



An introduction to the R Epidemics Consortium

Thibaut Jombart

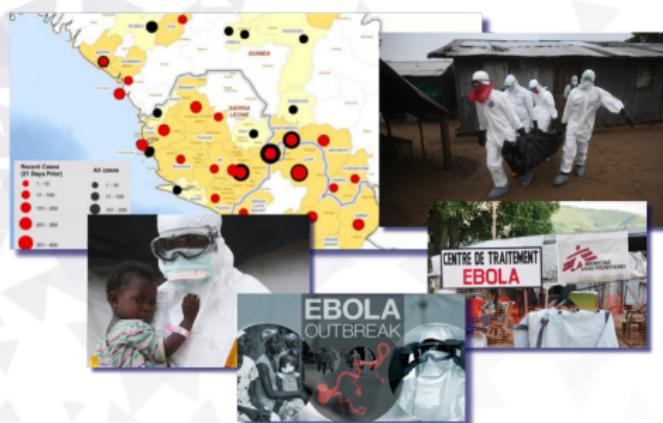
8th October 2018

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?

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

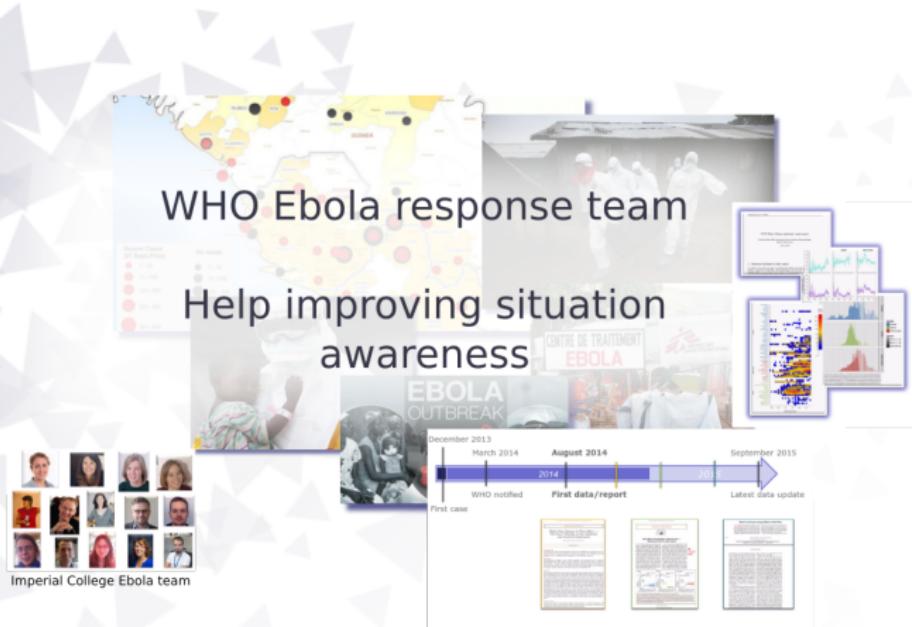
EBOLA OUTBREAK

December 2013 March 2014 August 2014 September 2015

First case WHO notified First data/report Latest data update

