



TMF-WORKSHOP REDCAP

VISUALISIERUNG VON REDCAP-DATEN

ANDREAS HETEY, BIH/CSC/CTO

TMF, 30.10.2019

- Report/Export
 - Bsp: CSV Daten mit Shiny
- Plugin
 - Bsp: mit PHP und REDCap Funktionen (PROMIS, QR)
 - Bsp: PHP/REDCap und externem Programm (R)
- API / Token
 - API Playground
 - Bsp: Automatische Exports mit Skript als Cron-Job
 - Bsp: JavaScript
 - Bsp: RStudio

Daten Export

Record ID record_id	Event Name redcap_event_name	Datum der Aufnahme date_demographics	Chiffre chiffre	Geburtsjahr geburtsjahr	Geschlecht geschlecht	Sind Sie schwanger? schwanger_yn	In den letzten 7 Tagen: Wie stark waren Ihre Schmerzen im Allgemeinen? schmerzen	Herkunftsland herkunftsland	Complete? demographics_complete	Größe an_groesse	Gewicht an_gewicht	BMI - Body Mass Index an_bmi	BSA - Body Surface Area an_bsa
<u>1</u>	V1 Einschluss	31-08-2018	878787	1988	weiblich (1)	Nein (0)	leicht (2)	Chile (CHL)	Complete (2)	190	98	27.1	2.3
<u>2</u>	V1 Einschluss	31-08-2018	777777	1985	männlich (0)		leicht (2)	Costa Rica (CRI)					
<u>3</u>	V1 Einschluss	31-08-2018	666666	1987	weiblich (1)	Ja (1)	stark (4)	Chad (TCD)					
<u>4</u>	V1 Einschluss	11-10-2018	231243	1986	weiblich (1)	Ja (1)	sehr stark (5)	Canada (CAN)					

- Report wird als Tabelle angezeigt
- Verschiedene Export-Formate
- CSV für Export/Import

Choose export format

-  CSV / Microsoft Excel (raw data)
-  CSV / Microsoft Excel (labels)
-  SPSS Statistical Software
-  SAS Statistical Software
-  R Statistical Software
-  Stata Statistical Software
-  CDISC ODM (XML)

CSV Daten – R-Shiny

CRU Project Reporting - REDCap Workload

Wähle eine Excel Datei aus:

Browse... CRUProjectReportingA-RedcapWorkload_klein2

Upload complete

Projekt:

(ALL)

Ein Projekt auswählen.

REDCap Demo Start anzeigen

REDCap Prod Start anzeigen

Vergleich zwischen 2 Projekten

Minimieren:

