

### BACKGROUND

- The data surrounding smart pumps operating on outdated drug libraries is limited.
- Abnormal infusion related processes cause smart pumps to fire alerts.
- Overwhelming amounts of alerts can cause a decrease in responsiveness, commonly known as alert fatigue.
- When alerts are overlooked, it can lead to harm in patient care.

### OBJECTIVES

- To assess alert impact caused by smart pumps operating on outdated drug libraries within the HSHS Illinois region facilities.
- To update 50% of the outdated smart pumps located at St. Elizabeth's Hospital.
- To educate the pharmacy department of the alert risk associated with outdated drug libraries.

### METHODS

#### Study Design

- Retrospective, Descriptive Analysis
- Primary Measure: The number of alerts fired by outdated drug libraries versus updated drug libraries.
- Secondary Measure: The number of alerts reduced by updating smart pump drug libraries.

#### Inclusion Criteria

- BD Alaris Smart Pumps located in the HSHS Illinois Region.
- Both smart pumps operating on outdated and updated drug libraries were included.
- Outdated Pump: Any pump operating on a drug library earlier than 4/2021.
- Updated Pump: Any pump operating on the 4/2021 drug library.

#### Confounding Variables

- Smart pump activity of use
- Network Connectivity.
- Smart pumps out of range

#### Data Analysis

- The BD Alaris Guardrails Suite produced the alert reports for all smart pumps.
- Microsoft Excel was utilized to combine all the alert reports into one table.
- The Pivot Table function provided by excel calculated the primary and secondary measures within the study design.

### RESULTS

Figure 1: The number of outdated and updated pumps at each facility in 04/2021.

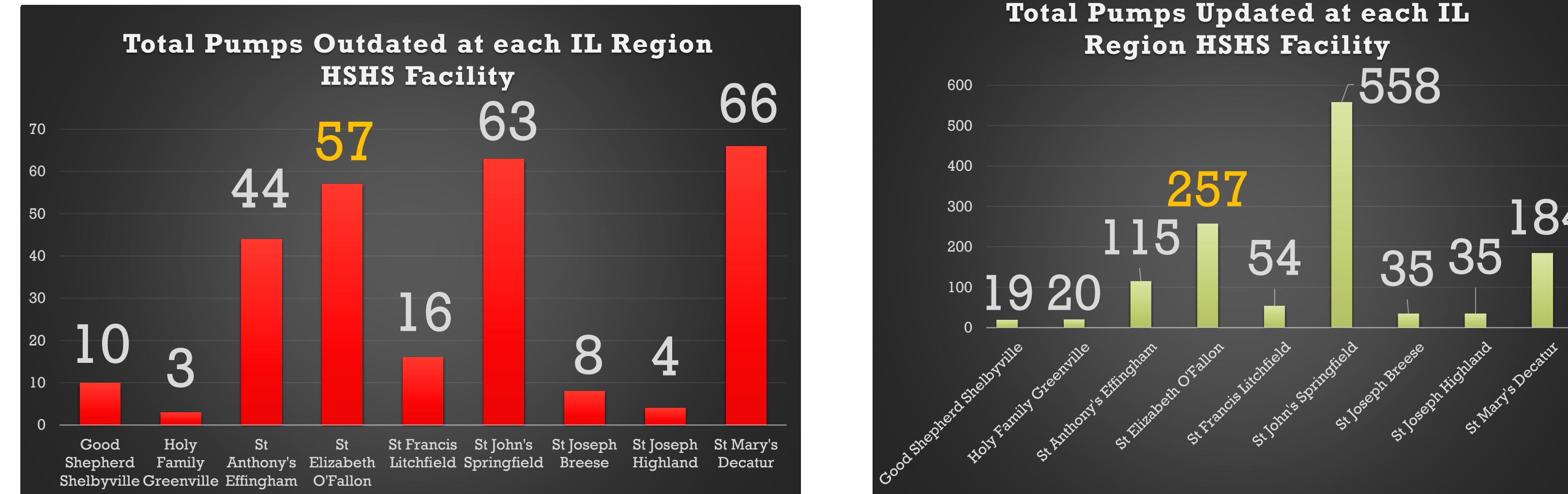


Figure 2: The total number of outdated and updated pumps combined for all facilities in 04/2021.

