

SHS + UHN

ASP

ANTIMICROBIAL
STEWARDSHIP
PROGRAM



Q4 REPORT

FISCAL YEAR 2018 | 2019



@shsuhnbsp



**Sinai
Health
System**



UHN

Toronto General
Toronto Western
Princess Margaret
Toronto Rehab
Michener Institute

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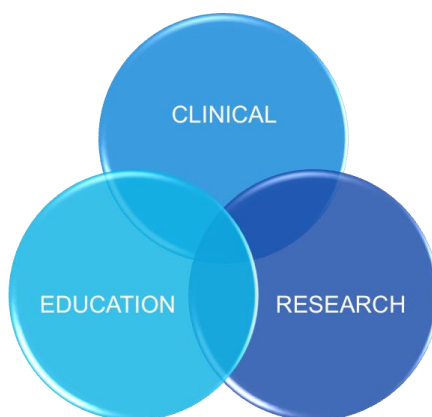
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“Getting patients the right antibiotics, when they need them”

EXECUTIVE SUMMARY

The Sinai Health System-University Health Network Antimicrobial Stewardship Program (SHS-UHN ASP) was established in 2009. The SHS-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 data-driven quality improvement methodology to pursue the best possible clinical outcomes for its patients.



The SHS-UHN ASP blends research, education, and clinical care to take a leadership role in antimicrobial stewardship and improving the quality of health care.

ANTIMICROBIAL CONSUMPTION AND COSTS

The ASP works with clinical teams across both Sinai Health System (Bridgepoint Health and Mount Sinai Hospital (MSH)) and University Health Network (Princess Margaret Cancer Centre (PM), Toronto General Hospital (TGH), Toronto Rehabilitation Institute (TRI), and Toronto Western Hospital (TWH)).

Where possible, we show Defined Daily Doses (DDD) together with Days of Therapy (DOT). The metrics are extracted from the hospital pharmacy databases and the Provincial Critical Care Information System (CCIS). Although these two metrics are closely related, using lower or higher doses of antimicrobials will result in a corresponding change in DDD without any change in DOT (i.e. inpatients with renal dysfunction, extremes of body mass, or central nervous system infections.) Table 1 summarizes antimicrobial usage and cost in the various units and services at SHS and UHN.

The Mount Sinai Hospital ICU continues to see an increase in cost in Q4. It is worth noting patients transferred from Princess Margaret accounted for 14% of patient visits and 61% of the antimicrobial costs. In the TGH Medical Surgical ICU, we had the highest count of candidemia (23 isolates) we've had in the past 12 years.

Table 1: Summary of Antimicrobial Usage and Cost by Hospital/Unit

Hospital/Unit	Antimicrobial Usage	Antimicrobial Cost
Mount Sinai Hospital: Medical Surgical ICU	↓	↑
Mount Sinai Hospital: Neonatal ICU	↓	↓
Toronto General Hospital: Cardiovascular ICU	↑	↑
Toronto General Hospital: Medical Surgical ICU	↓	↓
Toronto Western Hospital: Medical Surgical Neurosurgical ICU	↓	↓
Mount Sinai Hospital: General Internal Medicine	↓	↓
Toronto General Hospital: General Internal Medicine	↑	↓
Toronto Western Hospital: General Internal Medicine	↓	↑
Princess Margaret Cancer Centre: Leukemia Service	↑	↓
Princess Margaret Cancer Centre: Allogeneic Bone Marrow Transplant	↓	↓
Toronto General Hospital: Multi-Organ Transplant Program	↓	↓
Toronto Rehabilitation Institute: Bickle	↓	↓
Toronto Rehabilitation Institute: Lyndhurst	↑	↑
Toronto Rehabilitation Institute: University Centre	↑	↓



Decrease compared to previous YTD



Increase of < 10% compared to previous YTD



Increase of > 10% compared to previous YTD

FISCAL YEAR 18/19 Q4 HIGHLIGHTS

Research – Published In This Quarter

Multiple research projects continue, with many important projects nearing completion and being prepared for submission to key medical journals.

Publications

The following articles were published or accepted for publication in peer-reviewed medical journals:

- Campitelli MA, Maxwell CJ, MacLagan LC, Ko DT, Bell CM, Jeffs L, Morris AM, Lapane KL, Daneman N, Bronskill SE. One-year survival and admission to hospital for cardiovascular events among older residents of long-term care facilities who were prescribed intensive- and moderate-dose statins. *CMAJ*. 2019 Jan 14; 191(2):E32-E39.
- Morris AM, Bai A, Burry L, Dresser LD, Ferguson ND, Lapinsky SE, Lazar NM, McIntyre M, Matelski J, Minnema B, Mok K, Nelson S, Poutanen SM, Singh JM, So M, Steinberg M, Bell CM. Long-Term Effects of Phased Implementation of Antimicrobial Stewardship in Academic ICUs: 2007-2015. *Crit Care Med*. 2019 Feb; 47(2):159-166.
- Nhan D, Lentz EJM, Steinberg M, Bell CM, Morris AM. Structure of Antimicrobial Stewardship Programs in Leading US Hospitals: Findings of a Nationwide Survey. *Open Forum Infect Dis*. Accepted on Mar 27, 2019.
- Rzewuska M, Charani E, Clarkson JE, Davey PG, Duncan EM, Francis JJ, Gillies K, Kern WV, Lorencatto F, Marwick CA, McEwen J, Möhler R, Morris AM, Ramsay CR, Rogers Van Katwyk S12, Skodvin B, Smith I, Suh KN, Grimshaw JM, Joint Programming Initiative on Antimicrobial Resistance (JPIAMR) Working Group on Behavioural Approaches to Antibiotic Stewardship Programs. Prioritizing research areas for antibiotic stewardship programmes in hospitals: a behavioural perspective consensus paper. *Clin Microbiol Infect*. 2019 Feb 25(2):163-168
- Science M, Timberlake K, Morris A, Read S, Le Saux N, Groupe Antibiotherapie en Pediatrie Canada Alliance for Stewardship of Antimicrobials in P. Quality Metrics for Antimicrobial Stewardship Programs. *Pediatrics*. 2019 Mar 29. doi: 10.1542/peds.2018-2372. [ePub ahead of print].
- Thampi N, Shah PS, Nelson S, Agarwal A, Steinberg M, Diambomba Y, Morris AM. Prospective audit and feedback on antibiotic use in neonatal intensive care: a retrospective cohort study. *BMC pediatrics*. Accepted on Mar 31, 2019.
- Weis S, Kesselmeier M, Davis JS, Morris AM, Lee S, Scherag A, Hagel S, Pletz MW. Cefazolin versus anti-staphylococcal penicillins for the treatment of patients with *Staphylococcus aureus* bacteremia: a systematic review and meta-analysis. *Clin Microbiol Infect*. 2019 Mar 27. doi: 10.1016/j.cmi.2019.03.010. [ePub ahead of print]

Grants Awarded

- AHSC AFP Innovation Fund: Developing national antimicrobial prescribing guidelines. Principal Investigator: Andrew Morris. Co-investigators: Chaim Bell, Edith Blondel-Hill, Susan Fryters, Warren McIsaac, Patricia Sullivan-Taylor, Per Vandvik

Research Studies

The following grant-funded studies are progressing according to timelines:

- Designing an Effective Outpatient Antimicrobial Stewardship Program to Reduce Unnecessary Antibiotic Use in Primary Care using a Mixed-Methods Collaborative Model. AHSC AFP Innovation Fund. Principal Investigators: Warren McIsaac, Andrew Morris
- The Development and Testing of a Scaling Strategy for a Community-Based Primary Care Antimicrobial Stewardship Program Utilizing an Innovative University of Toronto Primary Care Testing Platform: the UTOPIAN Practice Based Research Network. Principal Investigator: Warren McIsaac. Co-investigators: Andrew Morris, Noah Ivers, Yoshiko Nakamachi. Funded by AHSC AFP Innovation Fund.
- A Multi-centre Investigation of the Management and Outcomes of Community-onset *Escherichia coli* Bacteremia. Principal Investigator: Andrew Morris. Co-investigators: Michael Bonares, Sam Thrall, Das Pavani. Funded by PSI Resident Research Grant and SHS DoM Resident Research Grant.
- National Antimicrobial Prescribing Survey (NAPS): Feasibility Project. Principal Investigator: Andrew Morris. Co-investigator: Yoshiko Nakamachi. Funded by Becton Dickinson & Company – Canada

In addition to these funded projects, multiple unfunded research projects continue, led by various members of the SHS-UHN ASP team. The following investigator-initiated studies are progressing:

- A survey on antimicrobial stewardship content in undergraduate health professions and veterinarian curricula in Canadian and top-ranked universities worldwide. Principal Investigator: Miranda So. Co-investigators: Wayne Gold, Scott Weese, Linda Dresser, Marie Rocchi, Chaim Bell, Lianne Jeffs, Fok Han Leung, Andrew Morris.

Best Practices

Several algorithms and best practice guidelines have been developed and implemented into practice across UHN and SHS. The algorithms and best practices can be found [here](#) on our ASP website.

Dr. Miranda So (ASP Pharmacist) and **Dr. Shahid Husain (ASP Physician)** have completed and implemented the “[Empiric Guidelines for Common Infections in Solid Organ Transplant Patients](#)”. The guidelines have undergone consultative reviews with stakeholders, content experts, and key opinion leaders. Guidelines continue to be introduced to staff and trainees in the **Multi-Organ Transplant Program** through a series of sessions with each of the transplant organ teams. Under the auspices of antimicrobial stewardship, the guidelines provide best practice recommendations to prescribers, pharmacists, and nurses on diagnostic workup, empiric therapy, and appropriate referral to specialist consultation, including Transplant Infectious Diseases.

JEDI and SABR. The ASP made the decision to **redesign ICU ASP interventions**. Over the past nine years, the ASP had employed an academic detailing model of three to five times a week. ICU staff who attended the multi-weekly ASP rounds were well-entrenched in the expectations of appropriate antimicrobial prescribing, and there was an appetite for change.

To that end, the ASP has moved to (1) **JEDI (Judicious Evaluation of antimicrobial Decision-making in the ICU) rounds**. This is being led by **Dr. Linda Dresser (ASP Pharmacist)**, whereby the ASP team **audits appropriateness** of antimicrobial prescribing in the ICUs once a week. The audit results are then shared and discussed with the ICU team during a weekly meeting. The **appropriateness of antimicrobial prescribing** adjudication uses locally-developed, peer-reviewed, and published criteria for appropriateness. This initiative went live in the TGH MSICU in October 2017, TGH CVICU December 2017, TWH MSNICU March 2018, and the MSH ICU June 2018. JEDI in the CCU at TGH will be the final ICU to go-live with this implementation.

The second component of our new ICU initiative is being led by **Linda Jorgoni (ASP Nurse Leader)** and is known as (2) **SABR (Stewardship at Bedside Rounds)**. This is an **innovative** way of **actively engaging nurses** in antimicrobial stewardship activities. The aim is to embed into daily bedside rounds “Infection” as a separate entity during the head-to-toe assessment. The components of “infection” include temperature, white blood cell count, antimicrobials, indication for antimicrobial use, and other relevant information that pertains to infection. This intervention is designed to change nursing practice using different behaviour change strategies (e.g. audit and feedback). We are currently collecting data to evaluate the intervention and to identify barriers to nursing engagement in antimicrobial stewardship.

These two new ICU ASP initiatives have been **well-received** by the key stakeholders prior to implementation, who have been very informative in their feedback throughout the process, allowing for continuous learning and improvement.

Provincial, National, and International Role

The SHS-UHN Antimicrobial Stewardship Program received a **grant by the Ontario Ministry of Health and Long-Term Care (MOHLTC)** and was tasked to provide awareness, education, and practical tools to community-based clinicians province-wide. As many of the concepts involving antimicrobial resistance (AMR) and antimicrobial stewardship (AMS) are relatively new to community-based clinicians, the initial strategy to improve antimicrobial usage is to provide background, syndrome-based information and decision aids to pharmacists. **Community pharmacists are in the unique position where they “touch” every community antibiotic prescription before it is dispensed.** Community pharmacists have been provided with education and practical tools (scripting, fax templates) to facilitate stewardship conversations and interventions with both patients and prescribers. The SHS-UHN ASP held a focus group in Q2 with a sample of community pharmacists from across Ontario to understand their needs as they relate to Antimicrobial Resistance and Stewardship and validate the provincial strategy.

The SHS-UHN ASP continues to work closely with **HealthCareCAN**, the **National Collaborating Centre for Infectious Diseases (NCCID)**, and the **Public Health Agency of Canada (PHAC)** to inform our national health leaders on Antimicrobial Stewardship (AMS) and Antimicrobial Resistance (AMR).

In the fall of 2018, and with the support of PHAC (Public Health Agency of Canada), BD (Becton Dickinson), and NCAS (National Centre for Antimicrobial Stewardship) in Australia, the SHS-UHN ASP is playing a lead role in implementing an antimicrobial survey tool across Canada. This tool, Canadian NAPS (National Antimicrobial Prescribing Survey), has been collecting information about antibiotic prescriptions, accompanying diagnoses, and the appropriateness of the prescriptions. Mount Sinai Hospital, Toronto General Hospital, and Toronto Western Hospital have taken this survey, along with over 35 other hospitals across Canada. The SHS-UHN ASP is poised to lead this initiative for Year 2, making it available to an even larger number of hospitals across Canada.



Aligned with the Federal Government's plan on addressing AMR, [Tackling Antimicrobial Resistance and Antimicrobial Use – A Pan Canadian Framework for Action](#), CANresist was created and has brought together over 150 of Canada's best researchers in AMR and AMS. The CANresist directorate consists of Drs. Andrew Morris (SHS-UHN ASP), David Patrick (BCCDC), and J. Scott Weese (University of Guelph), and Yoshiko Nakamachi (SHS-UHN ASP). Our network research members remain committed and active participants in the CANresist network.

The SHS-UHN ASP continues to be a leader in antimicrobial stewardship and is currently working with, and providing expert guidance to, over 30 hospitals, as well as to **PSASS** (Pharmacy Students for Antimicrobial Stewardship Society), **DSASS** (Dental Students for Antimicrobial Stewardship Society), and **SASS** (Students for Antimicrobial Stewardship Society).



The Leslie Dan Faculty of Pharmacy at the University of Toronto continues to be the only Pharmacy School in Canada to offer an elective course in Year 3 dedicated to Antimicrobial Stewardship, which is led by **Dr. Miranda So**, Assistant Professor and SHS-UHN ASP Pharmacist.

Drs. Shahid Husain and **Miranda So** are Chair and Co-Chair, respectively, of the Antimicrobial Resistance-Antimicrobial Stewardship White Paper Working Group of the American Society of Transplantation (AST). They are working with Dr. Jonathan Hand (also Co-Chair) of the Ochsner Health Centre in New Orleans, LA, USA. The Working Group consists of AST members from transplant infectious diseases and various organ transplant sub-specialties. The objective of the Working Group is to develop best practice recommendations for implementing antimicrobial stewardship program interventions in the solid organ transplant population.

New Collaboration with the Michener Institute

The Antimicrobial Stewardship Nursing Curriculum has been incorporated in the critical care certificate. **Linda Jorgoni, RN, ASP Nurse Leader**, and **Dr. Linda Dresser**, in partnership with the Michener Institute, developed the first known Canadian Nursing Curriculum addressing Antimicrobial Stewardship (AMS) concepts combined with infectious diseases management for critical care nurses. The content includes online modules, clinical placement, and in-classroom teaching. It provides nurses with foundational knowledge related to AMS and management of patients with infectious diseases. The first cohort of newly-hired critical care nurses received this new course content in October 2018. The next cohorts of students are scheduled to receive the education in March, June, and October 2019.

FISCAL YEAR 18/19 Q4 RESULTS

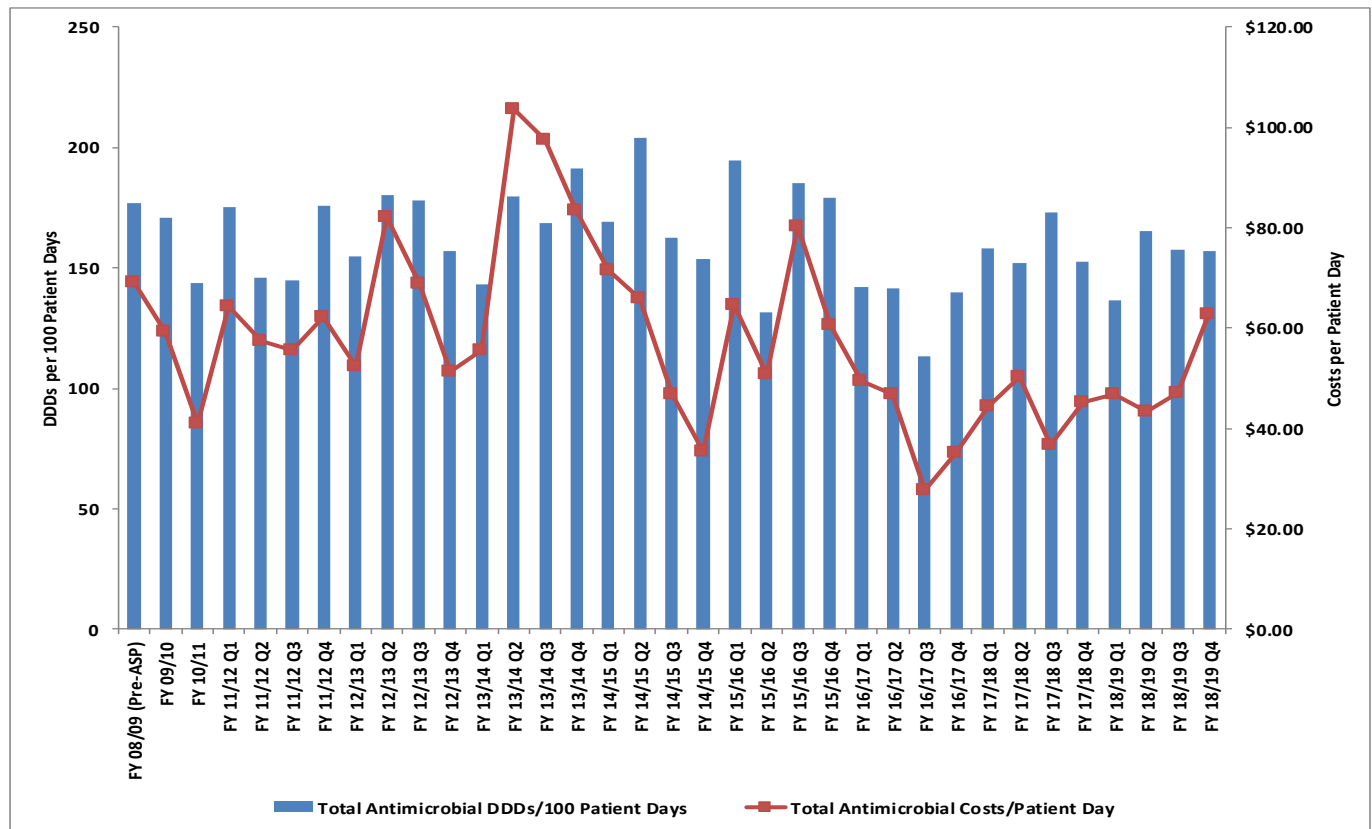
CRITICAL CARE

Mount Sinai Hospital: Medical Surgical ICU

The FY 18/19 Q4 summary includes:

- Antimicrobial consumption (using defined daily doses (DDDs) per 100 patient days) decreased (↓) by 2.9% compared to YTD last year.
- Antimicrobial costs per patient day increased (↑) by 13.0% compared to YTD last year.
- Antibacterial costs per patient day decreased (↓) by 3.9% compared to YTD last year.
- Antifungal costs per patient day increased (↑) by 30.8% compared to YTD last year.
- NB: Patients transferred from Princess Margaret accounted for 14% of patient visits and 61% of the antimicrobial costs. The last quarter increase is likely accounted for by immunocompromised patient(s).

Mount Sinai Hospital: Medical Surgical ICU Antimicrobial Consumption and Costs Per Patient Day



To view **Appendix 1: FY 18/19 Q4 Top 5 Antimicrobials by Usage (DDDs per 100 Patient Days) and Expenditures by ICU Site**, please click [here](#).

Mount Sinai Hospital: Medical Surgical ICU Antimicrobial Consumption as Defined Daily Dose versus Antimicrobial Consumption as Days of Therapy

- Antibacterial Days of Therapy (DOT) per 100 patient days increased (↑) by 2.4% compared to YTD last year.
- Antifungal Days of Therapy (DOT) per 100 patient days increased (↑) by 20.8% compared to YTD last year.

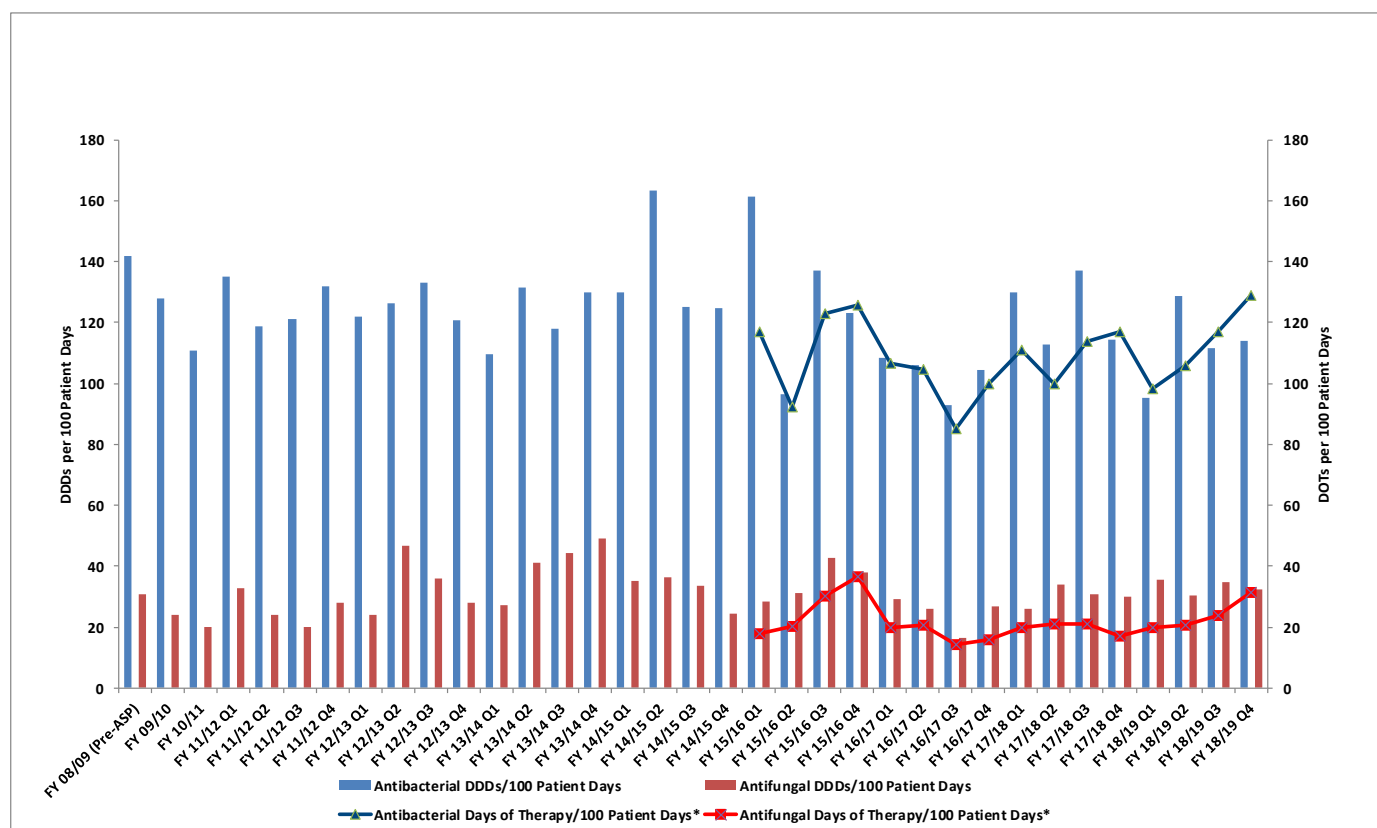


Table 2: Mount Sinai Hospital: Medical Surgical ICU

Indicators	FY 08/09 (Pre-ASP)	FY 09/10	FY 10/11	FY 11/12	FY 12/13	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	FY 18/19 Performance					YTD of Previous Year
											Q1	Q2	Q3	Q4	YTD	
Antimicrobial Usage and Costs																
Total Antimicrobial DDDs/100 Patient Days	177	171	144	167	170	172	164	156	135	159	137	165	157	157	154	159
Systemic Antibacterial DDDs/100 Patient Days	142	128	111	128	127	123	136	116	103	123	95	129	112	114	113	123
Systemic Antifungal DDDs/100 Patient Days	31	24	20	33	35	41	25	32	25	30	36	30	35	32	33	30
Total Antimicrobial Costs	\$332,724	\$285,975	\$193,129	\$279,859	\$291,470	\$424,044	\$232,814	\$274,258	\$187,684	\$206,738	\$59,573	\$55,625	\$59,698	\$83,926	\$258,822	\$206,738
Total Antimicrobial Costs/Patient Day	\$69.01	\$59.23	\$40.95	\$59.22	\$62.37	\$85.36	\$62.54	\$61.45	\$39.96	\$44.35	\$46.76	\$43.36	\$46.97	\$62.73	\$50.10	\$44.35
Systemic Antibacterial Costs	\$174,339	\$142,134	\$95,773	\$125,339	\$134,811	\$108,886	\$92,928	\$68,246	\$57,257	\$80,561	\$21,787	\$18,547	\$19,078	\$26,371	\$85,783	\$80,561
Systemic Antibacterial Costs/Patient Day	\$36.16	\$29.44	\$20.31	\$26.94	\$28.85	\$21.92	\$20.71	\$15.29	\$12.19	\$17.28	\$17.10	\$14.46	\$15.01	\$19.71	\$16.61	\$17.28
Systemic Antifungal Costs	\$143,100	\$132,519	\$88,998	\$141,877	\$144,811	\$296,573	\$134,504	\$189,661	\$119,234	\$112,610	\$36,410	\$34,620	\$36,953	\$55,211	\$163,194	\$112,610
Systemic Antifungal Costs/Patient Day	\$29.68	\$27.45	\$18.87	\$30.50	\$30.99	\$59.70	\$40.53	\$42.50	\$25.39	\$24.16	\$28.58	\$26.98	\$29.07	\$41.26	\$31.59	\$24.16
Antibacterial Days of Therapy/100 Patient Days*	n/a	n/a	n/a	n/a	n/a	111	109	115	99	110	98	106	117	129	113	110
Antifungal Days of Therapy/100 Patient Days*	n/a	n/a	n/a	n/a	n/a	17	21	27	18	20	20	21	24	31	24	20
Patient Care Outcomes																
Hospital-Acquired C. difficile Cases (rate per 1,000 pt days)	NA	NA	NA	5 (1.07)	8 (1.71)	4 (0.91)	7 (1.59)	5 (1.12)	2 (0.43)	4 (0.86)	1 (0.78)	0 (0.00)	0 (0)	0 (0)	1 (0.19)	4 (0.86)
ICU Average Length of Stay (Days)	5.84	5.57	5.67	5.51	5.24	6.10	5.26	4.45	4.20	4.54	5.09	4.76	4.25	6.37	5.12	4.54
ICU Mortality Rate (as a %)	20.1	17.6	16.3	16.5	17.0	15.3	13.9	14.2	12.5	14.7	11.6	15.7	11.7	20.2	14.8	14.7
ICU Readmission Rate Within 48 Hrs (as a %)	3.2	2.9	2.7	2.7	1.9	3.2	2.6	2.1	2.5	2.6	2.3	1.9	3.0	2.5	2.4	2.6
ICU Ventilator Days	NA	3286	2934	2677	2749	3069	2597	2504	2231	2845	663	633	655	933	2884	2845
ICU Multiple Organ Dysfunction Score (MODS)	4.00	4.04	4.12	4.25	4.62	4.87	4.73	4.43	3.92	3.86	4.02	3.93	4.04	4.34	4.08	3.86

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).

