# Process data from reproducibility service

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> Note: The PDF version of this document is transformed by manually printing from a browser.

# Requirements

This project requires - R (last run with R 3.6.2) - package `here` (>=0.1)

Other packages might be installed automatically by the programs, as long as the requirements above are met.

# Data

## Raw process data

Raw process data is manually extracted from Jira, and saved as - `jira-simple-export_MM-DD-YYYY.csv` (for collapsed information on issues) - `export_MM-DD-YYYY.csv` (for detailed transaction-level data)

We currently only use the latter. The data is not made available outside of the organization, as it contains names of replicators, manuscript numbers, and verbatim email correspondence.

At this time, the latest extract was made 11-28-2019.

## Anonymized data

We subset the raw data to variables of interest, and substitute random numbers for sensitive strings. This is done by running `04_jira_anonymize.R` :

```
source(file.path(programs,"04_jira_anonymize.R"),echo=TRUE)
```

# Describing the Data

The anonymized data has 7 columns.

## Variables

| name | description |
| --- | --- |
| ticket | The tracking number within the system. May be project specific, is sequentially assigned upon receipt. |
| date | Date of a transaction |
| Journal | Journal associated with an issue and manuscript. Derived from the manuscript number, possibly updated by hand |
| Status | Status associated with a ticket at any point in time. The schema for these has changed over time. |
| Changed.Fields | A transaction will change various fields. These are listed here. |
| Change.Author.Anon | The author ID associated with a change of field values |
| mc_number_anon | The (anonymized) number assigned by the editorial workflow system (Manuscript Central/ ScholarOne) to a manuscript. This is purged by a script of any revision suffixes, and is used to connect tickets over time when there are revisions. |

## Sample records

| ticket | date | Journal | Status | Changed.Fields | Change.Author.Anon | mc_number_anon |
| --- | --- | --- | --- | --- | --- | --- |
| AEAREP-346 | 2019-11-28 | AER:Insights | Open | | Author 14 | 49 |
| AEAREP-346 | 2019-11-26 | AER:Insights | Open | JiraSearchMC | Author 7 | 49 |
| AEAREP-346 | 2019-11-26 | AER:Insights | Open | MCStatus | Author 7 | 49 |
| AEAREP-346 | 2019-11-26 | AER:Insights | Open | MCEntryURL | Author 7 | 49 |
| AEAREP-346 | 2019-11-26 | AER:Insights | Open | Code provenance | Author 7 | 49 |
| AEAREP-346 | 2019-11-26 | AER:Insights | Open | Journal | Author 7 | 49 |

