

Implementation and Rapid Uptake of an Antimicrobial Stewardship Clinical Decision Support System Across 19 UPMC Hospitals

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Conclusions

- Having implemented a clinical decision support system (CDSS) for antimicrobial stewardship (AMS) across 19 hospitals in five months, the successful adoption and use of the software was demonstrated by increased monthly CDSS utilization and a high intervention acceptance rate.
- Communication within the software was frequent and increased over time. Despite a high rate of nonactionable alerts seen in the first six months of use, ILUM Insight was frequently and consistently used in this multisite model.
- The CDSS facilitated high intervention rates and streamlined documentation at those hospitals without local ID expertise.

Background

- Antimicrobial stewardship (AMS) at UPMC consists of independently functioning programs and a hub-and-spoke tele-antimicrobial stewardship program (TASP) that typically supports smaller community hospitals with less on-site resources and expertise.
- In this study we describe the implementation of a clinical decision support system (CDSS) for AMS at 19 UPMC hospitals, which ranged in size from 12-695 staffed beds.
- Examples of the CDSS (**Figure 1**) and implementation locations (**Figure 2**) are included.

Figure 1

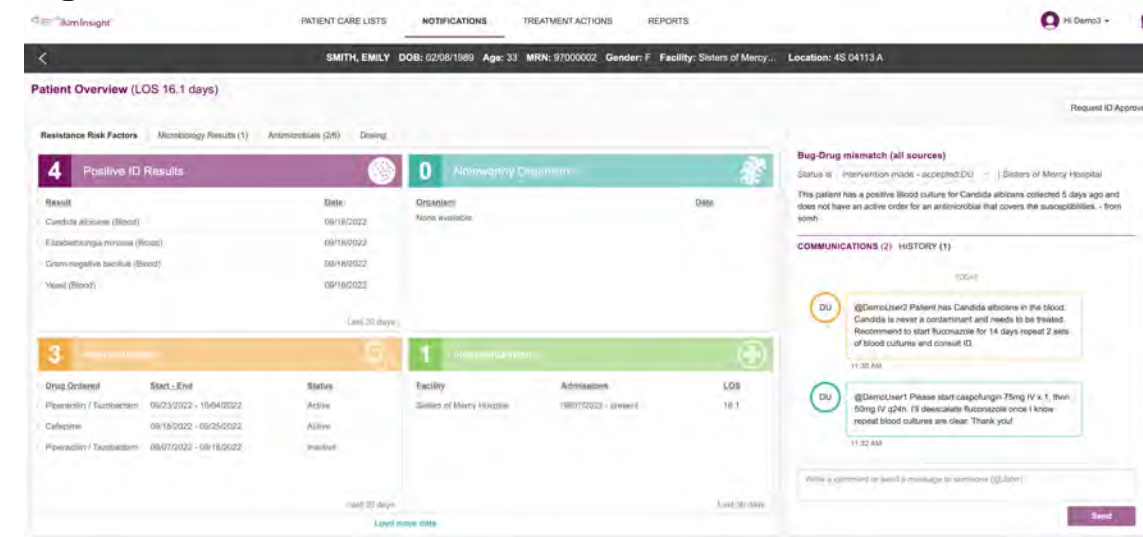
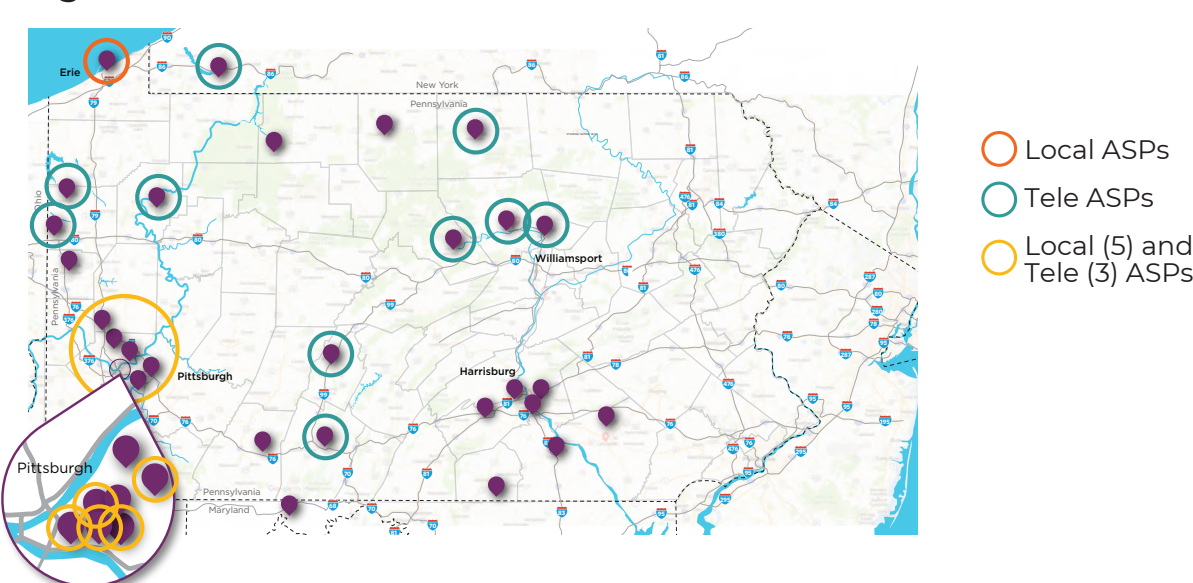


