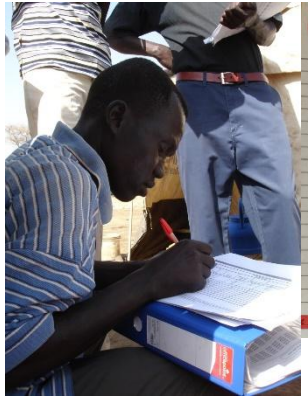
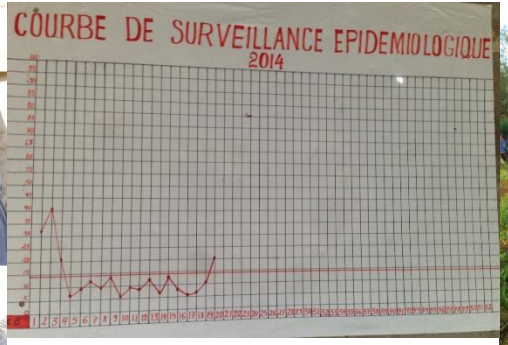
Advancing data analytics for field epidemiologists using R

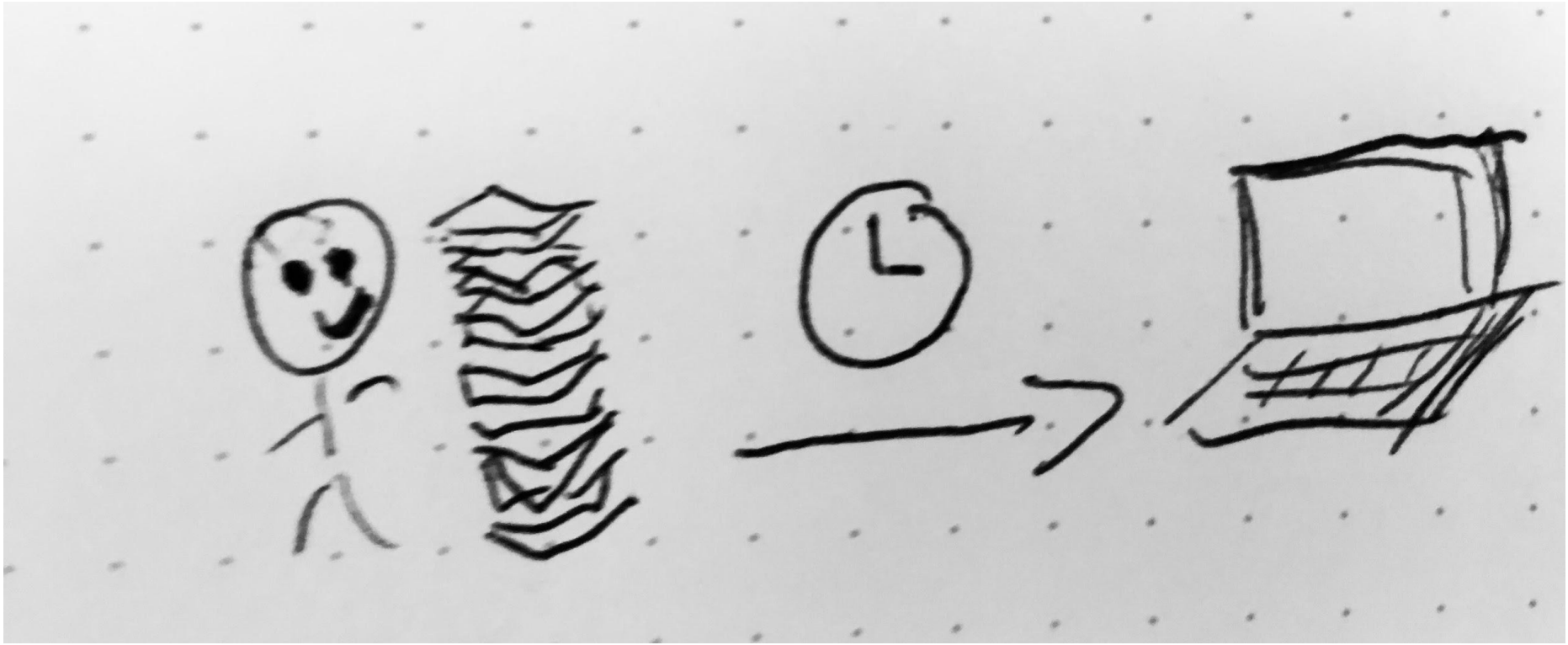
Amrish Baidjoe, Elburg van Boetzelaar, Raphael Brechard, Antonio Isidro Carrión Martín, Kate Doyle, Christopher Ian Jarvis, *Thibaut Jombart*, *Zhian N. Kamvar*, Patrick Keating, Anna Kuhne, Annick Lenglet, Pete Masters, *Dirk Schumacher*, Rosamund Southgate, Carolyn Tauro, Alex Spina, Maria Verdecchia, Larissa Vernier