# Some Analysis

```
## [1] "2020-02-24"
```

```
##
## > source(here::here("programs", "config.R"), echo = TRUE)
##
## > process_raw <- FALSE
##
## > basepath <- here::here()
##
## > setwd(basepath)
##
## > jirabase <- file.path(basepath, "data", "confidential")
##
## > jiraanon <- file.path(basepath, "data", "anon")
##
## > jirameta <- file.path(basepath, "data", "metadata")
##
## > images <- file.path(basepath, "images")
##
## > tables <- file.path(basepath, "tables")
##
## > programs <- file.path(basepath, "programs")
##
## > for (dir in list(images, tables, programs)) {
## +     if (file.exists(dir)) {
## +     }
## +     else {
## +         dir.create(file.path(dir))
## +     }
## + }
##
## > set.seed(20200201)
##
## > pkgTest <- function(x) {
## +     if (!require(x, character.only = TRUE)) {
## +         install.packages(x, dep = TRUE)
## +         if (!require(x, charact .... [TRUNCATED]
##
## > pkgTest.github <- function(x, source) {
## +     if (!require(x, character.only = TRUE)) {
## +         install_github(paste(source, x, sep = "/"))
## +      .... [TRUNCATED]
##
## > global.libraries <- c("ggplot2", "dplyr", "reshape2",
## +     "here")
##
## > results <- sapply(as.list(global.libraries), pkgTest)
```

```
## Loading required package: ggplot2
```

```
## Loading required package: reshape2
```

```
##
## Attaching package: 'reshape2'
```

```
## The following object is masked from 'package:tidyr':
##
##     smiths
```

```
## Loading required package: here
```

```
## here() starts at /mnt/local/slow_home/vilhuber/Workspace-non-encrypted/git/AEA/proce
ssing-jira-process-data
```

```
##
## > pkgTest.github("data.table", "Rdatatable")
```

```
## Loading required package: data.table
```

```
##
## Attaching package: 'data.table'
```

```
## The following objects are masked from 'package:reshape2':
##
##     dcast, melt
```

```
## The following objects are masked from 'package:dplyr':
##
##     between, first, last
```