Historical antimicrobial usage and cost data updated due to the discovery that selected added drug dosages (Fluconazole 400mg/200ml bag, Pip-Tazo 13.5gm vial, Daptomycin 500mg vial) were not included in the report. Data have been revised to include Fluconazole starting August 2013, Pip-Tazo January 2015, and Daptomycin, November 2015.

There was a calculation error for the ICU Readmission Rate for FY 16/17 Q3. That figure has now been corrected.

Table 3: Mount Sinai Hospital: Medical Surgical ICU Total Antimicrobial Costs

MSH ICU Total Antimicrobial Costs														
Antimicrobial Cost per Patient Day														
	FY 10/11	FY 11/12	FY 12/13	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	FY 18/19 Q1	FY 18/19 Q2	FY 18/19 Q3	FY 18/19 Q4	FY 18/19 YTD	Previous YTD
Non-PM Patients	\$78,737.00	\$87,931.12	\$109,282.63	\$150,869.65	\$118,306.39	\$78,180.71	\$59,166.51	\$93,341.59	\$31,567.12	\$19,741.84	\$40,810.00	\$9,240.54	\$101,359.50	\$93,341.59
	\$21.14	\$25.42	\$31.77	\$37.79	\$31.80	\$23.12	\$9.78	\$18.48	\$23.02	\$16.04	\$29.05	\$7.28	\$19.21	\$18.48
PM Patients	\$114,392.00	\$191,928.21	\$182,187.68	\$273,174.21	\$122,698.89	\$209,984.51	\$128,517.32	\$113,396.53	\$28,005.70	\$35,882.96	\$18,888.00	\$74,685.64	\$157,462.30	\$113,396.53
	\$179.02	\$181.58	\$249.91	\$317.64	\$170.89	\$231.26	\$191.53	\$155.98	\$149.76	\$116.88	\$125.09	\$149.07	\$137.40	\$155.98
Total ICUs	\$193,129.00	\$279,859.33	\$291,470.31	\$424,043.86	\$241,005.28	\$288,165.22	\$187,683.83	\$206,738.12	\$59,572.82	\$55,624.80	\$59,697.81	\$83,926.18	\$258,821.61	\$206,738.12
	\$44.26	\$61.97	\$69.91	\$87.40	\$54.30	\$67.17	\$27.93	\$35.78	\$38.24	\$36.17	\$38.37	\$47.39	\$40.30	\$35.78

Note: 15/16 is open year data; totals and cost per day may change based on coding changes. Antimicrobial costs from PharmNet; ICU visits and patient days from CIHI DAD Database.

**Mount Sinai Hospital: Medical Surgical ICU
Proportional Antimicrobial Costs for Princess Margaret Cancer Centre and
Non-Princess Margaret Cancer Centre Patients**
(with costs/patient day indicated)

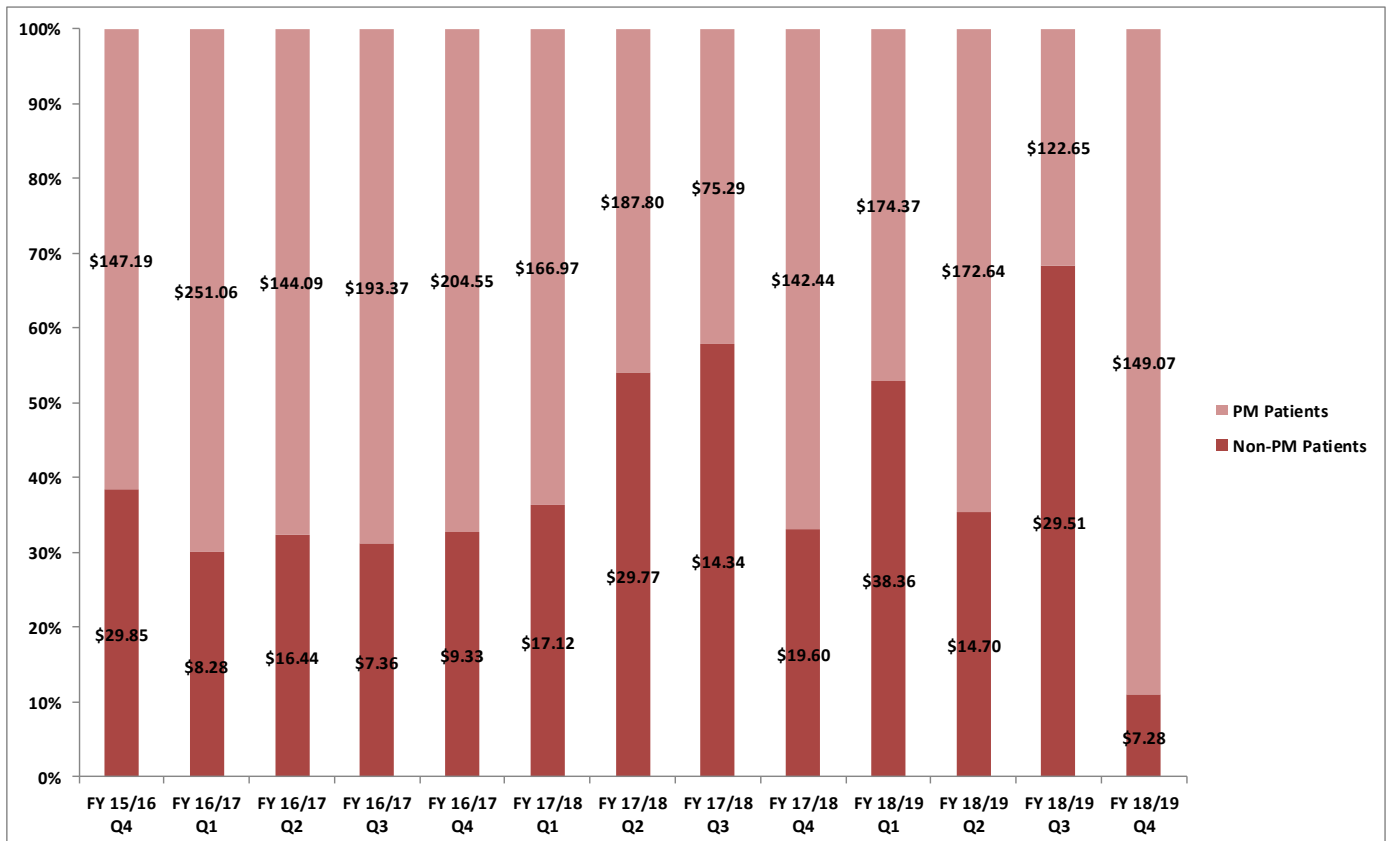
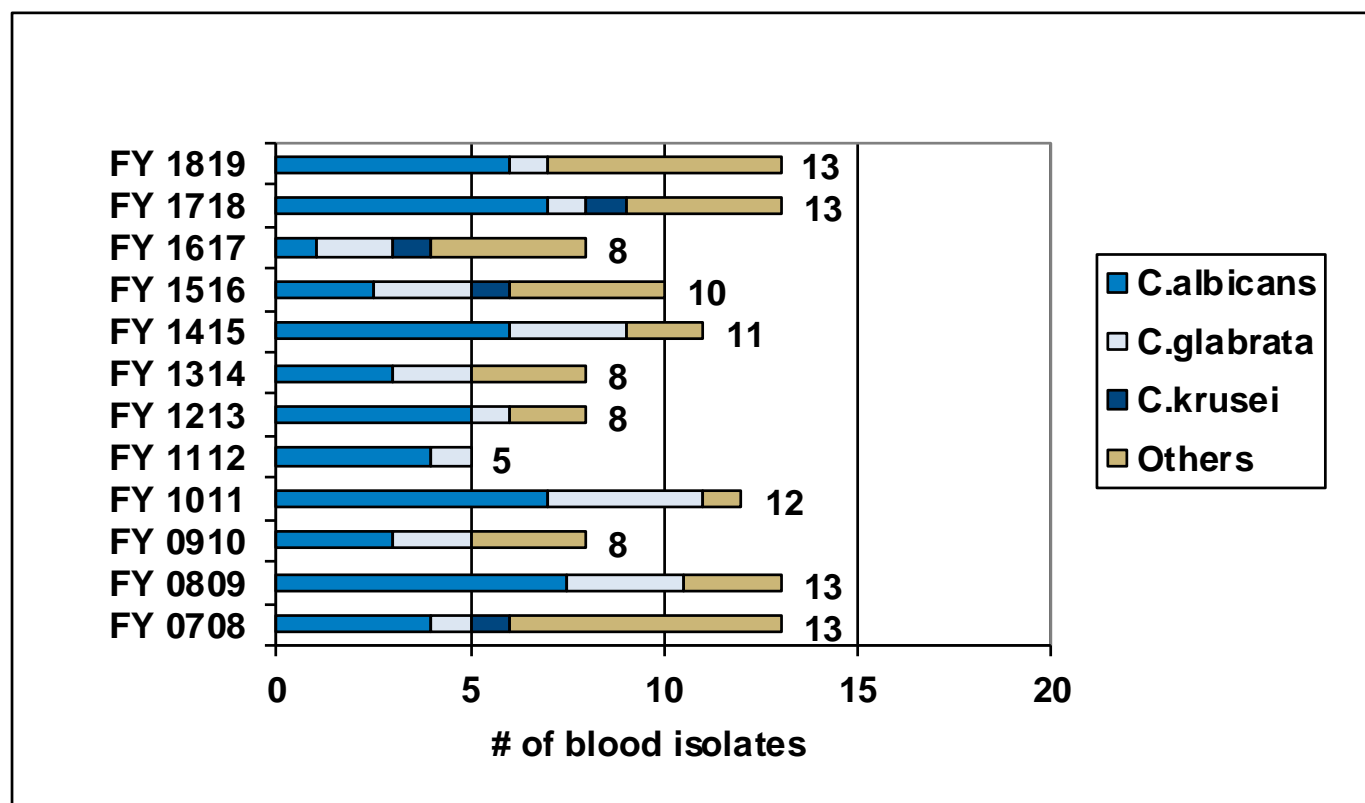
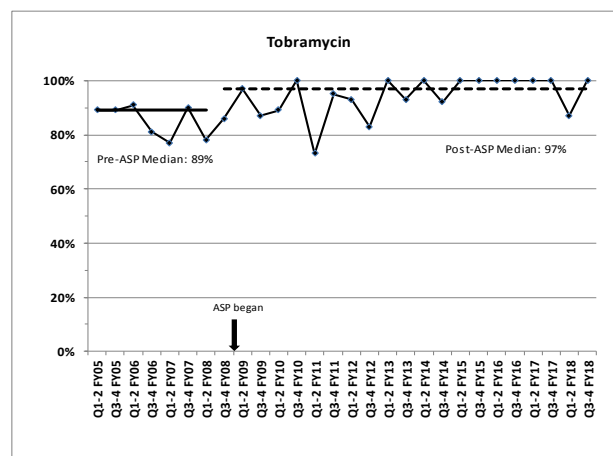
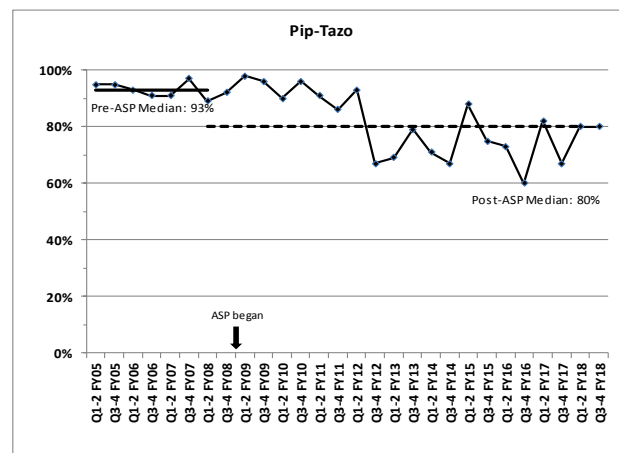
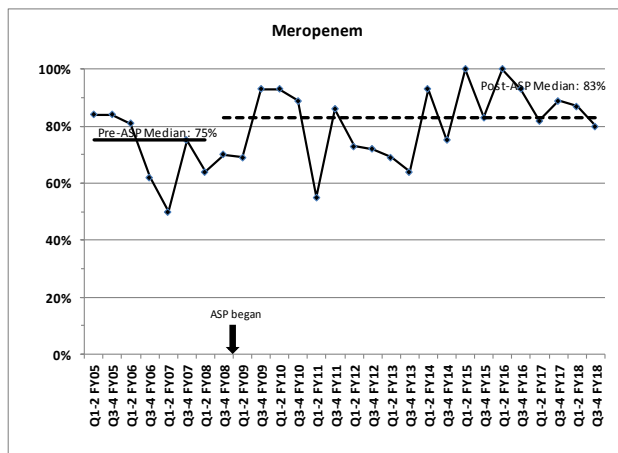
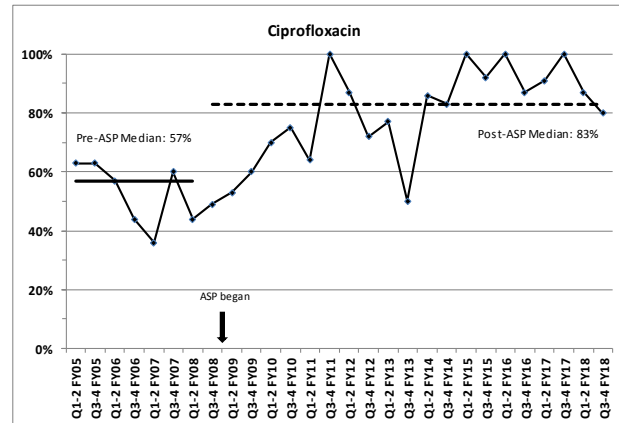
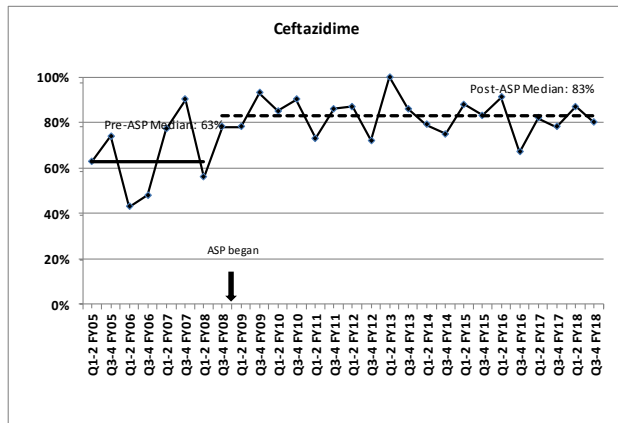


Table 4: Yeast Species Isolated in Blood – Mount Sinai Hospital: Medical Surgical ICU



NB: In past Quarterly Reports, if a patient had more than one culture of different organisms, it was counted as 0.5 each. Starting with the Q3 2017/18 Quarterly Report and moving forward, it will be counted as 1.

MSH ICU Pseudomonas Susceptibility



Mount Sinai Hospital: Neonatal ICU

Currently, there are no active ASP rounds in the NICU, however, we have continued to collect days of therapy (DOT), which is the standard metric for antimicrobial consumption for neonates. The FY 18/19 Q4 summary includes:

- Antimicrobial days of therapy (DOT) per 100 patient days decreased (↓) by 8.7% compared to YTD last year.
- Antimicrobial costs per patient day decreased (↓) by 21.4% compared to YTD last year.
- NB: Q4 results for both usage and expenditure reflect the lowest amounts seen to date.

Mount Sinai Hospital: Neonatal ICU Antimicrobial Consumption and Costs Per Patient Day

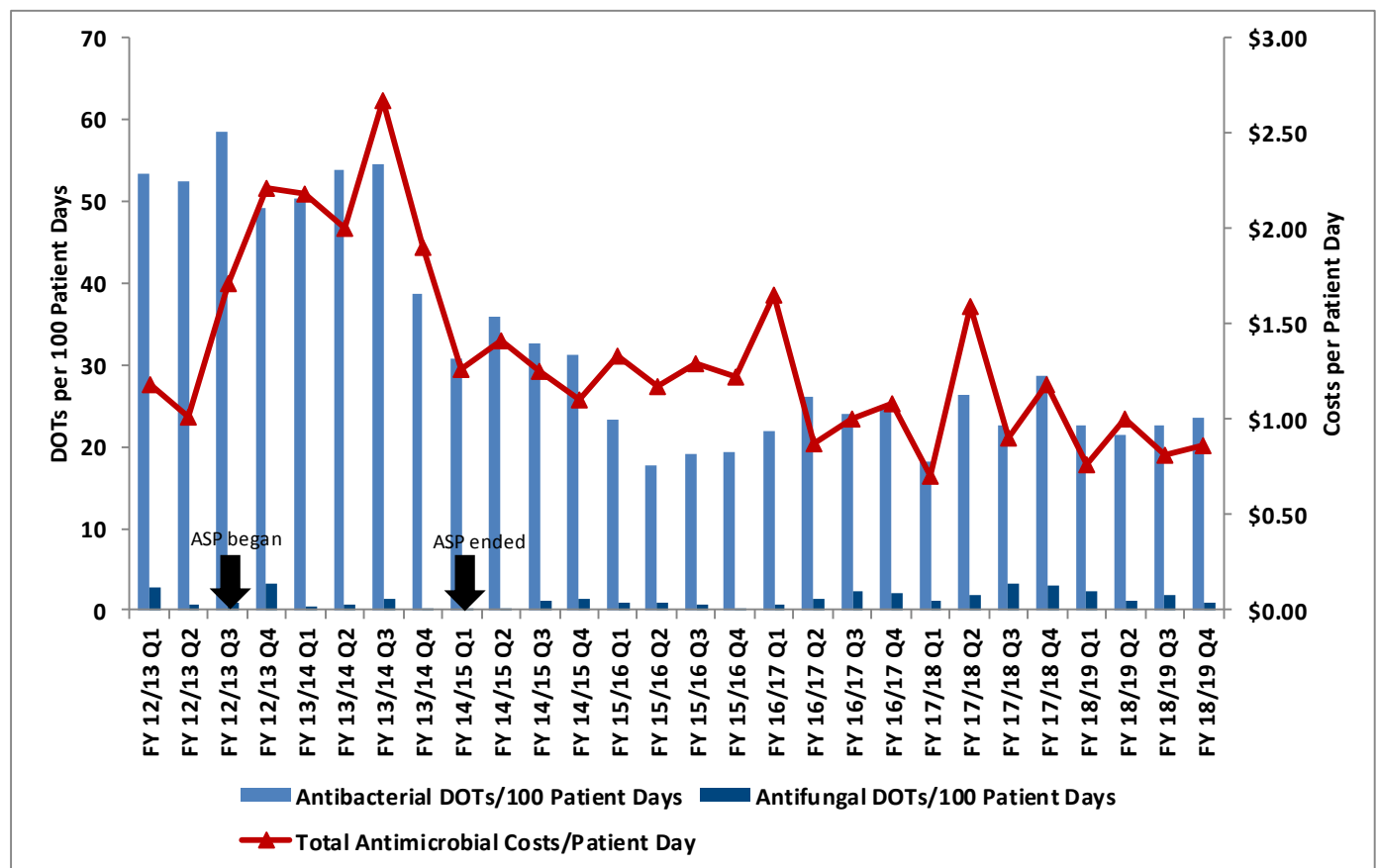


Table 5: Mount Sinai Hospital: Neonatal ICU

Indicators	FY 11/12	FY 12/13	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	FY18/19 Performance					YTD of Previous Year
								Q1	Q2	Q3	Q4	YTD	
Antimicrobial Usage and Costs													
Total Antimicrobial DOTs/100 Patient Days	67.3	55.4	49.4	33.5	20.6	25.8	26.4	24.9	22.6	24.3	24.5	24.1	26.4
Systemic Antibacterial DOTs/100 Patient Days	65.1	53.5	48.7	32.7	19.9	24.2	24.1	22.7	21.5	22.5	23.6	22.6	24.1
Systemic Antifungal DOTs/100 Patient Days	2.2	1.8	0.7	0.8	0.7	1.6	2.3	2.2	1.1	1.8	0.9	1.5	2.3
Total Antimicrobial Costs	\$16,415	\$17,682	\$26,162	\$21,371	\$21,232	\$19,618	\$19,272	\$3,456	\$4,499	\$3,680	\$3,690	\$15,325	\$19,272
Total Antimicrobial Costs/Patient Day	\$1.31	\$1.51	\$2.17	\$1.26	\$1.26	\$1.15	\$1.09	\$0.76	\$1.00	\$0.81	\$0.86	\$0.86	\$1.09
Systemic Antibacterial Costs	\$14,783	\$16,505	\$25,290	\$20,516	\$20,804	\$18,247	\$18,042	\$3,268	\$4,293	\$3,646	\$3,580	\$14,788	\$18,042
Systemic Antibacterial Costs/Patient Day	\$1.18	\$1.41	\$2.10	\$1.21	\$1.23	\$1.07	\$1.02	\$0.72	\$0.96	\$0.81	\$0.84	\$0.83	\$1.02
Systemic Antifungal Costs	\$1,632	\$1,177	\$872	\$855	\$428	\$1,372	\$1,230	\$102	\$206	\$34	\$109	\$451	\$1,230
Systemic Antifungal Costs/Patient Day	\$0.13	\$0.10	\$0.07	\$0.05	\$0.03	\$0.08	\$0.07	\$0.02	\$0.05	\$0.01	\$0.03	\$0.03	\$0.07

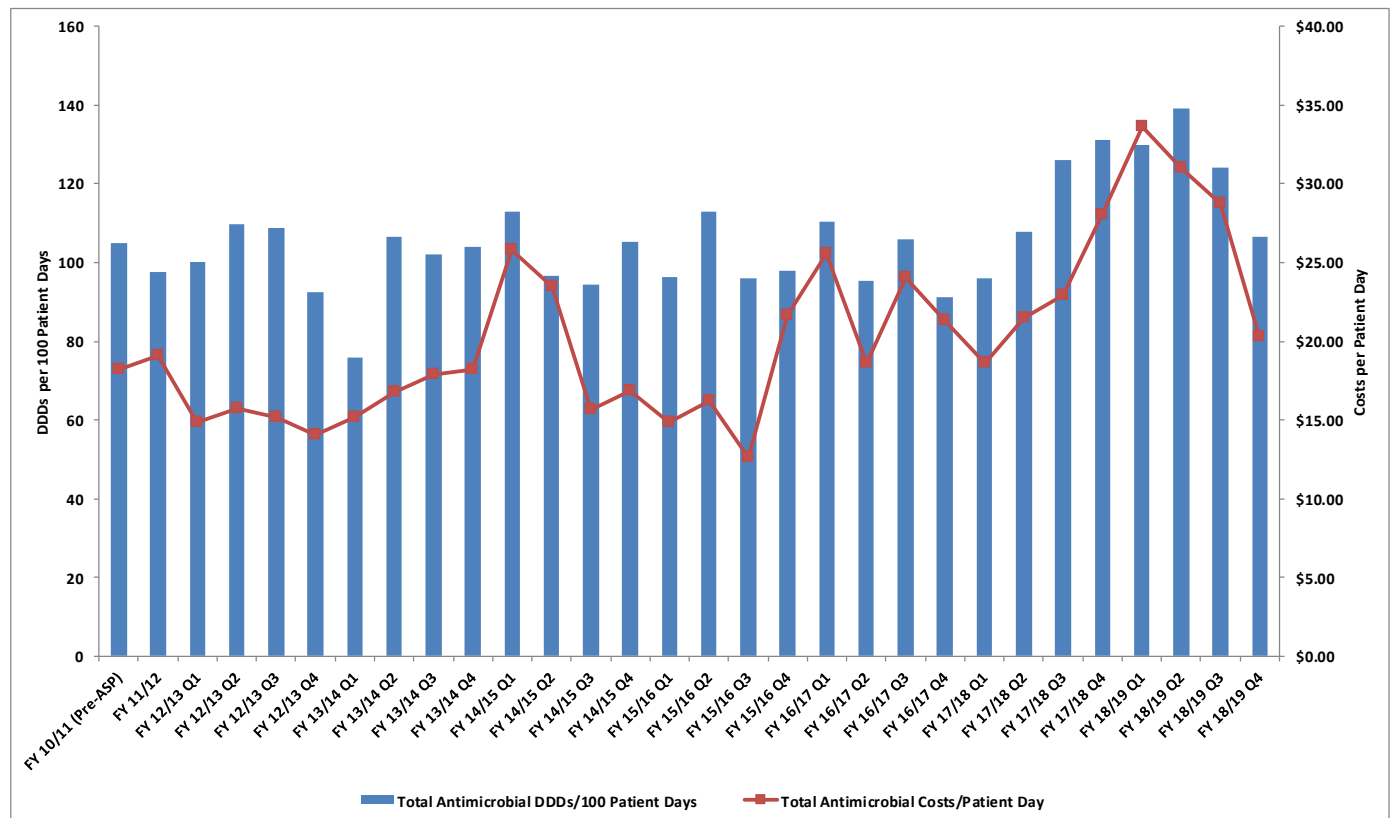
Notes: Effective January 15, 2014, the NICU changed to a mixed-acuity model of care. Prior to this, ASP reported level 3 pharmacy data only. As of January 15, pharmacy data includes both level 2 and level 3 usage and cost. Patient days include both level 2 and 3 days; January level 2 days were determined by dividing the total days for the month by 2, since the change occurred midway through the month. Days of Therapy (DOT) was used as the metric for antimicrobial consumption, which is considered to be the standard for neonates.