nein

ja

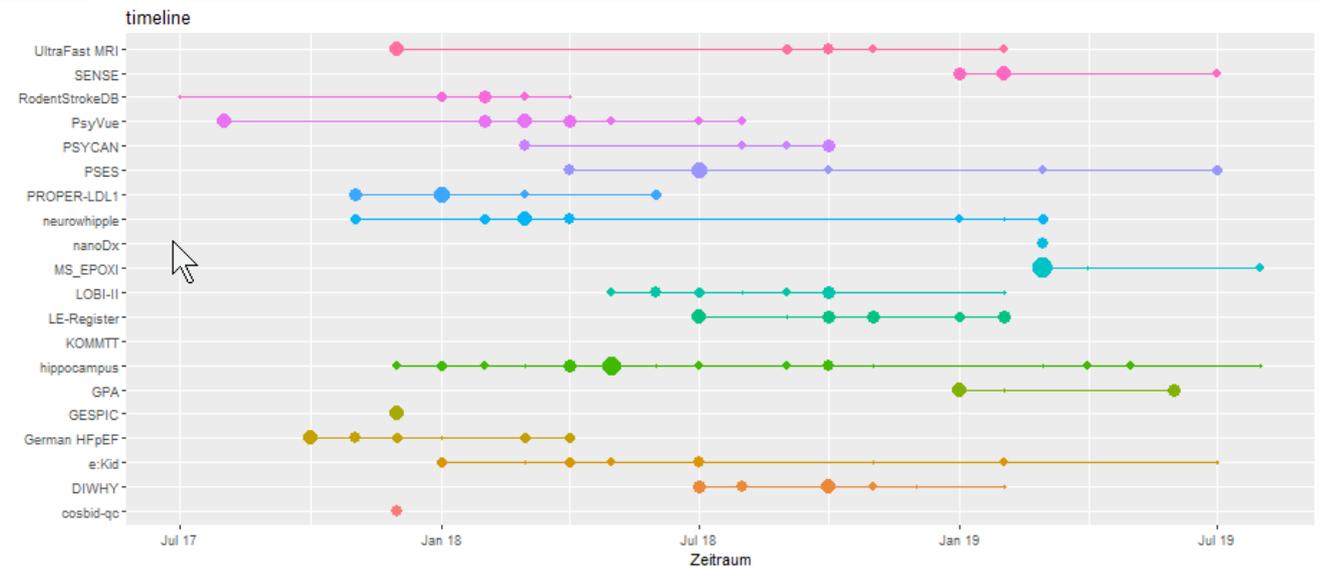
Heatmap für alle Projekte:

ja

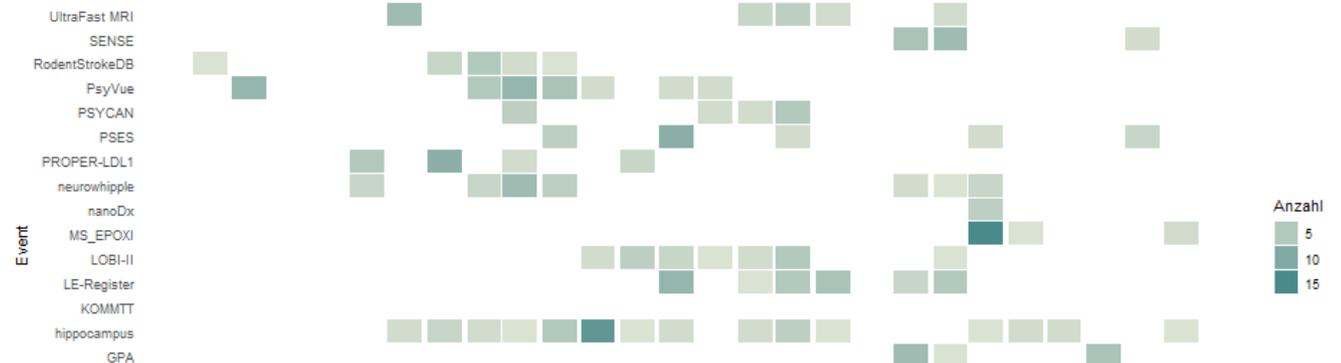
nein

CRU Projekte

Table Plots



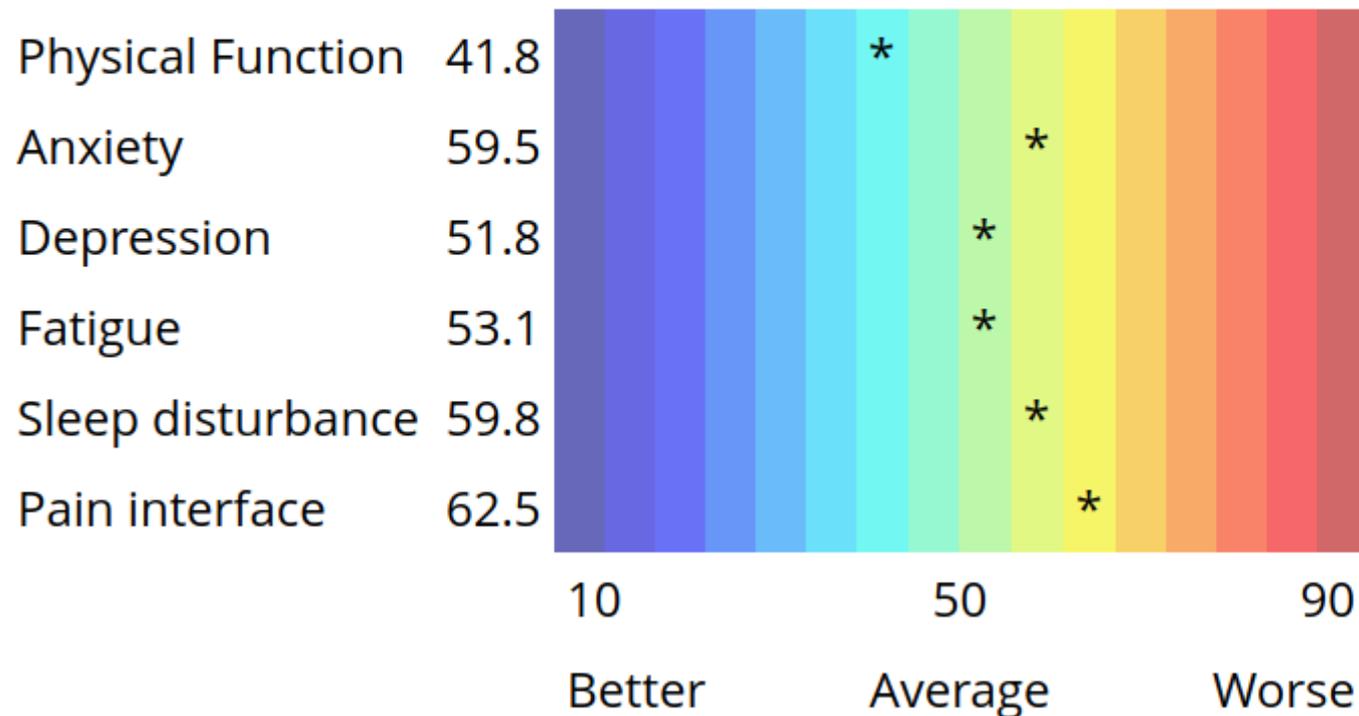
Headmap der REDCap Projekte



PHP/REDCap-Funktion

ID [1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 latest]

PROMIS T-Scores for id: 26



PHP Code

```
<?php
putenv('LANG=en_US.UTF-8');
require_once "../redcap_connect.php";

// OPTIONAL: Display the project header
require_once APP_PATH_DOCROOT . 'ProjectGeneral/header.php';

// Project PID, User
REDCap::allowProjects($pid);
REDCap::allowUsers('ichbins', 'admin42');

// Get all field variable names in project
$fields = ['record_id', 'datum_promis29', 'anxiety_4a_score'];
$record_id_field = REDCap::getRecordIdField();
$data = REDCap::getData('array', null, $fields);

foreach ($data as $key => $value) {
    // loop over records ...
}
```

PHP Code - Daten

```
Array
(
    [1] => Array
        (
            [328] => Array
                (
                    [record_id] => 1
                    [datum_promis29] => 2019-06-12 11:20:09
                    [anxiety_4a_score] => 6
                    [depression_score_4a] => 9
                    [physical_function_score_4a] => 20
                    [fatigue_4a_score] => 9
                    [sleep_disturbance_4a_score] => 8
                    [pain_interface_4a_score] => 4
                    [promis_29_profile_v20_complete] => 2
                )
            )
        )
    [2] => Array
        (
            [328] => Array
                (
                    [record_id] => 2
                    [datum_promis29] =>
                    [anxiety_4a_score] => 6
                    [depression_score_4a] => 12
                    [physical_function_score_4a] => 17
                    [fatigue_4a_score] => 10
                    [sleep_disturbance_4a_score] => 10
                    [pain_interface_4a_score] => 8
                    [promis_29_profile_v20_complete] => 2
                )
            )
        )
)
```

```
print "<h3>data</h3><pre>";
print_r($data); print "</pre>";
```

