



TRANSLATIONAL RESEARCH
AND INFORMATION LAB
accelerating innovation in health care

AAMC GIR Excellence Award: REDCap support during the COVID-19 pandemic

August 3, 2021, 9:00 a.m – 10 a.m.

Presenters

Adam Garrett, Director, Systems, Health Sciences Library

Bas de Veer, Data Services Manager, ITHS

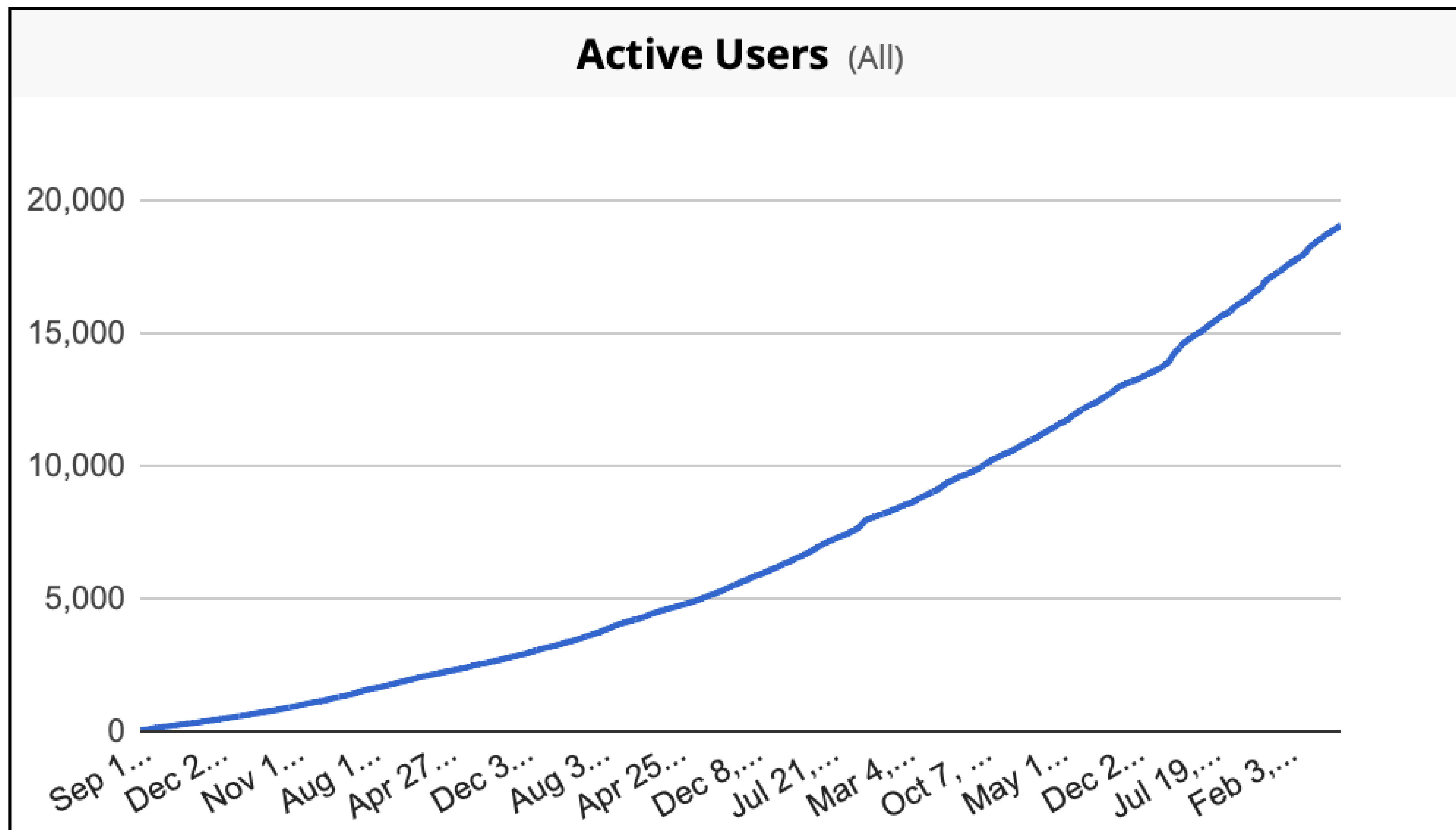
Ashleigh Lewis, REDCap Manager, ITHS

Michael Moore, Grants and Special Project Librarian, Health Sciences Library

A brief history of REDCap at our institution

- 2009:
 - Evaluation project for an EDC between REDCap & OpenClinica at ITHS
- 2012: *(Users: 400)*
 - Full time REDCap Administrator hired
 - New training curriculum (1 intro, 3 advanced classes)
 - OpenClinica sunsetted
- 2016: *(Users: 4,000)*
 - Trail collaboration started
 - 5 Health Sciences Library staff trained
- 2017: *(Users: 5,000)*
 - Ticketing system implemented
 - Training sessions moved to Health Science Library and expanded (1 intro, 4 200 level, 4 300 level)
- 2018: *(Users: 8,000)*
 - New REDCap Administrator hired; Old administrator promoted
- 2020: *(Users: 12,000)*
 - Rotation of 8 Health Sciences Library staff
 - Extra dedicated REDCap administrator hired
- 2021: *(Users: 19,000)*
 - Infrastructure upgrades due to increased demand and usage

REDCap User Growth



History of TRAIL



TRAIL SERVICES



Data Wall



Virtual Reality



REDCap Classes and
Consults



Mobile App Dev
Consults



Technology Tools



Computing
Environments



-omics Data Analysis



Access to UW EMR
Data



Biomedical
Informatics Consults



Clinical Study Cohort
Discovery



Biostatistical
Consults



Clinical Research
Support



Population Health
Research Consults



Bioethics Consults

Partner(s) responsible for each service



UW Health Sciences Library
(HSL)



Biomedical Informatics and
Medical Education (BIME)



Institute of Translational
Health Sciences (ITHS)



National Network of Libraries
of Medicine, Pacific North-
west Region (PNR)



UW Medicine Information
Technology Services (ITS)

