SHS + UHN

ASP ANTIMICROBIAL STEWARDSHIP PROGRAM

Q2 REPORT

FISCAL YEAR 2020 | 2021

@shsuhnasp

Sinai Health System

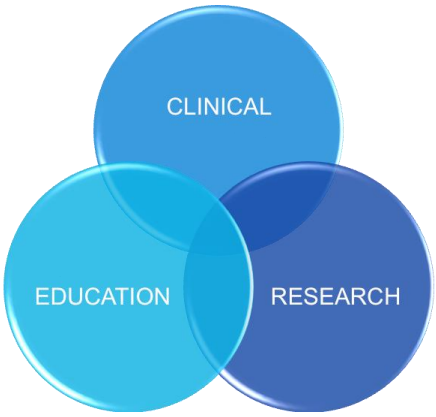
UHN Toronto General Toronto Western Princess Margaret Toronto Rehab Michener Institute

TABLE OF CONTENTS

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

EXECUTIVE SUMMARY

The Sinai Health-University Health Network Antimicrobial Stewardship Program (SH-UHN ASP) was established in 2009. The SH-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 SH-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 (Bridgepoint Health and Mount Sinai Hospital (MSH)) and University Health Network (Princess Margaret Cancer Centre (PM), Toronto General Hospital (TG), Toronto Rehabilitation Institute (TRI), and Toronto Western Hospital (TW)).

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 SH and UHN.

The COVID-19 pandemic arrived in Toronto in January 2020 and began influencing hospital service delivery in February 2020 with reductions in clinical services, including elective and non-urgent surgeries. Accordingly, acute care hospitals (including SH and UHN) saw an expected reduction in clinical demand for antimicrobial therapy, which is reflected in the data presented. The SH-UHN ASP had to alter its operations to support clinical teams while optimizing physical distancing.

Additionally, members of the SH-UHN ASP played a variety of important roles in the pandemic effort, including supporting the development of mission-critical IT applications and surveillance systems, assessing for COVID-19 at UHN's assessment centres, helping develop mathematical models for personal protective equipment and drug supply and demand, and developing clinical COVID-19 therapeutic practice guidelines and other resources to support healthcare provision.

Table 1: Summary of Antimicrobial Usage (DDDs) 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: Cardiac 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 20/21 Q2 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:

- Langford B, So M, Raybardhan S, Leung V, Westwood D, MacFadden D, Soucy J, Daneman N. Bacterial Co-Infection and Secondary Infection in Patients with COVID-19: A Living Rapid Review and Meta-Analysis. CMI. 2020 Jul [Epub].

- Jorgensen SCJ, Kebriaei R, Dresser LD. Remdesivir: A review of pharmacology, pre-clinical data and clinical experience for COVID-19. Pharmacotherapy. 2020 Jul;40(7):659-671.

- Jorgensen SCJ, Dresser LD, Dalton B. *Counterpoint:* Vancomycin AUC-based therapeutic drug monitoring should NOT become standard for patients with confirmed or suspected methicillin-resistant Staphylococcal aureus infections*. CJHP. 2020; [Accepted].*

- Jorgensen SCJ, Tse CLY, Burry L, Dresser LD. Baricitinib: review of pharmacology, safety and emerging clinical experience for COVID-19. Pharmacotherapy. 2020 Aug;40(8):843-856.

- Jorgensen SCJ, Stewart JS, Dalton B. Vancomycin AUC-guided therapeutic drug monitoring to reduce nephrotoxicity: are we overlooking a simpler solution? International Journal of Antimicrobial Chemotherapy. 2020 Aug 31[Epub].

- Jorgensen SCJ, Burry L, Tse CY, Dresser LD. Baricitinib: impact on COVID-19 coagulopathy? Clinical Infectious Diseases. 2020 Aug 14 [Epub].

- Wright WF, Jorgensen SCJ, Spellberg B. Heaping the Pelion of Vancomycin on the Ossa of MRSA: Back to Basics in Clinical Care and Guidelines. Clinical Infectious Diseases. 2020 Sep 9 [Epub].

- Hindmarch S, Wong A, Morris A, Fafard P, Patrick D, Packer C, Weese S, Wilson K, Labonte R, Ruckert A. Governing Antimicrobial Resistance: A Narrative Review of Global Governance Mechanisms. Journal of Public Health Policy. 2020 Sep 9:2-14 [Epub].

- Kruger SZ, Bronskill SE, Jeffs L, Steinberg M, et al. Evaluating and Prioritizing Antimicrobial Stewardship Programs for Nursing Homes: A Modified Delphi Panel. ICHE 2020 Sep; 41(9):1028-1034.

- Lee E, Detsky M, Ma J, et al. Variation in antibiotic use across Intensive Care Units in Ontario, Canada. ICHE 2020 Sep;41(9):1035-1041.

There are currently an additional four manuscripts that are close to ready for submission.

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.

- HIV and Hepatitis C Community Action Fund (Public Health Agency of Canada): Developing Model(s) for a Pan-Canadian Antimicrobial Resistance (AMR) Network. Principal Investigator: Andrew Morris. Co-investigators: Gerry Wright, Herman Barkema, Scott Weese.

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 SH DoM Resident Research Grant.

In addition to these funded projects, multiple unfunded research projects continue, led by various members of the SH-UHN ASP team. The following investigator-initiated study is 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 SH. The algorithms and best practices can be found here on our ASP website. The SH-UHN ASP continually updates these practice tools to reflect the latest evidence.

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

Throughout Wave 1 of the pandemic, a modified version of JEDI rounds was provided to our clinicians. Over its first nine years, the SH-UHN ASP employed an academic detailing model of three to five times a week. ICU staff who attended the multi-weekly ASP rounds were well-versed in appropriate antimicrobial prescribing, and there was a broad appetite for change.

To that end, the ASP moved to (1) **JEDI (Judicious Evaluation of antimicrobial Decision-making in the ICU) rounds**. This has been led by **Dr. Linda Dresser (ASP Pharmacist, recently retired),** 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 TG MSICU in October 2017, TG CVICU December 2017, TW MSNICU March 2018, and the MSH ICU June 2018. JEDI in the CCU at TG went live in Q2 2019/2020 and is the final ICU to go live with this implementation.

The second component of our new ICU initiative has been 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, who have been very informative in their feedback throughout the process, prior to implementation, allowing for continuous learning and improvement.

Antimicrobial Stewardship in Leukemia Program

During the early months of Wave 1 of the pandemic, twice-monthly directed antimicrobial surveys were put on pause. Regular meetings resumed in August 2020, and the results of the surveys are included in this report.

Drs. Husain and So have been conducting twice-monthly directed antimicrobial prescribing surveys using an online tool and *a priori* definitions developed by Australia's National Centre for Antimicrobial Stewardship (NCAS) to assess adherence to the High-Risk Febrile Neutropenia Guideline and appropriateness of antimicrobial prescriptions. The online tool is called the National Antimicrobial Prescribing Survey (NAPS). Starting in May 2019, the format of the antimicrobial stewardship intervention was updated from the conventional, twice weekly audit-and-feedback meetings reviewing all admitted patients (which had been in place since 2010) to a new format with two parts: (1) presentation of the aggregate "dashboard" metrics from the NAPS survey and (2) focused, in-depth discussions on specific patients with unique antimicrobial needs and themes identified from the dashboard. With the new format, antimicrobial stewardship meetings now take place twice per month.

Provincial, National, and International Role

In April 2019, the Ontario government announced it would expand the scope of practice for certain health professionals, including pharmacists. **The SH-UHN ASP is actively working with the OCP (Ontario College of Pharmacists)** in developing regulations that would authorize pharmacists to prescribe for minor ailments. Prescribing antimicrobials for certain types of infections is included in the expanded scope of practice.

The SH-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).

The SH-UHN ASP continues to play a leading role in implementing an antimicrobial survey tool across Canada. This tool, **Canadian NAPS**, has been collecting information about antibiotic prescriptions, accompanying diagnoses, and the appropriateness of the prescriptions. **The SH-UHN ASP continues to lead this initiative for Year 2**, making it available to an even larger number of hospitals across Canada in each of the provinces, with a **target of 100 acute care hospitals**. This initiative is being supported by PHAC (Public Health Agency of Canada), NCAS (National Centre for Antimicrobial Stewardship), and The Guidance Group in Australia.

Dr. Andrew Morris co-chairs with Dr. Gerry Wright (McMaster University) a Public Health Agency of Canada-funded initiative to develop a National Antimicrobial Resistance Network. This work, slated to be completed in the Spring 2021, is a national network to facilitate implementing the Pan-Canadian Action Plan on Antimicrobial Resistance. More information can be found at www.amrnetwork.ca.

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 **Drs. Linda Dresser (now retired) and Mark McIntyre**, SH-UHN ASP Pharmacists.

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 Nursing Certificate. **Linda Jorgoni, RN, ASP Nurse Leader**, and **Dr. Linda Dresser**, in partnership with the Michener Institute, developed the first **Canadian nursing curriculum addressing antimicrobial stewardship** concepts combined with infectious diseases management for critical care nurses. The content includes online modules, clinical placement, and in-class 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. Since then, multiple cohorts of students have taken this course. Throughout Wave 1 of the pandemic, the course was delivered virtually so as not to interrupt the certification process of our critical care nurses.

FISCAL YEAR 20/21 Q2 RESULTS

CRITICAL CARE

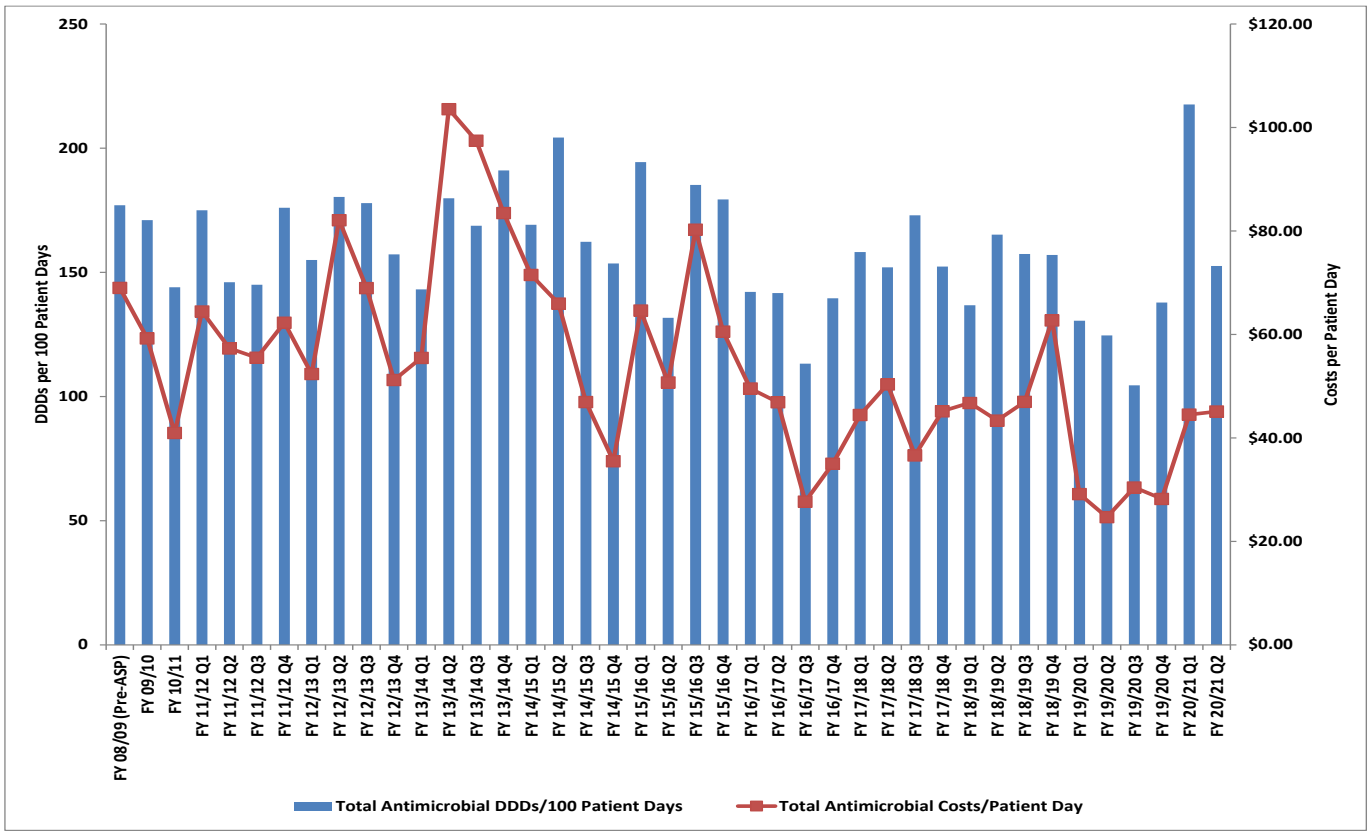
Mount Sinai Hospital: Medical Surgical ICU

The FY 20/21 Q2 summary includes:

- Antimicrobial consumption (using defined daily doses (DDDs) per 100 patient days) increased (↑) by 45.6% compared to YTD last year.
- Antimicrobial costs per patient day increased (↑) by 67.4% compared to YTD last year:
  - Antibacterial costs per patient day increased (↑) by 49.8% compared to YTD last year.
  - Antifungal costs per patient day increased (↑) by 86.1% compared to YTD last year.

NB: Patients transferred from Princess Margaret accounted for 14% of patient visits and 44% of the antimicrobial costs.

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



To view **Appendix 1: FY 20/21 Q2 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 5.1% compared to YTD last year.
- Antifungal Days of Therapy (DOT) per 100 patient days increased (↑) by 48.5% compared to YTD last year.

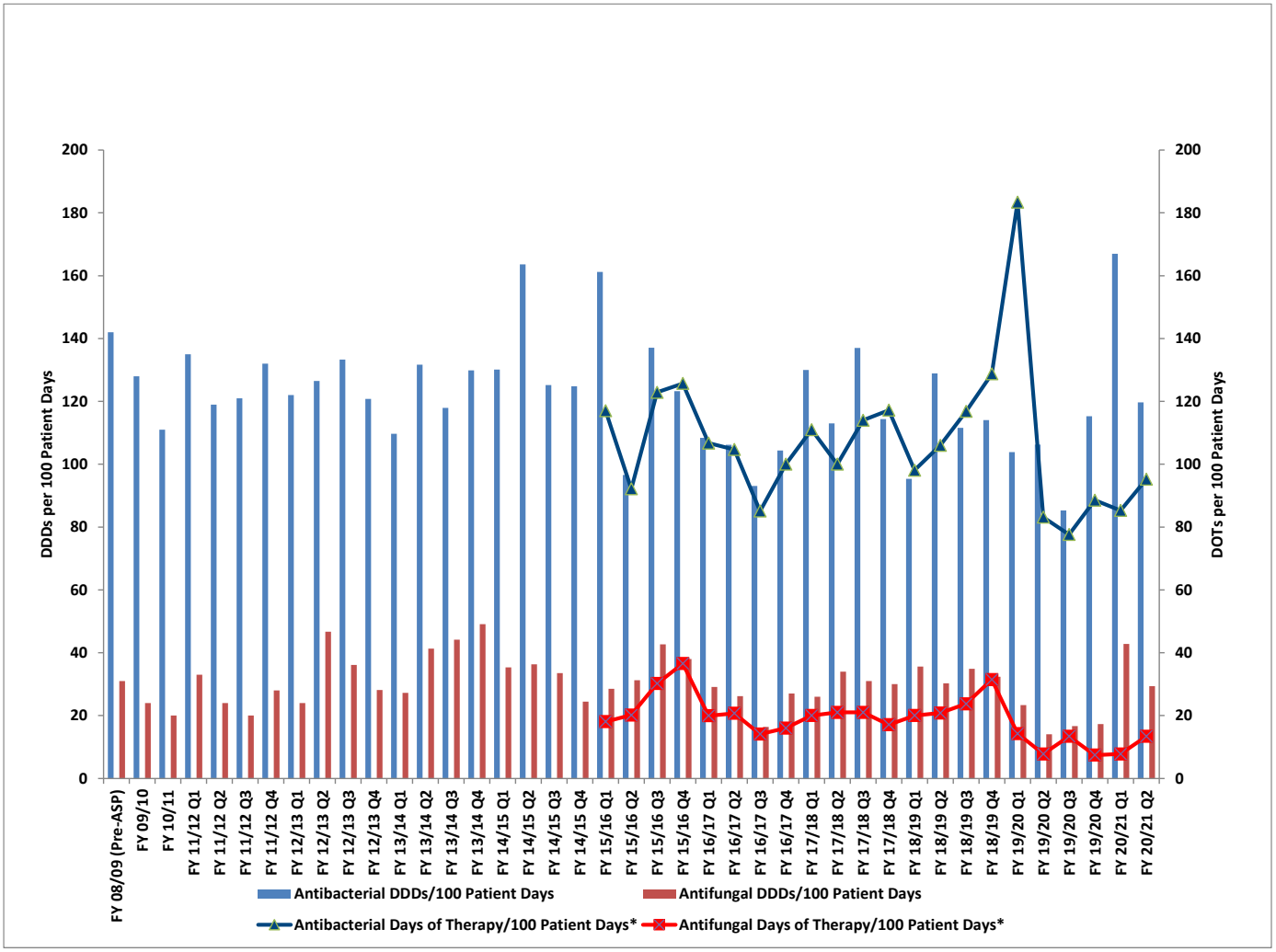


Table 2: Mount Sinai Hospital: Medical Surgical ICU

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	FY 19/20	FY 20/21 Performance Q1	Q2	Q3	Q4	YTD	YTD of Previous Year
Antimicrobial Usage and Costs																		
Total Antimicrobial DDDs/100 Patient Days	**177**	**171**	**144**	**167**	**170**	**172**	**164**	**156**	**135**	**159**	**154**	**124**	**218**	**153**			**185**	**127**
Systemic Antibacterial DDDs/100 Patient Days	142	128	111	128	127	123	136	116	103	123	113	102	167	120			144	105
Systemic Antifungal DDDs/100 Patient Days	31	24	20	33	35	41	25	32	25	30	33	18	43	29			36	18
Total Antimicrobial Costs	$332,724	$285,975	$193,129	$279,859	$291,470	$424,044	$232,814	$274,258	$187,684	$206,738	$258,822	$134,940	$49,218	$48,892			$98,109	$61,659
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**	**$50.10**	**$28.12**	**$44.50**	**$45.10**			**$44.80**	**$26.76**
Systemic Antibacterial Costs	$174,339	$142,134	$95,773	$125,339	$134,811	$108,886	$92,928	$68,246	$57,257	$80,561	$85,783	$63,733	$24,780	$18,287			$43,068	$30,237
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	$16.61	$13.28	$22.41	$16.87			$19.67	$13.12
Systemic Antifungal Costs	$143,100	$132,519	$88,998	$141,877	$144,811	$296,573	$134,504	$189,661	$119,234	$112,610	$163,194	$67,973	$23,037	$29,609			$52,647	$29,761
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	$31.59	$14.16	$20.83	$27.31			$24.04	$12.92
Antibacterial Days of Therapy/100 Patient Days*	n/a	n/a	n/a	n/a	n/a	111	109	115	99	110	113	84	85	95			90	86
Antifungal Days of Therapy/100 Patient Days*	n/a	n/a	n/a	n/a	n/a	17	21	27	18	20	24	10	11	18			15	10
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 (0.19)	1 (0.21)	3 (2.71)	1 (0.92)			4 (1.83)	1 (0.43)
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	5.12	5.62	8.90	7.14			8.02	6.15
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	14.8	16.50	12.1	12.7			12.40	15.1
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	2.4	1.80	2.3	3.0			2.60	1.6
ICU Ventilator Days	NA	3286	2934	2677	2749	3069	2597	2504	2231	2845	2884	2971	682	344			1026	1277
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	4.08	4.33	4.55	3.90			4.23	4.12