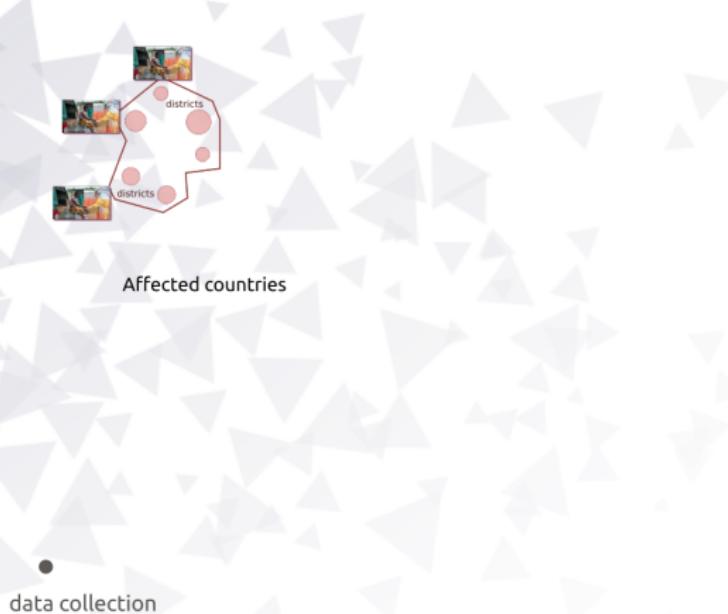
Imperial College Ebola team

Lessons learnt from the Ebola response



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

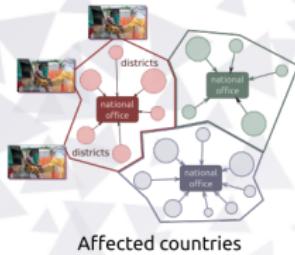
Informing the response in 'real time'?



Informing the response in 'real time'?

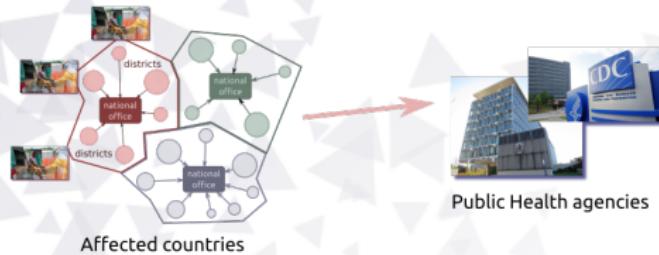


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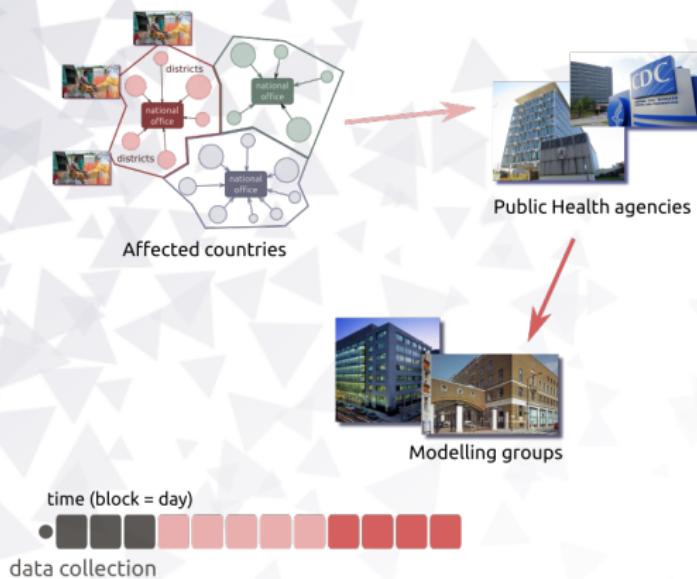


