



Memorial Sloan Kettering  
Cancer Center

# It's Time to *Shine* with the *timetrackR* App

February 26, 2020  
Jessica Lavery



# Time & the busy RLady

- Often feels like there aren't enough hours in the day
- Start working on one project, check email, bounce to another project, maybe remember to go back to first project, and oh look! It's 5pm
- Long term: you have no recollection of how you're spending your days





# So what's the problem?

*It's hard to manage your time if you  
don't know how you're spending  
your time*



# Potential solution: *time tracking app?*



# Potential tools for logging & tracking your time

	Existing software (e.g. Toggl, RescueTime, Everhour)	DIY
<b>General</b>	Free versions and paid versions with different capabilities	Free
<b>Logging your time</b>	Turn on timer to start/stop tracking	Self-report number of hours spent per task
	Some can monitor apps and URLs used and identify distractors (hello Slack!)	Only knows what you record
<b>Tracking &amp; analyzing your time</b>	Preset metrics; can export your data and modify as needed for analysis	Full ownership of your recorded data, can set up and analyze in a way that best suits your needs

# The DIY Approach: Motivation & Goals

- Motivation

- Interested in full customizability, less interested in identifying distractors
- Professional development: Wanted experience with R & Shiny
  - Used previous RLadies presentation to get started: [Learning Shiny with NBA data](#)

- Goals

- Wanted simple, easily interpretable metrics/visualization – didn't want to spend all of my time analyzing my time
- Use for goal-setting and evaluating overall project flow
- Aid in forecasting/resource allocation decisions
- “Where is my time going and can it be efficiently (re-) directed?”



# Thus, a (Shiny) star was born



# What is *timetrackR*?



Log hours



Track how you're spending your time: *timetrackR* Shiny App



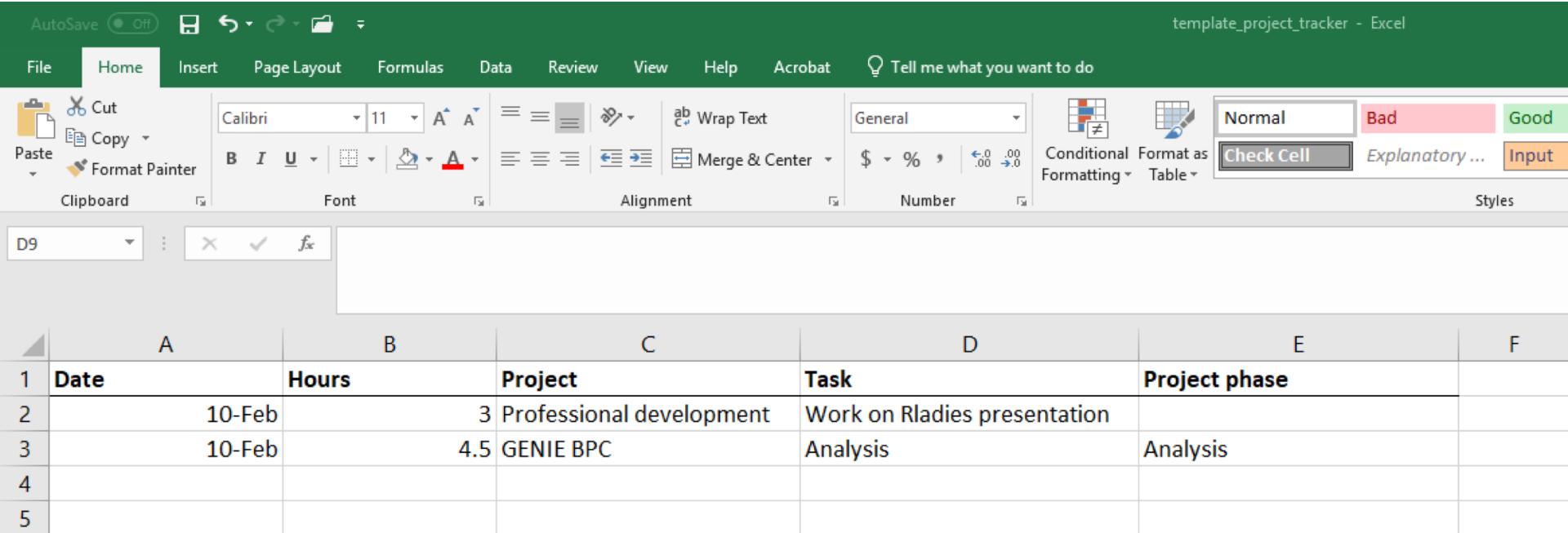
How I Spend My Time At Work



- Entertaining co-workers
- Looking at cats on the internet
- Sitting in meetings that could have been an email
- Being an awesome, efficient and amazing person