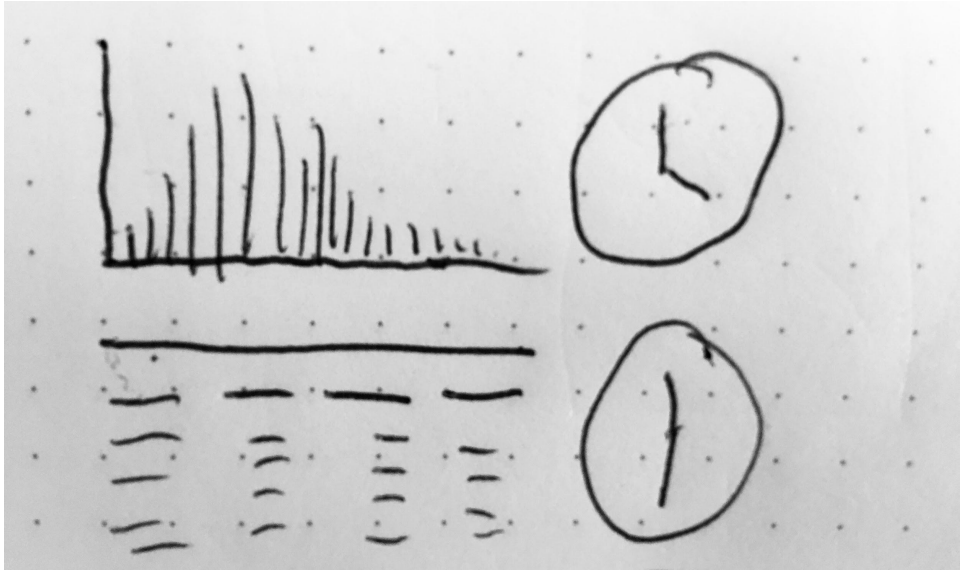


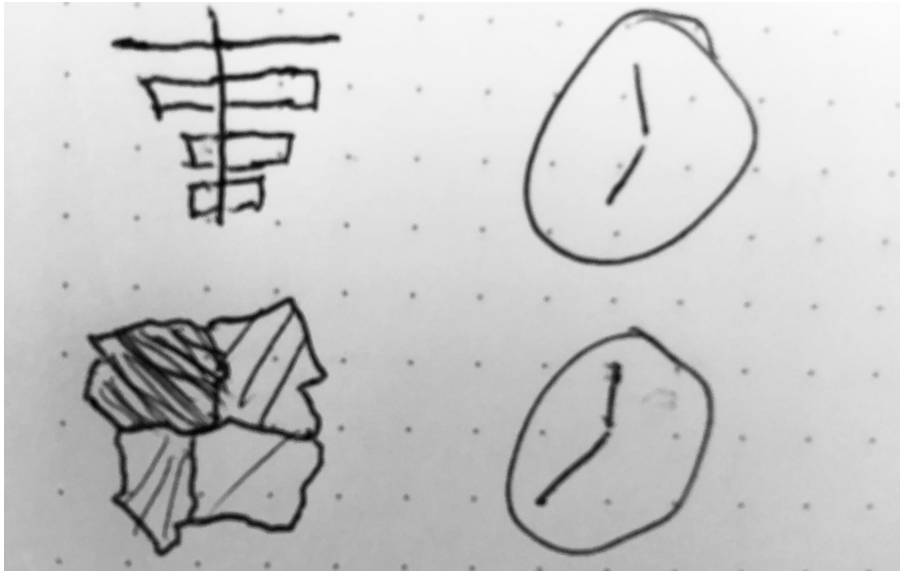


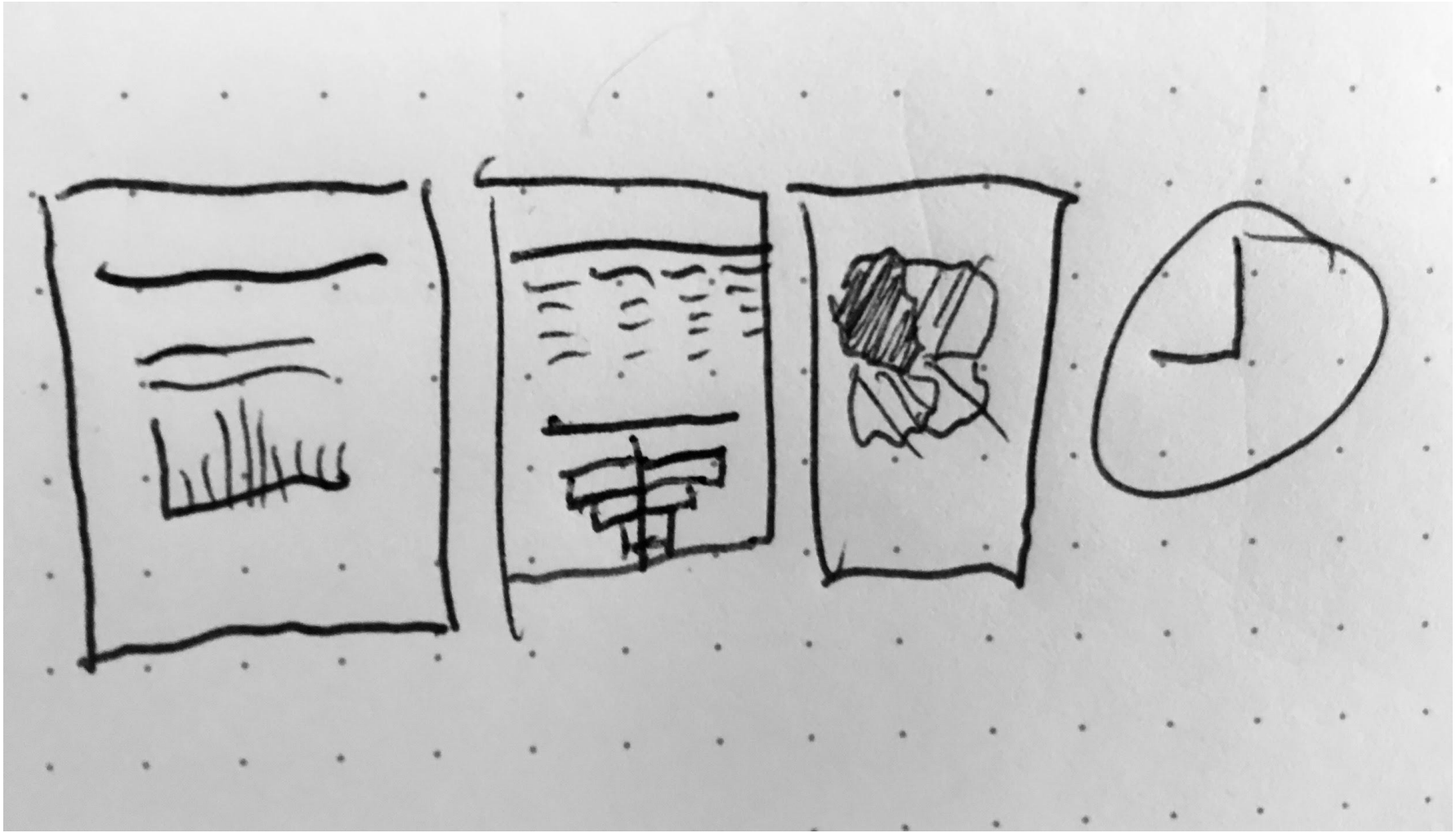
Field epidemiologists are essential

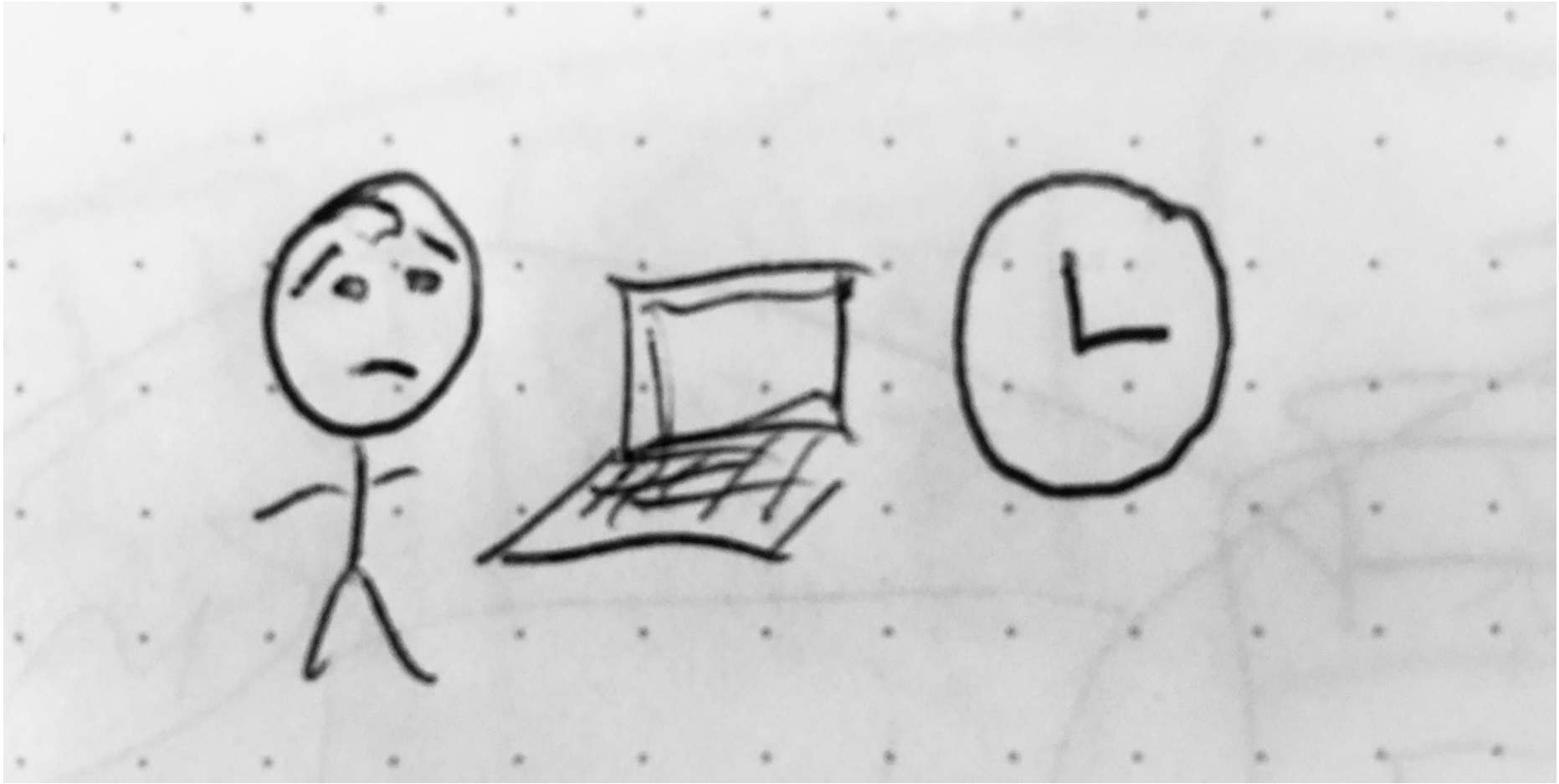
Photo Credit: Larissa Vernier
© MSF



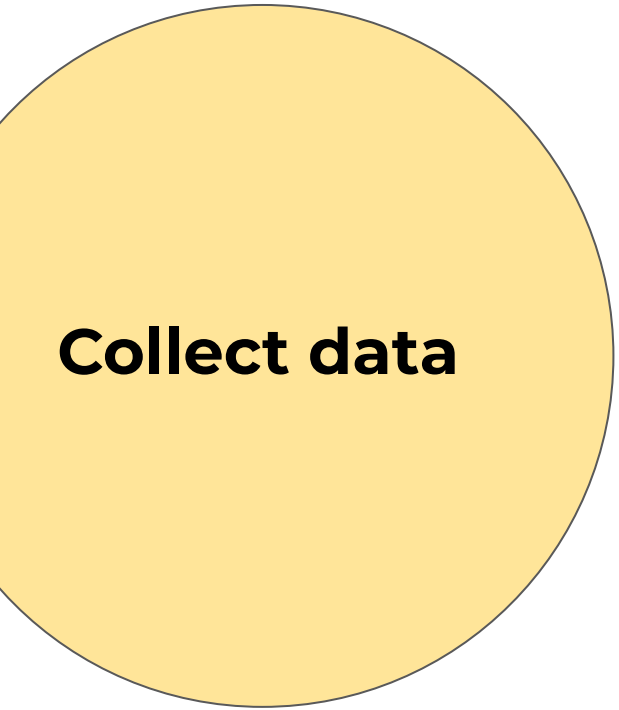









Collect data
Prepare report
Operational Decisions


Collect data


Prepare report


Operational
Decisions

RECON

+

Links to more information

https://repidemicsconsortium.org

https://blogs.msf.org/bloggers/larissa/innovation-introducing-r4epis

https://github.com/r4epi/

Slides

https://bit.ly/2YNAZLx


MSF_Public

Acknowledgements

- Neale Batra
- Maria Verdecchia
- Alanah Jansen
- Despina Pampaka
- Lukas Richter
- Greg Martin

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Funding: MSF Sapling Nursery Grant

MEDECINS SANS FRONTIERES
DOCTORS WITHOUT BORDERS

repis

RECON

Notable Acknowledgements

Annick Lenglet

Amrish Baidjoe

Alex Spina

Lukas Richter

Dirk Schumacher

Kate Doyle

THE GOAL

MEDECINS SANS FRONTIERES

Outbreak Response Plan and SitRep / Final Report [delete as appropriate]

Click on the words below to be taken to the relevant part of this form:

/

- *This template can be used to record the initial Outbreak Response Plan and, by keeping it updated, it can be used an Update Report/SitRep as the outbreak progresses. It may be used at a Mission or Project Level.*
- *This document should be updated after each Outbreak Response Team meeting – see the 'Coordination' page of the Outbreak Management Toolkit (on all field laptops and at: https://field.oca.msf.org/outbreak-management-toolkit) for a template agenda for Outbreak Response Team meetings*
- *If an MSF outbreak response is taking place across multiple sites, consider having a Response Plan and SitRep document for each site*
- *When new information is added, the date should be recorded so that the progress of the outbreak and response can be seen*
- *At the end of an outbreak response, the document can be turned into the Outbreak Response Final Report*