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 (Princess Margaret Cancer Centre (PM) and Non-PM Patients)

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	FY 19/20	FY 20/21 Q1	FY 20/21 Q2	FY 20/21 Q3	FY 20/21 Q4	FY 20/21 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	$91,857.61	$53,343.80	$29,526.05	$25,655.57			$55,181.62	$30,872.10
	$21.14	$25.42	$31.77	$37.79	$31.80	$23.12	$9.78	$18.48	$17.50	$9.51	$14.87	$26.23			$14.87	$22.52
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	$166,964.00	$81,595.88	$19,691.92	$23,235.95			$42,927.87	$28,700.72
	$179.02	$181.58	$249.91	$317.64	$170.89	$231.26	$191.53	$155.98	$142.46	$118.60	$148.06	$25.79			$148.06	$153.48
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	$258,821.61	$134,939.68	$49,217.97	$48,891.52			$98,109.49	$59,572.82
	$44.26	$61.97	$69.91	$87.40	$54.30	$67.17	$27.93	$35.78	$40.31	$21.43	$23.24	$26.02			$23.24	$38.24

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)

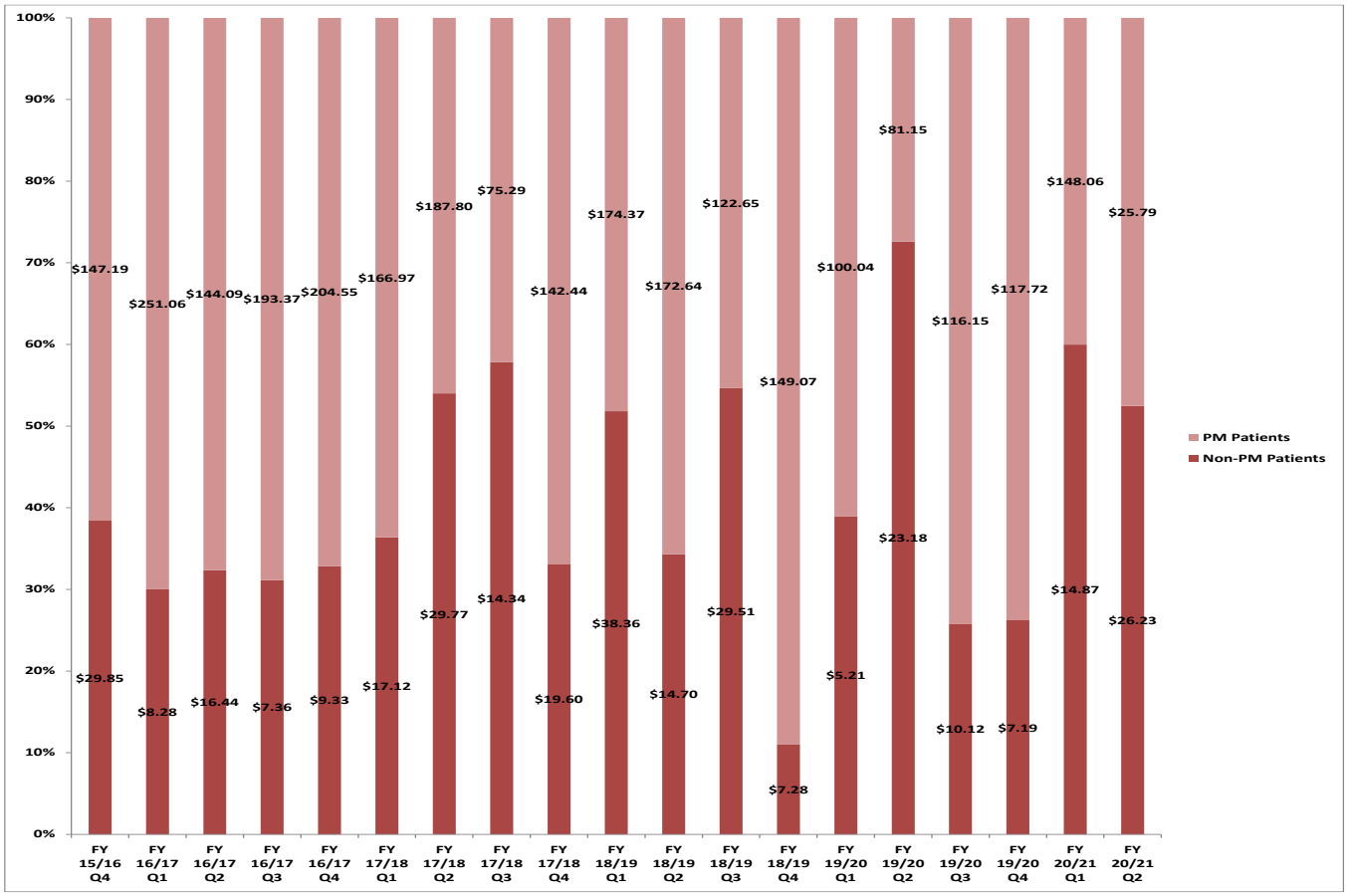
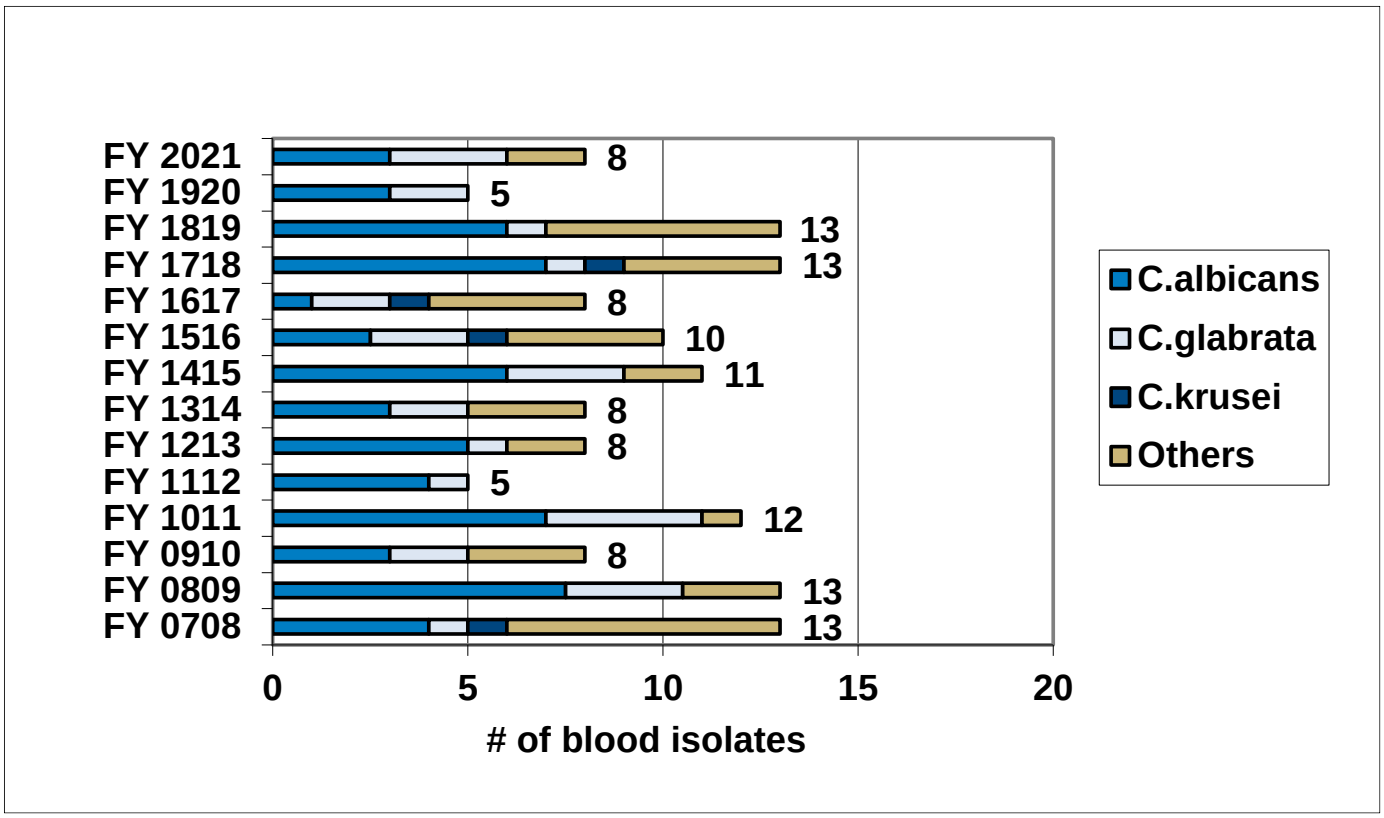
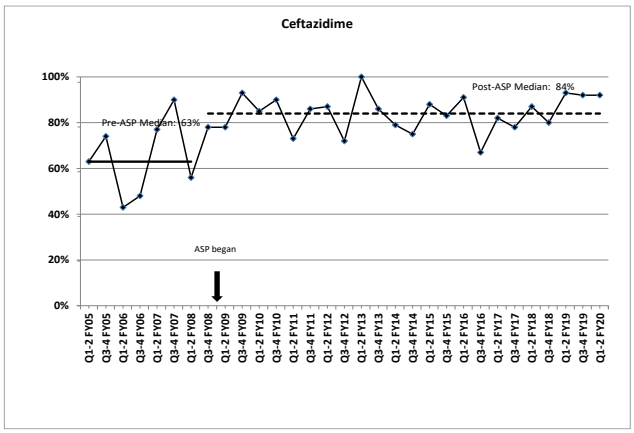


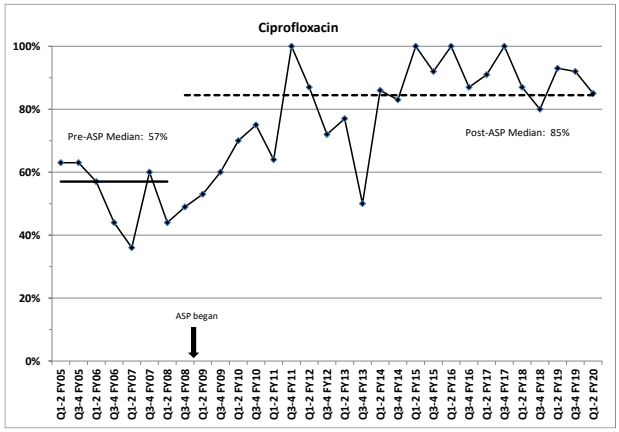
Table 4: Yeast Species Isolated in Blood – Mount Sinai Hospital: Medical Surgical ICU

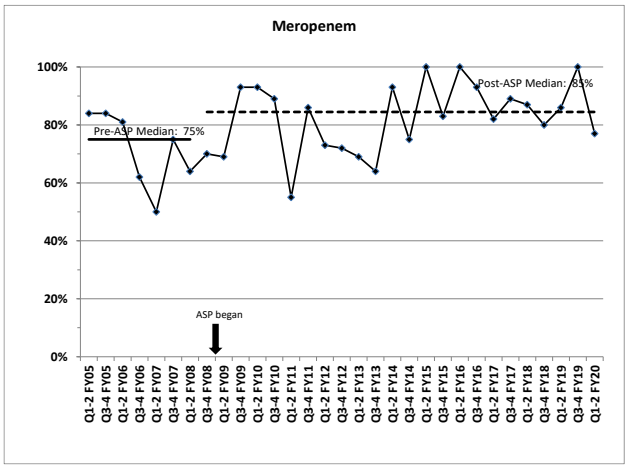


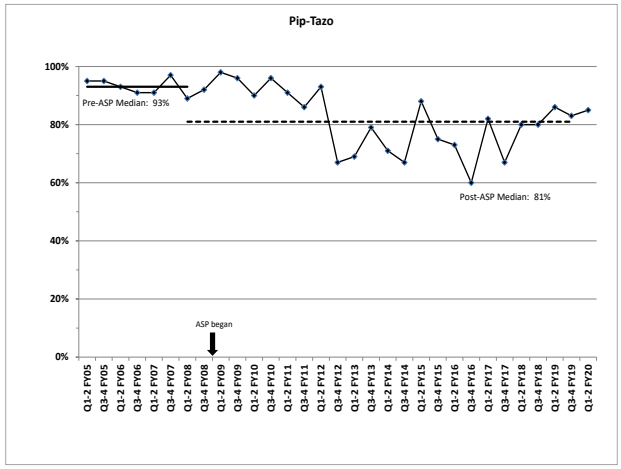
NB: In past Quarterly Reports, if a patient had more than one culture of different organisms, it was counted as 0.5 each. Starting with the Q3 2017/18 Quarterly Report and moving forward, it will be counted as 1.

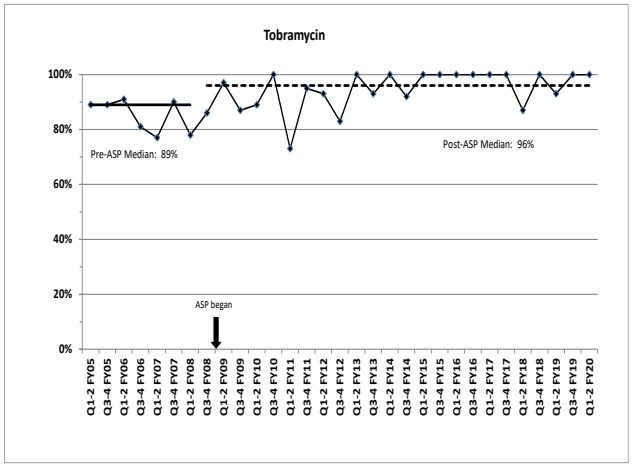
MSH ICU Pseudomonas Susceptibility











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 20/21 Q2 summary includes:

- Antimicrobial days of therapy (DOT) per 100 patient days decreased (↓) by 12.6% compared to YTD last year.
- Antimicrobial costs per patient day decreased (↓) by 54.0% compared to YTD last year.

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

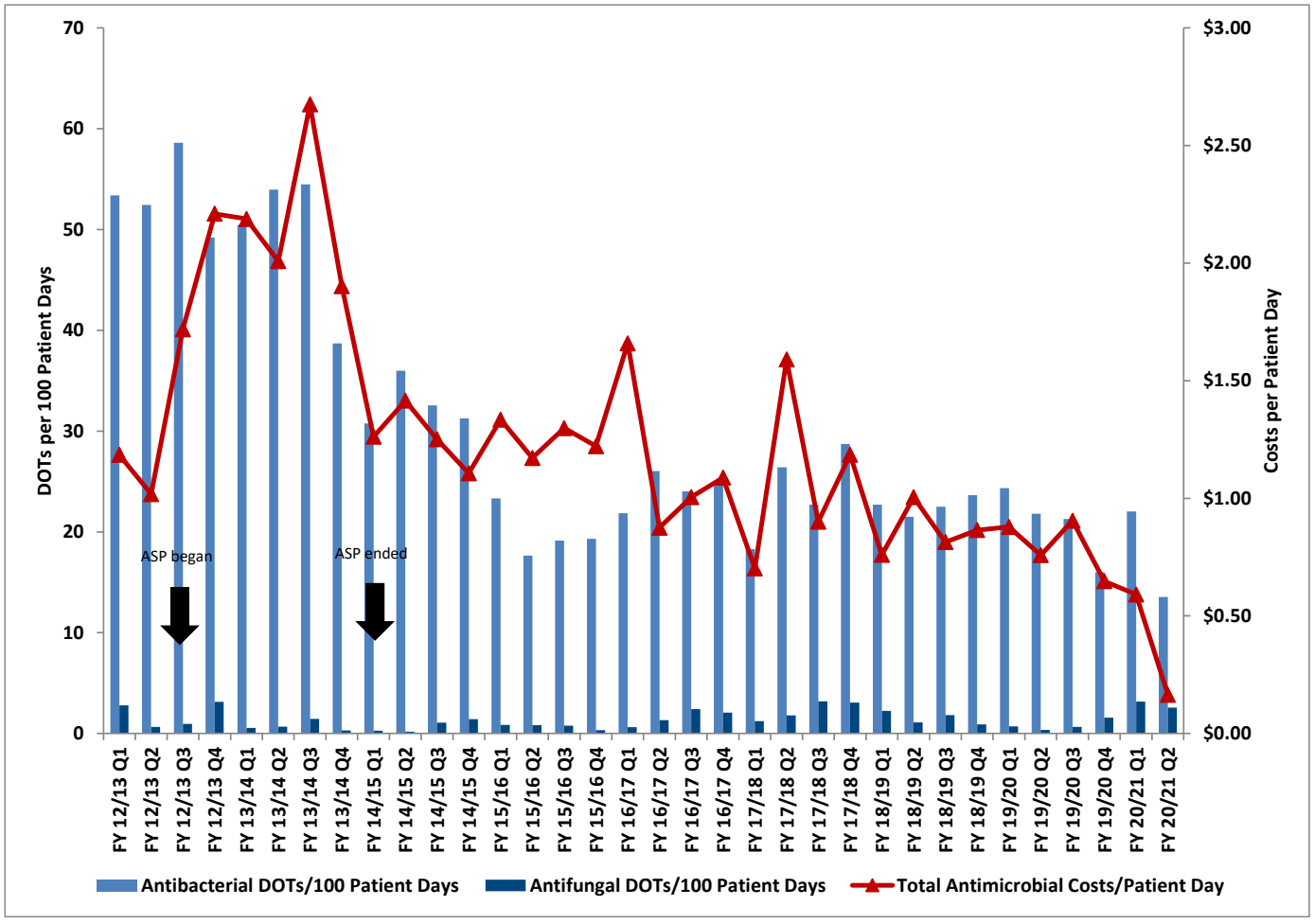


Table 5: Mount Sinai Hospital: Neonatal ICU

Indicators	FY 11/12	FY 12/13	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	FY 18/19	FY 19/20	FY20/21 Performance Q1	Q2	Q3	Q4	YTD	YTD of Previous Year
Antimicrobial Usage and Costs															
Total Antimicrobial DOTs/100 Patient Days	**67.3**	**55.4**	**49.4**	**33.5**	**20.6**	**25.8**	**26.4**	**24.1**	**21.6**	**25.2**	**16.1**			**20.6**	**23.6**
Systemic Antibacterial DOTs/100 Patient Days	65.1	53.5	48.7	32.7	19.9	24.2	24.1	22.6	20.8	22.0	13.6			17.8	23.1
Systemic Antifungal DOTs/100 Patient Days	2.2	1.8	0.7	0.8	0.7	1.6	2.3	1.5	0.8	3.2	2.6			2.9	0.5
Total Antimicrobial Costs	$16,415	$17,682	$26,162	$21,371	$21,232	$19,618	$19,272	$15,325	$13,996	$2,600	$730			$3,330	$7,091
Total Antimicrobial Costs/Patient Day	**$1.31**	**$1.51**	**$2.17**	**$1.26**	**$1.26**	**$1.15**	**$1.09**	**$0.86**	**$0.80**	**$0.59**	**$0.16**			**$0.38**	**$0.82**
Systemic Antibacterial Costs	$14,783	$16,505	$25,290	$20,516	$20,804	$18,247	$18,042	$14,788	$13,642	$2,406	$477			$2,882	$6,924
Systemic Antibacterial Costs/Patient Day	$1.18	$1.41	$2.10	$1.21	$1.23	$1.07	$1.02	$0.83	$0.78	$0.55	$0.11			$0.33	$0.80
Systemic Antifungal Costs	$1,632	$1,177	$872	$855	$428	$1,372	$1,230	$451	$354	$194	$254			$448	$167
Systemic Antifungal Costs/Patient Day	$0.13	$0.10	$0.07	$0.05	$0.03	$0.08	$0.07	$0.03	$0.02	$0.04	$0.06			$0.05	$0.02

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.