time (block = day)
• data collection

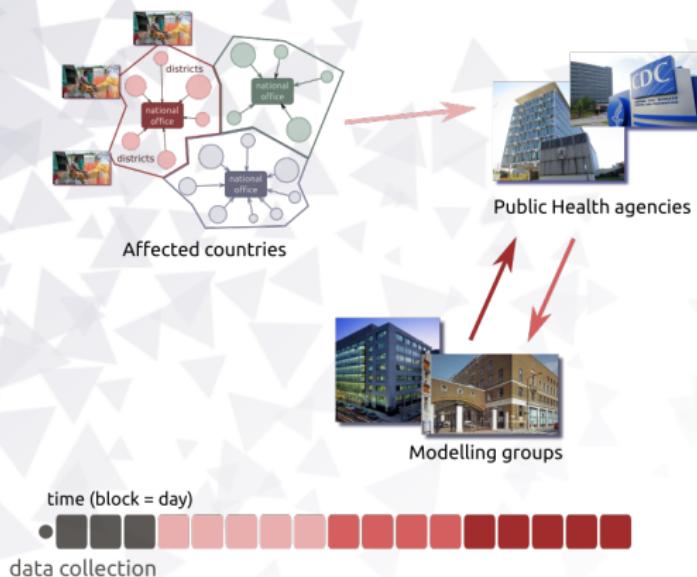
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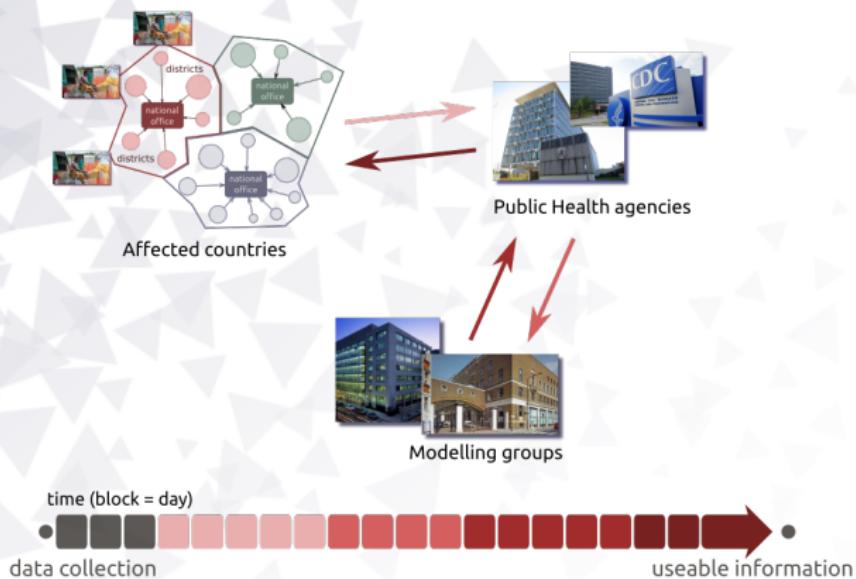
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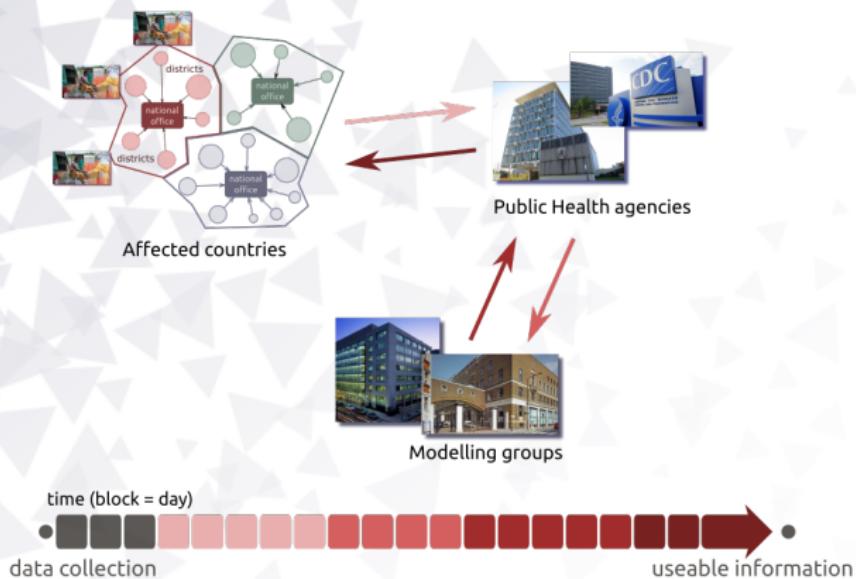
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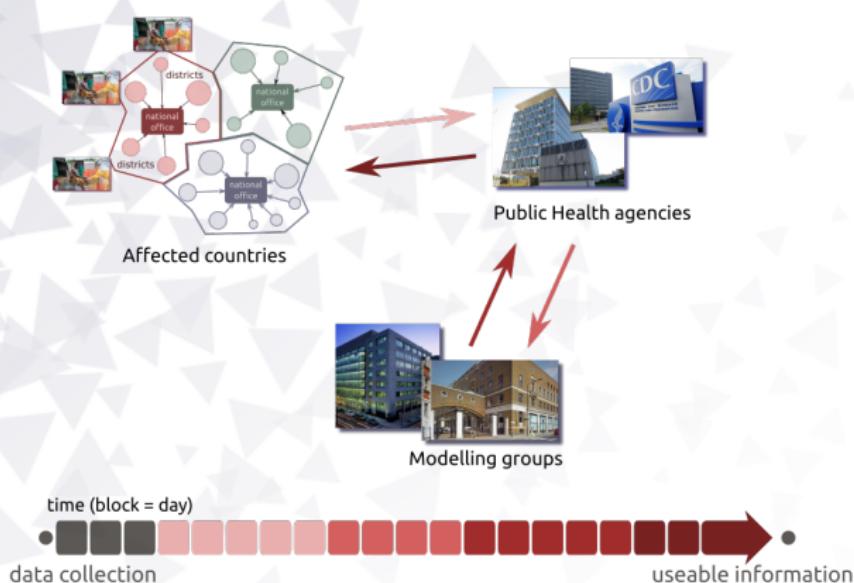


