MSH + UHN

ASP ANTIMICROBIAL STEWARDSHIP PROGRAM

Q1 REPORT:

FISCAL YEAR 2013 | 2014

MOUNT SINAI HOSPITAL
Joseph and Wolf Lebovic Health Complex

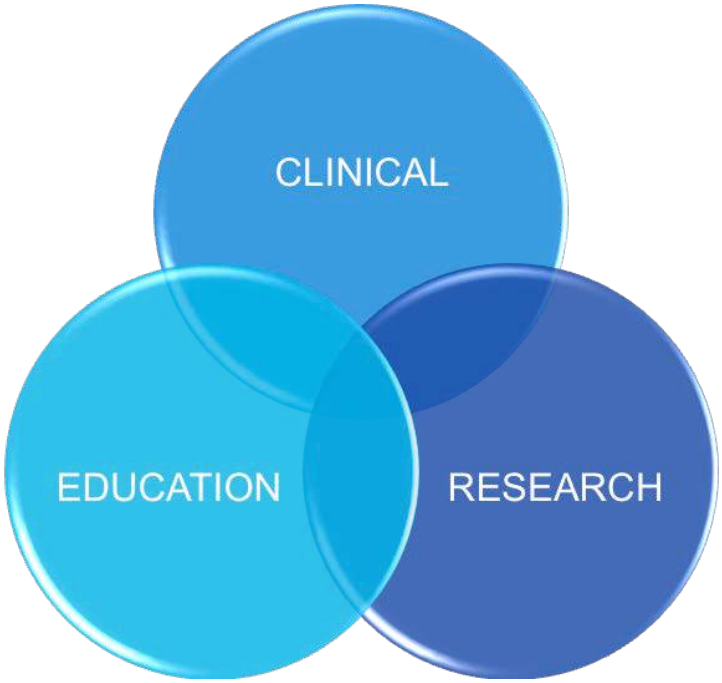
UHN
Toronto General
Toronto Western
Princess Margaret
Toronto Rehab

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 PDSA (Plan-Do-Study-Act) 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 (facilitated by Pfizer Canada's financial support), alongside clinical care, to take a leadership role in increasing antimicrobial stewardship capacity and improving the quality of health care.

MOUNT SINAI HOSPITAL Joseph and Wolf Lebovic Health Complex

UHN Toronto General Toronto Western Princess Margaret Toronto Rehab

MSH + UHN ASP ANTIMICROBIAL STEWARDSHIP PROGRAM

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

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

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

Susy Hota, MD, MSc, FRCPC
Infectious Diseases Specialist
Hospital Epidemiologist
Infection Prevention and Control
University Health Network

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

Nisha Thampi, MD, MSc, FRCPC
Clinical Fellow
Mount Sinai Hospital

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

OPERATIONS TEAM

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

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

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

Stephanie Olegario
Administrative Assistant, Antimicrobial Stewardship Program
University Health Network

MOUNT SINAI HOSPITAL Joseph and Wolf Lebovic Health Complex

UHN Toronto General Toronto Western Princess Margaret Toronto Rehab

KEY HIGHLIGHTS

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 has been working with the Mount Sinai Hospital (MSH) Intensive Care Unit (ICU) for 4 years, starting February 9, 2009. FY 13/14 Q1 highlights include:

- Antimicrobial usage (defined daily doses (DDDs) per 100 patient days) has decreased by 8% compared to the same period last year.
- Antimicrobial costs (per patient day) have increased by 6% compared to the same period last year.
- Antifungal utilization has remained steady, although antifungal costs continue to be high and may have increased compared to historical levels; this requires further attention and consideration (especially in relation to patients from Princess Margaret Cancer Centre).
- Princess Margaret patients accounted for 23% of patient visits and 72% of the 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	Previous YTD
Non-PMH Patients	$78,737 ($21.14)	$87,931 ($25.42)	$109,283 ($31.77)	$17,975 ($17.71)	$22,155 ($23.80)
PMH Patients	$114,392 ($179.02)	$191,928 ($181.58)	$182,188 ($249.91)	$46,659 ($207.37)	$44,328 ($221.64)
Total	$193,129 ($44.26)	$279,859 ($61.97)	$291,470 ($69.91)	$64,634 ($52.12)	$66,483 ($58.78)

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

PRINCESS MARGARET CANCER CENTRE: LEUKEMIA SERVICE

The ASP continues to work with the Princess Margaret Leukemia Service (14A, 15B, 15C). FY 13/14 Q1 highlights include:

- Antimicrobial usage (defined daily doses (DDDs) per 100 patient days) has increased by 5% compared to the same period last year.
- Antimicrobial costs (per patient day) have decreased by 15% compared to the same period last year. This could partially be explained by the genericization of meropenem, which came into effect in Q3 FY12/13 and a *decrease* in antifungal consumption.

TORONTO GENERAL HOSPITAL CARDIOVASCULAR ICU

The ASP continues to work with the Toronto General Hospital CVICU. FY 13/14 Q1 highlights include:

- Antimicrobial usage (using defined daily doses (DDDs) per 100 patient days) has decreased by 24% compared to the same period last year.
- Antimicrobial costs per patient day have marginally increased (by 2%) compared to the same period last year.

TORONTO GENERAL HOSPITAL MEDICAL SURGICAL ICU

The ASP continues to work with the Toronto General Hospital MSICU. FY 13/14 Q1 highlights include:

- Antimicrobial usage (defined daily doses (DDDs) per 100 patient days) has increased by 7% compared to the same period last year.

- Antimicrobial costs (per patient day) have increased by 35% compared to the same period last year.
- Meropenem is the highest used and most costly antibacterial drug this quarter, and liposomal Amphotericin B is the highest cost antifungal. This usage warrants further consideration: the ASP always watches for changes and trends and will continue to monitor on an ongoing basis.

TORONTO WESTERN HOSPITAL ICU

The ASP continues to work with the Toronto Western Hospital ICU. FY 13/14 Q1 highlights include:

- Antimicrobial usage (defined daily doses (DDDs) per 100 patient days) has increased by 60% compared to the same period last year.
- Antimicrobial costs (per patient day) has increased compared to the same period last year.
- Although last year's Q1 total antimicrobial usage and costs were lower than usual, Q1 13/14 results are in keeping with other quarters from last year. In particular, antibacterial usage and costs are consistent with prior quarters/years, and the high costs appear to be related to specific clinical need for liposomal amphotericin. The ASP team will continue monitoring these indicators.

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, led by Dr. Yenge Diambomba, Medical Director of the NICU. The program consists of daily prospective audit and feedback with the 2 clinical teams on all the neonates in the 36-bed unit. We have collected days of therapy (DOT) as the metric for antimicrobial consumption, which is considered to be the standard for neonates.

- Antimicrobial usage (days of therapy (DOTs) per 100 patient days) has decreased by 12.5% compared to the same period last year.
- Antimicrobial costs (per patient day) have increased compared to the same period last year.
- The ASP Team continues to monitor performance on a regular basis.

BEST PRACTICE GUIDELINES & ALGORITHMS:

- *High Risk* Febrile Neutropenia Protocol – With sincere thanks to the support from Senior Leadership at Princess Margaret, our consultation with UHN Healthcare Human Factors has been completed. The final version has been uploaded on the MSH-UHN Antimicrobial Stewardship website "Best Practices" page: http://www.antimicrobialstewardship.com/antimicrobial-stewardship-best-practices
  We are currently arranging short sessions to demonstrate how to access and use the dynamic, interactive protocol. Audit of adherence will be planned accordingly afterwards when an implementation date is identified.
- VAP Algorithm: Implemented in the MSH ICU in November 2011, TGH ICU since June 2012 and the TGH CVICU since October 2012.
- Pulmonary Infiltrate Protocol – A Working Group has been struck, involving Malignant Haematology, Respirology and Intervention Radiology. A kick-off meeting took place in July to discuss an initial draft of the protocol.

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
- 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
- Members of our group have recently been awarded the following grant funding:
  - Developing and Evaluating an Educational Intervention to Guide in the Implementation of Antimicrobial Stewardship Programs in Community Hospitals Across Ontario. Canadian Society of Hospital Pharmacists. $10 125 (Principal Applicant: Linda Dresser)
  - Development of an Antimicrobial Resistance Diversity Index (ARDI) to guide initiatives and investment in public health, antimicrobial stewardship and infection control. CIHR CHRP Grant. $397 000 (Principal Applicants: Jainhong Wu, Andrew Morris)
  - Evaluation of a Province Wide Roll-out of Antimicrobial Stewardship Programs in Critical Care Units: A Prospective Observational Study. Physician's Services Incorporated (PSI). $81 500 (Principal Applicant: Andrew Morris)

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 sites have implemented their ASP in the ICU, and the MSH-UHN ASP project team is currently in the process of conducting 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.