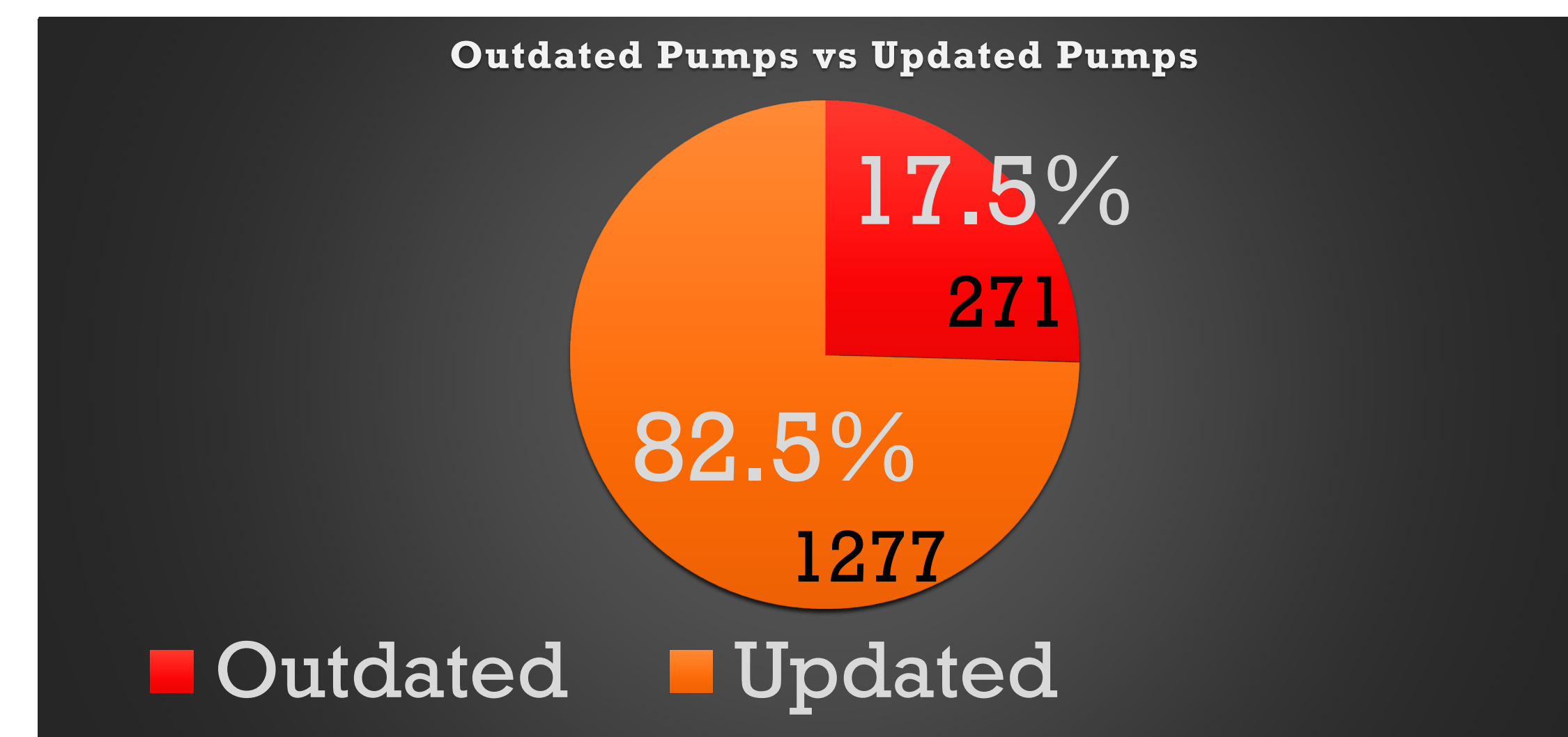


Figure 3: The total number of alerts fired by outdated and updated pumps in 4/2021.