Date Report last updated:	Date
Name of Project(s) responding and/or name of site:	Enter name of Project(s) responding to the outbreak, if applicable, and/or name of response site
Mission:	Enter name of Mission responding to outbreak
Disease causing the outbreak:	Enter name of disease ☐ Confirmed ☐ Probable
Outbreak Response Coordinator:	Enter name of assigned Outbreak Response Coordinator and his/her role in MSF

	Name	Usual role in Project/Mission	Role in Outbreak Response Team

1. MEDICAL AND EPIDEMIOLOGICAL INFORMATION

1.1 Typical signs and symptoms, or case definition

- *Brief description only.*
- *If case definition is given, specify the date it was agreed.*
- *If the case definition is changed during the response, add the date it was altered and the new case definition*

1.2 Epidemiological description *(Date last updated: Date)*

- *This information can be obtained from the Field Epidemiologist, if present.*
- *Alternatively, instructions on what data to consider, plus a tool to automatically create charts, can be found in the 'Outbreak Investigation Guide', and related graph tool, in the 'Epidemiology & Surveillance' page of the Outbreak Management Toolkit*

- Person:

[Who is affected: how many in total; male or female; young, adult or old? What are the links between affected people work place, school, social gathering? Is there a high rate of illness in contacts? Is there a high rate of illness in health workers? You may want to include: a bar chart showing case numbers or incidence by age group and sex; attack rate (AR); and numbers of deaths (in suspected and confirmed cases), mortality rates and/or case fatality ratio (CFR)]

- Time:

[When did the cases fall ill? Are numbers increasing or stable? You may want to include an Epi curve (bar chart showi number of new (suspected and confirmed) cases each day/week)]

Cholera outbreak report

Introduction to this template

This is a template which can be used to create an automated outbreak situation report for cholera.

