



Review of Antibiotic Stewardship Unit's Workflows & IT Systems

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Introduction

Inappropriate use of antibiotics contributes to development of antibiotic-resistant bacterial infections that are increasingly difficult to treat. It is imperative that hospitals ensure appropriate prescription of antibiotics through a stewardship programme. In SGH, the Antibiotics Stewardship Unit (ASU) started in 2006 and has achieved outstanding results, such as reduction in duration of antibiotic use and length of hospital stay. The ASU audits about 16,298 cases of antibiotic orders a year.

With the increase in workload over the years and potential to increase audit scope, it is necessary to understand the workflows and constructs of the IT system, review them, and potentially re-design the processes to enable the ASU team to function more efficiently and effectively in the future.

Objectives

- To review and analyse the current state workflows of ASU, including IT enablers e.g. Computer Decision Support System (CDSS)
- To identify opportunities to improve existing processes

Methodology

1) Genchi Genbutsu (March 2016)

- Gathered background information on the current ASU workflow
- Observed the antibiotic review process
- Interviewed senior and junior doctors from the Department of Internal Medicine to understand the process of ordering antibiotics
- Current ASU workflow were mapped after the observations and interviews



2) Focus Group Study (May – July 2016)

- Determined the psychosocial factors associated with doctors' acceptance or rejection of both CDSS' and ASU team's recommendations
- Conducted seven focus groups with doctors
- Feasibility study on suggestions given by doctors at focus groups was done to gather necessary information for the subsequent Kaizen Blitz Workshops

3) Kaizen Blitz Workshops (April – July 2016)

- Current workflow was discussed and confirmed (Figure 1)
- Value-added and non-value added steps were identified in the workflow (Figure 2)
- Non-value added steps could potentially be eliminated or enhanced in the ideal workflow

