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ASP ANTIMICROBIAL STEWARDSHIP PROGRAM

Q2 REPORT:

FISCAL YEAR 2013 | 2014

MOUNT SINAI HOSPITAL
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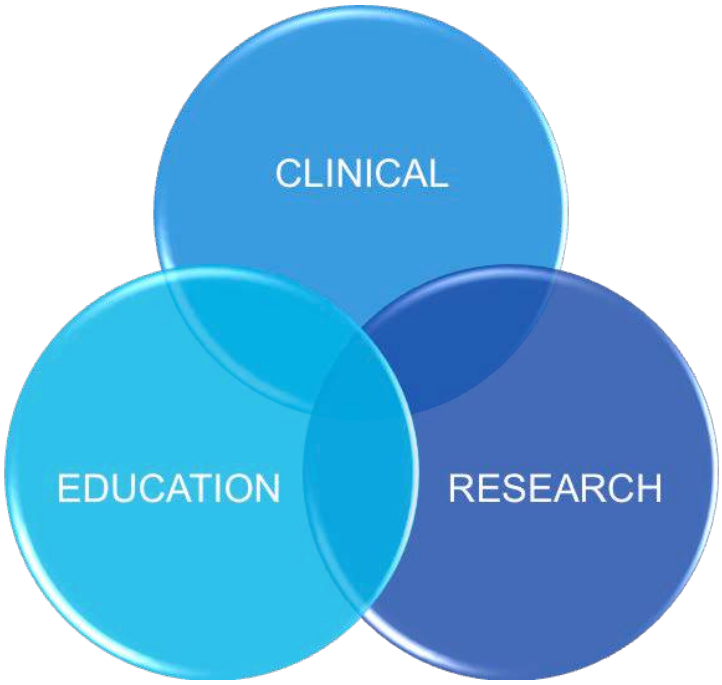
MSH + UHN ASP ANTIMICROBIAL STEWARDSHIP PROGRAM

"Getting patients the right antibiotics, when they need them"

EXECUTIVE SUMMARY

The Mount Sinai Hospital-University Health Network Antimicrobial Stewardship Program (ASP) has been active since 2009. The MSH-UHN ASP uses a collaborative and evidence-based approach to improve the quality of antimicrobial use by getting patients the right antibiotics, when they need them. The ASP follows quality improvement methodology to pursue the best possible clinical outcomes for its patients, relying heavily on patient-centred data.



The MSH-UHN ASP uses research and education, alongside clinical care, to take a leadership role in increasing antimicrobial stewardship capacity and improving the quality of health care.

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THE MSH-UHN ANTIMICROBIAL STEWARDSHIP TEAM

The MSH-UHN ASP team is a multi-disciplinary group comprised of physicians, pharmacists, microbiologists, project managers, data analysts and research coordinators.

PHYSICIAN TEAM

Andrew Morris, MD, SM, FRCPC
Medical Director, Antimicrobial Stewardship Program
Mount Sinai Hospital/University Health Network
Associate Professor, Department of Medicine
University of Toronto

Paul E. Bunce, MA, MD, FRCPC
Infectious Diseases and Internal Medicine
University Health Network
Assistant Professor, Department of Medicine
University of Toronto

Chaim Bell, MD, PhD, FRCPC
CIHR/CPSI Chair in Patient Safety & Continuity of Care
Mount Sinai Hospital
Associate Professor, Institute of Health Policy, Management, & Evaluation
University of Toronto

Shahid Husain, MD, MS
Director, Transplant Infectious Diseases
Division of Infectious Diseases and Multi-Organ Transplantation
University Health Network
Associate Professor, Department of Medicine
University of Toronto

PHARMACIST TEAM

Olavo Fernandes, PharmD
Clinical Director, Antimicrobial Stewardship Program
University Health Network
Assistant Professor (Status), Leslie Dan Faculty of Pharmacy
University of Toronto

Monique Pitre, B.Sc. Pharm, R.Ph., FCSHP
Manager, Pharmacy Clinical Informatics
Infectious Disease Pharmacist
University Health Network

Linda Dresser, PharmD, FCSHP
Pharmacotherapy Specialist – Antimicrobial Stewardship
University Health Network
Assistant Professor, Leslie Dan Faculty of Pharmacy
University of Toronto

Sandra Nelson, PharmD
Clinical Practice Leader – Infectious Diseases & Antimicrobial Stewardship
Mount Sinai Hospital

Kevin Duplisea, PharmD
Pharmacotherapy Specialist – Antimicrobial Stewardship
University Health Network

Miranda So, PharmD
Pharmacotherapy Specialist – Antimicrobial Stewardship
University Health Network
Assistant Professor (Status), Leslie Dan Faculty of Pharmacy, University of Toronto.

OPERATIONS TEAM

Josie Hughes, BSc, MRM, PhD, Post-Doctoral Fellow
Researcher, Antimicrobial Stewardship Program
Mount Sinai Hospital and York University

Stephanie Olegario
Administrative Assistant, Antimicrobial Stewardship Program
University Health Network

Tanaz Jivraj, RN, BScN, MBA
Project Manager, Antimicrobial Stewardship Program
Mount Sinai Hospital/University Health Network

Marilyn Steinberg, RN
Research Coordinator, Antimicrobial Stewardship Program
Mount Sinai Hospital

Lopa Naik, BSc, MCA (*On maternity leave)*
Technical Analyst, Antimicrobial Stewardship Program
University Health Network

Melanie Thomson, BA, CHIM
Data Analyst, Antimicrobial Stewardship Program
Mount Sinai Hospital

Yoshiko Nakamachi, RN, BScN, BA
Project Manager, CAHO Project
Mount Sinai Hospital

Sarah West, RN
Consultant, Antimicrobial Stewardship Program
Mount Sinai Hospital

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KEY HIGHLIGHTS

NATIONAL ANTIBIOTIC AWARENESS WEEK:

November 18-22nd was National Antibiotic Awareness Week. The MSH-UHN ASP had a busy and interactive week across the hospitals. This year, the ASP developed a Medical Animation video which was available on the ASP YouTube site. Links to this video were included in all-users emails at both sites promoting Antibiotic Awareness Week and the ASP. An Open House was held on Monday and attended by colleagues across all sites, including Pharmacy, SIMS, Infection Prevention and Control/Infection Control, and Quality and Performance Measurement. The ASP had a booth at each site to build awareness to staff and patients/families about the program. Education sessions were also held in Pharmacy and finally, two patient testimonials were shared in collaboration with Communications and Marketing.

ANTIMICROBIAL CONSUMPTION AND COSTS:

The ASP continues to work with clinical teams across all four hospitals.
Antimicrobial consumption and costs by site are included below. Detailed tables and graphs are appended.

MOUNT SINAI HOSPITAL ICU

The ASP continues to work with the Mount Sinai Hospital (MSH) Intensive Care Unit (ICU). FY 13/14 YTD highlights include:

- Antimicrobial usage (using defined daily doses (DDDs) per 100 patient days) decreased (↓) by 3% compared to YTD last year.
- Antimicrobial costs per patient day increased (↑) by 23% compared to YTD last year.
- Patients originating from Princess Margaret accounted for approximately 17% of patient visits and 72% of the antimicrobial costs (please refer to the MSH ICU Total Antimicrobial Costs Table in the Appendix).

PRINCESS MARGARET CANCER CENTRE: LEUKEMIA SERVICE

The ASP continues to work with the Princess Margaret Leukemia Service (14A, 15A, 15B). FY 13/14 YTD highlights include:

- Antimicrobial usage (using defined daily doses (DDDs) per 100 patient days) increased (↑) by 5% compared to YTD last year.
- Antimicrobial costs per patient day decreased (↓) by 18% compared to YTD last year.

TORONTO GENERAL HOSPITAL CARDIOVASCULAR ICU

The ASP continues to work with the Toronto General Hospital CVICU. FY 13/14 YTD highlights include:

- Antimicrobial usage (using defined daily doses (DDDs) per 100 patient days) increased (↑) by 7% compared to YTD last year.
- Antimicrobial costs per patient day decreased (↓) by 13% compared to YTD last year.

TORONTO GENERAL HOSPITAL MEDICAL SURGICAL ICU

The ASP continues to work with the Toronto General Hospital MSICU. FY 13/14 YTD highlights include:

- Antimicrobial usage (using defined daily doses (DDDs) per 100 patient days) increased (↑) by 9% compared to YTD last year.
- Antimicrobial costs per patient day increased (↑) by 7% compared to YTD last year.

MOUNT SINAI HOSPITAL NEONATAL ICU

The ASP initiative in the Neonatal Intensive Care Unit (NICU) was started in October 2012 with strong support from the neonatology group. We have collected days of therapy (DOT) as the metric for antimicrobial consumption, which is considered to be the standard for neonates. FY 13/14 YTD highlights include:

- Antimicrobial days of therapy (DOT) per 100 patient days decreased (↓) by 10% by compared to YTD last year.

- Antimicrobial costs per patient day increased (↑) by 85% compared to YTD last year ($1.01 to $2.01), and represent a small fraction of the costs involved in adult ICU care.

TORONTO WESTERN HOSPITAL ICU

The ASP continues to work with the Toronto Western Hospital ICU. FY 13/14 YTD highlights include:

- Antimicrobial usage (using defined daily doses per 100 patient days) increased (↑) by 19% compared to YTD last year
- Antimicrobial costs per patient day increased (↑) by 63% compared to YTD last year.

BEST PRACTICE GUIDELINES & ALGORITHMS:

- The ASP team has been working with various stakeholders (especially General Internal Medicine, Emergency Medicine, and Infectious Diseases recently) to standardize common practices. We have developed a variety of 1-page summaries (available on our website and soon to be available via handheld device) serving as clinical decision support for frontline providers.
- We have begun work on a Pulmonary Infiltrates in Immunocompromised Hosts algorithm through a Working Group of key stakeholders.
- A VAP algorithm has been in use at MSH ICU since November 2011, TGH MSICU since June 2012, TWH ICU since July 2012 and TGH CVICU since October 2012.
- The High Risk Febrile Neutropenia Protocol, developed recently, is currently being introduced to various clinical groups as part of its knowledge translation strategy.

RESEARCH:

Multiple research projects continue, with many important projects nearing completion and being prepared for submission to key medical journals. The following manuscripts are currently in preparation:

- Antimicrobial stewardship using dynamic prospective audit and feedback in tertiary intensive care units: a multi-site prospective study
- A national survey of critical care physicians' knowledge, attitudes and perceptions of antimicrobial stewardship programs
- A Point Prevalence Study to Evaluate Clinical Compliance with an Interdisciplinary Ventilator Associated Pneumonia Algorithm in the Intensive Care Unit
- Usefulness of Past Methicillin Resistant Staphylococcus aureus Screening Swab in Predicting Methicillin Resistance and Guiding Empiric Antimicrobial Therapy for S. aureus Bacteremia

The following projects are currently undergoing the final stages of data analysis:

- Analysis of Investigations, Treatments and Outcomes associated with Staphylococcus aureus Bacteremia in the Greater Toronto Area
- Analysis of Investigations, Antifungal Treatments, and Outcomes Associated with Patients with Acute Myeloid Leukemia Undergoing First Remission-Induction Chemotherapy at Princess Margaret Hospital

Q2 Posters Presented

- Cost-of-illness Analysis of *Staphylococcus aureus* Bacteremia. Nisha Thampi MD, MSc, Adrienne Showler MD, Lisa Burry PharmD, Anthony Bai BHSc, Marilyn Steinberg RN, Chaim Bell MD PhD, Andrew Morris MD SM. Poster presentation to IDSA Annual Meeting, San Francisco, CA; October 2-6, 2013
- A National Survey of Critical Care Physicians' Knowledge, Attitudes and Perceptions of Antimicrobial Stewardship Programs. Marilyn Steinberg RN, Linda Dresser PharmD, Nicole Marinoff RN, Andrea Matte RRT, Orla Smith MScN, Nick Daneman MD MSc, Chaim M. Bell MD PhD, Andrew M. Morris MD SM. Poster presentation to the Critical Care Canada Forum. Toronto, ON; November 10-12, 2013. **Winner: 'Best Scientific Poster' Award**

Q2 Grant Awards received by members of our program:

- 2013-2014 Evaluating the Impact of Antimicrobial Stewardship Prospective Audit-and-Feedback Intervention in Patients with Malignant Haematological Diseases. Canadian Society of Hospital Pharmacists Scott Walker Research Grant. Principal Applicant: Miranda So. Collaborators: Shahid Husain, MD; Andre Schuh, John Kuruvilla, Mark Minden, MD, Muhammad Mamdani, PharmD, Sue Poutanen, MD, Marilyn Steinberg, RN, Chaim Bell, MD, Andrew Morris, MD. $1000 CAD

As a result of a previous awarded CIHR Dissemination Grant (Principal Applicant- Dr. Andrew Morris) to share "Early Results and Lessons Learned from Ontario's Roll-out of Antimicrobial Stewardship Programs", a half-day ASP program was held at the Critical Care Canada Forum in Toronto on November 12, 2013.