- It is organised by time, place and person.
- You can type normal text in white spaces (such as here) and r-code in grey spaces (denoted by three backticks and r) (see Rmarkdown introduction and Markdown basics)
- Introductions and contents of sections are within square brackets "[...]" and can be deleted as appropriate
- Examples of inline code (to automate updating numbers, e.g. in the "Person section"), can similarly be removed/updated
- Code itself can be deleted, but as a word of caution: make sure you aren't deleting bits where variables are created/manipulated, or at least update them appropriatley
- For a more detailed exaplanation of this template, see Wiki
- ADD LIST ON WHICH PACKAGES WILL BE USED FOR WHAT REASONS! AND HOW TO INSTALL
- OTHER INFO TO ADD??

Person

- [Who is affected: how many in total; male or female; young, adult or old? What are the links between affected people – work place, school, social gathering? Is there a high rate of illness in contacts? Is there a high rate of illness in a specific group of people (e.g. health workers)? You may want to include: a bar chart showing case numbers or incidence by age group and sex; attack rates (AR); and numbers of deaths (in suspected and confirmed cases), mortality rates and/or case fatality ratio (CFR)]

From the start of the outbreak up until 2018-W16 there were a total of 300 cases. There were 99 (33.0%) females and 92 (30.7%) males.

The most affected age group was 45+ years.

Demographics

Cases by age group and definition

Age group (years)	Confirmed cases (n)	%	Probable cases (n)	%	Suspected cases (n)	%	Total
0-4	10	4.2	0	0.0	1	3.1	11
5-14	13	5.4	1	3.6	3	9.4	17
15-29	26	10.8	4	14.3	6	18.8	36
30-44	29	12.1	2	7.1	3	9.4	34
45+	162	67.5	21	75.0	19	59.4	202
Total	240	100.0	28	100.0	32	100.1	300

Cases by age group and sex

Age group (years)	Female cases (n)	%	Male cases (n)	%	Missing (n)	%	Total
0-4	5	5.1	2	2.2	4	3.7	11
5-14	7	7.1	4	4.3	6	5.5	17
15-29	13	13.1	12	13.0	11	10.1	36
30-44	13	13.1	9	9.8	12	11.0	34
45+	61	61.6	65	70.7	76	69.7	202
Total	99	100.0	92	100.0	109	100.0	300

Alternatively if you would like proportions to be of the total population, use the following.

Age group (years)	Female cases (n)	%	Male cases (n)	%	Missing (n)	%	Total
0-4	5	1.7	2	0.7	4	1.3	11
5-14	7	2.3	4	1.3	6	2.0	17
15-29	13	4.3	12	4.0	11	3.7	36
30-44	13	4.3	9	3.0	12	4.0	34
45+	61	20.3	65	21.7	76	25.3	202
Total	99	32.9	92	30.7	109	36.3	300

Age pyramid by case definition

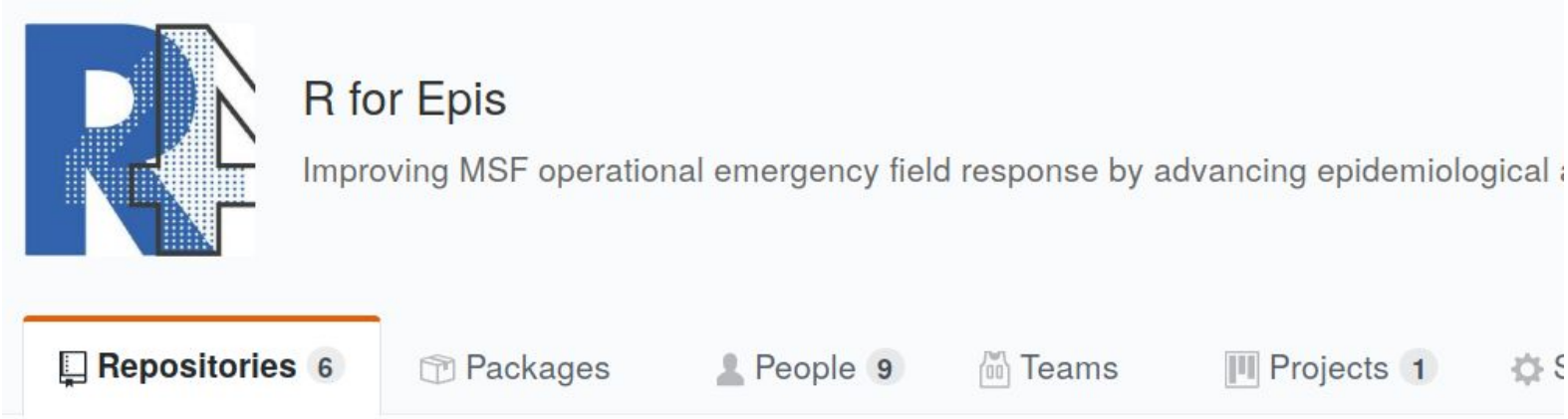
There were 109 (36.3%) cases missing information on sex, 0 (0.0%) missing case definitions and 0 (0.0%) missing age group.

Outbreak Reports

- Cholera
- Measles
- Meningitis
- Acute Jaundice Syndrome

Survey Reports

- Vaccination coverage
- Malnutrition
- Retrospective mortality access to care




```
remotes::install_github("R4EPI/sitrep")
```

sitrep

WIP Report templates and helper functions for EPI

R 4 4 17 (3 issues need help) 2 Updated 12 hours ago

BUILDING SITREP

package	published	dl_last_month	stars	tidyverse_happy	has_tests	vignette	last_commit	last_issue_closed	contributors	depends_count	reverse_count
epitrix	2018-08-28	339	4		✔	✔	0.9	0.9	3	1	1
incidence	2018-08-24	562	13	Y	✔	✔		0.5	6		1
epicontacts	2017-11-21	298	5	Y	✔	✔		1.3	0		1
epiflows	2018-08-14	215	7	Y	✔	✔		2.6	2	1	0
scanstatistics	2018-01-24	232	26	Y	✔	✔		1.9	1	1	0
surveillance	2018-07-24	1058			✔	✔				8	1
EpiContactTrace	2017-10-19	337	2		✖				10	1	0
epitab	2018-07-04	280	1	Y	✖	✔			0		0
pubh	2018-08-30	237	0		✖	✔			0	5	0
epitools	2017-10-26	7691			✖					1	8
epitools	2017-10-26	7691			✖						
epibasix	2012-11-15	660			✖						
Epi	2018-08-23	6555			✖						
epiR	2018-08-22	4054			✖					2	7
EpiStats	2018-10-08	624			✖	✔				2	0
epiDisplay	2018-05-10	1904			✖					5	1
EpiCurve	2018-04-24	369			✖	✔				5	0
EpiEstim	2013-03-08	341			✖						1
epinet	2018-02-13	324			✖						0
RSurveillance	2016-10-04	212			✖						0

summarise survey_ratio not treating groups with zero counts #49

Edit New issue

Closed **zkamvar** opened this issue on Mar 14 · 9 comments

zkamvar commented on Mar 14

Hello,

We ran into an issue with `survey_ratio()` and grouped data where one group was missing. As shown below, we get the error "Argument 2 must be length 4, not 3".