```
## [1] "OK"
##
## > jira <- readRDS(file.path(jiraanon, "jira.anon.RDS"))
##
## > jira.manuscripts <- jira %>% select(mc_number_anon) %>%
## +     distinct()
##
## > unique_total <- nrow(jira.manuscripts)
##
## > unique_total_journal <- jira %>% group_by(Journal) %>%
## +     summarise(unique_mc_numbers = n_distinct(mc_number_anon))
##
## > duration.data <- jira %>% mutate(Status = ifelse(Status ==
## +     "Submitted to MC" & Changed.Fields == "Status" & Change.Author.Anon ==
## +     "Lar ..." ... [TRUNCATED]
##
## > table.duration <- duration.data %>% group_by(length) %>%
## +     summarise(n_tickets = n_distinct(ticket))
##
## > revision_round_length <- ggplot(duration.data, aes(x = length)) +
## +     geom_histogram(aes(y = ..density..), colour = "white", fill = "grey",
## +     .... [TRUNCATED]
##
## > revision_round_length.bar <- ggplot(table.duration,
## +     aes(x = length, y = n_tickets)) + geom_bar(stat = "identity") +
## +     theme_classic() +  .... [TRUNCATED]
##
## > revision_round_length.pos <- ggplot(duration.data %>%
## +     filter(length >= 1), aes(x = length)) + geom_histogram(aes(y = ..density..),
## +     col .... [TRUNCATED]
##
## > ggsave(file.path(images, "revision_round_length_hist.png"),
## +     revision_round_length + labs(y = element_blank(), title = element_blank()))
```
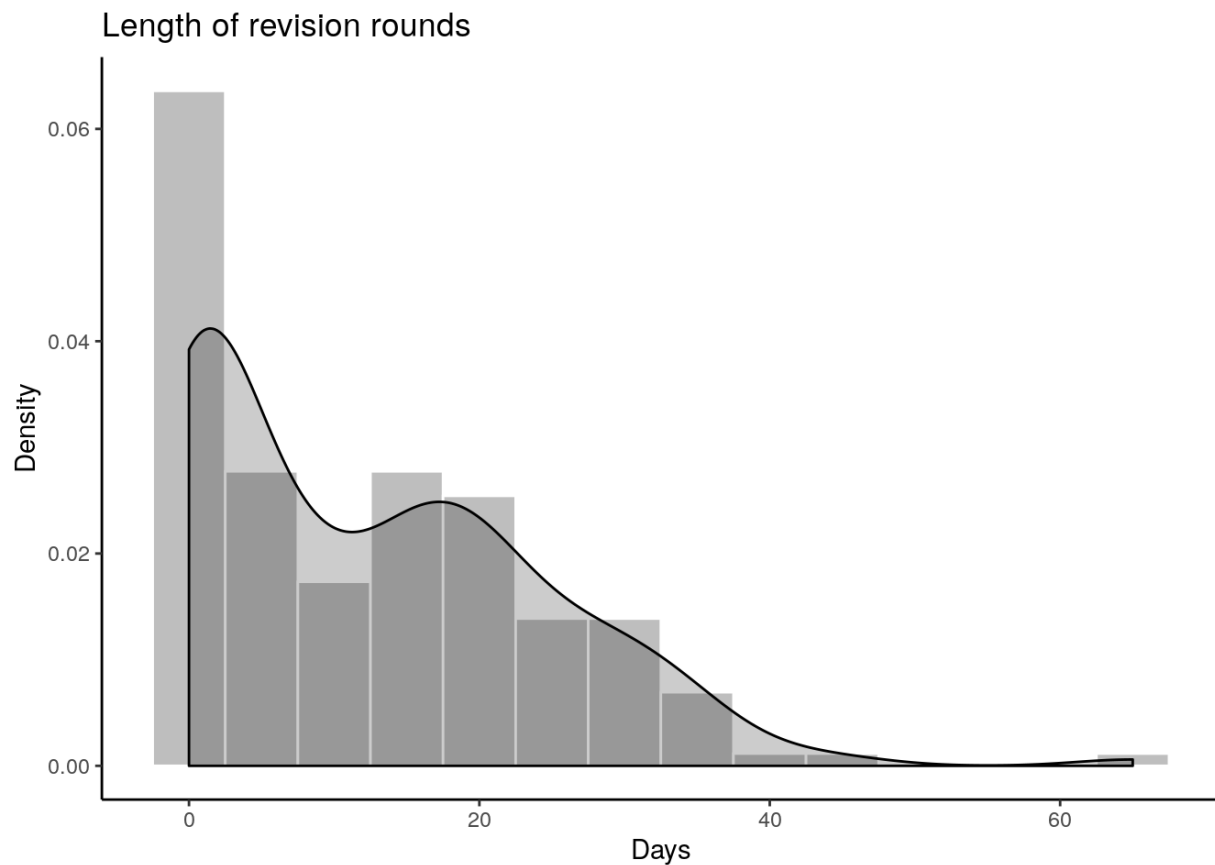
```
## Saving 7 x 5 in image
```

```
## Don't know how to automatically pick scale for object of type difftime. Defaulting t
o continuous.
```

```
##
## > ggsave(file.path(images, "revision_round_length_hist2.png"),
## +     revision_round_length.bar + labs(y = element_blank(), title = element_blank
()))
```

```
## Saving 7 x 5 in image
## Don't know how to automatically pick scale for object of type difftime. Defaulting t
o continuous.
```

```
