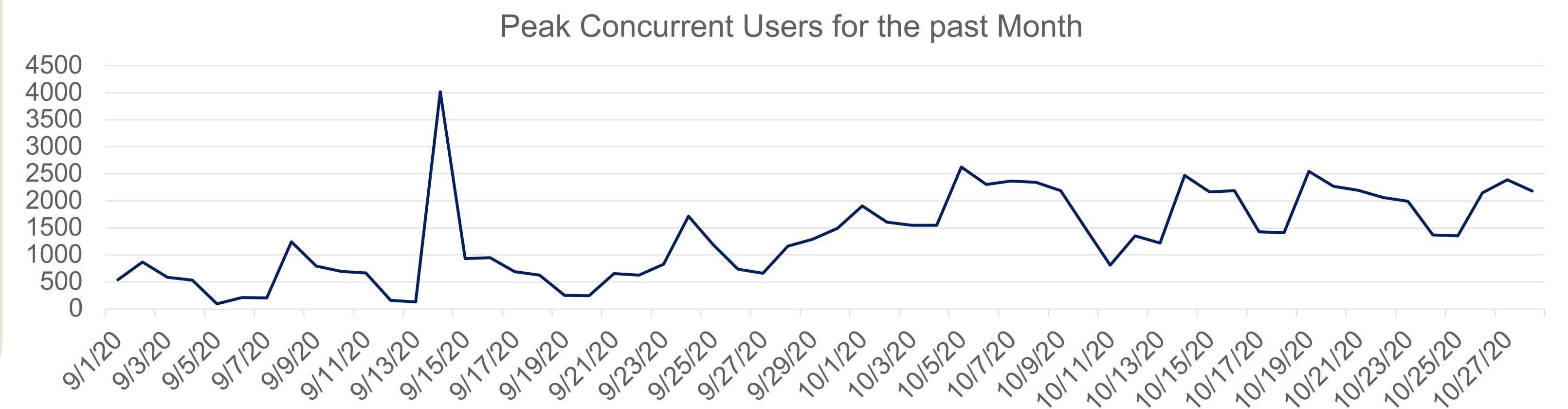
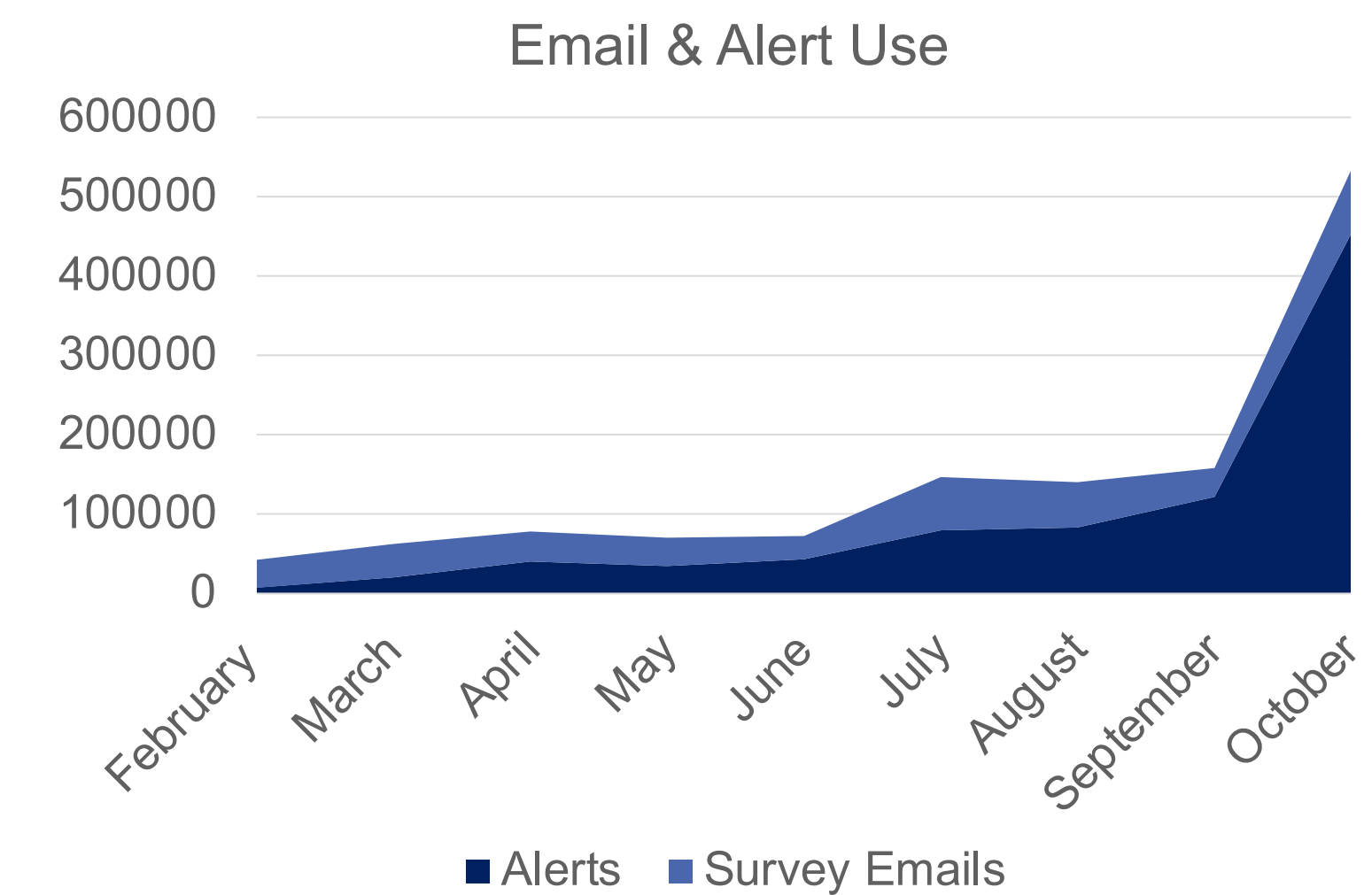