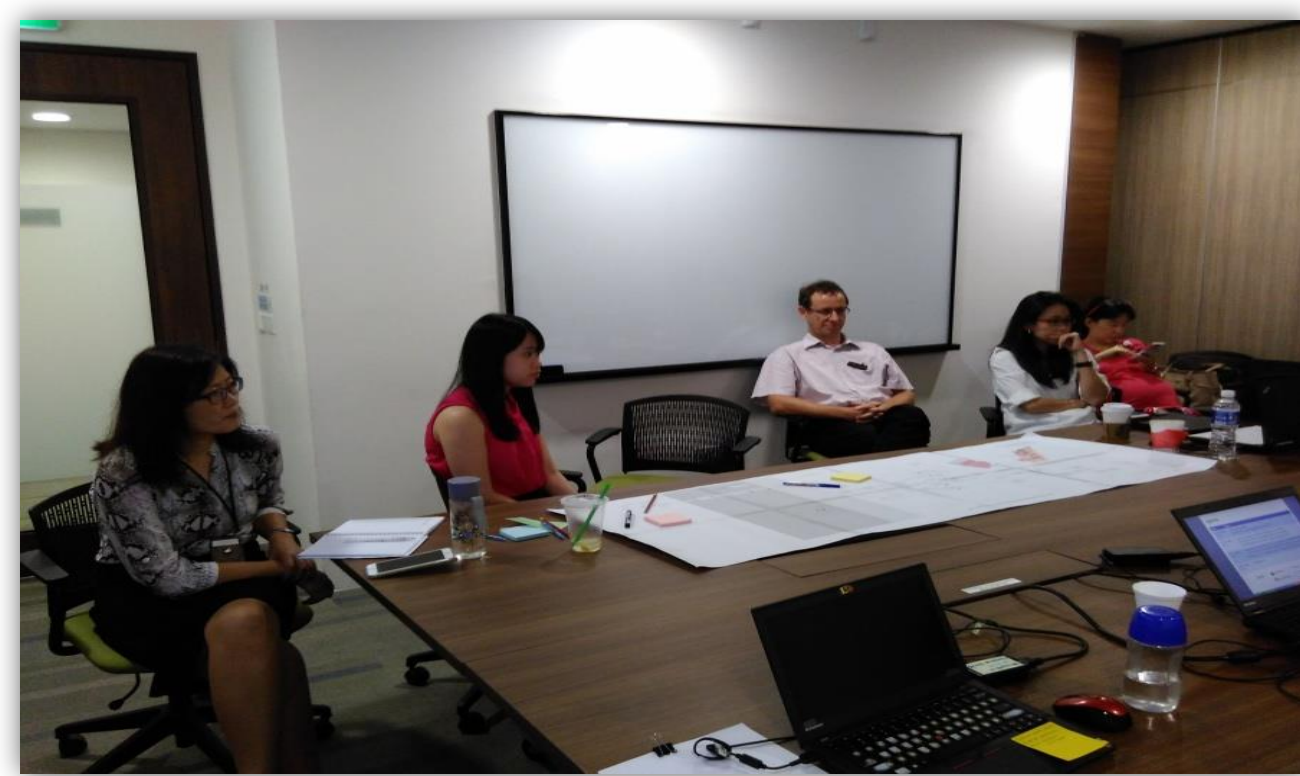


Fig 1. ASU team verified the current workflow

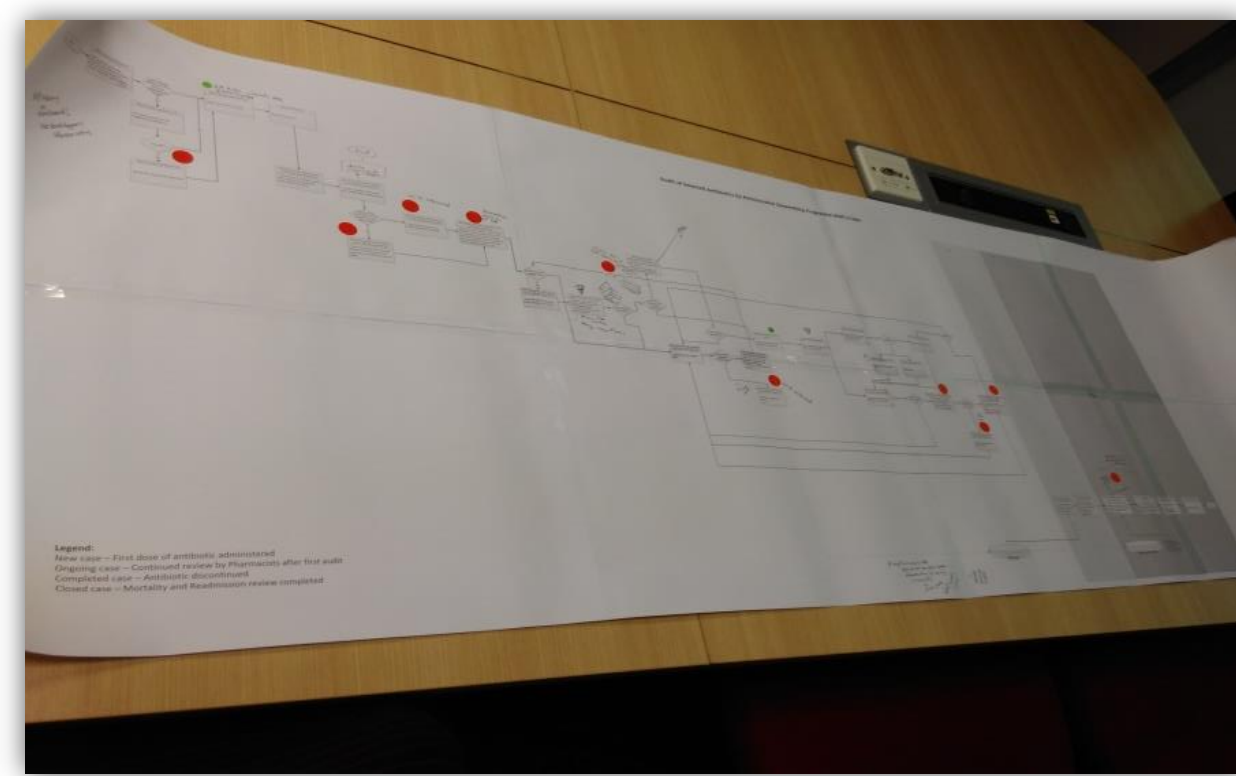


Fig 2. Non-value added steps were identified

- ASU team brainstormed and wrote their wish list on post-it notes
- Focus group findings were shared with the ASU team
- Keeping the wish list and focus group findings in mind, the ASU team proceeded to design the future ideal ASU workflow
- ASU team discussed solutions that bridged the gap between the current and ideal workflows (Figure 3)
- Two-by-two matrix with impact and effort as the criteria (Figure 4) was used to prioritise the solutions
- Action plan was discussed for implementation of solutions