Informing the response in 'real time' ?



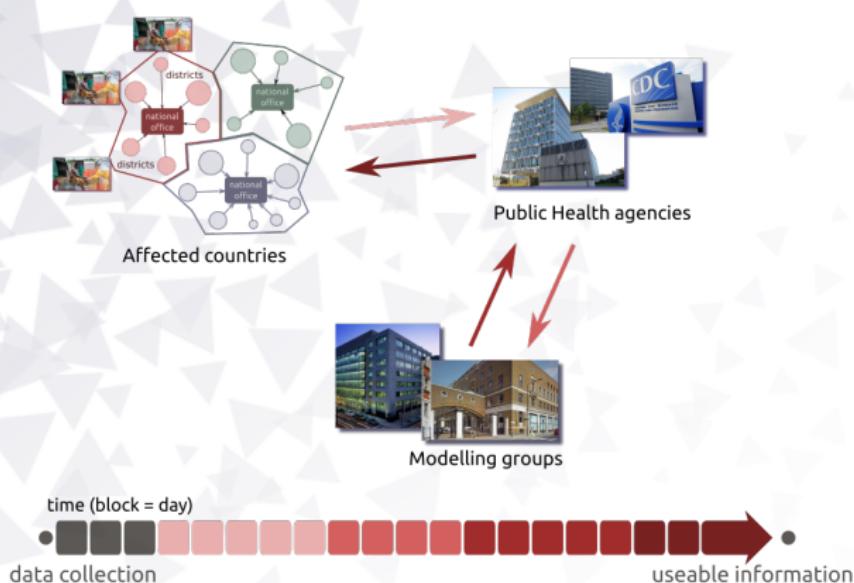
- good **tools** will shorten only some delays

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?



Who do we need to develop outbreak analytics tools?

Public Health



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 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 tools
- unit data report
- synchronised anonymised
- epistein situation
- contact delay
- epilnfo clean time
- compiled interface tree
- outbreaker interface fellow
- symptoms tracing shiny
- linelist cdc
- automation edc
- epicontacts bayesian siterep
- incidence cleaning
- ggplot clusters rates
- parallel reliable
- dashboard contacttracing
- parameters epidemics
- genomics distribution
- estimation censored
- transmission package
- reproducible
- acquisition
- logistics
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- exposure period
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- line lists
- epi
- model
- curator
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From a hack to a pack



Hackout 3, summer 2016, Berkeley

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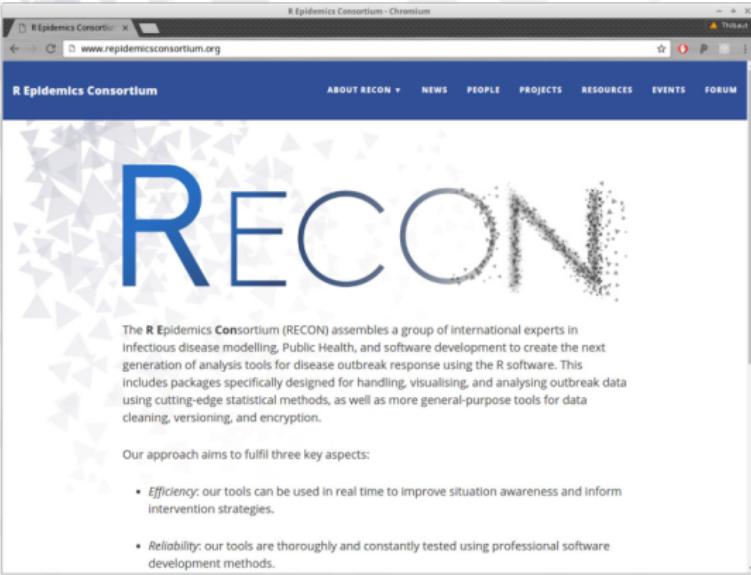
RECON
[The R Epidemics Consortium]