Toronto General Hospital: Cardiovascular ICU

The FY 18/19 Q4 summary includes:

- Antimicrobial consumption (using defined daily doses (DDDs) per 100 patient days) increased (↑) by 8.3% compared to YTD last year.
 - Antimicrobial costs per patient day increased (↑) by 24.1% compared to YTD last year.
 - Antibacterial costs per patient day increased (↑) by 22.0% compared to YTD last year.
 - Antifungal costs per patient day increased (↑) by 28.9% compared to YTD last year.
- NB: micafungin prophylaxis in heart transplant patients had stopped in October 2015 and was then reinstated in March of 2016
- These increases in cost and consumption are associated with a few patients with prolonged stays and complicated infectious issues.

Toronto General Hospital: Cardiovascular ICU Antimicrobial Consumption and Costs Per Patient Day



Toronto General Hospital: Cardiovascular ICU Antimicrobial Consumption as Defined Daily Dose Versus Antimicrobial Consumption as Days of Therapy

- Antibacterial Days of Therapy (DOT) per 100 patient days increased (↑) by 6.4% compared to YTD last year.
- Antifungal Days of Therapy (DOT) per 100 patient days increased (↑) by 16.8% compared to YTD last year.

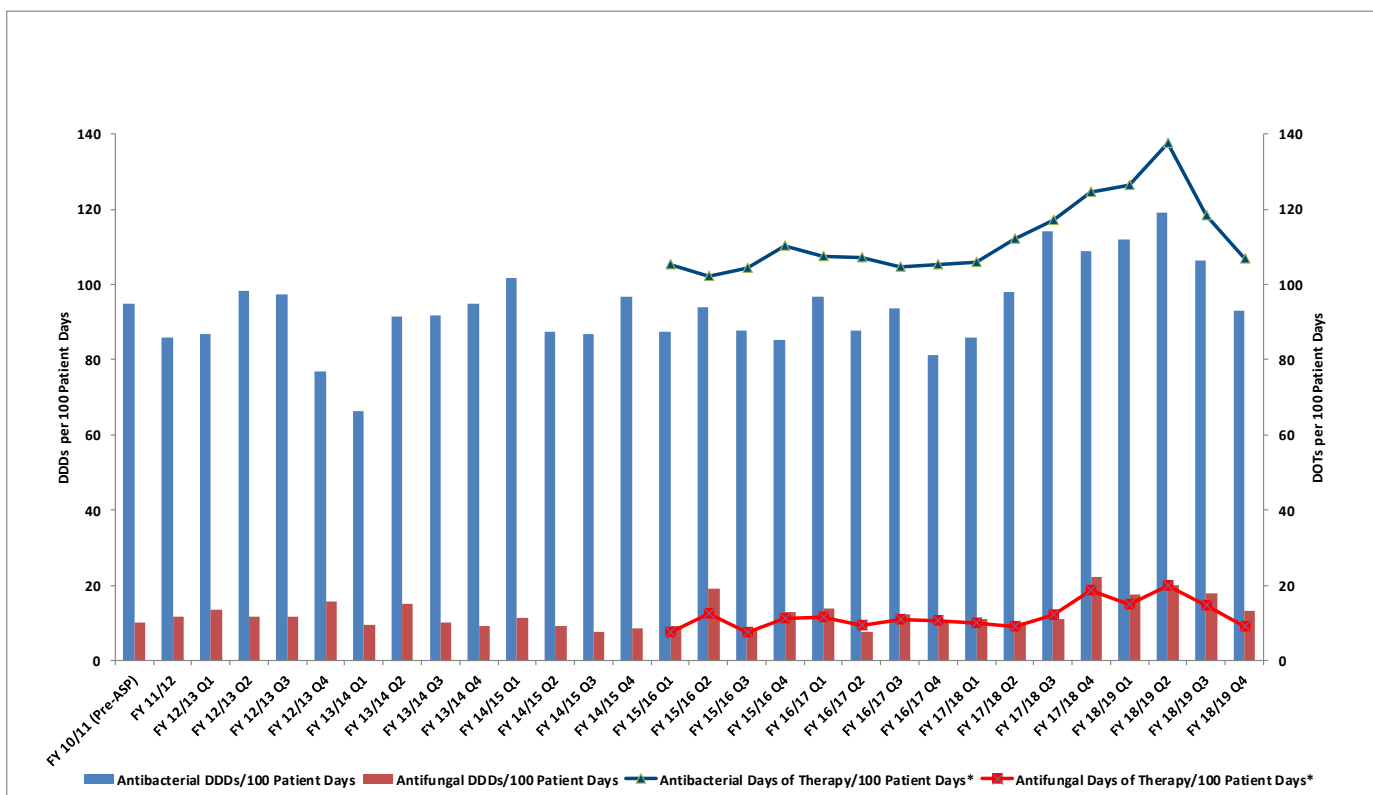


Table 6: Toronto General Hospital: Cardiovascular ICU

Indicators	FY 10/11 (Pre-ASP)	FY 11/12	FY 12/13	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	FY 18/19 Performance					YTD of Previous Year
									Q1	Q2	Q3	Q4	YTD	
Antimicrobial Usage and Costs														
Total Antimicrobial DDDs/100 Patient Days	105	98	102	97	102	101	101	115	130	139	124	106	125	115
Systemic Antibacterial DDDs/100 Patient Days	95	86	89	86	93	89	90	102	112	119	106	93	108	102
Systemic Antifungal DDDs/100 Patient Days	10	12	13	11	9	13	11	14	18	20	18	13	17	14
Total Antimicrobial Costs	\$108,172	\$108,464	\$85,916	\$100,736	\$129,314	\$110,716	\$153,093	\$160,790	\$53,453	\$54,330	\$49,103	\$34,959	\$191,845	\$160,790
Total Antimicrobial Costs/Patient Day	\$18.20	\$19.06	\$14.99	\$17.00	\$20.46	\$16.34	\$22.44	\$22.80	\$33.62	\$30.96	\$28.73	\$20.28	\$28.30	\$22.80
Systemic Antibacterial Costs	\$100,375	\$99,261	\$74,232	\$80,204	\$91,366	\$85,343	\$96,782	\$112,228	\$38,222	\$32,352	\$33,030	\$28,046	\$131,651	\$112,228
Systemic Antibacterial Costs/Patient Day	\$16.89	\$17.44	\$12.95	\$13.54	\$14.45	\$12.60	\$14.19	\$15.92	\$24.04	\$18.43	\$19.33	\$16.27	\$19.42	\$15.92
Systemic Antifungal Costs	\$7,797	\$9,204	\$11,684	\$20,532	\$37,948	\$25,373	\$56,311	\$48,562	\$15,231	\$21,978	\$16,073	\$6,912	\$60,194	\$48,562
Systemic Antifungal Costs/Patient Day	\$1.31	\$1.62	\$2.04	\$3.47	\$6.00	\$3.75	\$8.26	\$6.89	\$9.58	\$12.52	\$9.40	\$4.01	\$8.88	\$6.89
Antibacterial Days of Therapy/100 Patient Days*	n/a	n/a	n/a	n/a	129	105	106	115	126	138	118	107	122	115
Antifungal Days of Therapy/100 Patient Days*	n/a	n/a	n/a	n/a	28	10	11	13	15	20	15	9	15	13
Patient Care Outcomes														
Hospital-Acquired C. difficile Cases (rate per 1,000 pt days)	2 (0.34)	5 (0.88)	6 (1.05)	7 (1.18)	7 (1.11)	7 (1.03)	6 (0.88)	19 (2.69)	0 (0)	0 (0)	2 (1.17)	2 (1.16)	4 (0.59)	19 (2.69)
ICU Average Length of Stay (days)	3.12	2.95	2.97	3.20	3.46	3.45	3.48	3.22	3.84	3.46	3.30	3.6	3.55	3.2225
ICU Mortality Rate (as a %)	3.5	3.0	3.0	4.6	4.6	4.0	3.7	4.3	2.3	2.8	3.04	3.2	2.80	4.3
ICU Readmission Rate Within 48 Hrs (as a %)	1.6	2.2	1.8	2.2	2.4	1.6	2.0	2.0	1.4	1.9	1.0	2.0	1.6	2.0
Central Line Infection Rate (per 1000 pt days)	0.73	0.17	0.34	0.16	0.15	0.53	0.84	2.41	0.0	1.60	0.57	0.56	0.70	2.4
Ventilator-Associated Pneumonia Rate (per 1,000 pt days)	2.99	2.80	1.91	1.73	2.81	0.94	4.06	4.11	3.51	2.94	0.00	5.93	3.10	4.1125
ICU Multiple Organ Dysfunction Score (MODS)	6.22	6.07	5.51	5.77	5.60	5.83	6.04	5.44	3.76	4.13	3.91	4.16	3.99	5.44
ICU Ventilator Days	3015	3571	3676	4049	3925	4239	4917	4555	854	1022	1018	1012	3906	4555

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). *An error in DDD calculation for Pip-tazo was detected in Q3 2013; all historical data prior to this was rerun, resulting in minor changes to antibacterial DDDs.

There was a calculation error for the ICU Readmission Rate for FY 16/17 Q3. That figure has now been corrected.

Table 7: TGH CVICU FY 18/19 Q4 Top 5 Antimicrobials by Usage (DDD's per 100 patient days) and Expenditures

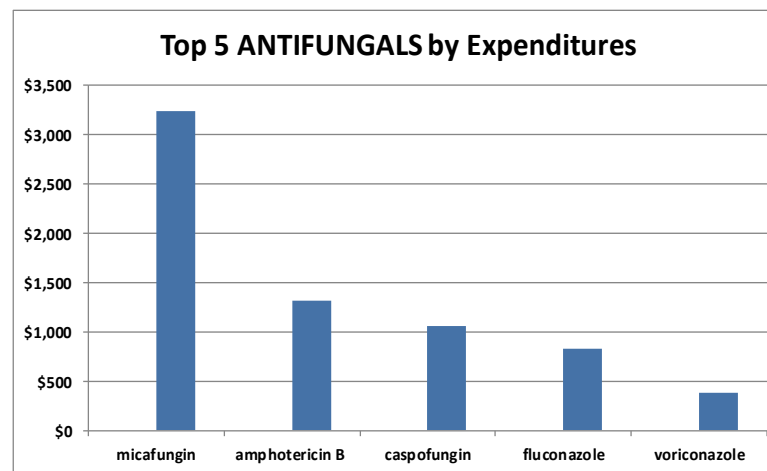
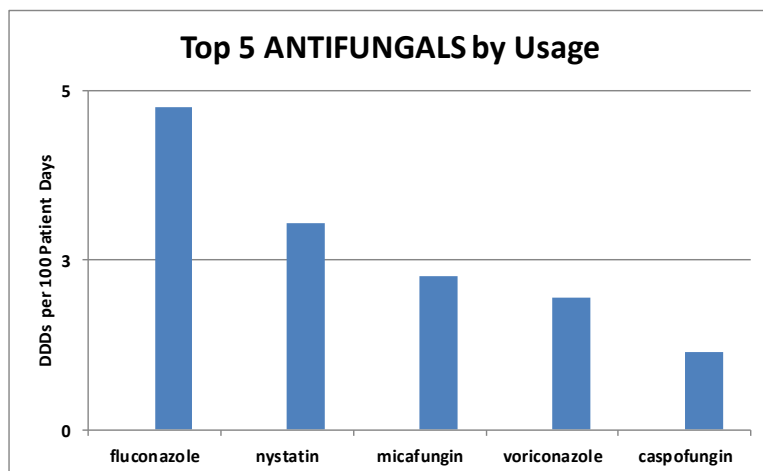
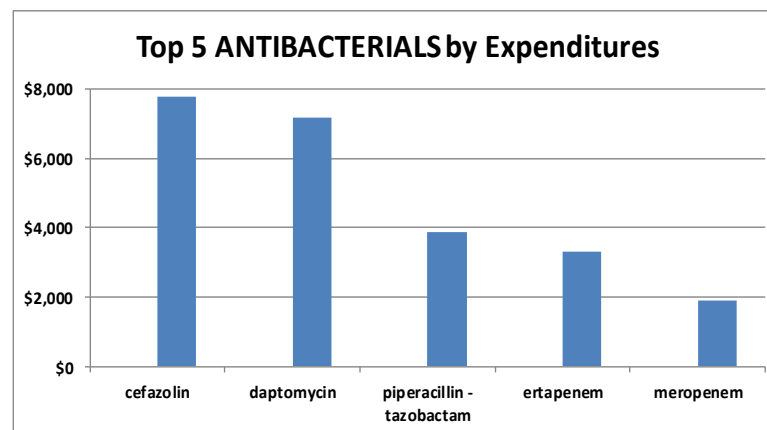
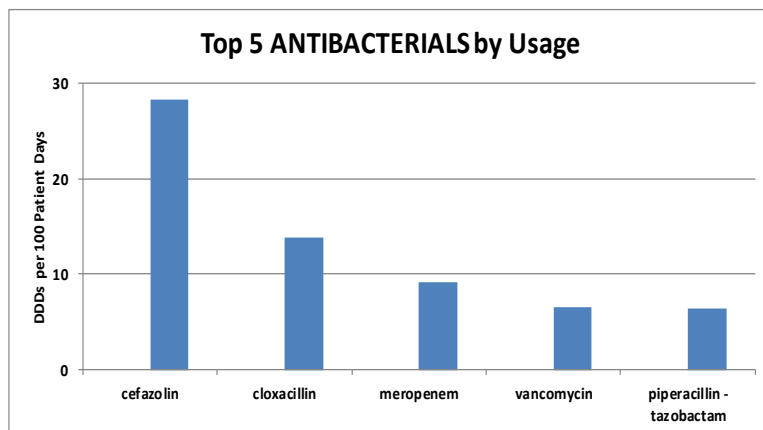


Table 8: Daptomycin Use – Toronto General Hospital Cardiovascular ICU

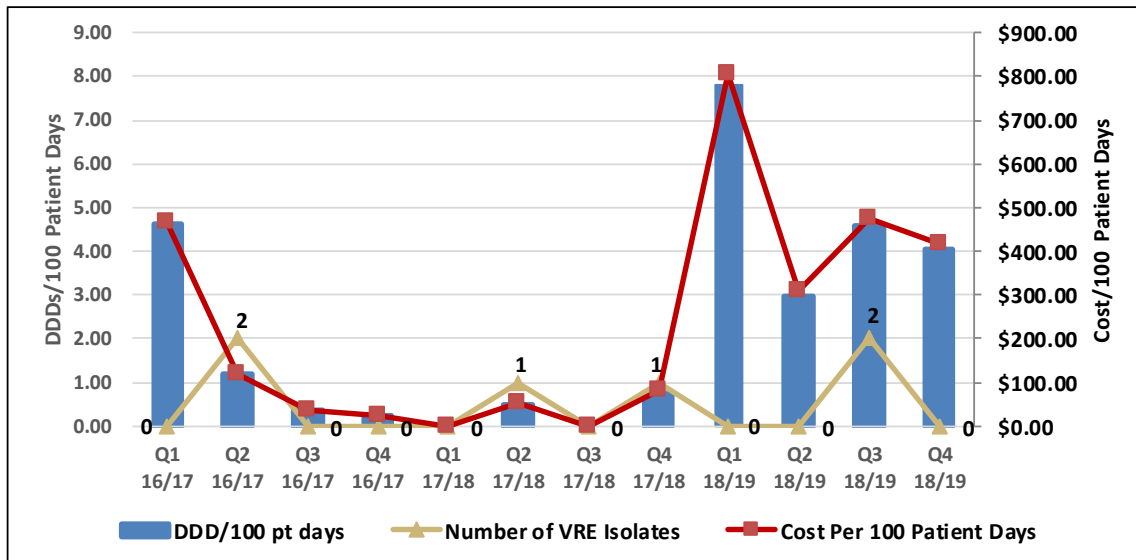
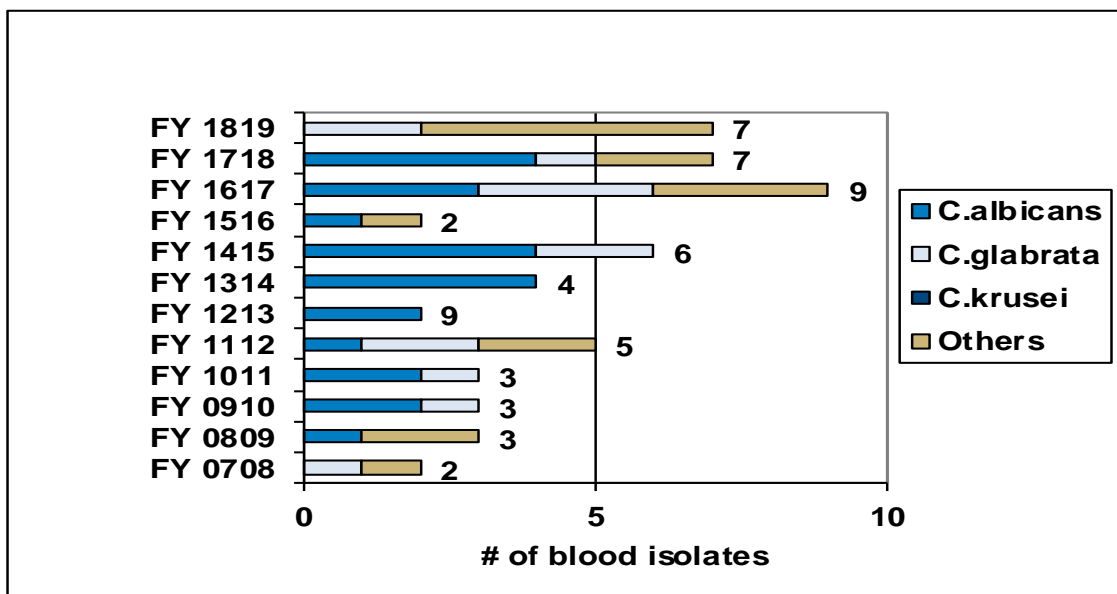


Table 9: Yeast Species Isolated in Blood – Toronto General Hospital Cardiovascular ICU



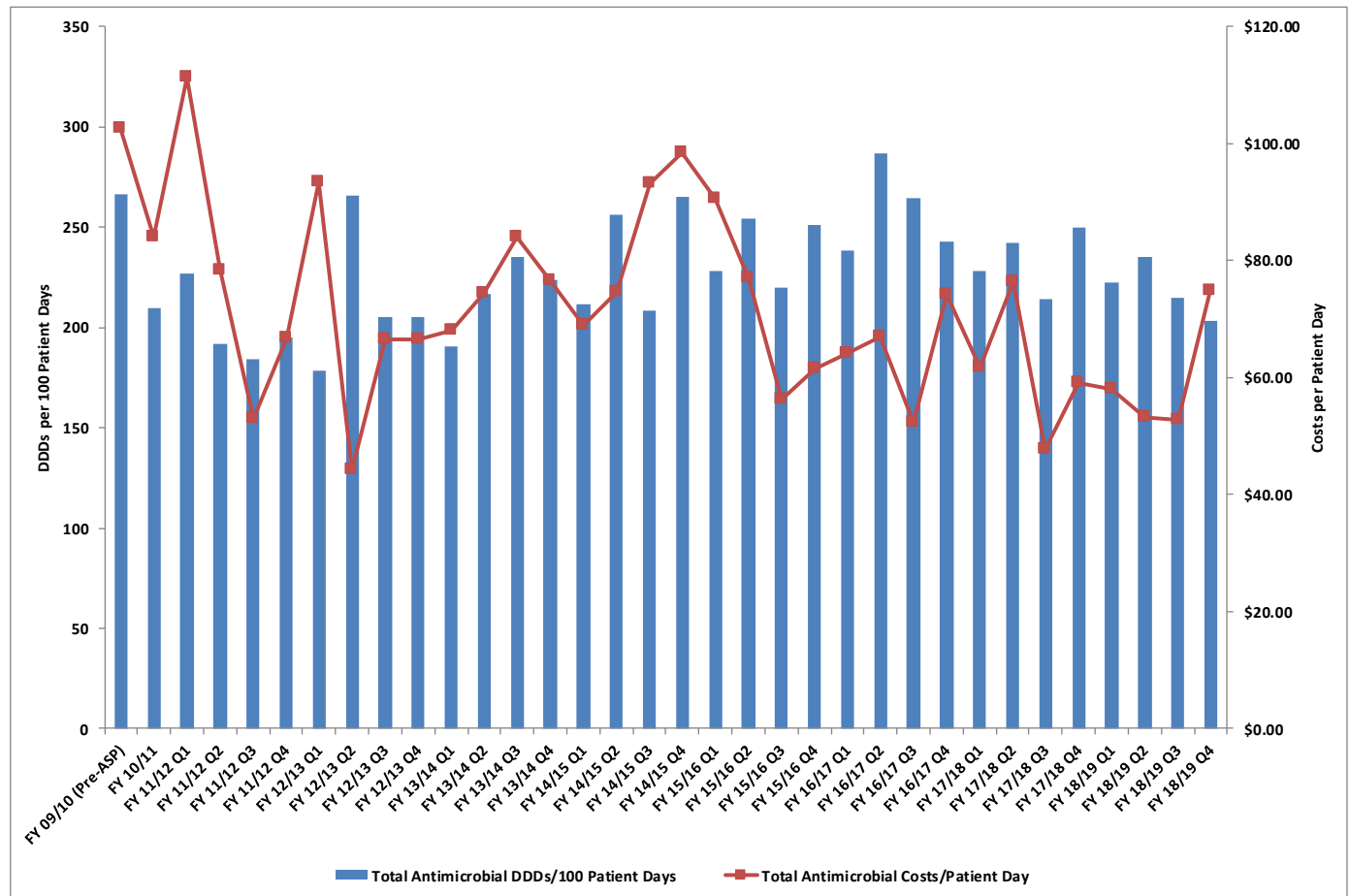
NB: In past Quarterly Reports, if a patient had more than one culture of different organisms, it was counted as 0.5 each. Starting with the Q3 2017/18 Quarterly Report and moving forward, it will be counted as 1.

Toronto General Hospital: Medical Surgical ICU

The FY 18/19 Q4 summary includes:

- Antimicrobial consumption (using defined daily doses (DDDs) per 100 patient days) decreased (↓) by 6.4% compared to YTD last year.
- Antimicrobial costs per patient day decreased (↓) by 2.2% compared to YTD last year.
- Antibacterial costs per patient day decreased (↓) by 6.8% compared to YTD last year.
- Antifungal costs per patient day increased (↑) by 2.4% compared to YTD last year.

Toronto General Hospital: Medical Surgical ICU Antimicrobial Consumption and Costs Per Patient Day



To view **Appendix 1: FY 18/19 Q4 Top 5 Antimicrobials by Usage (DDDs per 100 Patient Days) and Expenditures by ICU Site**, please click [here](#).

Toronto General Hospital: Medical Surgical ICU Antimicrobial Consumption as Defined Daily Dose Versus Antimicrobial Consumption as Days of Therapy

- Antibacterial Days of Therapy (DOT) per 100 patient days increased (↑) by 0.5% compared to YTD last year.
- Antifungal Days of Therapy (DOT) per 100 patient days increased (↑) by 5.6% compared to YTD last year.