PHP Code QR

```
$cantab_id = $data[$record_id][$array_nr]['cantab_id'];  
$mrt_id    = $data[$record_id][$array_nr]['mrt_id'];  
  
// ...  
print "<tr><td><img src=\".make_qrcode_id($cantab_id).\" /></td></tr>\n";  
print "<tr><th>survey_id $cantab_id </th></tr>\n";  
print "<tr><td><img src=\".make_qrcode_id($mrt_id).\" /></td></tr>\n";  
print "<tr><th>survey_id $mrt_id </th></tr>\n";  
  
// QR-Code  
require_once APP_PATH_LIBRARIES . "phpqrcode/qrlib.php";  
function make_qrcode_id ($codeContents) {  
    // ...  
    QRcode::png($codeContents, $pngAbsolutePath, 'H', 6);  
    QRtools::timeBenchmark();  
    return $urlRelativeFilePath;  
}
```



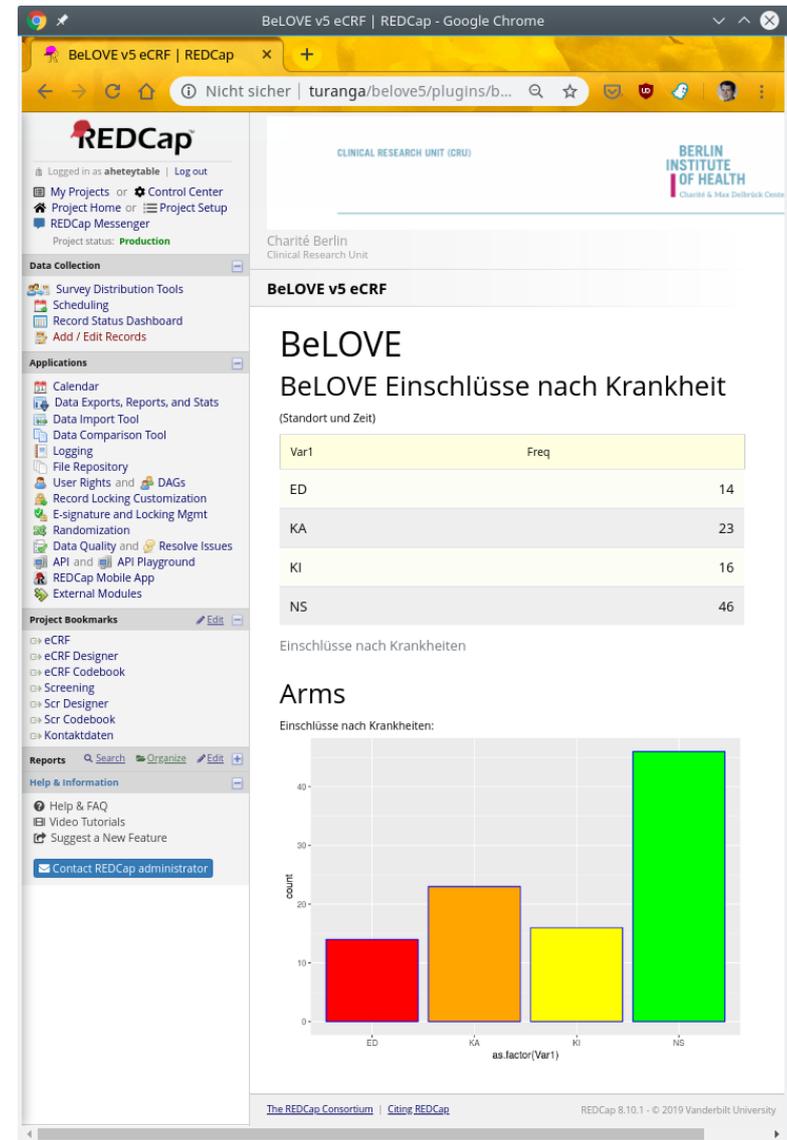
cantab_id CANTAB-093966



mrt_id BLV-MRT-9397956

PHP/REDCap, ext. R

- Plugin sucht Daten
- Schreibt in CSV
- Start ext. R-Programm
 - liest CSV-Daten
 - erzeugt Tabelle, Grafik
 - Ausgabe als Html
- Plugin bindet Html ein