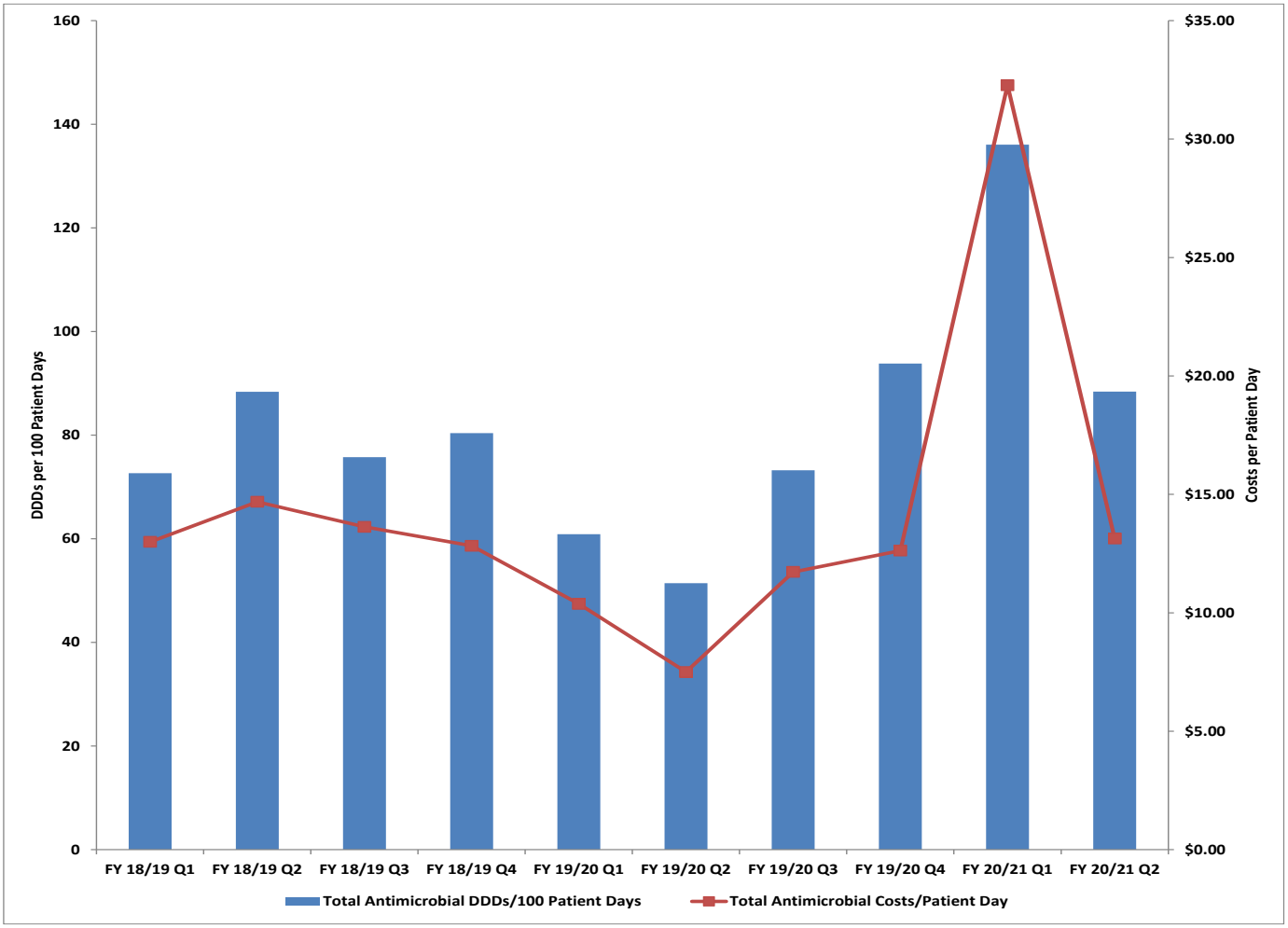
Toronto General Hospital: Cardiac ICU

The FY 20/21 Q2 summary includes:

- Antimicrobial consumption (using defined daily doses (DDDs) per 100 patient days) increased (↑) by 101.3% compared to YTD last year.
- Antimicrobial costs per patient day increased (↑) by 157.8% compared to YTD last year:
  - Antibacterial costs per patient day increased (↑) by 175.5% compared to YTD last year.
  - Antifungal costs per patient day increased (↑) by 106.3% 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.

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



Toronto General Hospital: Cardiac 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 69.9% compared to YTD last year.
- Antifungal Days of Therapy (DOT) per 100 patient days increased (↑) by 72.5% compared to YTD last year.

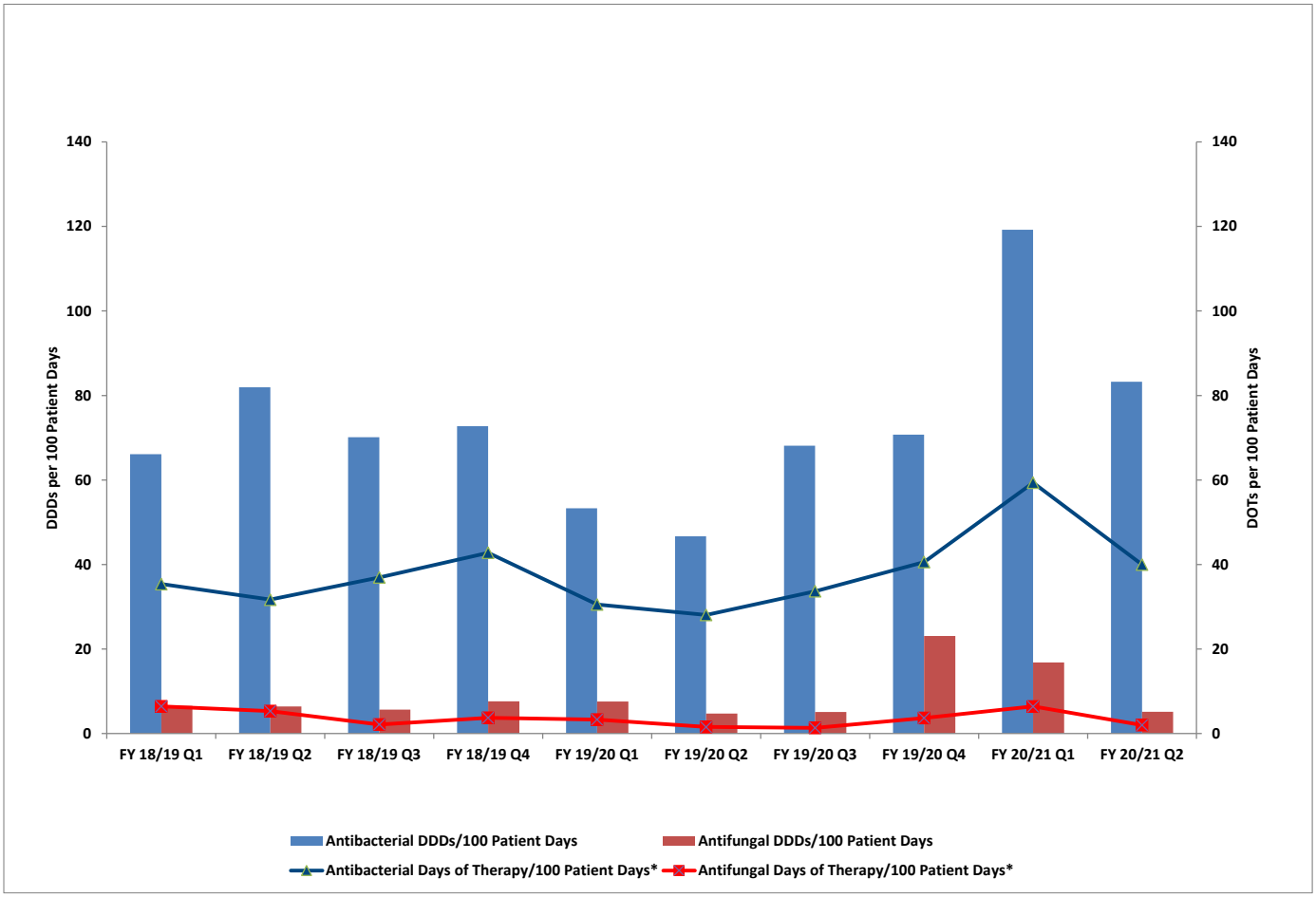
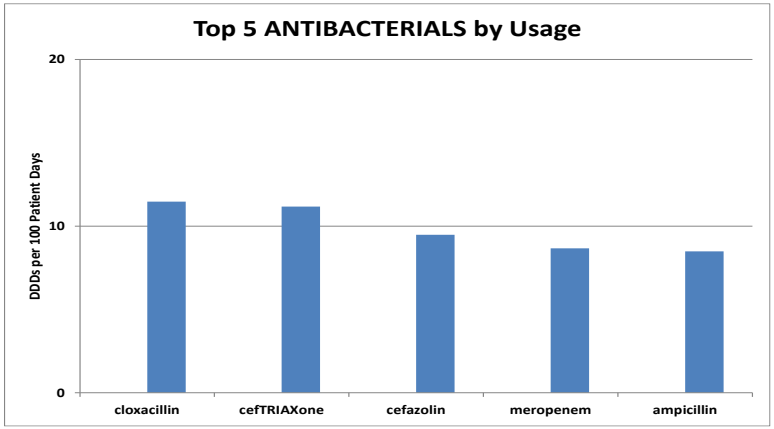


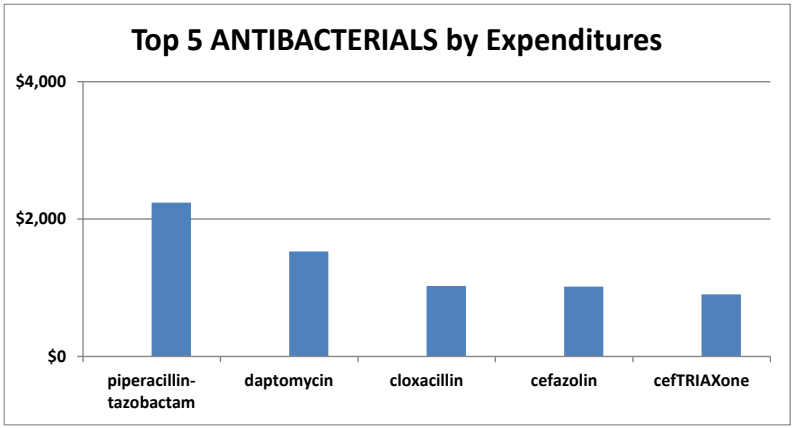
Table 6: Toronto General Hospital: Cardiac ICU

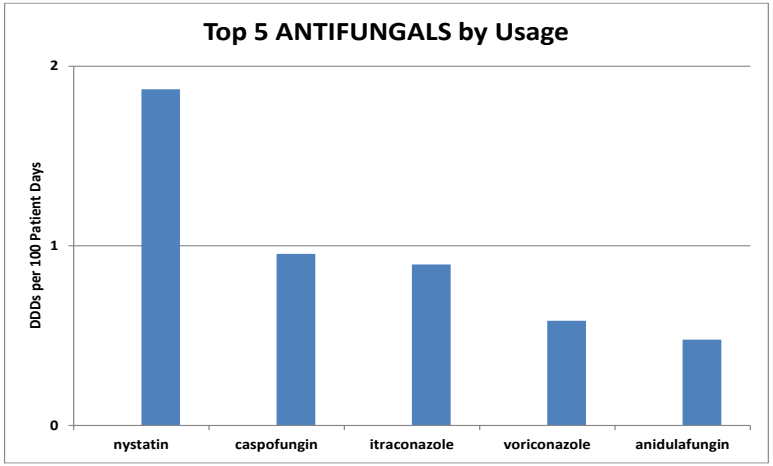
Indicators	FY 18/19 (Pre-ASP)	FY 19/20	FY 20/21 Performance					YTD of Previous Year
			Q1	Q2	Q3	Q4	YTD	
Antimicrobial Usage and Costs								
Total Antimicrobial DDDs/100 Patient Days	**79**	**70**	**136**	**88**			**113**	**56**
Systemic Antibacterial DDDs/100 Patient Days	73	60	119	83			102	50
Systemic Antifungal DDDs/100 Patient Days	7	10	17	5			11	6
Total Antimicrobial Costs	$54,453	$41,378	$29,434	$10,993			$40,427	$17,870
Total Antimicrobial Costs/Patient Day	**$13.53**	**$10.54**	**$32.27**	**$13.13**			**$23.11**	**$8.97**
Systemic Antibacterial Costs	$48,188	$33,665	$22,372	$9,793			$32,164	$13,305
Systemic Antibacterial Costs/Patient Day	$11.97	$8.57	$24.53	$11.70			$18.39	$6.68
Systemic Antifungal Costs	$6,265	$7,713	$7,063	$1,200			$8,263	$4,565
Systemic Antifungal Costs/Patient Day	$1.56	$1.96	$7.74	$1.43			$4.72	$2.29
Antibacterial Days of Therapy/100 Patient Days*	37	33	59	40			50	29
Antifungal Days of Therapy/100 Patient Days*	4	2	6	2			4	2
Patient Care Outcomes								
Hospital-Acquired C. difficile Cases (rate per 1,000 pt days)	3 (0.75)	1 (0.25)	3 (3.29)	1 (1.19)			4 (2.29)	1 (0.5)
ICU Average Length of Stay (days)	2.95	2.97	3.68	3.47			3.575	3.055
ICU Mortality Rate (as a %)	6.63	6.68	7.0	5.4			6.20	7.1
ICU Readmission Rate Within 48 Hrs (as a %)	1.92	1.7	2.7	2.9			2.8	2.9
Central Line Infection Rate (per 1000 pt days)	0.7	0.80	0.0	0.00			0.00	0.7
Ventilator-Associated Pneumonia Rate (per 1,000 pt days)	0.00	0.00	0.00	0.00			0.00	0.00
ICU Multiple Organ Dysfunction Score (MODS)	2.12	2.11	2.61	2.36			2.49	1.98
ICU Ventilator Days	819	743	322	159			481	376

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).

Table 7: TG CICU FY 20/21 Q2 Top 5 Antimicrobials by Usage (DDDs per 100 patient days) and Expenditures







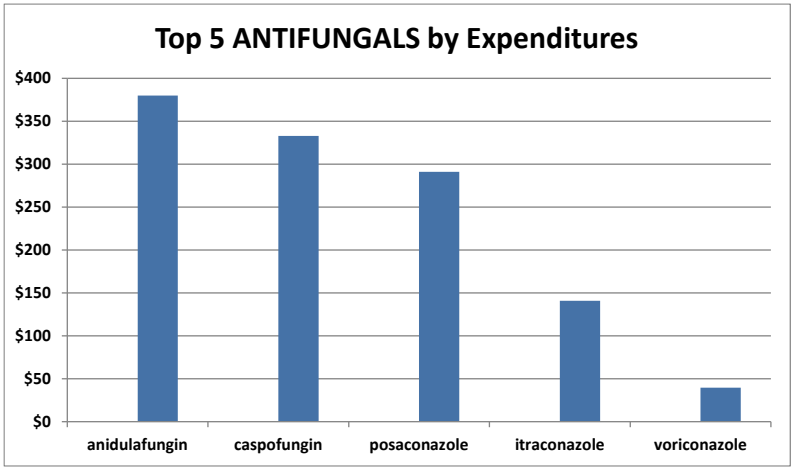
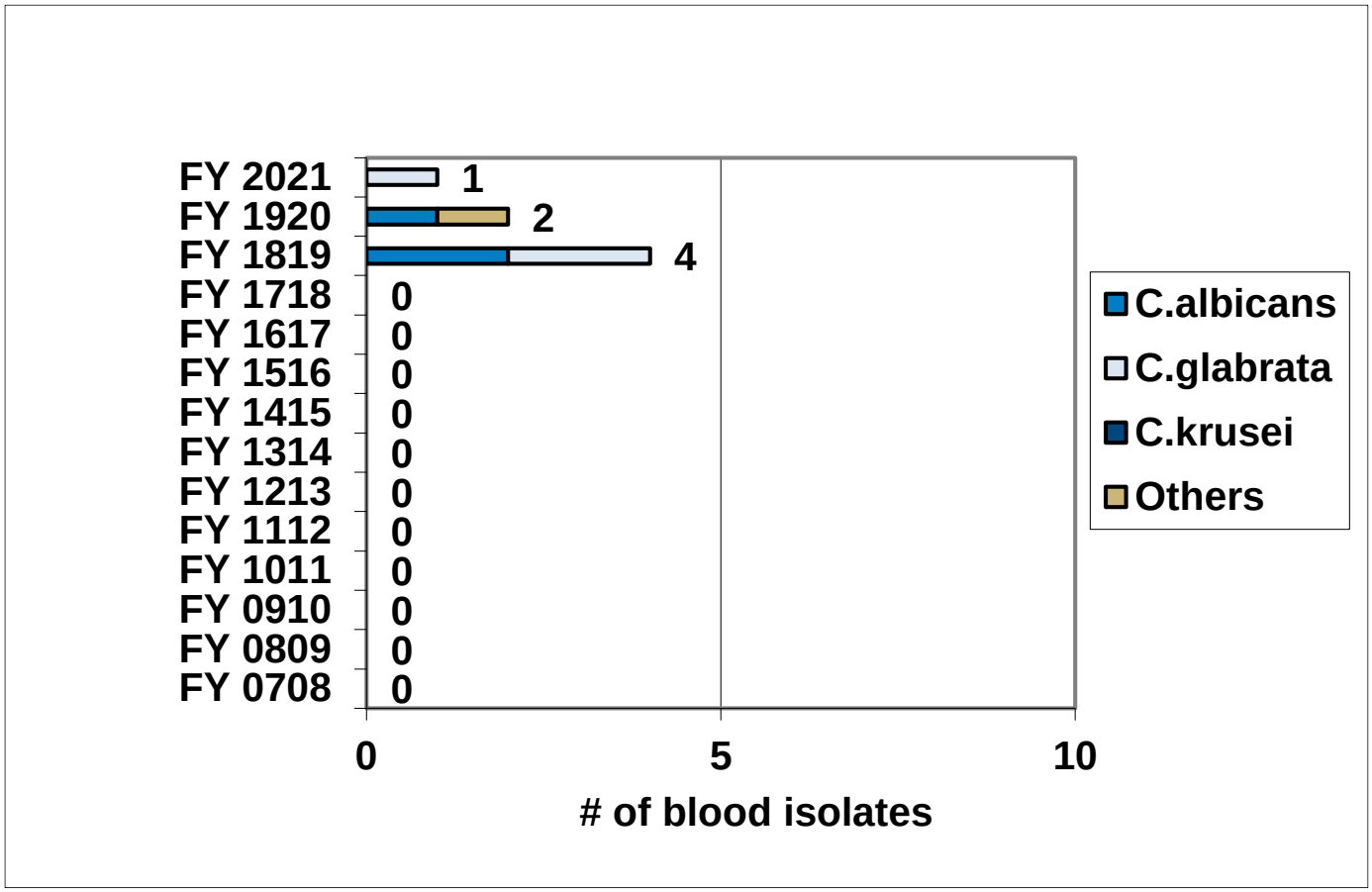
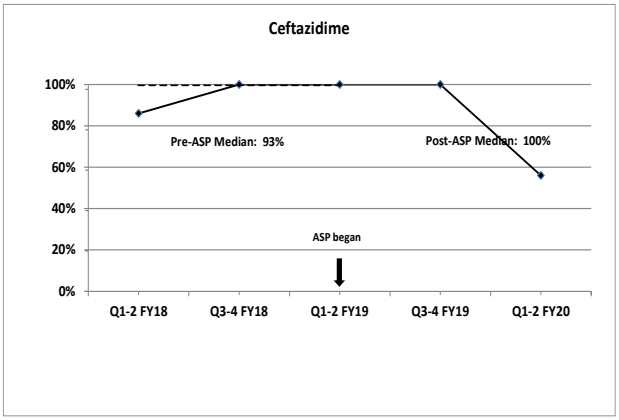