# Log hours

- Started logging my time in 2017
- Log in 15-minute increments
- Update 1-2x/day
- Reasonably consistent: 4-5 days/week
- Spend <5 minutes a day recording my time



A screenshot of Microsoft Excel showing a project tracker template. The ribbon is visible at the top with tabs for File, Home, Insert, Page Layout, Formulas, Data, Review, View, Help, and Acrobat. The Home tab is selected. The main area shows a table with columns labeled A through F. Row 1 contains the headers: Date, Hours, Project, Task, and Project phase. Rows 2 and 3 contain data entries. Row 2 shows 10-Feb in column A, 3 in column B, Professional development in column C, Work on Rladies presentation in column D, and an empty cell in column E. Row 3 shows 10-Feb in column A, 4.5 in column B, GENIE BPC in column C, Analysis in column D, and Analysis in column E.

	A	B	C	D	E	F
1	Date	Hours	Project	Task	Project phase	
2	10-Feb	3	Professional development	Work on Rladies presentation		
3	10-Feb	4.5	GENIE BPC	Analysis	Analysis	
4						
5						

# *timetrackR* Metrics & Visualizations

1. **Percent effort:** Time spent per project/investigator/project phase
2. **Total hours:** Cumulative number of hours spent on a project
3. **Project Timeline:** Visualization of project phase by calendar time



# Time tracking metrics: Percent effort

- Allocated vs expended effort
  - Did an investigator ask for “quick help” on a project that is now taking up 30 hours a week?
- Task management
  - As a statistician, what percentage of time is spent in meetings vs doing analyses? Does this need to be rebalanced?
  - Are the right projects/tasks being prioritized?
- Protecting your time
  - What percentage of my time am I spending on professional development? Is this more or less than I want it to be?
  - What percentage of my time am I spending on departmental activities (seminars, interviews, etc.) or other non-project work? Am I appropriately accounting for that when estimating how long it will take me to complete a project?



# Time tracking metrics: Total hours

- Comparing time invested to products generated
  - Did an abstract take as long as a full analysis for a manuscript?
  - For a time-intensive project, was the result multiple manuscripts?
- Determining when to cut your losses and when to pursue a project further
  - “We’ve spent 200+ hours on this project and aren’t close to the deliverable. Is this even going to be feasible?”
  - “We’ve spent 100 hours on work for this conference presentation, should we turn it into a manuscript?”
- Guiding project workflow
  - Useful metric for when re-analyses are requested
  - “We’ve spent 20 hours on the analysis, please circulate the manuscript draft before we complete additional analyses.”



# Time tracking viz: Project Timeline

- Useful for a big picture overview of what projects are going on & when (and for how long)
  - Based on a Gantt Chart which is usually used prospectively, but good for a year in review when used retrospectively
  - Indicates transitions between analysis and re-analysis, indicates if analyses are happening after a manuscript is drafted, etc.
    - Want to see: Project planning -> Analysis -> Manuscript -> Revisions
    - Do not want to see: Analysis -> Manuscript -> Re-analysis -> Project Planning -> Analysis -> etc.