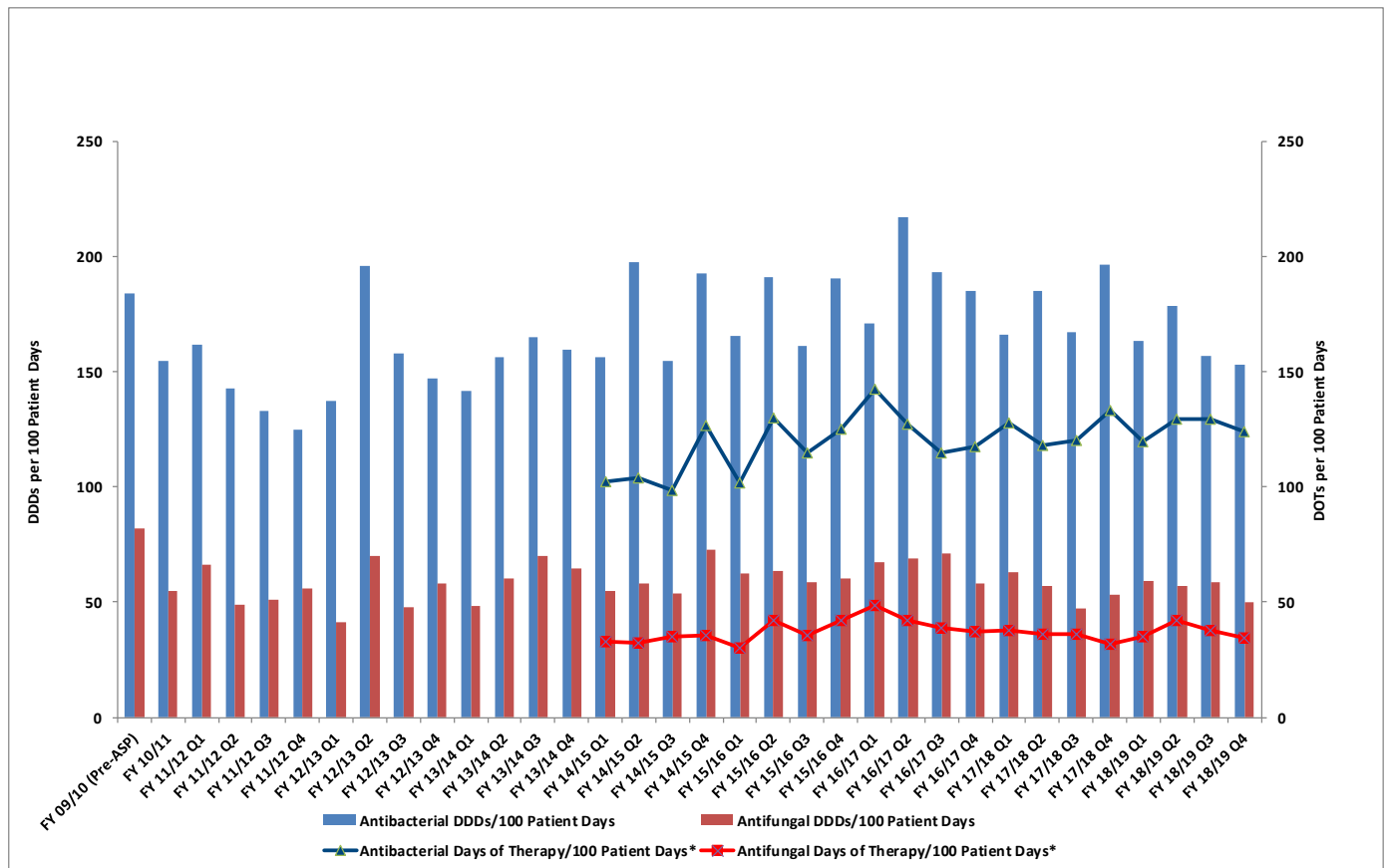


Table 10: Toronto General Hospital: Medical Surgical ICU

Indicators	FY 09/10 (Pre-ASP)	FY 10/11	FY 11/12	FY 12/13	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	FY 18/19 Performance					YTD of Previous Year
	Q1	Q2	Q3	Q4	YTD										
Antimicrobial Usage and Costs															
Total Antimicrobial DDDs/100 Patient Days	266	209	199	213	217	235	239	258	234	222	235	215	203	219	234
Systemic Antibacterial DDDs/100 Patient Days	184	155	143	159	156	175	178	191	179	163	178	157	153	163	179
Systemic Antifungal DDDs/100 Patient Days	82	55	55	54	61	60	84	66	55	59	57	58	50	56	55
Total Antimicrobial Costs	\$701,451	\$629,472	\$567,532	\$473,613	\$584,018	\$686,577	\$587,950	\$557,091	\$521,004	\$137,236	\$127,078	\$133,513	\$188,777	\$586,604	\$521,004
Total Antimicrobial Costs/Patient Day	\$102.52	\$84.06	\$76.93	\$63.75	\$75.71	\$83.65	\$71.06	\$64.53	\$61.18	\$58.03	\$53.24	\$52.81	\$74.79	\$59.83	\$61.18
Systemic Antibacterial Costs	\$390,209	\$375,436	\$292,355	\$231,171	\$225,557	\$293,126	\$254,392	\$267,107	\$259,216	\$77,195	\$81,453	\$66,368	\$53,114	\$278,131	\$259,216
Systemic Antibacterial Costs/Patient Day	\$57.03	\$50.14	\$39.63	\$31.12	\$29.24	\$35.71	\$30.75	\$30.94	\$30.44	\$32.64	\$34.12	\$26.25	\$21.04	\$28.37	\$30.44
Systemic Antifungal Costs	\$311,242	\$254,036	\$275,176	\$242,443	\$358,461	\$393,451	\$333,559	\$289,984	\$261,788	\$60,041	\$45,625	\$67,145	\$135,663	\$308,473	\$261,788
Systemic Antifungal Costs/Patient Day	\$45.49	\$33.93	\$37.30	\$32.63	\$46.47	\$47.94	\$40.31	\$33.59	\$30.74	\$25.39	\$19.11	\$26.56	\$53.75	\$31.46	\$30.74
Antibacterial Days of Therapy/100 Patient Days*	n/a	n/a	n/a	n/a	n/a	107.9	118.3	126	125	120	129	129	124	126	125
Antifungal Days of Therapy/100 Patient Days*	n/a	n/a	n/a	n/a	n/a	34.1	37.7	42	35	35	42	38	35	37	35
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)	12 (1.56)	10 (1.22)	10 (1.21)	15 (1.74)	9 (1.06)	3 (1.27)	3 (1.26)	4 (1.58)	4 (1.58)	14 (1.43)	9 (1.06)
ICU Average Length of Stay (days)	8.24	8.61	8.85	7.79	8.22	8.08	7.62	7.94	7.10	7.24	8.57	6.38	9.85	8.01	7.10
ICU Mortality Rate (as a %)	16.2	15.7	16.3	16.0	17.8	17.2	17.2	16.8	15.7	15.7	18.0	14.6	16.9	16.30	15.7
ICU Readmission Rate Within 48 Hrs (as a %)	3.8	4.4	4.4	2.8	3.5	3.0	3.4	3.2	2.3	4.7	3.0	2.81	3.0	3.40	2.3
ICU Ventilator Days	5399	6256	6507	6458	24620	7330	7048	7657	7670	1892	1983	2124	2306	8305	7670
Apache II Score	n/a	n/a	16.1	15.8	15.9	15.1	15.4	16.7	16.9	16.6				16.60	16.9
ICU Multiple Organ Dysfunction Score (MODS)										5.85	5.82	5.73	5.91	5.83	

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). *An error in DDD calculation for Pip-tazo was detected in Q3 2013; all historical data prior to this was rerun, resulting in minor changes to antibacterial DDDs.

There was a calculation error for the ICU Readmission Rate for FY 16/17 Q3. That figure has now been corrected.

Table 11: Daptomycin Use – Toronto General Hospital: Medical Surgical ICU

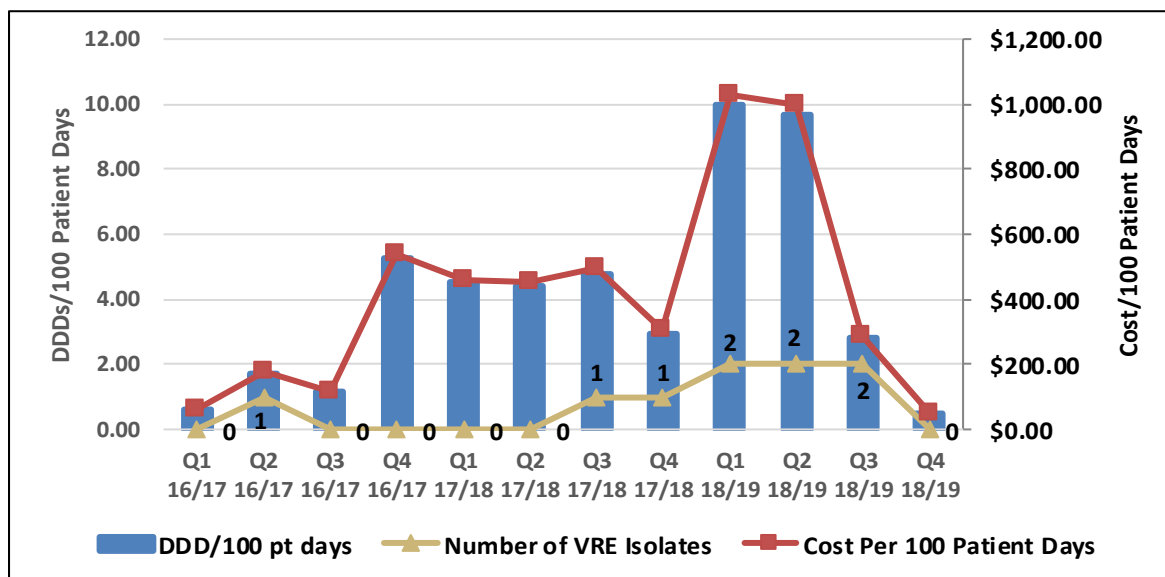
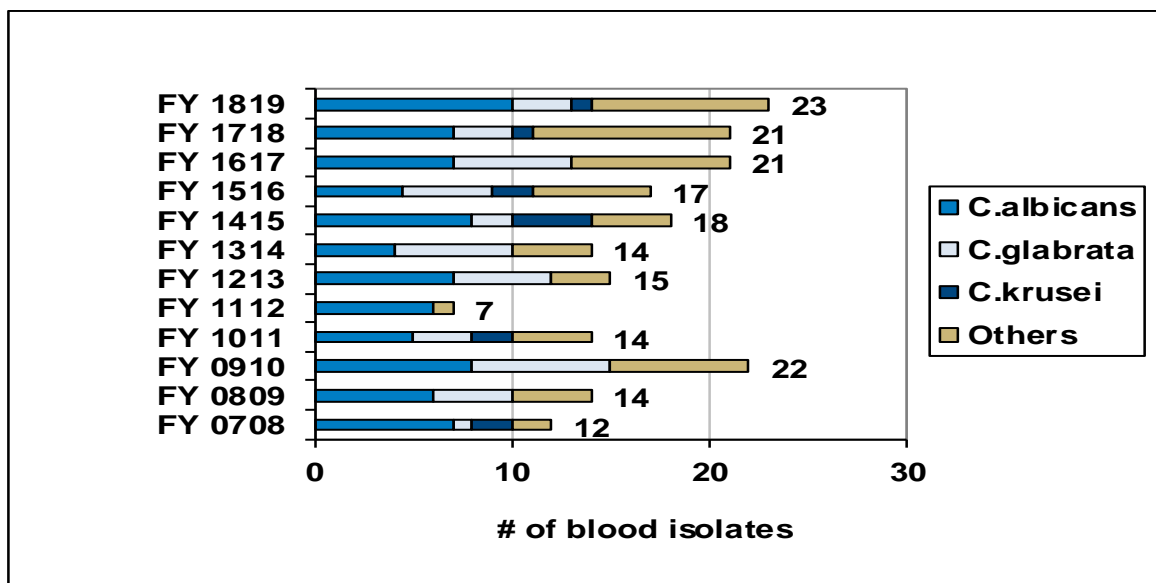
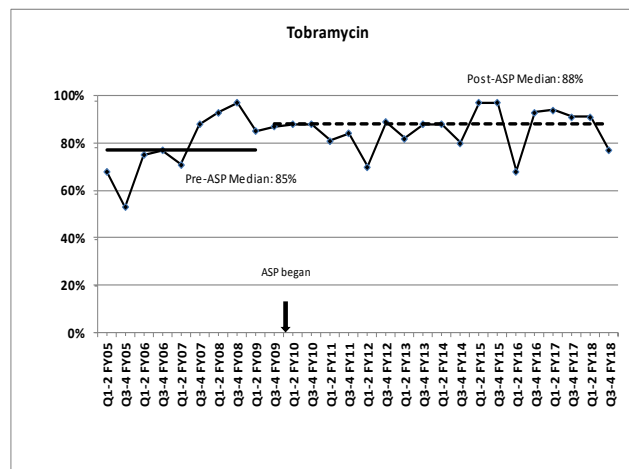
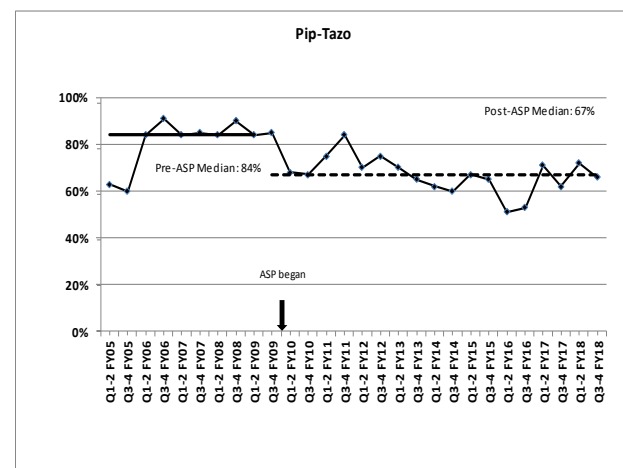
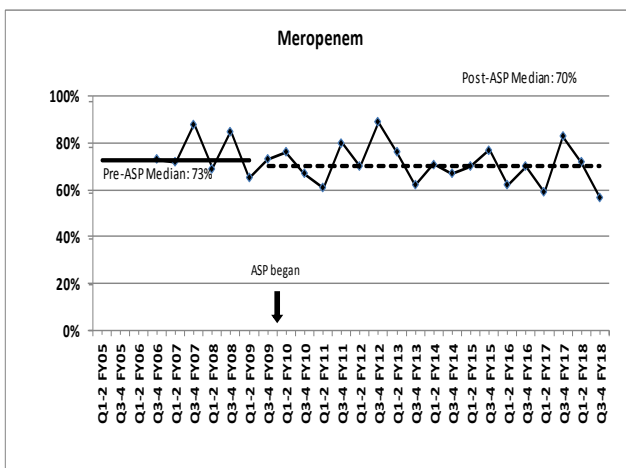
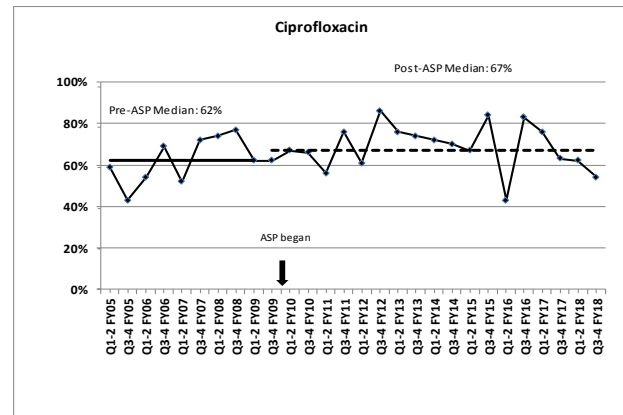
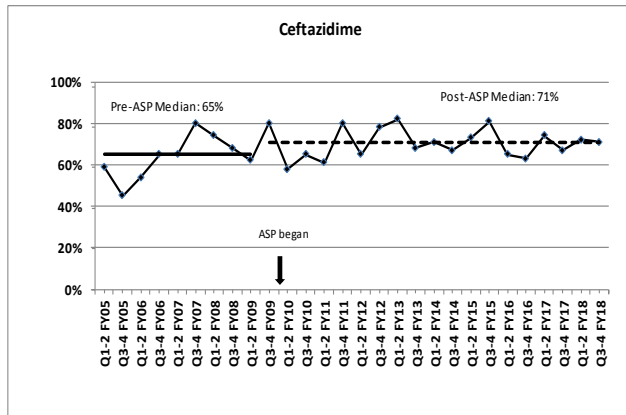


Table 12: Yeast Species Isolated in Blood – Toronto General Hospital: Medical Surgical ICU



NB: In past Quarterly Reports, if a patient had more than one culture of different organisms, it was counted as 0.5 each. Starting with the Q3 2017/18 Quarterly Report and moving forward, it will be counted as 1.

TGH MSICU Pseudomonas Susceptibility

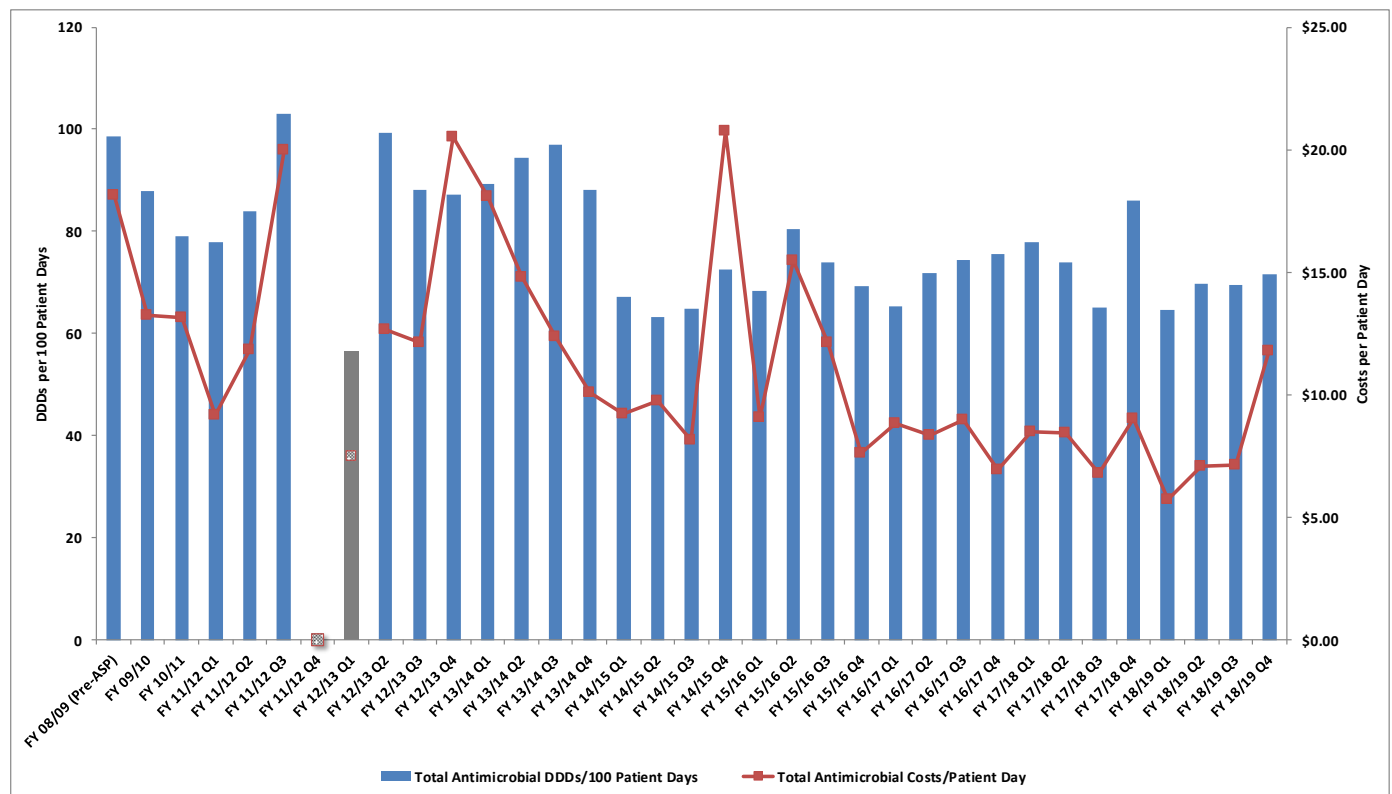


Toronto Western Hospital: Medical, Surgical, and Neurosurgical ICU

The FY 18/19 Q4 summary includes:

- Antimicrobial consumption (using defined daily doses (DDDs) per 100 patient days) decreased (↓) by 8.9% compared to YTD last year.
- Antimicrobial costs per patient day decreased (↓) by 2.9% compared to YTD last year.
- Antibacterial costs per patient day decreased (↓) by 14.3% compared to YTD last year.
- Antifungal costs per patient day increased (↑) by 36.7% compared to YTD last year.

Toronto Western Hospital: Medical, Surgical, and Neurosurgical ICU Antimicrobial Consumption and Costs Per Patient Day

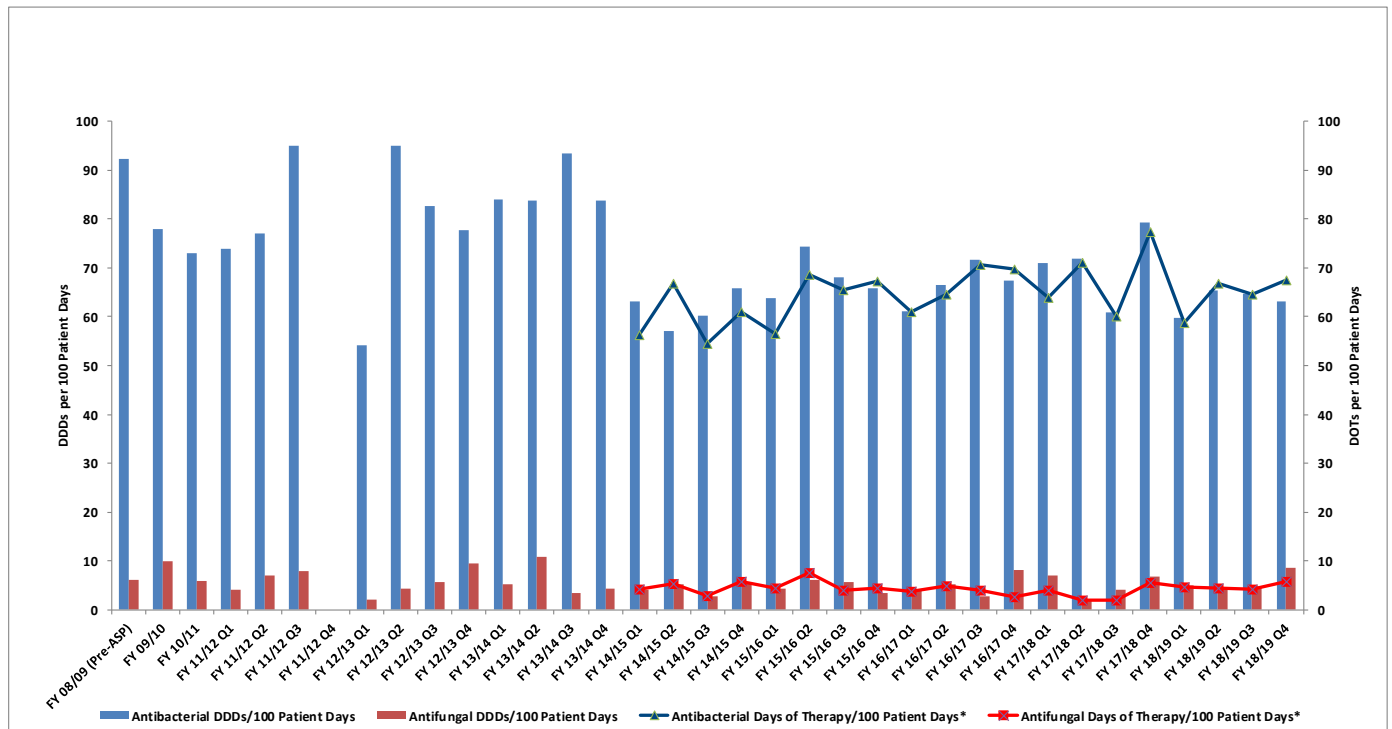


Due to an error in the Centricity Pharmacy database, we are not able to provide accurate DDD data and utilization cost for the Toronto Western Hospital ICU for FY 11/12 Q4. This also affected the recovery in FY 12/13 Q1 so neither quarter is reflected in the above graph.

To view **Appendix 1: FY 18/19 Q4 Top 5 Antimicrobials by Usage (DDDs per 100 Patient Days) and Expenditures by ICU Site**, please click [here](#).

Toronto Western Hospital: Medical, Surgical, and Neurosurgical ICU Antimicrobial Consumption as Defined Daily Dose Versus Antimicrobial Consumption as Days of Therapy

- Antibacterial Days of Therapy (DOT) per 100 patient days decreased (↓) by 5.6% compared to YTD last year. Compared to DDD/100 patient days, this suggests a more profound increase in daily drug dose than initiation events.
- Antifungal Days of Therapy (DOT) per 100 patient days increased (↑) by 41.0% compared to YTD last year.



Due to an error in the Centricity Pharmacy database, we are not able to provide accurate DDD data and utilization cost for the Toronto Western Hospital ICU for FY 11/12 Q4.

Table 13: Toronto Western Hospital: Medical, Surgical, and Neurosurgical ICU

Indicators	FY 08/09 (Pre-ASP)	FY 09/10	FY 10/11	FY 11/12	FY 12/13	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	FY18/19 Performance					YTD of Previous Year
											Q1	Q2	Q3	Q4	YTD	
Antimicrobial Usage and Costs																
Total Antimicrobial DDDs/100 Patient Days	99	88	79	83	83	92	67	77	72	76	65	70	69	72	69	76
Systemic Antibacterial DDDs/100 Patient Days	92	78	73	77	78	86	62	68	67	71	60	65	65	63	63	71
Systemic Antifungal DDDs/100 Patient Days	6	10	6	6	5	6	5	9	5	5	5	4	5	8	6	5
Total Antimicrobial Costs	\$136,758	\$100,408	\$101,191	\$105,899	\$102,978	\$120,538	\$138,014	\$127,293	\$98,672	\$93,958	\$17,004	\$20,575	\$21,403	\$34,866	\$93,848	\$93,958
Total Antimicrobial Costs/Patient Day	\$18.16	\$13.24	\$13.17	\$13.60	\$13.37	\$13.49	\$11.97	\$11.10	\$8.28	\$8.18	\$5.73	\$7.09	\$7.15	\$11.80	\$7.94	\$8.18
Systemic Antibacterial Costs	\$123,314	\$87,445	\$79,280	\$89,784	\$70,099	\$85,916	\$89,382	\$74,877	\$69,868	\$73,007	\$15,569	\$17,715	\$18,729	\$12,373	\$64,386	\$73,007
Systemic Antibacterial Costs/Patient Day	\$16.37	\$11.53	\$10.32	\$11.53	\$9.10	\$9.61	\$7.75	\$6.53	\$5.86	\$6.35	\$5.25	\$6.10	\$6.26	\$4.19	\$5.45	\$6.35
Systemic Antifungal Costs	\$13,444	\$12,963	\$21,911	\$16,115	\$32,879	\$34,623	\$48,631	\$52,416	\$28,805	\$20,951	\$1,435	\$2,860	\$2,674	\$22,493	\$29,462	\$20,951
Systemic Antifungal Costs/Patient Day	\$1.79	\$1.71	\$2.85	\$2.07	\$4.27	\$3.87	\$4.22	\$4.57	\$2.42	\$1.82	\$0.48	\$0.98	\$0.89	\$7.61	\$2.49	\$1.82
Antibacterial Days of Therapy/100 Patient Days*	n/a	n/a	n/a	n/a	n/a	n/a	60	65	67	68	59	67	65	68	64	68
Antifungal Days of Therapy/100 Patient Days*	n/a	n/a	n/a	n/a	n/a	n/a	4	5	4	3	5	4	4	6	5	3
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)	12 (1.34)	10 (1.16)	9 (0.78)	8 (0.67)	10 (0.87)	4 (1.35)	6 (2.07)	5 (1.67)	5 (1.69)	20 (1.69)	10 (0.87)
ICU Average Length of Stay (days)	8.39	7.44	10.68	9.71	7.98	7.68	8.7	8.01	9.5	8.2	8.17	9.2	7.8	8.5	8.405	8.2025
ICU Mortality Rate (as a %)	19.6	19.9	18.1	17.0	16.4	17.1	19.0	17.9	18.5	16.3	15.5	10.0	13.0	15.8	13.6	16.3275
ICU Readmission Rate Within 48 Hrs (as a %)	3.9	4.7	4.9	3.21	3.00	3.85	3.40	2.54	1.34	2.61	3.24	3.98	1.69	0.58	2.37	2.6125
ICU Ventilator Days	4617	6305	5960	5578	4947	5523	5180	5414	4937	4755	1267	1113	980	1124	4484	4755
ICU Apache II Score	15.0	14.7	13.7	13.8	12.9	12.8	13.2	13.0	14.0	13.4	13.5				13.5	13.35
ICU Multiple Organ Dysfunction Score (MODS)											3.10	3.14	3.35	3.45	3.26	

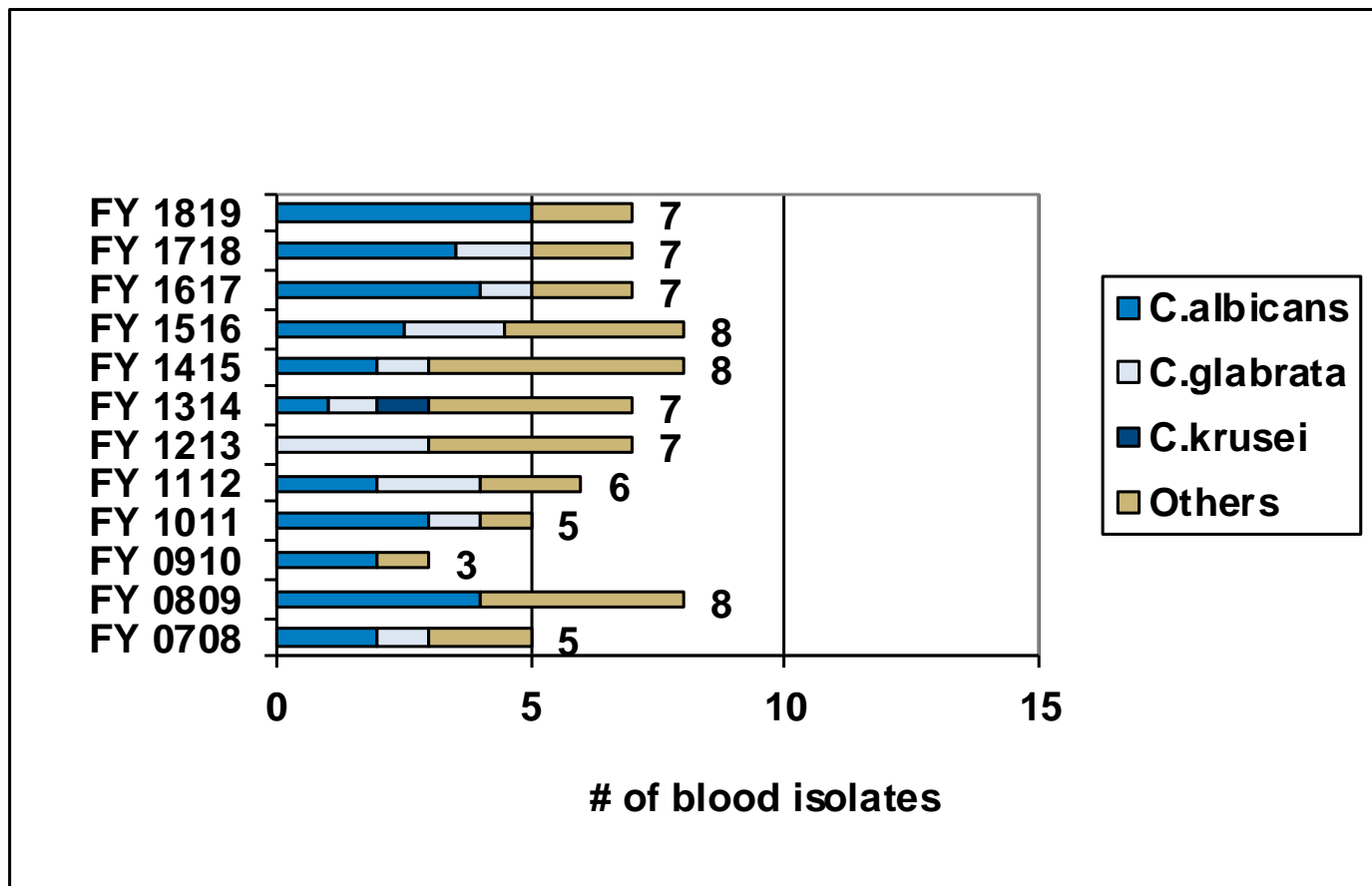
Notes: Data beginning in Q4 13/14 data consists of MSNICU patients (including eight ICU II patients).