Josie Hughes, a post-doctoral fellow with expertise in ecology and mathematical modeling, has commenced her work with the ASP on developing an Antimicrobial Resistance Diversity Index. This work, supported by a CIHR-NSERC grant, has potentially far-reaching implications for advancing the fields of antimicrobial stewardship and infection control.

EDUCATION:

A Canadian Society of Hospital Pharmacists grant, Developing and Evaluating an Educational Intervention to Guide the Implementation of Antimicrobial Stewardship Programs in Community Hospitals Across Ontario, was awarded to develop education modules for community hospitals regarding antimicrobial stewardship. There are 13 sites across Ontario recruited to the grant; there will be a series of lectures on stewardship principles and therapeutic topics over a 6 month period and each site will gather and report baseline and ongoing antimicrobial consumption data. Impact of the program at each site will be measured by antimicrobial consumption and a series of surveys among users and frontline clinicians. Clinical team members are recording presentations as part of the dissemination of education. As well, a medical animation series related to antimicrobial stewardship is underway. The first medical animation module was for hospital staff and the general public related to the importance of antimicrobial stewardship, and is featured on the ASP website and ASP YouTube page. This has also been featured by AMMI Canada and Canadian Healthcare News.

Link to the Medical Animation Video on the ASP YouTube site: http://www.youtube.com/user/TorontoASP

The ASP is involved in developing the next generation of antimicrobial stewards by being a part of the new Year 3 Elective "Introduction to Antimicrobial Stewardship" at the Leslie Dan Faculty of Pharmacy (Course Coordinator: Miranda So). At least 100 students are currently enrolled. The course will give pharmacy students a 360-view of antimicrobial stewardship in different patient settings, encompassing clinical practice; change management; program development; and an introductory component to research.

PROVINCIAL ROLE:

CAHO ASP ARTIC Project:

The MSH-UHN ASP continues to lead the provincial initiative assisting the academic hospitals throughout Ontario in implementing a stewardship program in their ICUs. Project initiation was in January 2012 and the project is due to be completed in December 2013 with the final report being submitted in March 2014.

All 14 participating ICUs have implemented their ASP, and the MSH-UHN ASP project team has completed their post-implementation on-site visits at the academic hospitals. The main objective of the post-implementation visit is to evaluate each hospital's program and identify opportunities to improve their current ASP, identify potential threats, and provide guidance for sustainability and growth of their ASP beyond the ICU. A formal post-implementation visit report is then provided to the hospital's stakeholders.

Critical Care Services Ontario (CCSO):

The MSH-UHN ASP has been working with CCSO (formerly known as the Critical Care Secretariat) in developing reports for three new antimicrobial indicators in the Critical Care Information System (CCIS). These reports will allow each adult ICU in Ontario to evaluate their Antimicrobial use (days of antibacterial therapy, days of antifungal therapy), and ICU-onset C. difficile. The data for these indicators are collected and entered into CCIS on a daily basis, and includes data from January 21st, 2013 and onwards. This is the first such provincial network of antimicrobial utilization implemented anywhere in Canada.

In addition, the MSH-UHN ASP has partnered with CCSO in a new provincial initiative to assist community hospitals in setting up an antimicrobial stewardship program (ASP). The team has identified gaps in knowledge and process relating to antimicrobial stewardship in the community. Our collaborative efforts will also help these sites meet Accreditation Canada's Required Organizational Practice for Antimicrobial Stewardship. This project

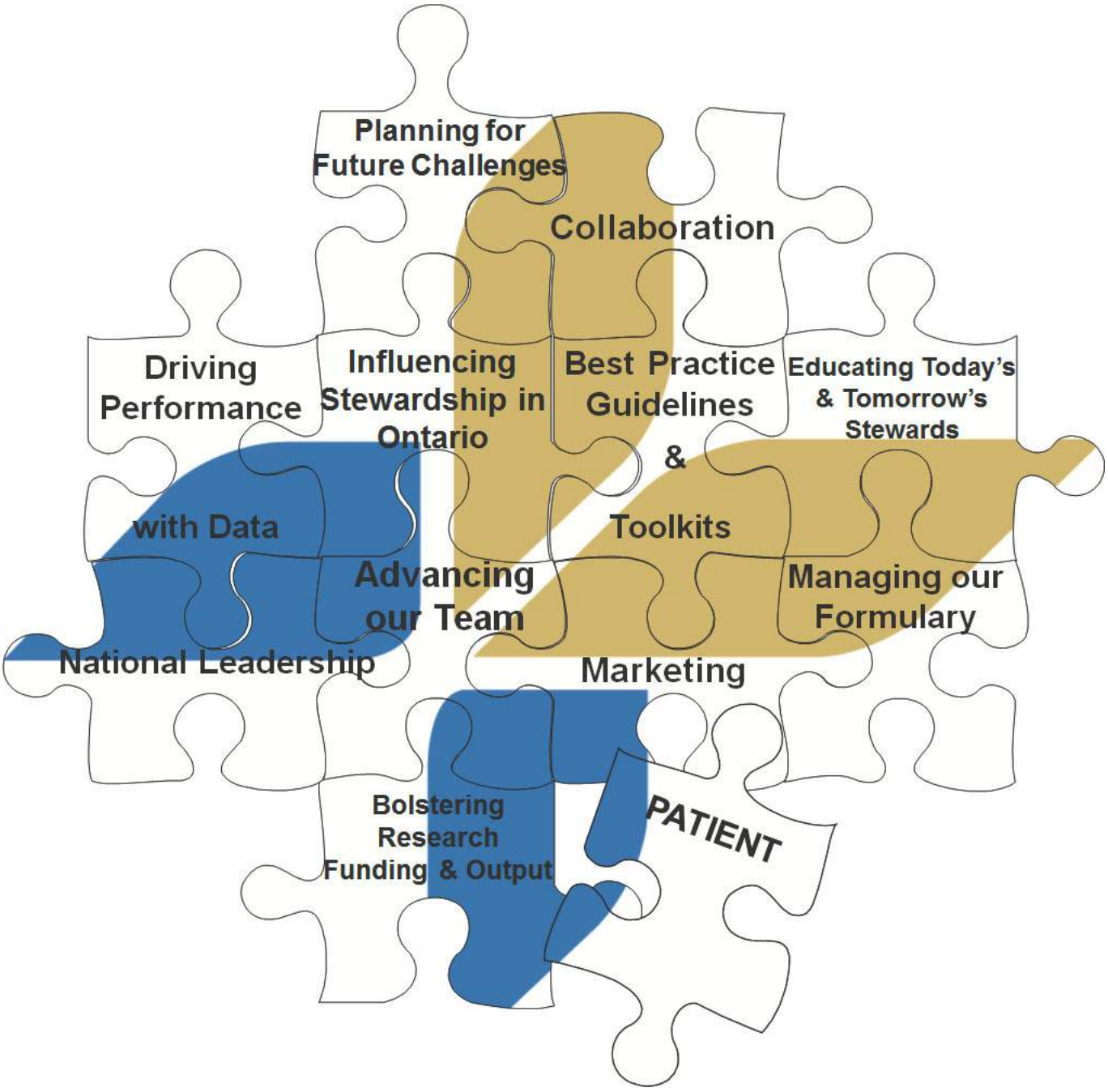
includes a phased approach to assist sites in the preparation, implementation, and evaluation of their ASP. The MSH-UHN ASP team will be providing content expertise and tools in addition to providing site specific coaching and support. The goal is to have sites implement their ASP in January/February 2014. The project has been endorsed by Accreditation Canada.

Critical Care Canada Forum (CCCF) 2013:
The MSH-UHN ASP team had a dedicated half-day ASP track at the CCCF conference (the largest Critical Care Conference in Canada annually) this November whereby "Lessons learned from the CAHO ASP ARTIC project" were disseminated. This was the first time an ASP track was included in CCCF's annual conference.

STRATEGIC PLANNING:

The MSH-UHN ASP Strategic Plan 2013-2016 is available on the ASP website. Please contact Stephanie Olegario (Stephanie.Olegario@uhn.ca) if you would like a copy.

MSH-UHN Antimicrobial Stewardship Program Strategic Priorities:



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APPENDIX

MOUNT SINAI HOSPITAL: ICU

Indicators	FY 08/09 (Pre-ASP)	FY 09/10	FY 10/11	FY 11/12	FY 12/13	FY13/14 Performance					YTD of Previous Year
						Q1	Q2	Q3	Q4	YTD	
Antimicrobial Usage & Costs											
Total Antimicrobial DDDs/100 Patient Days	177	171	144	167	170	143	176			160	164
Systemic Antibacterial DDDs/100 Patient Days	142	128	111	128	127	110	132			121	123
Systemic Antifungal DDDs/100 Patient Days	31	24	20	33	35	27	37			32	34
Total Antimicrobial Costs	$332,724	$285,975	$193,129	$279,859	$291,470	$64,634	$127,482			$192,116	$156,129
Total Antimicrobial Costs/Patient Day	$69.01	$59.23	$40.95	$59.22	$62.37	$55.48	$103.31			$80.08	$65.22
Systemic Antibacterial Costs	$174,339	$142,134	$95,773	$125,339	$134,811	$21,387	$34,127			$55,514	$73,225
Systemic Antibacterial Costs/Patient Days	$36.16	$29.44	$20.31	$26.94	$28.85	$18.36	$27.66			$23.14	$30.59
Systemic Antifungal Costs	$143,100	$132,519	$88,998	$141,877	$144,811	$40,572	$89,203			$129,775	$75,152
Systemic Antifungal Costs/Patient Days	$29.68	$27.45	$18.87	$30.50	$30.99	$34.83	$72.29			$54.10	$31.39
Patient Care Outcomes											
Hospital acquired C. difficile cases (rate per 1,000 pt days)	NA	NA	NA	5 (1.07)	8 (1.71)	0 (0.0)	1 (0.81)			1 (0.42)	3 (2.36)
ICU Average Length of Stay (days)	5.84	5.57	5.67	5.51	5.24	6.06	5.39			5.71	5.43
ICU Mortality Rate (as a %)	20.1	17.6	16.3	16.5	17.04	16.3	13.9			15.1	16.6
ICU Readmission Rate within 48 hrs (as a %)	3.2	2.9	2.7	2.7	1.86	4.0	3.9			3.9	1.6
ICU Ventilator Days	NA	3286	2934	2677	2749	747	748			1495	1366
ICU Multiple Organ Dysfunction Score (MODS)	4.00	4.04	4.12	4.25	4.62	4.73	4.69			4.71	4.58

Notes: Defined Daily Dose (DDD) is an internationally accepted method to measure and compare antimicrobial usage (World Health Organization, http://www.whocc.no/atc_ddd_index/)
Total Antimicrobial DDDs is the sum of systemic antibacterial DDDs + systemic antifungal DDDs + systemic antivirals; non-systemic antimicrobials are excluded
Data Sources: Antimicrobial DDD and Costs (Pharmnet), C difficile (Infection Control Dashboards), Other ICU Patient Care Indicators (Critical Care Information System).