# *timetrackR* Demo

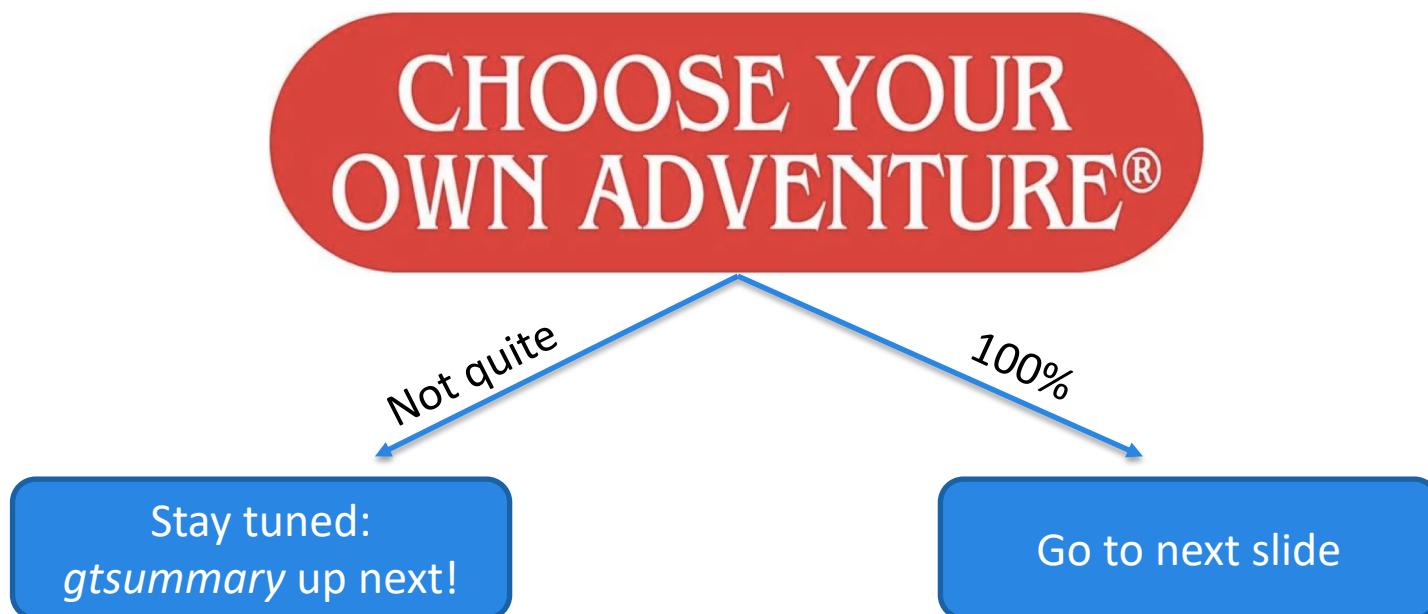


# Information learned from *timetrackR*

- In the last 3 months, >75% of my time has been devoted to a single project. Can we can bring someone else on to that project? (**percent effort**)
- I spent more hours on a presentation for JSM than I thought I did. Maybe I should turn that into a manuscript? (**total hours**)
- A particular project transitioned between analysis and re-analysis several times throughout the project's life cycle. Is it time for a regroup with the investigator?  
(**project timeline**)



# *Have I sold you on logging your hours & tracking your time yet?*



# Adapting for your own use

## 1. Fork the GitHub repo

- Includes a template Excel spreadsheet for logging your hours
- Required: Hours tracker is where you log your hours
- Optional: Project tracker summarizes information like principal investigator (PI), deliverable, status, etc.

## 2. Start logging your hours



# Required: Template Time Tracker

AutoSave (Off)

template\_project\_tracker - Saved

File Home Insert Page Layout Formulas Data Review View Help Acrobat Tell me what you want to do

Cut Copy Format Painter Normal Bad Check Cell Explanatory

Paste Font Alignment Number Conditional Formatting Format as Table Styles

Clipboard Font Alignment Number Conditional Formatting Format as Table Styles

C20

	A	B	C	D	E
1	Date	Hours	Project	Task	Project phase
2	19-Feb		3 Sample Project	Analysis	Re-analysis
3					

Hours Tracker



# Optional: Template Project Tracker

AutoSave Off

File Home Insert Page Layout Formulas Data Review View Help Acrobat Tell me what you want to do

Cut Copy Format Painter Paste Clipboard

Font Alignment Number Styles

Calibri 11 Wrap Text General Conditional Formatting Check Cell Explanatory... Followed Hy... Hyperlink