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) *An error in DDD calculation for Pip-tazo was detected in Q3 2013; all historical data prior to this was rerun, resulting in minor changes to antibacterial DDDs.

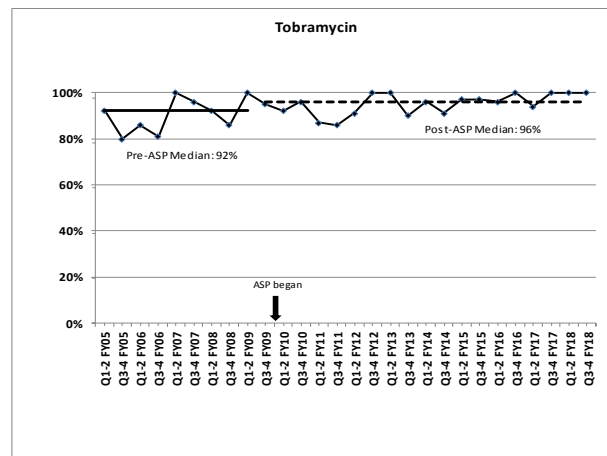
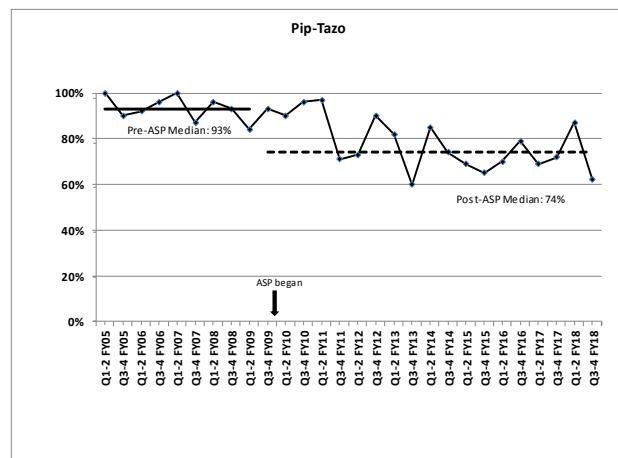
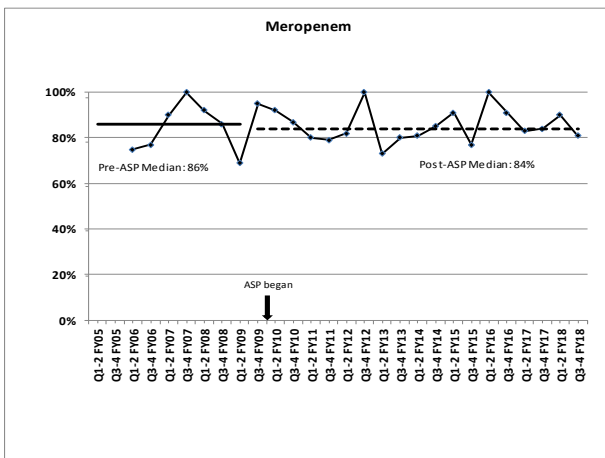
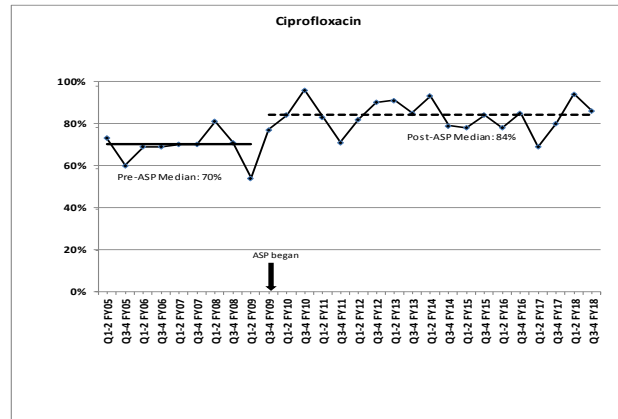
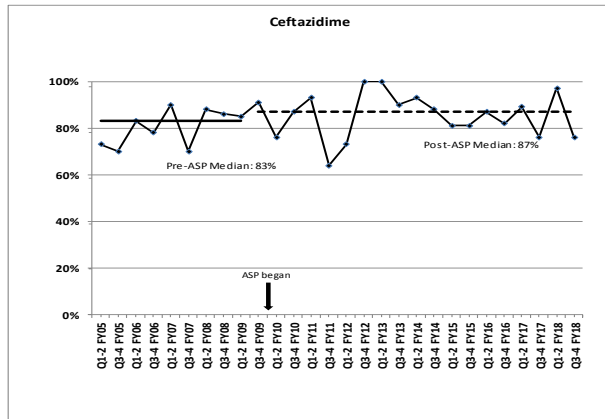
There was a calculation error for the ICU Readmission Rate for FY 16/17 Q3. That figure has now been corrected.

Table 14: Yeast Species Isolated in Blood – Toronto Western Hospital: Medical, Surgical, and Neurosurgical ICU



NB: In past Quarterly Reports, if a patient had more than one culture of different organisms, it was counted as 0.5 each. Starting with the Q3 2017/18 Quarterly Report and moving forward, it will be counted as 1.

TWH MSNICU Pseudomonas Susceptibility



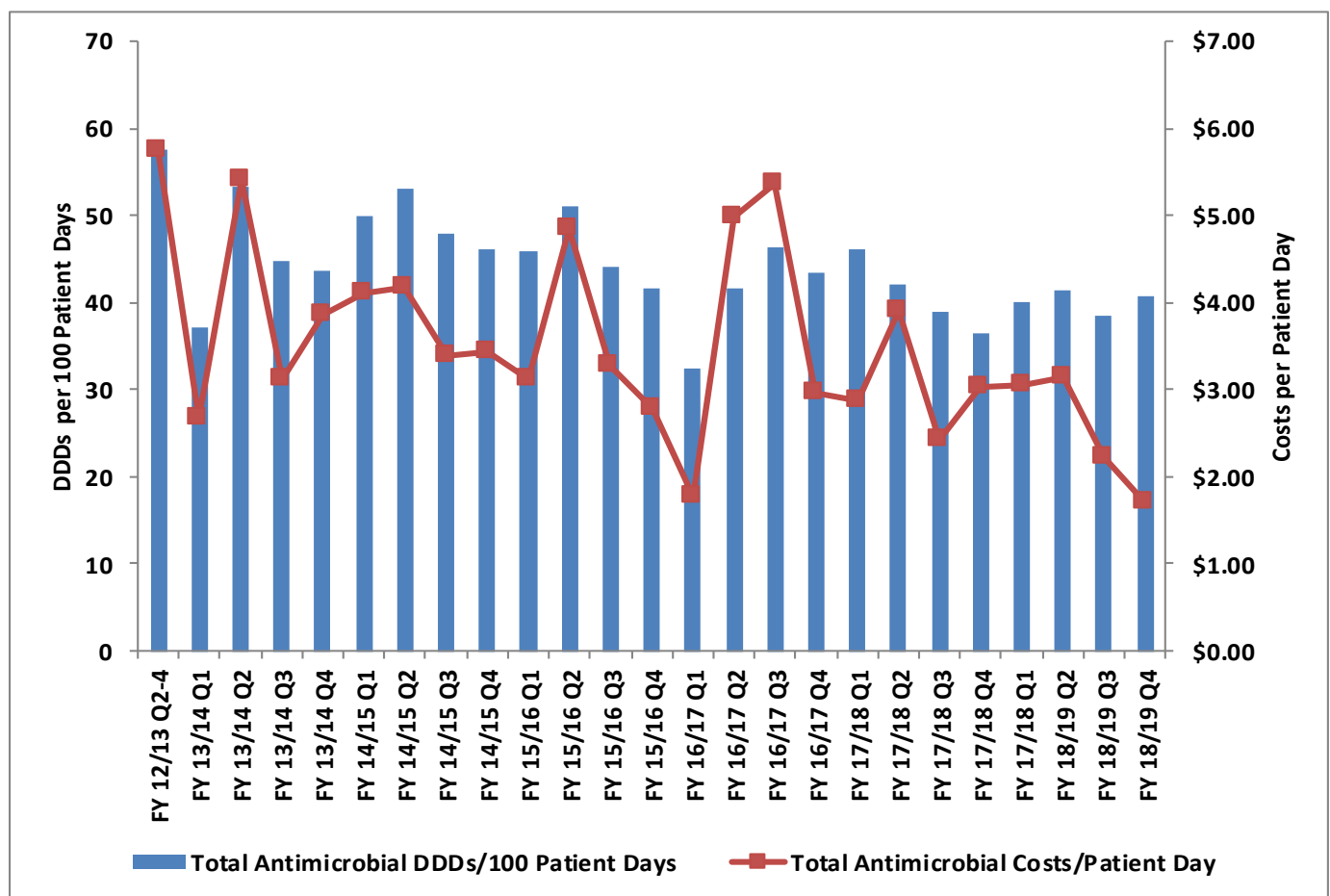
GENERAL INTERNAL MEDICINE

Mount Sinai Hospital: General Internal Medicine

The FY 18/19 Q4 summary includes:

- Antimicrobial consumption (using defined daily doses (DDDs) per 100 patient days) decreased (↓) by 1.2% compared to YTD last year.
 - Antimicrobial costs per patient day decreased (↓) by 22.8% compared to YTD last year.
 - Antibacterial costs per patient day decreased (↓) by 13.3% compared to YTD last year.
 - Antifungal costs per patient day decreased (↓) by 66.2% compared to YTD last year.
- NB: Usage data calculated for patients admitted by admission to GIM medical service at MSH.

Mount Sinai Hospital: General Internal Medicine Antimicrobial Consumption and Costs Per Patient Day



To view **Appendix 2: General Internal Medicine FY 18/19 Q4 Top 5 Antimicrobials by Usage (DDDs per 100 patient days) and Expenditures**, please click [here](#).

Table 15: Mount Sinai Hospital: General Internal Medicine

Indicators	FY 12/13 (Q2-4)	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	FY 18/19 Performance					YTD of Previous Year
							Q1	Q2	Q3	Q4	YTD	
Antimicrobial Usage and Costs												
Total Antimicrobial DDDs/100 Patient Days	58	45	48	43	41	41	40	41	39	41	40	41
Systemic Antibacterial DDDs/100 Patient Days	53	41	43	39	37	37	35	37	34	36	36	37
Systemic Antifungal DDDs/100 Patient Days	3	3	3	3	3	3	4	3	3	3	3	3
Total Antimicrobial Costs	\$125,012	\$123,737	\$128,661	\$106,518	\$126,283	\$105,254	\$21,352	\$29,375	\$20,868	\$16,624	\$88,219	\$105,254
Total Antimicrobial Costs/Patient Day	\$5.74	\$3.76	\$3.63	\$2.92	\$3.69	\$3.04	\$2.35	\$3.15	\$2.22	\$1.70	\$2.35	\$3.04
Systemic Antibacterial Costs	\$105,621	\$99,731	\$104,822	\$84,173	\$78,418	\$81,436	\$19,627	\$25,381	\$17,085	\$14,536	\$76,628	\$81,436
Systemic Antibacterial Costs/Patient Day	\$4.85	\$3.03	\$2.96	\$2.31	\$2.29	\$2.35	\$2.16	\$2.72	\$1.82	\$1.49	\$2.04	\$2.35
Systemic Antifungal Costs	\$15,422	\$20,153	\$16,352	\$15,983	\$42,012	\$17,644	\$1,154	\$2,792	\$1,397	\$1,133	\$6,476	\$17,644
Systemic Antifungal Costs/Patient Day	\$0.71	\$0.61	\$0.46	\$0.44	\$1.23	\$0.51	\$0.13	\$0.30	\$0.15	\$0.12	\$0.17	\$0.51
Patient Care Outcomes												
Hospital-Acquired C. difficile Cases (rate per 1,000 patient days)	16 (0.64)	8 (0.32)	7 (0.27)	7 (0.28)	9 (0.35)	13 (0.55)	8 (1.36)	1 (0.16)	1 (0.16)	1 (0.15)	11 (0.44)	13 (0.55)

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).

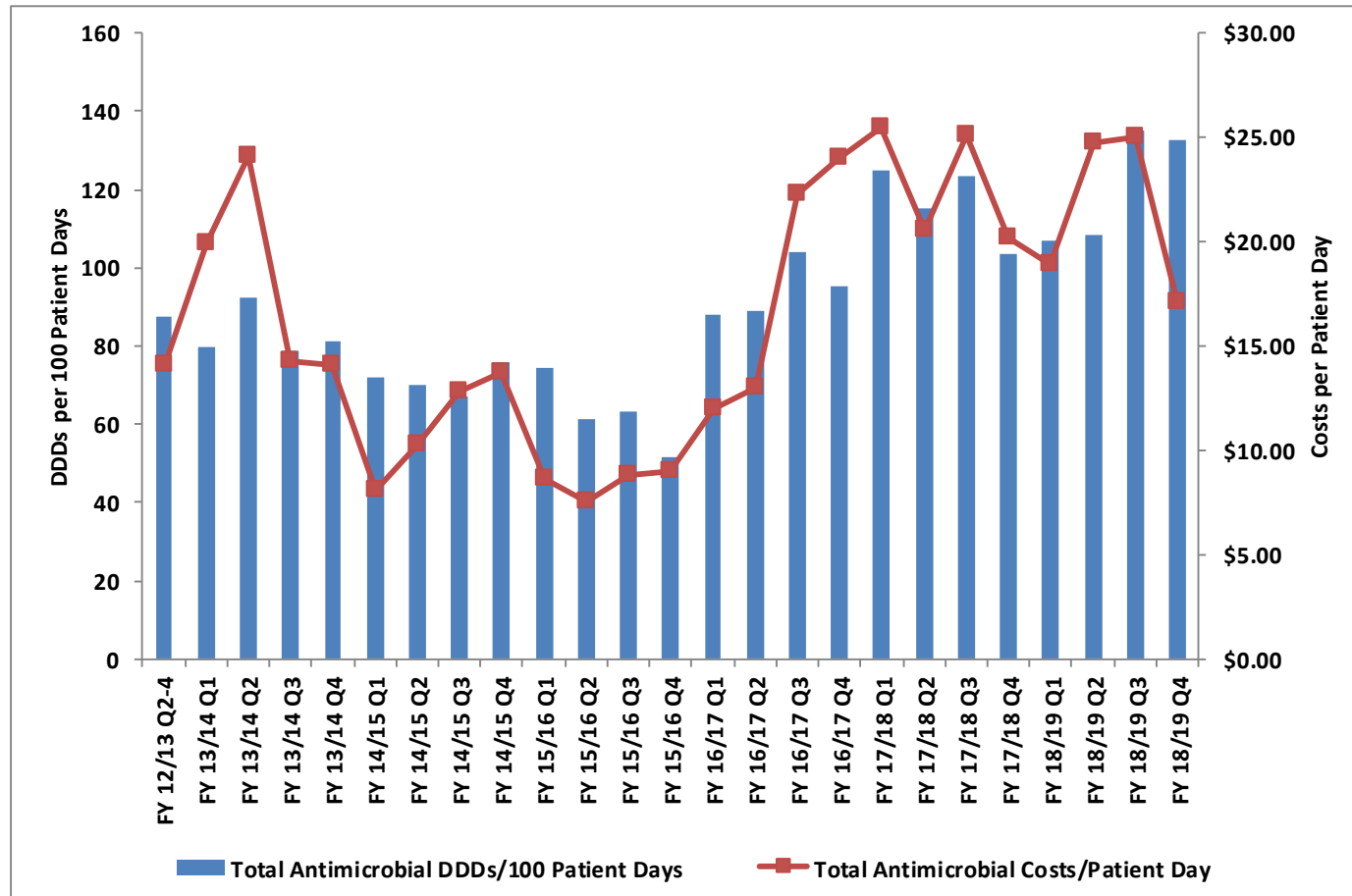
Historical antimicrobial usage and cost data updated due to the discovery that selected added drug dosages (Fluconazole 400mg/200ml bag, Pip-Tazo 13.5gm vial, Daptomycin 500mg vial) were not included in the report. Data have been revised to include Fluconazole starting August 2013, Pip-Tazo January 2015, and Daptomycin, November 2015.

Toronto General Hospital: General Internal Medicine

The FY 18/19 Q4 summary includes:

- Antimicrobial consumption (using defined daily doses (DDDs) per 100 patient days) increased (↑) by 3.2% compared to YTD last year.
 - Antimicrobial costs per patient day decreased (↓) by 6.2% compared to YTD last year.
 - Antibacterial costs per patient day decreased (↓) by 2.2% compared to YTD last year.
 - Antifungal costs per patient day decreased (↓) by 11.6% compared to YTD last year.
- NB: Usage data calculated for patients admitted to primary GIM units at TGH.

Toronto General Hospital: General Internal Medicine Antimicrobial Consumption and Costs Per Patient Day



To view **Appendix 2: General Internal Medicine FY 18/19 Q4 Top 5 Antimicrobials by Usage (DDDs per 100 patient days) and Expenditures**, please click [here](#).

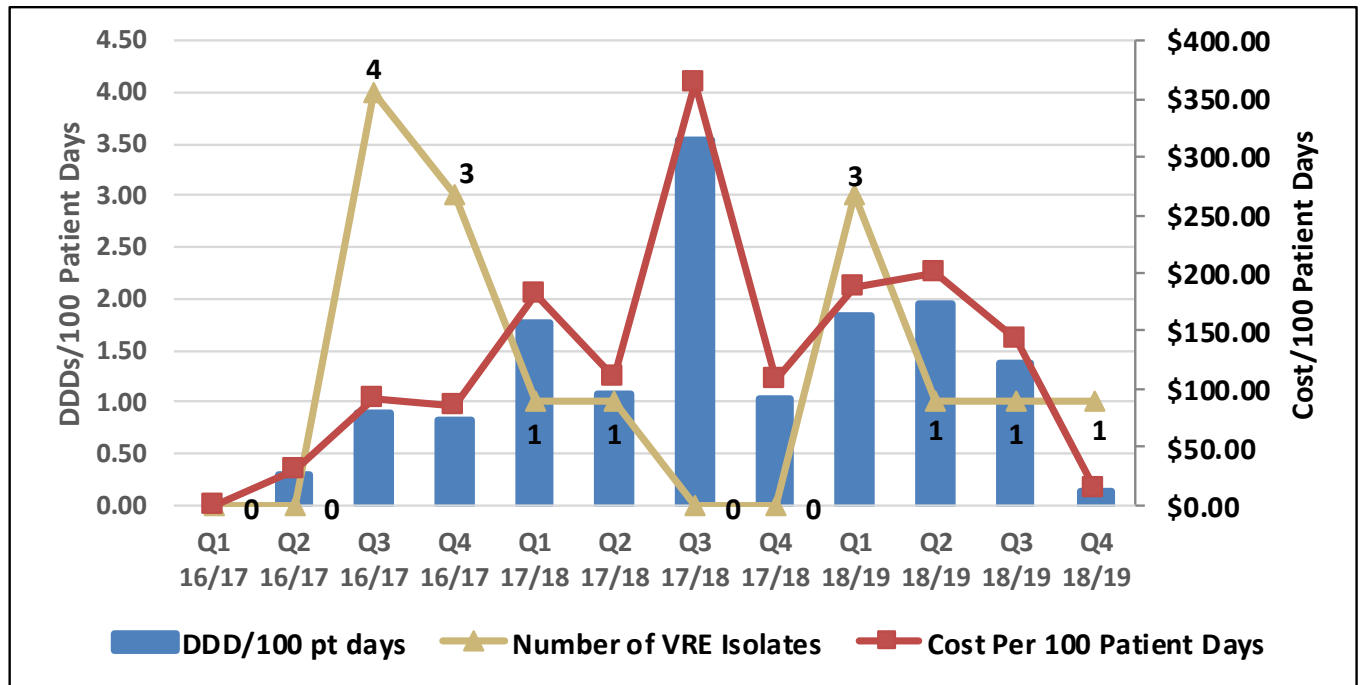
Table 16: Toronto General Hospital: General Internal Medicine

Indicators	FY 12/13 (Q2-4)	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	FY 18/19 Performance					YTD of Previous Year
							Q1	Q2	Q3	Q4	YTD	
Antimicrobial Usage and Costs												
Total Antimicrobial DDDs/100 Patient Days	87	83	83	63	94	117	107	108	135	133	120	117
Systemic Antibacterial DDDs/100 Patient Days	77	70	73	55	78	99	90	93	119	117	104	99
Systemic Antifungal DDDs/100 Patient Days	11	13	10	8	16	17	17	15	16	15	16	17
Total Antimicrobial Costs	\$279,644	\$471,342	\$352,036	\$313,464	\$494,787	\$640,238	\$129,894	\$170,938	\$163,220	\$112,855	\$576,907	\$640,238
Total Antimicrobial Costs/Patient Day	\$14.10	\$18.05	\$13.30	\$8.48	\$17.77	\$22.84	\$18.90	\$24.74	\$25.05	\$17.06	\$21.44	\$22.84
Systemic Antibacterial Costs	\$171,817	\$225,491	\$221,389	\$202,012	\$250,100	\$370,814	\$81,410	\$88,856	\$98,259	\$79,801	\$348,326	\$370,814
Systemic Antibacterial Costs/Patient Day	\$8.67	\$8.64	\$8.36	\$5.47	\$8.98	\$13.23	\$11.84	\$12.86	\$15.08	\$12.06	\$12.94	\$13.23
Systemic Antifungal Costs	\$107,827	\$245,851	\$130,647	\$111,452	\$244,687	\$269,424	\$48,484	\$82,082	\$64,961	\$33,054	\$228,581	\$269,424
Systemic Antifungal Costs/Patient Day	\$5.44	\$9.42	\$4.93	\$3.02	\$8.79	\$9.61	\$7.05	\$11.88	\$9.97	\$5.00	\$8.49	\$9.61
Patient Care Outcomes												
Hospital-Acquired C. difficile Cases (rate per 1,000 patient days)	15 (0.76)	16 (0.61)	15 (0.68)	14 (0.6)	5 (0.19)	15 (0.54)	2 (0.29)	1 (0.14)	1 (0.15)	3 (0.45)	7 (0.26)	15 (0.54)

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). *An error in DDD calculation for Pip-tazo was detected in Q3 2013; all historical data prior to this was rerun, resulting in minor changes to antibacterial DDDs.