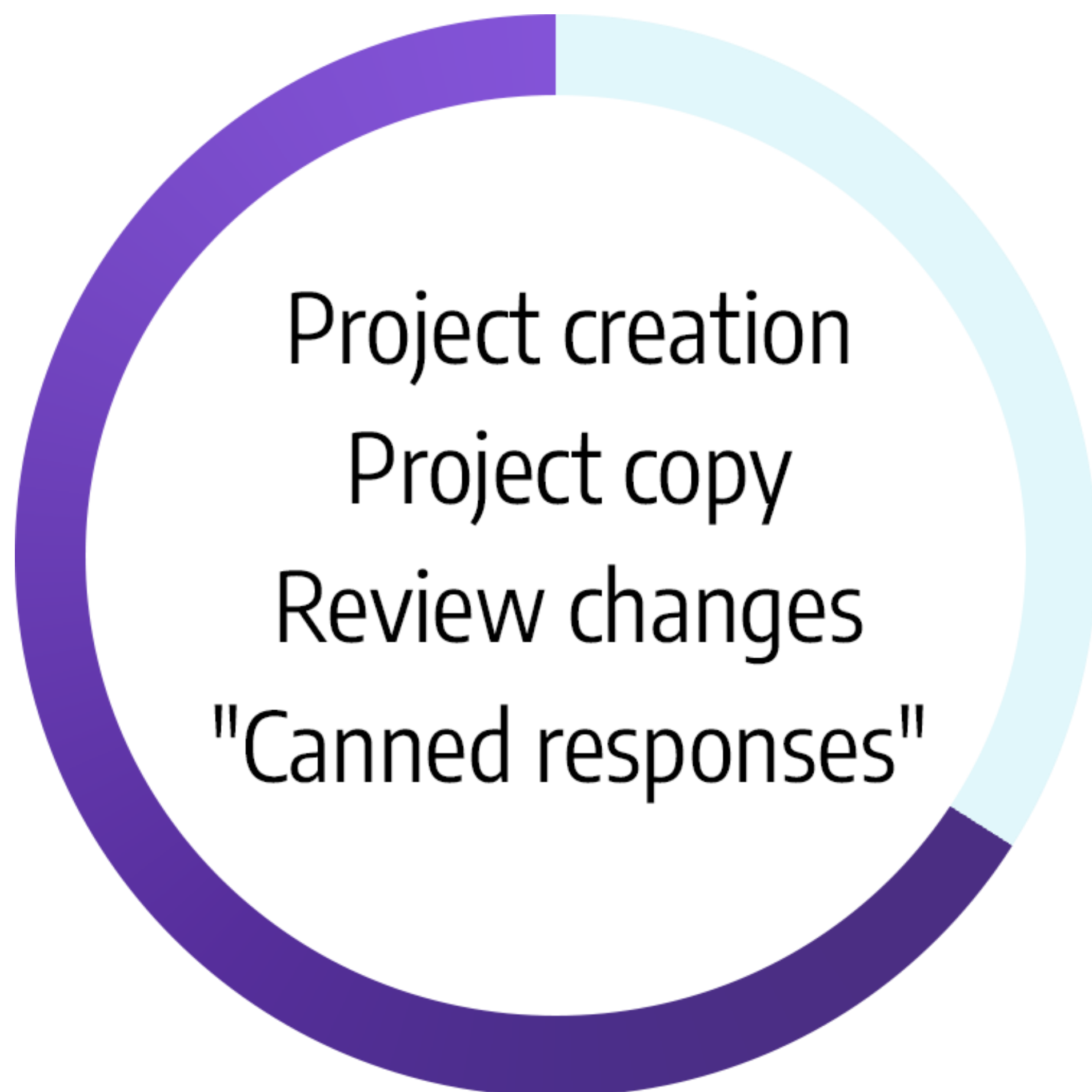
IMLS-Funded Virtual Reality Project



Library Support for REDCap

- **Existing skillsets**
 - Research data management
 - Data wrangling
 - Data visualization
 - Database design
 - Assessment
 - Basic coding language
- **Experience providing support**
- **Capacity from larger staff**
- **Ability to incorporate into job workflows**

Level 1



Level 2 / 3





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HSL Agents

Amber Atkins

Sara Rind

Lynly Beard

Ruba Sadi

Paul Ludecke

Nancy Shin

Michael Moore

Frank Stieber

Training of REDCap level 1

Prior to 2021

- One-on-one training with REDCap admin
- Less consistent
- Time consuming especially with staff turnover and additions

2021+ Level 1 Ticket Workflow

- Thorough and adaptable
- Consistent training
- Walk through system

What type of request is this?

- ☐ Project Creation/Copy
- ☐ Change Request
- ☐ Delete Project
- ☐ NSA: / SA: / NP:
- ☐ Undeliverable: / Delivery Status Notification (Failure)
- ☐ Automatic reply:
- ☐ General Question or Unknown

works)

Fields to be ADDED: none

Forms to be ADDED: none

Fields to be DELETED:

- what_is_your_name "What is your name?"
- what_is_your_age "What is your age"
- pass "嗨，我正在測試" (1 records/events affected)

no records

1 record

Are there any records affected? ☒ Yes ☐ No [reset](#)

Please use the "CH - Fields to be deleted" canned response or copy and use the language below:

These variable deletions will cause you to lose the data in those variables.

Please let us know if you would like to proceed with these changes. If you do not want to proceed with your changes, we can reject your request and you can update your edits, or we can remove ALL edits and take your project out of draft mode.