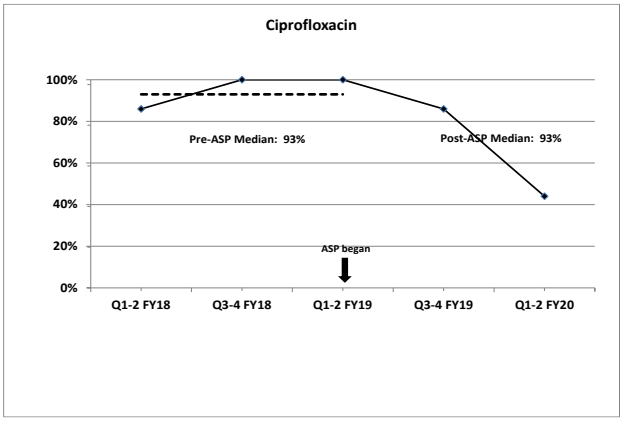
Table 8: Yeast Species Isolated in Blood – Toronto General Hospital Cardiac ICU

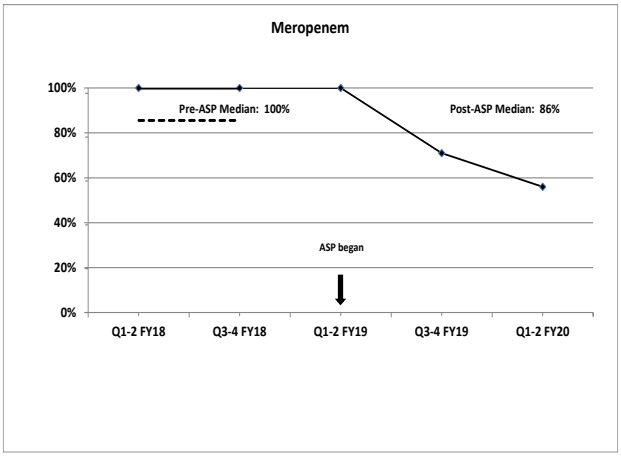


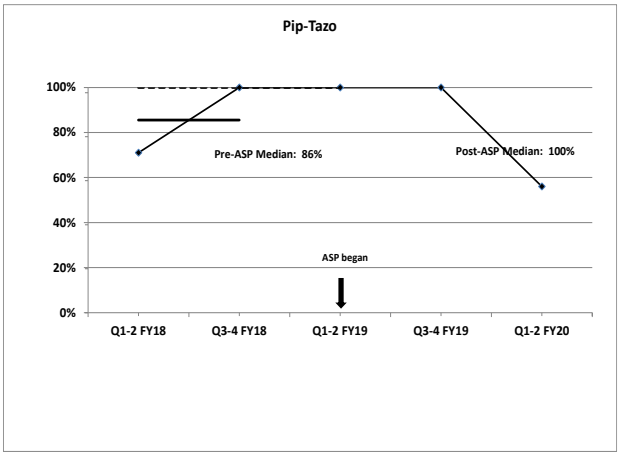
NB: In past Quarterly Reports, if a patient had more than one culture of different organisms, it was counted as 0.5 each. Starting with the Q3 2017/18 Quarterly Report and moving forward, it will be counted as 1.

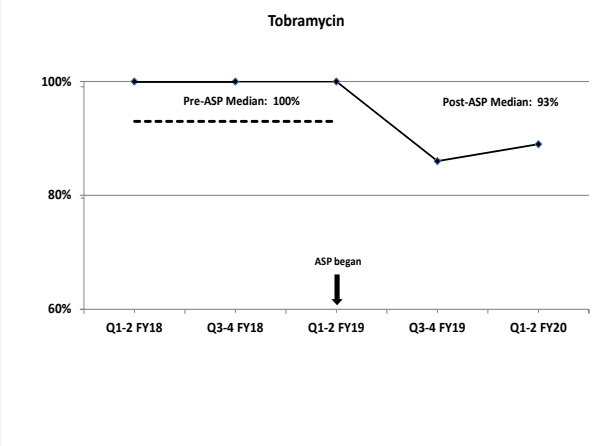
TG CICU Pseudomonas Susceptibility











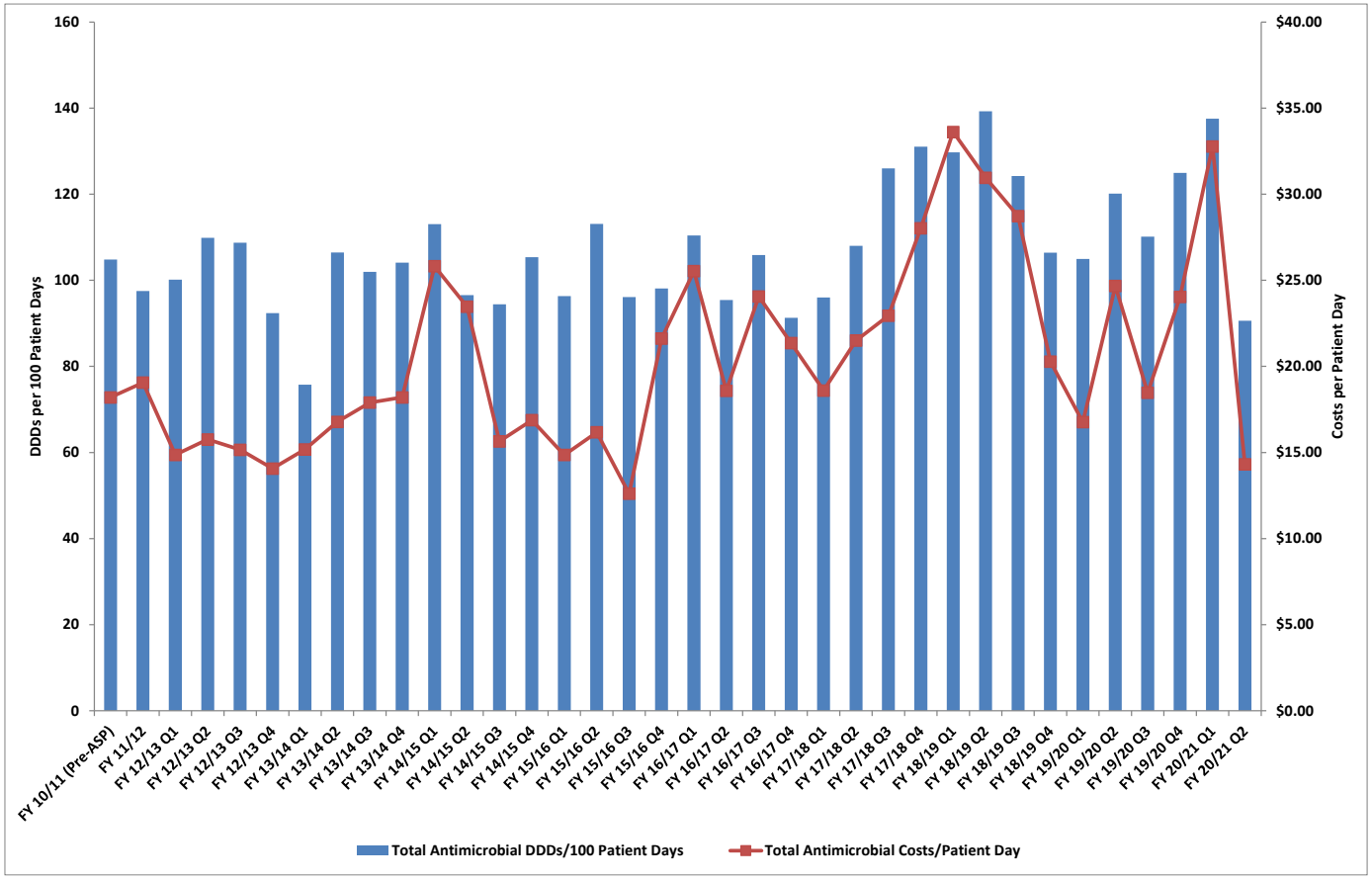
Toronto General Hospital: Cardiovascular ICU

The FY 20/21 Q2 summary includes:

- Antimicrobial consumption (using defined daily doses (DDDs) per 100 patient days) increased (↑) by 2.2% compared to YTD last year.
- Antimicrobial costs per patient day increased (↑) by 16.4% compared to YTD last year:
  - Antibacterial costs per patient day increased (↑) by 6.5% compared to YTD last year.
  - Antifungal costs per patient day increased (↑) by 34.0% 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

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 9.8% compared to YTD last year.
- Antifungal Days of Therapy (DOT) per 100 patient days increased (↑) by 13.6% compared to YTD last year.

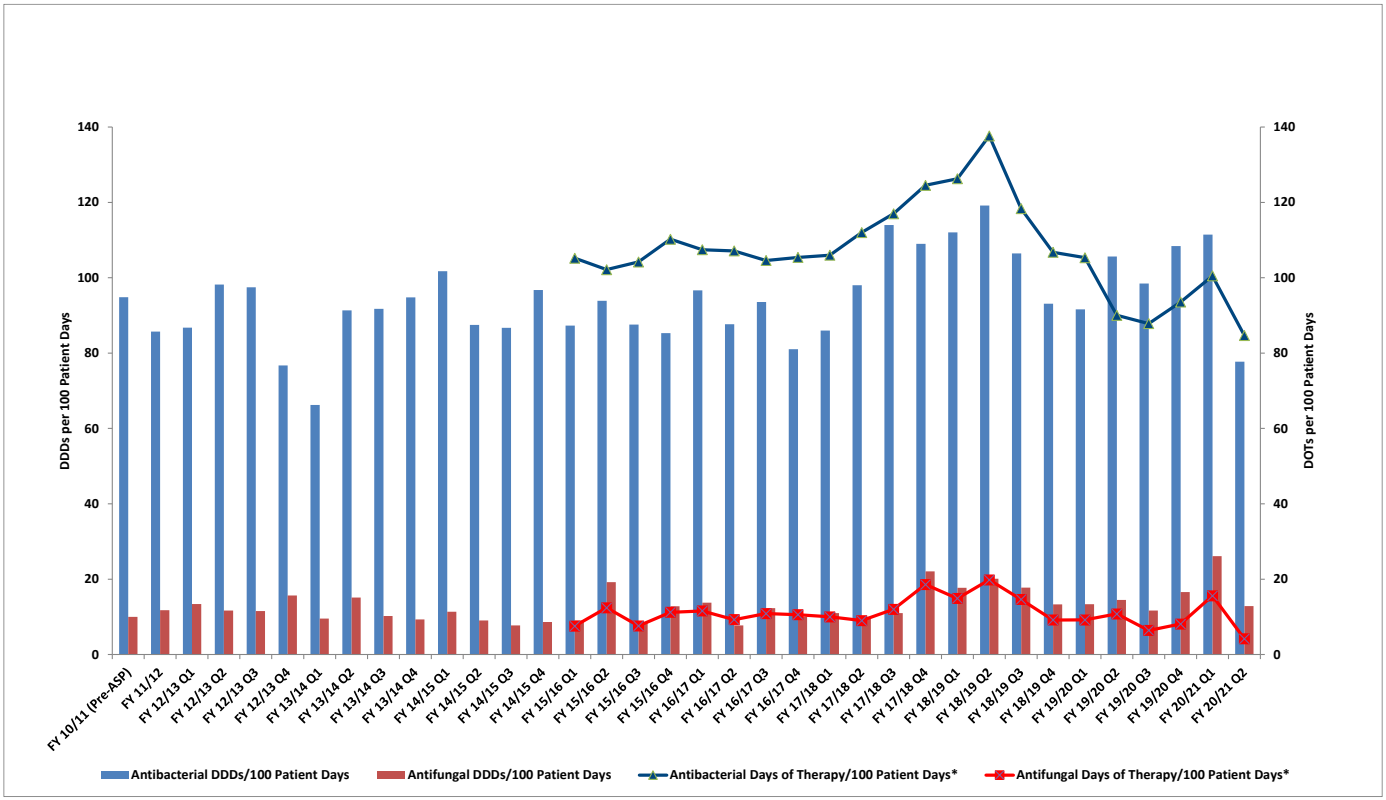


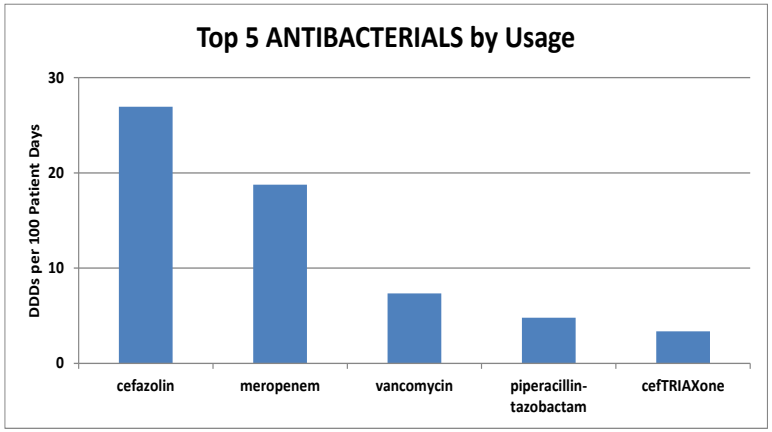
Table 9: Toronto General Hospital: Cardiovascular ICU

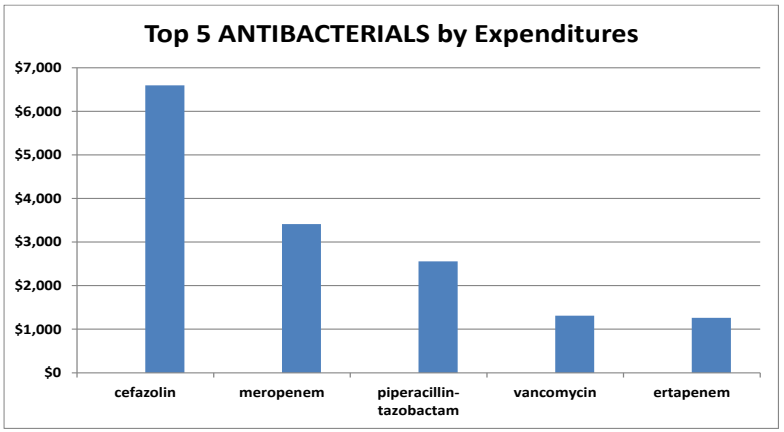
Indicators	FY 10/11 (Pre-ASP)	FY 11/12	FY 12/13	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	FY 18/19	FY 19/20	FY 20/21 Performance					YTD of Previous Year
											Q1	Q2	Q3	Q4	YTD	
Antimicrobial Usage and Costs																
Total Antimicrobial DDDs/100 Patient Days	**105**	**98**	**102**	**97**	**102**	**101**	**101**	**115**	**125**	**114**	**138**	**91**			**114**	**112**
Systemic Antibacterial DDDs/100 Patient Days	95	86	89	86	93	89	90	102	108	101	111	78			94	98
Systemic Antifungal DDDs/100 Patient Days	10	12	13	11	9	13	11	14	17	14	26	13			19	14
Total Antimicrobial Costs	$108,172	$108,464	$85,916	$100,736	$129,314	$110,716	$153,093	$160,790	$191,845	$123,093	$49,194	21749..45			$70,944	$60,751
Total Antimicrobial Costs/Patient Day	**$18.20**	**$19.06**	**$14.99**	**$17.00**	**$20.46**	**$16.34**	**$22.44**	**$22.80**	**$28.30**	**$20.70**	**$32.77**	**$14.32**			**$23.49**	**$20.18**
Systemic Antibacterial Costs	$100,375	$99,261	$74,232	$80,204	$91,366	$85,343	$96,782	$112,228	$131,651	$88,887	$24,987	$16,640			$41,627	$38,942
Systemic Antibacterial Costs/Patient Day	$16.89	$17.44	$12.95	$13.54	$14.45	$12.60	$14.19	$15.92	$19.42	$14.95	$16.65	$10.95			$13.78	$12.94
Systemic Antifungal Costs	$7,797	$9,204	$11,684	$20,532	$37,948	$25,373	$56,311	$48,562	$60,194	$34,207	$24,207	$5,109			$29,316	$21,809
Systemic Antifungal Costs/Patient Day	$1.31	$1.62	$2.04	$3.47	$6.00	$3.75	$8.26	$6.89	$8.88	$5.75	$16.13	$3.36			$9.71	$7.25
Antibacterial Days of Therapy/100 Patient Days*	n/a	n/a	n/a	n/a	129	105	106	115	122	87	100	85			92	84
Antifungal Days of Therapy/100 Patient Days*	n/a	n/a	n/a	n/a	28	10	11	13	15	8	16	4			10	9
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)	4 (0.59)	1 (0.17)	2 (1.33)	0 (0)			2 (0.66)	1 (0.33)
ICU Average Length of Stay (days)	3.12	2.95	2.97	3.20	3.46	3.45	3.48	3.22	3.55	3.13	4.24	2.76			3.5	3.16
ICU Mortality Rate (as a %)	3.5	3.0	3.0	4.6	4.6	4.0	3.7	4.3	2.80	3.50	8.7	2.4			5.50	2.8
ICU Readmission Rate Within 48 Hrs (as a %)	1.6	2.2	1.8	2.2	2.4	1.6	2.0	2.0	1.6	2.0	3.3	1.4			2.3	1.6
Central Line Infection Rate (per 1000 pt days)	0.73	0.17	0.34	0.16	0.15	0.53	0.84	2.41	0.70	0.60	0.0	0.00			0.00	0.6
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	3.10	2.16	0	0.00			0.00	1.17
ICU Multiple Organ Dysfunction Score (MODS)	6.22	6.07	5.51	5.77	5.60	5.83	6.04	5.44	3.99	3.91	4.11	3.36			3.74	4.14
ICU Ventilator Days	3015	3571	3676	4049	3925	4239	4917	4555	3906	3405	825	689			1514	1859