Table 17: Daptomycin Use – Toronto General Hospital: General Internal Medicine



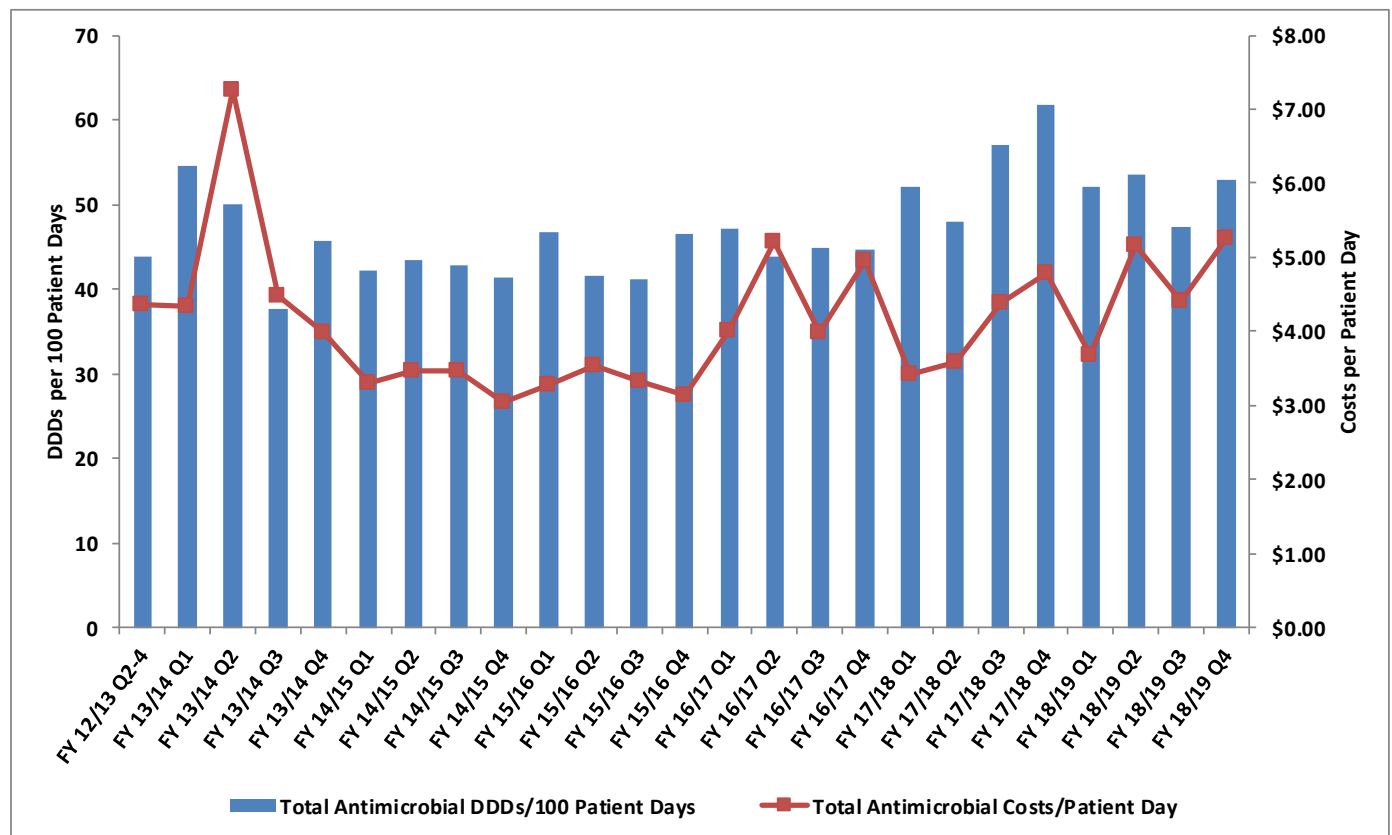
Toronto Western Hospital: General Internal Medicine

The FY 18/19 Q4 summary includes:

- Antimicrobial consumption (using defined daily doses (DDDs) per 100 patient days) decreased (↓) by 8.2% compared to YTD last year.
- Antimicrobial costs per patient day increased (↑) by 14.5% compared to YTD last year.
- Antibacterial costs per patient day increased (↑) by 11.2% compared to YTD last year.
- Antifungal costs per patient day increased (↑) by 72.3% compared to YTD last year*.

NB: Usage data calculated for patients admitted to primary GIM units at TWH.

Toronto Western Hospital: General Internal Medicine Antimicrobial Consumption and Costs Per Patient Day



To view **Appendix 2: General Internal Medicine FY 18/19 Q4 Top 5 Antimicrobials by Usage (DDDs per 100 patient days) and Expenditures**, please click [here](#).

Table 18: Toronto Western Hospital: General Internal Medicine

Indicators	FY 12/13 (Q2-4)	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	FY 18/19 Performance					YTD of Previous Year
							Q1	Q2	Q3	Q4	YTD	
Antimicrobial Usage and Costs												
Total Antimicrobial DDDs/100 Patient Days	44	47	42	47	45	56	52	54	47	53	51	56
Systemic Antibacterial DDDs/100 Patient Days	41	44	40	42	42	53	48	51	46	50	49	53
Systemic Antifungal DDDs/100 Patient Days	3	3	3	6	3	3	4	3	2	3	3	3
Total Antimicrobial Costs	\$74,737	\$115,919	\$110,889	\$108,612	\$146,214	\$121,275	\$26,440	\$35,978	\$33,278	\$40,129	\$135,824	\$121,275
Total Antimicrobial Costs/Patient Day	\$4.36	\$5.01	\$3.32	\$3.32	\$4.52	\$4.04	\$3.68	\$5.16	\$4.41	\$5.26	\$4.63	\$4.04
Systemic Antibacterial Costs	\$60,999	\$93,779	\$103,080	\$105,744	\$118,506	\$114,772	\$25,699	\$34,792	\$32,984	\$31,394	\$124,868	\$114,772
Systemic Antibacterial Costs/Patient Day	\$3.56	\$4.05	\$3.09	\$3.23	\$3.67	\$3.83	\$3.57	\$4.99	\$4.38	\$4.12	\$4.26	\$3.83
Systemic Antifungal Costs	\$13,738	\$22,140	\$7,810	\$2,868	\$27,708	\$6,503	\$741	\$1,186	\$294	\$8,735	\$10,956	\$6,503
Systemic Antifungal Costs/Patient Day	\$0.80	\$0.96	\$0.23	\$0.09	\$0.86	\$0.22	\$0.10	\$0.17	\$0.04	\$1.15	\$0.37	\$0.22
Patient Care Outcomes												
Hospital-Acquired C. difficile Cases (rate per 1,000 patient days)	7 (0.41)	14 (0.6)	11 (0.33)	7 (0.21)	10 (0.31)	14 (0.47)	3 (0.42)	3 (0.43)	1 (0.13)	4 (0.52)	11 (0.38)	14 (0.47)

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). *An error in DDD calculation for Pip-tazo was detected in Q3 2013; all historical data prior to this was rerun, resulting in minor changes to antibacterial DDDs.

IMMUNOCOMPROMISED HOST

Princess Margaret Cancer Centre: Leukemia Service

The FY 18/19 Q4 summary includes:

- Current year-to-date (YTD) antimicrobial consumption in defined daily doses (DDDs) per 100 patient days increased (↑) by 2.1% compared to last year.
- YTD antimicrobial costs per patient day decreased (↓) by 4.5% compared to last year.
- YTD antibacterial costs per patient day decreased (↓) by 5.5% compared to last year.
- YTD antifungal costs per patient day decreased (↓) by 4.1% compared to last year.
- Drs. So, Husain, and Morris and Yoshiko Nakamachi continue to work with PM's Senior Leadership Team to optimize the impact of antimicrobial stewardship interventions in malignant haematology.

Princess Margaret Cancer Centre: Leukemia Service Antimicrobial Consumption and Costs

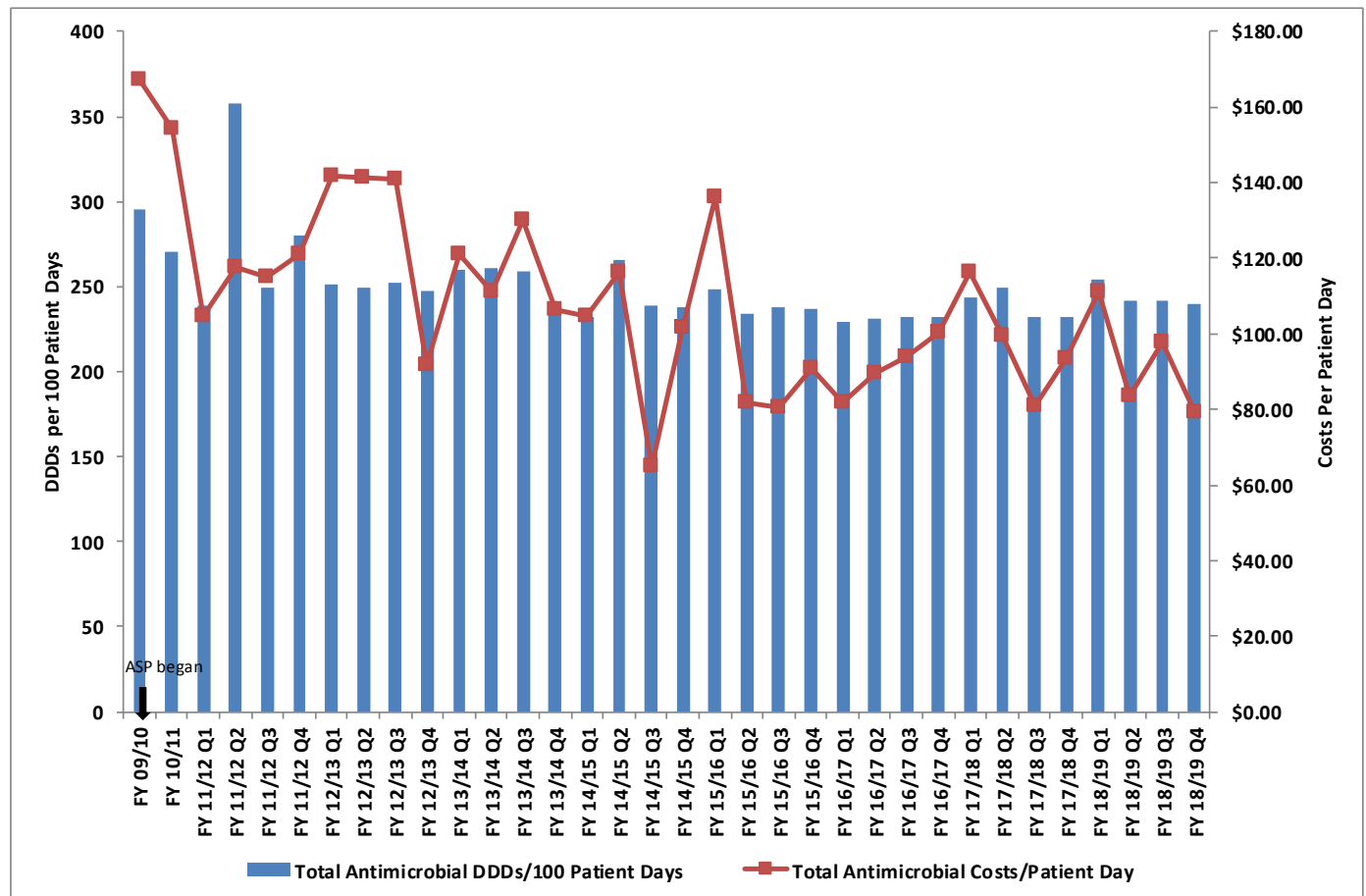


Table 19: Princess Margaret Cancer Centre: Leukemia Service

Indicators	FY 09/10	FY 10/11	FY 11/12	FY 12/13	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	Q1	Q2	FY 18/19 Performance			YTD of Previous Year
												Q3	Q4	YTD	
Antimicrobial Usage and Costs															
Total Antimicrobial DDDs/100 Patient Days	295	270	239	250	255	244	239	231	239	254	242	242	240	244	239
Systemic Antibacterial DDDs/100 Patient Days	191	163	134	146	138	136	138	132	140	149	137	136	146	142	140
Systemic Antifungal DDDs/100 Patient Days	104	107	105	104	117	108	101	99	99	105	105	105	94	102	99
Total Antimicrobial Costs	\$1,768,317	\$1,641,331	\$1,310,857	\$1,695,539	\$1,534,499	\$1,412,805	\$1,479,103	\$1,469,522	\$1,568,972	\$445,771	\$344,158	\$396,313	\$301,161	\$1,487,404	\$1,568,972
Total Antimicrobial Costs/Patient Day	\$167.12	\$154.32	\$115.13	\$128.91	\$117.10	\$96.46	\$96.98	\$91.50	\$97.45	\$111.33	\$83.68	\$97.64	\$79.25	\$93.10	\$97.45
Systemic Antibacterial Costs	\$659,034	\$609,747	\$663,175	\$422,438	\$485,263	\$471,597	\$403,399	\$376,733	\$433,025	\$103,356	\$105,233	\$97,614	\$99,763	\$405,965	\$433,025
Systemic Antibacterial Costs/Patient Day	\$62.28	\$57.33	\$58.24	\$45.85	\$37.03	\$32.20	\$26.45	\$23.46	\$26.89	\$25.81	\$25.59	\$24.05	\$26.25	\$25.41	\$26.89
Systemic Antifungal Costs	\$1,109,283	\$1,031,584	\$647,637	\$1,092,448	\$1,049,236	\$941,208	\$1,075,705	\$1,092,789	\$1,135,947	\$342,416	\$238,926	\$298,700	\$201,397	\$1,081,438	\$1,135,947
Systemic Antifungal Costs/Patient Day	\$104.84	\$96.99	\$56.88	\$83.06	\$80.07	\$64.26	\$70.53	\$68.04	\$70.55	\$85.52	\$58.09	\$73.59	\$53.00	\$67.69	\$70.55
Patient Care Outcomes															
Hospital-Acquired C. difficile Cases (rate per 1,000 patient days)	6 (0.56)	7 (0.65)	14 (1.17)	5 (0.51)	11 (0.84)	13 (0.89)	14 (0.92)	13 (0.81)	14 (0.87)	1 (0.25)	2 (0.49)	0 (0)	1 (0.26)	4 (0.25)	14 (0.87)

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). *An error in DDD calculation for Pip-tazo was detected in Q3 2013; all historical data prior to this was rerun, resulting in minor changes to antibacterial DDDs.

Table 20: Daptomycin Use – Princess Margaret Cancer Centre: Leukemia Service

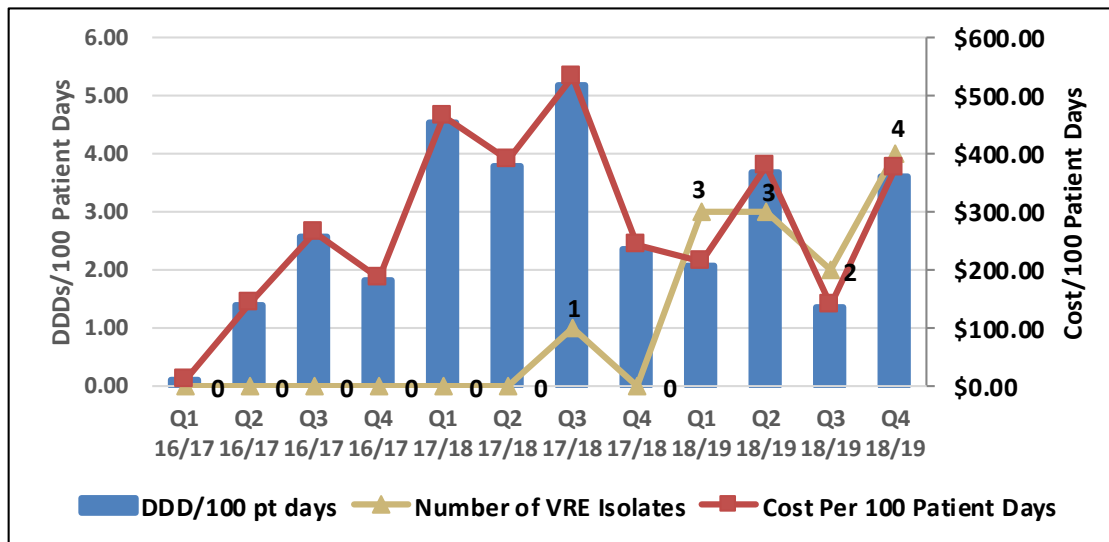
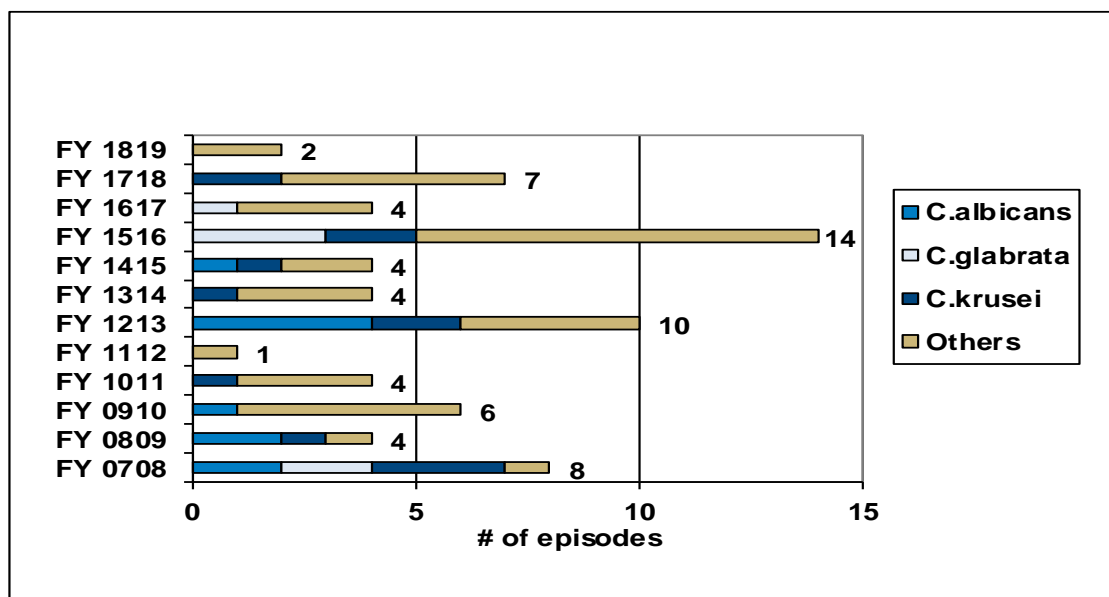
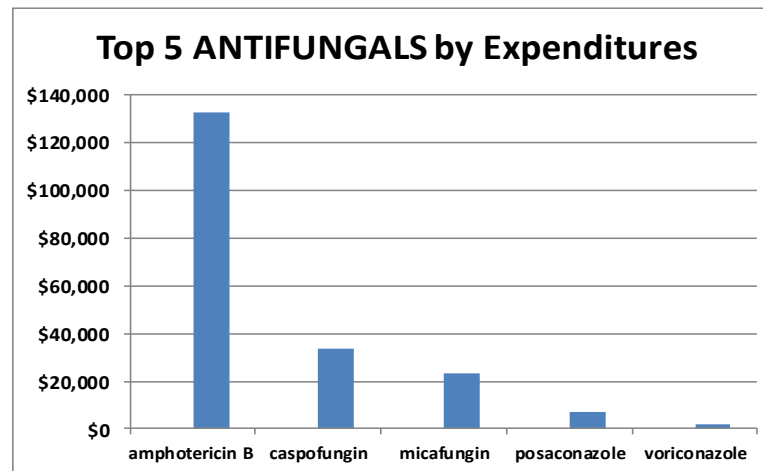
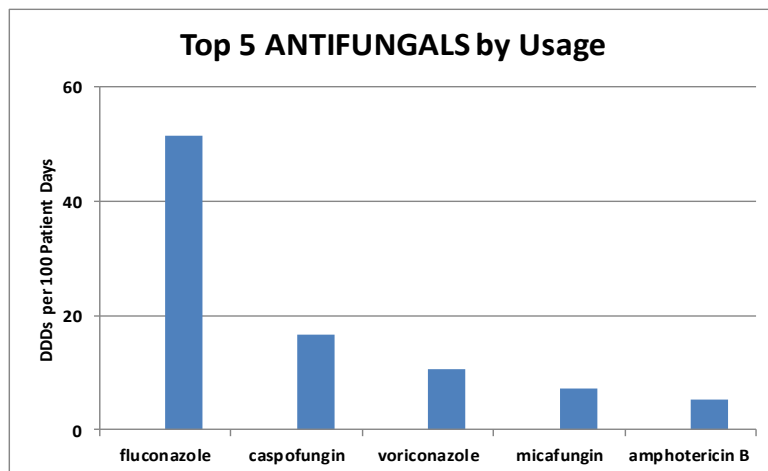
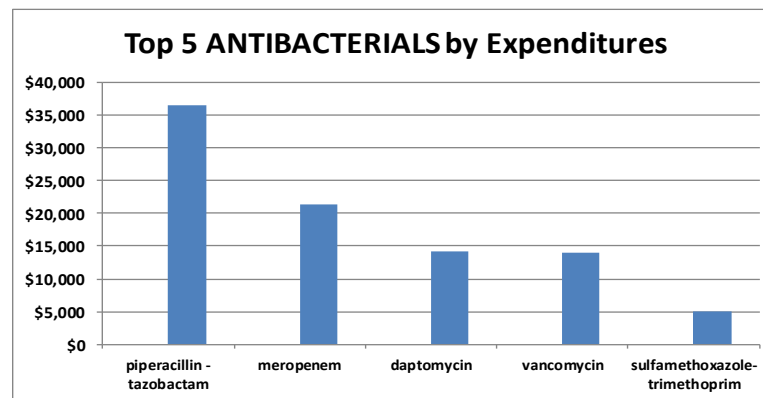
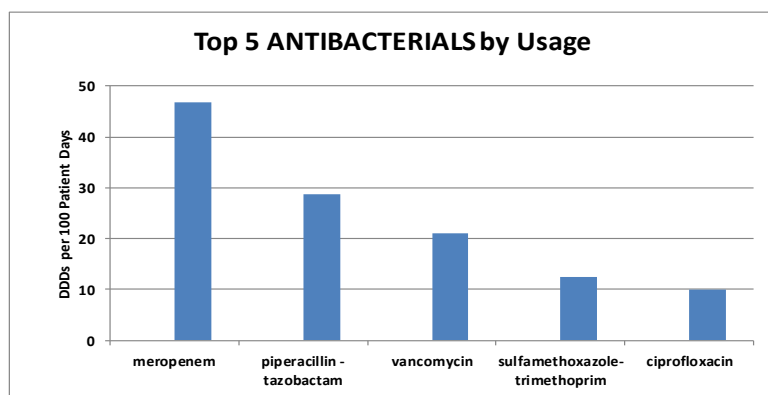


Table 21: Yeast Species Isolated in Blood – Princess Margaret Cancer Centre: Leukemia Service



NB: In past Quarterly Reports, if a patient had more than one culture of different organisms, it was counted as 0.5 each. Starting with the Q3 2017/18 Quarterly Report and moving forward, it will be counted as 1.

Table 22: Princess Margaret Cancer Centre: Leukemia FY 18/19 Q4 Top 5 Antimicrobials by Usage and Expenditures



Princess Margaret Cancer Centre: Allogeneic Bone Marrow Transplant

The FY 18/19 Q4 summary includes:

- Year-to-date (YTD) antimicrobial consumption in defined daily doses (DDDs) per 100 patient days decreased (↓) by 5.1% compared to last year.
- YTD antimicrobial costs per patient day decreased (↓) by 8.6% compared to last year.
- YTD antibacterial costs per patient day decreased (↓) by 0.9% compared to last year.
- YTD antifungal costs per patient day decreased (↓) by 10.1% compared to last year.

Princess Margaret Cancer Centre: Allogeneic Bone Marrow Transplant Antimicrobial Consumption and Costs

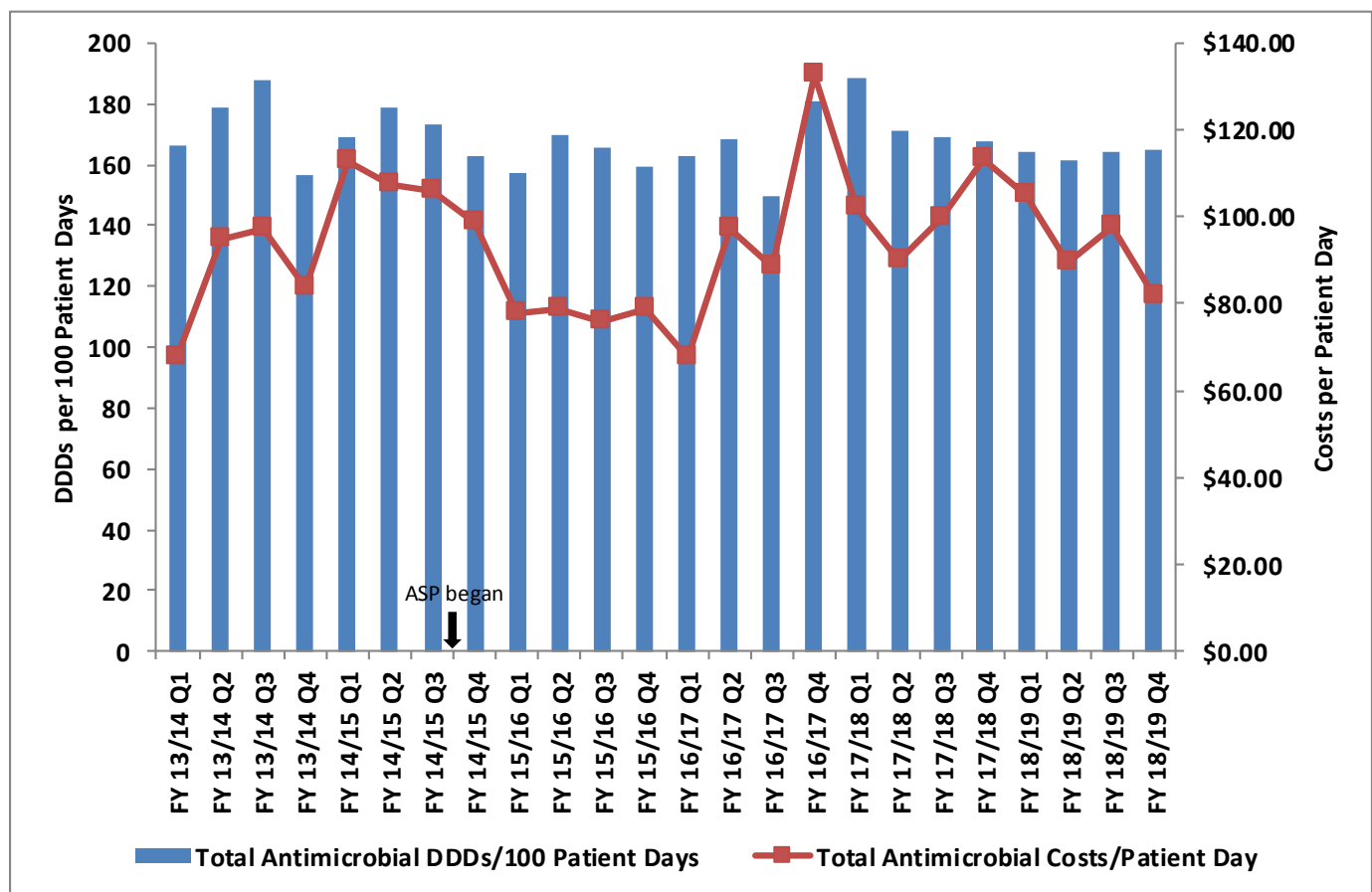


Table 23: Princess Margaret Cancer Centre: Allogeneic Bone Marrow Transplant

Indicators						FY 18/19 Performance					YTD of Previous Year
	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	Q1	Q2	Q3	Q4	YTD	
Antimicrobial Usage and Costs											
Total Antimicrobial DDDs/100 Patient Days	172	171	163	163	173	164	162	164	165	164	173
Systemic Antibacterial DDDs/100 Patient Days	114	104	107	107	123	112	108	107	113	110	123
Systemic Antifungal DDDs/100 Patient Days	59	67	56	56	50	52	54	57	52	54	50
Total Antimicrobial Costs	\$416,614	\$512,300	\$381,633	\$381,633	\$689,940	\$219,966	\$198,199	\$210,148	\$163,319	\$791,632	\$689,940
Total Antimicrobial Costs/Patient Day	\$85.65	\$106.13	\$77.62	\$77.62	\$102.50	\$105.25	\$89.48	\$97.83	\$81.78	\$93.68	\$102.50
Systemic Antibacterial Costs	\$75,219	\$78,038	\$60,088	\$60,088	\$111,250	\$47,172	\$29,727	\$33,087	\$28,451	\$138,437	\$111,250
Systemic Antibacterial Costs/Patient Day	\$15.46	\$16.17	\$12.22	\$12.22	\$16.53	\$22.57	\$13.42	\$15.40	\$14.25	\$16.38	\$16.53
Systemic Antifungal Costs	\$341,395	\$434,261	\$321,545	\$321,545	\$578,690	\$172,794	\$168,472	\$177,061	\$134,868	\$653,195	\$578,690
Systemic Antifungal Costs/Patient Day	\$70.19	\$89.97	\$65.39	\$65.39	\$85.97	\$82.68	\$76.06	\$82.43	\$67.54	\$77.30	\$85.97
Patient Care Outcomes											
Hospital-Acquired C. difficile Cases (rate per 1,000 patient days)	4 (0.82)	12 (2.49)	7 (1.42)	7 (1.42)	13 (1.93)	0 (0)	4 (1.81)	3 (1.4)	4 (2)	11 (1.3)	13 (1.93)

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). *An error in DDD calculation for Pip-tazo was detected in Q3 2013; all historical data prior to this was rerun, resulting in minor changes to antibacterial DDDs.