B I U Merge & Center \$ % , .00 .00

F6

	A	B	C	D	E	F	G	H	I
1	Priority	Study title	PI	Current status	As of	Project initiated	Project completed	Hours	Final product
2	ACTIVE	Sample Project	Last, First	Survival analyses in progress	27-Jan	2017-Mar-23		3	Manuscript
3									

Project Tracker



# Adapting for your own use

1. Fork the GitHub Repo
2. Start logging your hours
3. Set up *timetrackR* Shiny App to work for you
  - **create\_datasets**: read in time tracking spreadsheets
  - **server**: set of instructions to build the app
  - **ui**: defines a webpage that the user interacts with, it controls layout and appearance
  - May need to update to reflect project phases and levels of stratification that are relevant to your work
4. Continue logging your hours and running the app at regular intervals (Weekly? Monthly? Quarterly?) to assess



# R Code Highlights: The **switch** function and **geom\_segment()**



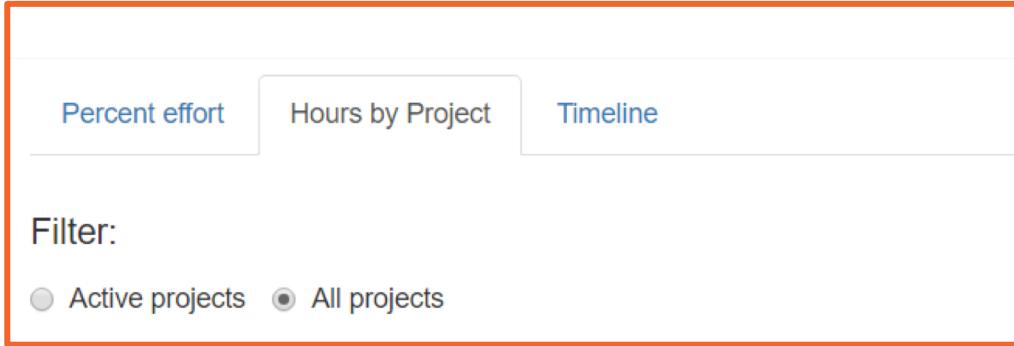
# The **switch** function

- Used to update the figure depending on which input (statistician, date range, project status) is selected
- To display the bar chart for active projects or for all projects:
  - Utilize radio button so that user can select active or all projects
  - Use the switch function to update the data frame depending on which is selected



# switch function: Bar chart application

App interface:



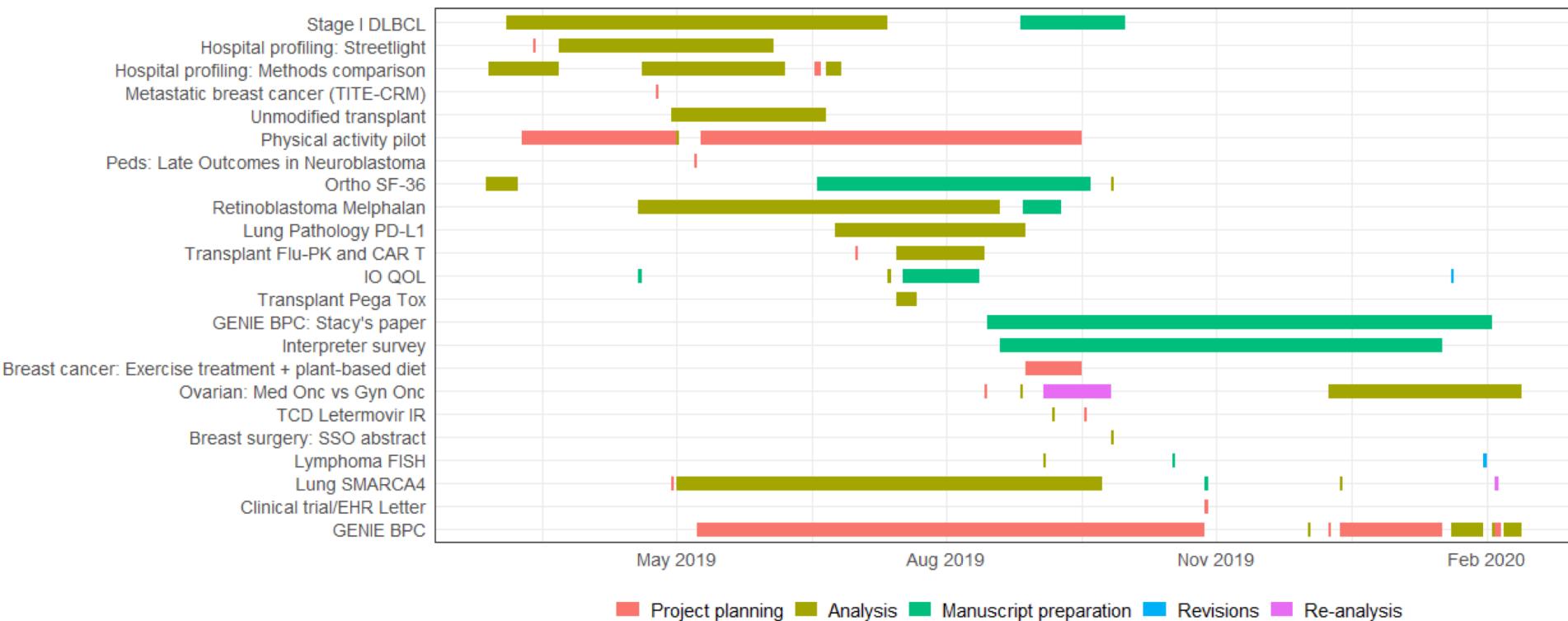
- `input$status_filter_bar` returns either “Active projects” or “All projects” depending on which radio button is selected
- Code (server.R):

```
switch(input$status_filter_bar,
       "Active projects" = bar_filtered <- tracker %>%
         filter(status == "Active"),
       "All projects" = bar_filtered <- tracker)
```