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UW Medicine IT Agents

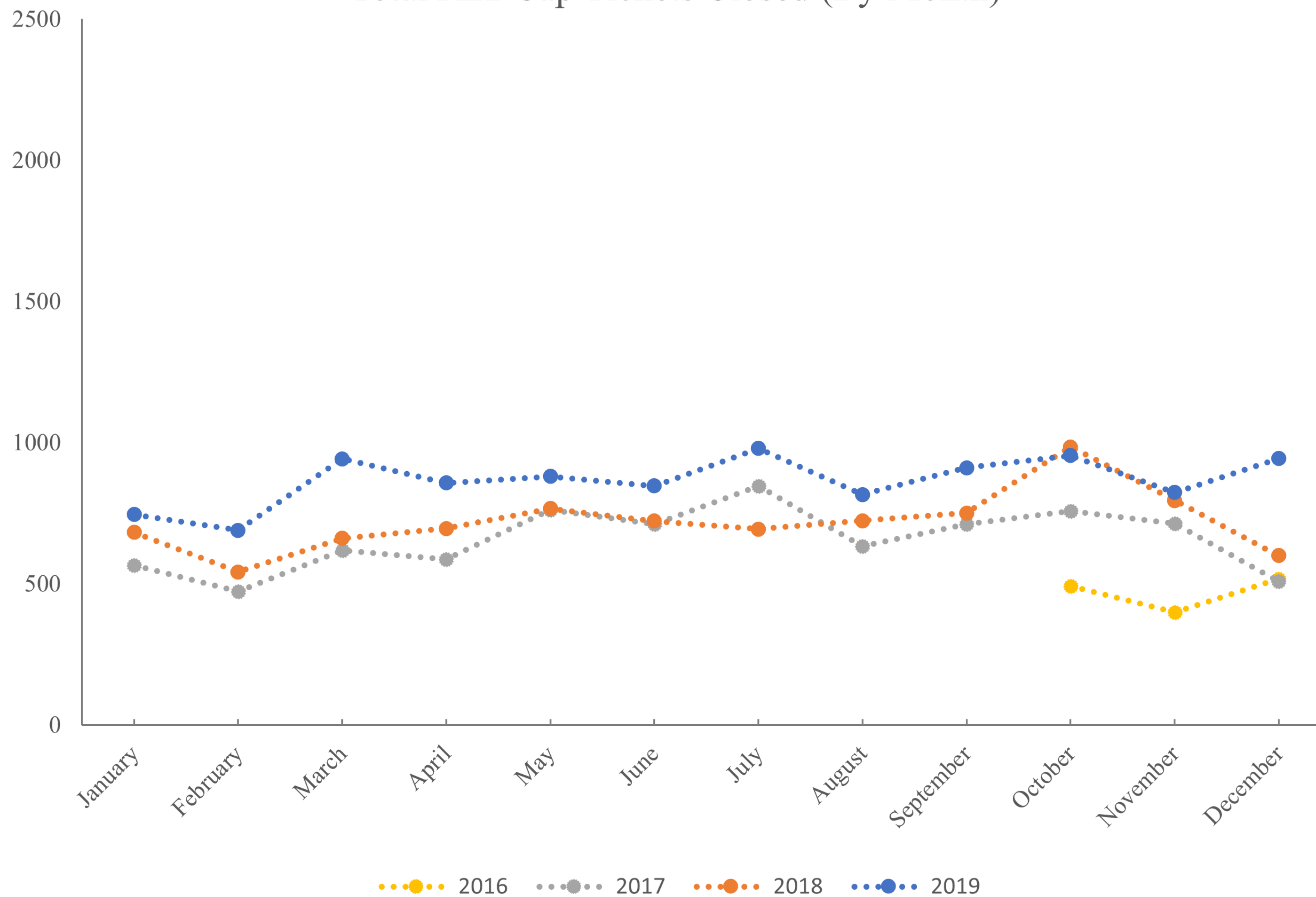
Bas de Veer

Ashleigh Lewis

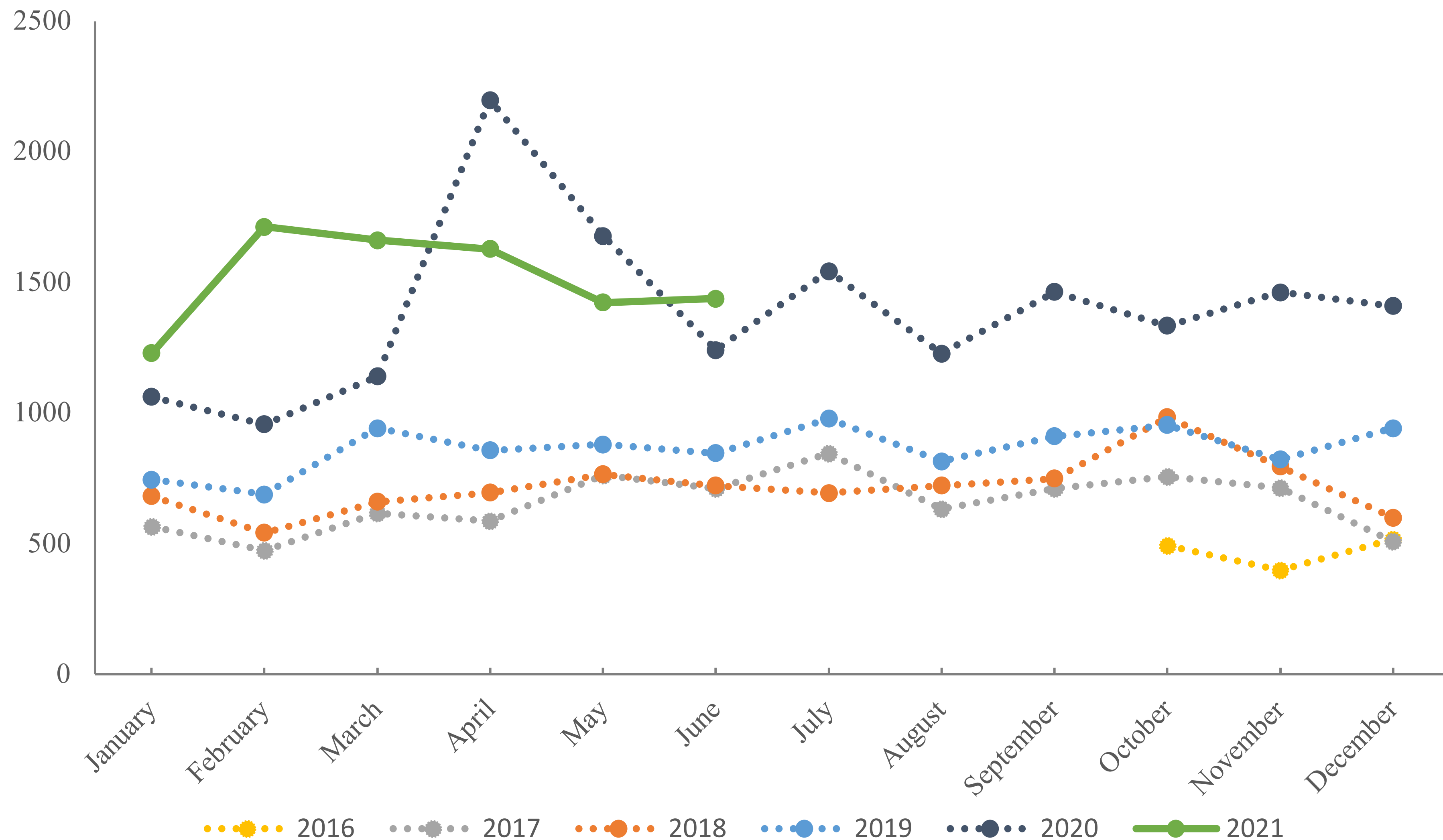
Fred Dowd

Courtney Howell

Total REDCap Tickets Closed (By Month)