Table 24: Daptomycin Use – Princess Margaret Cancer Centre: Allogeneic Bone Marrow Transplant

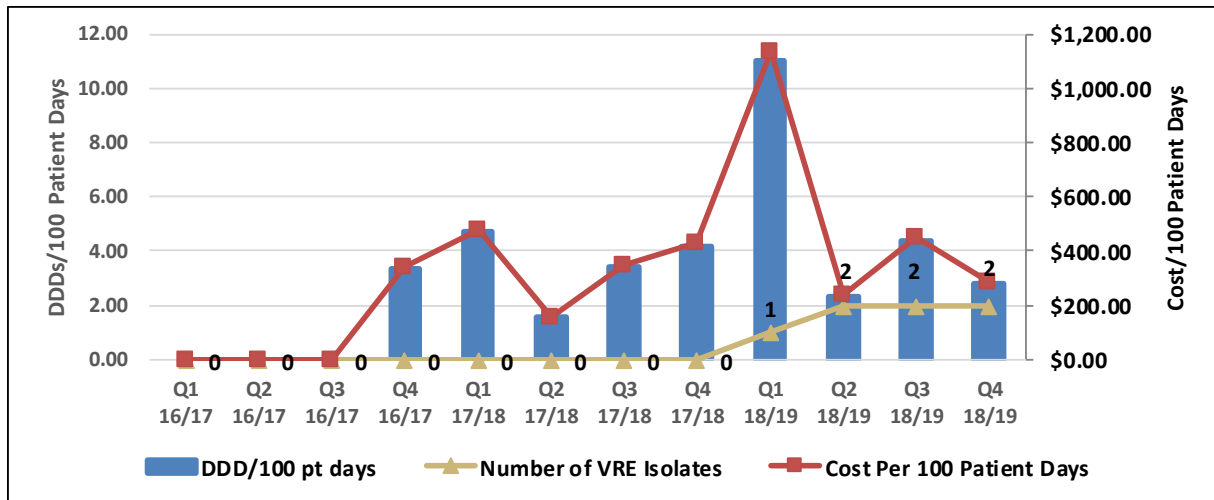
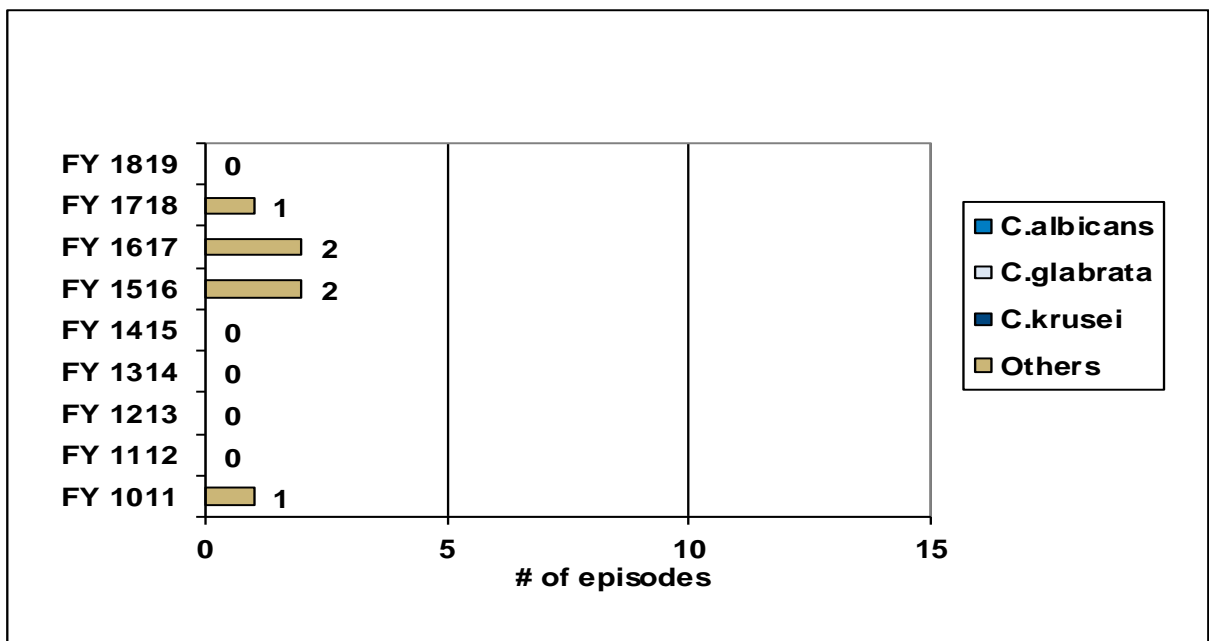
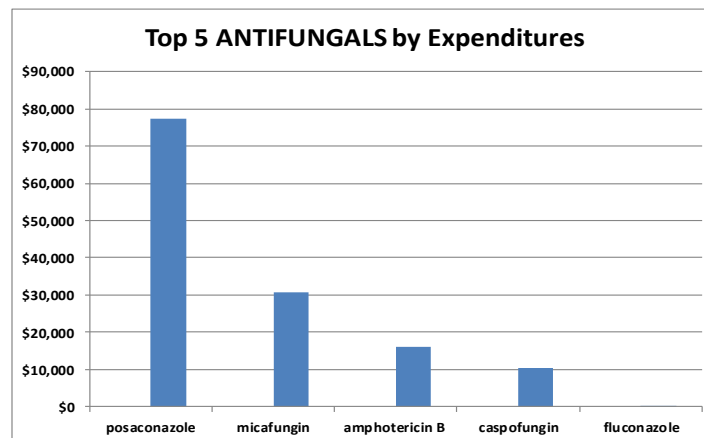
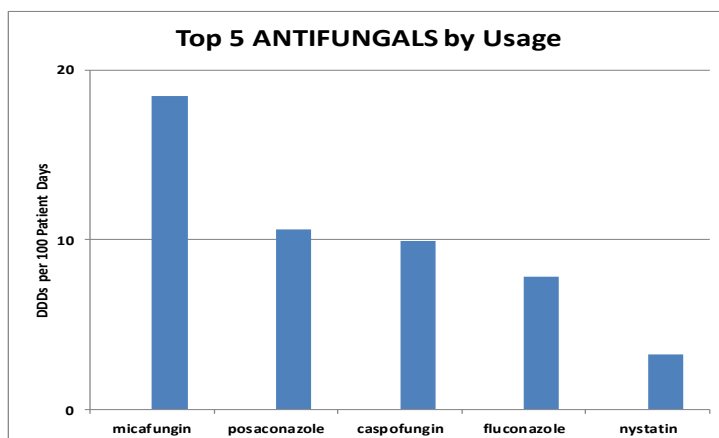
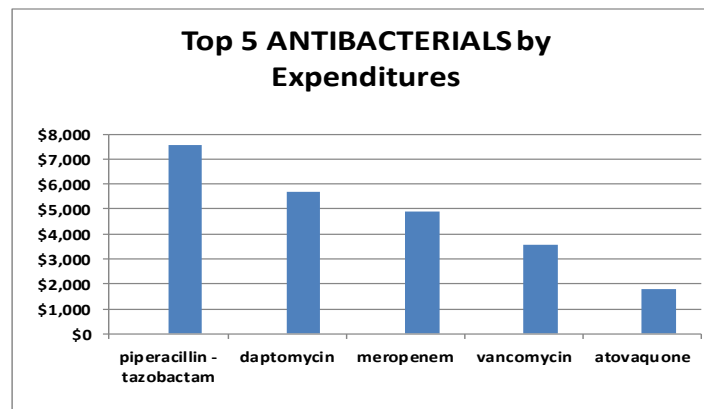
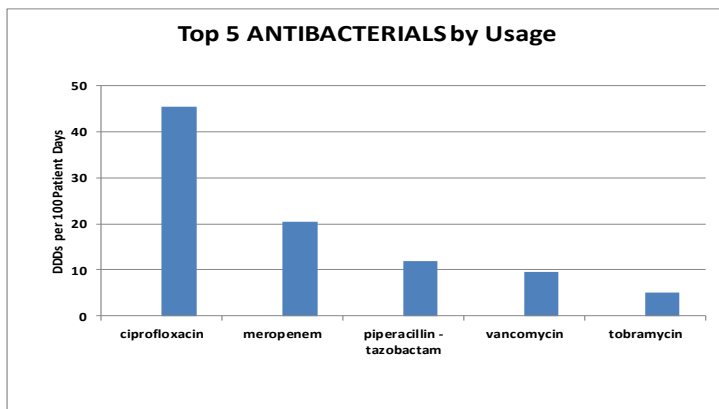


Table 25: Yeast Species Isolated in Blood – Princess Margaret Cancer Centre: Allogeneic Bone Marrow Transplant



NB: In past Quarterly Reports, if a patient had more than one culture of different organisms, it was counted as 0.5 each. Starting with the Q3 2017/18 Quarterly Report and moving forward, it will be counted as 1.

Table 26: Princess Margaret Cancer Centre: Allogeneic Bone Marrow Transplant 18/19 Q4 Top 5 Antimicrobials by Usage (DDDs per 100 patient days) and Expenditures



Toronto General Hospital: Multi-Organ Transplant Program (MOTP)

The FY 18/19 Q4 summary includes:

- Year-to-date (YTD) antimicrobial consumption in defined daily doses (DDDs) per 100 patient days decreased (↓) by 7.0% compared to last year.
- YTD antimicrobial costs per patient day decreased (↓) by 8.0% compared to last year.
- YTD antibacterial costs per patient day decreased (↓) by 6.5% compared to last year.
- YTD antifungal costs per patient day decreased (↓) by 10.3% compared to last year.

Toronto General Hospital: Multi-Organ Transplant Program (MOTP) Antimicrobial Consumption and Costs

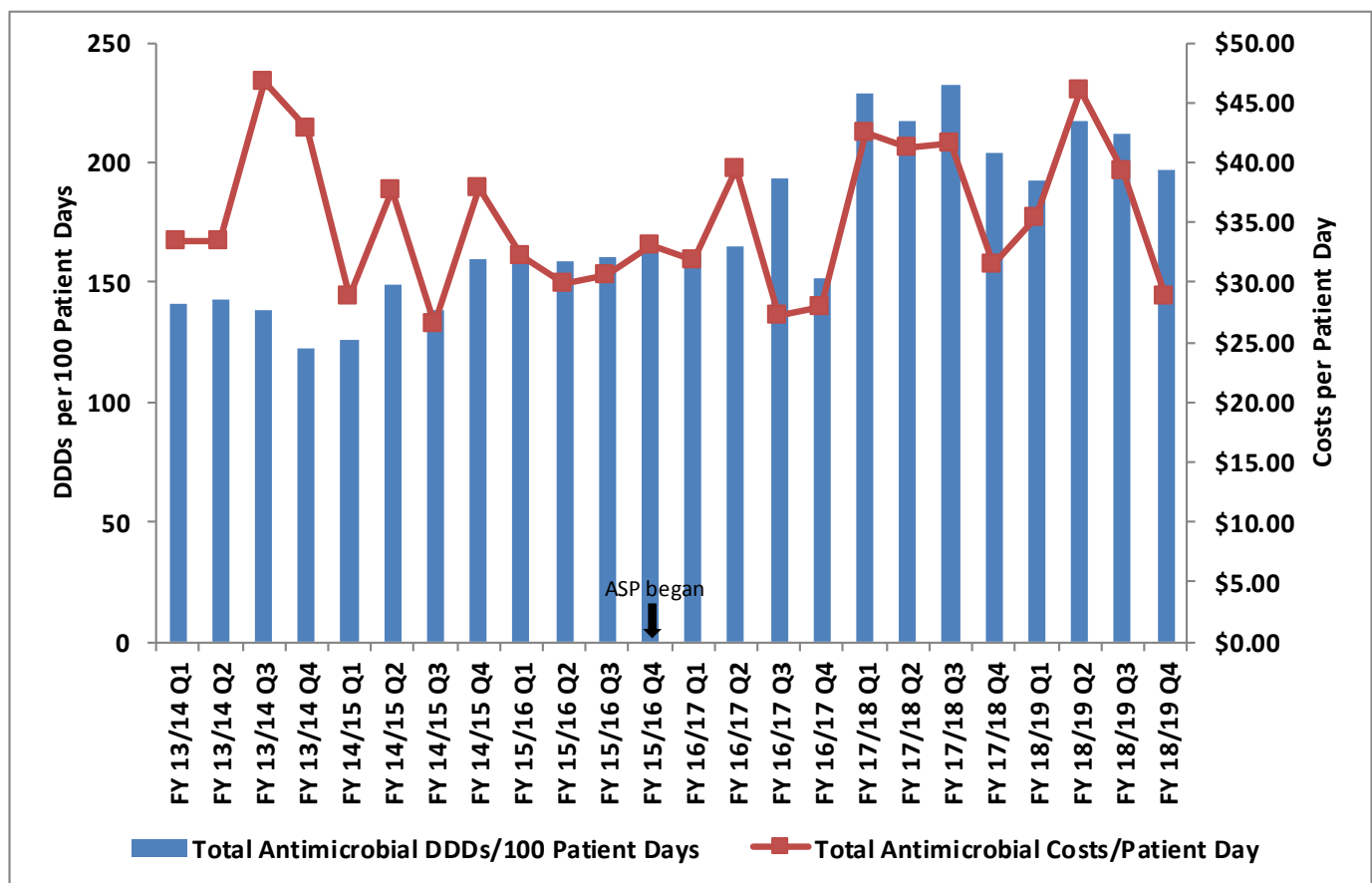


Table 27: Toronto General Hospital: Multi-Organ Transplant Program (MOTP)

Indicators	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	FY 18/19 Performance					YTD of Previous Year
						Q1	Q2	Q3	Q4	YTD	
Antimicrobial Usage and Costs											
Total Antimicrobial DDDs/100 Patient Days	136	143	211	156	220	193	217	212	197	205	220
Systemic Antibacterial DDDs/100 Patient Days	93	98	112	108	155	135	152	147	139	143	155
Systemic Antifungal DDDs/100 Patient Days	43	45	99	48	65	58	66	64	58	62	65
Total Antimicrobial Costs	\$837,263	\$725,411	\$709,892	\$904,028	\$859,544	\$177,441	\$240,435	\$206,662	\$141,028	\$765,566	\$859,544
Total Antimicrobial Costs/Patient Day	\$39.16	\$32.69	\$31.47	\$31.57	\$40.78	\$35.31	\$46.05	\$39.23	\$28.83	\$37.52	\$40.78
Systemic Antibacterial Costs	\$327,831	\$379,748	\$342,941	\$452,266	\$519,656	\$118,498	\$141,504	\$120,779	\$89,621	\$470,402	\$519,656
Systemic Antibacterial Costs/Patient Day	\$15.33	\$17.11	\$15.20	\$15.79	\$24.66	\$23.58	\$27.10	\$22.93	\$18.32	\$23.05	\$24.66
Systemic Antifungal Costs	\$509,433	\$345,664	\$366,951	\$451,762	\$339,887	\$58,943	\$98,931	\$85,883	\$51,407	\$295,164	\$339,887
Systemic Antifungal Costs/Patient Day	\$23.82	\$15.58	\$16.26	\$15.78	\$16.13	\$11.73	\$18.95	\$16.30	\$10.51	\$14.47	\$16.13
Patient Care Outcomes											
Hospital-Acquired C. Difficile Cases (rate per 1,000 patient days)	14 (0.65)	18 (0.81)	11 (0.49)	17 (0.59)	11 (0.52)	2 (0.4)	3 (0.57)	5 (0.95)	6 (1.23)	16 (0.78)	11 (0.52)

Table 28: Daptomycin Use – Toronto General Hospital: Multi-Organ Transplant Program (MOTP)

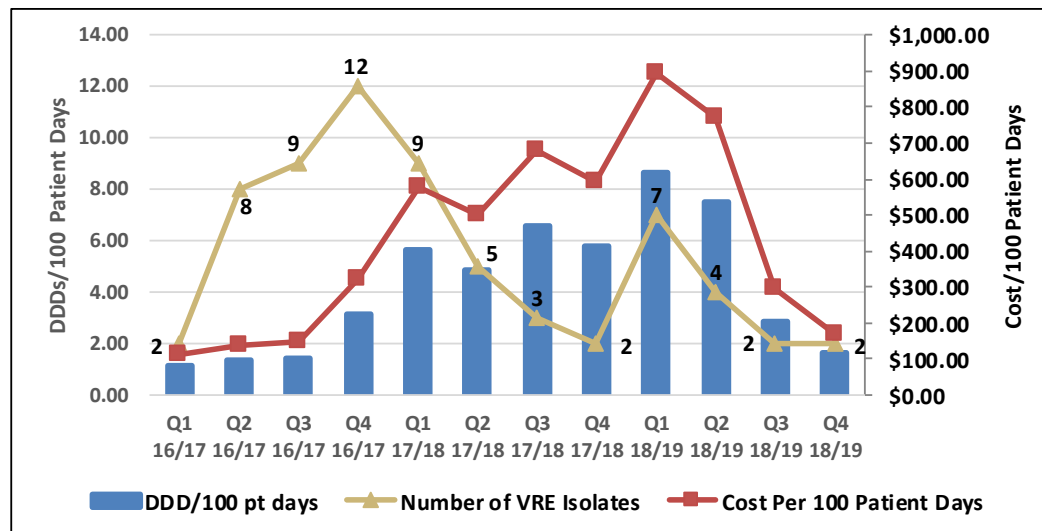
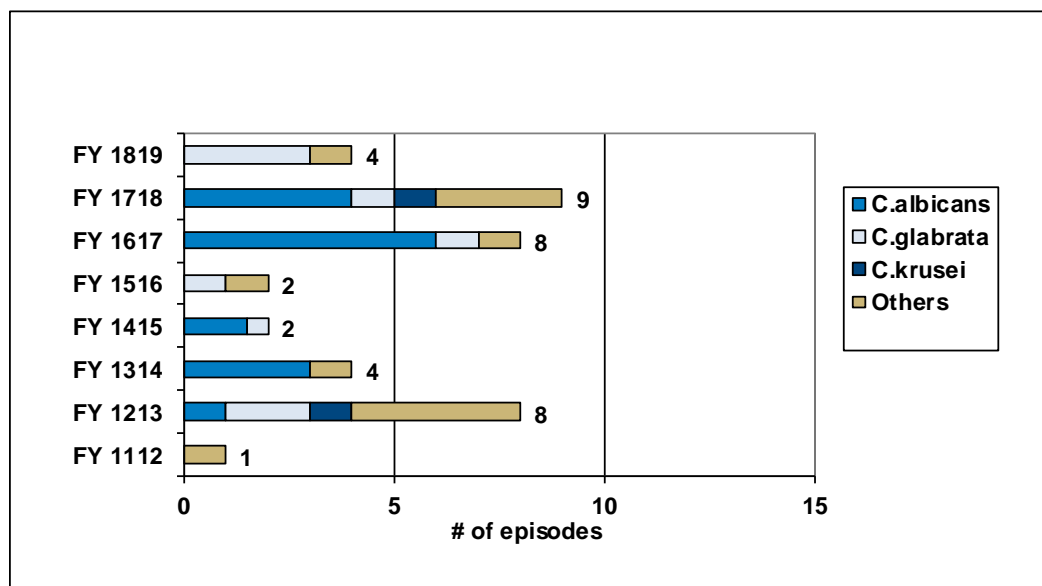


Table 29: Yeast Species Isolated in Blood – Toronto General Hospital: Multi-Organ Transplant Program (MOTP)



NB: In past Quarterly Reports, if a patient had more than one culture of different organisms, it was counted as 0.5 each. Starting with the Q3 2017/18 Quarterly Report and moving forward, it will be counted as 1.

TORONTO REHABILITATION INSTITUTE

Toronto Rehabilitation Institute: Bickle

The FY 18/19 Q4 summary includes:

- Antimicrobial consumption (using defined daily doses (DDDs) per 100 patient days) decreased (↓) by 2.8% compared to YTD last year.
- Antimicrobial costs per patient day decreased (↓) by 31.3% compared to YTD last year.
- Antibacterial costs per patient day decreased (↓) by 2.0% compared to YTD last year.
- Antifungal costs per patient day decreased (↓) by 94.5% compared to YTD last year.

Toronto Rehabilitation Institute: Bickle Antimicrobial Consumption and Costs Per Patient Day

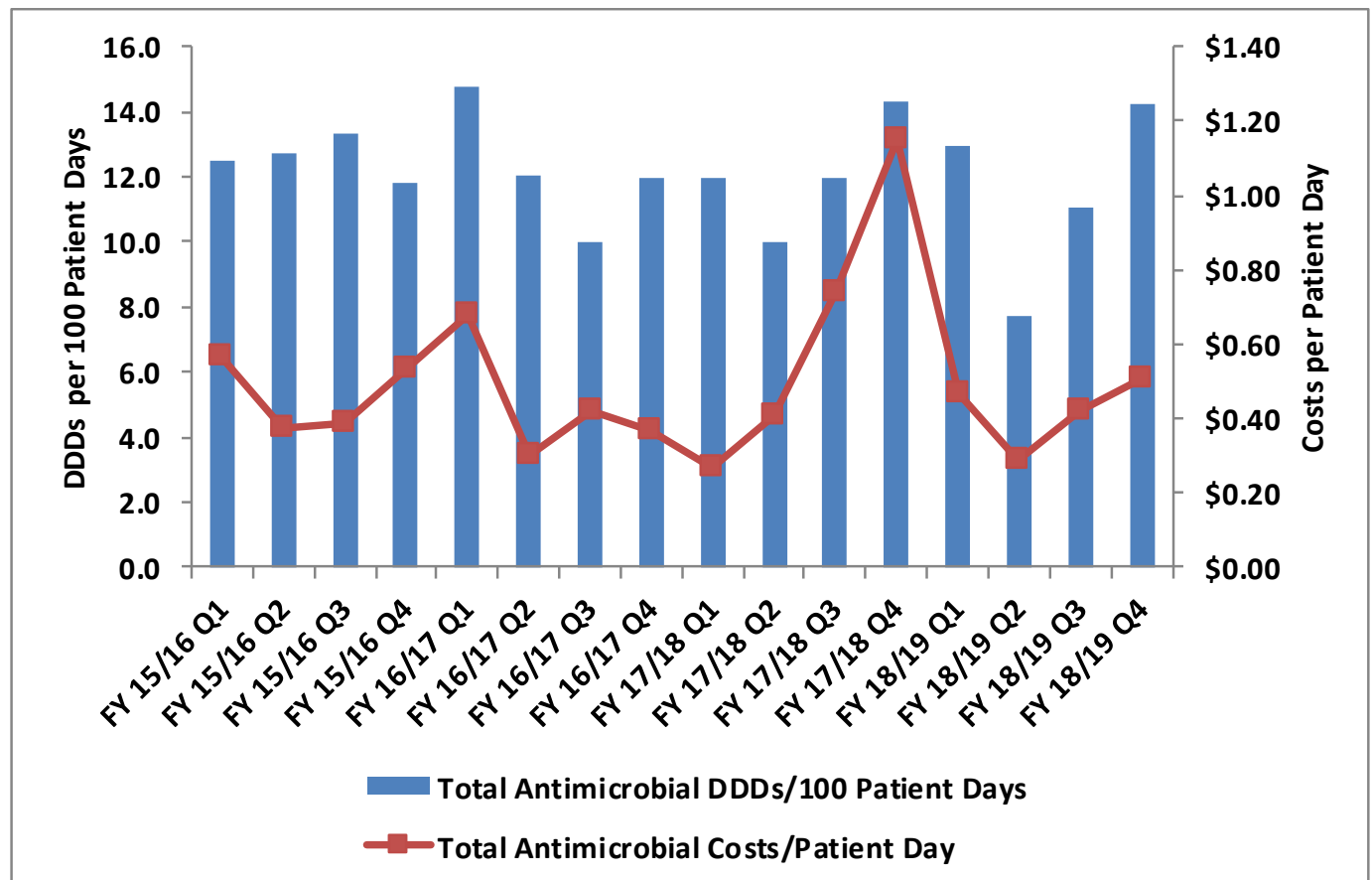


Table 30: Toronto Rehabilitation Institute: Bickle

Indicators				FY18/19 Performance					YTD of Previous Year
	FY 15/16	FY 16/17	FY 17/18	Q1	Q2	Q3	Q4	YTD	
Antimicrobial Usage and Costs									
Total Antimicrobial DDDs/100 Patient Days	13	12	12	13	8	11	14	11	12
Systemic Antibacterial DDDs/100 Patient Days	11	11	11	11	8	11	14	11	11
Systemic Antifungal DDDs/100 Patient Days	2	2	1	1	0	0	0	1	1
Total Antimicrobial Costs	\$31,326	\$28,952	\$38,119	\$7,583	\$4,452	\$6,911	\$7,998	\$26,945	\$38,119
Total Antimicrobial Costs/Patient Day	\$0.46	\$0.44	\$0.63	\$0.52	\$0.29	\$0.42	\$0.51	\$0.43	\$0.63
Systemic Antibacterial Costs	\$29,933	\$23,571	\$26,056	\$7,008	\$4,431	\$6,886	\$7,941	\$26,265	\$26,056
Systemic Antibacterial Costs/Patient Day	\$0.44	\$0.36	\$0.43	\$0.48	\$0.29	\$0.42	\$0.51	\$0.42	\$0.43
Systemic Antifungal Costs	\$1,393	\$5,381	\$12,063	\$575	\$21	\$26	\$58	\$679	\$12,063
Systemic Antifungal Costs/Patient Day	\$0.02	\$0.08	\$0.20	\$0.04	\$0.00	\$0.00	\$0.00	\$0.01	\$0.20
Patient Care Outcomes									
Hospital-Acquired C. Difficile Cases (rate per 1,000 patient days)	7 (0.10)	7 (0.11)	4 (0.07)	1 (0.07)	0 (0)	0 (0)	0 (0)	1 (0.02)	4 (0.07)

Toronto Rehabilitation Institute: Lyndhurst

The FY 18/19 Q4 summary includes:

- Antimicrobial consumption (using defined daily doses (DDDs) per 100 patient days) increased (↑) by 7.8% compared to YTD last year.
- Antimicrobial costs per patient day increased (↑) by 15.0% compared to YTD last year.
- Antibacterial costs per patient day increased (↑) by 15.4% compared to YTD last year.
- Antifungal costs per patient day increased (↑) by 10.3% compared to YTD last year.