Our current workaround is to run `survey_ratio()` separately and then join the results, but that's less

Assignees

No one assigned

Labels

None yet

Projects

Welcome to the *aweek* package!

This package will convert dates to US CDC epiweeks, isoweeks, and all others in between with minimal overhead.

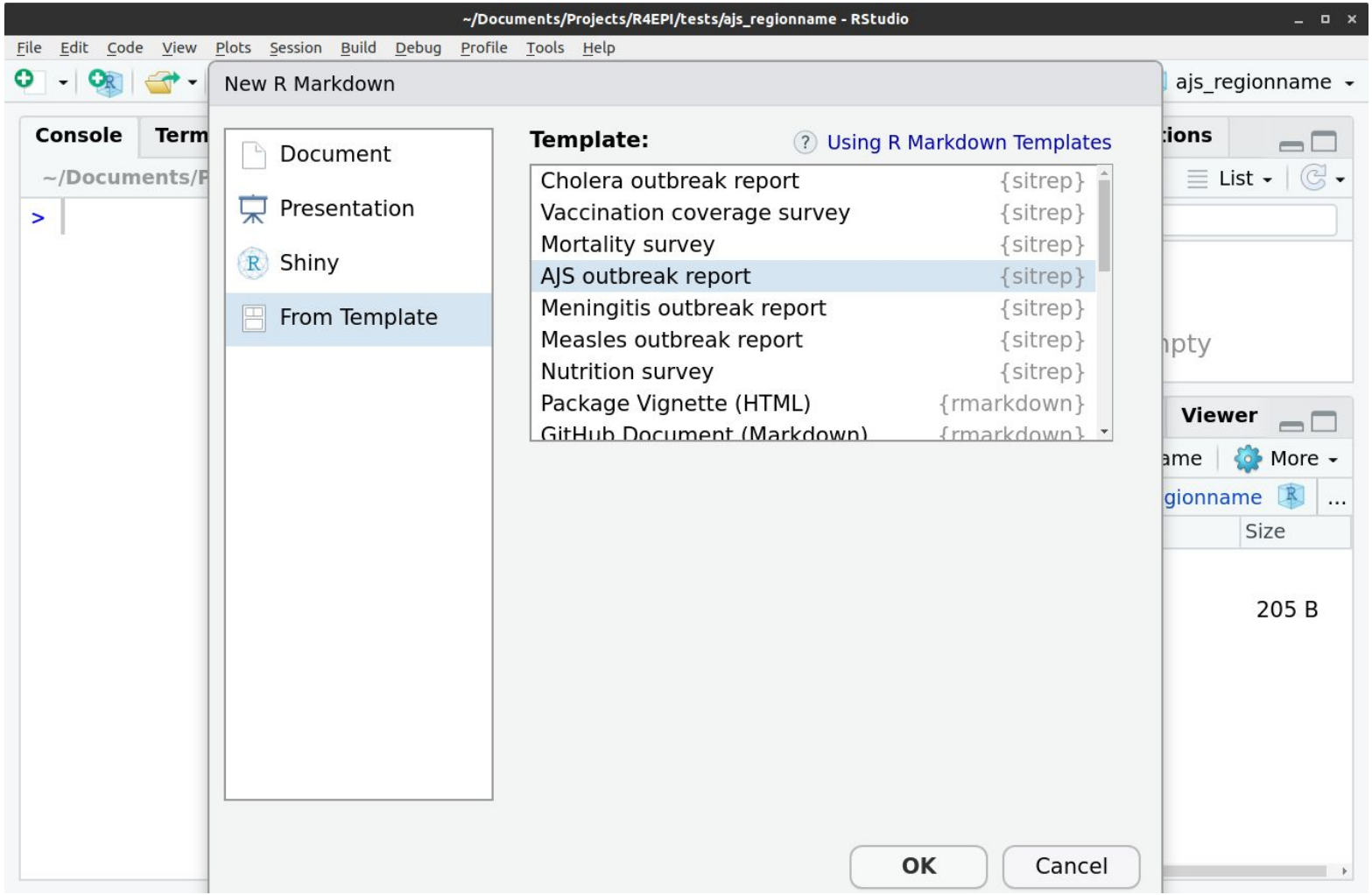
Installing the package

To install the stable package version from CRAN, you can use

```
install.packages("aweek")
```

To benefit from the latest features and bug fixes, install the development, *github* version of the package using:

```
# install.packages("remotes")
remotes::install_github("reconhub/aweek")
```


~/Documents/Projects/R4EPI/tests/ajs_regionname - RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
ajs_regionname
Console
Term
~/Documents/P
>
New R Markdown
Document
Presentation
Shiny
From Template
Template:
Using R Markdown Templates
Cholera outbreak report {sitrep}
Vaccination coverage survey {sitrep}
Mortality survey {sitrep}
AJS outbreak report {sitrep}
Meningitis outbreak report {sitrep}
Measles outbreak report {sitrep}
Nutrition survey {sitrep}
Package Vignette (HTML) {rmarkdown}
GitHub Document (Markdown) {rmarkdown}
OK
Cancel
List
Viewer
More
Size
205 B