Ext. Skript aufrufen

- Im PHP-Skript CSV-Daten generieren und schreiben:
`file_put_contents('/opt/knitr/belove/blvid-data.csv', $csv);`
- Externes Programm aufrufen:
`passthru("/opt/knitr/belove/run_blvid.sh");`
- R-Programm aufrufen
`/usr/bin/Rscript -e "library(knitr); rmarkdown::render('./blvid.Rmd)'"`

API-Playground

- Zugriff mit externem Programm auf REDCap Daten
- API: Programmierschnittstelle
- API-Token zur Authentifizierung
- API-Playground: Skripts interaktiv erstellen



Displayed in the box below is the code you would use to execute this A

```
format: 'json',  
returnFormat: 'json'  
}  
ch = pycurl.Curl()  
ch.setopt(ch.URL, 'https://redcap.charite.de/demo')  
ch.setopt(ch.HTTPPOST, data.items())  
ch.setopt(ch.WRITEFUNCTION, buf.write)  
ch.perform()  
ch.close()  
print buf.getvalue()  
buf.close()
```

Select an API method from the drop-down list below, after which it will load any other options that are specific to that method.

API Method: Export Records

Format: JSON

Type: flat

Records: 1, 2, 3, 4, 5

Fields: an_bmi, an_bsa, an_gewicht, an_groesse, an_medikamente

Forms: anamnese, anamnese_followup, demographics, laborparameter_a, laborparameter_b

Events: v1_einschluss_arm_1, v2_visite_2_arm_1, v3_visite_3_arm_1

Raw Labels: raw

Raw Headers: raw

Checkbox Labels: false

Survey Fields: false

Data Access Groups: false

Filter Logic:

Records Created or Modified in Timespan (begin) (YYYY-MM-DD HH:MM:SS format):

Records Created or Modified in Timespan (end) (YYYY-MM-DD HH:MM:SS format):

Errors: JSON

API Token

- User beantragt Token
- durch Admin freigeben
- Userrights: API Export, API Import/Update



 My Token

 Manage All Project Tokens

Your API token for project "TMF-Workshop REDCap Intro ah"

The API token below is **ONLY for you** and will work **ONLY with this project**. This token allows special access to REDCap data and **should NOT be shared with others**. If you think your token has been compromised, then please contact your REDCap administrator immediately *AND* either delete or regenerate your token by using the buttons below.

 API Token:

8787878787GEHEIMER0000TOKEN565656565

Delete token

Finished using the API for this project? If so, please delete your token for security reasons.

Regenerate token

Think someone else knows your token? If so, please regenerate your token for security reasons.