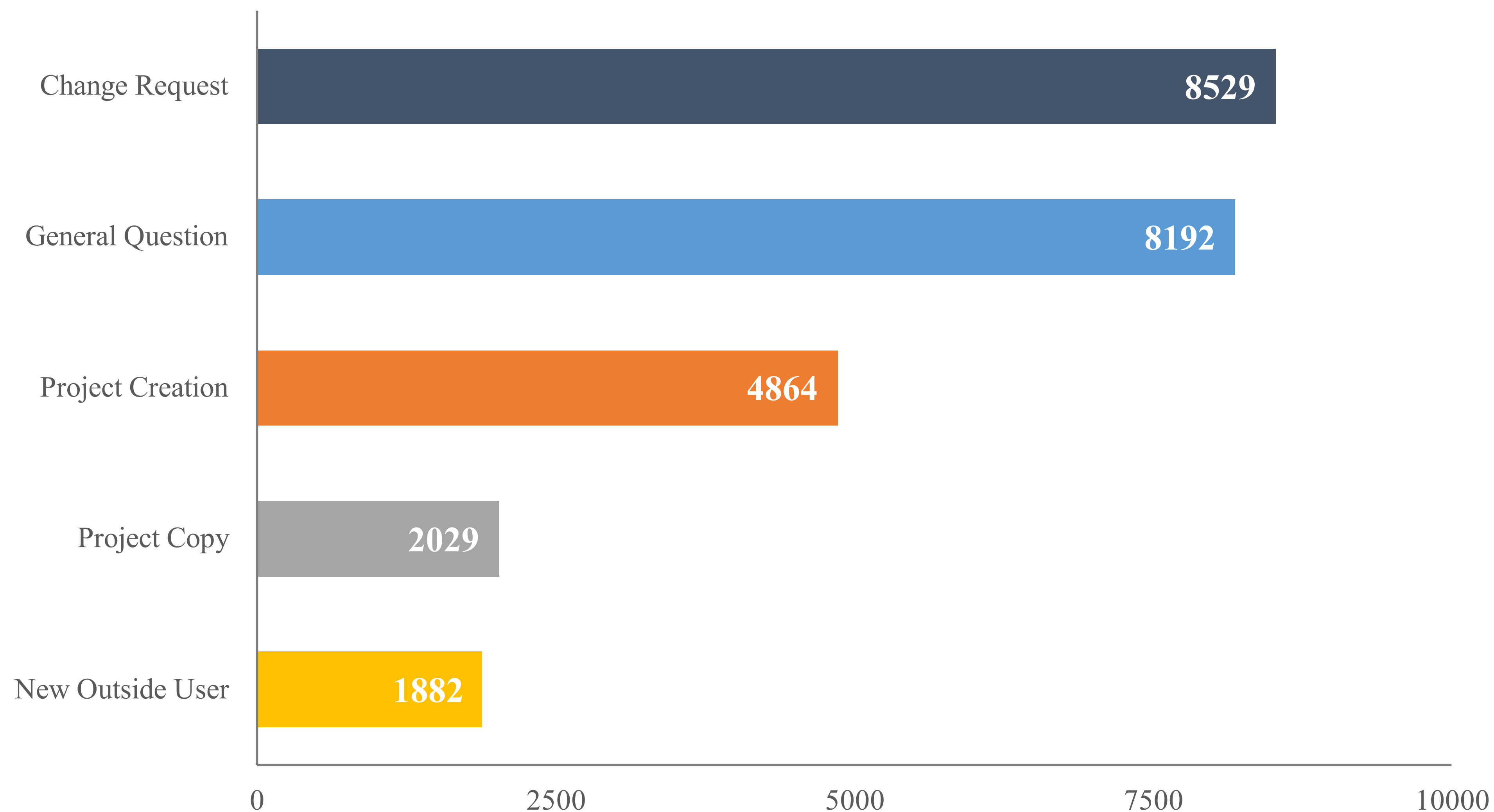
Total REDCap Tickets Closed, by Month



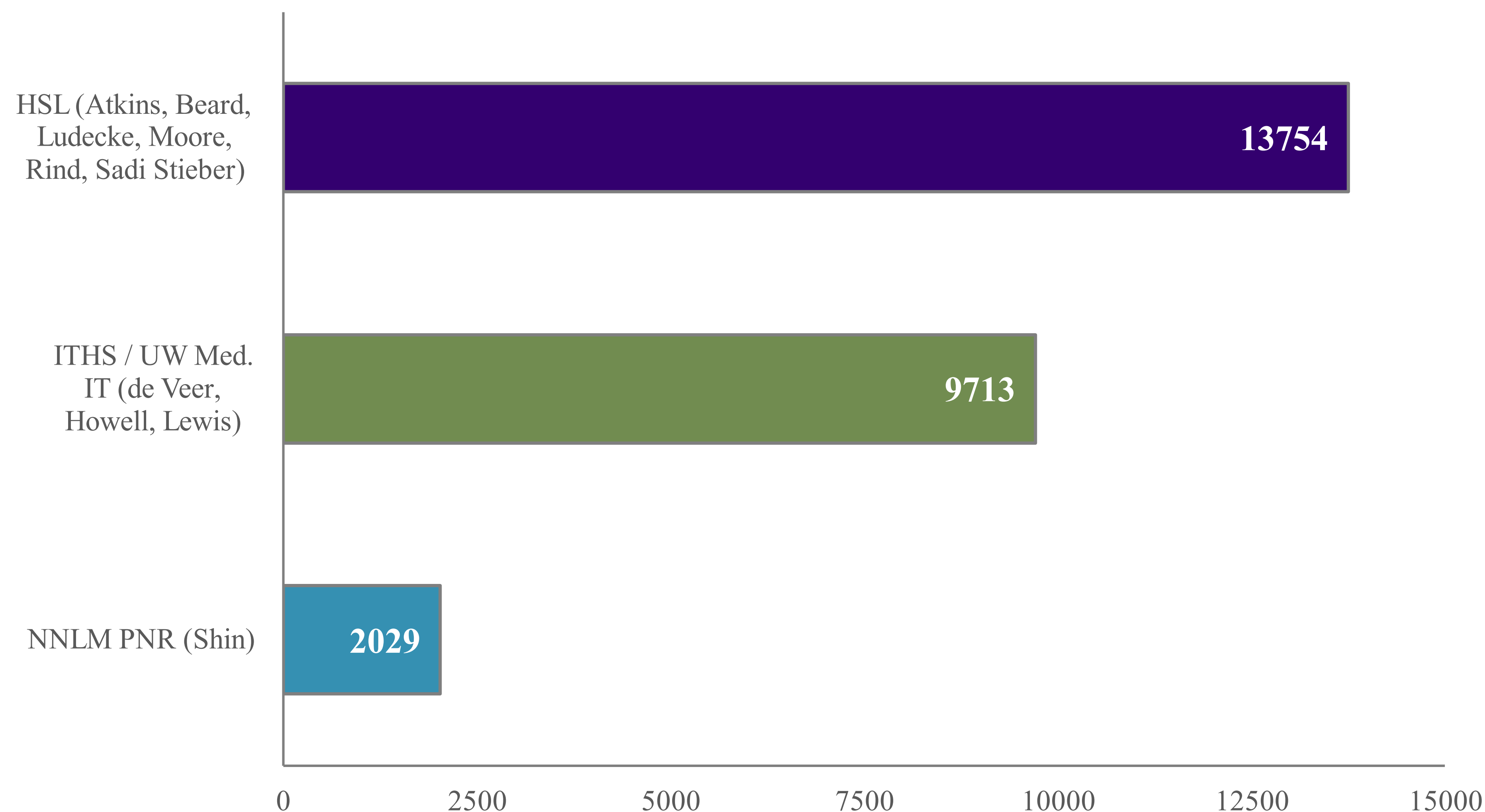