##
## > ggsave(file.path(images, "revision_round_length_hist_pos.png"),
## +      revision_round_length.pos + labs(y = element_blank(), title = element_blank()
.... [TRUNCATED]
```

```
## Saving 7 x 5 in image
## Don't know how to automatically pick scale for object of type difftime. Defaulting t
o continuous.
```
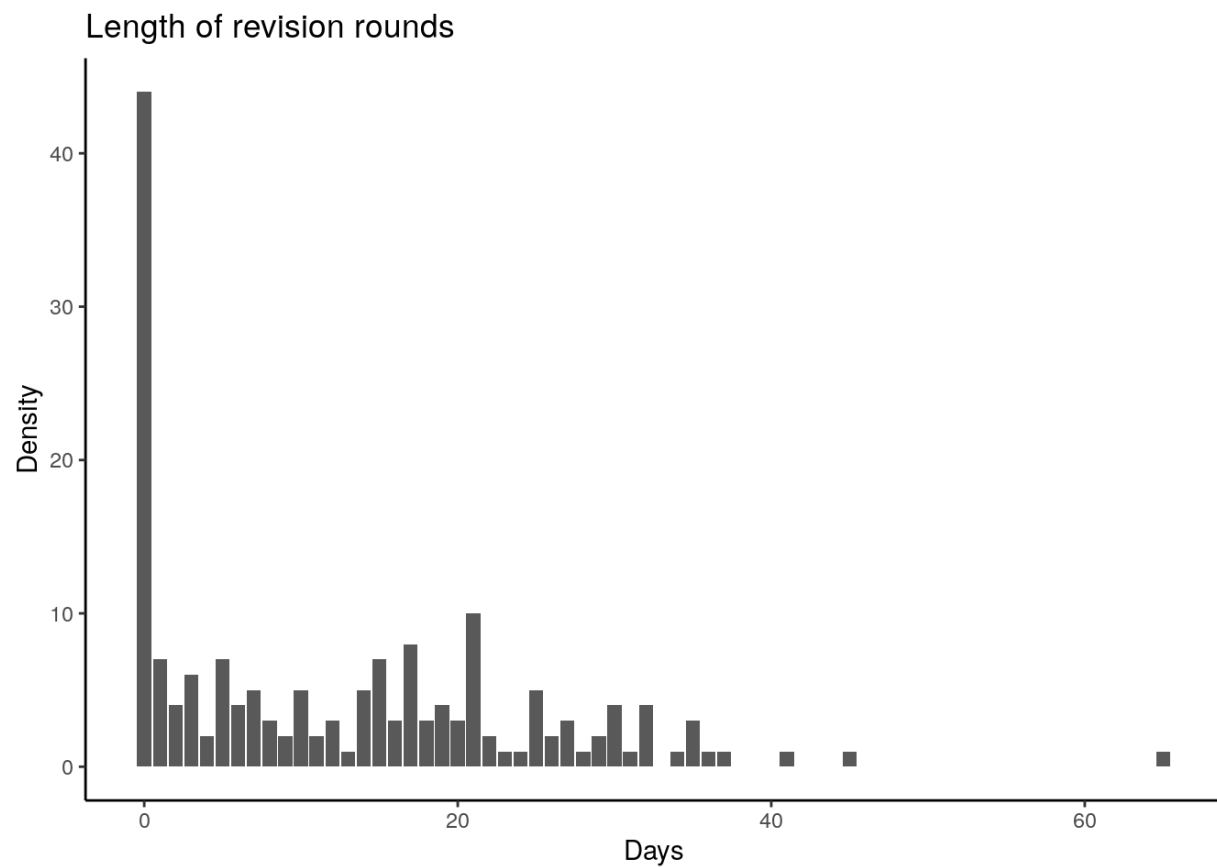
```
##
## > revision_round_length
```

```
## Don't know how to automatically pick scale for object of type difftime. Defaulting t
o continuous.
```



```
##
## > revision_round_length.bar
```

```
## Don't know how to automatically pick scale for object of type difftime. Defaulting t
o continuous.
```
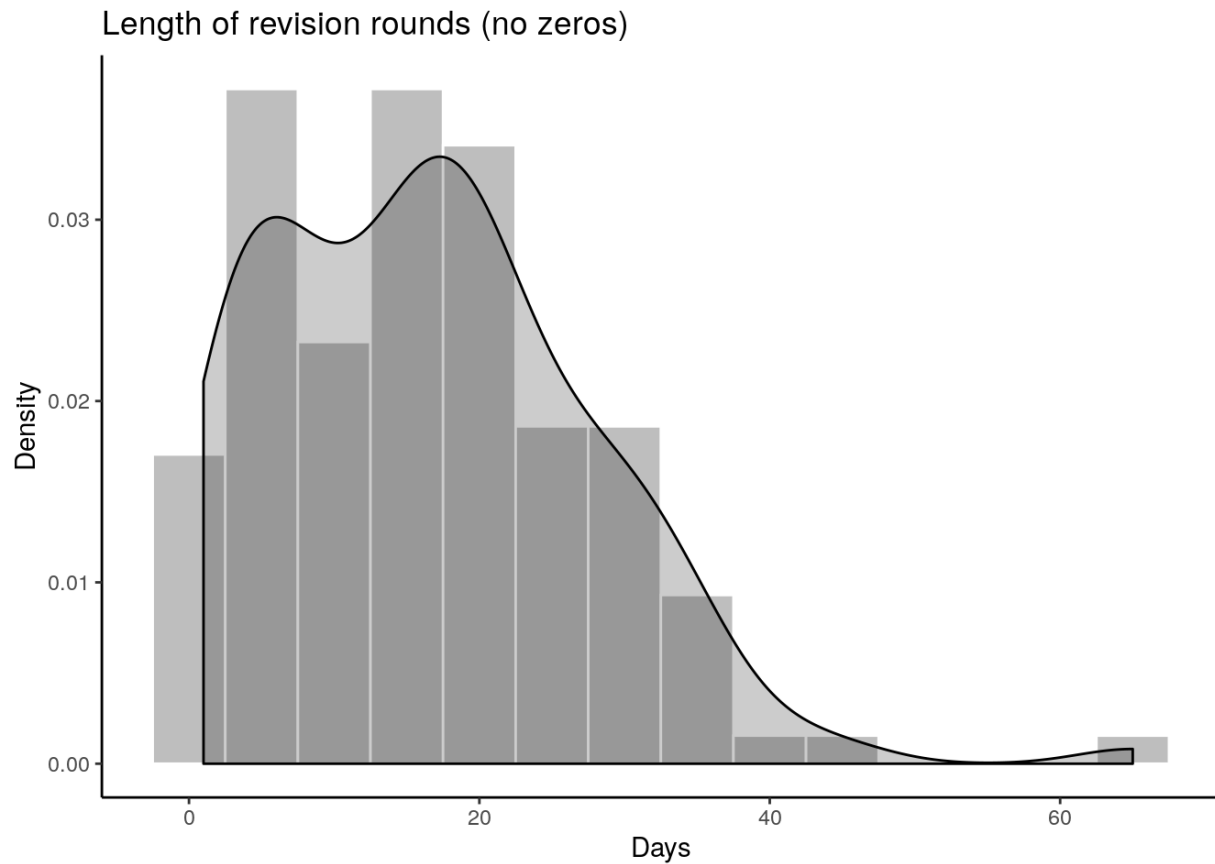
## Length of revision rounds



```
## 
## > revision_round_length.pos
```

```
## Don't know how to automatically pick scale for object of type difftime. Defaulting t
o continuous.
```

```
##
## > mean(duration.data$length)
## Time difference of 12.33526 days
##
## > median(duration.data$length)
## Time difference of 10 days
##
## > tmp <- mutate(duration.data, n_length = as.numeric(length)) %>%
## +     select(n_length) %>% filter(n_length >= 1)
##
## > mean(tmp$n_length)
## [1] 16.54264
##
## > median(tmp$n_length)
## [1] 16
##
## > length.data <- jira %>% mutate(Status = ifelse(Status ==
## +     "Submitted to MC" & Changed.Fields == "Status" & Change.Author.Anon ==
## +     "Lars  ..." ... [TRUNCATED]
##
## > table.issue.length <- length.data %>% group_by(length) %>%
## +     summarise(n_tickets = n_distinct(mc_number_anon))
##
## > fig.total_length <- ggplot(table.issue.length, aes(x = length)) +
## +     geom_histogram(aes(y = ..density..), colour = "white", fill = "grey",
## +     .... [TRUNCATED]
##
## > ggsave(file.path(images, "total_length_hist.png"),
## +     fig.total_length + labs(y = element_blank(), title = element_blank()))
```

```
## Saving 7 x 5 in image
## Don't know how to automatically pick scale for object of type difftime. Defaulting t
o continuous.
```