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PRINCESS MARGARET CANCER CENTRE: LEUKEMIA SERVICE (14A, 15B, 15C)

Indicators	FY 09/10	FY 10/11	FY 11/12	FY 12/13	FY13/14 Performance Q1	Q2	Q3	Q4	YTD	YTD of Previous Year
Antimicrobial Usage & Costs										
Total Antimicrobial DDDs/100 Patient Days	295	274	282	253	264	265			264	252
Systemic Antibacterial DDDs/100 Patient Days	191	167	164	149	146	145			145	143
Systemic Antifungal DDDs/100 Patient Days	104	107	105	104	117	120			119	108
Total Antimicrobial Costs	$1,768,317	$1,641,331	$1,310,857	$4,720,505	$392,066	$362,634			$754,700	$929,579
Total Antimicrobial Costs/Patient Day	$167.12	$154.32	$115.13	$128.91	$120.93	$111.24			$116.07	$141.53
Systemic Antibacterial Costs	$659,034	$609,747	$663,175	$1,931,956	$124,075	$123,513			$247,588	$358,821
Systemic Antibacterial Costs/Patient Days	$62.28	$57.33	$58.24	$45.85	$38.27	$37.89			$38.08	$54.63
Systemic Antifungal Costs	$1,109,283	$1,031,584	$647,637	$2,788,504	$267,990	$239,121			$507,111	$570,758
Systemic Antifungal Costs/Patient Days	$104.84	$96.99	$56.88	$83.06	$82.66	$73.35			$77.99	$86.90
Patient Care Outcomes										
Hospital acquired C. Difficile cases (rate per 1,000 patient days)	6 (0.56)	7 (0.65)	14 (1.17)	5 (.51)	2 (.62)	2(0.61)			4 (.62)	3 (.46)

Notes: Defined Daily Dose (DDD) is an internationally accepted method to measure and compare antimicrobial usage (World Health Organization, http://www.whocc.no/atc_ddd_index/)
Total Antimicrobial DDDs is the sum of systemic antibacterial DDDs + systemic antifungal DDDs; non-systemic antimicrobials and antivirals are excluded
Data Sources: Antimicrobial DDD and Costs (Centricity)

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TORONTO GENERAL HOSPITAL: CVICU

Indicators	FY 10/11 (Pre-ASP)	FY 11/12	FY 12/13	FY13/14 Performance					YTD of Previous Year
				Q1	Q2	Q3	Q4	YTD	
Antimicrobial Usage & Costs									
Total Antimicrobial DDDs/100 Patient Days	115	98	102	76	152			112	105
Systemic Antibacterial DDDs/100 Patient Days	104	86	89	67	139			101	92
Systemic Antifungal DDDs/100 Patient Days	11	12	13	10	13			11	13
Total Antimicrobial Costs	$117,356	$107,795	$85,596	$23,405	$15,227			$38,632	$42,784
Total Antimicrobial Costs/Patient Day	$19.75	$18.94	$14.93	$15.18	$11.04			$13.23	$15.29
Systemic Antibacterial Costs	$109,110	$98,591	$73,627	$16,738	$12,901			$29,638	$36,601
Systemic Antibacterial Costs/Patient Days	$18.36	$17.32	$12.84	$10.85	$9.36			$10.15	$13.08
Systemic Antifungal Costs	$8,246	$9,204	$11,969	$6,667	$2,326			$8,993	$6,183
Systemic Antifungal Costs/Patient Days	$1.39	$1.62	$2.09	$4.32	$1.69			$3.08	$2.21
Patient Care Outcomes									
Hospital acquired C. difficile cases (rate per 1,000 pt days)	2 (0.34)	5 (0.88)	6 (1.05)	1 (0.65)	5(3.63)			6 (2.05)	3 (1.07)
ICU Average Length of Stay (days)	3.12	2.95	2.97	3.26	2.91			3.1	2.92
ICU Mortality Rate (as a %)	3.5	3.0	3.0	3.0	4.2			4.0	3.2
ICU Readmission Rate within 48 hrs (as a %)	1.6	2.2	1.8	2.4	2.4			2.4	2.4
Central Line Infection Rate (per 1000 pt days)	0.73	0.17	0.34	0.0	0.0			0.00	0.35
Ventilator Associated Pneumonia Rate (per 1000 pt days)	2.99	2.80	1.91	2.95	1.04			2.0	1.14
ICU Multiple Organ Dysfunction Score (MODS)	6.22	6.07	5.51	5.72	5.8			5.8	5.96
ICU Ventilator Days	3015	3571	3676	1018	963			1981	1759

Notes: * Due to an error in the Centricity Pharmacy data we are unable to provide accurate DDD data and utilization cost for the CVICU for the 4th quarter of fiscal 11/12 and 1st quarter of fiscal 12/13. Use of Centricity data resumes effective 2nd quarter of fiscal 12/13.
** FY 11/12 Q4 and FY 12/13 Q1 Total Antimicrobial, Total Antibacterial and Total Antifungal Costs and DDD are taken from the estimated Centricity cost/DDD, which is 95% of the General Ledger (GL) cost/DDD.
Defined Daily Dose (DDD) is an internationally accepted method to measure and compare antimicrobial usage (World Health Organization, http://www.whocc.no/atc_ddd_index/)
Total Antimicrobial DDDs is the sum of systemic antibacterial DDDs + systemic antifungal DDDs; non-systemic antimicrobials and antivirals are excluded
Data Sources: Antimicrobial DDD and Costs (Centricity)

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TORONTO GENERAL HOSPITAL: MSICU

Indicators	FY 09/10 (Pre-ASP)	FY 10/11	FY 11/12	FY 12/13	FY13/14 Performance					YTD of Previous Year
					Q1	Q2	Q3	Q4	YTD	
Antimicrobial Usage & Costs										
Total Antimicrobial DDDs/100 Patient Days	266	208	200	214	192	295			245	224
Systemic Antibacterial DDDs/100 Patient Days	184	153	141	160	144	224			185	166
Systemic Antifungal DDDs/100 Patient Days	82	55	55	54	49	71			60	58
Total Antimicrobial Costs	$701,451	$627,540	$572,443	$472,334	$127,286	$168,046			$295,332	$255,376
Total Antimicrobial Costs/Patient Day	$102.52	$83.81	$77.60	$63.58	$67.99	$86.31			$77.33	$72.61
Systemic Antibacterial Costs	$390,209	$373,504	$288,775	$229,892	$46,929	$74,461			$121,390	$133,572
Systemic Antibacterial Costs/Patient Days	$57.03	$49.88	$39.15	$30.95	$25.07	$38.24			$31.79	$37.98
Systemic Antifungal Costs	$311,242	$254,036	$275,176	$242,443	$80,357	$93,585			$173,942	$121,804
Systemic Antifungal Costs/Patient Days	$45.49	$33.93	$37.30	$32.63	$42.93	$48.07			$45.55	$34.63
Patient Care Outcomes										
Hospital acquired C. difficile cases (rate per 1,000 pt days)	10 (1.46)	10 (1.33)	11 (1.49)	11 (1.48)	2 (1.07)	2(1.03)			4 (1.05)	7 (1.99)
ICU Average Length of Stay (days)	8.24	8.61	8.85	7.79	8.10	7.30			7.70	7.22
ICU Mortality Rate (as a %)	16.2	15.7	16.3	16.0	19.2	14.7			16.9	15.3
ICU Readmission Rate within 48 hrs (as a %)	3.8	4.4	4.4	2.8	5.8	3.5			4.6	3.2
ICU Ventilator Days	5399	6256	6507	6458	1704	1791			3495	2961
Apache II score	n/a	n/a	16.1	15.775	15.0	14.6			14.8	15.7

Notes:
* Due to an error in the Centricity Pharmacy data we are unable to provide accurate DDD data and utilization cost for the TGH ICU for the 1st quarter of fiscal 12/13. Use of Centricity data resumes effective 2nd quarter of fiscal 12/13. FY 12/13 Q1 Costs and DDD are taken from the estimated Centricity cost, which is 95% of the GL cost.
Defined Daily Dose (DDD) is an internationally accepted method to measure and compare antimicrobial usage (World Health Organization, http://www.whocc.no/atc_ddd_index/)
Total Antimicrobial DDDs is the sum of systemic antibacterial DDDs + systemic antifungal DDDs; non-systemic antimicrobials and antivirals are excluded
Data Sources: Antimicrobial DDD and Costs (Centricity)

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MOUNT SINAI HOSPITAL: NICU

Indicators	FY 11/12	FY 12/13	FY13/14 Performance					YTD of Previous Year
			Q1	Q2	Q3	Q4	YTD	
Antimicrobial Usage & Costs								
Total Antimicrobial DOTs/100 Patient Days	67.3	55.5	49.2	48.8			49.0	54.6
Systemic Antibacterial DOTs/100 Patient Days	65.1	53.6	48.7	48.2			48.4	52.9
Systemic Antifungal DOTs/100 Patient Days	2.2	1.8	0.6	0.7			0.6	1.7
Total Antimicrobial Costs	$16,415	$17,707	$6,195	$5,243			$11,438	$6,663
Total Antimicrobial Costs/Patient Day	$1.31	$1.51	$2.15	$1.90			$2.03	$1.10
Systemic Antibacterial Costs	$14,783	$16,530	$6,131	$5,196			$11,327	$6,130
Systemic Antibacterial Costs/Patient Days	$1.18	$1.41	$2.13	$1.88			$2.01	$1.01
Systemic Antifungal Costs	$1,632	$1,177	$64	$47			$111	$534
Systemic Antifungal Costs/Patient Days	$0.13	$0.10	$0.02	$0.02			$0.02	$0.09

Notes:
Days of Therapy (DOT) was used as the metric for antimicrobial consumption, which is considered to be the standard for neonates.
Patient Care Outcome data is underway.

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MSH + UHN ASP ANTIMICROBIAL STEWARDSHIP PROGRAM

TORONTO WESTERN HOSPITAL: ICU

Indicators	FY 08/09 (Pre-ASP)	FY 09/10	FY 10/11	FY 11/12	FY 12/13	FY13/14 Performance					YTD of Previous Year
						Q1	Q2	Q3	Q4	YTD	
Antimicrobial Usage & Costs											
Total Antimicrobial DDDs/100 Patient Days	101	88	79	83	83	90	95			93	78
Systemic Antibacterial DDDs/100 Patient Days	94	78	73	77	78	85	85			85	75
Systemic Antifungal DDDs/100 Patient Days	6	10	6	6	5	5	11			8	3
Total Antimicrobial Costs	$138,502	$100,408	$101,191	$105,899	$102,978	$37,529	$28,499			$66,028	$37,102
Total Antimicrobial Costs/Patient Day	$18.39	$13.24	$13.17	$13.60	$13.37	$18.09	$14.80			$16.51	$10.10
Systemic Antibacterial Costs	$123,278	$87,445	$79,280	$89,784	$70,099	$20,426	$23,389			$43,815	$34,771
Systemic Antibacterial Costs/Patient Days	$16.37	$11.53	$10.32	$11.53	$9.10	$9.85	$12.15			$10.96	$9.46
Systemic Antifungal Costs	$13,444	$12,963	$21,911	$16,115	$32,879	$17,103	$5,109			$22,212	$2,332
Systemic Antifungal Costs/Patient Days	$1.79	$1.71	$2.85	$2.07	$4.27	$8.25	$2.65			$5.55	$0.63
Patient Care Outcomes											
Hospital acquired C. difficile cases (rate per 1,000 pt days)	6 (0.79)	9 (1.18)	4 (0.52)	13 (1.66)	5 (0.65)	3 (1.45)	3(1.55)			6 (1.50)	3 (0.82)
ICU Average Length of Stay (days)	8.39	7.44	10.68	9.71	7.98	6.17	9.69			7.85	7.83
ICU Mortality Rate (as a %)	19.6	19.9	18.1	17.0	16.4	14.3	21.4			17.6	16.0
ICU Readmission Rate within 48 hrs (as a %)	3.9	4.7	4.9	3.21	3.00	5.56	4.3			4.99	1.74
ICU Ventilator Days	4617	6305	5960	5578	4947	1339	1297			2636	2285
ICU Apache II Score	15.0	14.7	13.7	13.8	12.9	12.7	13.3			13.0	13.1

Notes:
* Due to an error in the Centricity Pharmacy data we are unable to provide accurate DDD data and utilization cost for the TGH ICU for the 1st quarter of fiscal 12/13. Use of Centricity data resumes effective 2nd quarter of fiscal 12/13. FY 12/13 Q1 Costs and DDD are taken from the estimated Centricity cost, which is 95% of the GL cost.
Defined Daily Dose (DDD) is an internationally accepted method to measure and compare antimicrobial usage (World Health Organization, http://www.whocc.no/atc_ddd_index/)
Total Antimicrobial DDDs is the sum of systemic antibacterial DDDs + systemic antifungal DDDs; non-systemic antimicrobials and antivirals are excluded
Data Sources: Antimicrobial DDD and Costs (Centricity)