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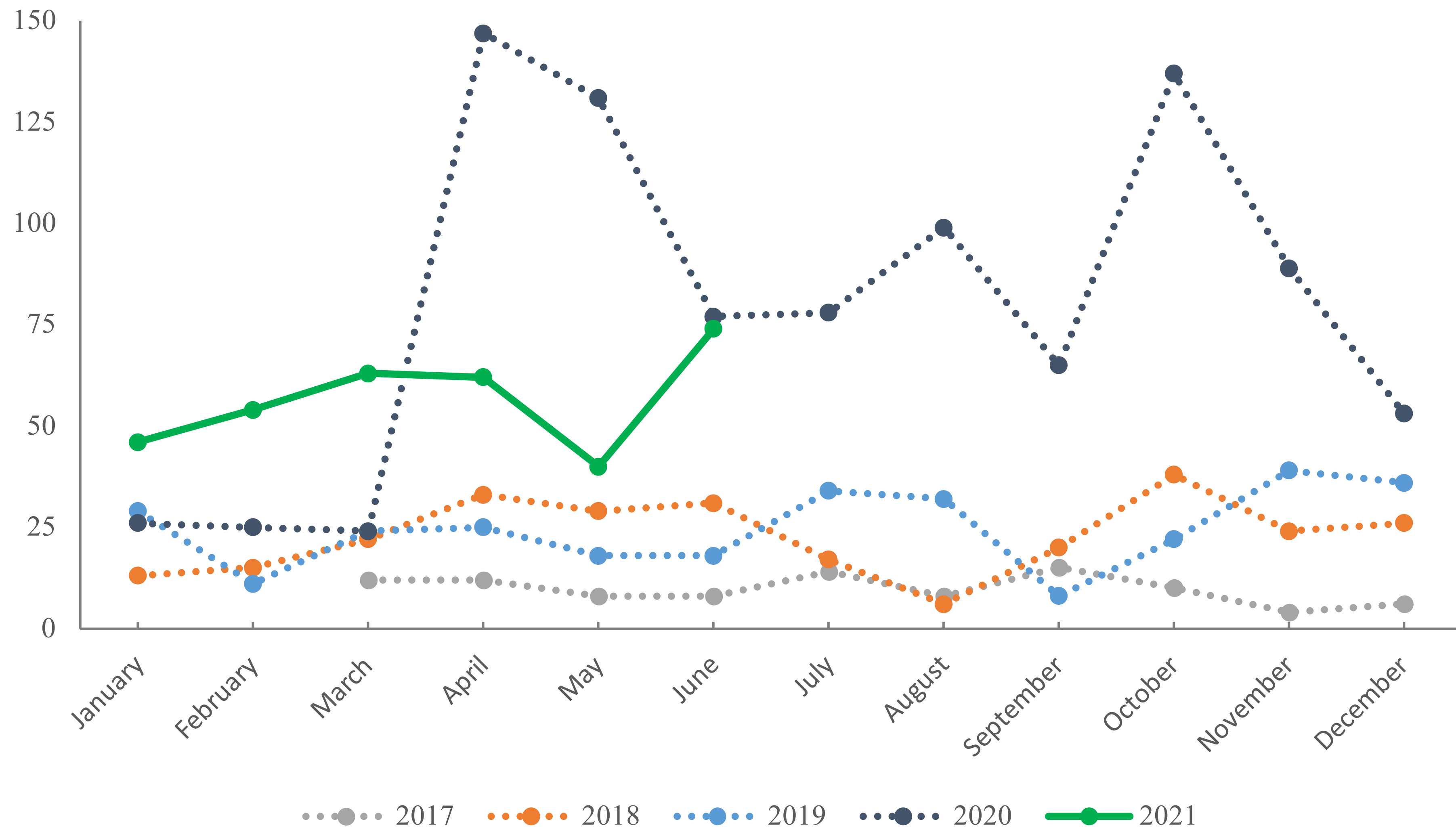
Tickets Closed, by Topic (Jan. 2020 - June 2021)