## Length of revision rounds (no zeros)



```
##
## > fig.total_length
```

```
## Don't know how to automatically pick scale for object of type difftime. Defaulting t
o continuous.
```

```
##
## > author_length <- jira %>% filter(mc_number_anon !=
## +     "", ticket != mc_number_anon, !grepl("#", mc_number_anon,
## +     fixed = TRUE)) %>% select .... [TRUNCATED]
##
## > n_rounds <- author_length %>% mutate(completed = ifelse(grepl("Pending publicatio
n",
## +     Status, fixed = TRUE) == TRUE, 1, 0)) %>% group_by(mc_nu .... [TRUNCATED]
##
## > n_rounds_plot <- ggplot(n_rounds, aes(x = rounds,
## +     y = frac_papers)) + geom_bar(stat = "identity", colour = "white",
## +     fill = "grey") + t .... [TRUNCATED]
##
## > ggsave(file.path(images, "n_rounds_plot.png"), n_rounds_plot +
## +     labs(y = element_blank(), title = element_blank()))
```
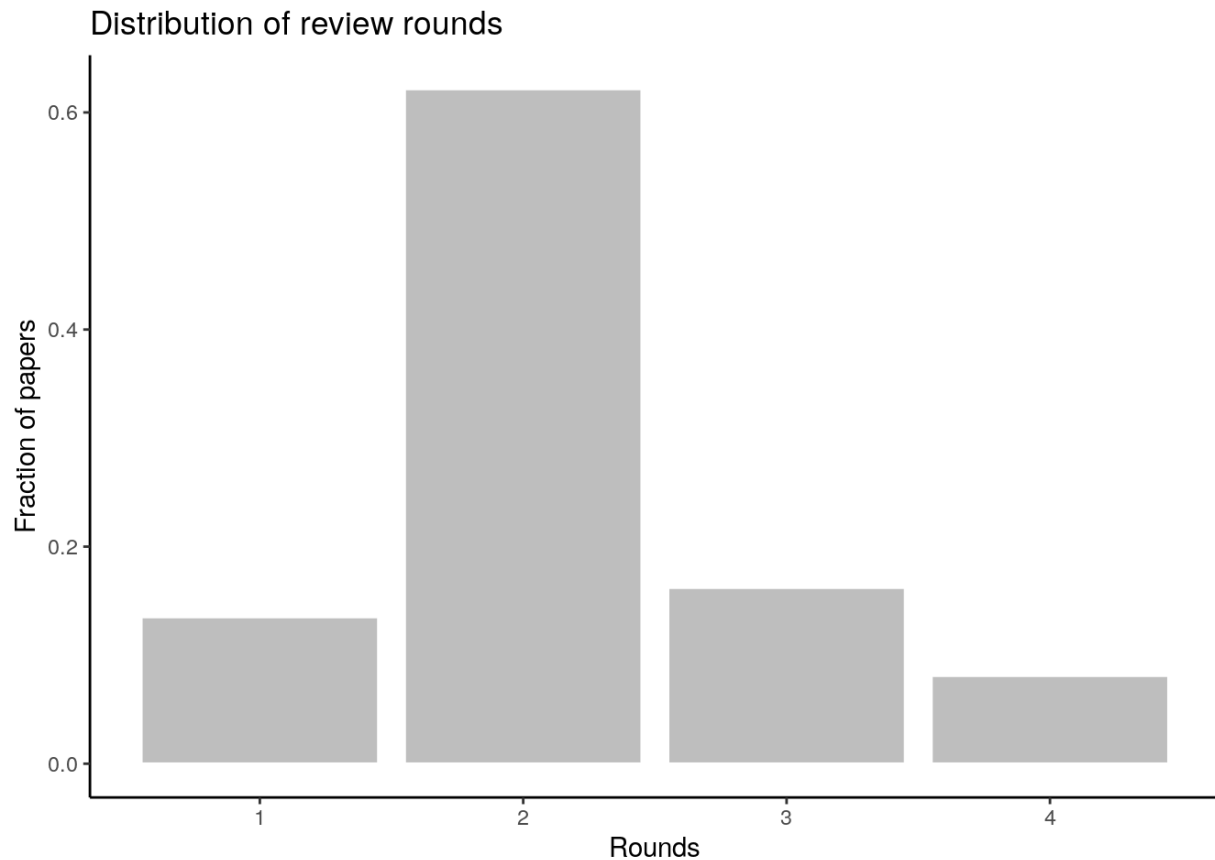
```
## Saving 7 x 5 in image
```