Critical Care Services Ontario (CCSO):

The MSH-UHN ASP has been working with CCSO (formerly 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. 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 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.

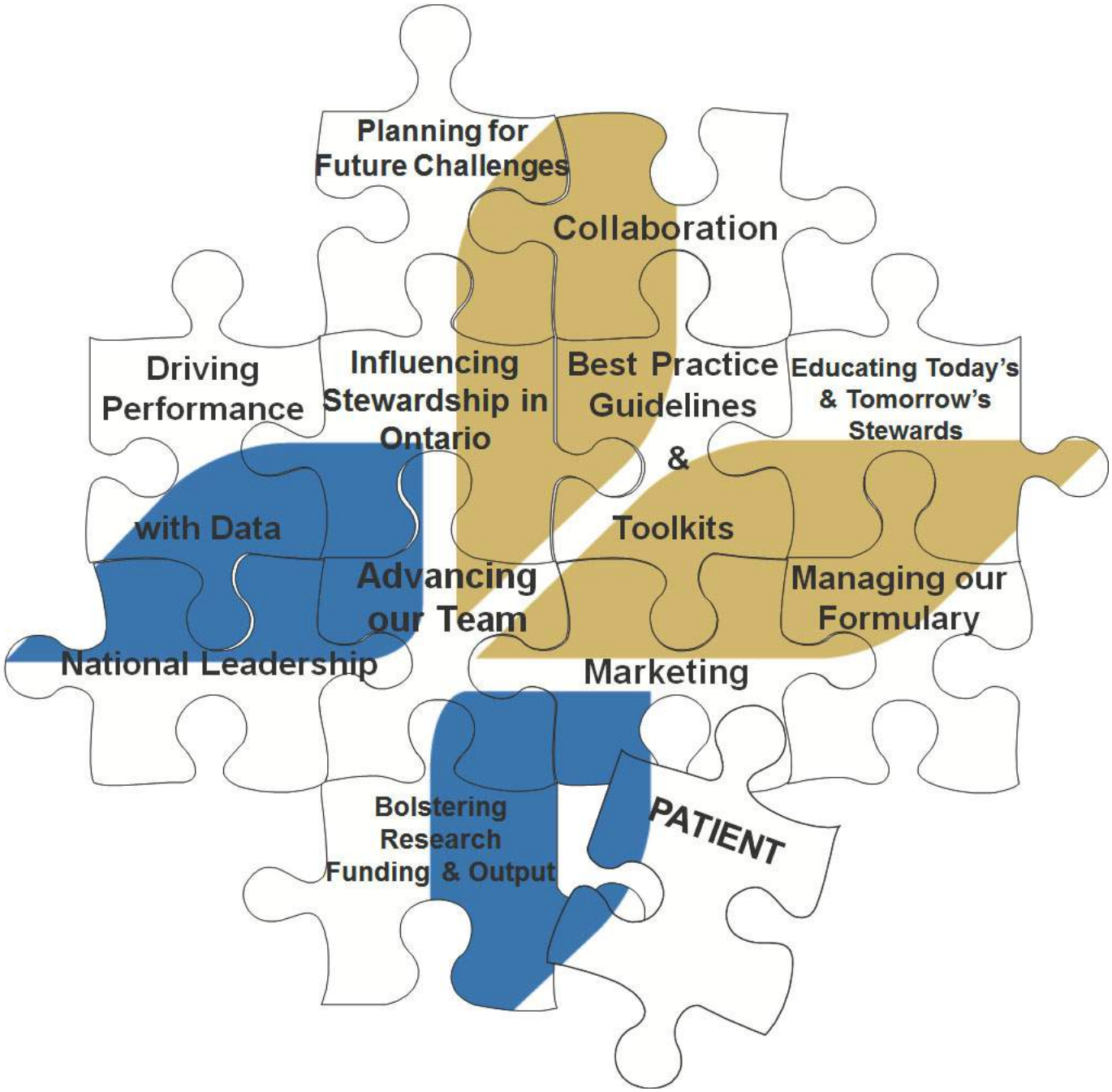
Critical Care Canada Forum (CCCF) 2013:

The MSH-UHN ASP team will have a dedicated half-day ASP track at the CCCF conference this November whereby "Lessons learned from the CAHO ASP ARTIC project" will be disseminated. This will be the first time an ASP track is included in CCCF's annual conference.

STRATEGIC PLANNING:

The ASP team went through a comprehensive planning process over the past year to develop the MSH-UHN ASP Strategic Plan 2013-2016. This was reviewed and approved by the MSH-UHN ASP Oversight Committee. Implementation of strategic priorities has begun with ASP team members leading various projects. Please contact Stephanie Olegario (Stephanie.Olegario@uhn.ca) if you would like a copy.

MSH-UHN Antimicrobial Stewardship Program Strategic Priorities:



MSH + UHN ASP ANTIMICROBIAL STEWARDSHIP PROGRAM

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				143	155
Systemic Antibacterial DDDs/100 Patient Days	142	128	111	128	127	110				110	122
Systemic Antifungal DDDs/100 Patient Days	31	24	20	33	35	27				27	24
Total Antimicrobial Costs	$332,724	$285,975	$193,129	$279,859	$291,470	$64,634				$64,634	$66,483
Total Antimicrobial Costs/Patient Day	$69.01	$59.23	$40.95	$59.22	$62.37	$55.48				$55.48	$52.35
Systemic Antibacterial Costs	$174,339	$142,134	$95,773	$125,339	$134,811	$21,387				$21,387	$31,853
Systemic Antibacterial Costs/Patient Days	$36.16	$29.44	$20.31	$26.94	$28.85	$18.36				$18.36	$25.08
Systemic Antifungal Costs	$143,100	$132,519	$88,998	$141,877	$144,811	$40,572				$40,572	$30,446
Systemic Antifungal Costs/Patient Days	$29.68	$27.45	$18.87	$30.50	$30.99	$34.83				$34.83	$23.97
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)				0 (0.0)	3 (2.36)
ICU Average Length of Stay (days)	5.84	5.57	5.67	5.51	5.24	6.06				6.06	5.79
ICU Mortality Rate (as a %)	20.1	17.6	16.3	16.5	17.04	16.3				16.3	16.5
ICU Readmission Rate within 48 hrs (as a %)	3.2	2.9	2.7	2.7	1.86	4.0				4.0	0.8
ICU Ventilator Days	NA	3286	2934	2677	2749	747				747	757
ICU Multiple Organ Dysfunction Score (MODS)	4.00	4.04	4.12	4.25	4.62	4.73				4.73	4.49

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).

MSH + UHN ASP ANTIMICROBIAL STEWARDSHIP PROGRAM

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				264	251
Systemic Antibacterial DDDs/100 Patient Days	191	167	164	149	146				146	139
Systemic Antifungal DDDs/100 Patient Days	104	107	105	104	117				117	112
Total Antimicrobial Costs	$1,768,317	$1,641,331	$1,310,857	$1,695,539	$392,066				$392,066	$464,387
Total Antimicrobial Costs/Patient Day	$167.12	$154.32	$115.13	$128.91	$120.93				$120.93	$141.62
Systemic Antibacterial Costs	$659,034	$609,747	$663,175	$422,438	$124,075				$124,075	$178,027
Systemic Antibacterial Costs/Patient Days	$62.28	$57.33	$58.24	$45.85	$38.27				$38.27	$54.29
Systemic Antifungal Costs	$1,109,283	$1,031,584	$647,637	$1,092,448	$267,990				$267,990	$286,360
Systemic Antifungal Costs/Patient Days	$104.84	$96.99	$56.88	$83.06	$82.66				$82.66	$87.33
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 (.62)	2 (.61)

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).

