



# **APT-Sepsis Dashboard Development Documentation**

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## Table of abbreviations

APT-Sepsis	Active Prevention and Treatment of Maternal Sepsis
IPC	Infection Prevention and Control
REDCap	Research Electronic Data Capture
API	Application Programming Interface
KPI	Key Performance Indicator
PowerBI	Power Business Intelligence

## 1. Project Overview

The APT-Sepsis Dashboards was developed to support the Active Prevention and Treatment of Maternal Sepsis (APT-Sepsis) study in both Malawi and Uganda. The dashboards visualized key indicators such as maternal infection rates, availability of antibiotics, Infection Prevention and Control (IPC) materials, hand hygiene stations, and patient monitoring tools in real time. The dashboard transforms data from REDCap and other sources into actionable insights for clinical and management teams.

## 2. Objectives

- Provide real-time monitoring of maternal infection and sepsis indicators.
- Visualize adherence to IPC practices across sites.
- Track clinical performance and highlight areas needing intervention.
- Support monthly and quarterly reviews and data-driven decisions at site and project level.

## 3. Data Sources

Source	Type	Connection Method	Frequency	Remarks
REDCap	Web Database	API connection via redcapAPI package	Daily	Facility and patient registry data Clinical and IPC data from all sites
CSV	Text/CSV	Web directory connection	Once	Coordinates for study sites

## 4. Data Preparation and Transformation

Tools Used: Power BI (Power Query), R (for API extraction)

1. Connected to REDCap API using secure tokens.
2. Extracted raw data – just specific variables (patients, facility, observations, IPC forms, staff) using R and save to web directory in csv format
3. Loaded using web data source into Power BI.
4. Transformed and modeled the data
5. Applied logic to identify infection-related cases.
6. Calculated derived metrics (infection rate, sepsis cases, compliance).
7. Created a calendar table for time intelligence.
8. Merged facility-level and patient-level data.

## 5. Data Refresh

Automatic data extraction is scheduled to refresh daily at 4:30am from REDCap to csv and in power service is configured for scheduled refresh from CSV to visualizations at 5:30am daily.

The notifications are configured to be sent to the data manager and other designated staff if the data or/and dashboard fail to refresh.

## 5. Dashboard Design

Theme: Red and White (aligned APT-Sepsis logo colors branding) – refer to appendix B.

- Facility Data page – Map showing locations of site, power and water supply rates
- Patient Data page - Infection metrics and rates, births, and infection trends.
- Case comparison page – Bar charts for infections enrolled to compare with daily identified infections.
- Facility Resource Issues page – Table of facility-specific IPC, antibiotic and other related issues
- Intervention page – Heat maps to monitor intervention resources
- Monthly Summary – charts showing primary indicators for each site for each month.
- Quarterly Summary – charts showing primary indicators for each site for each quarter.

## 8. Interactivity and Navigation

- Filters for Group, Facility and Dates.
- Drill-up and down for overview of date trends.
- Tooltips for dynamic summaries on hover.
- Sync slicers for consistent filters across pages.

## 9. Software

Below we list the software required for developing and accessing APT-Sepsis dashboard.

- Mozilla Firefox or another internet browser  
[www.mozilla.org/en-US/firefox/new/](http://www.mozilla.org/en-US/firefox/new/)
- Excel (Microsoft Office) or other spreadsheet-based program  
[www.microsoft.com/en-us/microsoft-365/excel](http://www.microsoft.com/en-us/microsoft-365/excel)
- Installed R  
[www.cran.r-project.org/mirrors.html](http://www.cran.r-project.org/mirrors.html) and optionally  
[www.rstudio.com/products/rstudio/download/](http://www.rstudio.com/products/rstudio/download/) or
- PowerBI Desktop by Microsoft (Windows 8 or later)  
<https://www.microsoft.com/en-us/download/details.aspx?id=58494>
- Power Service (internal link)  
<https://app.powerbi.com>
- Data Portal (internal link)  
[https://data.mlw.mw/project\\_portal/home](https://data.mlw.mw/project_portal/home)

## 9. Security and Access

The dashboard is published to power service where embedded link is generated that is configured to data portal. The dashboard is accessed through the MLW data portal. The data portal access is restricted to project team leads and data managers using username and password that are configured in the data portal.