### Total length of review
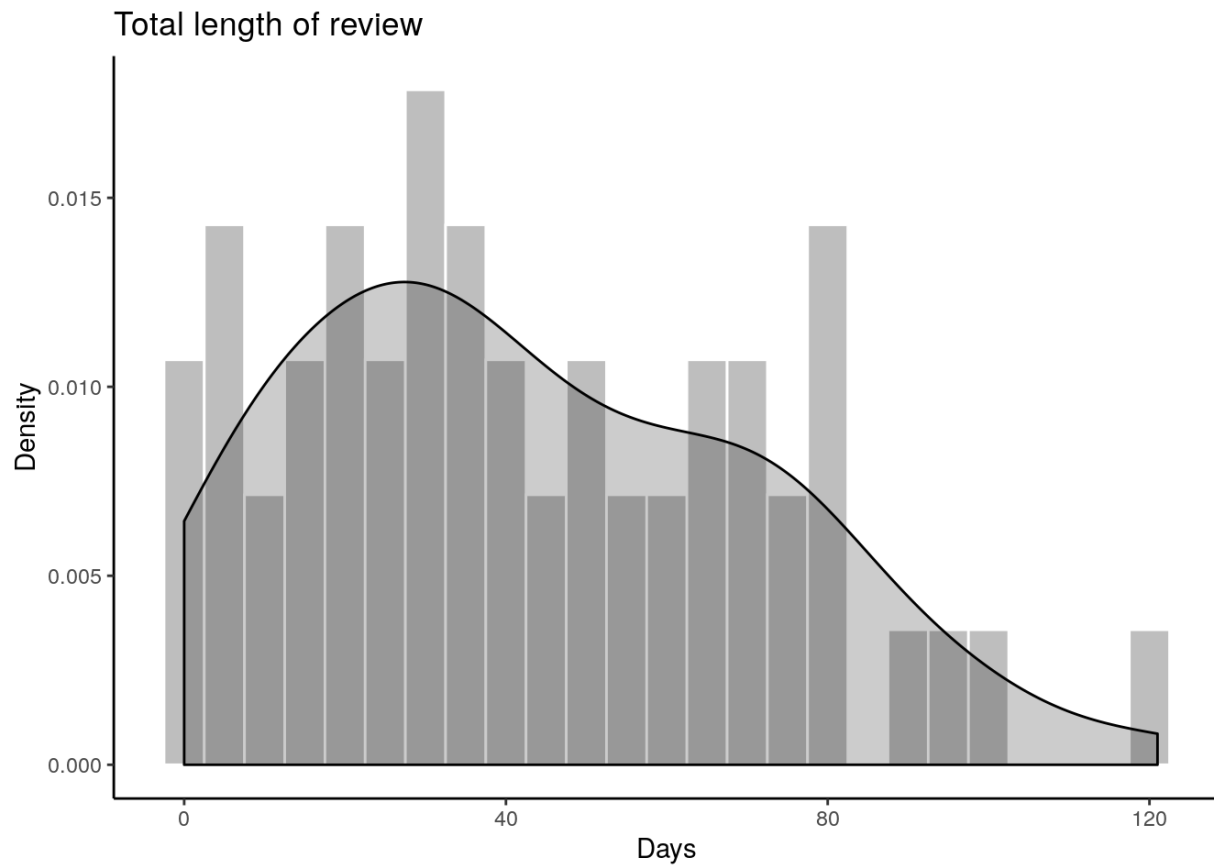


```
##
## > n_rounds_plot
```

```
##
## > n_rounds_journal <- author_length %>% mutate(completed = ifelse(grepl("Pending pub
lication",
## +     Status, fixed = TRUE) == TRUE, 1, 0)) %>% group_ .... [TRUNCATED]
##
## > n_rounds_journal_plot <- ggplot(n_rounds_journal,
## +     aes(x = rounds, y = frac_papers)) + geom_bar(stat = "identity",
## +     colour = "white", fi .... [TRUNCATED]
##
## > ggsave(file.path(images, "n_rounds_journal_plot.png"),
## +     n_rounds_journal_plot + labs(y = element_blank(), title = element_blank()))
```

```
## Saving 7 x 5 in image
```