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. The title bar reads "RECON: the R Epidemics Consortium - Chromium". The address bar shows "www.repidemcisconsortium.org". The page header includes the RECON logo and navigation links for "ABOUT RECON", "NEWS", "PEOPLE", "PROJECTS", "RESOURCES", "EVENTS", and "FORUM". The main content features a large, stylized "RECON" logo where the letters are composed of small dots. Below the logo 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 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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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.

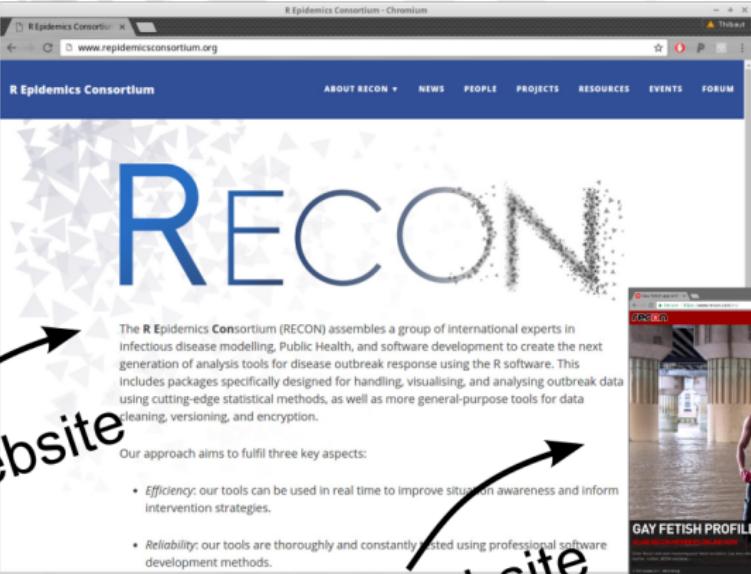
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The screenshot shows the homepage of the RECON website. The title "RECON" is prominently displayed in large blue letters, with the "O" composed of a grid of smaller dots. Below the title is a paragraph of text describing the consortium's mission. A 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 under the GNU General Public License.



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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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- 2 years later: **~100 members, 30 countries, 60 institutions**
- **~ 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

www.repidemicsconsortium.org

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



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- **new remit:** free analytics resources to respond to outbreaks, health emergencies, humanitarian crises
- **new membership:** now only active contributors
- **activities:** software, training, deployment

RECON packages

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



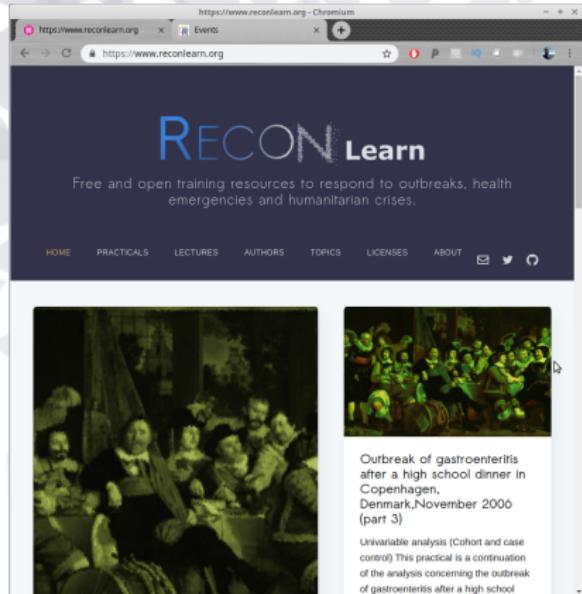
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RECON packages

- released (9): epicurves, contact data, transmissibility, forecasting, outbreak reconstructions
- upcoming (~ 15-20): deployable systems (RECON deployer), population flows, outbreak clusters, reproducible data cleaning, rmarkdown workflows, GUIs
- planned (?): automated reports, mapping, outbreak simulators