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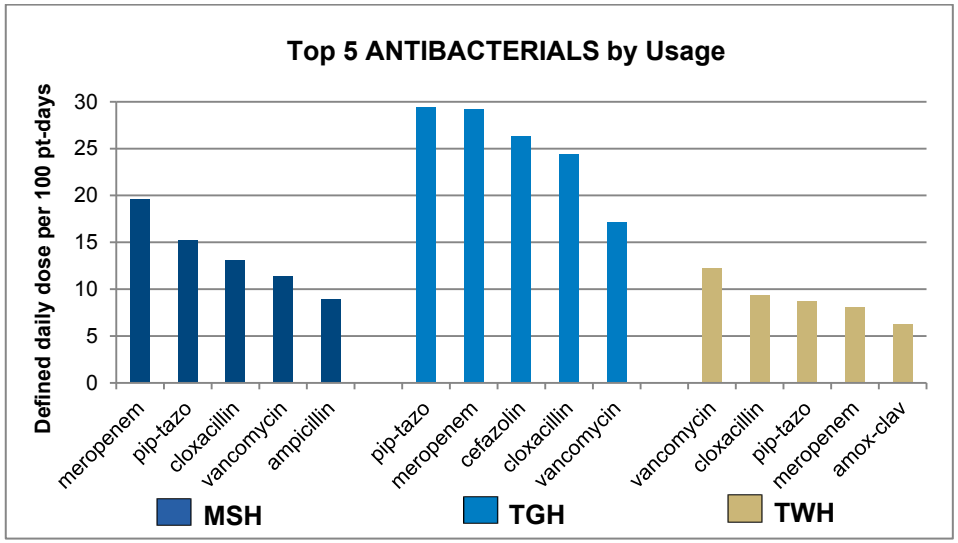
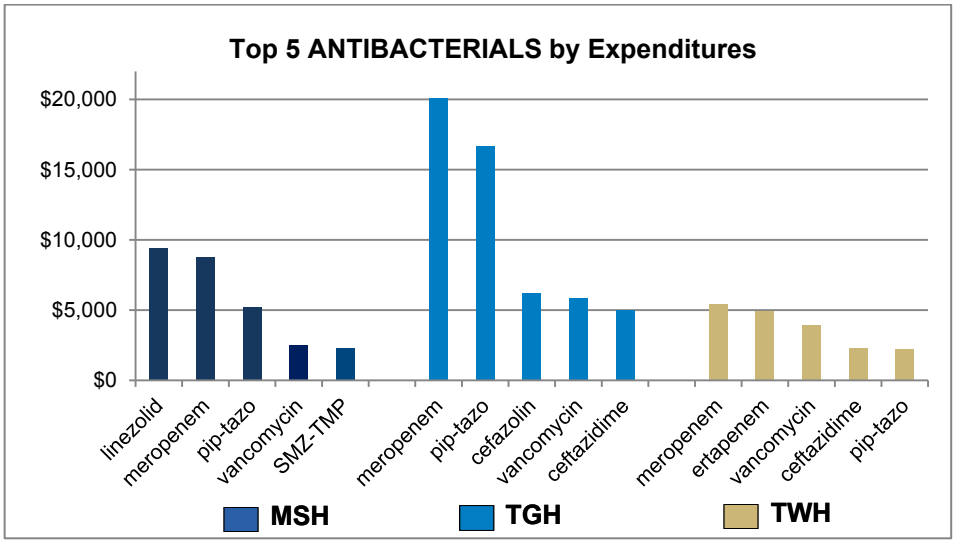
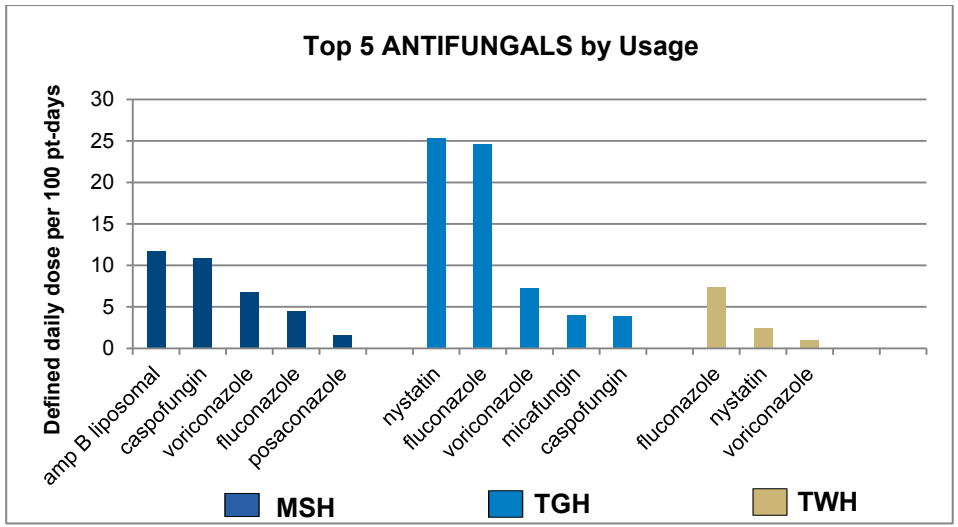
MSH + UHN ASP ANTIMICROBIAL STEWARDSHIP PROGRAM

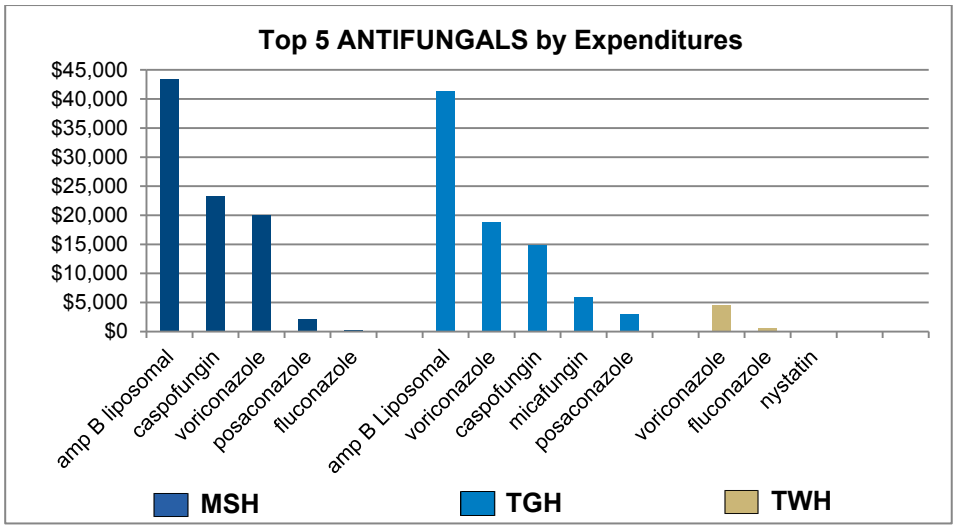
FY 13/14 Q2 Top 5 ANTIBACTERIALS by Usage (DDDs per 100 patient-days) and Expenditures





FY 13/14 Q2 Top 5 ANTIFUNGALS by Usage (DDDs per 100 patient-days) and Expenditures





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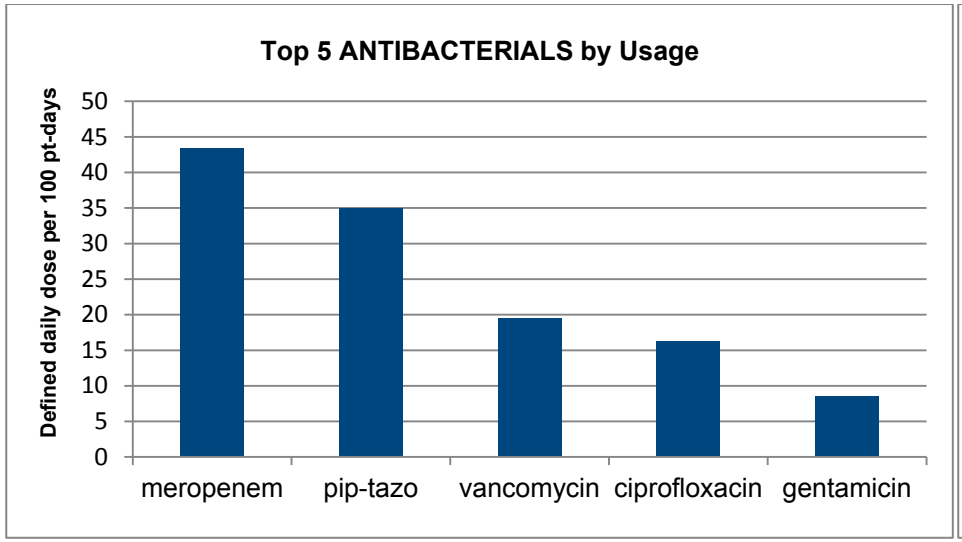
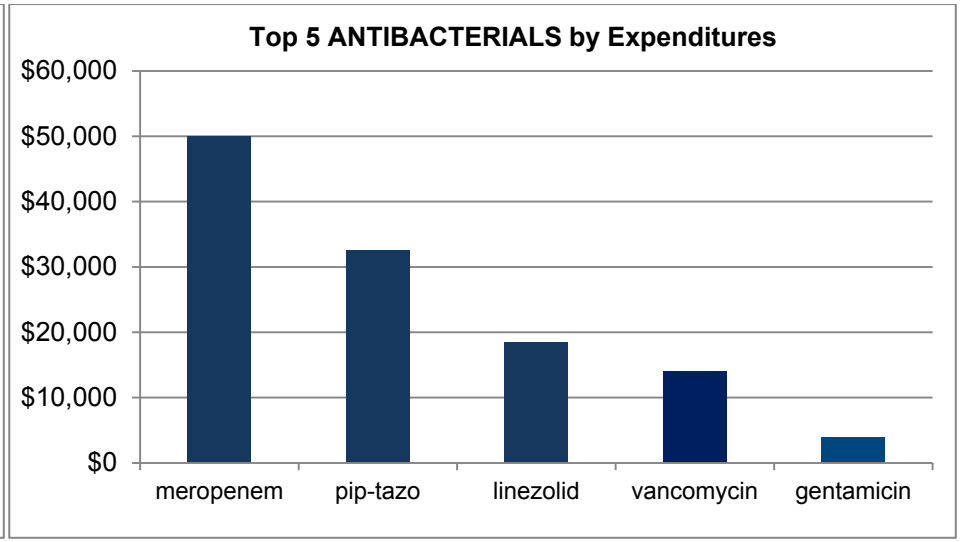
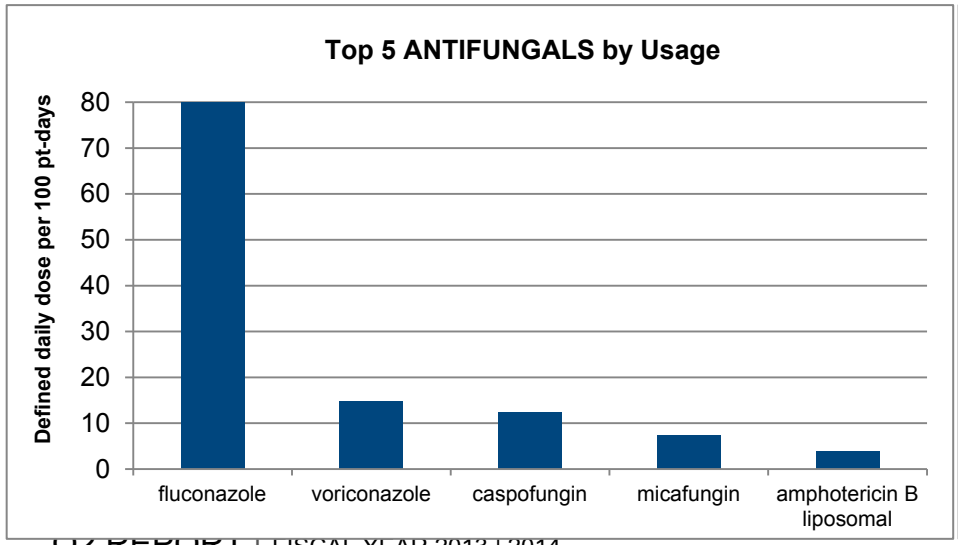
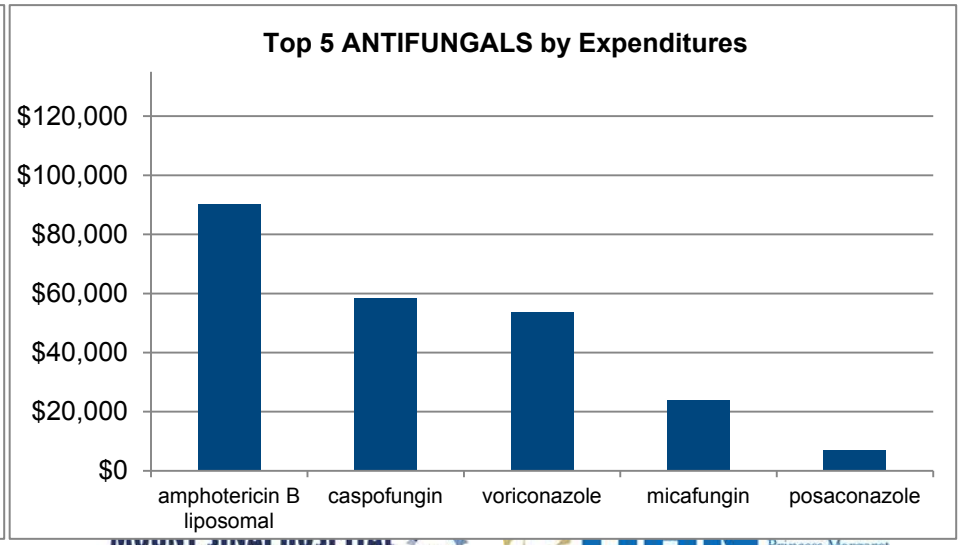
PM Leukemia FY 12/13 Q1 Top 5 ANTIBACTERIALS by Usage (DDDs per 100 patient-days) and Expenditures