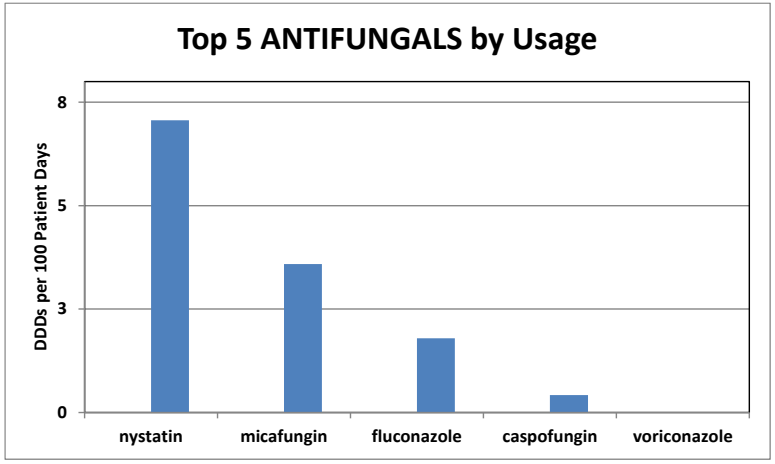
Total Antimicrobial DDDs is the sum of systemic antibacterial DDDs + systemic antifungal DDDs; non-systemic antimicrobials and antivirals are excluded.
Data Sources: Antimicrobial DDD and Costs (Centricity). *An error in DDD calculation for Pip-tazo was detected in Q3 2013; all historical data prior 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 10: TG CVICU FY 20/21 Q2 Top 5 Antimicrobials by Usage (DDDs per 100 patient days) and Expenditures







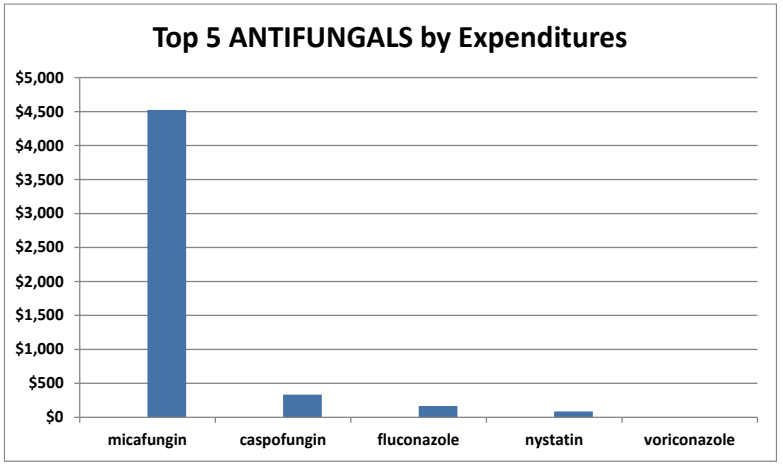


Table 11: Daptomycin Use – Toronto General Hospital Cardiovascular ICU

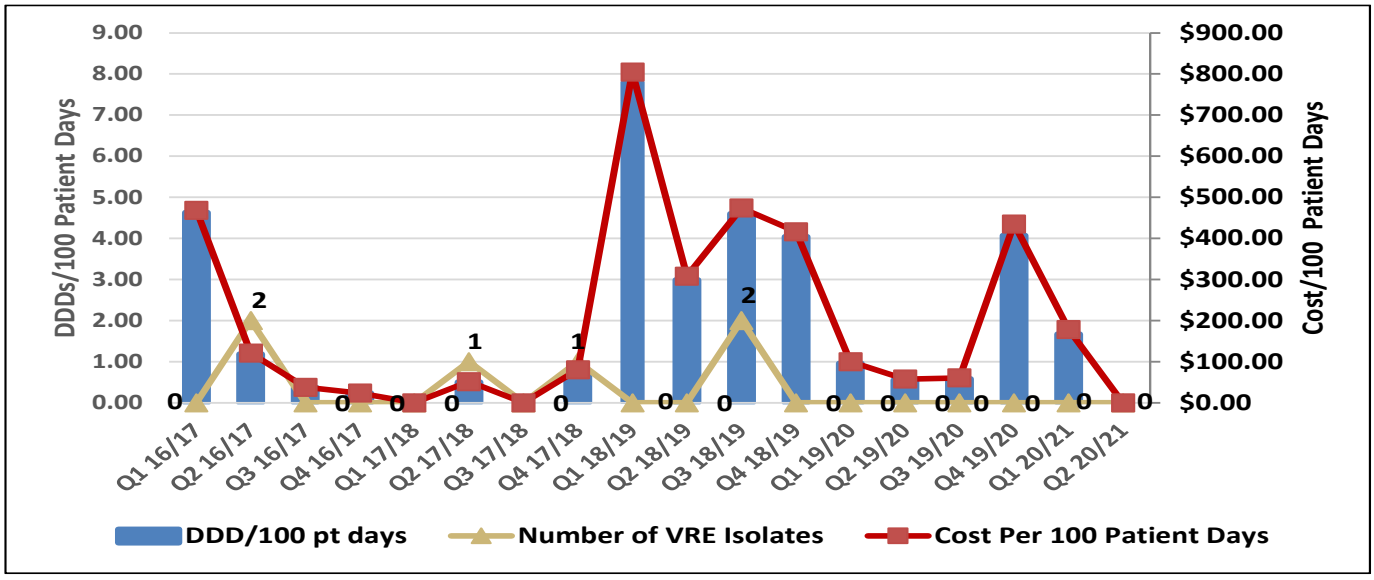
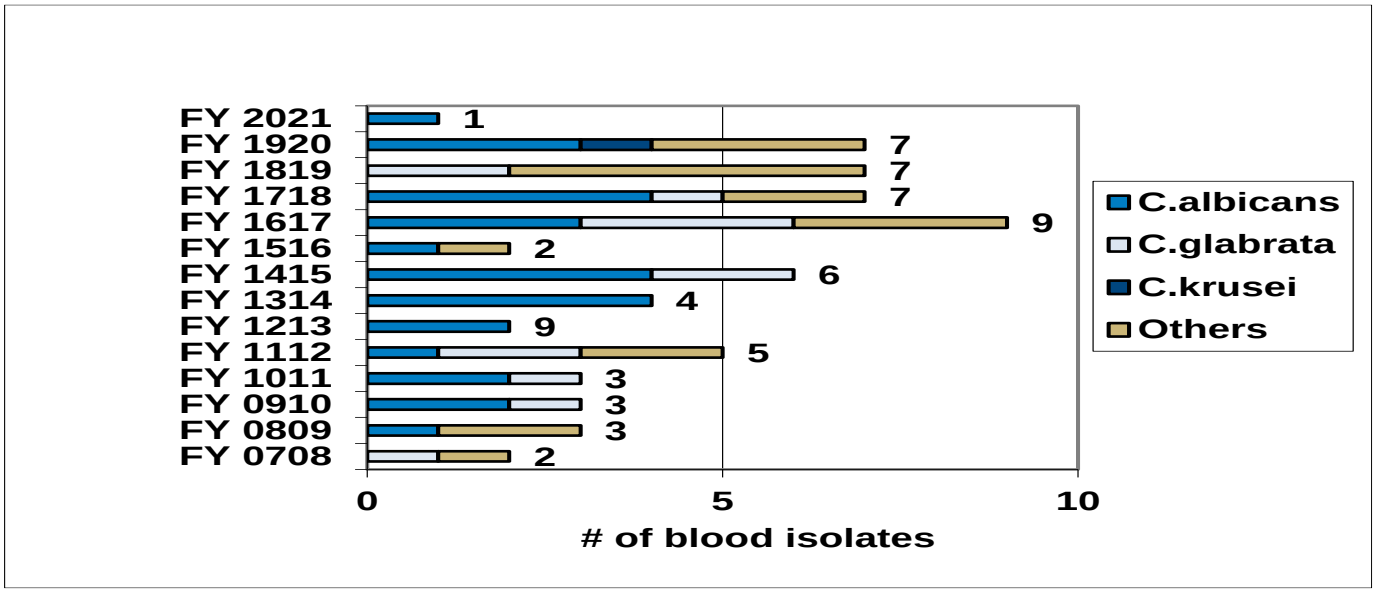


Table 12: Yeast Species Isolated in Blood – Toronto General Hospital Cardiovascular ICU



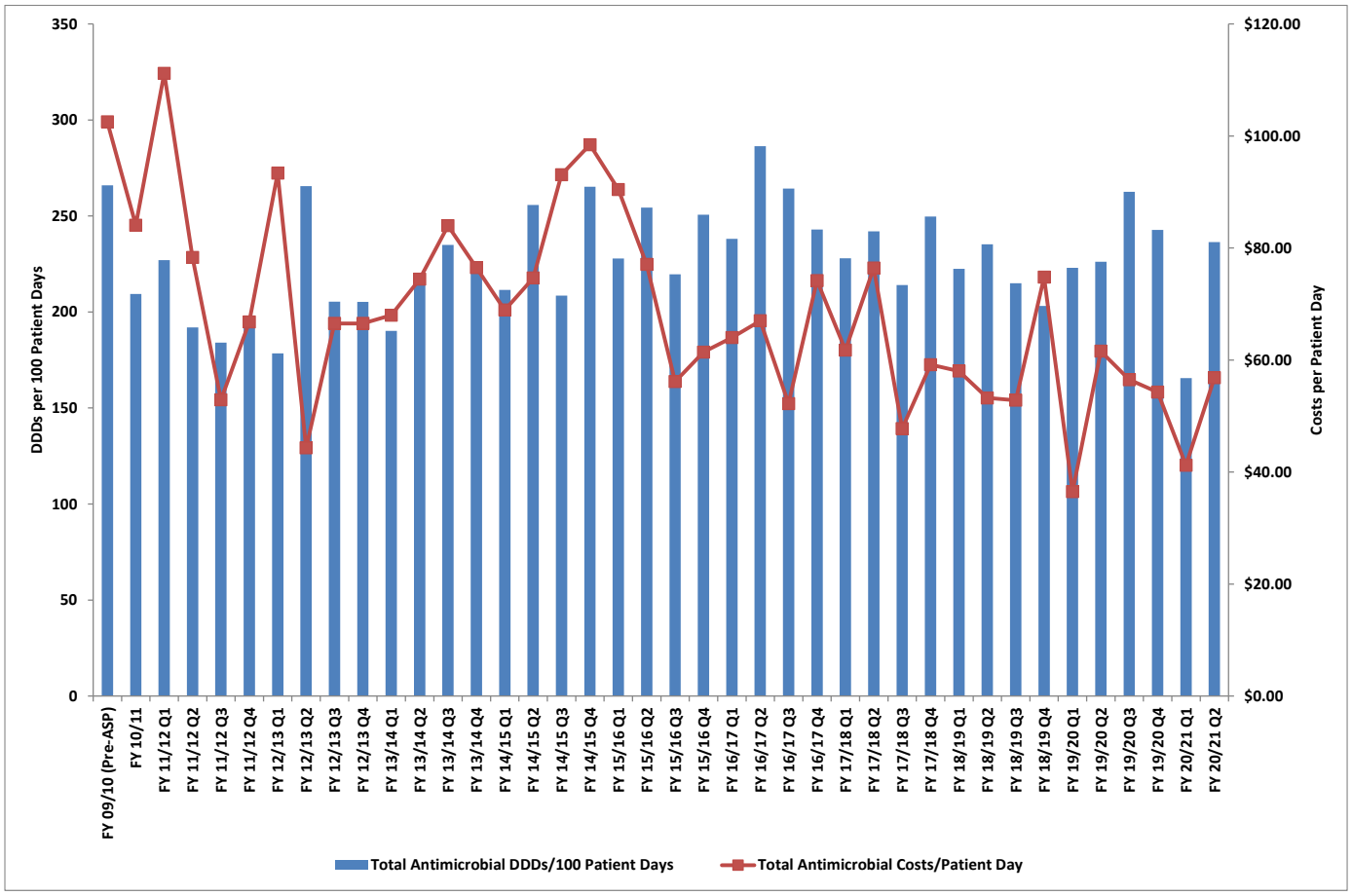
NB: In past Quarterly Reports, if a patient had more than one culture of different organisms, it was counted as 0.5 each. Starting with the Q3 2017/18 Quarterly Report and moving forward, it will be counted as 1.

Toronto General Hospital: Medical Surgical ICU

The FY 20/21 Q2 summary includes:

- Antimicrobial consumption (using defined daily doses (DDDs) per 100 patient days) decreased (↓) by 10.4% compared to YTD last year.
- Antimicrobial costs per patient day increased (↑) by 0.3% compared to YTD last year:
  - Antibacterial costs per patient day increased (↑) by 25.2% compared to YTD last year.
  - Antifungal costs per patient day decreased (↓) by 28.0% compared to YTD last year.

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



To view **Appendix 1: FY 20/21 Q2 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 decreased (↓) by 14.1% compared to YTD last year.
- Antifungal Days of Therapy (DOT) per 100 patient days decreased (↓) by 45.8% compared to YTD last year.

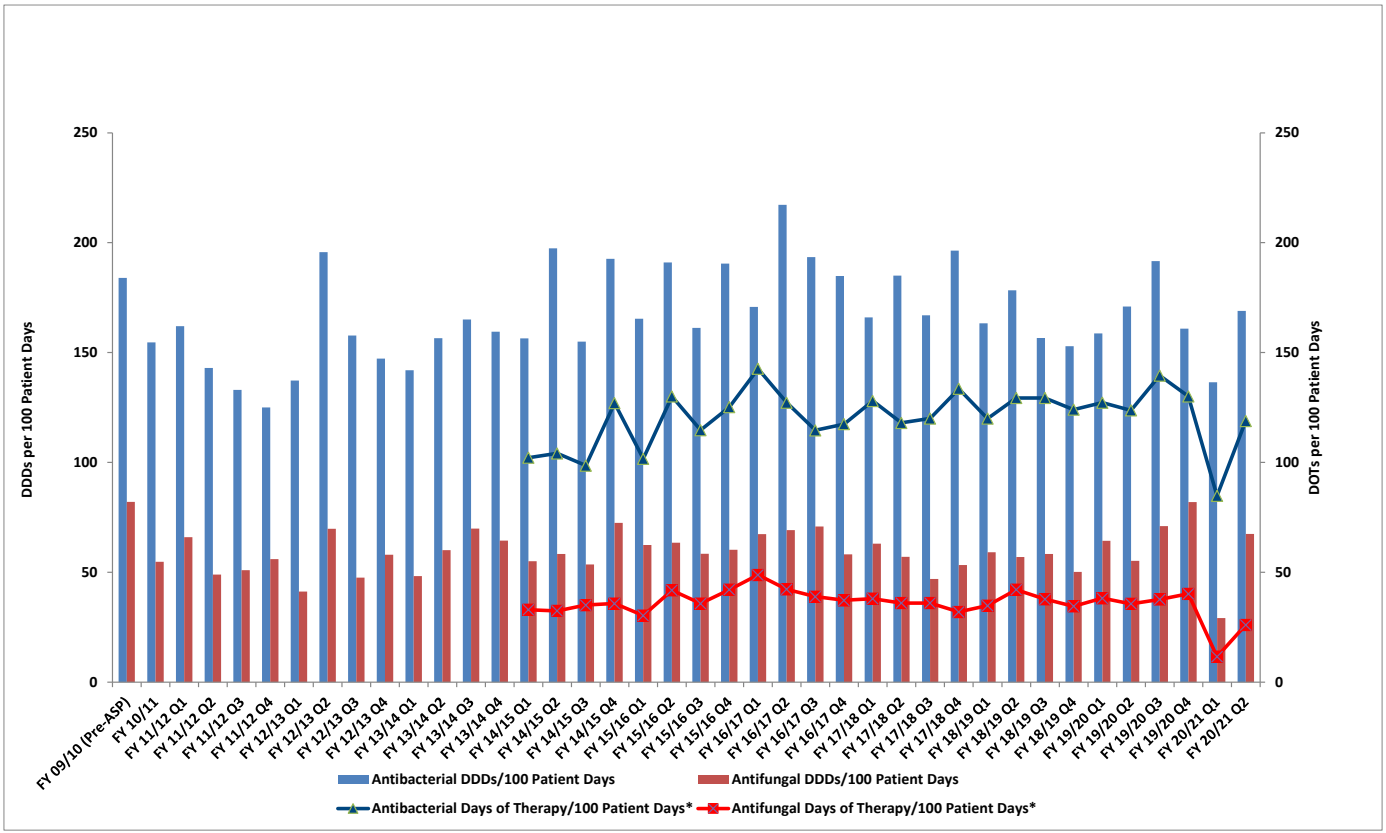


Table 13: Toronto General Hospital: Medical Surgical ICU

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	FY 19/20	FY 20/21 Performance Q1	Q2	Q3	Q4	YTD	YTD of Previous Year
Antimicrobial Usage and Costs																	
Total Antimicrobial DDDs/100 Patient Days	**266**	**209**	**199**	**213**	**217**	**235**	**239**	**258**	**234**	**219**	**239**	**166**	**236**			**201**	**225**
Systemic Antibacterial DDDs/100 Patient Days	184	155	143	159	156	175	178	191	179	163	171	136	169			153	165
Systemic Antifungal DDDs/100 Patient Days	82	55	55	54	61	60	84	66	55	56	68	29	67			48	60
Total Antimicrobial Costs	$701,451	$629,472	$567,532	$473,613	$584,018	$686,577	$587,950	$557,091	$521,004	$586,604	$523,646	$97,150	$136,440			$233,590	$242,569
Total Antimicrobial Costs/Patient Day	**$102.52**	**$84.06**	**$76.93**	**$63.75**	**$75.71**	**$83.65**	**$71.06**	**$64.53**	**$61.18**	**$59.83**	**$52.21**	**$41.22**	**$56.83**			**$49.09**	**$48.94**
Systemic Antibacterial Costs	$390,209	$375,436	$292,355	$231,171	$225,557	$293,126	$254,392	$267,107	$259,216	$278,131	$270,654	$57,065	$98,020			$155,085	$129,013
Systemic Antibacterial Costs/Patient Day	$57.03	$50.14	$39.63	$31.12	$29.24	$35.71	$30.75	$30.94	$30.44	$28.37	$26.98	$24.21	$40.82			$32.59	$26.03
Systemic Antifungal Costs	$311,242	$254,036	$275,176	$242,443	$358,461	$393,451	$333,559	$289,984	$261,788	$308,473	$252,992	$40,085	$38,420			$78,505	$113,556
Systemic Antifungal Costs/Patient Day	$45.49	$33.93	$37.30	$32.63	$46.47	$47.94	$40.31	$33.59	$30.74	$31.46	$25.22	$17.01	$16.00			$16.50	$22.91
Antibacterial Days of Therapy/100 Patient Days*	n/a	n/a	n/a	n/a	n/a	107.9	118.3	126	125	126	127	85	119			102	119
Antifungal Days of Therapy/100 Patient Days*	n/a	n/a	n/a	n/a	n/a	34.1	37.7	42	35	37	37	12	26			19	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)	14 (1.43)	8 (0.8)	5 (2.12)	4 (1.67)			9 (1.89)	4 (0.81)
ICU Average Length of Stay (days)	8.24	8.61	8.85	7.79	8.22	8.08	7.62	7.94	7.10	8.01	8.41	9.01	7.35			8.18	8.20
ICU Mortality Rate (as a %)	16.2	15.7	16.3	16.0	17.8	17.2	17.2	16.8	15.7	16.30	15.34	18.7	17.9			18.30	11.8
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	3.40	3.02	6.5	3.5			5.00	2.5
ICU Ventilator Days	5399	6256	6507	6458	24620	7330	7048	7657	7670	8305	8203	2060	1451			3511	1940
Apache II Score	n/a	n/a	16.1	15.8	15.9	15.1	15.4	16.7	16.9	16.60	15.43					0.00	
ICU Multiple Organ Dysfunction Score (MODS)										5.83	5.83	6.61	5.58			6.10	5.81

