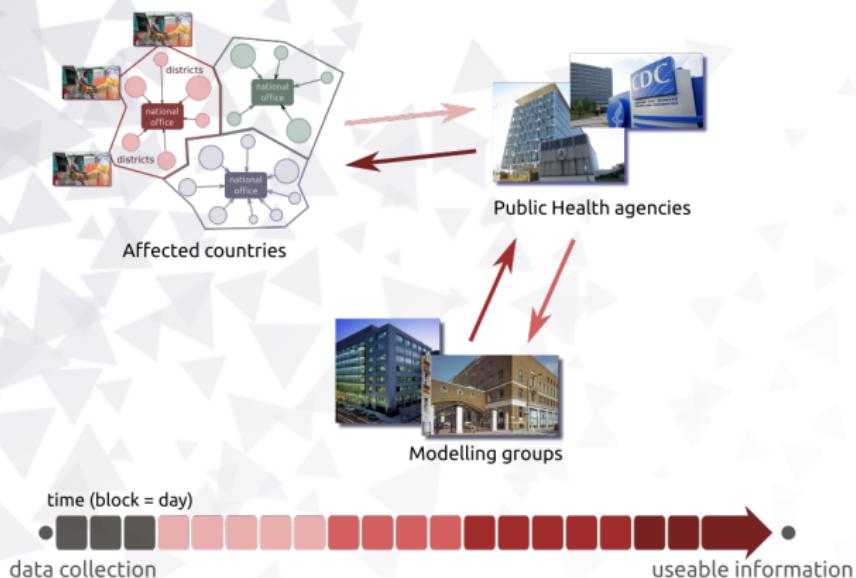
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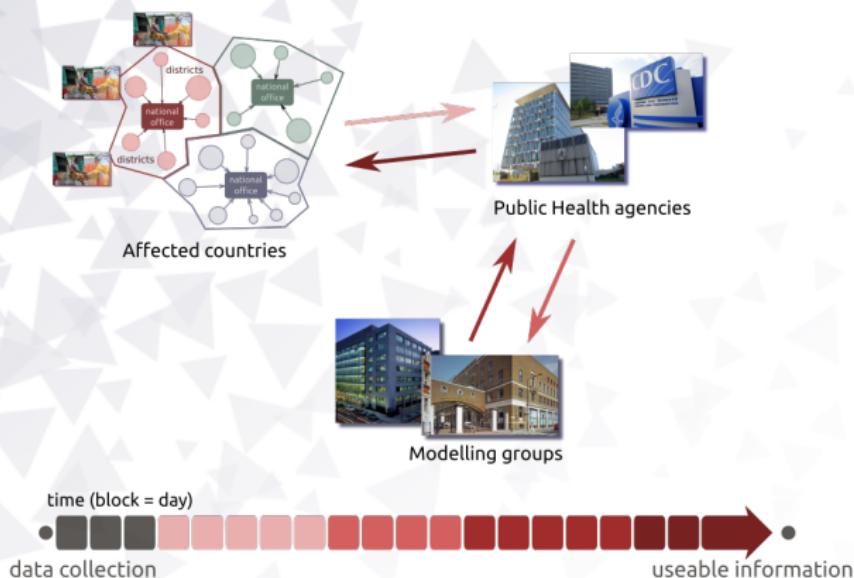