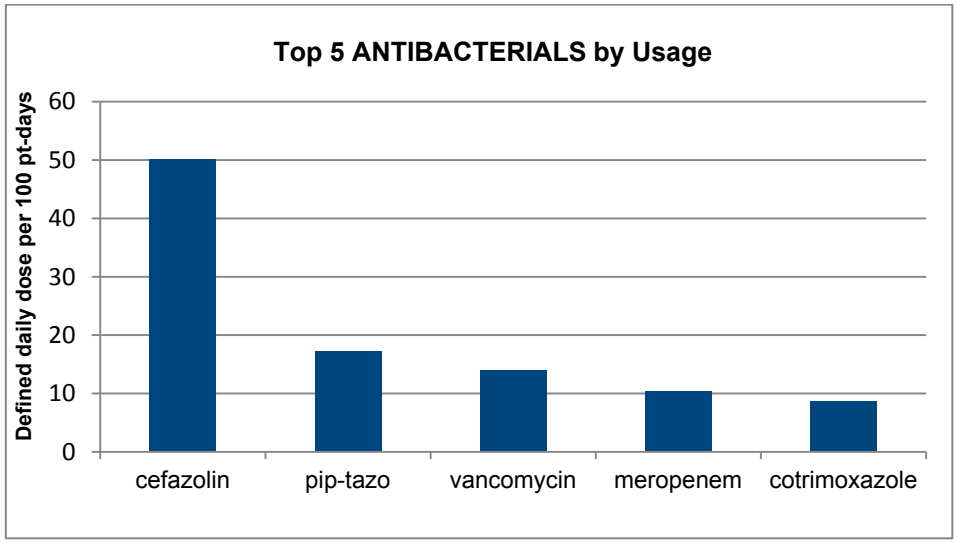
PM Leukemia FY 13/14 Q1 Top 5 ANTIFUNGALS by Usage (DDDs per 100 patient-days) and Expenditures

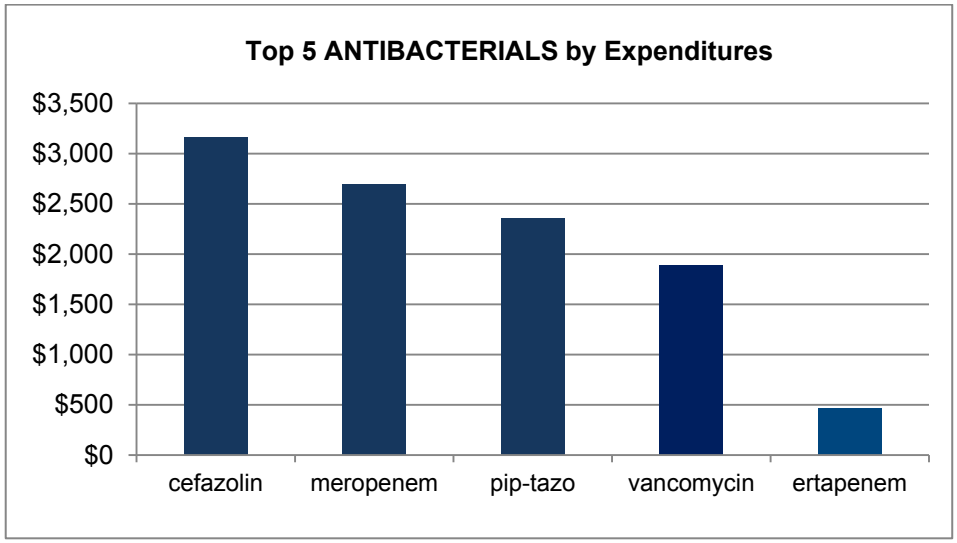




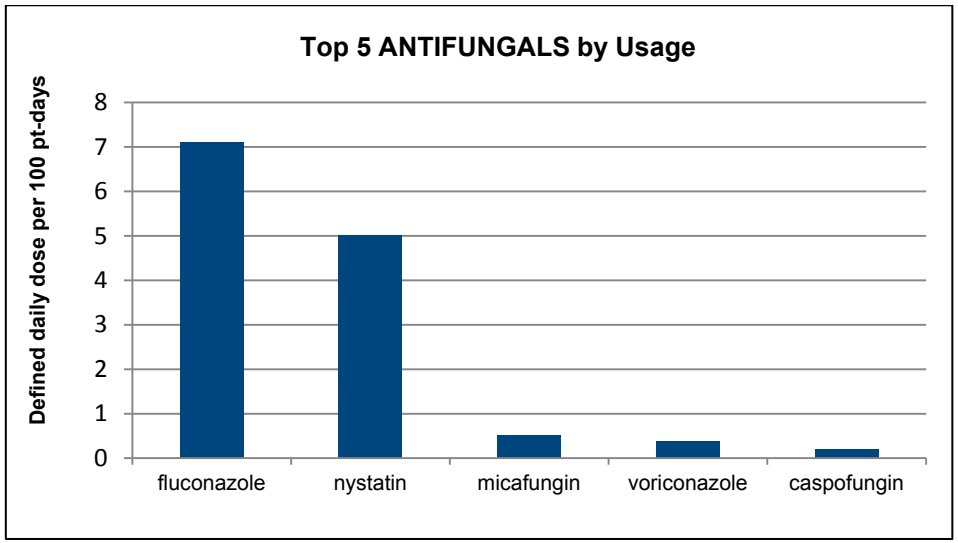
MSH + UHN ASP ANTIMICROBIAL STEWARDSHIP PROGRAM

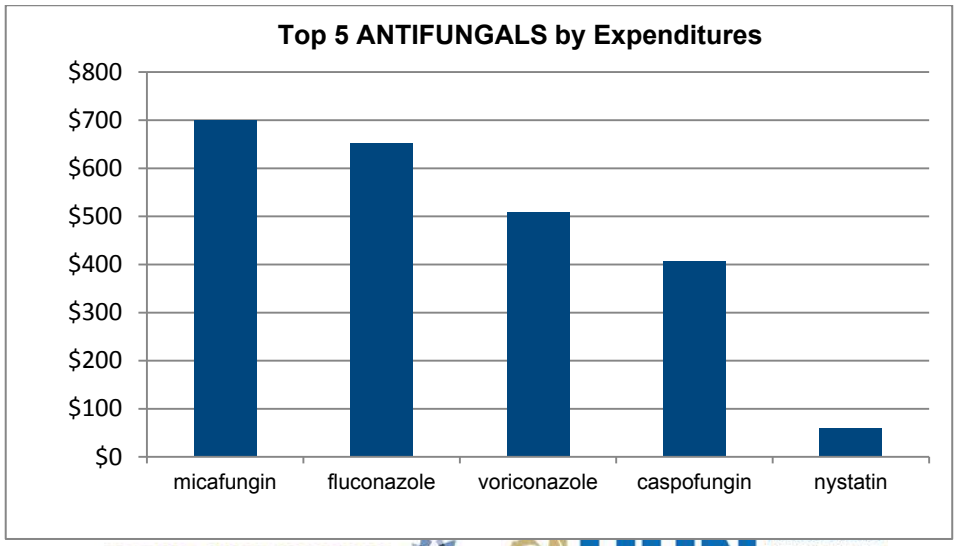
TGH CVICU FY 13/14 Q2 Top 5 ANTIBACTERIALS by Usage (DDDs per 100 patient-days) and Expenditures





TGH CVICU FY 13/14 Q2 Top 5 ANTIFUNGALS by Usage (DDDs per 100 patient-days) and Expenditures





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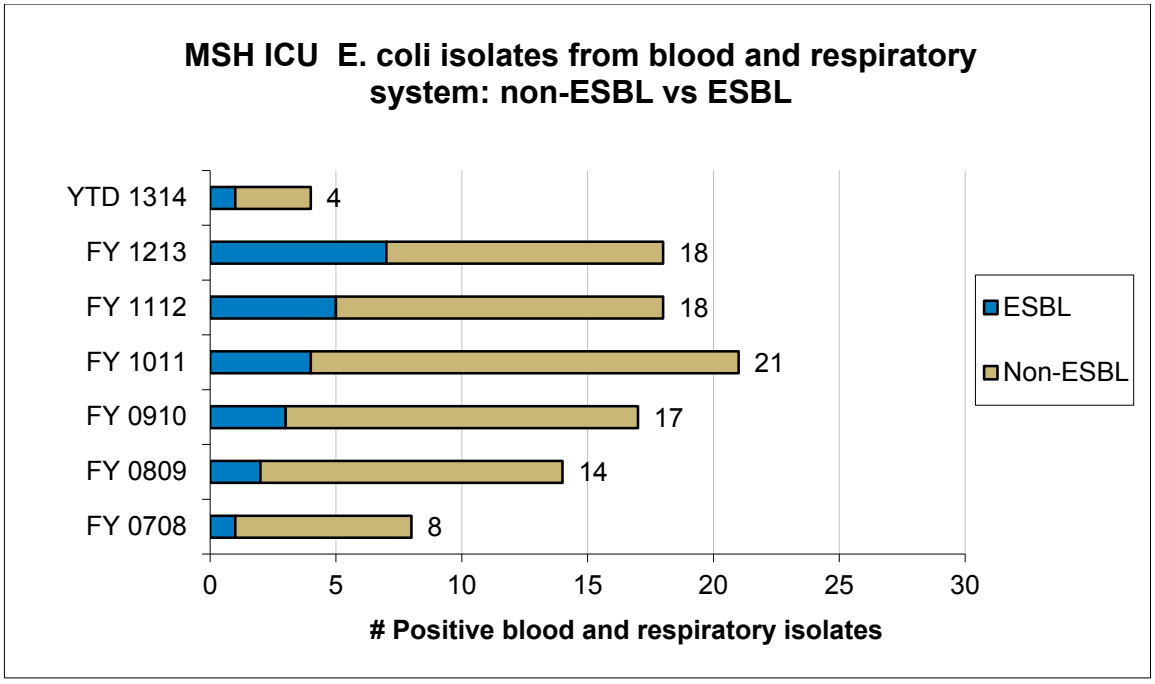
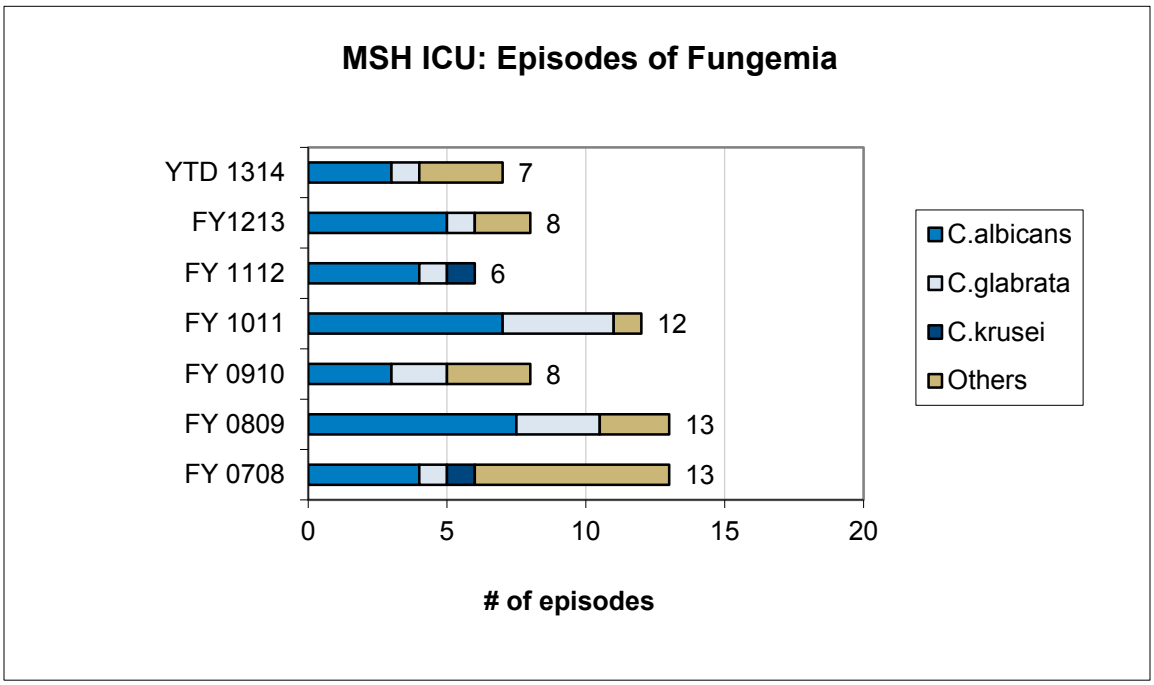
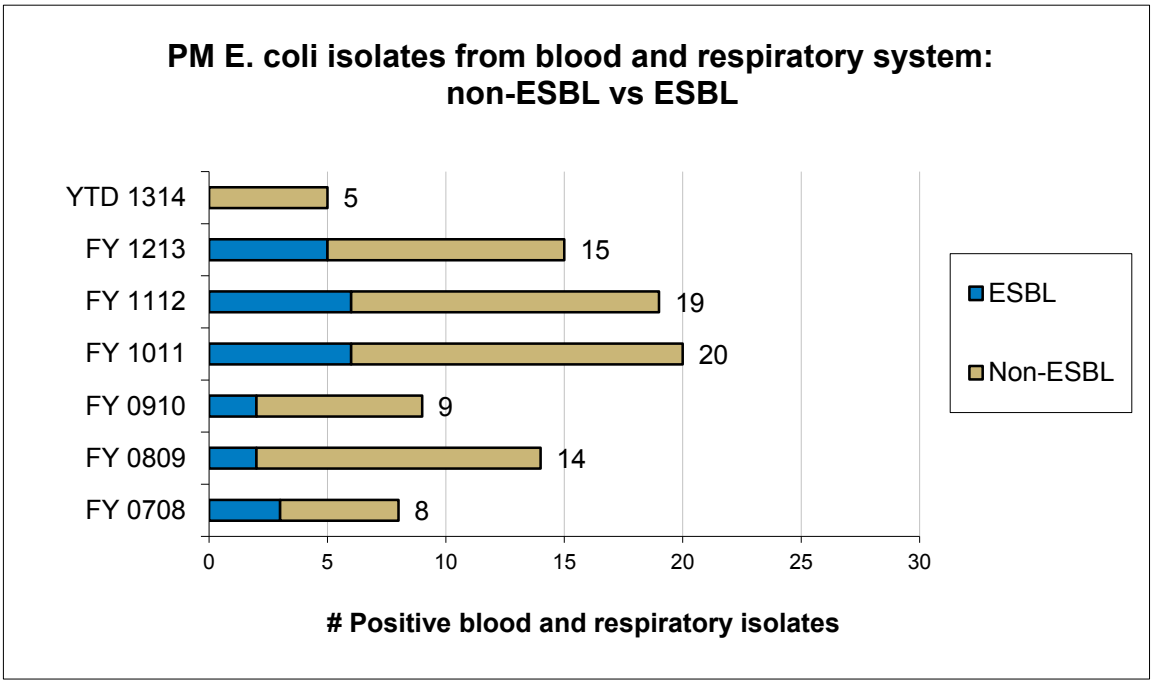
Antimicrobial Susceptibility and Pathogen Surveillance
E.Coli isolates: Blood and Respiratory