## Distribution of review rounds



```
##
## > n_rounds_journal_plot
```

```
##
## > n_assessments <- author_length %>% mutate(completed = ifelse(grepl("Pending public
ation",
## +     Status, fixed = TRUE) == TRUE, 1, 0)) %>% group_by( .... [TRUNCATED]
##
## > n_assessments_journal <- author_length %>% mutate(completed = ifelse(grepl("Pendin
g publication",
## +     Status, fixed = TRUE) == TRUE, 1, 0)) %>% g .... [TRUNCATED]
##
## > n_assessments_journal_plot <- ggplot(n_assessments_journal,
## +     aes(x = journal_f, y = total_assessments_made)) + geom_bar(stat = "identity",
## +  .... [TRUNCATED]
##
## > ggsave(file.path(images, "n_assessments_journal_plot.png"),
## +     n_assessments_journal_plot + labs(y = element_blank(), title = element_blank
()))
```
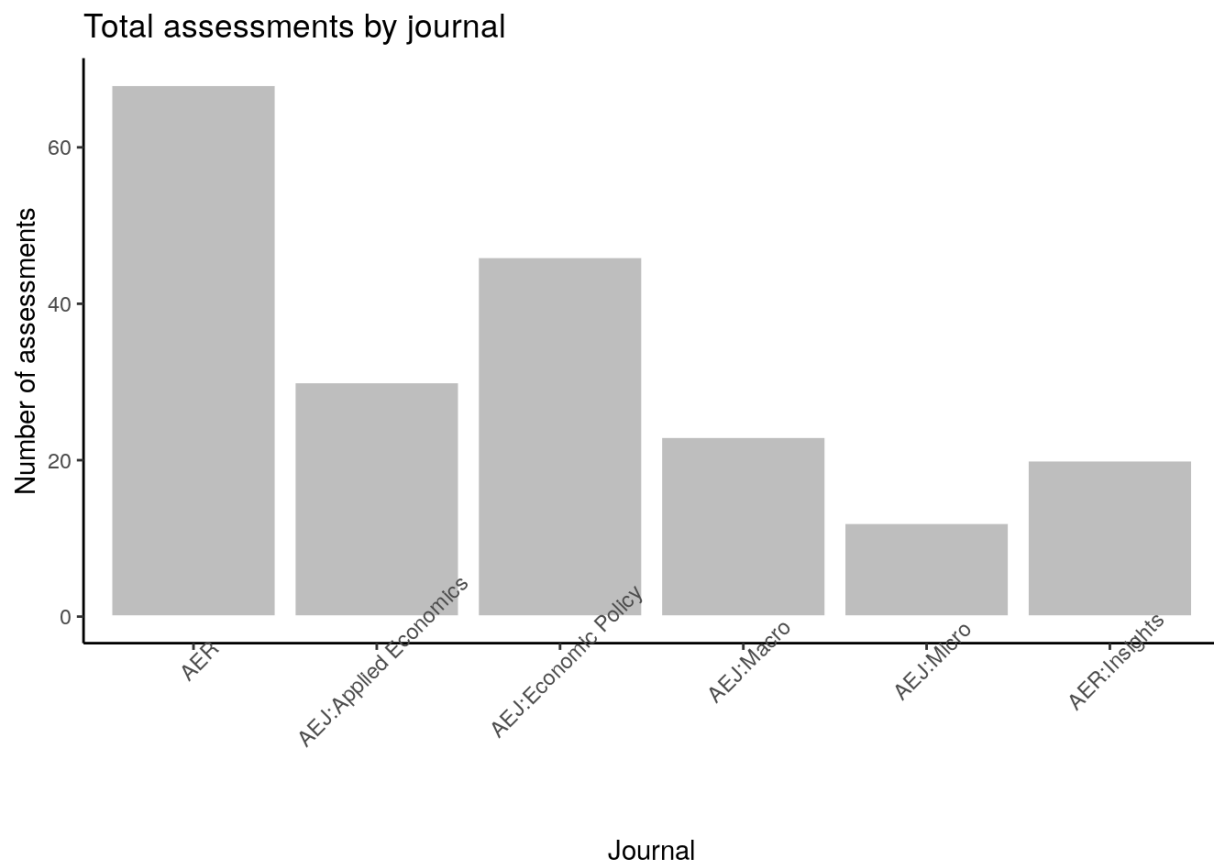
```
## Saving 7 x 5 in image
```