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: Daptomycin Use – Toronto General Hospital: Medical Surgical ICU

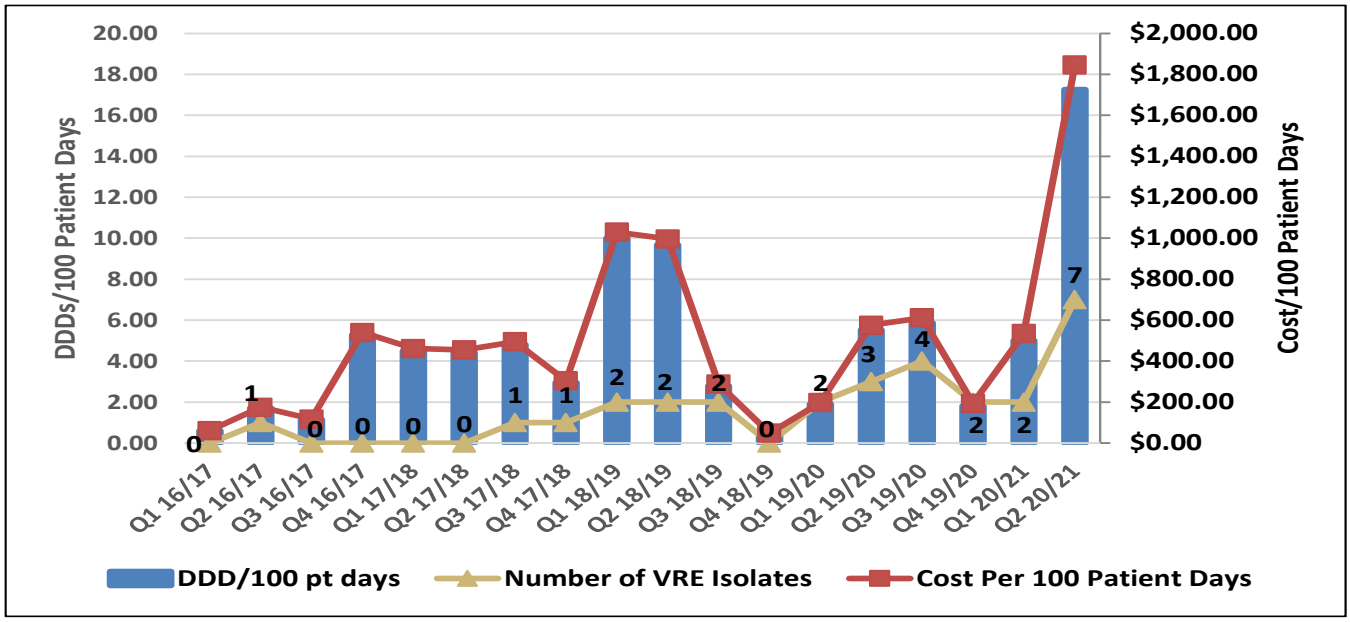
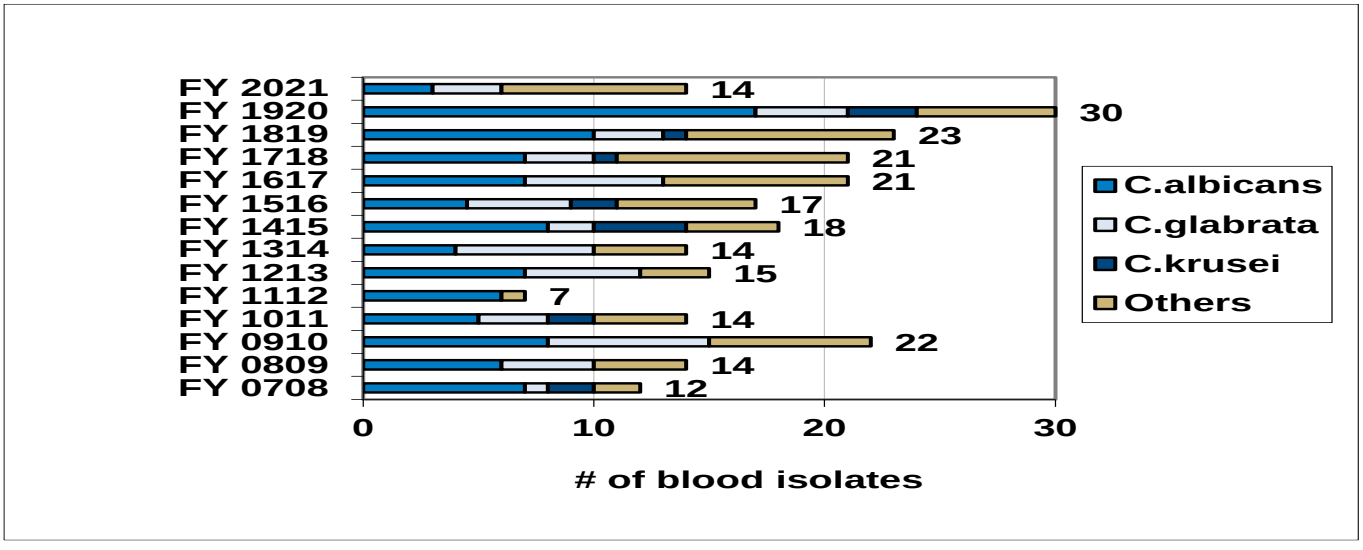
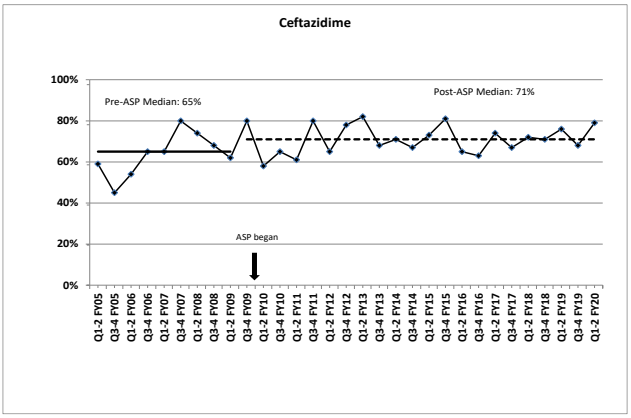


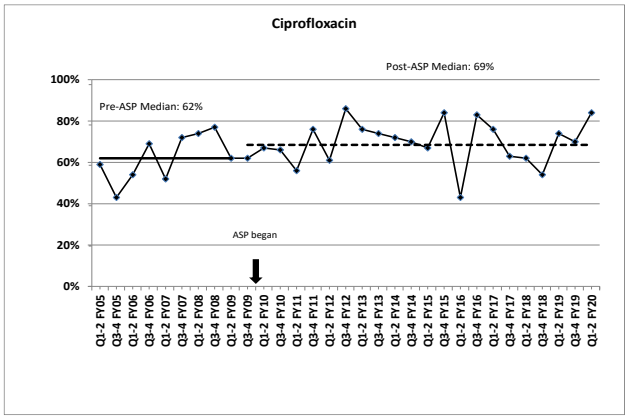
Table 15: Yeast Species Isolated in Blood – Toronto General Hospital: Medical Surgical ICU

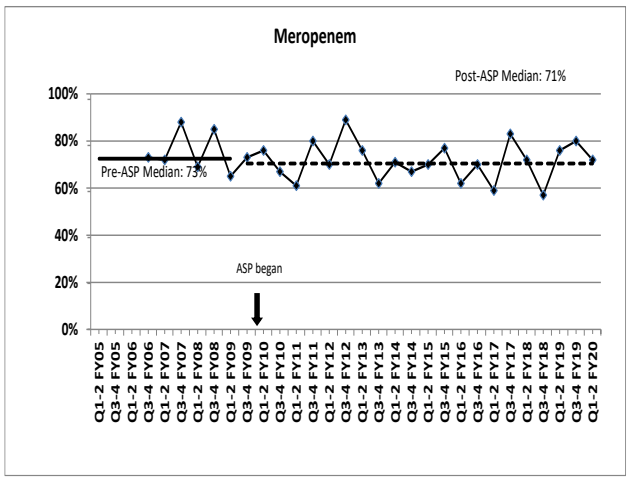


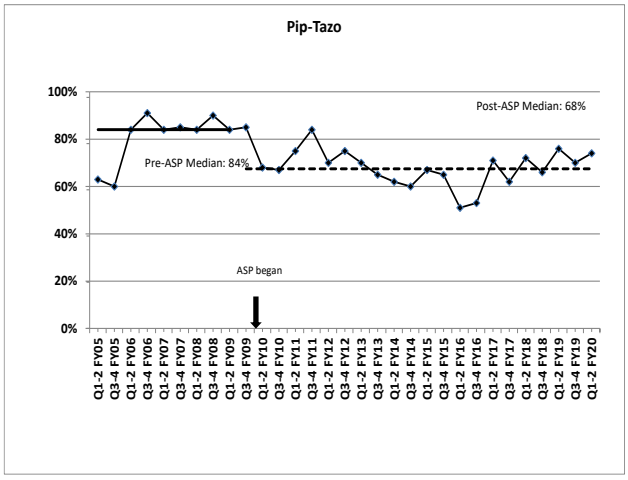
NB: In past Quarterly Reports, if a patient had more than one culture of different organisms, it was counted as 0.5 each. Starting with the Q3 2017/18 Quarterly Report and moving forward, it will be counted as 1.

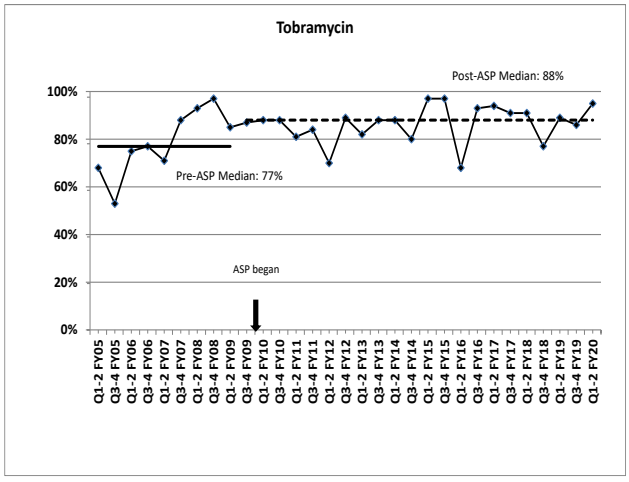
TG MSICU Pseudomonas Susceptibility











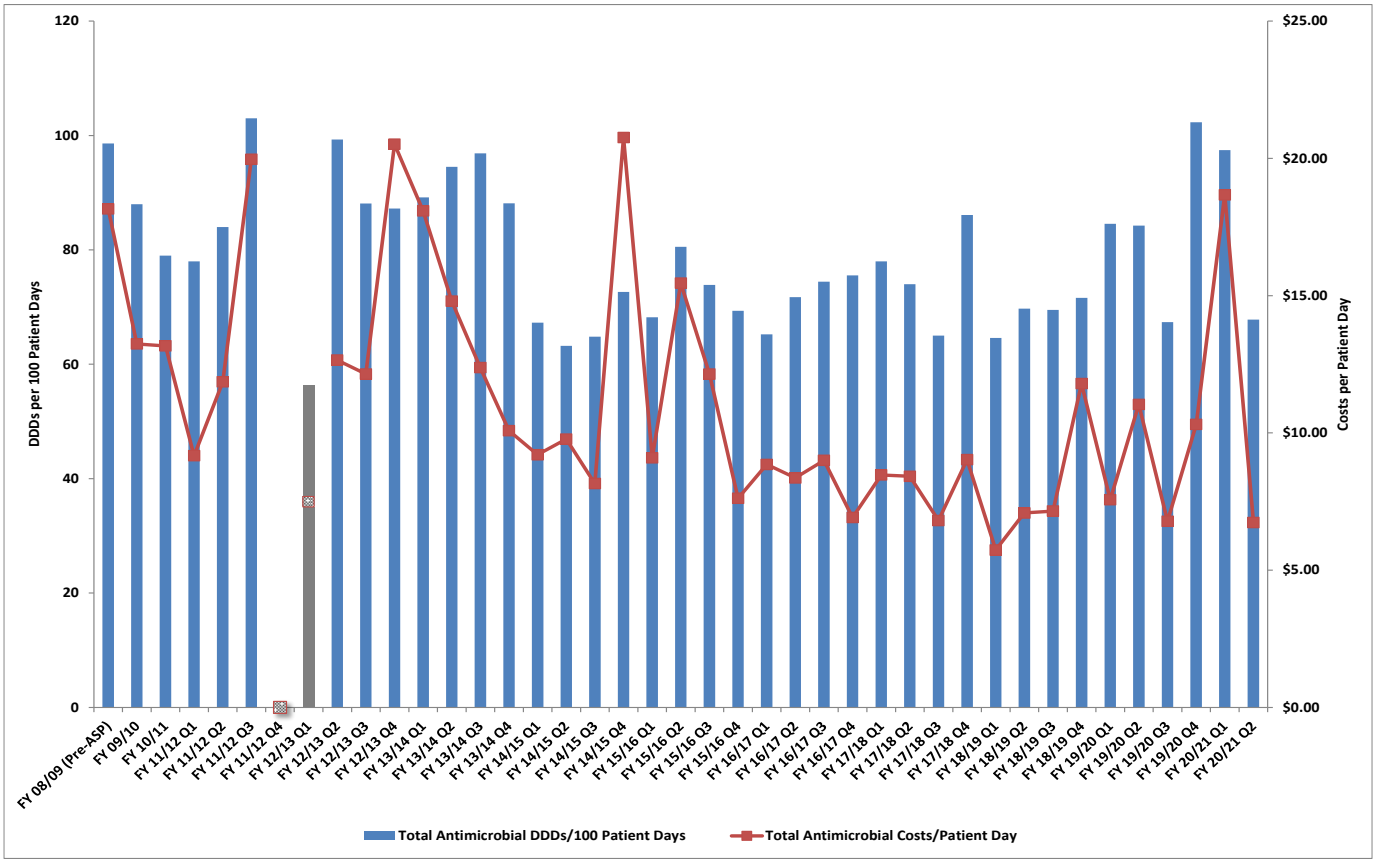
Toronto Western Hospital: Medical, Surgical, and Neurosurgical ICU

The FY 20/21 Q2 summary includes:

- Antimicrobial consumption (using defined daily doses (DDDs) per 100 patient days) decreased (↓) by 2.3% compared to YTD last year.
- Antimicrobial costs per patient day increased (↑) by 37.1% compared to YTD last year:
  - Antibacterial costs per patient day increased (↑) by 3.8% compared to YTD last year.
  - Antifungal costs per patient day increased (↑) by 266.9% compared to YTD last year.

  NB: TW cost data is nearly entirely driven by increases in ICU fungemia cases in Q1.

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

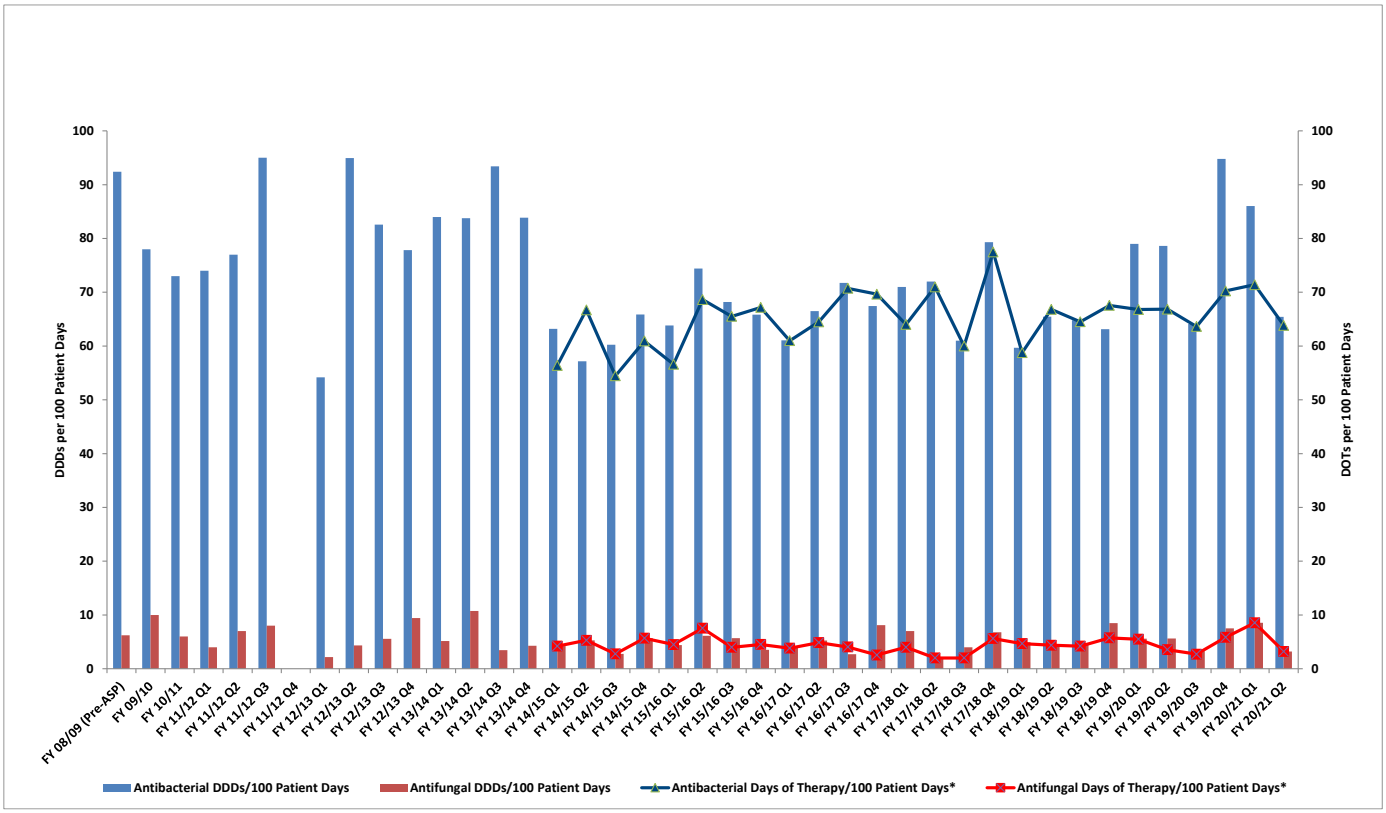


Due to an error in the Centricity Pharmacy database, we are not able to provide accurate DDD data and utilization cost for the Toronto Western Hospital ICU for FY 11/12 Q4. This also affected the recovery in FY 12/13 Q1 so neither quarter is reflected in the above graph.

To view **Appendix 1: FY 20/21 Q2 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 increased (↑) by 7.0% compared to YTD last year.
- Antifungal Days of Therapy (DOT) per 100 patient days increased (↑) by 36.4% 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.