Tickets Closed, by TRAIL Partner (Jan. 2020 - June 2021)

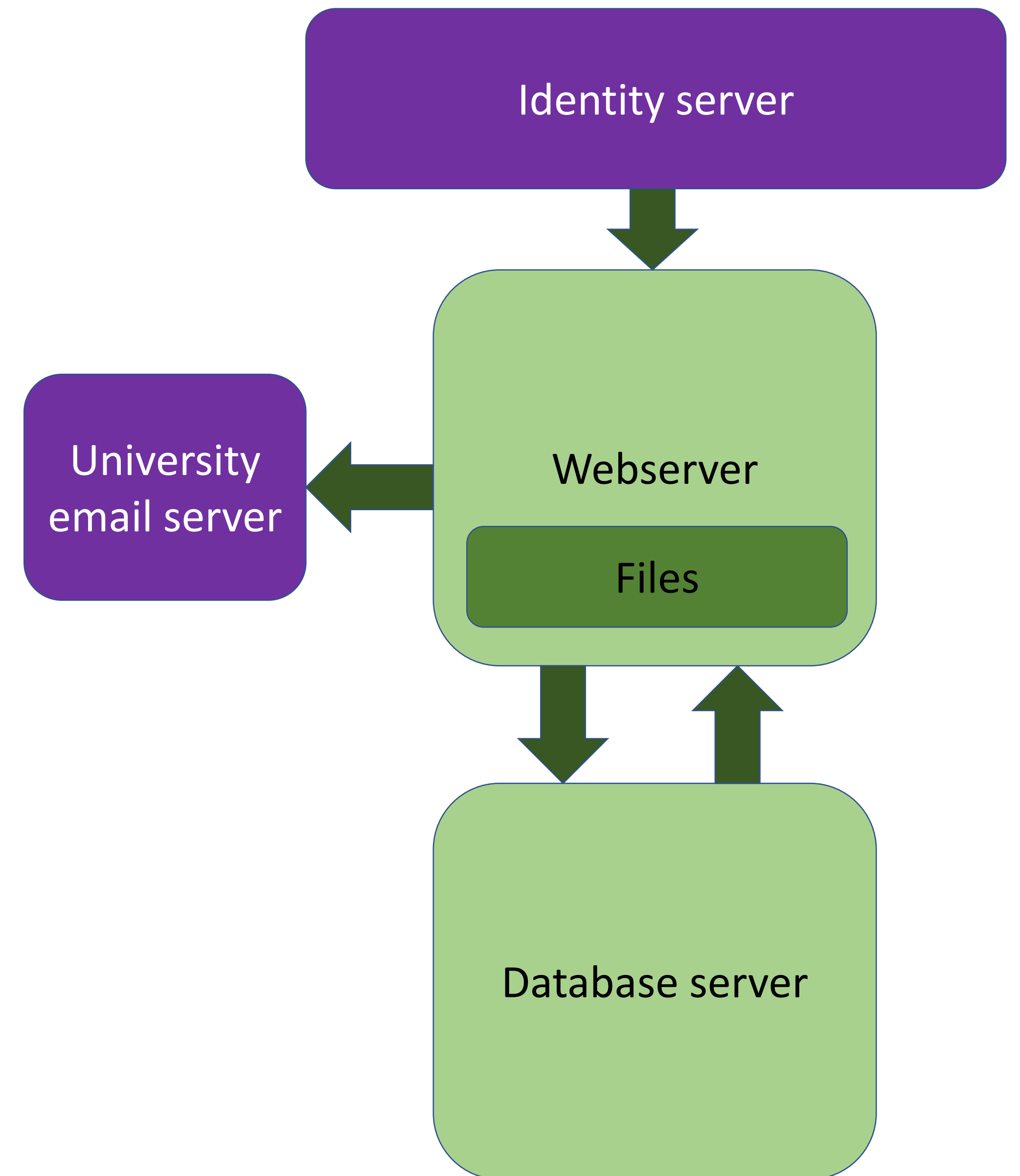


REDCap Class Attendance, by Month



COVID-19 Impacts

- Effects of the COVID-19 Pandemic
 - Number of users ↑
 - Users with logins
 - Survey participants
 - Number of survey invitations ↑
 - Number of projects with surveys
 - Projects with large number of participants
 - Need for e-consent options
 - Need for more REDCap build consults ↑
 - Quick turn around
 - More complex builds



UW-ITHS REDCap infrastructure
Pre-COVID-19 Pandemic

Problem 1 – Response spikes

Issue:

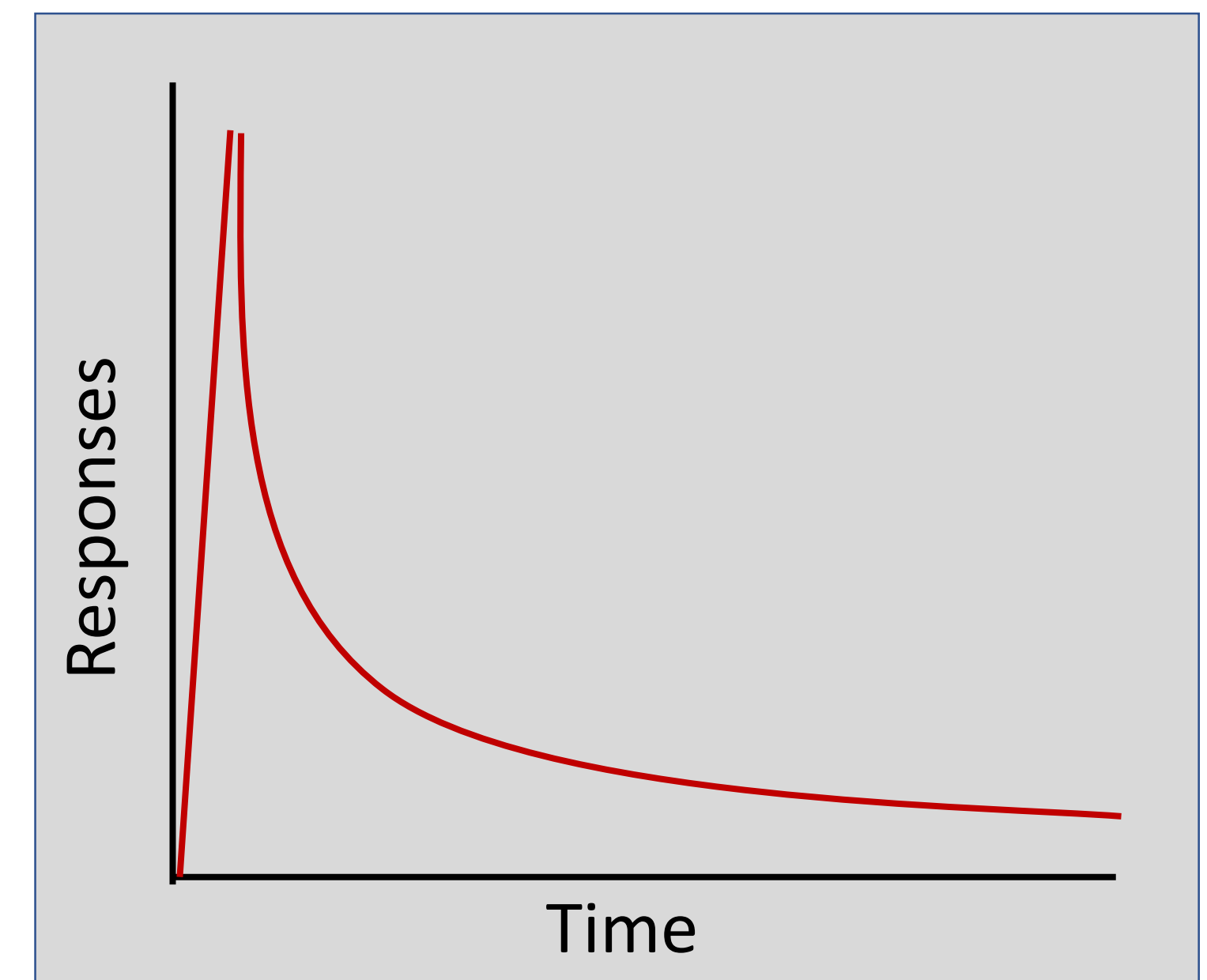
Significant server slowdown due to participant response spikes

Cause:

Small number of projects sending large batches of invitations at the same time

Solution:

Ask users to “batch” invitations with 10-15 min intervals



Problem 2 – Increased usage

Issue:

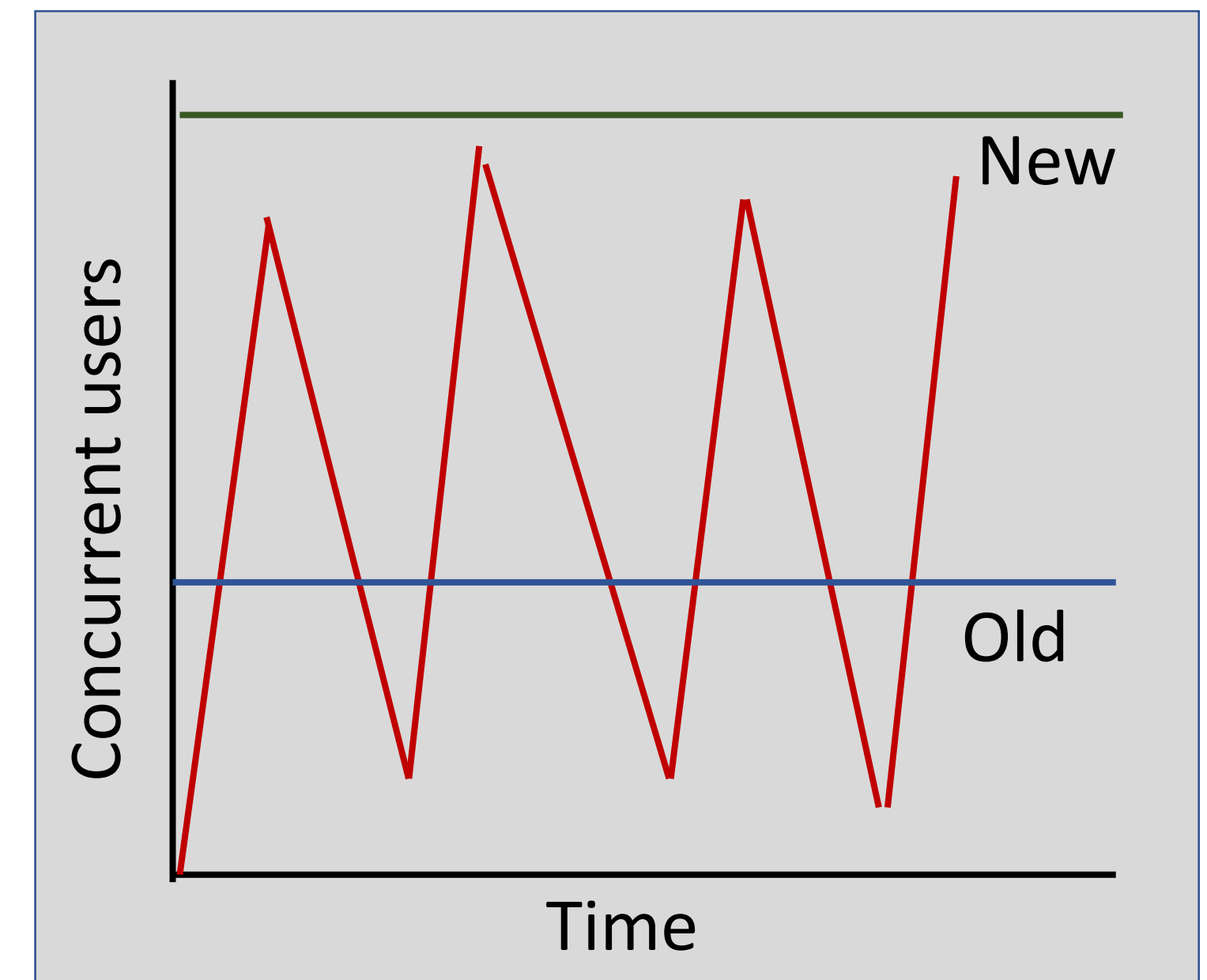
Server slow downs and crashes due to increased peak load