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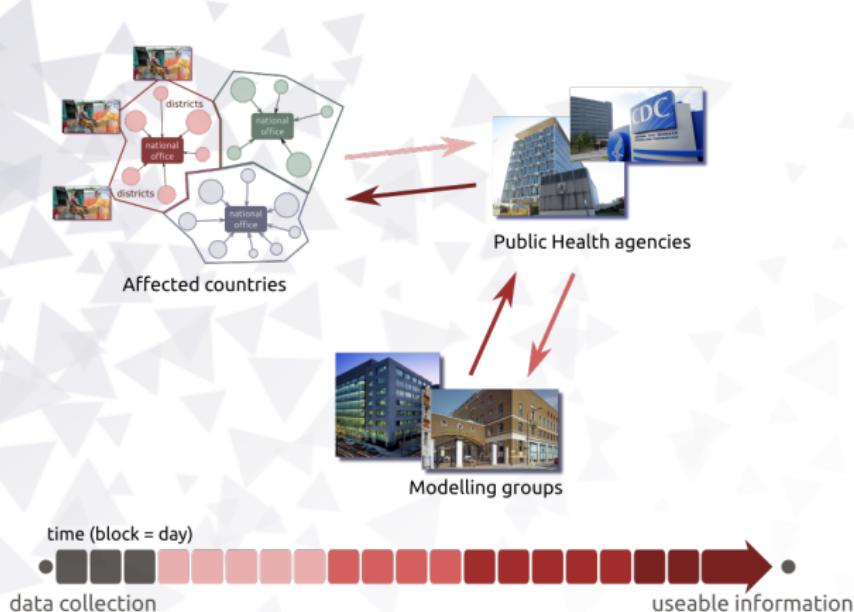
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# Informing the response in 'real time'?



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



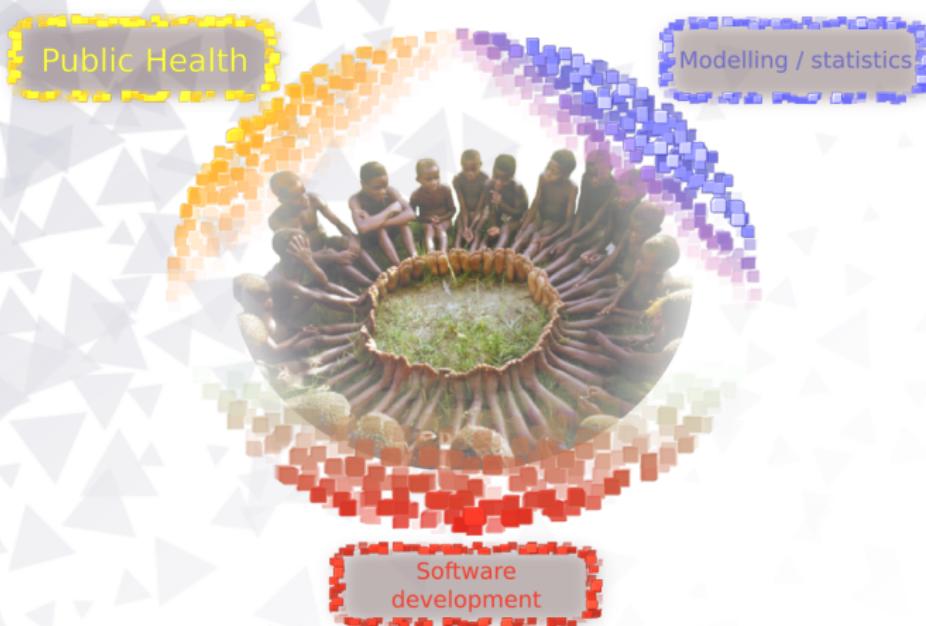
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Public Health

Modelling / statistics

Software  
development

# 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 representing the themes and tools used in the development of the project, 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
- epidemian contact delay
- epiinfo clean time
- compiled interface tree
- outbreaker fellow
- symptoms tracing shiny
- linelist cdc
- automation edc
- epicontacts bayesian site report
- incidence cleaning
- ggplot clusters rates
- parallel reliable
- dashboard contacttracing
- parameters epidemics
- genomics distribution
- estimation censored
- transmission package
- reproducible
- curcation model
- exposure period
- mutations linelist
- period