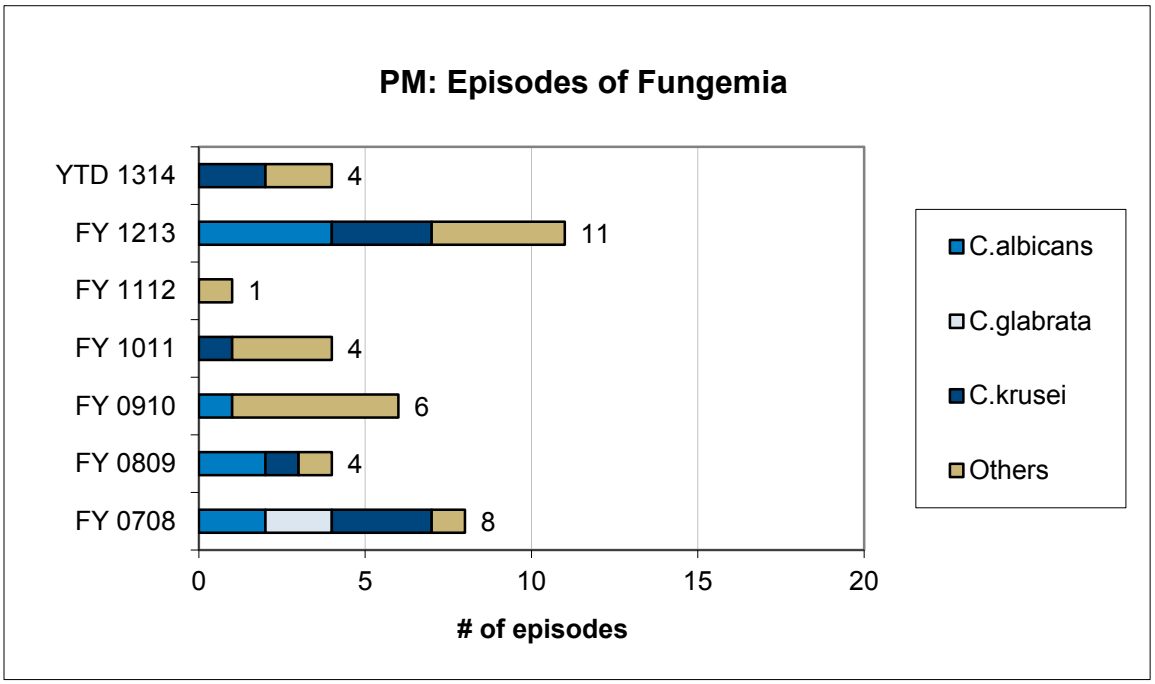
Yeast Species Isolated in Blood – MSH ICU



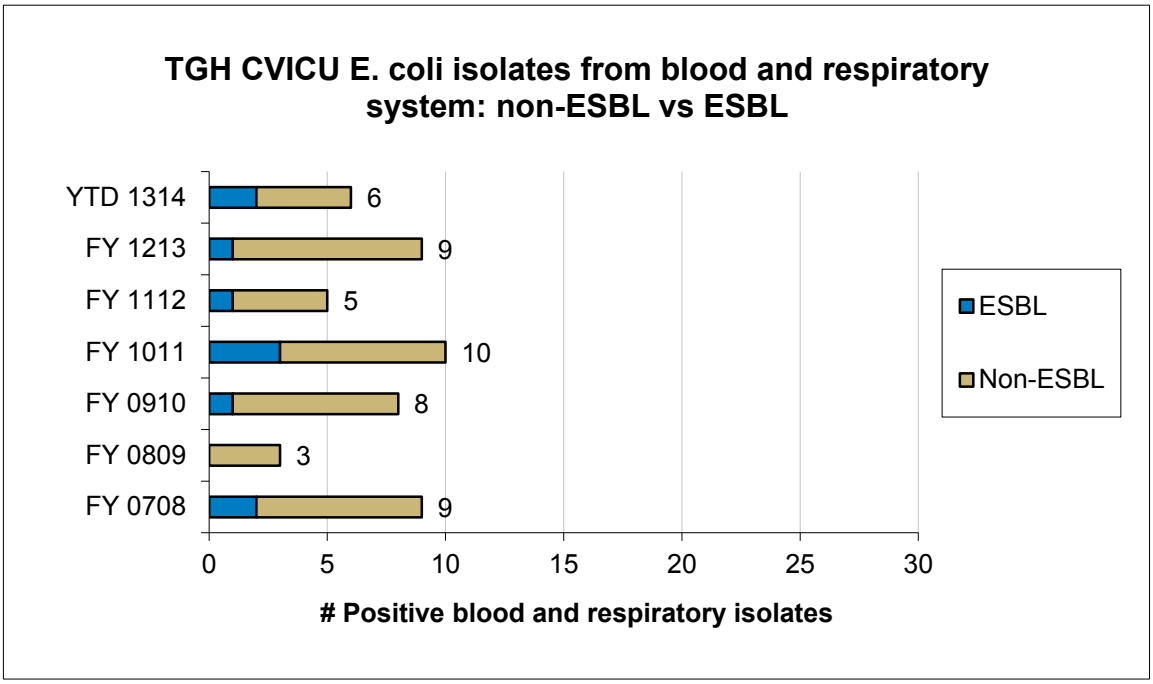
Antimicrobial Susceptibility and Pathogen Surveillance
E.Coli isolates: Blood and Respiratory



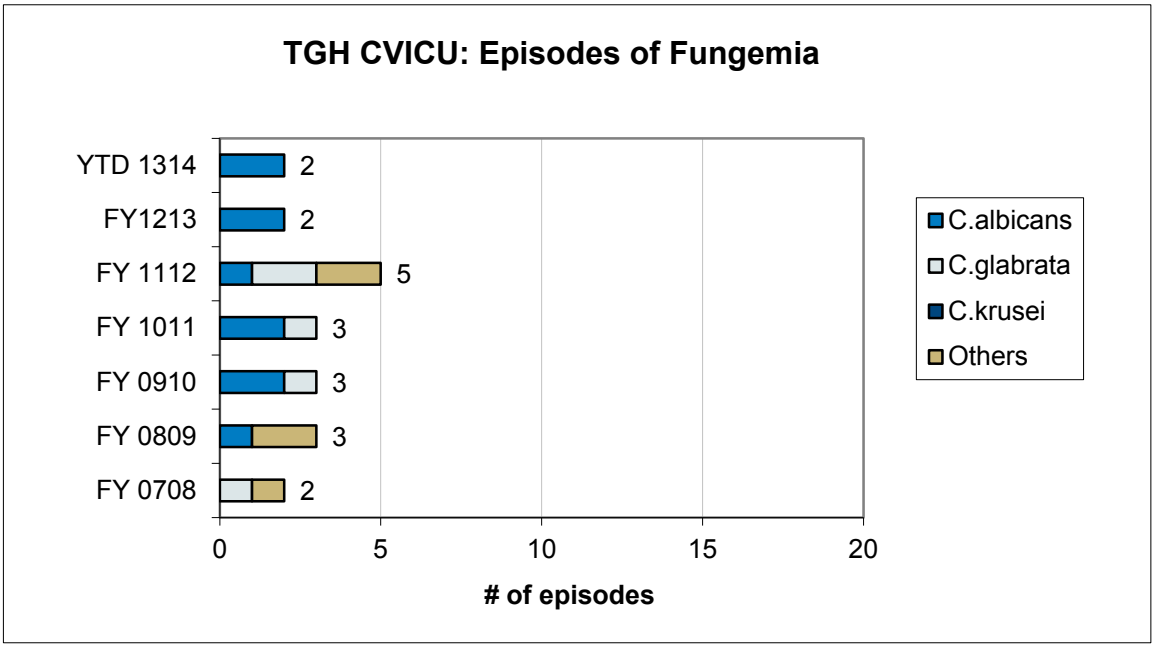
Yeast Species Isolated in Blood – Princess Margaret



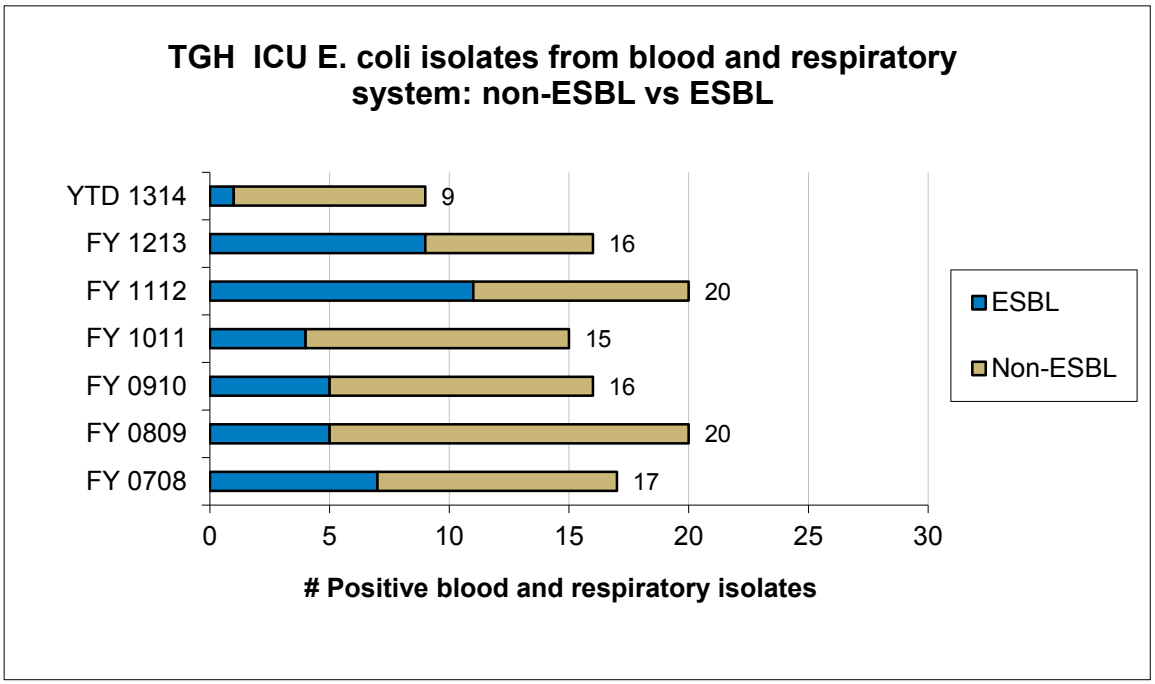
Antimicrobial Susceptibility and Pathogen Surveillance
E.Coli isolates: Blood and Respiratory