RStudio

File Edit Code View Plots Session Build Debug Profile Tools Help

Go to file/function | Addins

Untitled1

Knit | Insert | Run

```
---
title: "Cholera outbreak report"
output: word_document
---

# Introduction to this template

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report for cholera.

- It is organised by time, place and person.
- You can type normal text in white spaces (such as here) and r-code in grey
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    introduction](https://rmarkdown.rstudio.com/articles_intro.html) and
    [Markdown basics](https://rmarkdown.rstudio.com/authoring_basics.html))
- Introductions and contents of sections are within square brackets "[...]" and
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    them appropriatley
- For a more detailed exaplanation of this template, see [wiki](https://github.com/R4EPI/sitrep/wiki)
- ADD LIST ON WHICH PACKAGES WILL BE USED FOR WHAT REASONS! AND HOW TO INSTALL
- OTHER INFO TO ADD??

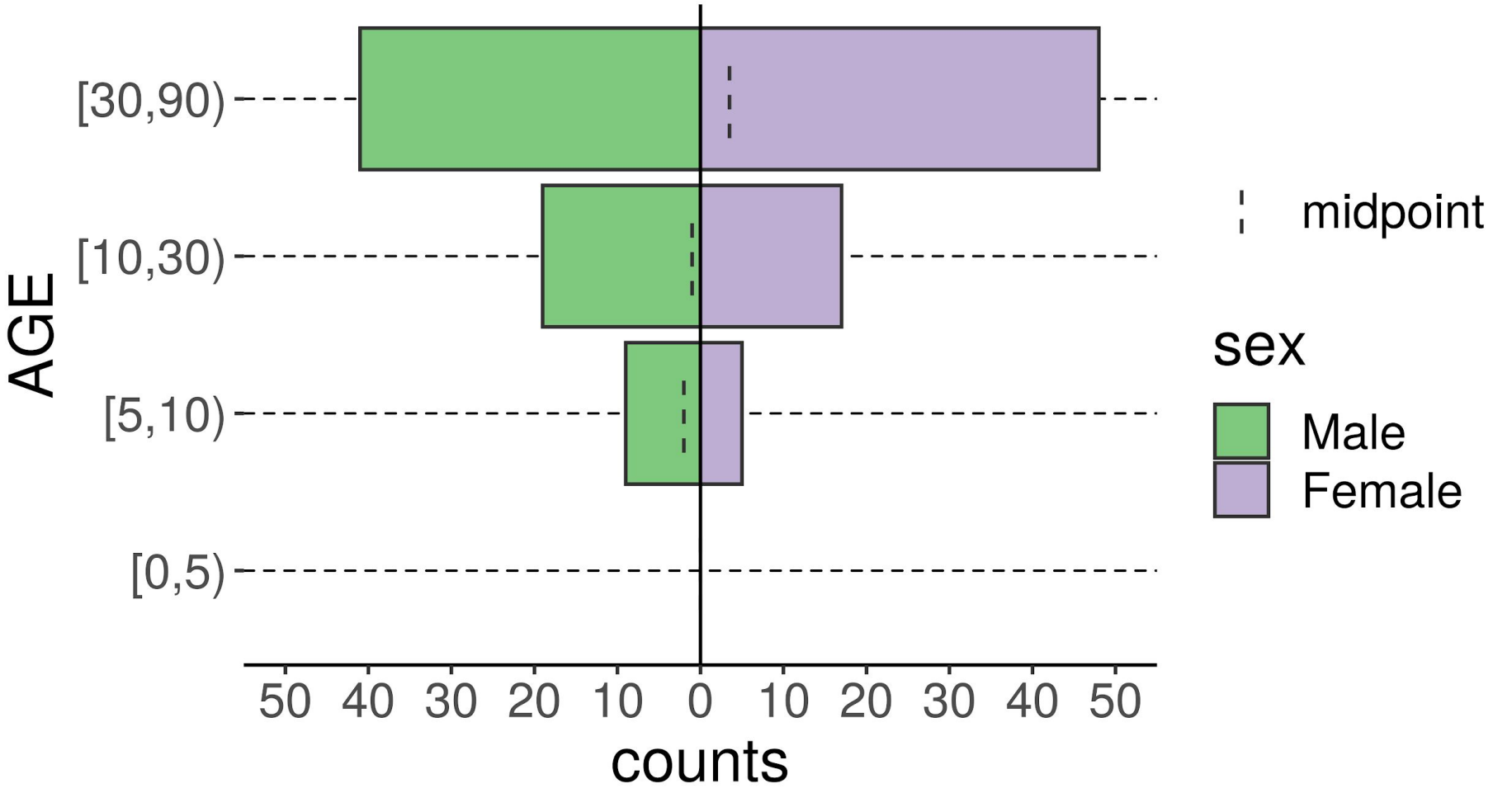

```{r setup, include=FALSE}
# hide all code chunks in the output, but show errors
knitr::opts_chunk$set(echo = FALSE, error = TRUE, fig.width = 6*1.25, fig.height = 6)
# set default NA to - in output, define figure width/height
options(knitr.kable.NA = "-")


library(knitr) # for creating output doc
library(dplyr) # for cleaning/shaping data
library(ggplot2) # for plotting diagrams

# epi packages
library(sitrep) # for msf field epi functions
library(incidence) # for epicurves
library(ISOweek) # for creating epiweeks
library(epitools) # for creating 2by2 tables

# spatial packages
library(sf)
library(ggspatial)

# set default text size to 16 for plots
# give classic black/white axes for plots
ggplot2::theme_set(theme_classic(base_size = 18))
```

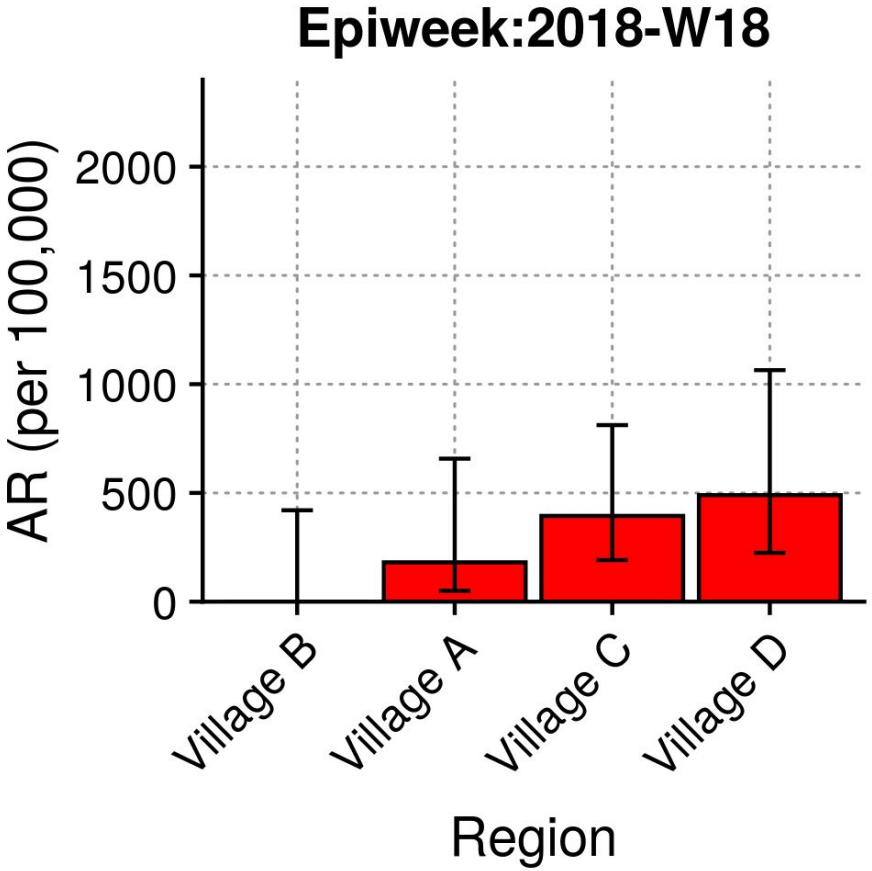


```{r read_DHIS_excel_data}
```

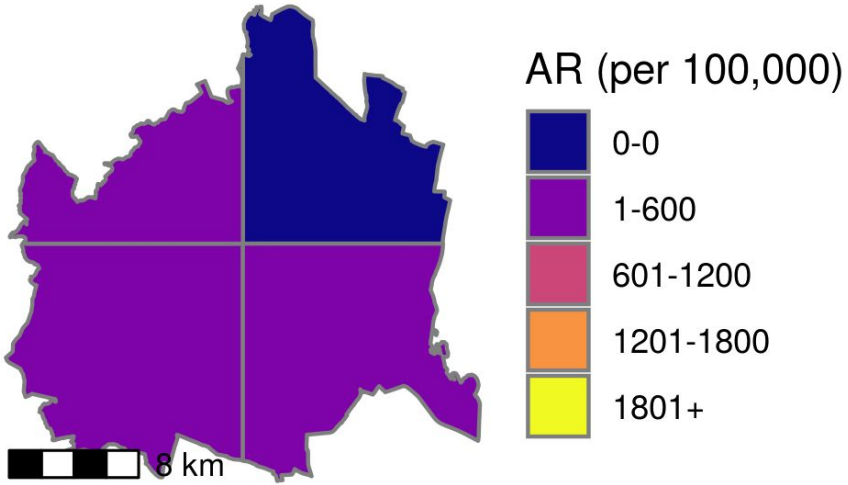
1:1 | Cholera outbreak report

Console
```