# From a hack to a pack



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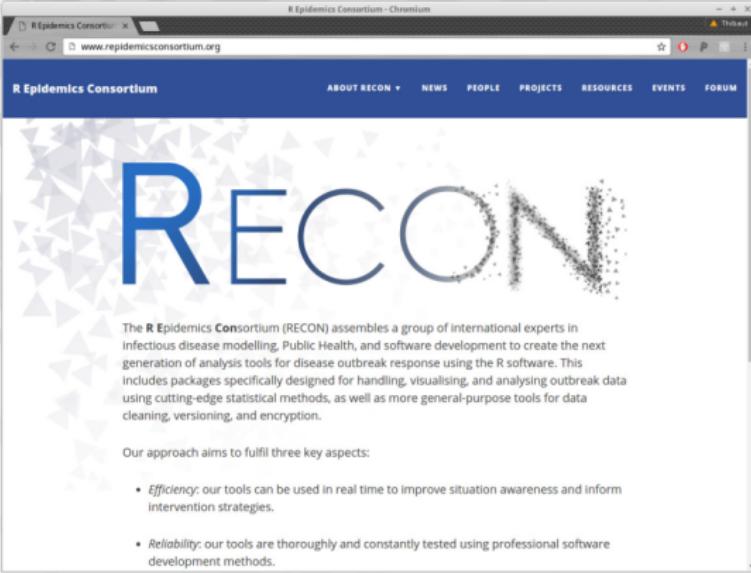
**RECON**  
[The R Epidemics Consortium]

# 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](http://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."

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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.

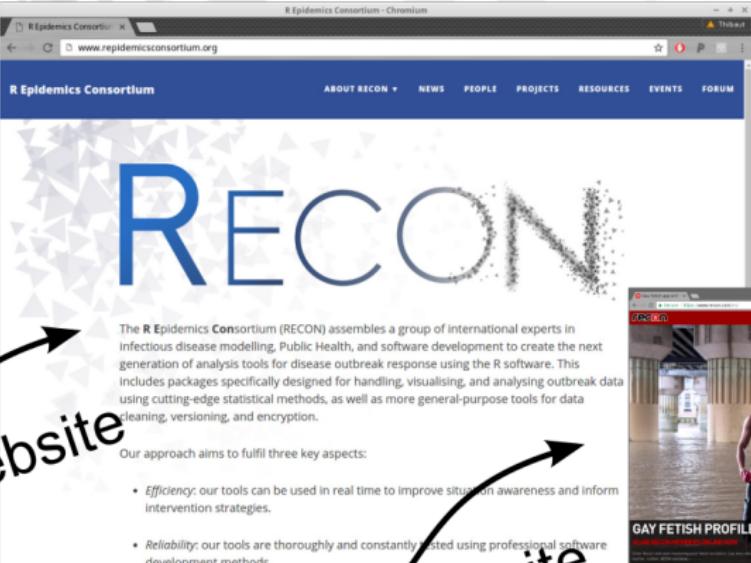
Our approach aims to fulfil three key aspects:

- *Efficiency*: our tools can be used in real time to improve situation awareness and inform intervention strategies.
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# RECON: the R Epidemics Consortium

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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 released under the GNU General Public License Version 3.



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## RECON in a nutshell

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## The first 2 years



*www.repidemicsconsortium.org*

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

## Recent changes

RECON

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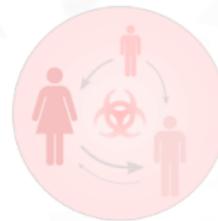


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- **new membership:** now only active contributors
- **activities:** software, training, deployment

# RECON packages

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



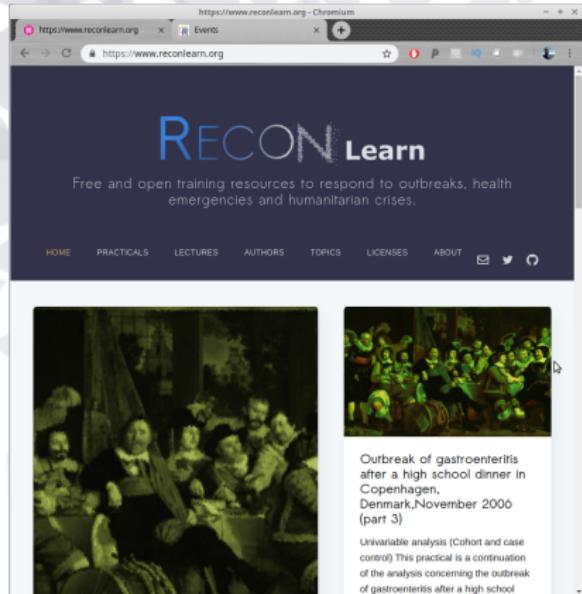
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- planned (?): automated reports, mapping, outbreak simulators