MSH + UHN ASP ANTIMICROBIAL STEWARDSHIP PROGRAM

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				76	100
Systemic Antibacterial DDDs/100 Patient Days	104	86	89	67				67	87
Systemic Antifungal DDDs/100 Patient Days	11	12	13	10				10	13
Total Antimicrobial Costs	$117,356	$107,795	$85,596	$23,405				$23,405	$21,718
Total Antimicrobial Costs/Patient Day	$19.75	$18.94	$14.93	$15.18				$15.18	$14.86
Systemic Antibacterial Costs	$109,110	$98,591	$73,627	$16,738				$16,738	$18,169
Systemic Antibacterial Costs/Patient Days	$18.36	$17.32	$12.84	$10.85				$10.85	$12.43
Systemic Antifungal Costs	$8,246	$9,204	$11,969	$6,667				$6,667	$3,550
Systemic Antifungal Costs/Patient Days	$1.39	$1.62	$2.09	$4.32				$4.32	$2.43
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)				1 (0.65)	0 (0.0)
ICU Average Length of Stay (days)	3.12	2.95	2.97	3.26				3.26	3.03
ICU Mortality Rate (as a %)	3.5	3.0	3.0	3.0				3.0	3.8
ICU Readmission Rate within 48 hrs (as a %)	1.6	2.2	1.8	2.4				2.4	1.6
Central Line Infection Rate (per 1000 pt days)	0.73	0.17	0.34	0.0				0.0	0.0
Ventilator Associated Pneumonia Rate (per 1000 pt days)	2.99	2.80	1.91	2.95				2.95	1.06
ICU Multiple Organ Dysfunction Score (MODS)	6.22	6.07	5.51	5.72				5.72	5.96
ICU Ventilator Days	3015	3571	3676	1018				1018	944

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 are excluded. Data Sources: Antimicrobial DDD and Costs (Centricity).

MOUNT SINAI HOSPITAL Joseph and Wolf Lebovic Health Complex

UHN Toronto General Toronto Western Princess Margaret Toronto Rehab

MSH + UHN ASP ANTIMICROBIAL STEWARDSHIP PROGRAM

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				192	179
Systemic Antibacterial DDDs/100 Patient Days	184	153	141	160	144				144	137
Systemic Antifungal DDDs/100 Patient Days	82	55	55	54	49				49	41
Total Antimicrobial Costs	$701,451	$627,540	$572,443	$472,334	$127,286				$127,286	$85,182
Total Antimicrobial Costs/Patient Day	$102.52	$83.81	$77.60	$63.58	$67.99				$67.99	$50.28
Systemic Antibacterial Costs	$390,209	$373,504	$288,775	$229,892	$46,929				$46,929	$50,733
Systemic Antibacterial Costs/Patient Days	$57.03	$49.88	$39.15	$30.95	$25.07				$25.07	$29.95
Systemic Antifungal Costs	$311,242	$254,036	$275,176	$242,443	$80,357				$80,357	$34,448
Systemic Antifungal Costs/Patient Days	$45.49	$33.93	$37.30	$32.63	$42.93				$42.93	$20.34
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 (1.07)	4 (2.36)
ICU Average Length of Stay (days)	8.24	8.61	8.85	7.79	8.10				8.10	7.44
ICU Mortality Rate (as a %)	16.2	15.7	16.3	16.0	19.2				19.2	14.5
ICU Readmission Rate within 48 hrs (as a %)	3.8	4.4	4.4	2.8	5.8				5.8	2.6
ICU Ventilator Days	5399	6256	6507	6458	1704				1704	1394
Apache II score	n/a	n/a	16.1	15.775	15.0				15.0	15.0

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 + systemic antivirals; non-systemic antimicrobials are excluded. Data Sources: Antimicrobial DDD and Costs (Centricity)

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				90	56
Systemic Antibacterial DDDs/100 Patient Days	94	78	73	77	78	85				85	54
Systemic Antifungal DDDs/100 Patient Days	6	10	6	6	5	5				5	2
Total Antimicrobial Costs	$138,502	$100,408	$101,191	$105,899	$102,978	$37,529				$37,529	$13,632
Total Antimicrobial Costs/Patient Day	$18.39	$13.24	$13.17	$13.60	$13.37	$18.09				$18.09	$7.49
Systemic Antibacterial Costs	$123,278	$87,445	$79,280	$89,784	$70,099	$20,426				$20,426	$12,337
Systemic Antibacterial Costs/Patient Days	$16.37	$11.53	$10.32	$11.53	$9.10	$9.85				$9.85	$6.78
Systemic Antifungal Costs	$13,444	$12,963	$21,911	$16,115	$32,879	$17,103				$17,103	$1,295
Systemic Antifungal Costs/Patient Days	$1.79	$1.71	$2.85	$2.07	$4.27	$8.25				$8.25	$0.71
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 (1.45)	2 (1.10)
ICU Average Length of Stay (days)	8.39	7.44	10.68	9.71	7.98	6.17				6.17	7.76
ICU Mortality Rate (as a %)	19.6	19.9	18.1	17.0	16.4	14.3				14.3	18.5
ICU Readmission Rate within 48 hrs (as a %)	3.9	4.7	4.9	3.21	3.00	5.56				5.56	1.32
ICU Ventilator Days	4617	6305	5960	5578	4947	1339				1339	1114
ICU Apache II Score	15.0	14.7	13.7	13.8	12.9	12.7				12.7	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 TWH ICU for the 4th quarter of fiscal 2011 and 1st quarter of fiscal 12/13. Use of Centricity data resumes effective 2nd quarter of fiscal 2012/13
** FY 11/12 Q4 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.
*** FY 12/13 Q1 Total Antimicrobial, Total Antibacterial and Total Antifungal Costs 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 + systemic antivirals; non-systemic antimicrobials are excluded. Data Sources: Antimicrobial DDD and Costs (Centricity)