AGE
[30,90)
[10,30)
[5,10)
[0,5)
50 40 30 20 10 0 10 20 30 40 50
counts
midpoint
sex
Male
Female



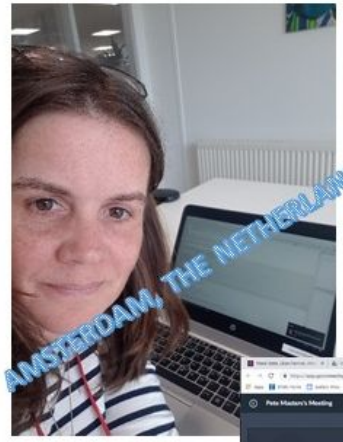
Source: MSF data from 2018-W20



HACKATHON

04-05 July 2019

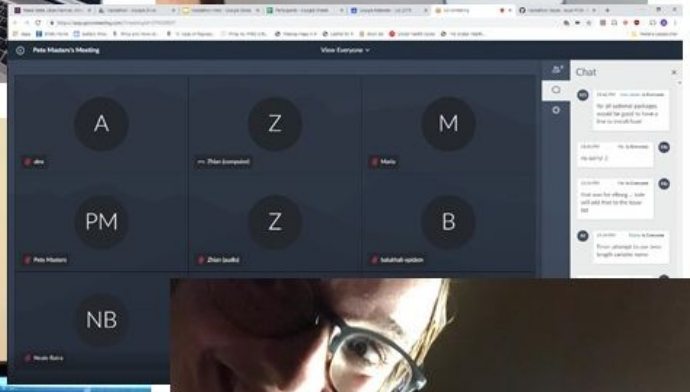

GOMA, DRC


AMSTERDAM, THE NETHERLANDS


COX BAZAR, BANGLADESH


GOMA, DRC


BEIRUT, LEBANON


Pete Masters's Meeting
View Everyone
Chat
A
Z
M
PM
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B
NB