Fig 3. ASU team brainstormed solutions

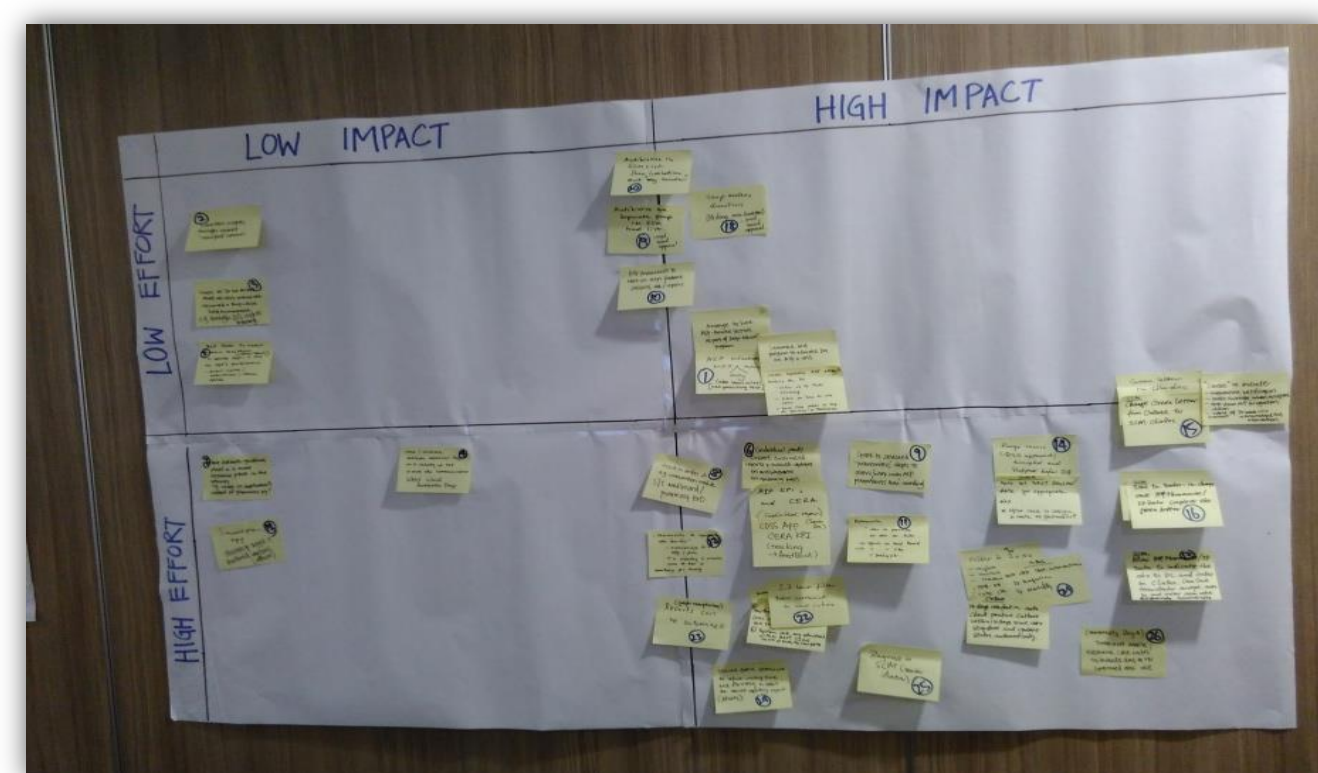


Fig 4. 2x2 matrix to prioritise action items

Results

Twenty improvement opportunities identified were categorised into three groups: **IT Enhancements, ASU Team's Role, Education & Benchmarking.** Initiatives requiring Medical Board's approval were presented and Medical Board's endorsement was obtained. The proposed IT solutions have also been put up for the FY2017 workplan and budget cycle.