MOUNT SINAI HOSPITAL Joseph and Wolf Lebovic Health Complex

UHN Toronto General Toronto Western Princess Margaret Toronto Rehab

MSH + UHN ASP ANTIMICROBIAL STEWARDSHIP PROGRAM

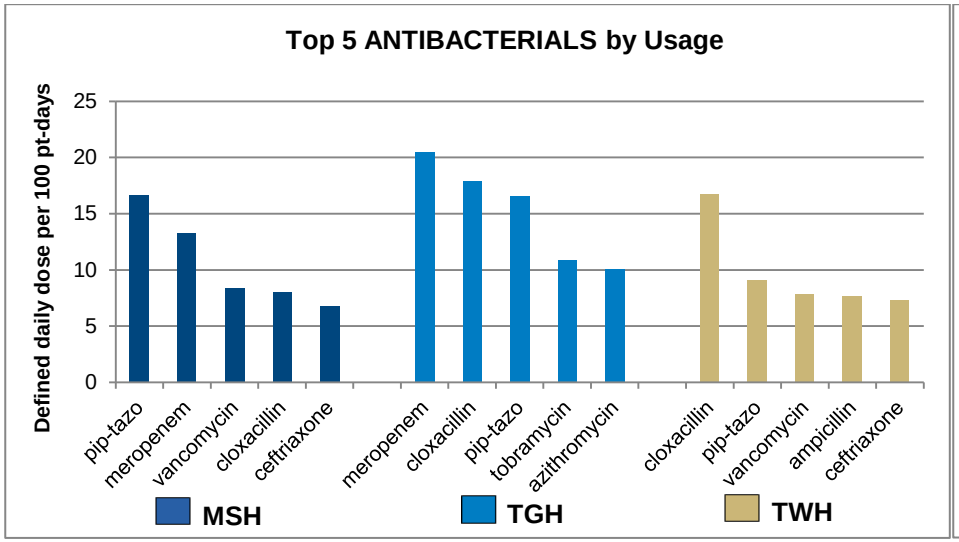
MOUNT SINAI HOSPITAL: NICU

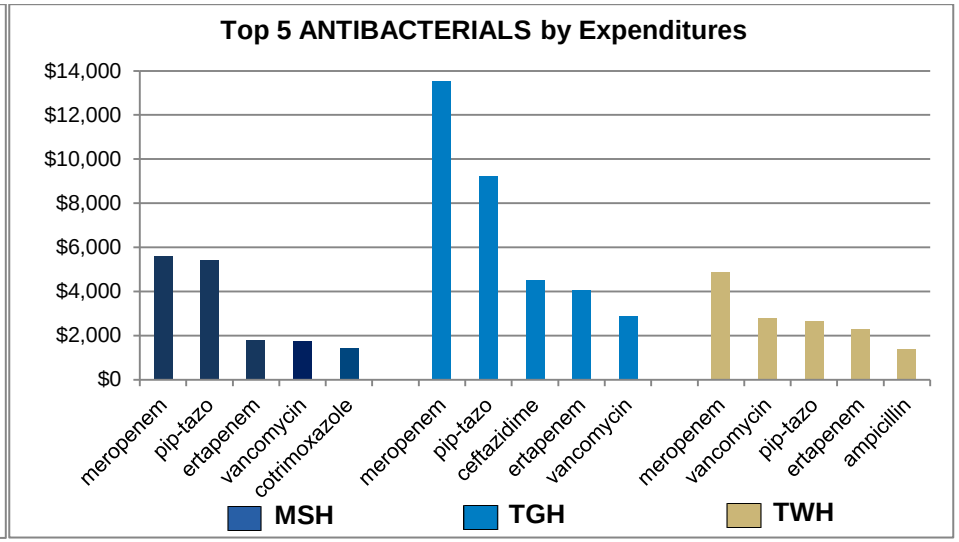
Indicators	FY 11/12	FY 12/13	FY13/14 Performance					YTD of Previous Year
			Q1	Q2	Q3	Q4	YTD	
Antimicrobial Usage & Costs								
Total Antimicrobial DOTs/100 Patient Days	67.3	55.5	49.2				49.2	56.2
Systemic Antibacterial DOTs/100 Patient Days	65.1	53.6	48.7				48.7	53.4
Systemic Antifungal DOTs/100 Patient Days	2.2	1.8	0.6				0.6	2.8
Total Antimicrobial Costs	$16,415	$17,707	$6,195				$6,195	$3,548
Total Antimicrobial Costs/Patient Day	$1.31	$1.51	$2.15				$2.15	$1.18
Systemic Antibacterial Costs	$14,783	$16,530	$6,131				$6,131	$3,095
Systemic Antibacterial Costs/Patient Days	$1.18	$1.41	$2.13				$2.13	$1.03
Systemic Antifungal Costs	$1,632	$1,177	$64				$64	$453
Systemic Antifungal Costs/Patient Days	$0.13	$0.10	$0.02				$0.02	$0.15

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.

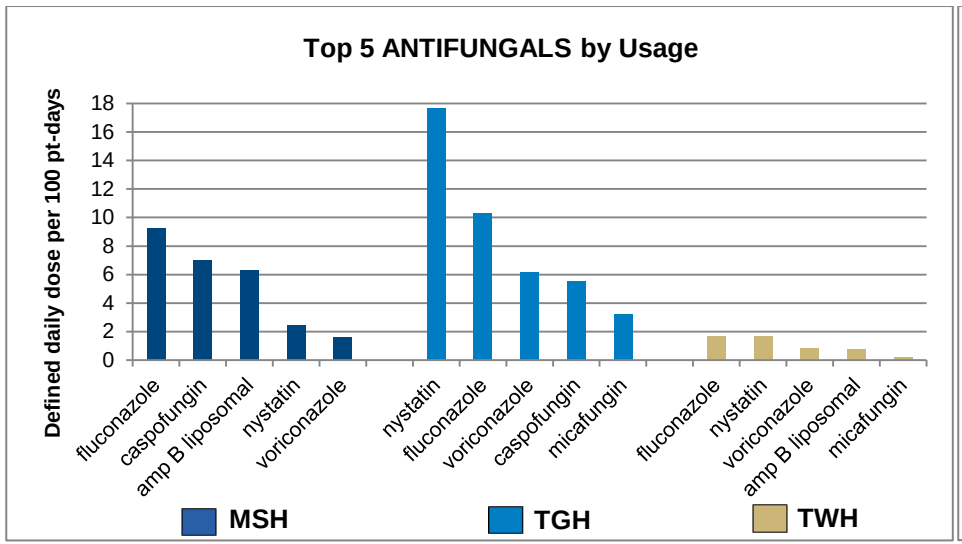
MSH + UHN ASP ANTIMICROBIAL STEWARDSHIP PROGRAM

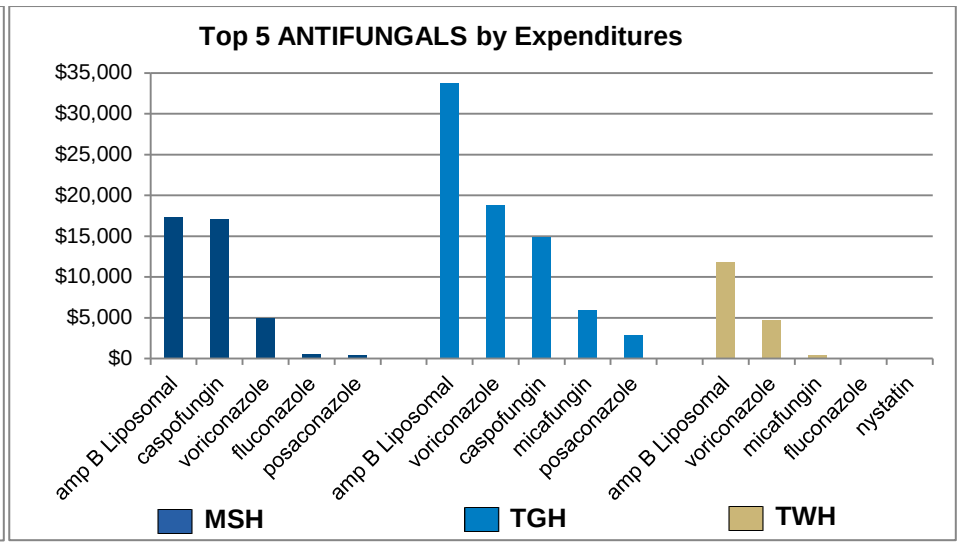
Q1 FY 13/14 Top 5 ANTIBACTERIALS by Usage (DDDs per 100 patient-days) and Expenditures