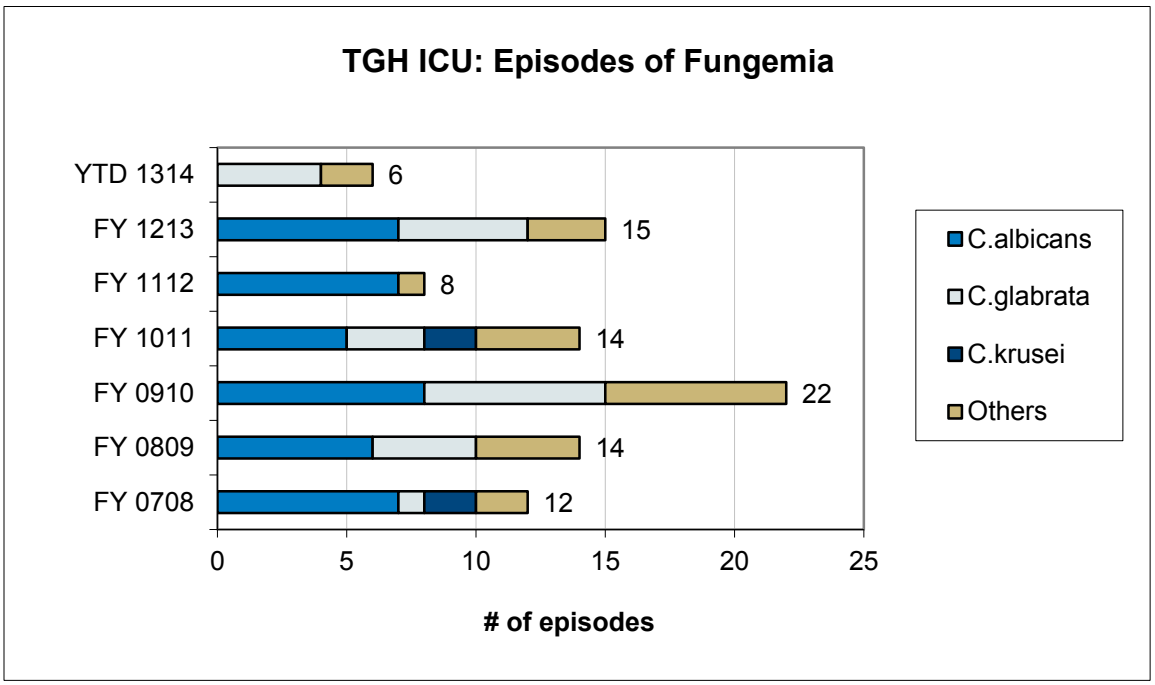
Yeast Species Isolated in Blood – CVICU



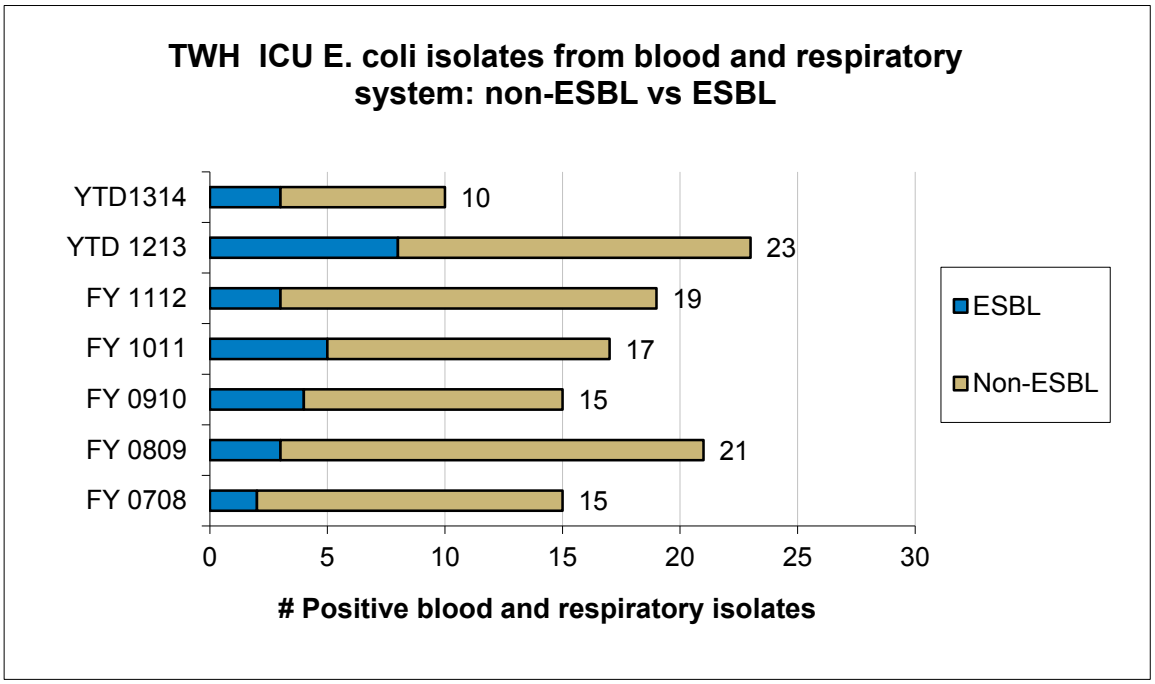
Antimicrobial Susceptibility and Pathogen Surveillance
E.Coli isolates: Blood and Respiratory



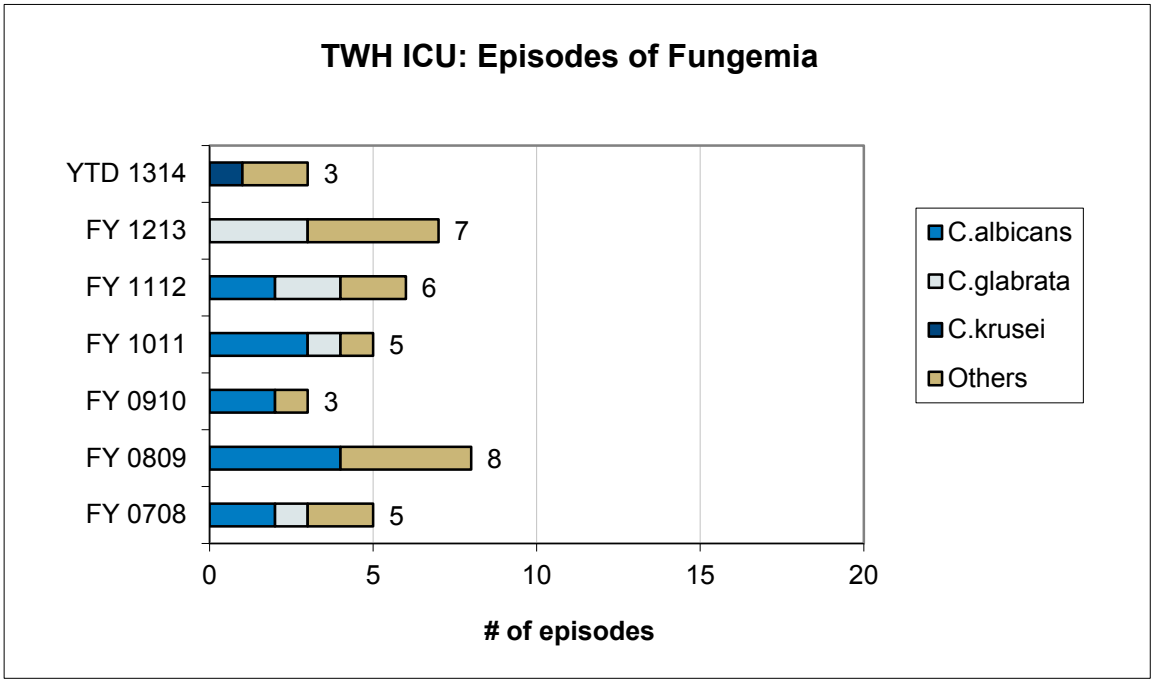
Yeast Species Isolated in Blood – TGH ICU



Antimicrobial Susceptibility and Pathogen Surveillance
E.Coli isolates: Blood and Respiratory



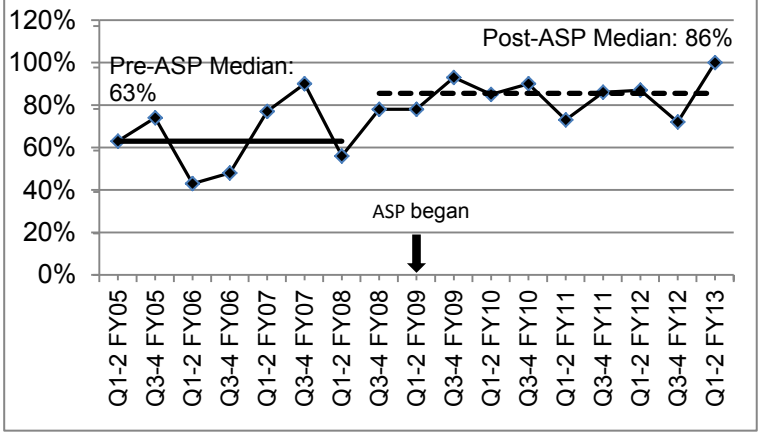
Yeast Species Isolated in Blood – TWH ICU



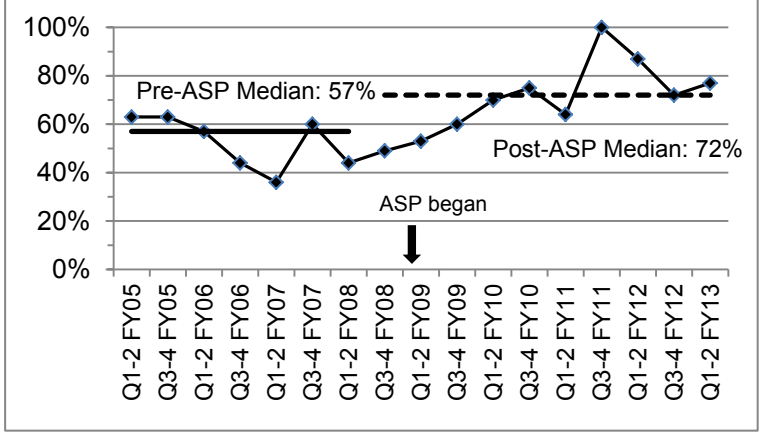
MSH + UHN ASP ANTIMICROBIAL STEWARDSHIP PROGRAM

MSH ICU Antimicrobial Susceptibility and Pathogen Surveillance
Pseudomonas Susceptibility