Implemented Initiatives:

1) ASU Pharmacists Rounded with Doctors of Selected Departments

- Rounded with Internal Medicine (DIM) doctors from 15th August 2016, and extended joint rounding to Infectious Diseases and Vascular Surgery
- Number of ASU interventions and acceptance by doctors from mid-August to October are shown in Table 1
- Doctors gave feedback that ASU Pharmacists provided useful recommendations on both audited and non-audited antibiotics

Type of Intervention	Interventions Made	Accepted Interventions	% Accepted
Stopping an audited antibiotic from being ordered	2	2	100%
Audited antibiotic (in use)	13	13	100%
Non-audited antibiotic	33	31	94%
Total	48	46	96%

Table 1 Number and percentage of interventions accepted by doctors at ward rounds

2) Feedback on Individual and Department Performances

- ASU sent personal feedback to doctors that ordered audited antibiotics inappropriately
- ASU proposed for the following indicators to be displayed on Intranet for open benchmarking:
 - Appropriate selection of antibiotic indication
 - Appropriate prescription of audited antibiotics
 - Acceptance of ASU interventions
- Quarterly clinical HOD report was modified (Figure 5) to include a comparison across departments on the indicators

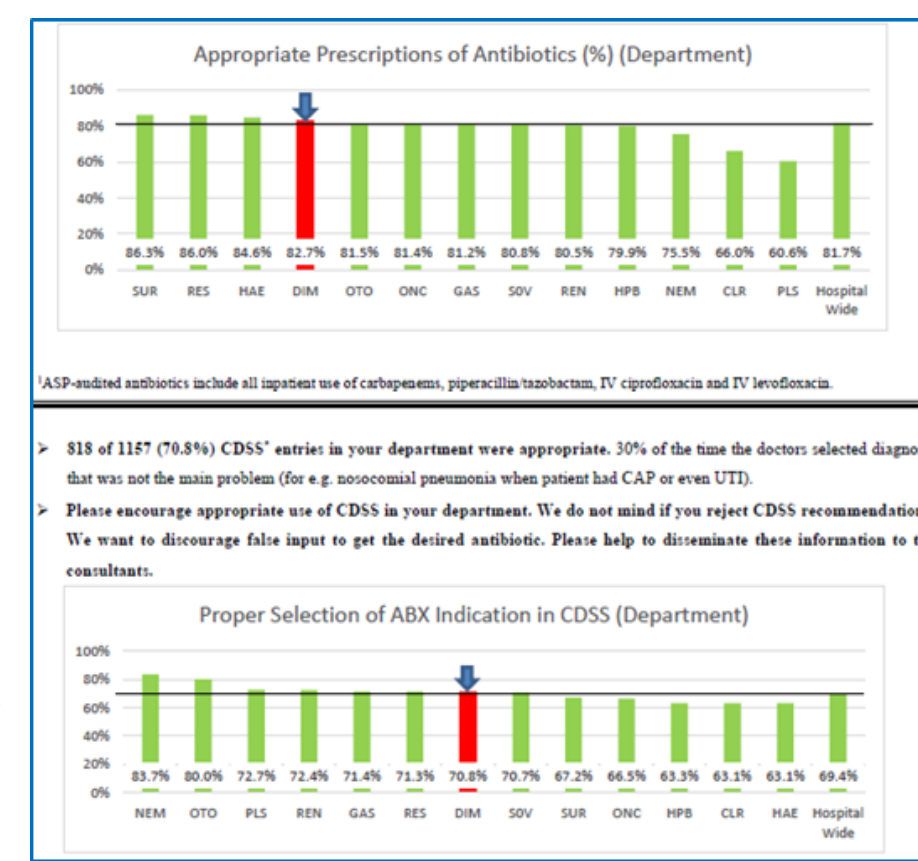


Fig 5. Excerpt of HOD report

3) Antibiotics Awareness Week to Increase Visibility of ASU

- ASU organised SGH's first Antibiotics Awareness Week (14th to 20th November 2016)
- 9 'Appropriate Antimicrobial Use' Awards were presented to doctors to promote appropriate antibiotic prescribing

Potential Man-Hour Savings:

Figure 6 shows the potential man-hours savings with stratification of workflows and implementation of proposed initiatives. Subtracting the time spent on rounding with doctors and organising the Antibiotics Awareness Week, **2,511 man-hours** may be saved in a year.