Toronto Rehabilitation Institute: Lyndhurst Antimicrobial Consumption and Costs Per Patient Day

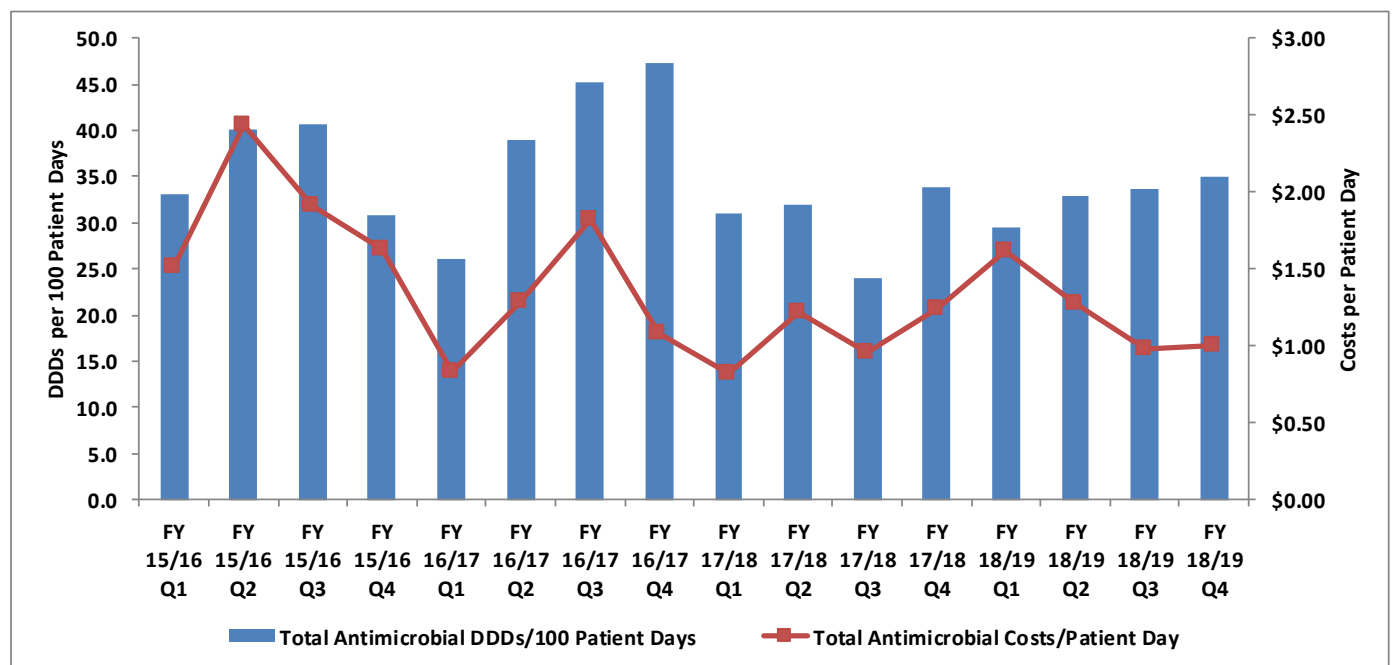


Table 31: Toronto Rehabilitation Institute: Lyndhurst

Indicators	FY 15/16	FY 16/17	FY 17/18	FY18/19 Performance					YTD of Previous Year
				Q1	Q2	Q3	Q4	YTD	
Antimicrobial Usage and Costs									
Total Antimicrobial DDDs/100 Patient Days	36	39	30	30	33	34	35	33	30
Systemic Antibacterial DDDs/100 Patient Days	34	38	30	29	33	34	35	32	30
Systemic Antifungal DDDs/100 Patient Days	2	1	1	1	0	0	0	0	1
Total Antimicrobial Costs	\$35,817	\$23,520	\$19,991	\$7,651	\$6,045	\$4,782	\$4,783	\$23,262	\$19,991
Total Antimicrobial Costs/Patient Day	\$1.88	\$1.26	\$1.06	\$1.62	\$1.27	\$0.98	\$1.00	\$1.22	\$1.06
Systemic Antibacterial Costs	\$35,473	\$23,404	\$18,691	\$7,629	\$4,633	\$4,781	\$4,770	\$21,813	\$18,691
Systemic Antibacterial Costs/Patient Day	\$1.86	\$1.26	\$0.99	\$1.61	\$0.98	\$0.98	\$1.00	\$1.14	\$0.99
Systemic Antifungal Costs	\$344	\$116	\$1,300	\$23	\$1,412	\$2	\$13	\$1,450	\$1,300
Systemic Antifungal Costs/Patient Day	\$0.02	\$0.01	\$0.07	\$0.00	\$0.30	\$0.00	\$0.00	\$0.08	\$0.07
Patient Care Outcomes									
Hospital-Acquired C. Difficile Cases (rate per 1,000 patient days)	3 (0.16)	1 (0.05)	1 (0.05)	0 (0)	0 (0)	0 (0)	1 (0.21)	1 (0.05)	1 (0.05)

Toronto Rehabilitation Institute: University Centre

The FY 18/19 Q4 summary includes:

- Antimicrobial consumption (using defined daily doses (DDDs) per 100 patient days) increased (↑) by 9.3% compared to YTD last year.
- Antimicrobial costs per patient day decreased (↓) by 24.4% compared to YTD last year.
- Antibacterial costs per patient day increased (↑) by 14.9% compared to YTD last year.
- Antifungal costs per patient day decreased (↓) by 61.6% compared to YTD last year.

Toronto Rehabilitation Institute: University Centre Antimicrobial Consumption and Costs Per Patient Day

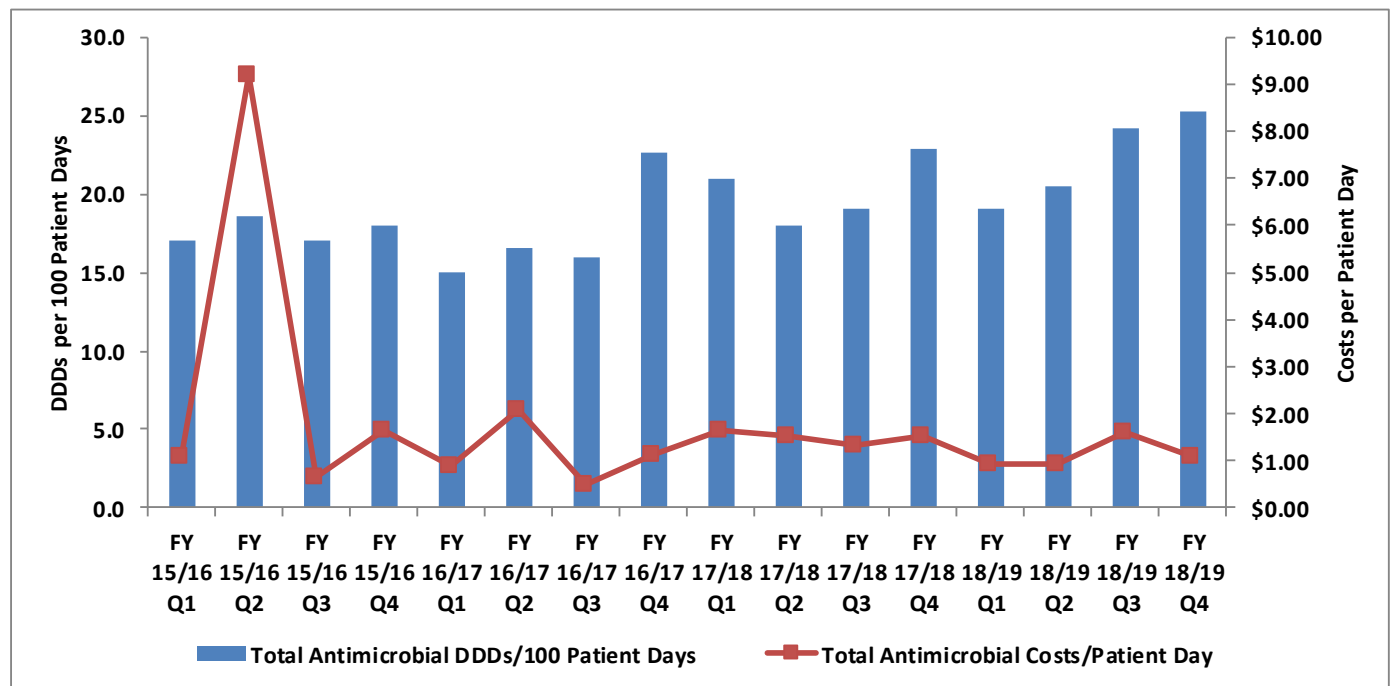


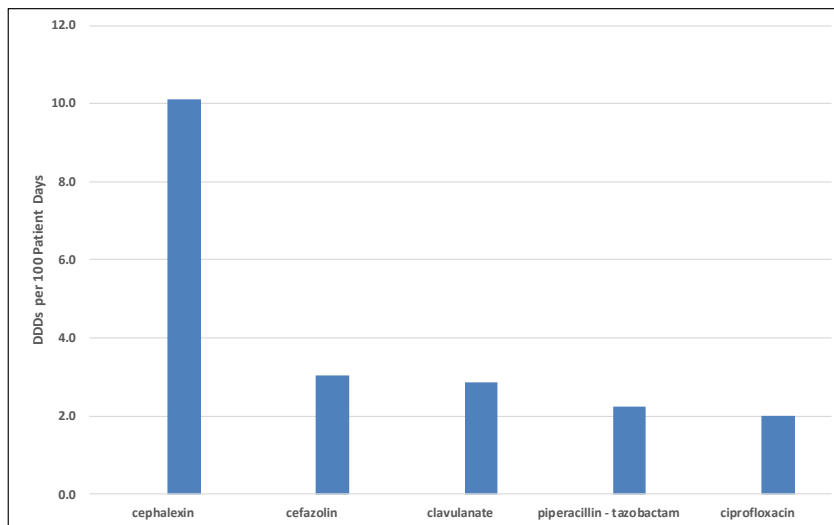
Table 32: Toronto Rehabilitation Institute: University Centre

Indicators	FY 15/16	FY 16/17	FY 17/18	FY18/19 Performance					YTD of Previous Year
				Q1	Q2	Q3	Q4	YTD	
Antimicrobial Usage and Costs									
Total Antimicrobial DDDs/100 Patient Days	18	18	18	19	21	24	25	21	20
Systemic Antibacterial DDDs/100 Patient Days	16	15	15	16	17	21	20	18	18
Systemic Antifungal DDDs/100 Patient Days	1	3	3	3	3	4	5	3	2
Total Antimicrobial Costs	\$154,345	\$58,364	\$58,364	\$12,602	\$11,617	\$20,873	\$14,050	\$45,092	\$80,657
Total Antimicrobial Costs/Patient Day	\$3.09	\$1.14	\$1.14	\$0.94	\$0.93	\$1.60	\$1.08	\$1.16	\$1.51
Systemic Antibacterial Costs	\$52,505	\$30,908	\$30,908	\$10,982	\$9,125	\$11,885	\$11,678	\$31,991	\$39,159
Systemic Antibacterial Costs/Patient Day	\$1.05	\$0.60	\$0.60	\$0.82	\$0.73	\$0.91	\$0.90	\$0.82	\$0.73
Systemic Antifungal Costs	\$1,840	\$27,456	\$27,456	\$1,620	\$2,492	\$8,988	\$2,372	\$13,101	\$41,498
Systemic Antifungal Costs/Patient Day	\$0.04	\$0.54	\$0.54	\$0.12	\$0.20	\$0.69	\$0.18	\$0.34	\$0.77
Patient Care Outcomes									
Hospital-Acquired C. Difficile Cases (rate per 1,000 patient days)	2 (0.04)	2 (0.04)	2 (0.04)	0 (0)	0 (0)	1 (0.08)	3 (0.23)	1 (0.03)	3 (0.06)

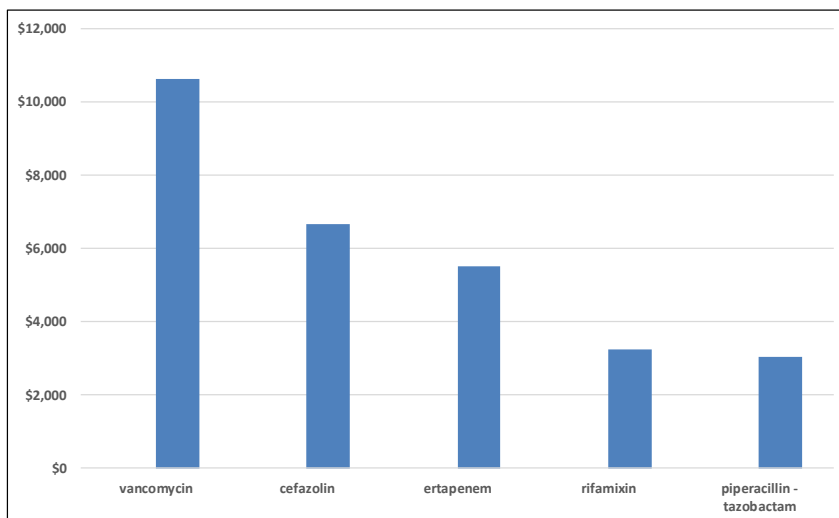
BRIDGEPOINT HEALTH

Bridgepoint Health: Hospital-Wide

Bridgepoint Health: Hospital-Wide Top 5 ANTIBACTERIALS by Usage 2018/19 YTD



Bridgepoint Health: Hospital-Wide Top 5 ANTIBACTERIALS by Expenditures 2018/19 YTD



BEST PRACTICE GUIDELINES AND ALGORITHMS

- Drs. Husain and So have implemented the ASP MOT Common Infections Management Guidelines for Solid Organ Transplant Patients. The guidelines have undergone consultative reviews by content experts in MOT and Transplant Infectious Diseases and have been introduced to all the transplant teams.
- The ASP-Allogeneic Bone Marrow Transplant Working Group was formed to update the antimicrobial prophylaxis guideline for allogeneic bone marrow transplant recipients. It is currently being formatted for incorporation into the existing High-Risk Febrile Neutropenia Protocol. Drs. Husain and So would like to thank the members of the Working Group for their contributions.
- Clinical summaries continue to be available on the [ASP website](#) and on [mobile device web browsers](#) for a series of common and important conditions. We are currently in the process of reviewing and updating all our clinical summaries – ensuring that they reflect best practices based on the current clinical literature.
- Whiteboard animation videos continue to be available on [our program's YouTube channel](#).

EDUCATION

- As part of our General Internal Medicine (GIM) initiative, the ASP team has been providing ongoing education and support to GIM Pharmacists at both MSH and UHN. The ASP team provides education and tools to physicians and medical trainees through several means, including ASP/ID GIM case-based noon rounds and via a mobile ASP web application (<http://www.antimicrobialstewardship.com/treatment>) to provide efficient access to resources.
- Once a month the ASP team meets with all Nurse Practitioners from the Malignant Hematology program for case rounds.
- The Leslie Dan Faculty of Pharmacy at the University of Toronto is the first institution to offer an elective in Antimicrobial Stewardship in the Entry-to-Practice Doctor of Pharmacy Curriculum. Dr. Miranda So (ASP Pharmacist and Assistant Professor) is the course coordinator, with contributions from other ASP team members.
- The SHS-UHN ASP continues to provide ASP rotations for residents and fellows from across the country and internationally.
- The Michener Critical Care RN Infection Module has been offered four times now, once a quarter.

MEMBERSHIPS

Public Health Agency of Canada

Dr. Andrew Morris is an invited member of EAGAR (Expert Advisory Group on Antimicrobial Resistance), chaired by the Federal Chief Medical Officer of Health, Dr. Theresa Tam.

Association of Medical Microbiology and Infectious Diseases Canada

Dr. Andrew Morris is a physician member of AMMI Canada's Antimicrobial Stewardship and Resistance Committee. Dr. Linda Dresser is a pharmacist member of this committee.

Society for Hospital Epidemiology of America (SHEA)

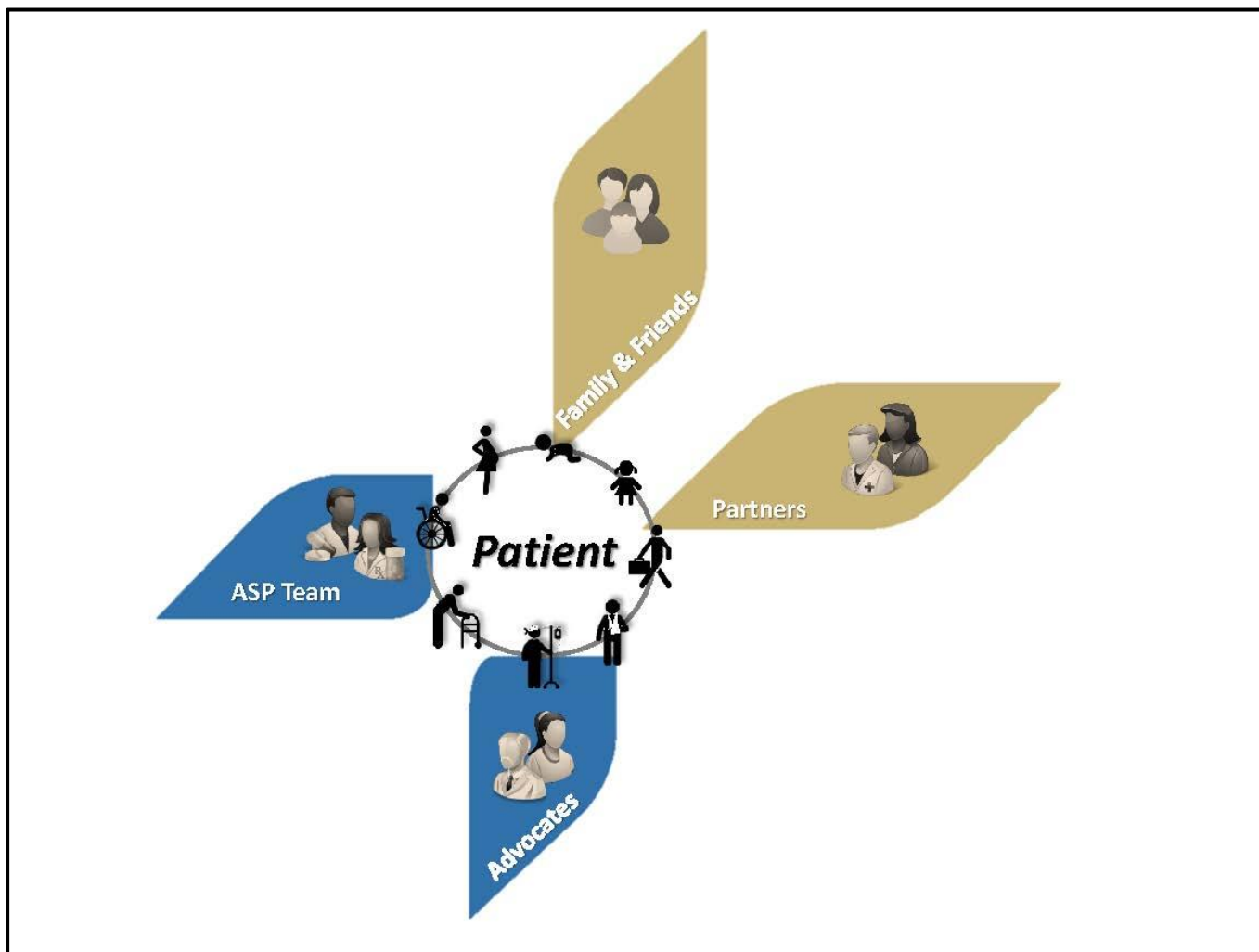
Dr. Andrew Morris is Chair of SHEA's Antimicrobial Stewardship and Resistance Committee.

Federal/Provincial/Territorial Pan-Canadian Antimicrobial Stewardship Task Group

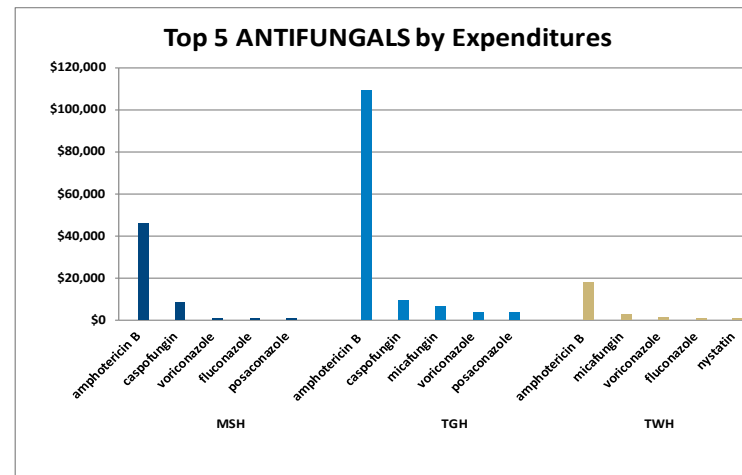
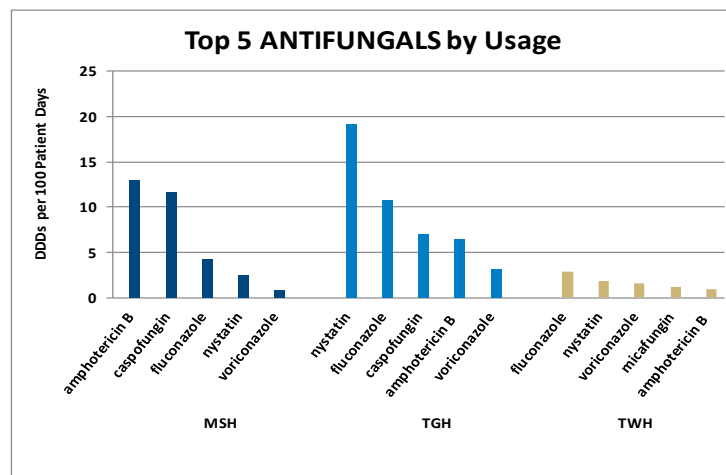
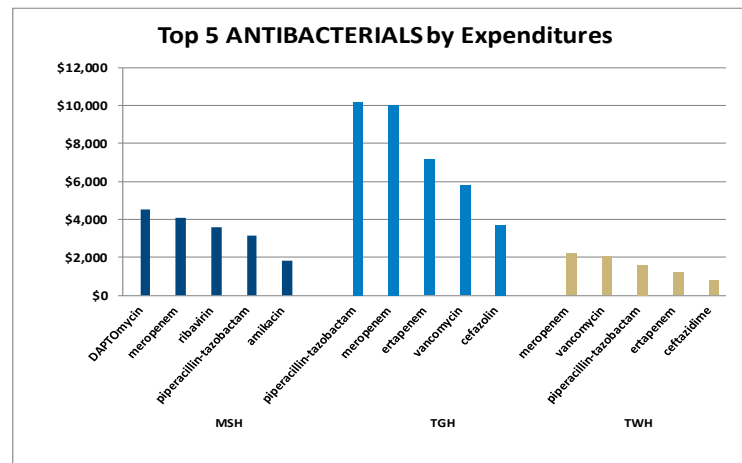
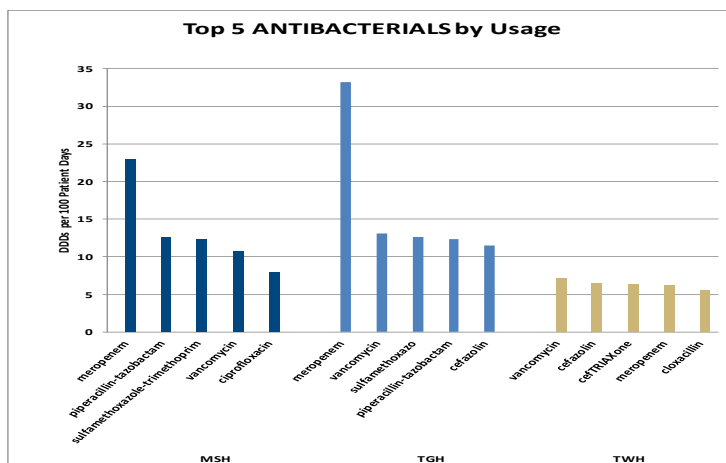
Yoshiko Nakamachi is a member of the Federal/Provincial/Territorial Pan-Canadian Antimicrobial Stewardship Task Group for the development of the Pan-Canadian AMR Action Plan.

STRATEGIC PLANNING

The ASP team developed the SHS-UHN ASP Strategic Plan 2016-2019. Please contact Yoshiko Nakamachi (Yoshiko.Nakamachi@uhn.ca) if you would like a copy.



Appendix 1: FY 18/19 Q4 Top 5 Antimicrobials by Usage (DDDs per 100 Patient Days) and Expenditures by ICU Site



Appendix 2: General Internal Medicine FY 18/19 Q4 Top 5 Antimicrobials by Usage (DDDs per 100 patient days) and Expenditures