Figure 2



Disclosures

Rima Abdel-Massih is Co-founder, CMO, and share option holder of Infectious Disease Connect. John Mellors is Co-founder, Advisory Board Chair, and share option holder of Infectious Disease Connect. All other contributing authors have no disclosures.

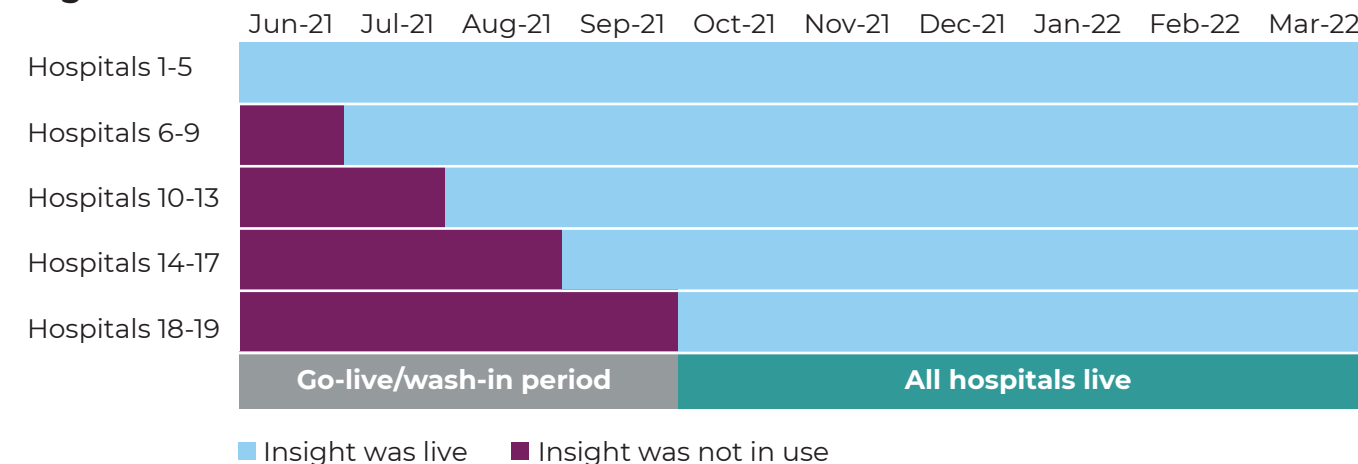
Methods

- This CDSS - ILUM Insight[®] from Infectious Disease Connect - extracts electronic medical record (EMR) data to provide real-time alerts, facilitate communication among all end users in the UPMC system, and delivers asynchronous workflow across different team members. The adoption of this CDSS is further explained by the summarized categories of alerts included over time (**Table 1**).
- Category 1 alerts were independently reviewed by all local pharmacists.
- Category 2 alerts were reviewed either by local pharmacists, or by the TASP.
- CDSS utilization, intervention data, and balancing measures from October 2021 to March 2022.
- Implementation timeline (**Figure 3**).