The following user(s) have API tokens for this project: **heteya**

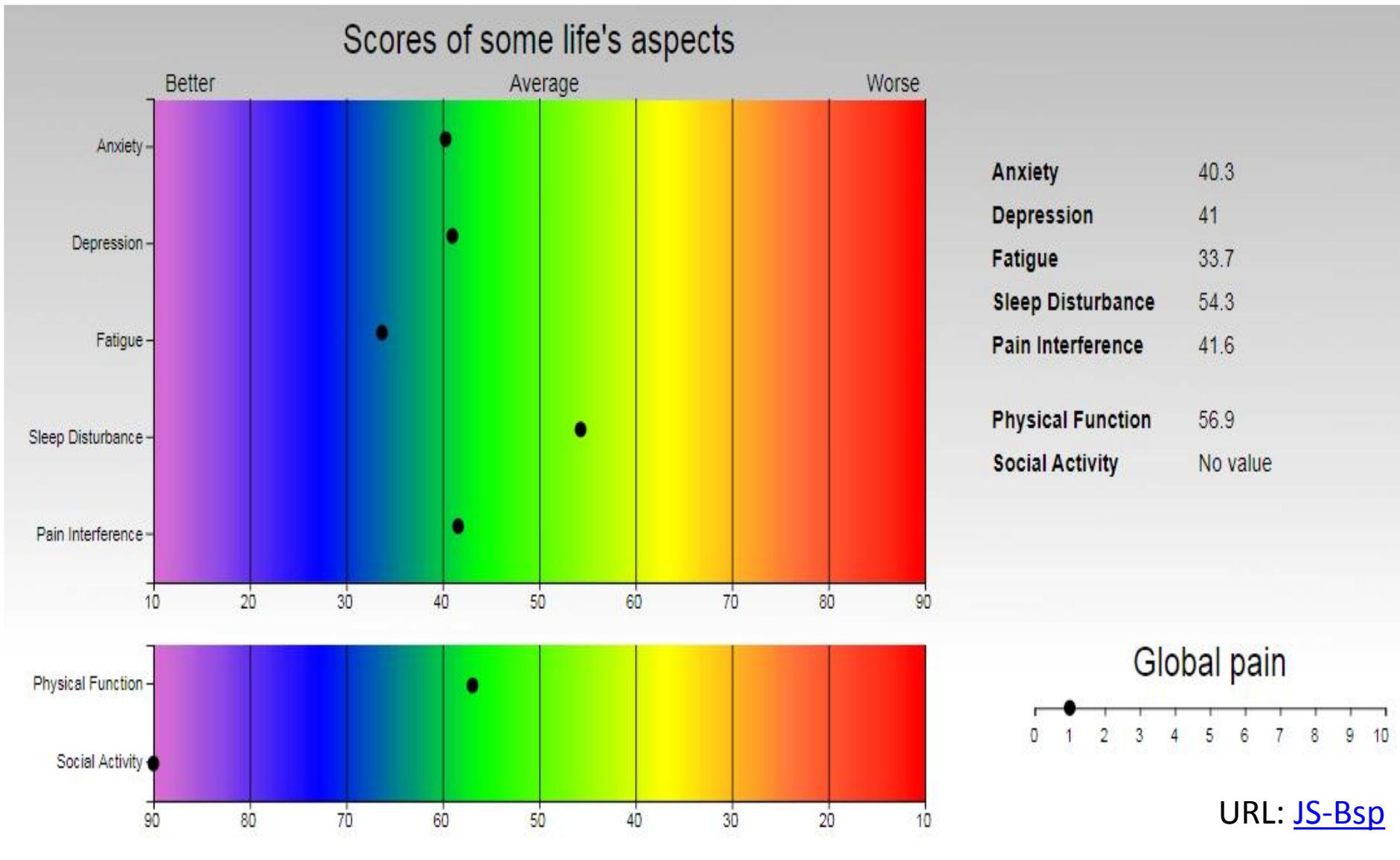
autom. Report Export

- Report erstellen
- Skript im API-PlaygroundAPI-Methode: Export Report
- cURL Skript in Datei speichern
- Ausgabe umleiten in CSV-Datei
- In cron-tab als job registrieren TODO

```
# m h dom mon dow  command
4 5 * * 1,3,5 /home/mb-redcadm/bin/get-nal-report-039-glukose.sh
> /mnt/lws/Export-NAL/nal-report-039-glukose.csv 2> /dev/null
```

```
#!/bin/sh
DATA="token=0000GEHEIMER147FTOKEND83B4&content=report&format=csv&report_id=502&
rawOrLabel=raw&rawOrLabelHeaders=raw&exportCheckboxLabel=false&returnFormat=json"
CURL=`which curl`
$CURL -H "Content-Type: application/x-www-form-urlencoded" \
      -H "Accept: application/json" \
      -X POST \
      -d $DATA \
      https://redcap.charite.de/demo/api/
```