- Using switch function to subset the data on active projects if needed, otherwise proceeding with all projects

# Project Timeline

- Made using [ggplot](#) with `geom_segment()`



# Project Timeline: Data wrangling

Summarize hourly data into project phase start / stop times

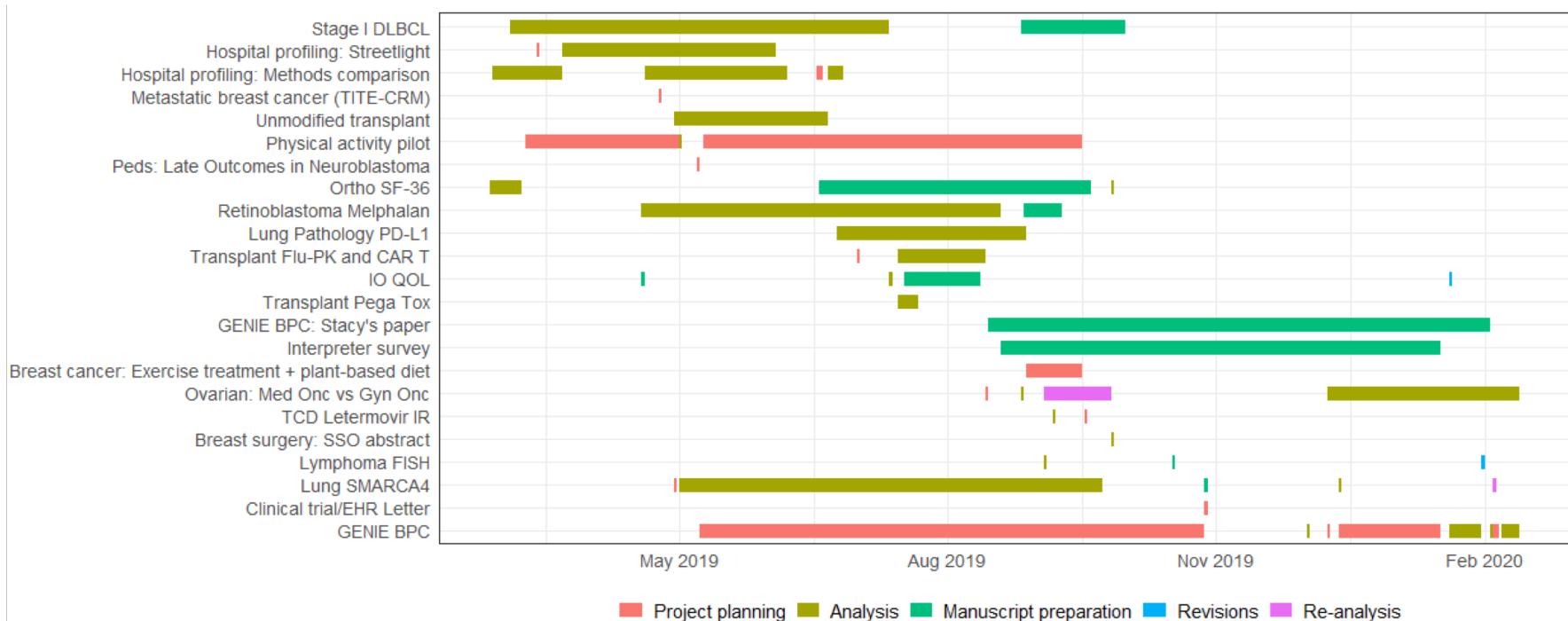
date	hours	study_title	task	project_phase
2020-02-04	0.50	Lung SMARCA4	Meeting	Re-analysis
2020-01-31	1.00	Ovarian: Med Onc vs Gyn Onc	Survival analysis	Analysis
2020-01-17	0.75	Interpreter survey	Review manuscript	Manuscript preparation
2020-02-03	3.00	GENIE BPC	QA Reports	Analysis
2020-01-20	2.00	IO QOL	Respond to reviewer comments	Revisions