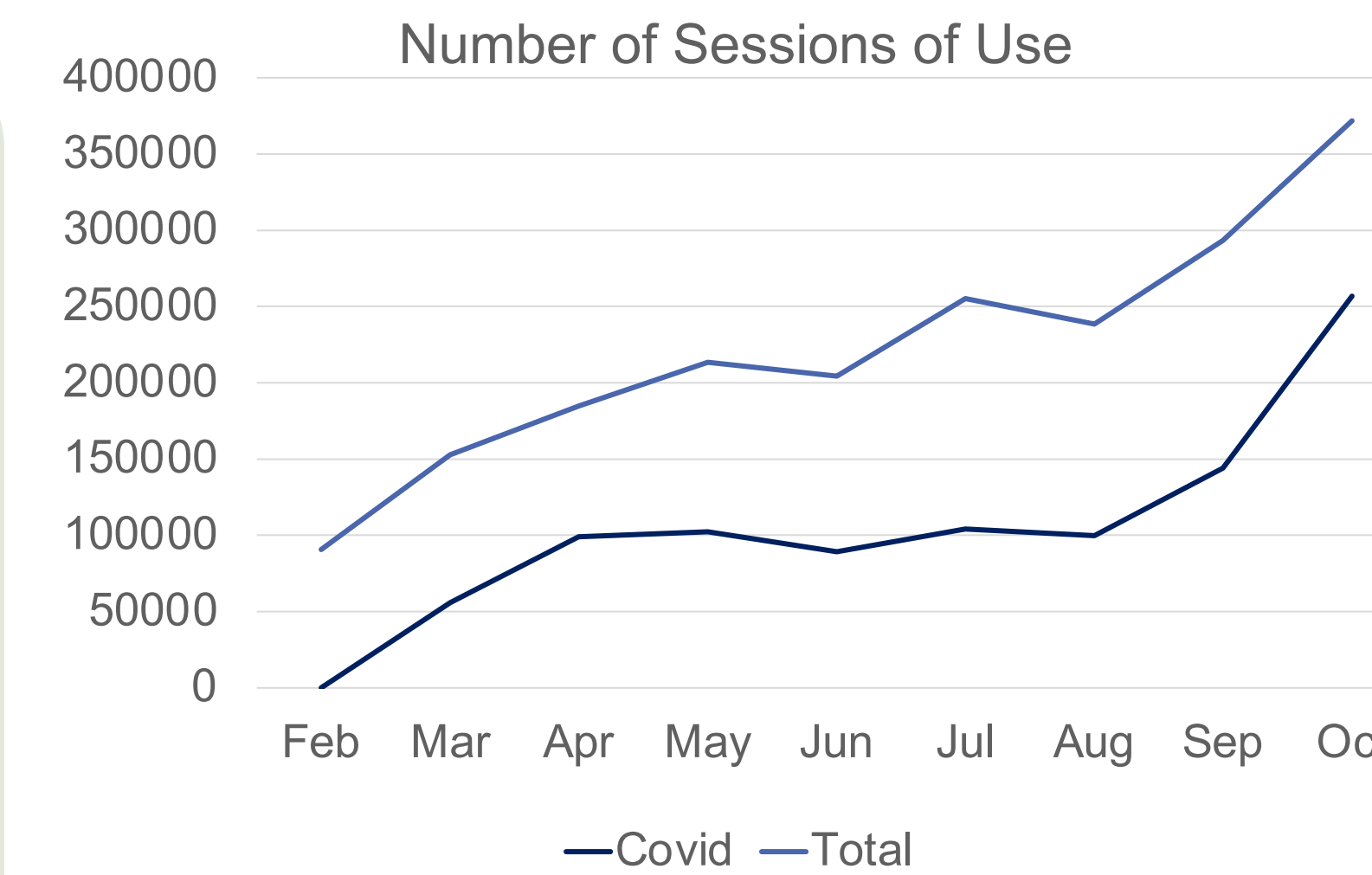