Cause:

Research studies needing to move to remote
Everybody working remotely

Solution:

- 1) Increase the available resources for the server
- 2) Redo the entire server infrastructure



Problem 3 – Database Server Bottlenecks

Issue:

Database server crash due to increased volume of write commands

Cause:

Practical limit to number of writes a server can do per second
Increased usage frequently hit that limit

Solution:

- 1) Increase the available resources for the database server
- 2) Split out the server into a cluster with multiple nodes

Problem 4 – Email Server slowdowns

Issue:

Emails (invitations, alerts) were delayed by hours or days

Cause:

Increased email traffic per second hit the “spam limit” set by the university IT department

Solution:

- 1) Escalate through university leadership to set expectations
- 2) Ask users to batch their emails into smaller numbers

Problem 5 – Uneven utilization

Issue:

Small number of projects using most of the capacity for both the server infrastructure and support capacity

Cause:

Several COVID tracking projects with high number of participants with daily interactions

Solution:

- 1) Maintenance plans (*supplies funding for more people*)
- 2) Tailoring specialized REDCap servers for big projects

Problem 6 – e-Consenting unclarity

Issue:

Most studies needed to move online including the consent process.
Very little guidance from legal, IRB, compliance if this is ok

Cause:

E-Consenting module in REDCap is a relatively new feature. Laws regarding e-Consent are vague and differ per state.

Solution:

Custom workgroup dedicated to creating guidance for e-Consenting

Problem 7 – Increased support burden

Issue:

More tickets submitted with tougher problems

Cause:

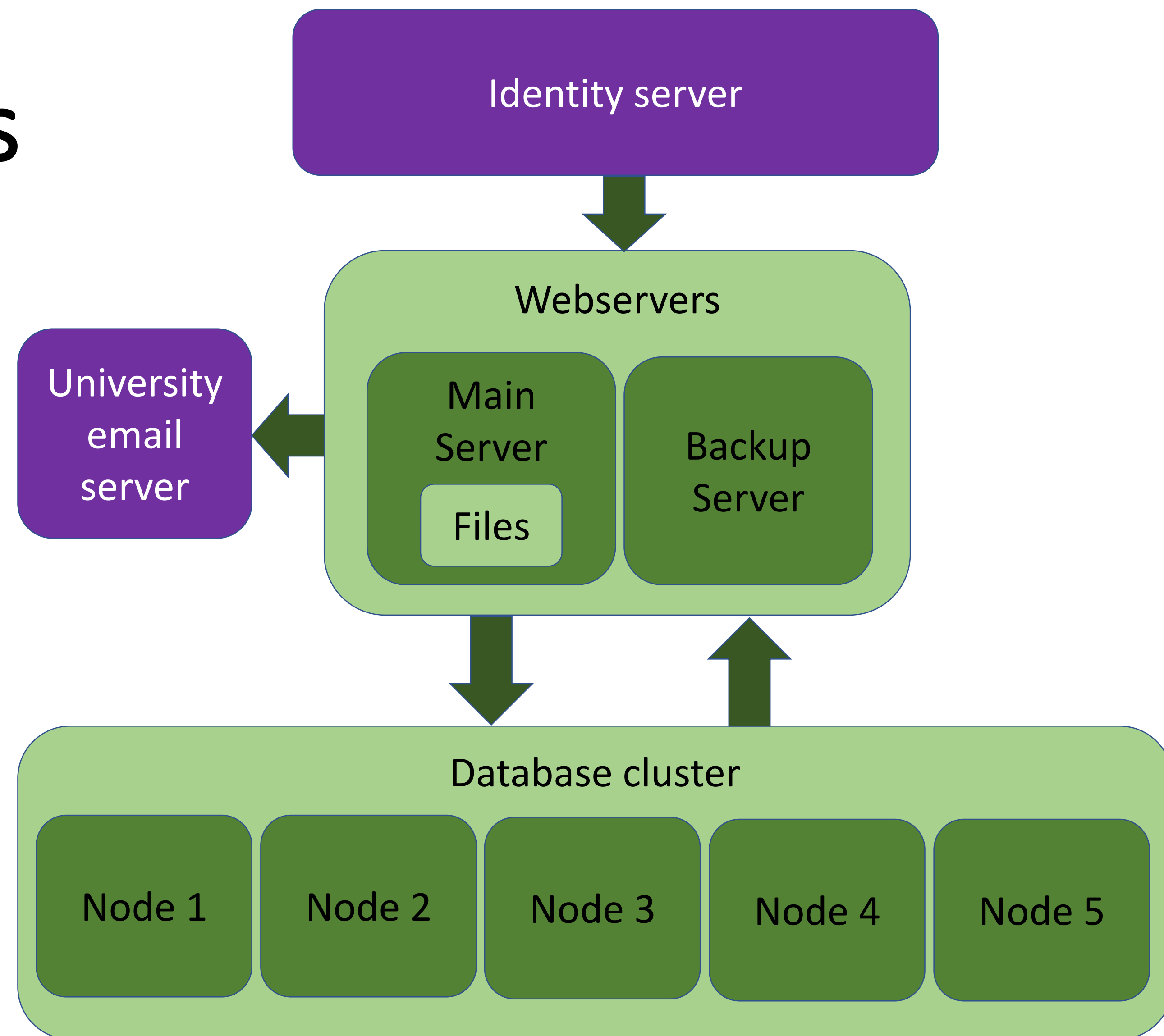
Users trying to do everything online are finding limitations of the software

Solution:

- 1) Have a solid ticketing system in place
- 2) Hire more people

Current State Challenges

- Support Burden:
 - Feb 2020: 1000 closed tickets
 - Feb 2021: 1658 closed tickets
- Cluster infrastructure
 - New concept for REDCap
 - Backup methods
 - File server
- Scalability
 - ~13.5K users
 - 18K+ projects
- Funding
 - Infrastructure
 - People



UW-ITHS REDCap infrastructure
March 2021



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Questions?

Find us:

<https://hsl.uw.edu/trail/> or email trailq@uw.edu



TRAIL

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