## 10. Deployment

Environment	Tool	Details
REDCap	Web database	Daily data collection
CSV	Specified data fields Daily at 4:30 AM	Daily data extracted - automatic
Power BI Service	Workspace	APT-Sepsis Workspace
Refresh Schedule	Daily at 5:30 AM	Automatic
Sharing	Dashboard access	Access via secure data portal

## 11. Maintenance and Update Plan

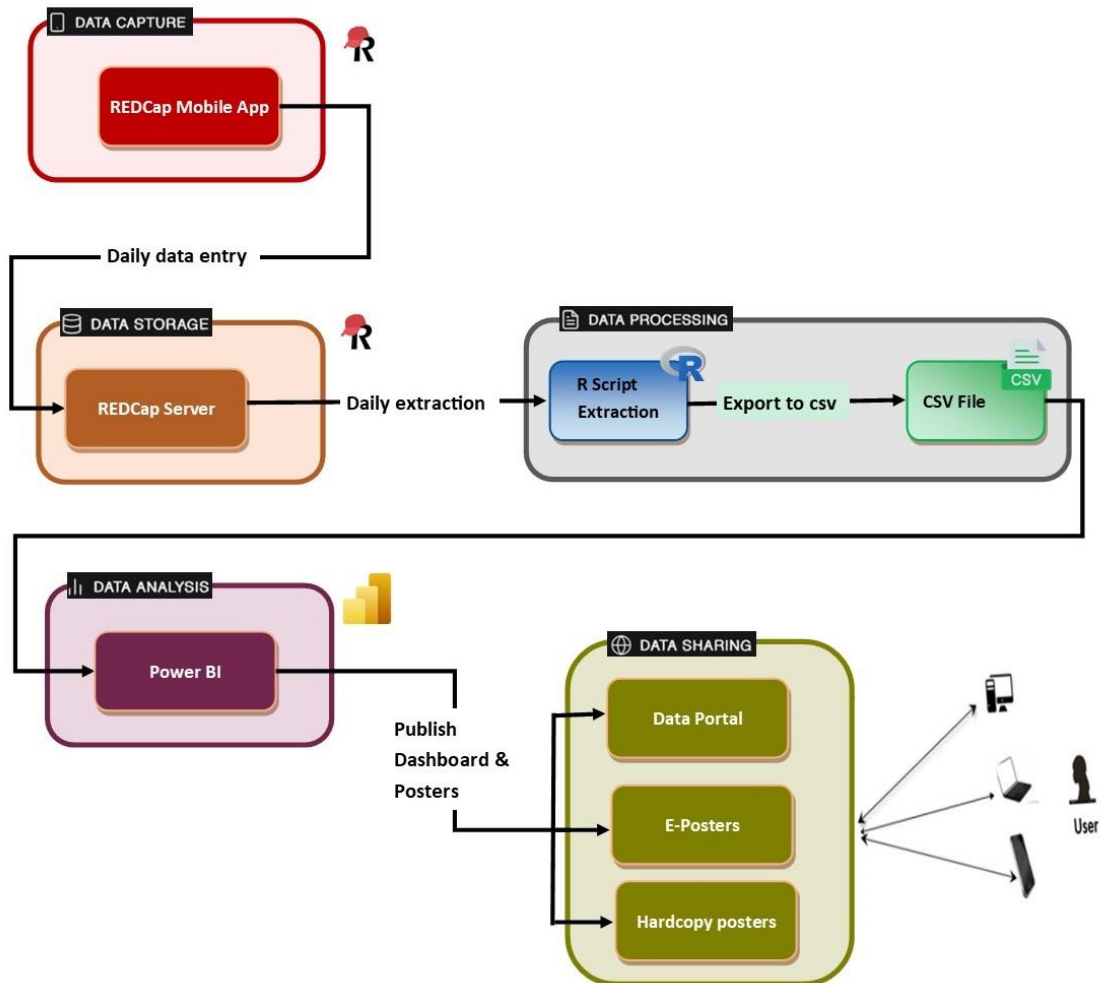
- Weekly: Check refresh logs and data validity.
- Monthly: Review dashboard visuals with study team.
- Quarterly: Update KPIs and thresholds as per protocol changes.