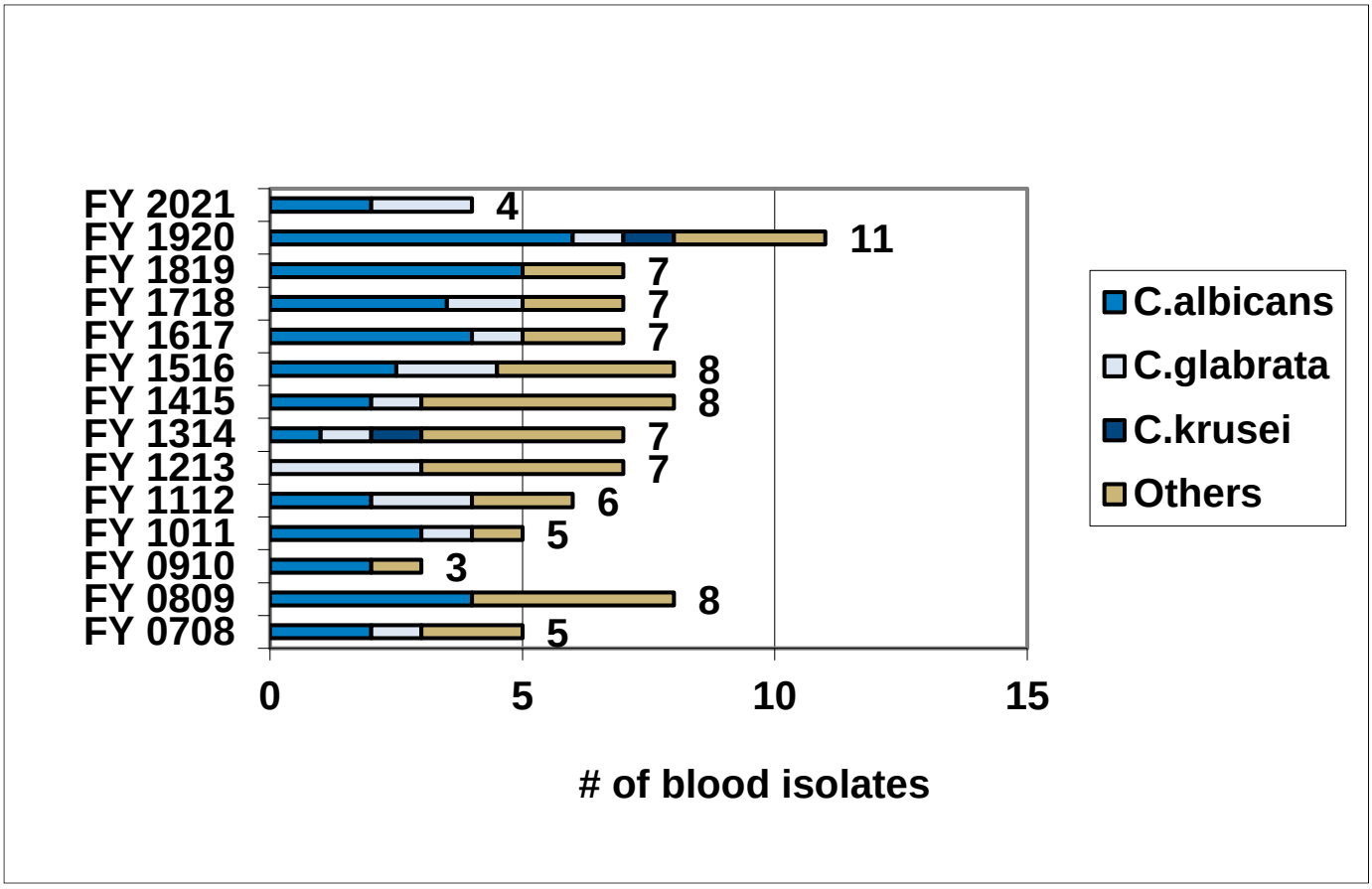
Table 16: Toronto Western Hospital: Medical, Surgical, and Neurosurgical ICU

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	FY 18/19	FY 19/20	FY20/21 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**	**69**	**85**	**97**	**68**			**82**	**84**
Systemic Antibacterial DDDs/100 Patient Days	92	78	73	77	78	86	62	68	67	71	63	79	86	65			76	79
Systemic Antifungal DDDs/100 Patient Days	6	10	6	6	5	6	5	9	5	5	6	5	11	2			7	6
Total Antimicrobial Costs	$136,758	$100,408	$101,191	$105,899	$102,978	$120,538	$138,014	$127,293	$98,672	$93,958	$93,848	$102,868	$53,800	$19,840			$73,639	$52,201
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**	**$7.94**	**$8.88**	**$18.67**	**$6.74**			**$12.64**	**$9.22**
Systemic Antibacterial Costs	$123,314	$87,445	$79,280	$89,784	$70,099	$85,916	$89,382	$74,877	$69,868	$73,007	$64,386	$89,646	$30,297	$18,399			$48,697	$45,595
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	$5.45	$7.74	$10.52	$6.25			$8.36	$8.05
Systemic Antifungal Costs	$13,444	$12,963	$21,911	$16,115	$32,879	$34,623	$48,631	$52,416	$28,805	$20,951	$29,462	$13,223	$23,502	$1,440			$24,943	$6,606
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	$2.49	$1.14	$8.16	$0.49			$4.28	$1.17
Antibacterial Days of Therapy/100 Patient Days*	n/a	n/a	n/a	n/a	n/a	n/a	60	65	67	68	64	65	71	64			68	63
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	9	3			6	4
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)	20 (1.69)	11 (0.95)	2 (0.69)	10 (3.4)			12 (2.06)	2 (0.35)
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	8.405	8.4	14.78	8.0			11.4	8.35
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	13.6	15.6	15.8	15.8			15.8	16.3
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	2.37	1.6	3.18	1.01			2.1	1.19
ICU Ventilator Days	4617	6305	5960	5578	4947	5523	5180	5414	4937	4755	4484	4457.0	1508	1408			2916.0	2052
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							
ICU Multiple Organ Dysfunction Score (MODS)											3.26	3.91	4.17	4.08			4.13	3.57

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.

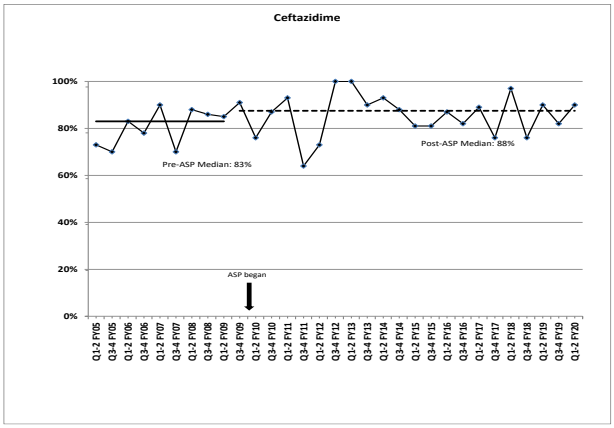
There was a calculation error for the ICU Readmission Rate for FY 16/17 Q3. That figure has now been corrected.

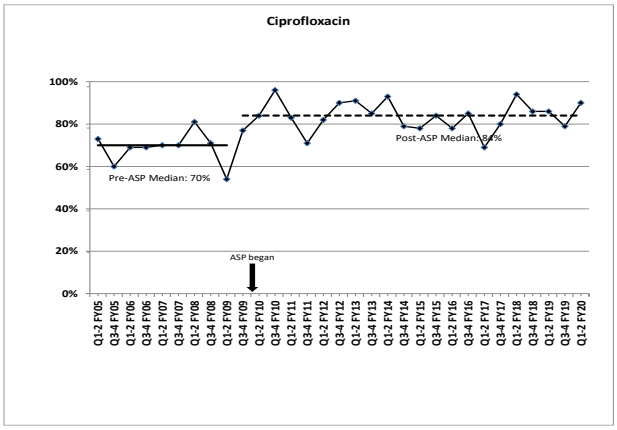
Table 17: Yeast Species Isolated in Blood – Toronto Western Hospital: Medical, Surgical, and Neurosurgical ICU

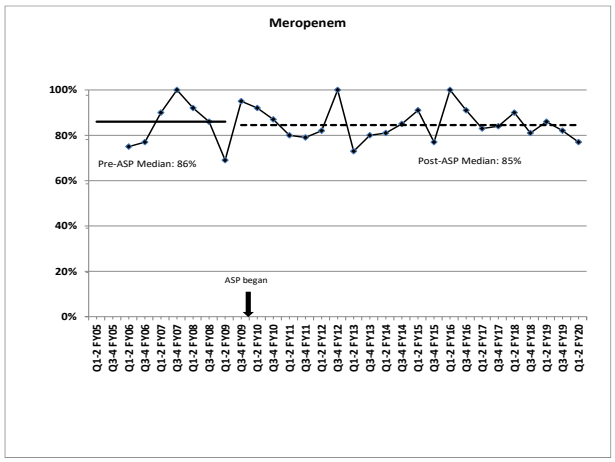


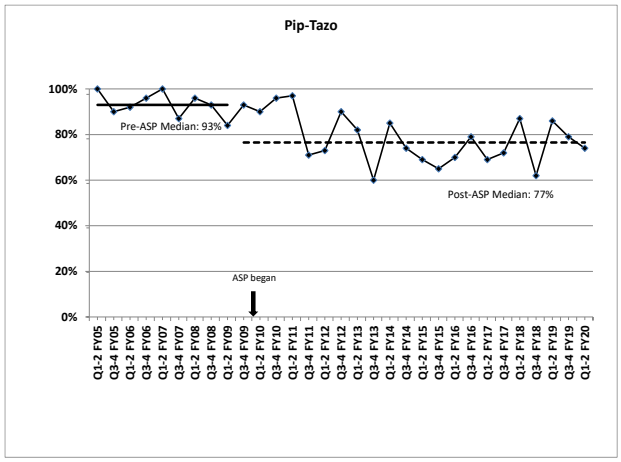
NB: In past Quarterly Reports, if a patient had more than one culture of different organisms, it was counted as 0.5 each. Starting with the Q3 2017/18 Quarterly Report and moving forward, it will be counted as 1.

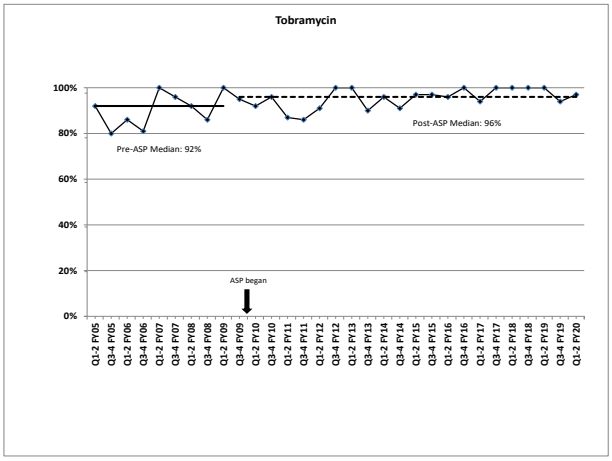
TW MSNICU Pseudomonas Susceptibility











GENERAL INTERNAL MEDICINE

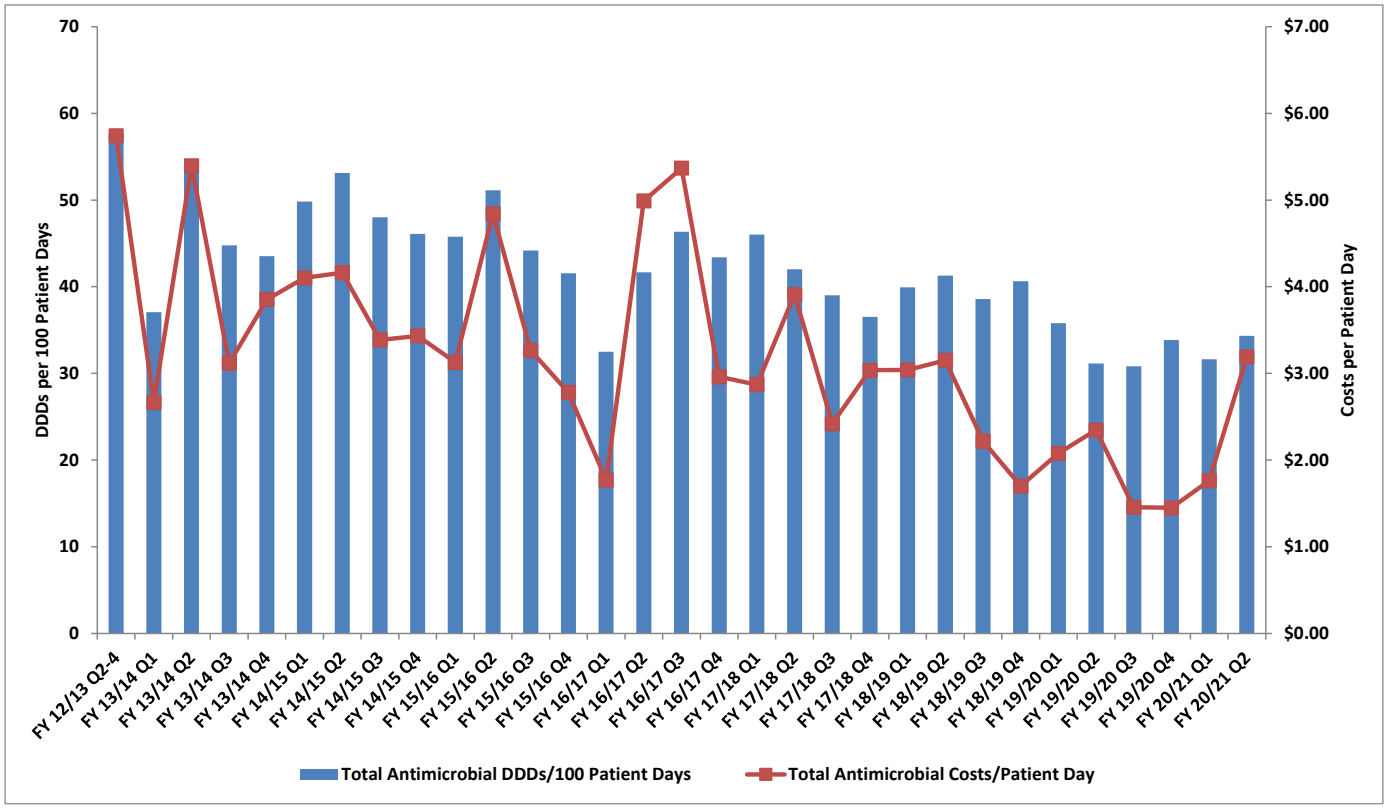
Mount Sinai Hospital: General Internal Medicine

The FY 20/21 Q2 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 increased (↑) by 14.0% compared to YTD last year:
  - Antibacterial costs per patient day increased (↑) by 5.9% compared to YTD last year.
  - Antifungal costs per patient day increased (↑) by 75.0% compared to YTD last year.

  NB: Usage data calculated for patients admitted by admission to GIM medical service at MSH. MSH usage data is nearly entirely driven by increases in a single patient for meropenem in Q2.

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



To view **Appendix 2: General Internal Medicine FY 20/21 Q2 Top 5 Antimicrobials by Usage (DDDs per 100 patient days) and Expenditures**, please click **here**.

Table 18: 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	FY 19/20	FY 20/21 Performance Q1	Q2	Q3	Q4	YTD	YTD of Previous Year
Antimicrobial Usage and Costs														
Total Antimicrobial DDDs/100 Patient Days	**58**	**45**	**48**	**43**	**41**	**41**	**40**	**33**	**32**	**34**			**33**	**33**
Systemic Antibacterial DDDs/100 Patient Days	53	41	43	39	37	37	36	30	28	33			31	30
Systemic Antifungal DDDs/100 Patient Days	3	3	3	3	3	3	3	2	3	2			2	2
Total Antimicrobial Costs	$125,012	$123,737	$128,661	$106,518	$126,283	$105,254	$88,219	$78,788	$15,146	$31,235			$46,382	$47,316
Total Antimicrobial Costs/Patient Day	**$5.74**	**$3.76**	**$3.63**	**$2.92**	**$3.69**	**$3.04**	**$2.35**	**$1.83**	**$1.76**	**$3.19**			**$2.52**	**$2.21**
Systemic Antibacterial Costs	$105,621	$99,731	$104,822	$84,173	$78,418	$81,436	$76,628	$66,233	$12,650	$22,802			$35,452	$38,931
Systemic Antibacterial Costs/Patient Day	$4.85	$3.03	$2.96	$2.31	$2.29	$2.35	$2.04	$1.54	$1.47	$2.33			$1.93	$1.82
Systemic Antifungal Costs	$15,422	$20,153	$16,352	$15,983	$42,012	$17,644	$6,476	$8,187	$1,843	$7,945			$9,788	$6,503
Systemic Antifungal Costs/Patient Day	$0.71	$0.61	$0.46	$0.44	$1.23	$0.51	$0.17	$0.19	$0.21	$0.81			$0.53	$0.30
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)	11 (0.44)	2 (0.08)	1 (0.18)	4 (0.63)			5 (0.42)	1 (0.08)

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).

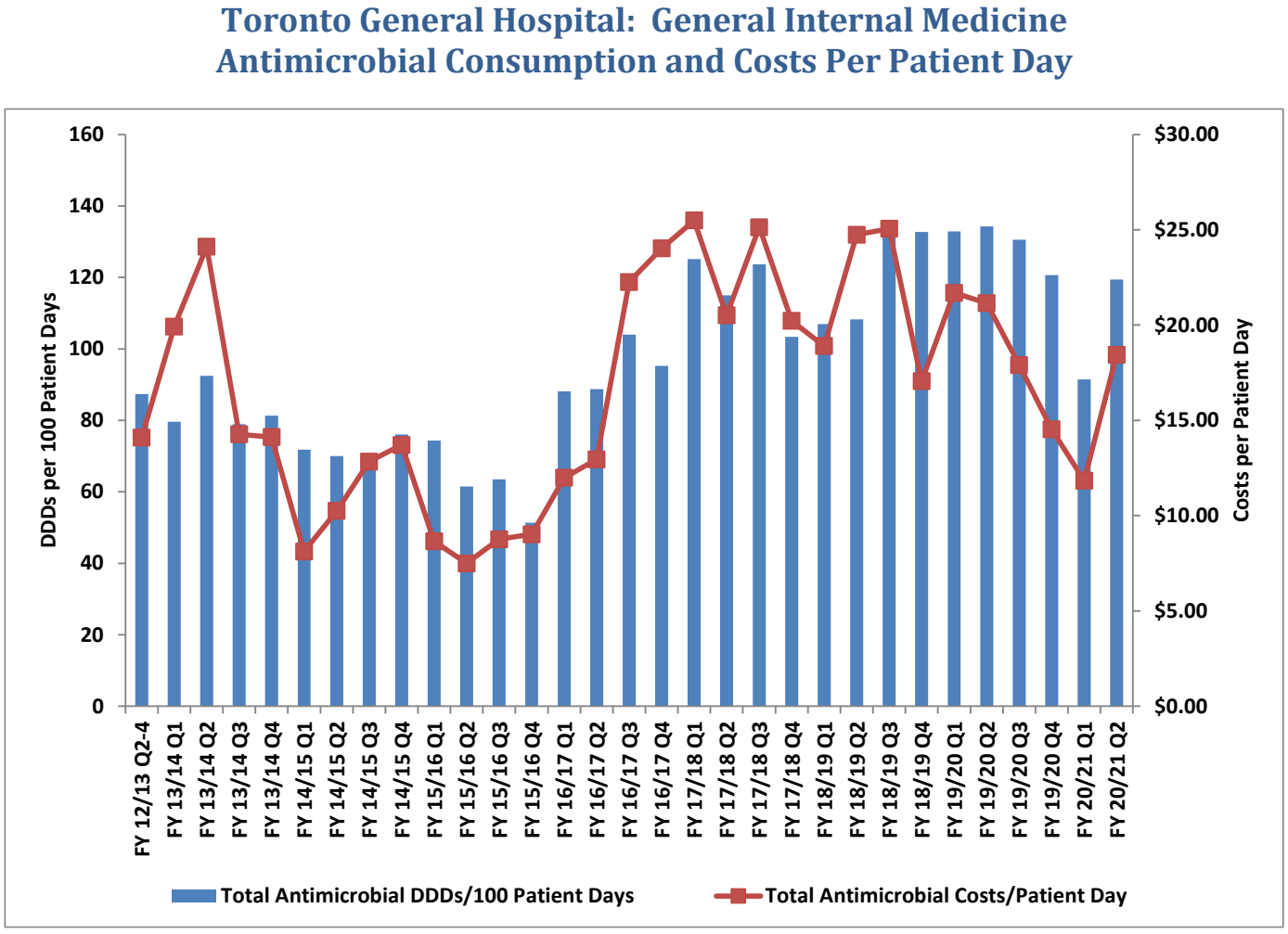
Historical antimicrobial usage and cost data updated due to the discovery that selected added drug dosages (Fluconazole 400mg/200ml bag, Pip-Tazo 13.5gm vial, Daptomycin 500mg vial) were not included in the report. Data have been revised to include Fluconazole starting August 2013, Pip-Tazo January 2015,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

Toronto General Hospital: General Internal Medicine

The 20/21 Q2 summary includes:

- Antimicrobial consumption (using defined daily doses (DDDs) per 100 patient days) decreased (↓) by 20.5% compared to YTD last year.
- Antimicrobial costs per patient day decreased (↓) by 28.5% compared to YTD last year:
  - Antibacterial costs per patient day decreased (↓) by 22.3% compared to YTD last year.
  - Antifungal costs per patient day decreased (↓) by 41.7% compared to YTD last year.