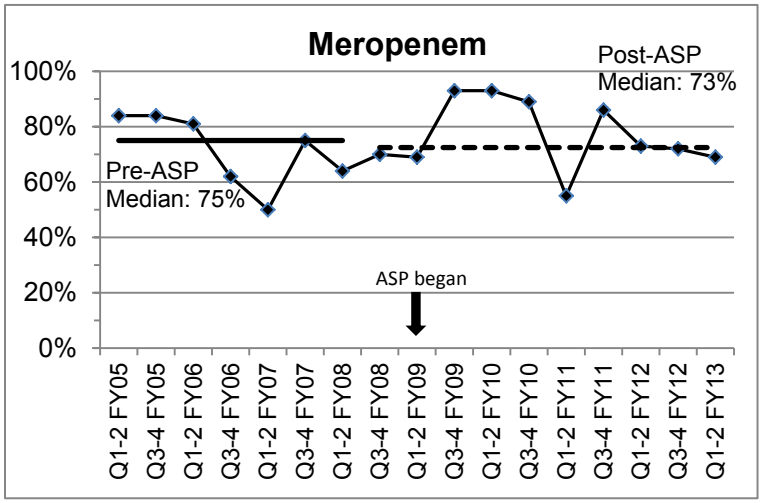
Ceftazidime



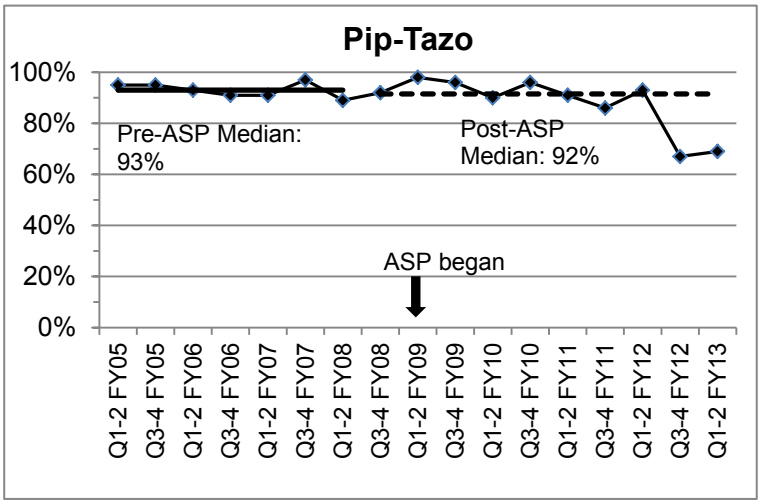
Ciprofloxacin



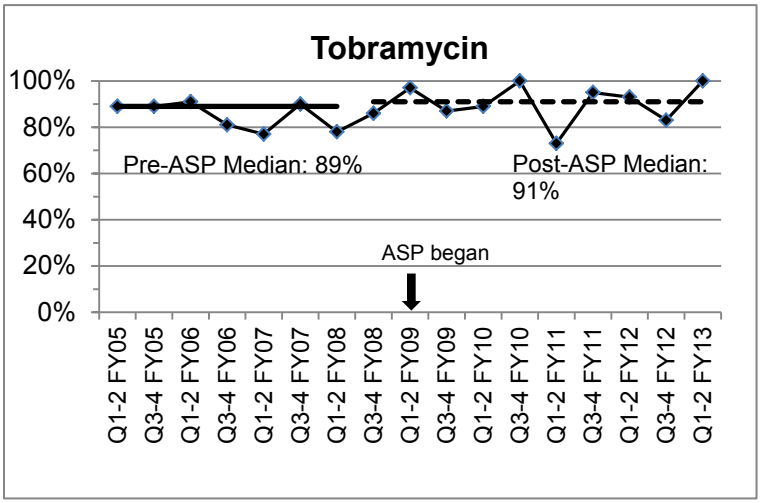
Meropenem



Pip-Tazo



Tobramycin



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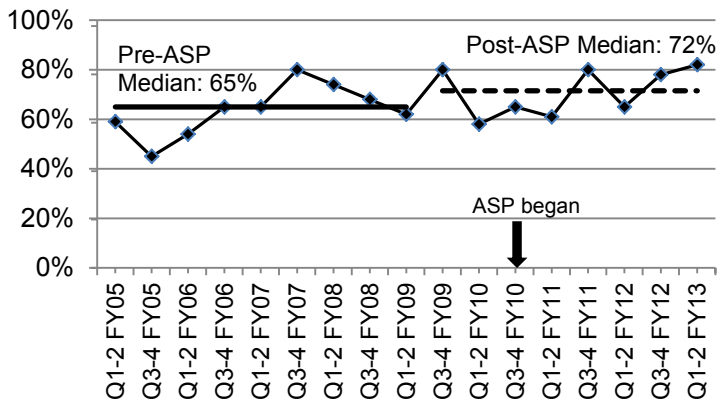
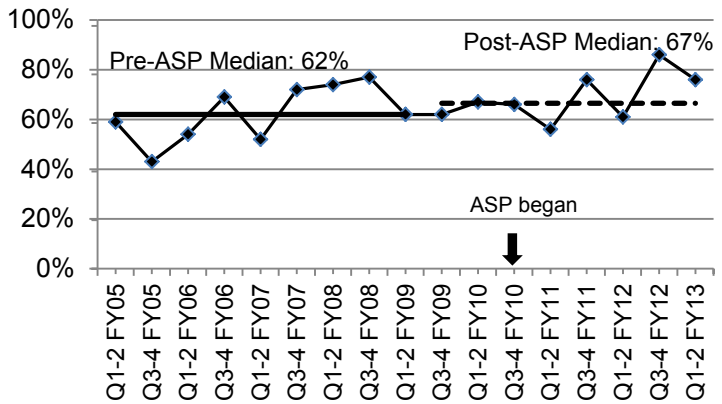
MSH + UHN ASP ANTIMICROBIAL STEWARDSHIP PROGRAM

TGH MSICU Antimicrobial Susceptibility and Pathogen Surveillance
Pseudomonas Susceptibility

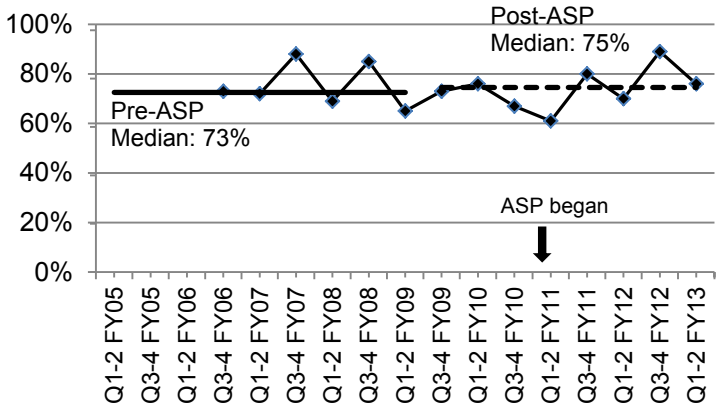
Ceftazidime



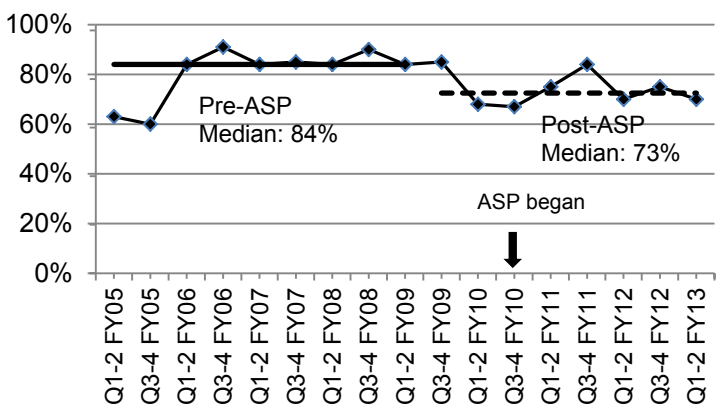
Ciprofloxacin



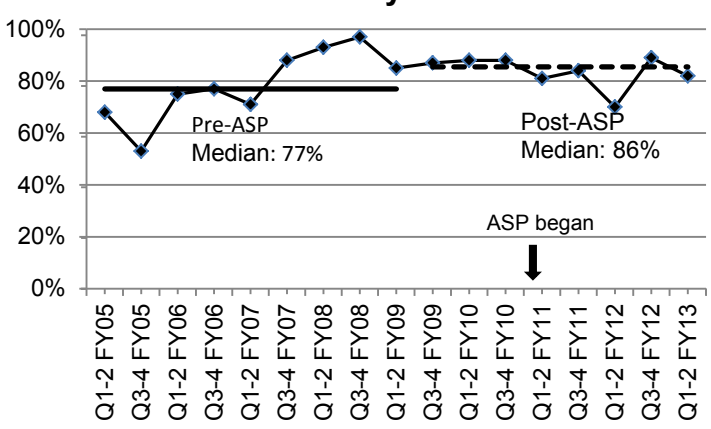
Meropenem



Pip-Tazo



Tobramycin



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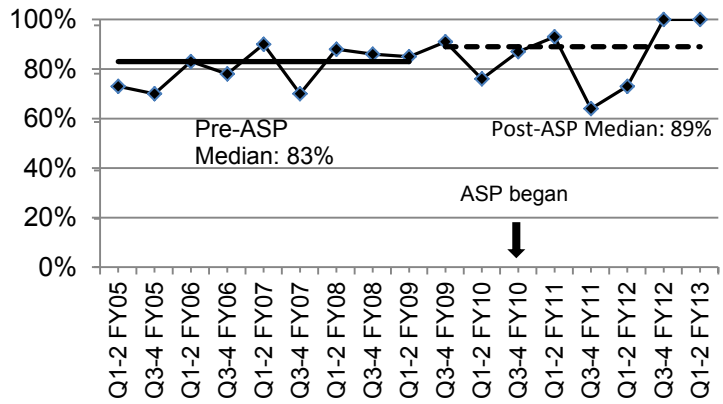
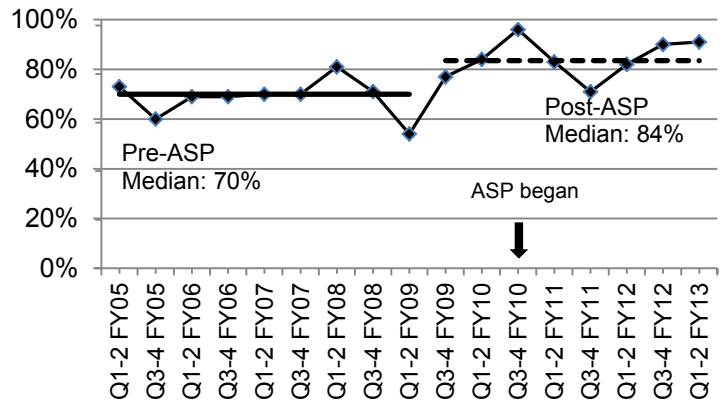
MSH + UHN ASP ANTIMICROBIAL STEWARDSHIP PROGRAM

TWH ICU Antimicrobial Susceptibility and Pathogen Surveillance
Pseudomonas Susceptibility

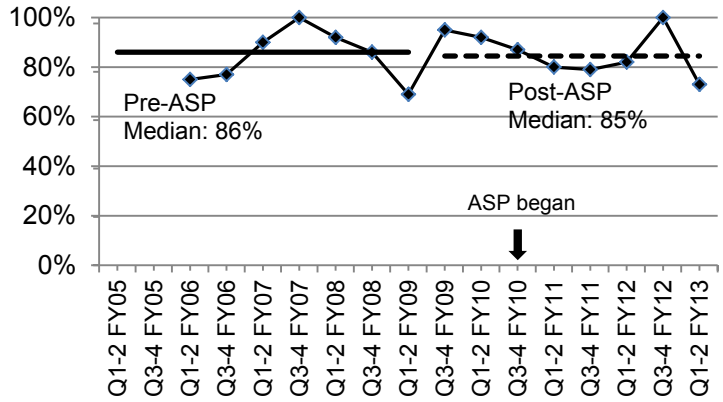
Ceftazidime



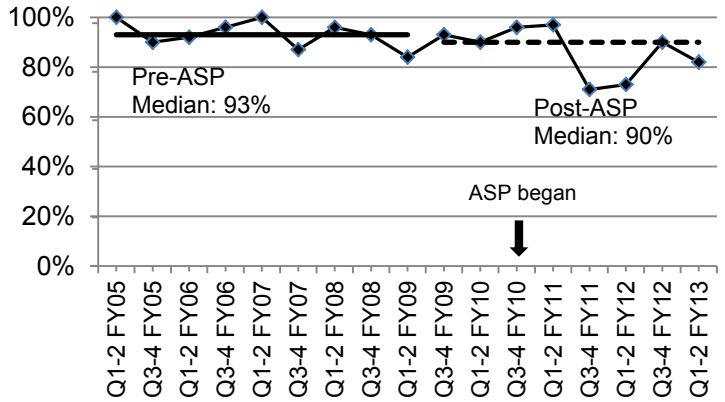
Ciprofloxacin



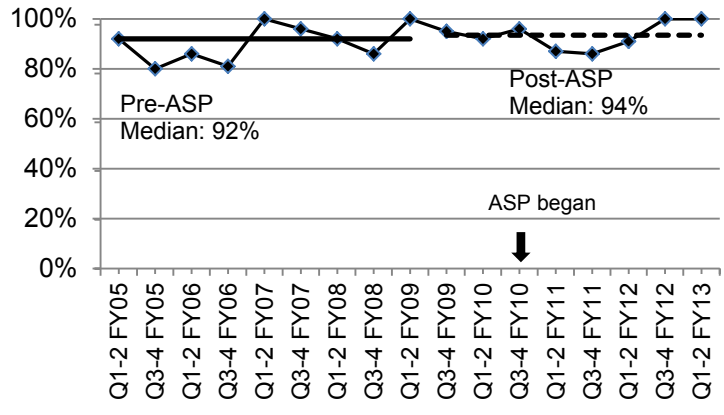
Meropenem



Pip-Tazo



Tobramycin



MOUNT SINAI HOSPITAL Joseph and Wolf Lebovic Health Complex

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MSH ICU Total Antimicrobial Costs

MSH ICU Total Antimicrobial Costs (Antimicrobial Costs per patient day)							
	FY 10/11	FY 11/12	FY 12/13	FY 13/14 Q1	FY 13/14 Q2	FY 13/14 YTD	Previous YTD
Non-PMH Patients	$78,737	$87,931	$109,283	$17,975	$35,568	$53,543	$54,608
	($21.14)	($25.42)	($31.77)	($17.71)	($49.82)	($30.97)	($28.15)
PMH Patients	$114,392	$191,928	$182,188	$46,659	$91,914	$138,573	$101,521
	($179.02)	($181.58)	($249.91)	($207.37)	($427.51)	($314.94)	($277.38)
Total	$193,129	$279,859	$291,470	$64,634	$127,482	$192,116	$156,129
	($44.26)	($61.97)	($69.91)	($52.12)	($137.23)	($88.57)	($67.71)

Note: Antimicrobial costs from PharmNet; ICU visits and patient days from CIHI DAD Database.