### Background

- Since March 2020, in response to the COVID-19 Pandemic, several new large projects have begun to use the UW Medicine – ITHS Instance of REDCap.
- As testing increased, so did the usage of the REDCap for both Research and QI initiatives. As a result of the significant increase in use, users began to experience multiple issues in their use of system.
- By early September 2020, the system experienced double the load in terms of utilization.

Examples of the issues caused by increased resource demand were:

- The amount of concurrent users above capacity on the ITHS REDCap instance was causing instability.
- Data quality issues when more concurrent users are entering data than the REDCap configuration can support.
- Decreasing REDCap support resources for non COVID projects.



### Solution

#### Reconfiguration of The ITHS REDCap Infrastructure

**Issue:** User Web Traffic High/Growing

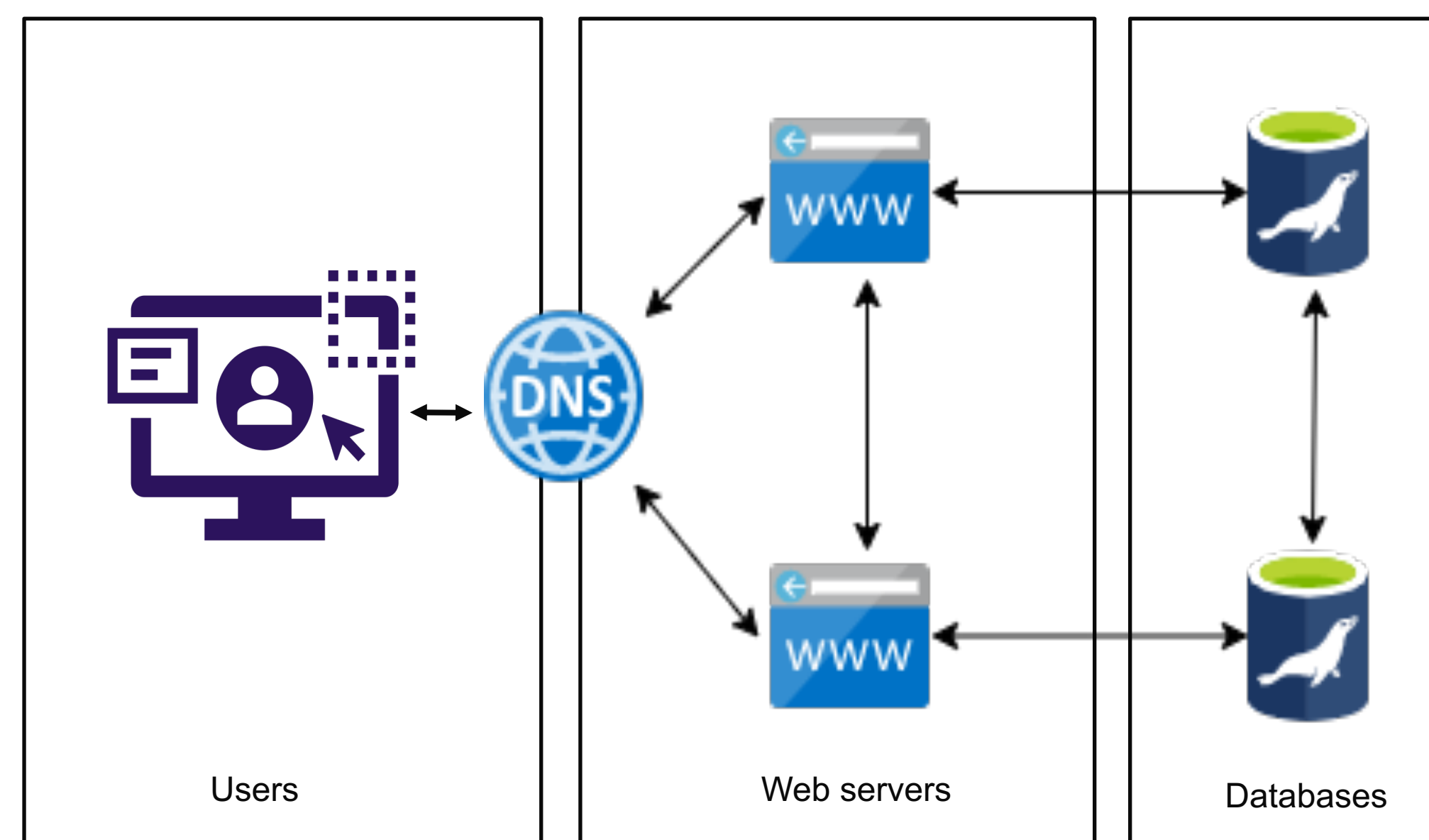
**Solution:** A higher utilization required more resources. We split out the existing webserver into multiple webservers in order to scale our operation with the new resource demands.

**Issue:** Significant growth of files

**Solution:** Migrated the file storage to an independent webserver in order to decrease load on the webservers and improve scalability.

**Issue:** Number of database writes too high

**Solution:** The original hard drive system was not fast enough to accommodate the number of write operations per second. We implemented a newer SSD based drive system to solve this issue. However, proper implementation best practices required us to set this up in a multi-write cluster spread out over multiple database servers in order to have both increased speed and redundancy.



**Overall Outcome:** The system now obtains high availability with less lag, reducing the risk that a single failure will cause service disruption.

### Discussion

REDCap at the University of Washington has grown into one of the most important tools for supporting clinical research and public health efforts. This value was widely recognized during the initial days of the Covid-19 pandemic. Our instance supported data collection that drove an early New England Journal of Medicine manuscript describing Covid-19 clinically in North America. We also supported the first 'Drive Through Testing' site in the nation as well as wide employee health and first responder screening tools, and other instruments. In order to support continued exponential growth, we are implementing a more scalable solution to support future research needs. REDCap sites interested in learning more should consider contacting us at [iths\\_redcap\\_admin@uw.edu](mailto:iths_redcap_admin@uw.edu) for a consultation.

#### Acknowledgements

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