## 12. Resources

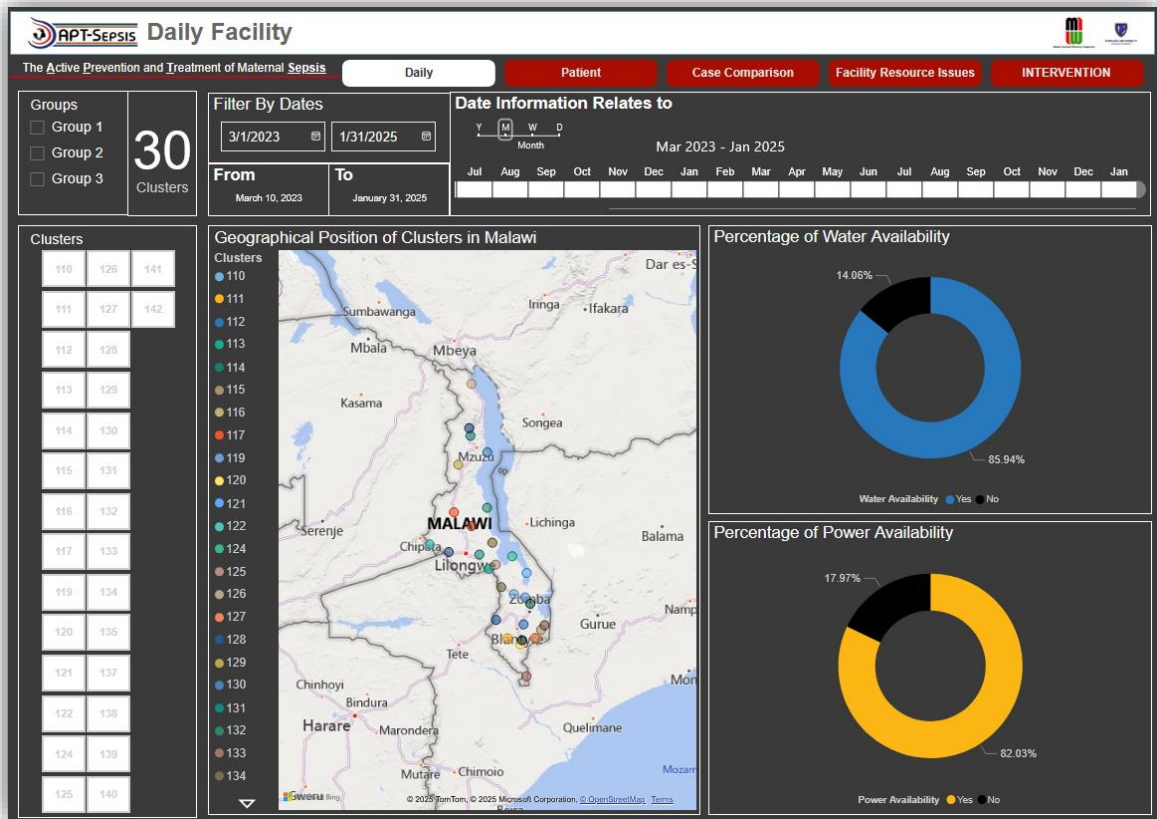
- A quick guide to choosing the right graph to visualize data:  
[www.chart.guide/topics/chartguide-poster-4-0/](http://www.chart.guide/topics/chartguide-poster-4-0/)
- Power BI training link  
<https://learn.microsoft.com/en-us/training/courses/pl-300t00>