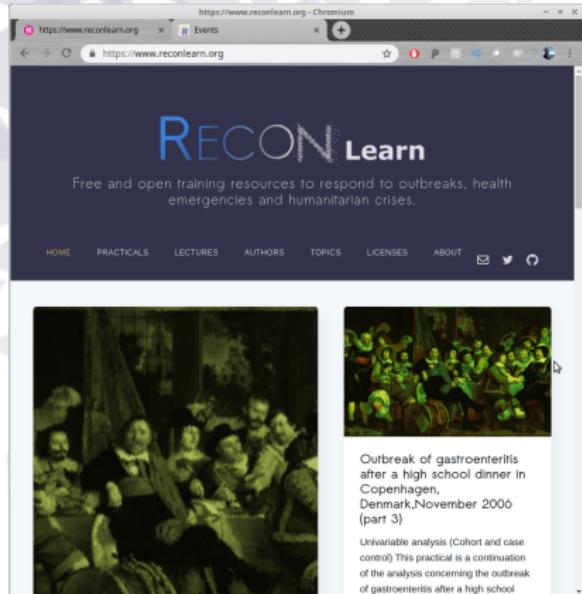
reconlearn.org: training resources for epidemics analysis



- repository for free, open training material

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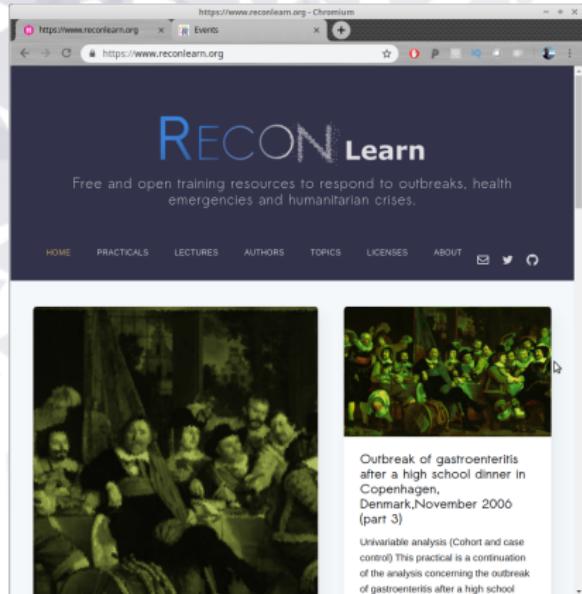
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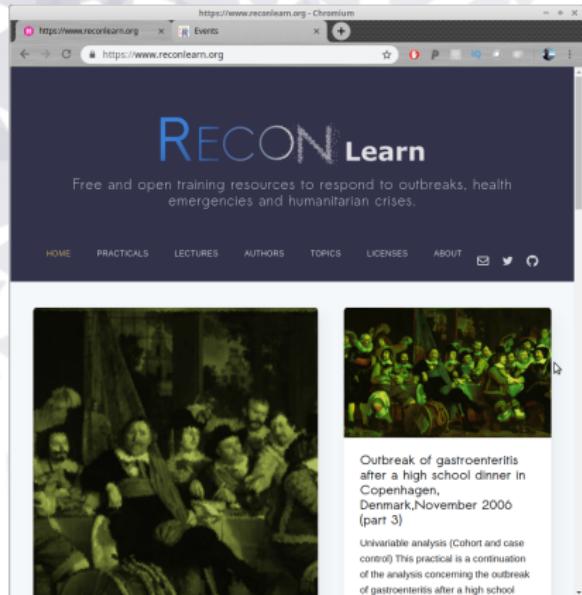
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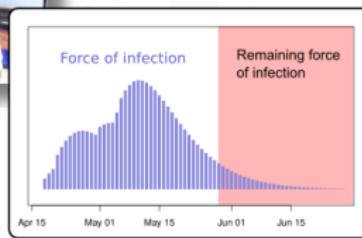
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- podcast: **Rtips** on YouTube