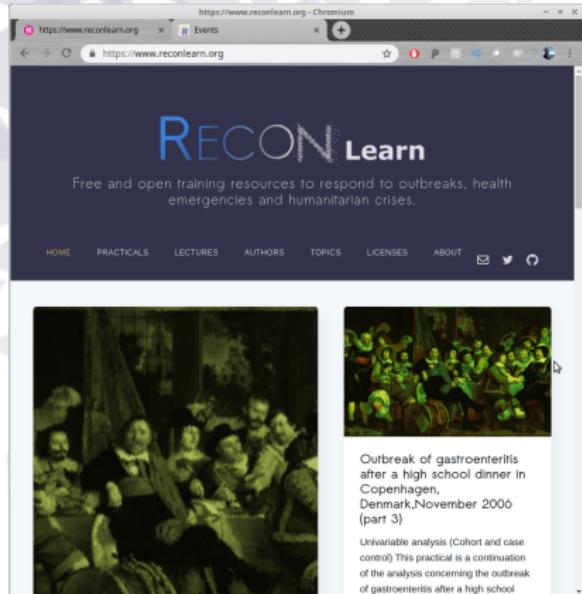
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- repository for free, open training material

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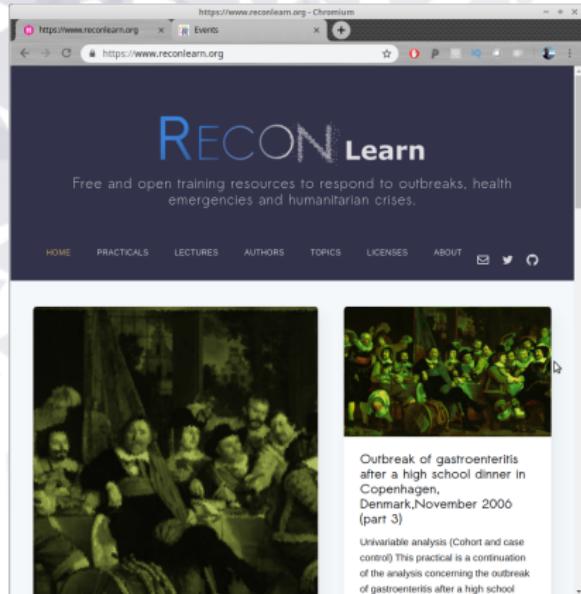
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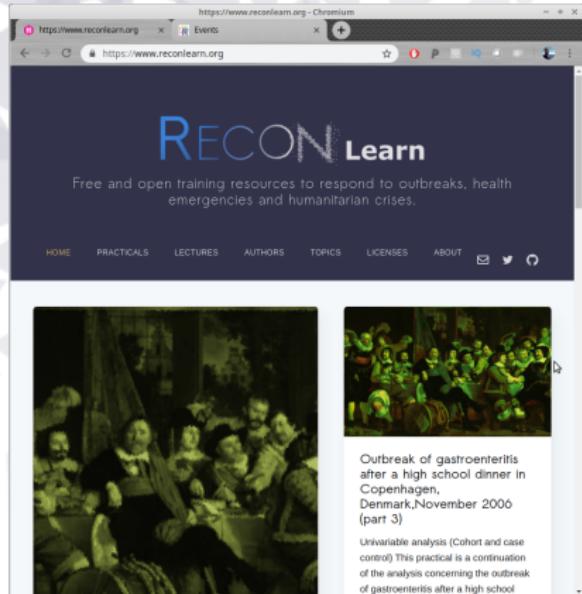
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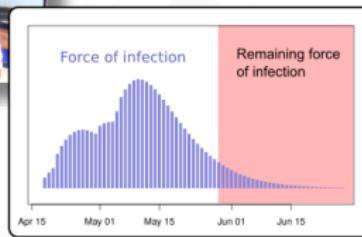
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- podcast: **Rtips** on YouTube