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

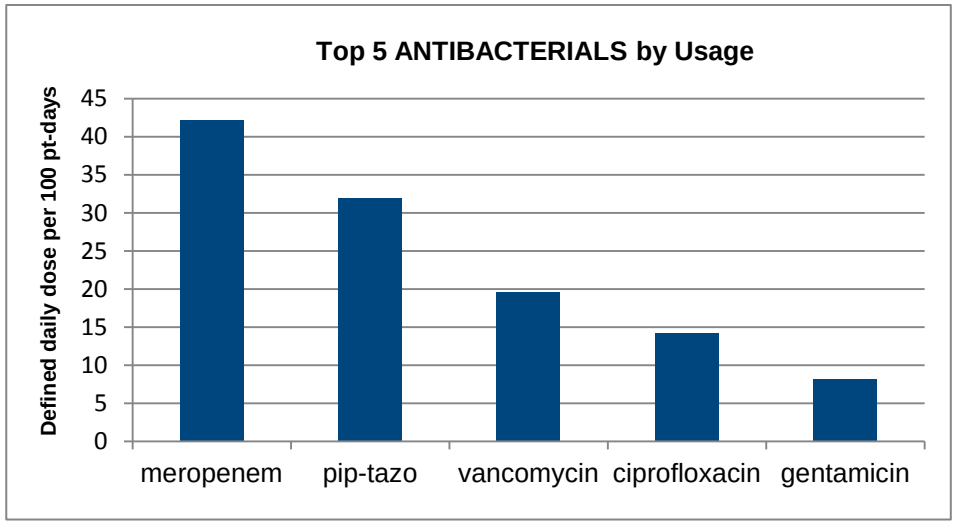


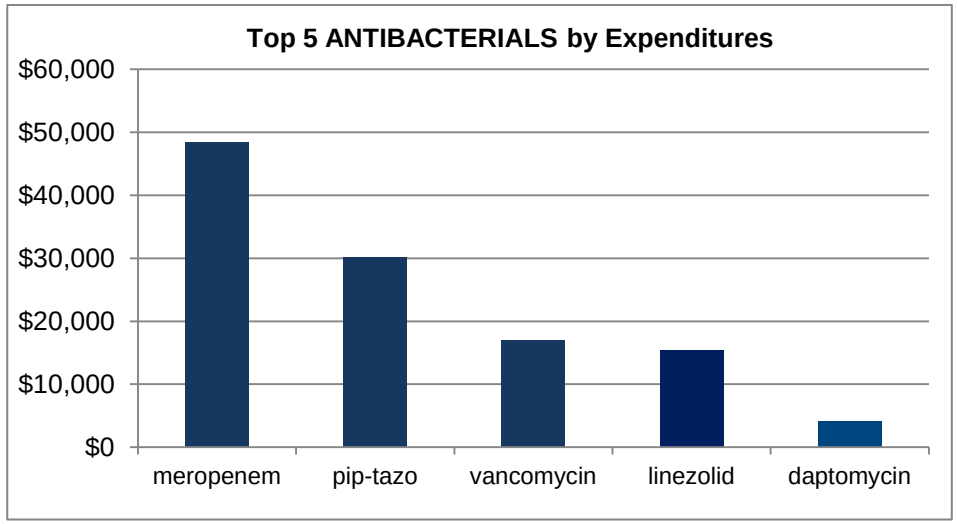


MOUNT SINAI HOSPITAL Joseph and Wolf Lebovic Health Complex

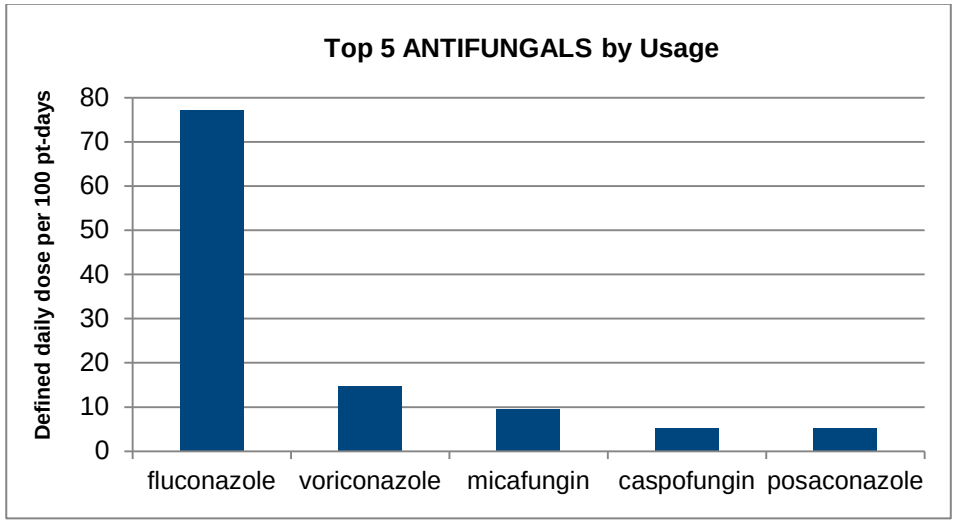
UHN Toronto General Toronto Western Princess Margaret Toronto Rehab

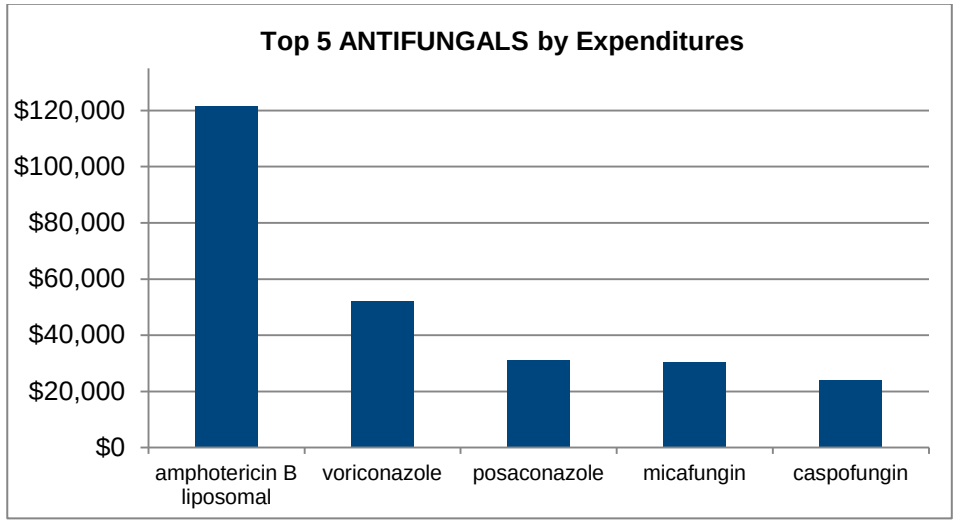
PMH Q1 FY 12/13 Top 5 ANTIBACTERIALS by Usage (DDDs per 100 patient-days) and Expenditures



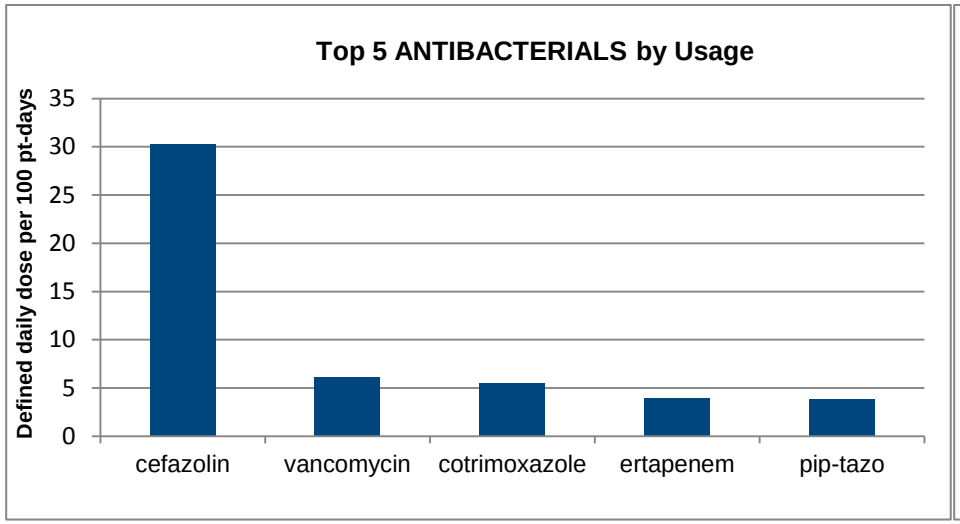


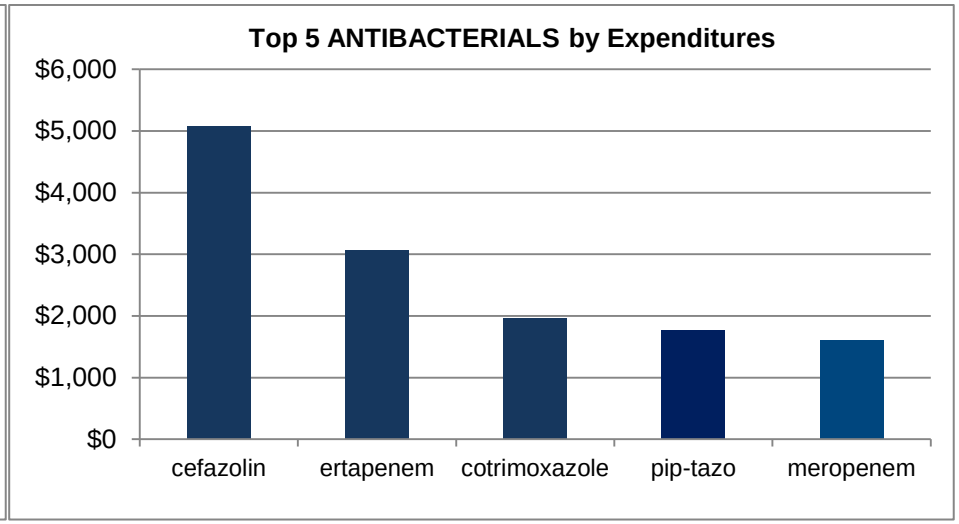
PMH Q1 FY 13/14 Top 5 ANTIFUNGALS by Usage (DDDs per 100 patient-days) and Expenditures