## Distribution of review rounds by journal
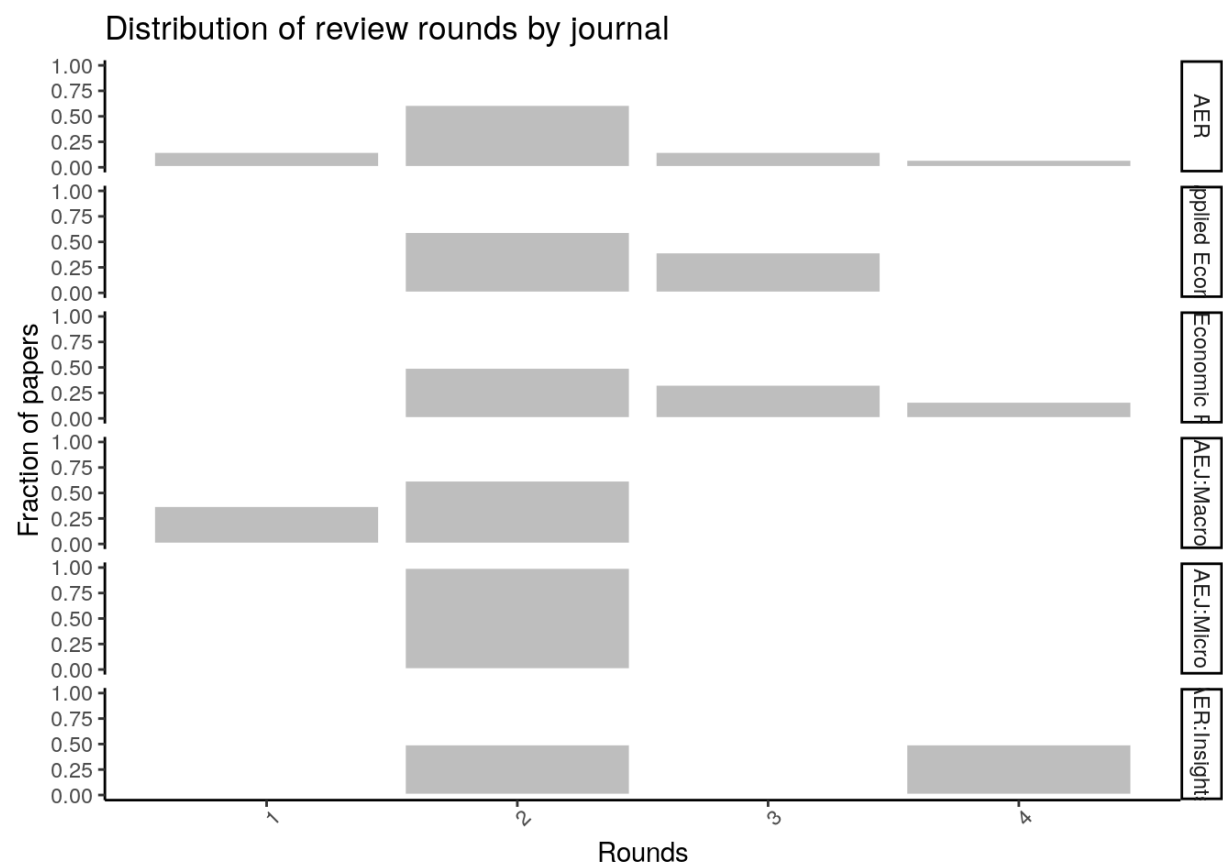


```
## 
## > n_assessments_journal_plot
```

```
##
## > author_length2 <- author_length %>% select(-Journal) %>%
## +      filter(Status %in% c("Open", "Submitted to MC"), rounds >
## +          1) %>% distinct .... [TRUNCATED]
##
## > author_length3 <- author_length2 %>% mutate(diff1_2 = start_round2 -
## +      end_round1, diff2_3 = start_round3 - end_round2, diff3_4 = start_round4  ....
[TRUNCATED]
##
## > author_response_dist <- reshape2::melt(data = author_length3,
## +      id = c("mc_number_anon"))
##
## > author_response_dist <- author_response_dist %>% rename(response_round = variable,
## +      length = value) %>% select(-response_round) %>% mutate(len .... [TRUNCATED]
##
## > author_response_hist <- ggplot(author_response_dist,
## +      aes(x = length)) + geom_histogram(aes(y = ..density..), colour = "white",
## +      fill =  .... [TRUNCATED]
##
## > ggsave(file.path(images, "author_response_hist.png"),
## +      author_response_hist + labs(y = element_blank(), title = element_blank()))
```

```
## Saving 7 x 5 in image
```

## Total assessments by journal

```
##
## > author_response_hist
```

Length of author responses