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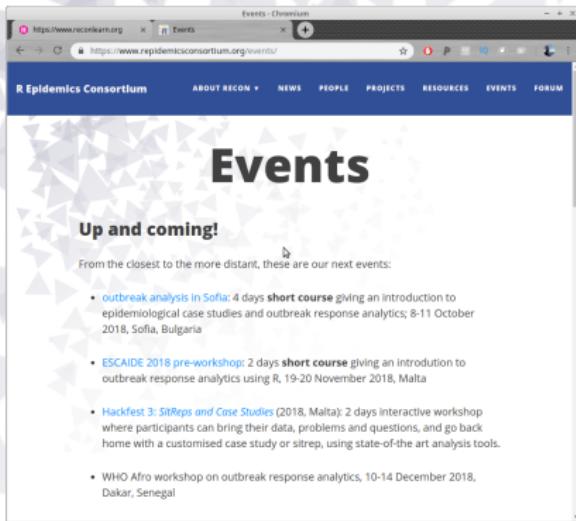
# Supporting outbreak response in the field: Ebola outbreak in Likati (DRC) 2017



- 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



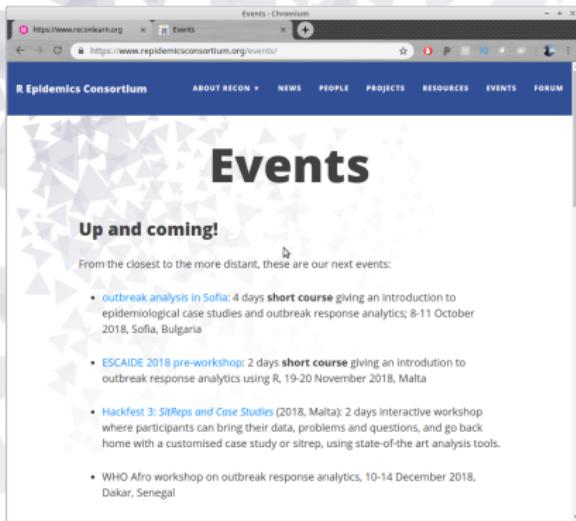
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- outbreak analysis In Sofia: 4 days **short course** giving an introduction to epidemiological case studies and outbreak response analytics; 8-11 October 2018, Sofia, Bulgaria
- ESCAIDE 2018 pre-workshop: 2 days **short course** giving an introduction 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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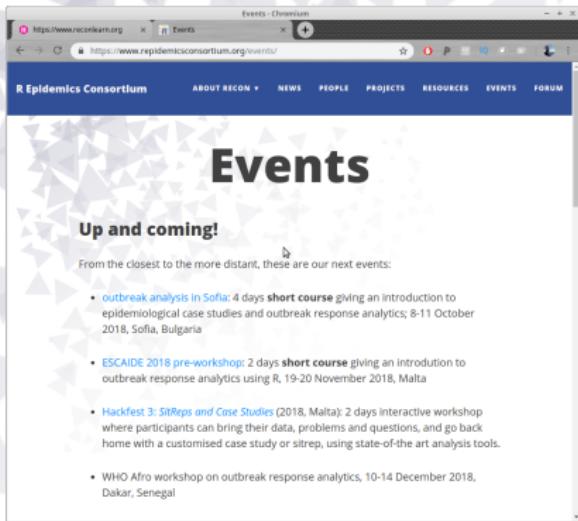
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here and now!