Table 1

Category 1	Category 2
<ul style="list-style-type: none"> Beta-lactam allergy evaluation Duplicate anaerobic coverage IV to PO Active IV vancomycin with negative MRSA nasal screen Positive C. difficile 	<ul style="list-style-type: none"> Antimicrobial timeout (48h, 72h, or 96h) Broad spectrum beta-lactam agents Restricted antimicrobial Antipseudomonal agent without Pseudomonas in culture at 96 hours Bug-drug mismatch (all sources) De-escalation by susceptibility Positive blood culture Positive Cerebrospinal Fluid culture

Figure 3



Results

- Communications between various AMS members increased over time.
- An average of 7,033 alerts per month (70-798 per hospital) were reviewed between October 2021 and March 2022. (**Figure 4** shows CDSS usage over time)
- Most CDSS users were pharmacists.
- 93% of alerts requiring intervention resulted in an accepted intervention.
- On average, 508 unique patients each month had an antibiotic restarted within 2-7 days of stopping that same antibiotic.
- Table 2** summarizes all the successful, unsuccessful, and nonactionable alerts.

Figure 4

CDSS Utilization

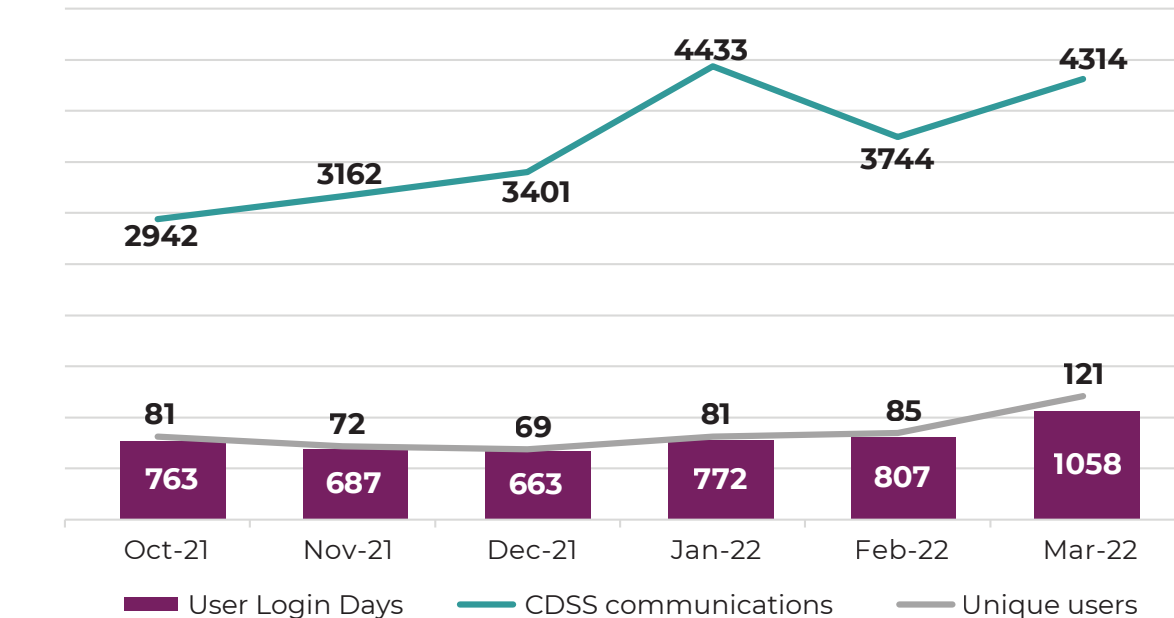


Table 2

Final Alert Status	Monthly Average (N)	Average Monthly Total Reviewed Alerts (N)	% of Total Reviewed Alerts	% of Actionable Alerts
Successful Intervention Accepted	959	7033	14%	93%
Failures Intervention Rejected	70	7033	1%	7%
Already Appropriate Current therapy ok No treatment needed	1795	7033	26%	N/A
Nonactionable alerts Duplicate alert Discharged prior to intervention	2694	7033	38%	N/A