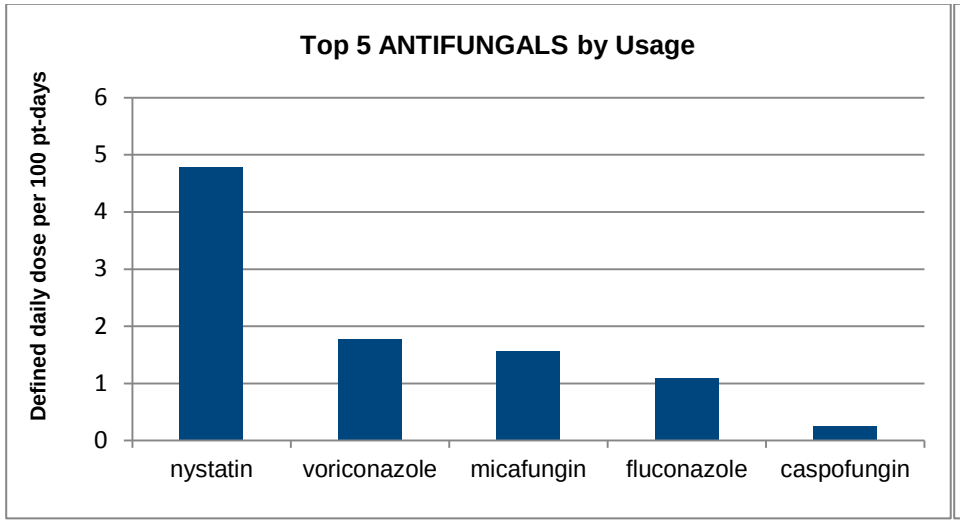


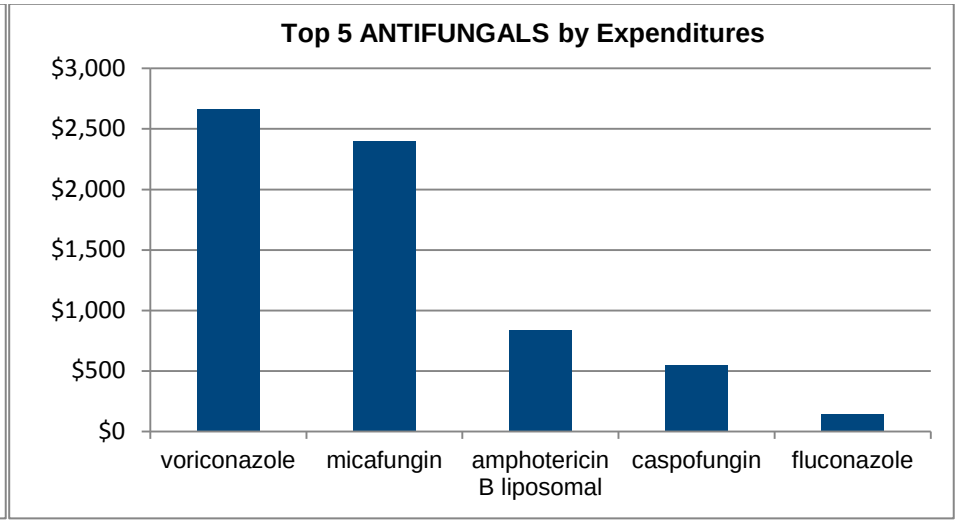
CVICU Q1 FY 13/14 Top 5 ANTIBACTERIALS by Usage (DDDs per 100 patient-days) and Expenditures



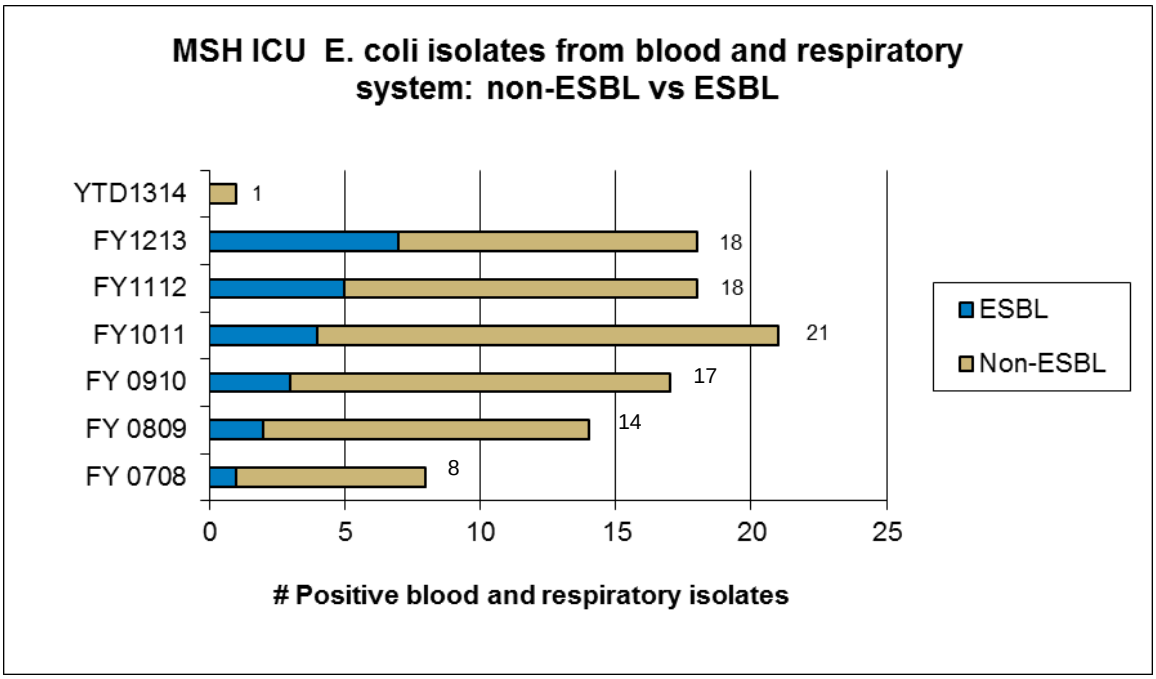


CVICU Q1 FY 13/14 Top 5 ANTIFUNGALS by Usage (DDDs per 100 patient-days) and Expenditures

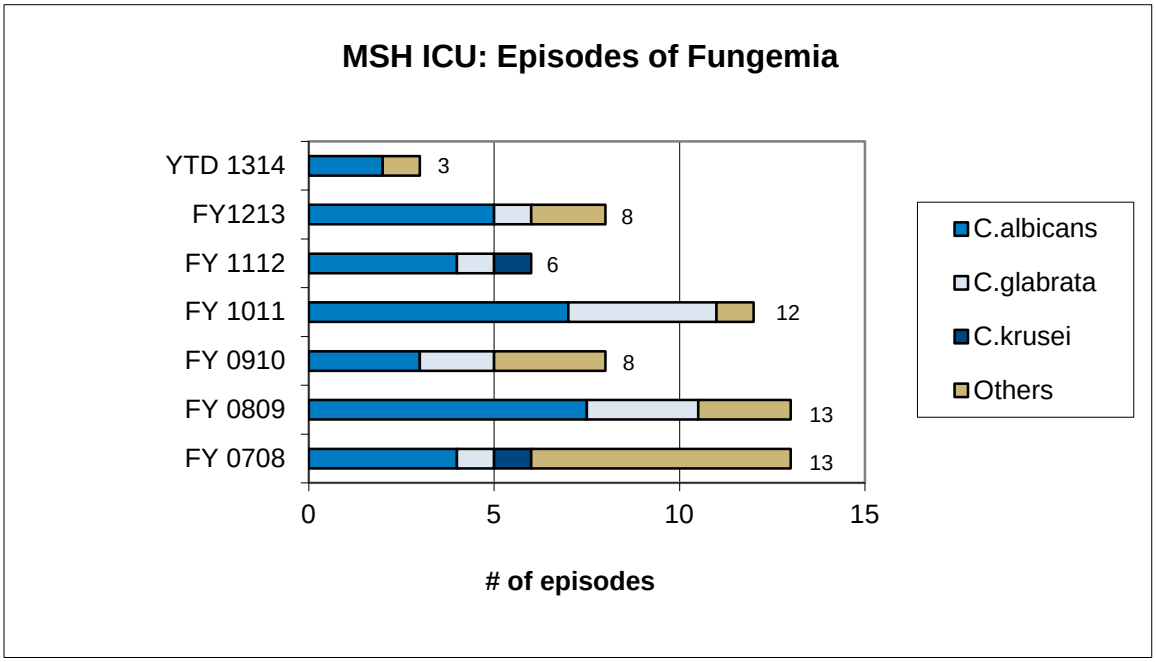




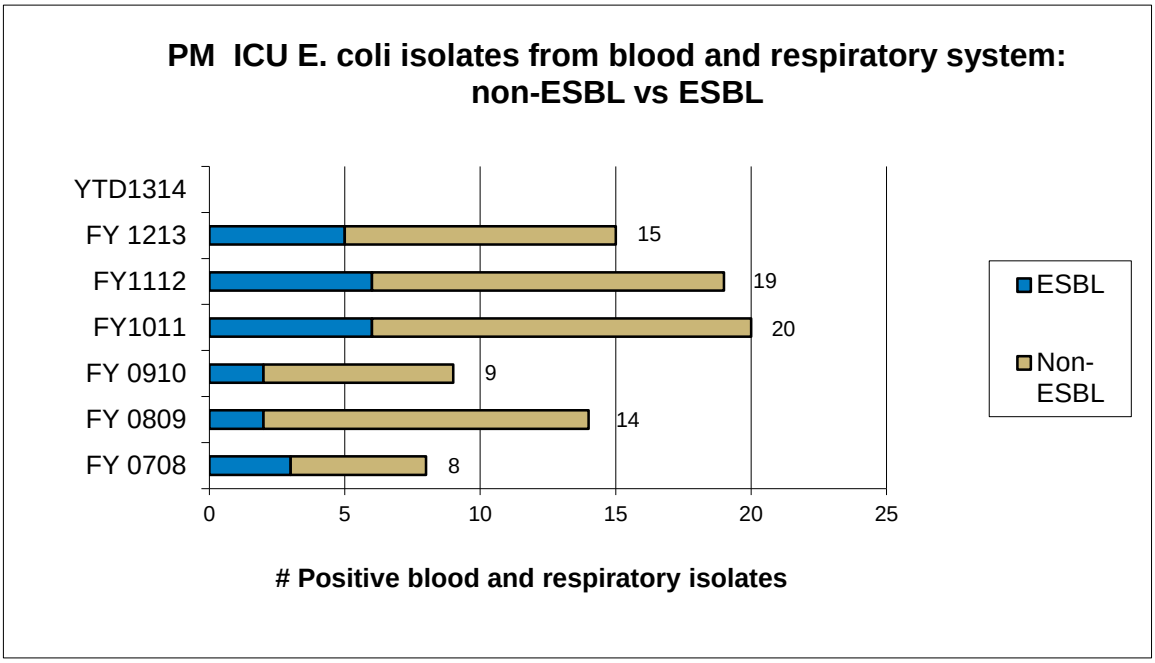
Antimicrobial Susceptibility and Pathogen Surveillance
E.Coli isolates: Blood and Respiratory