study_title	project_phase	start_dt	end_dt
Lung SMARCA4	Project planning	2019-04-29	2019-04-30
Lung SMARCA4	Analysis	2019-05-01	2019-09-23
Lung SMARCA4	Manuscript preparation	2019-10-28	2019-10-29
Lung SMARCA4	Analysis	2019-12-13	2019-12-14
Lung SMARCA4	Re-analysis	2020-02-04	2020-02-05

# Project Timeline: Data Viz

```
ggplot(phase_filtered) +  
  geom_segment(aes(x = start_dt, xend = end_dt,  
                    y = study_title, yend = study_title,  
                    colour = project_phase), size = 4) +  
  theme_bw() +  
  theme(legend.position = "bottom",  
        legend.title = element_blank(),  
        axis.title = element_blank(),  
        axis.ticks = element_blank()) +  
  scale_x_date(breaks = "3 months", date_labels = "%b %Y")
```



# Unrelated to time tracking: Hex Sticker

```
library(hexSticker)

sticker(# figure information
        subplot = "/calendar_light_orange.png",
        s_x = 1.05, s_y = .7,
        s_width = 0.5, s_height = 0.6,
        # hex sticker information
        h_fill = "#007CBA", h_color = "#006098",
        # package information
        package = "timetrackR",
        p_size = 8, p_color = "#F6C65B")
```



# Caveats

- Be careful about your denominators: Analysis is based on *what you recorded*
  - Won't tell you if you spent 2 hours on Twitter or 45 minutes replying to an email (unless you log that yourself!)
- Corollary: this is only useful if you log your time relatively accurately
  - 15 minute increments at a minimum, sometimes record a single project or activity for an entire day
  - Do what works best for you
- Entirely retrospective: it's a summary of what you've done, doesn't include projected time allocations



# Future Plans

- Incorporate with Toggl app (or other)
  - More automated time tracking + customizable reporting = best of both worlds?
- Incorporate additional visualizations and/or summary measures
  - Changes over time?
  - Suggestions?



# Summary

- Very few metrics are needed to gain a general understanding of how you're spending your time
- *timetrackR* can be used for reporting across a team or individually
- Can be used to align (or re-align) your workflow with how you *intend* to spend your time



# Thank you!



<https://github.com/jalavery/timetrackR>



[laveryj@mskcc.org](mailto:laveryj@mskcc.org)



@jessicalavs



[www.JessicaLavery.com](http://www.JessicaLavery.com)

*Special thanks to Margie Hannum & Karissa Whiting for sharing their creative naming skills to come up with the name of both the app and this talk.*

*Thanks also to Mike Curry for letting me share his time tracking data and his patience in answering my many R questions.*



Memorial Sloan Kettering  
Cancer Center