## 14. Appendix

### A. Data Flow



## B. Dashboard Screenshots



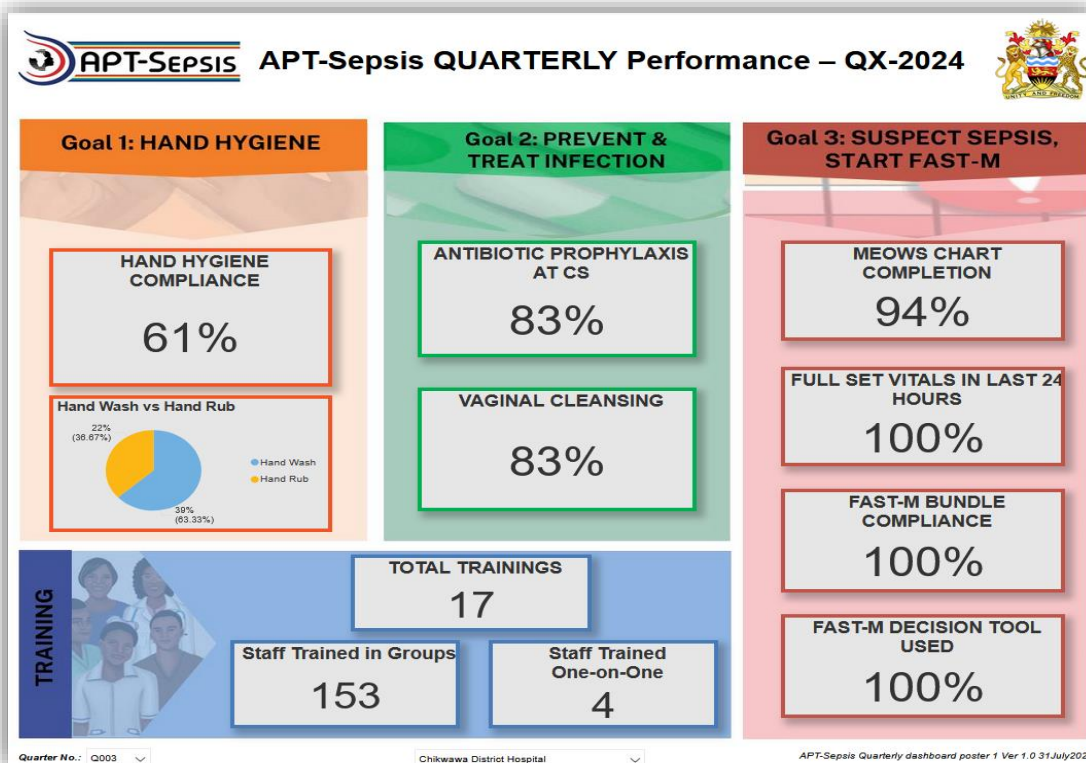
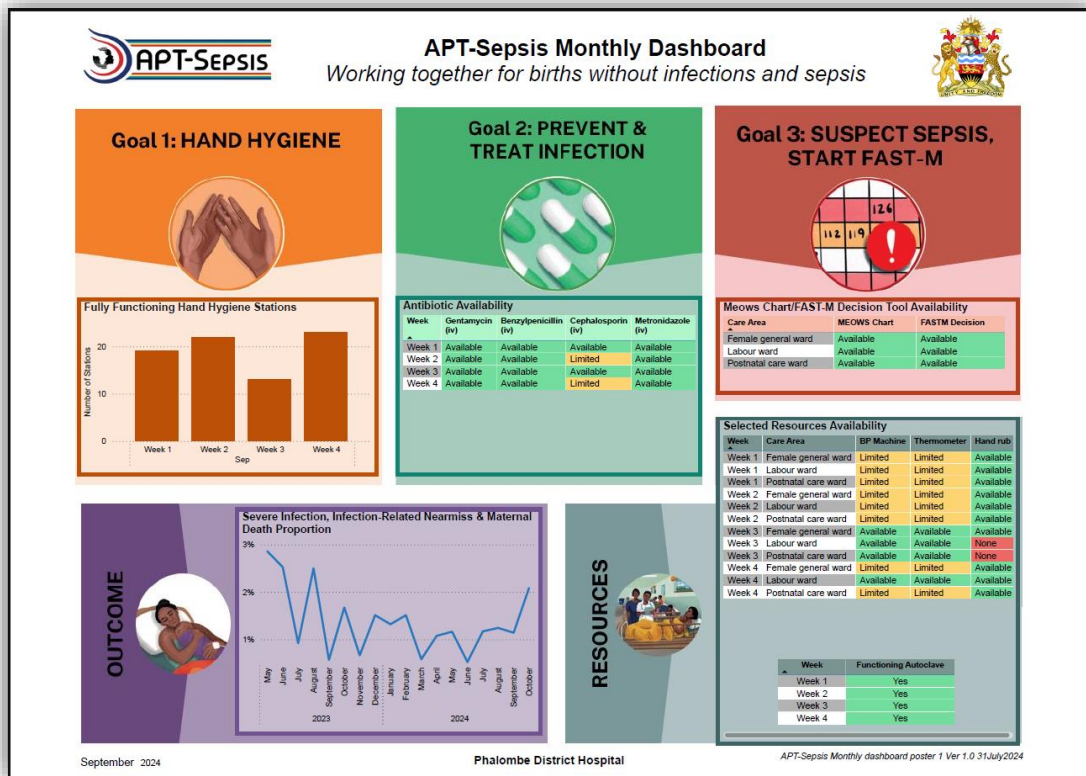












C. Contact List

Role	Name	Institution	Email
Data Manager	Nyadani Chitsulo	Malawi-Liverpool-Wellcome Research Programme	nchitsulo@mlw.mw