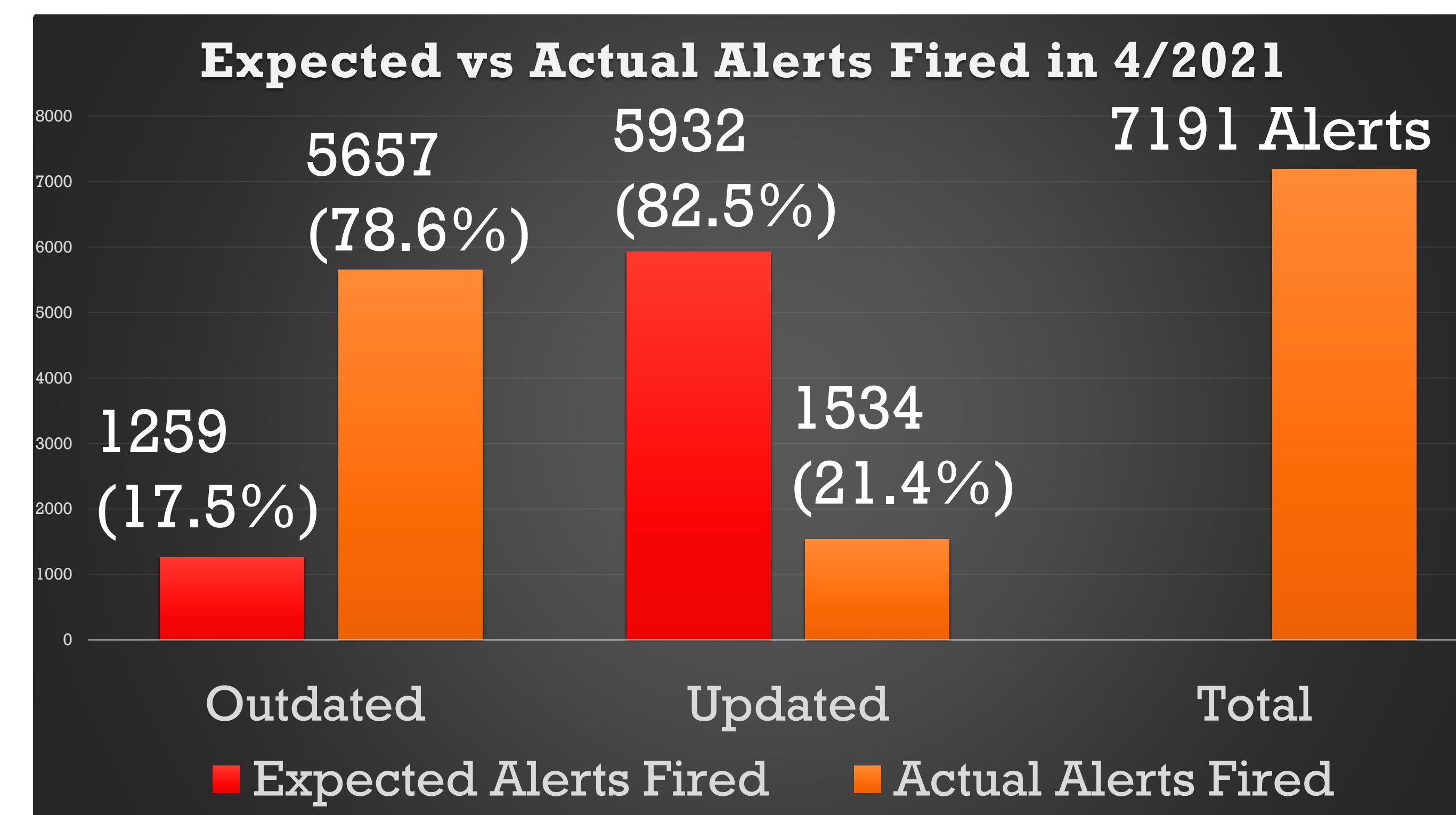
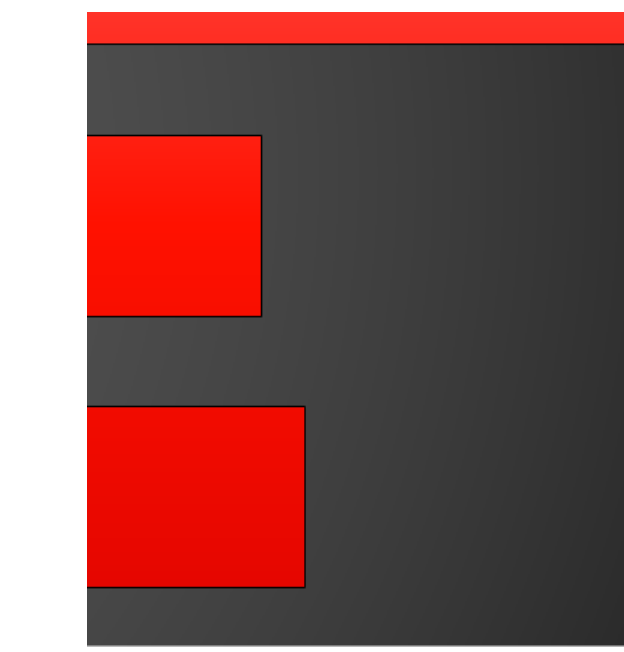


Table 1: The total number of alerts per pump.

|                     | Outdated Pumps     | Updated Pumps    | Total |
|---------------------|--------------------|------------------|-------|
| Alerts in April     | 5657               | 1534             | 7191  |
| # of Pumps in April | 271                | 1277             | 1548  |
| Alerts per pump     | 20 alerts per pump | 1 alert per pump |       |

Figure 4: The number of pumps updated after the study was completed.



|                           |     |
|---------------------------|-----|
| # of Pumps                | 30  |
| Potential alert reduction | 600 |

### DISCUSSION

#### Smart Pump outcomes:

- A small majority of outdated pumps created a huge risk for alert fatigue.
- Only 17.5% of the total pumps contained outdated drug libraries, but they caused almost 80% of the alerts fired.
- If more pumps contained outdated drug libraries, the alert volume and alarm fatigue risk would have increased.

#### Locating Smart Pumps

- Radio frequency identification (RFID) technology was utilized to locate the outdated smart pumps at St. Elizabeth Hospital.
- Each smart pumps RFID tag number was entered into a real time location service (RTLS) entitled Enterprise View, to provide the last location tracked.
- Locating and updating 30 outdated smart pumps required a duration of 10 days.

#### Limitations to Providing Updates:

- Some pumps were actively being used by patients.
- Certain pumps lacked network connectivity.
- The last location identified for several pumps was not correct.
- Some pumps were not in the building possibly due to loss.
- St. Elizabeth O'Fallon is the only hospital in HSHS that utilizes RFID technology.
- The more pumps at the facility, the longer the update process will take.
- Geographics limited this study from being reproduced at other sites.

### CONCLUSION

- Smart pumps operating on outdated drug libraries were capable of firing 20 more alerts than pumps operating on updated drug libraries.
- Updating smart pumps after each drug library update is vital to reduce the risk of alert fatigue in smart pump users.
- The St. Elizabeth pharmacy department is aware of the exact alert risk an outdated smart pump poses.