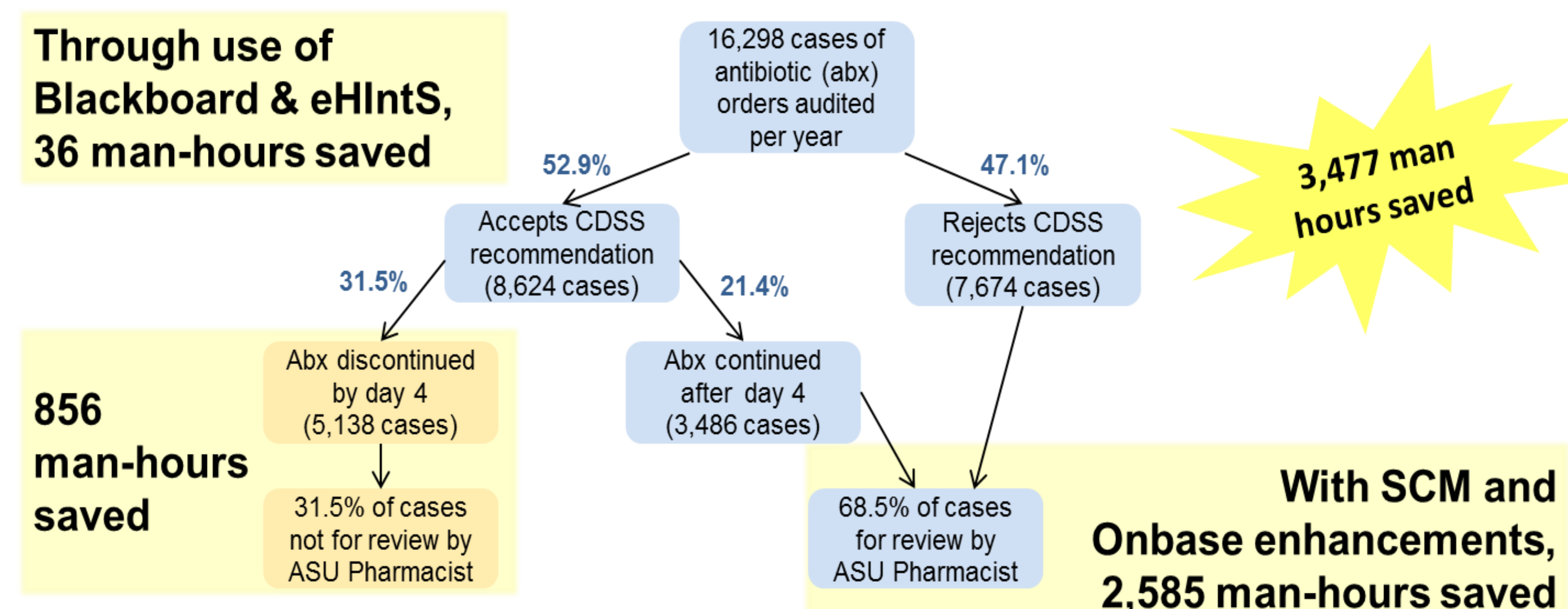


Fig 6. Potential man-hours saved with implementation of proposed initiatives

Conclusion

ASU has been functioning at its maximal capacity within existing resources. The proposed initiatives and IT enhancements, which are targeted towards a lean and more efficient workflow, will enable ASU to engage in more value-added activities such as point prevalence studies, while using existing manpower. Better use of manpower will enable the team to implement new strategies and engage physicians to continuously strive towards appropriate antibiotic use.