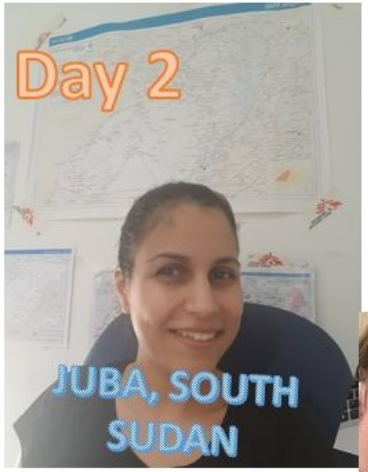

LONDON, UK

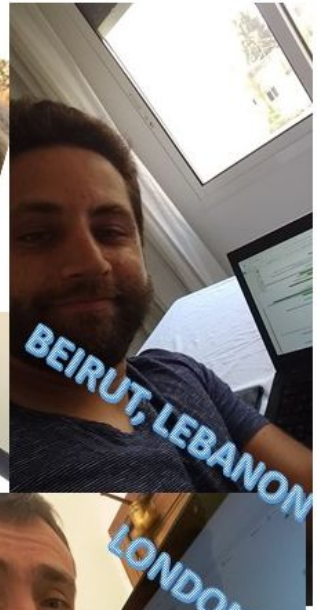

KIGALI, RWANDA

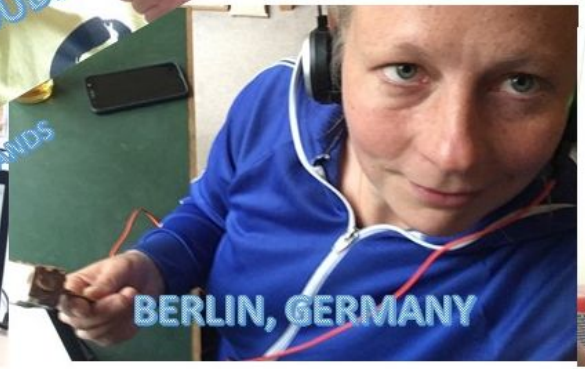

COX BAZAR, BANGLADESH

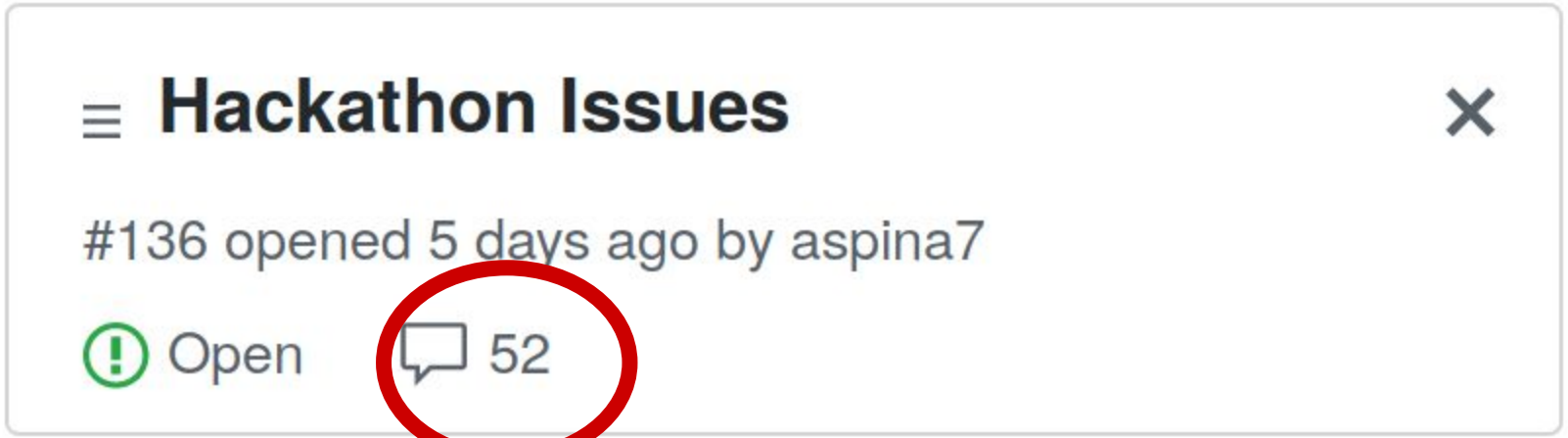

KATMANDU, NEPAL

Hackathon Day 2

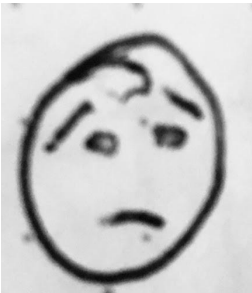




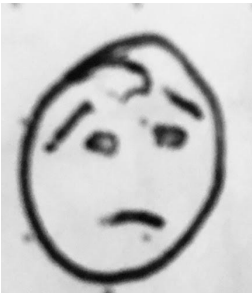



Hackathon Issues
#136 opened 5 days ago by aspina7
Open
52

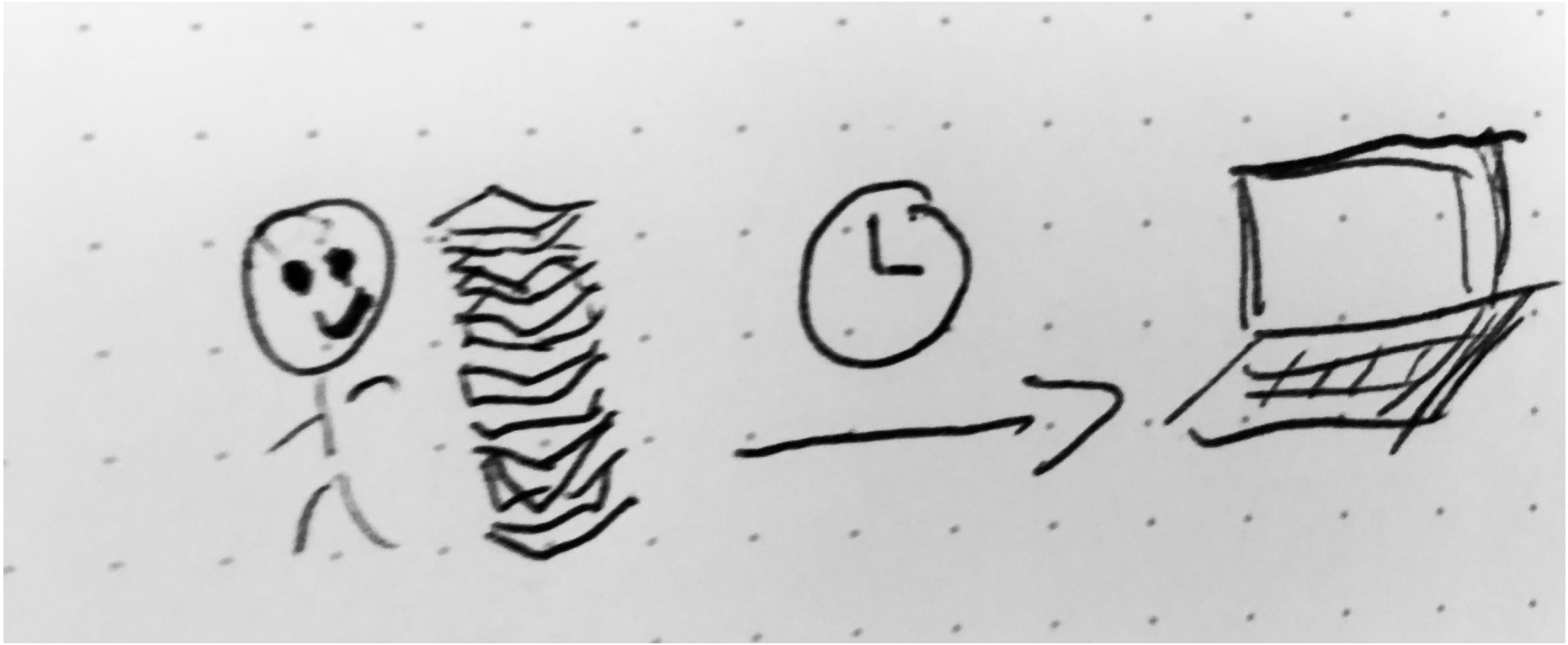
- Working directory (fix: RStudio project)
- Package installation (fix: restart R)
- Matching columns (“exquisitely painful”)



- Type errors (e.g. as.Date(NA))
- Mis-typed filter rule; lost progress
- Protected spreadsheets (need rJava 😩)



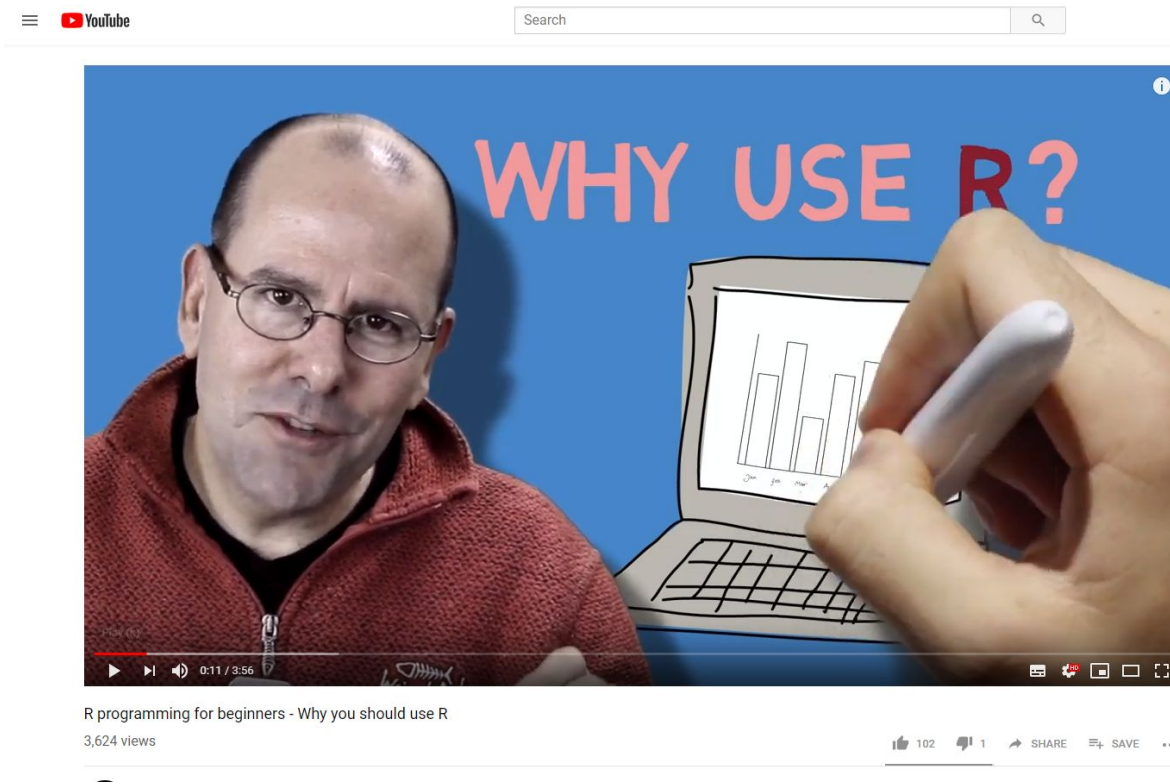
- Very detailed and well-organised instructions
- “Saves time to do complex tasks”
- “Openness” and customizability of templates
- Excellent support from Alex and Zhian



FUTURE WORK

Training Strategy

- Case Studies
- Video Tutorials by Greg Martin
- Dedicated technical support + maintenance



THANK YOU!

Twitter: @zkamvar
Hashtag: #R4epis
Templates: https://github.com/R4EPI/sitrep