# Previous participants survived!



**SPSS**

# Previous participants survived!



**SPSS**



MATLAB

# Previous participants survived!



SPSS®



MATLAB



sas

# Previous participants survived!



SPSS®



MATLAB



sas



STATA

# Previous participants survived!



SPSS



MATLAB



Sas



R



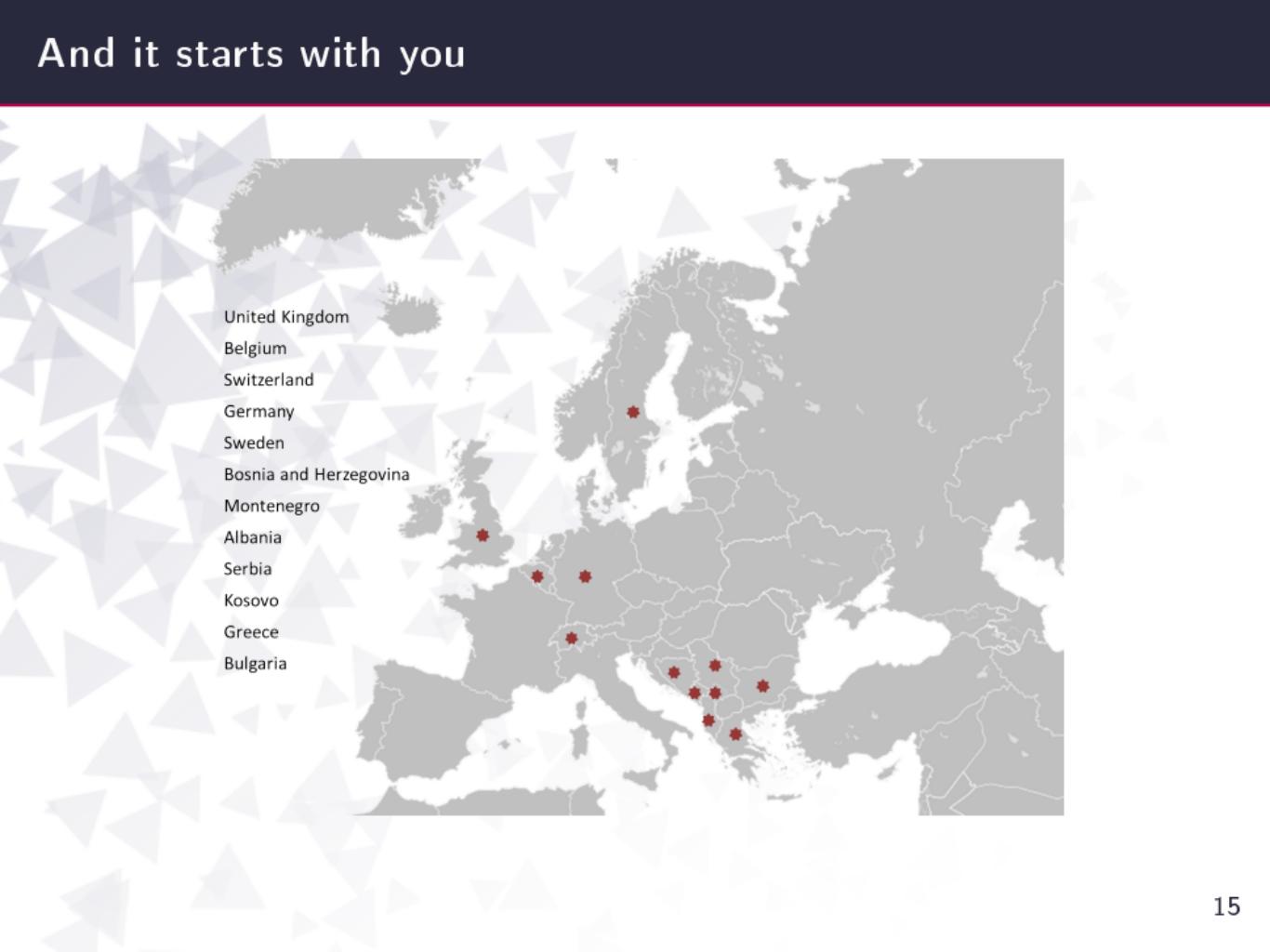
STATA

And now,  
time for  
some



HAPPY?

# And it starts with you



A map of Europe showing the locations of 15 countries where the initiative started. Each country is marked with a red star on its map area. The countries listed are:

- United Kingdom
- Belgium
- Switzerland
- Germany
- Sweden
- Bosnia and Herzegovina
- Montenegro
- Albania
- Serbia
- Kosovo
- Greece
- Bulgaria