Bsp: JS/d3.js



Bsp: RStudio

```
library(tidyr)
library(REDCapR)
library(gtools)
library(ggplot2)

# REDCap Schulung ah v1
uri='https://redcap.charite.de/demo/api/'
token='0000GEHEIMER147FTOKEND83B4'

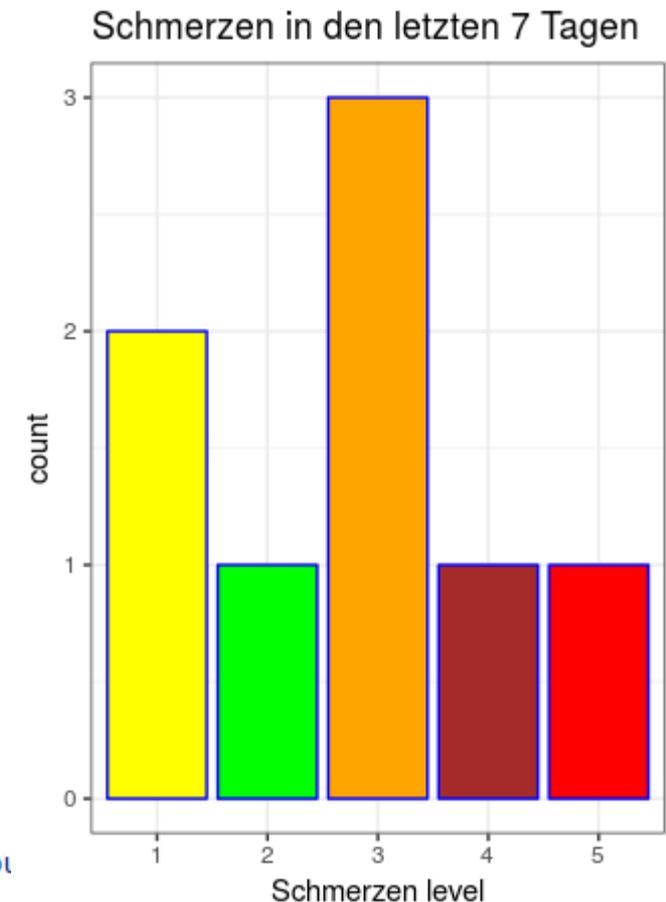
# get Codebook
codebook=as.data.frame(redcap_metadata_read(redcap_uri=uri, token=token))
# get data
data <- redcap_read_oneshot(redcap_uri=uri, token=token)

frame1=data$data
schmerz=data[["data"]][["schmerzen"]]

# use only data from event 1, remove no data (na) other of other events
frame_without_NA = subset(frame1,!is.na(schmerzen))

# plot schmerz data as bar chart
ggplot(frame_without_NA,aes(x=as.factor(schmerzen)))+
  geom_bar(aes(y = ..count..),width = 0.5)+
  geom_bar(stat='count',fill=c('yellow','green','orange','brown','red'),color=
  ggtitle("Schmerzen in den letzten 7 Tagen") +
  theme_bw()+xlab("Schmerzen level")

# schmerz as pie chart
pie(table(as.factor(frame_without_NA$schmerzen)),main="Pie Chart der Schmerzen",col=rainbow(length(labels)))
```





VIELEN DANK!

KONTAKT

Andreas Hetey
REDCap Team

**Berliner Institut
für Gesundheitsforschung
Clinical Trial Office (CTO)**

Charitéplatz 1
10117 Berlin
Tel. 030 450 643 506
andreas.hetey@charite.de
www.bihealth.org
www.charite.de