<https://reconlearn.org>

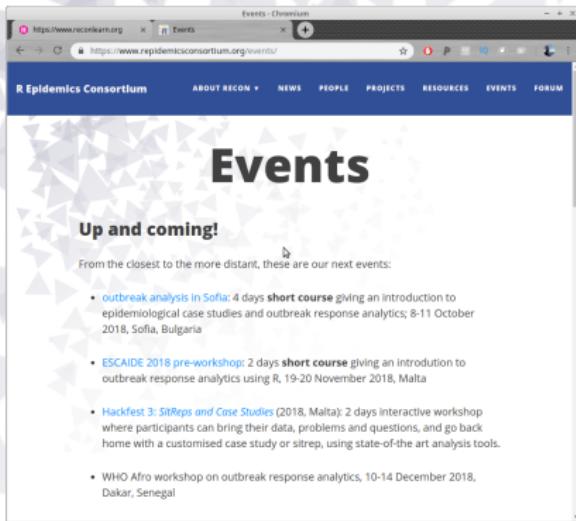
Supporting outbreak response in the field: Ebola outbreak in Likati (DRC) 2017



- 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



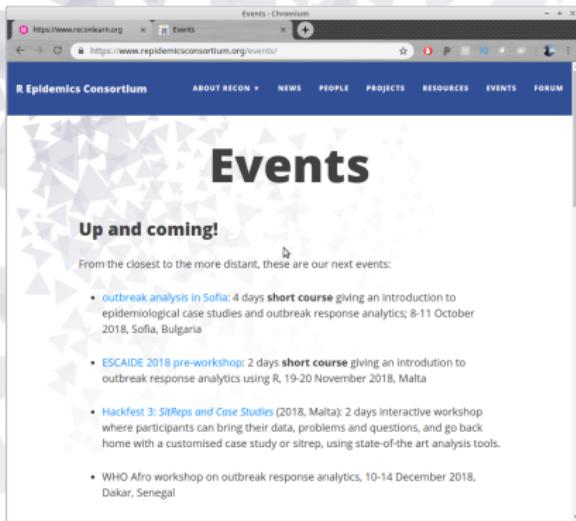
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- outbreak analysis In Sofia: 4 days **short course** giving an introduction to epidemiological case studies and outbreak response analytics; 8-11 October 2018, Sofia, Bulgaria
- ESCAIDE 2018 pre-workshop: 2 days **short course** giving an introduction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



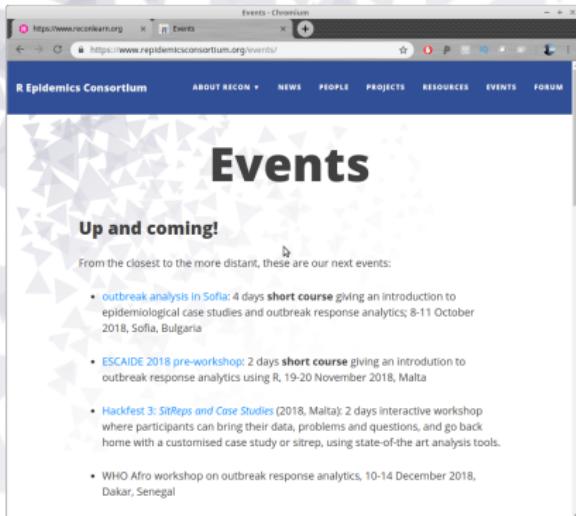
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RECON events



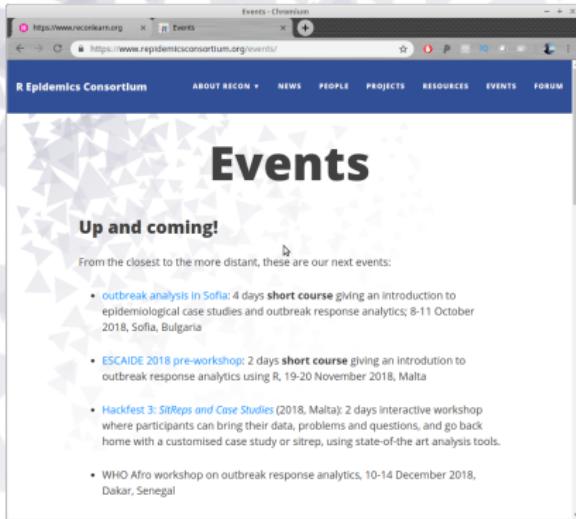
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here and now! :)