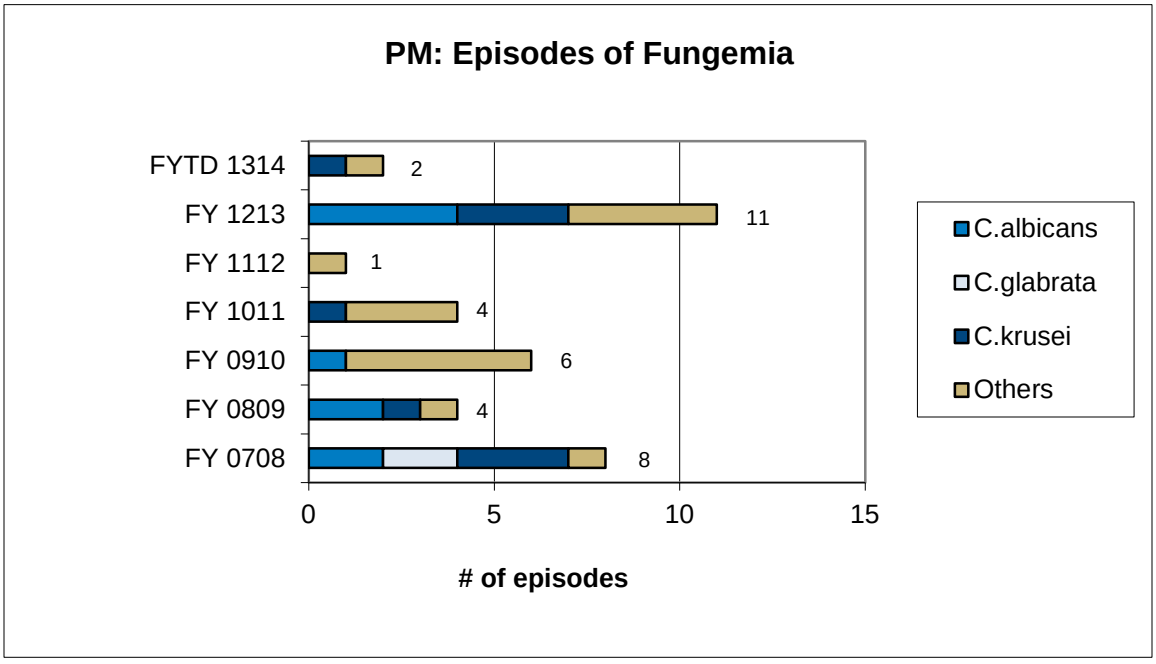
Yeast Species Isolated in Blood – MSH ICU



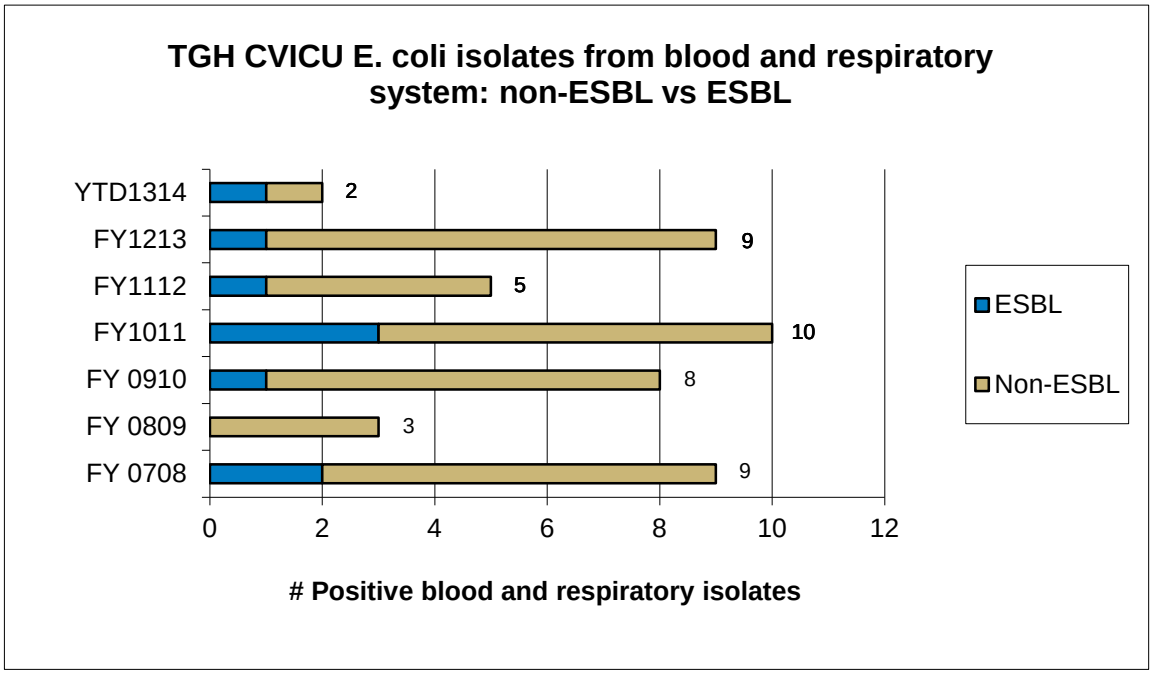
Antimicrobial Susceptibility and Pathogen Surveillance
E.Coli isolates: Blood and Respiratory



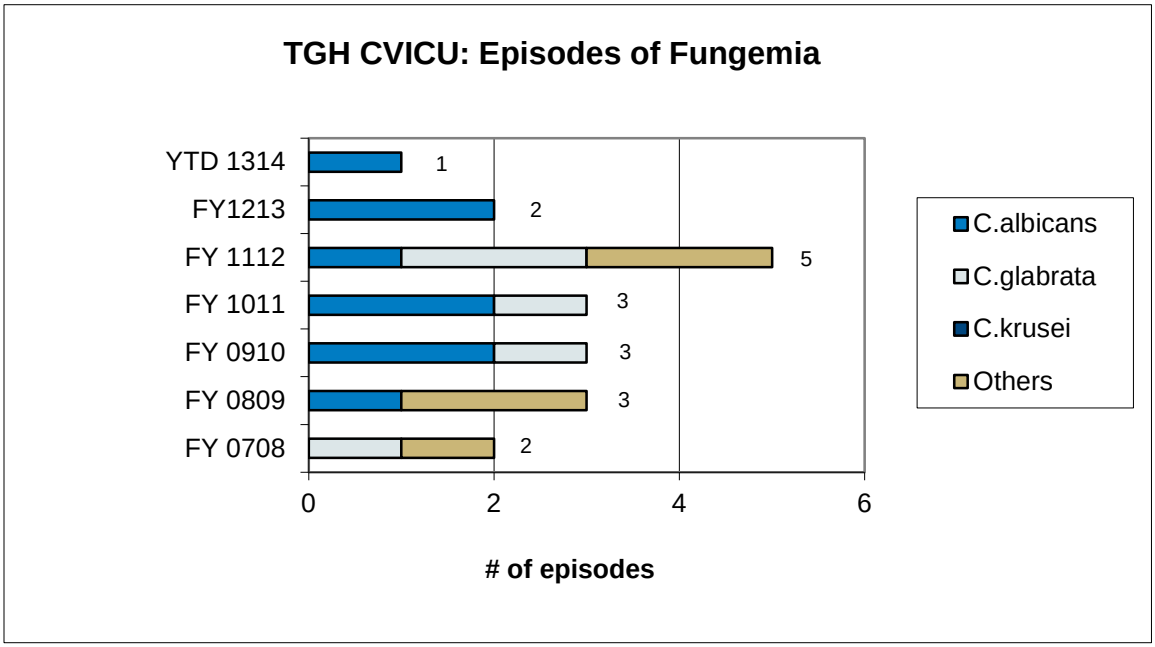
Yeast Species Isolated in Blood – Princess Margaret



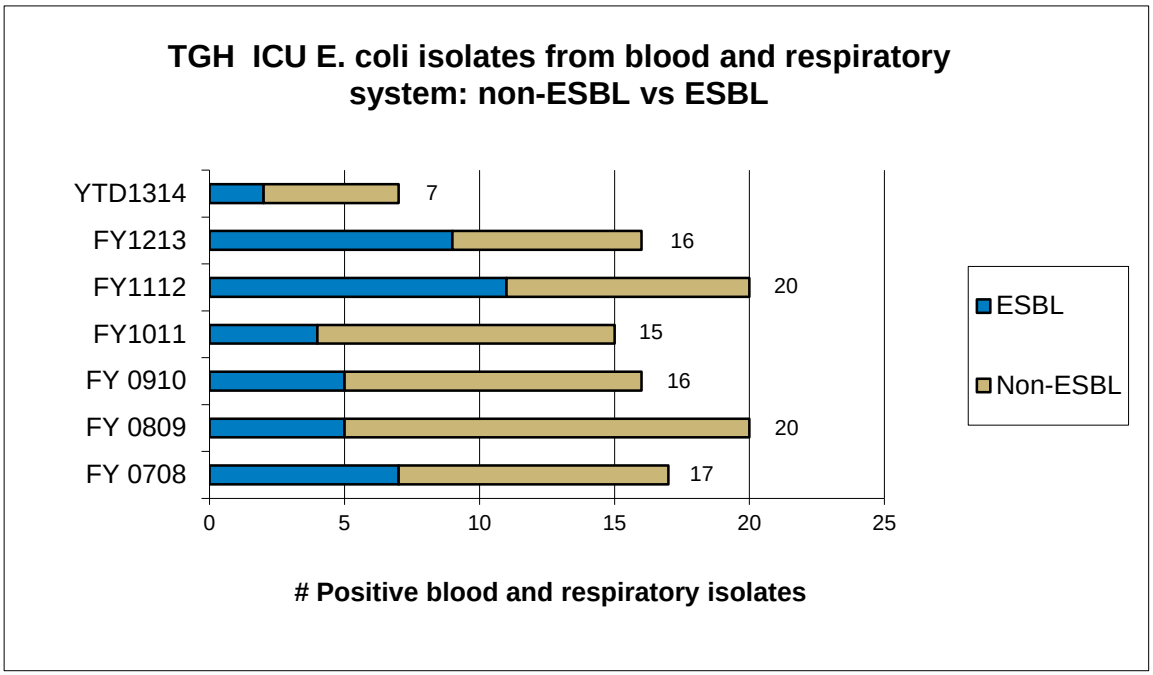
Antimicrobial Susceptibility and Pathogen Surveillance
E.Coli isolates: Blood and Respiratory



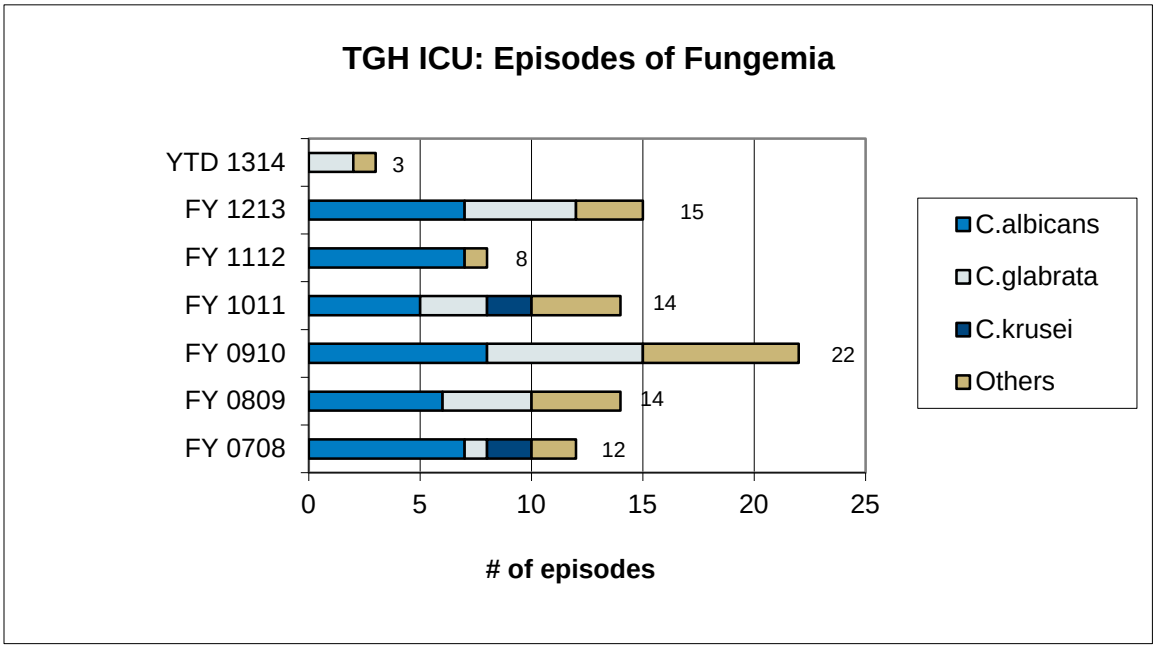
Yeast Species Isolated in Blood – CVICU



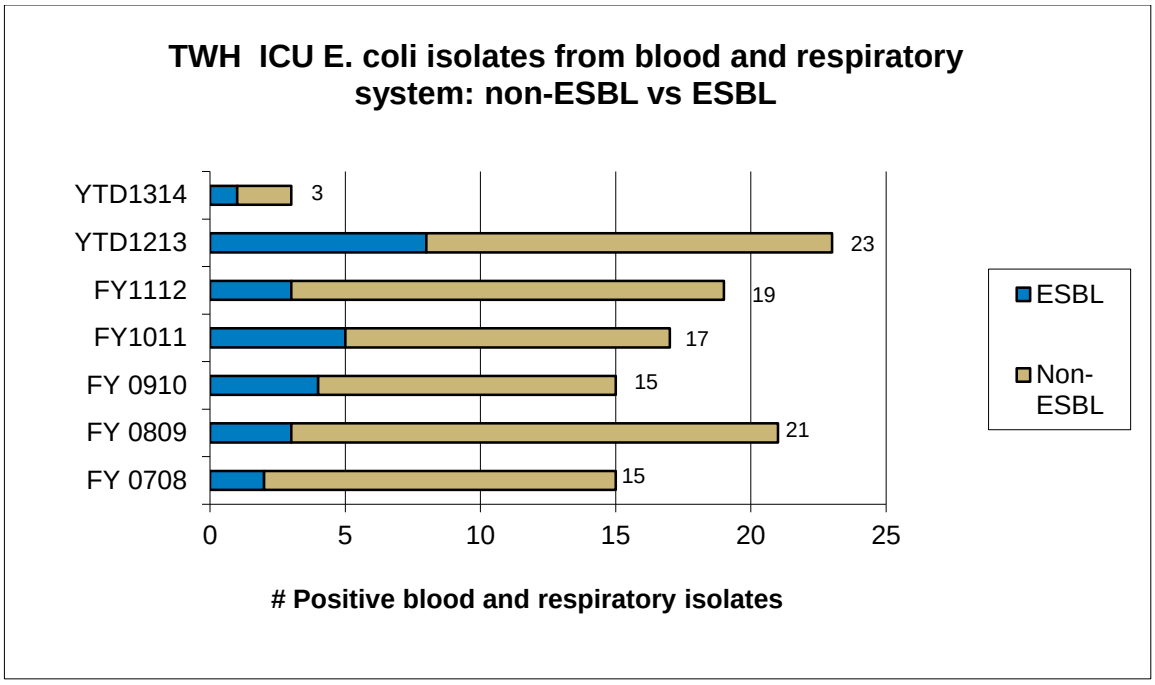
Antimicrobial Susceptibility and Pathogen Surveillance
E.Coli isolates: Blood and Respiratory



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