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



To view **Appendix 2: General Internal Medicine FY 20/21 Q2 Top 5 Antimicrobials by Usage (DDDs per 100 patient days) and Expenditures**, please click **here**.

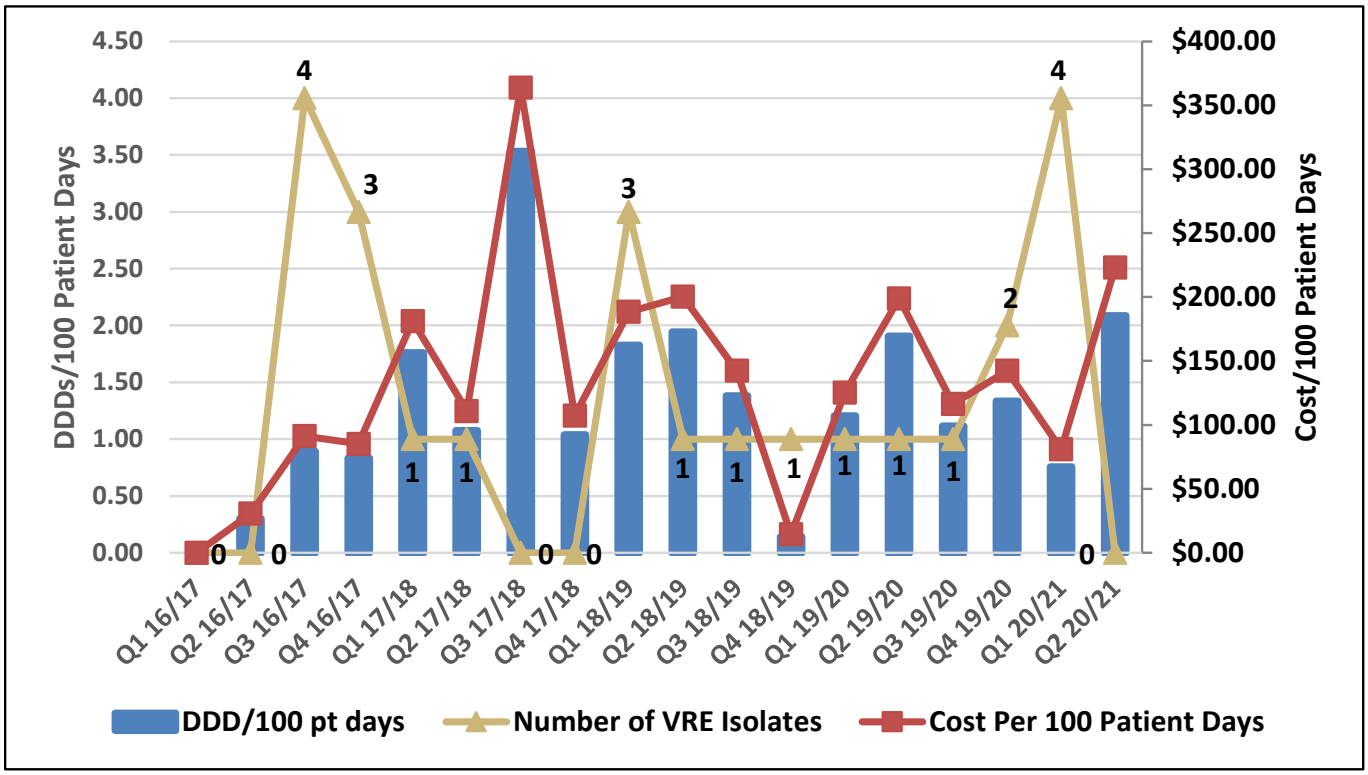
Table 19: Toronto General Hospital: General Internal Medicine

Indicators	FY 12/13 (Q2-4)	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	FY 18/19	FY 19/20	FY 20/21 Performance Q1	Q2	Q3	Q4	YTD	YTD of Previous Year
Antimicrobial Usage and Costs														
Total Antimicrobial DDDs/100 Patient Days	**87**	**83**	**83**	**63**	**94**	**117**	**120**	**130**	**91**	**119**			**106**	**134**
Systemic Antibacterial DDDs/100 Patient Days	77	70	73	55	78	99	104	112	79	102			91	117
Systemic Antifungal DDDs/100 Patient Days	11	13	10	8	16	17	16	17	13	18			15	16
Total Antimicrobial Costs	$279,644	$471,342	$352,036	$313,464	$494,787	$640,238	$576,907	$508,715	$61,463	$105,791			$167,255	$290,210
Total Antimicrobial Costs/Patient Day	**$14.10**	**$18.05**	**$13.30**	**$8.48**	**$17.77**	**$22.84**	**$21.44**	**$18.84**	**$11.84**	**$18.44**			**$15.30**	**$21.42**
Systemic Antibacterial Costs	$171,817	$225,491	$221,389	$202,012	$250,100	$370,814	$348,326	$375,780	$45,747	$77,662			$123,409	$197,017
Systemic Antibacterial Costs/Patient Day	$8.67	$8.64	$8.36	$5.47	$8.98	$13.23	$12.94	$13.92	$8.81	$13.54			$11.29	$14.54
Systemic Antifungal Costs	$107,827	$245,851	$130,647	$111,452	$244,687	$269,424	$228,581	$132,936	$15,716	$28,129			$43,846	$93,193
Systemic Antifungal Costs/Patient Day	$5.44	$9.42	$4.93	$3.02	$8.79	$9.61	$8.49	$4.92	$3.03	$4.90			$4.01	$6.88
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)	7 (0.26)	10 (0.37)	1 (0.19)	2 (0.35)			3 (0.27)	6 (0.44)

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 – Toronto General Hospital: General Internal Medicine



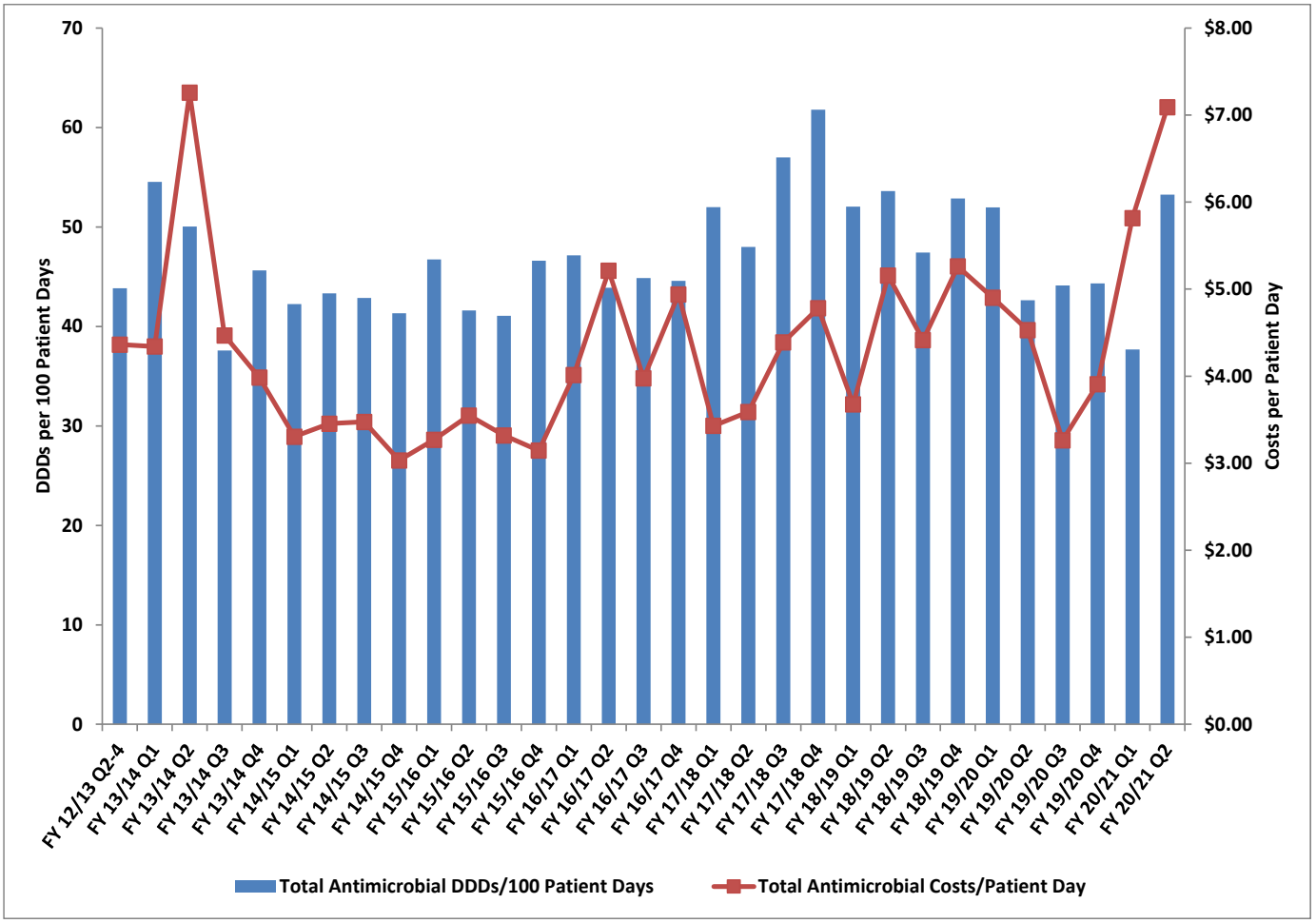
Toronto Western Hospital: General Internal Medicine

The FY 20/21 Q2 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 increased (↑) by 38.9% compared to YTD last year:
  - Antibacterial costs per patient day increased (↑) by 2.5% compared to YTD last year.
  - Antifungal costs per patient day increased (↑) by 339.5% compared to YTD last year.

NB: Usage data calculated for patients admitted to primary GIM units at TW. TW cost data is nearly entirely driven by increases in a single patient for amphotericin in Q2.

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



To view **Appendix 2: General Internal Medicine FY 20/21 Q2 Top 5 Antimicrobials by Usage (DDDs per 100 patient days) and Expenditures**, please click **here**.

Table 21: 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	FY 19/20	FY 20/21 Performance Q1	Q2	Q3	Q4	YTD	YTD of Previous Year
Antimicrobial Usage and Costs														
Total Antimicrobial DDDs/100 Patient Days	**44**	**47**	**42**	**47**	**45**	**54**	**51**	**46**	**38**	**53**			**47**	**47**
Systemic Antibacterial DDDs/100 Patient Days	41	44	40	42	42	51	49	43	35	49			43	45
Systemic Antifungal DDDs/100 Patient Days	3	3	3	6	3	3	3	2	3	4			4	2
Total Antimicrobial Costs	$74,737	$115,919	$110,889	$108,612	$146,214	$121,275	$135,824	$128,301	$21,965	$35,112			$57,077	$72,669
Total Antimicrobial Costs/Patient Day	**$4.36**	**$5.01**	**$3.32**	**$3.32**	**$4.52**	**$4.04**	**$4.63**	**$4.14**	**$5.82**	**$7.09**			**$6.54**	**$4.71**
Systemic Antibacterial Costs	$60,999	$93,779	$103,080	$105,744	$118,506	$93,880	$124,868	$115,758	$14,610	$22,965			$37,575	$64,821
Systemic Antibacterial Costs/Patient Day	$3.56	$4.05	$3.09	$3.23	$3.67	$3.13	$4.26	$3.74	$3.87	$4.64			$4.31	$4.20
Systemic Antifungal Costs	$13,738	$22,140	$7,810	$2,868	$27,708	$6,569	$10,956	$12,543	$7,355	$12,147			$19,502	$7,847
Systemic Antifungal Costs/Patient Day	$0.80	$0.96	$0.23	$0.09	$0.86	$0.22	$0.37	$0.40	$1.95	$2.45			$2.23	$0.51
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)	11 (0.38)	9 (0.29)	1 (0.26)	3 (0.61)			4 (0.46)	5 (0.32)

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 20/21 Q2 summary includes:

- Current year-to-date (YTD) antimicrobial consumption in defined daily doses (DDDs) per 100 patient days decreased (↓) by 10.6% compared to last year.
- YTD antimicrobial costs per patient day decreased (↓) by 11.9% compared to last year:
  - YTD antibacterial costs per patient day decreased (↓) by 2.9% compared to last year.
  - YTD antifungal costs per patient day decreased (↓) by 15.9% 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

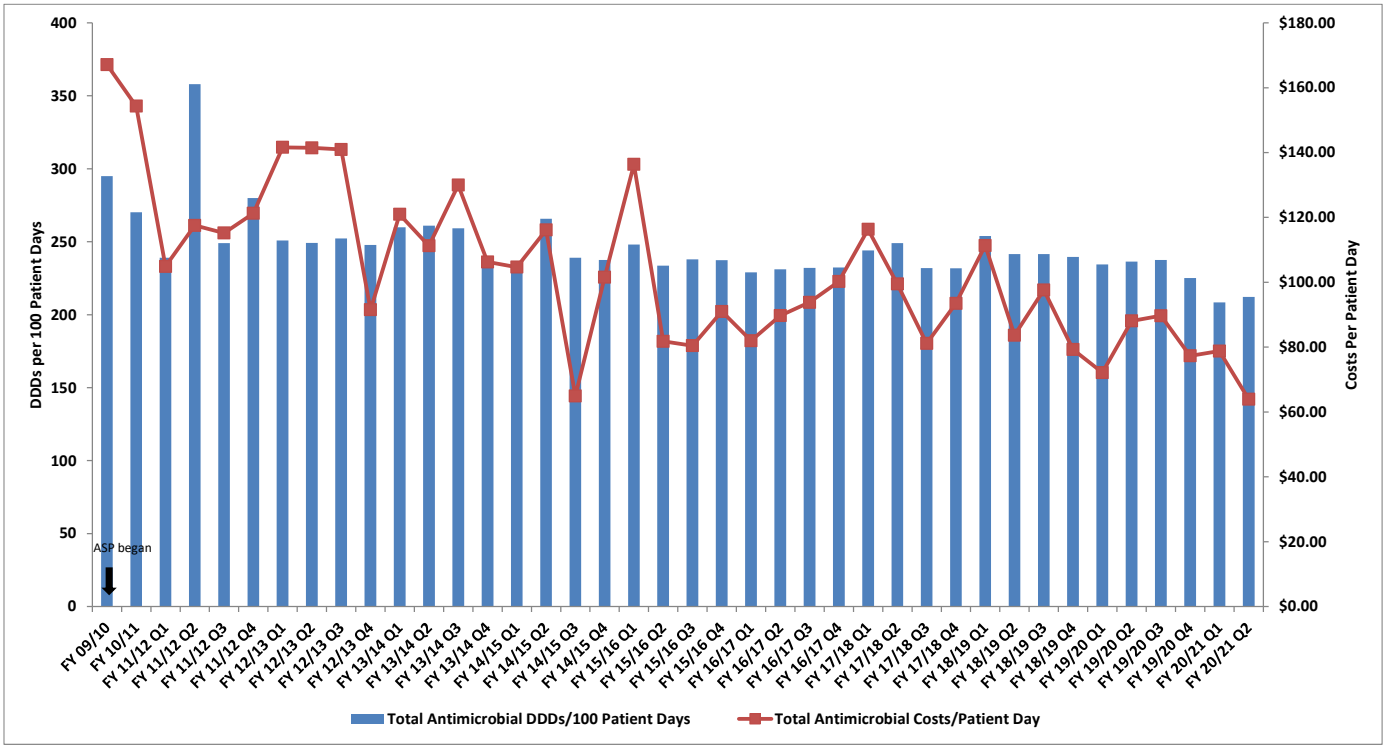


Table 22: Princess Margaret Cancer Centre: Leukemia Service

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	FY 18/19	FY 19/20	FY 20/21 Performance Q1	Q2	Q3	Q4	YTD	YTD of Previous Year
Antimicrobial Usage and Costs																	
Total Antimicrobial DDDs/100 Patient Days	**295**	**270**	**239**	**250**	**255**	**244**	**239**	**231**	**239**	**244**	**233**	**208**	**212**			**211**	**235**
Systemic Antibacterial DDDs/100 Patient Days	191	163	134	146	138	136	138	132	140	142	144	137	125			130	141
Systemic Antifungal DDDs/100 Patient Days	104	107	105	104	117	108	101	99	99	102	89	72	88			80	94
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	$1,487,404	$1,291,277	$243,855	$243,930			$487,785	$632,750
Total Antimicrobial Costs/Patient Day	**$167.12**	**$154.32**	**$115.13**	**$128.91**	**$117.10**	**$96.46**	**$96.98**	**$91.50**	**$97.45**	**$93.10**	**$81.91**	**$78.79**	**$63.96**			**$70.60**	**$80.17**
Systemic Antibacterial Costs	$659,034	$609,747	$663,175	$422,438	$485,263	$471,597	$403,399	$376,733	$433,025	$405,965	$419,026	$82,069	$82,032			$164,102	$193,152
Systemic Antibacterial Costs/Patient Day	$62.28	$57.33	$58.24	$45.85	$37.03	$32.20	$26.45	$23.46	$26.89	$25.41	$26.58	$26.52	$21.51			$23.75	$24.47
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	$1,081,438	$872,251	$161,786	$161,897			$323,683	$439,597
Systemic Antifungal Costs/Patient Day	$104.84	$96.99	$56.88	$83.06	$80.07	$64.26	$70.53	$68.04	$70.55	$67.69	$55.33	$52.27	$42.45			$46.85	$55.69
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)	4 (0.25)	7 (0.44)	2 (0.65)	3 (0.79)			5 (0.72)	5 (0.63)

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 23: Daptomycin Use – Princess Margaret Cancer Centre: Leukemia Service

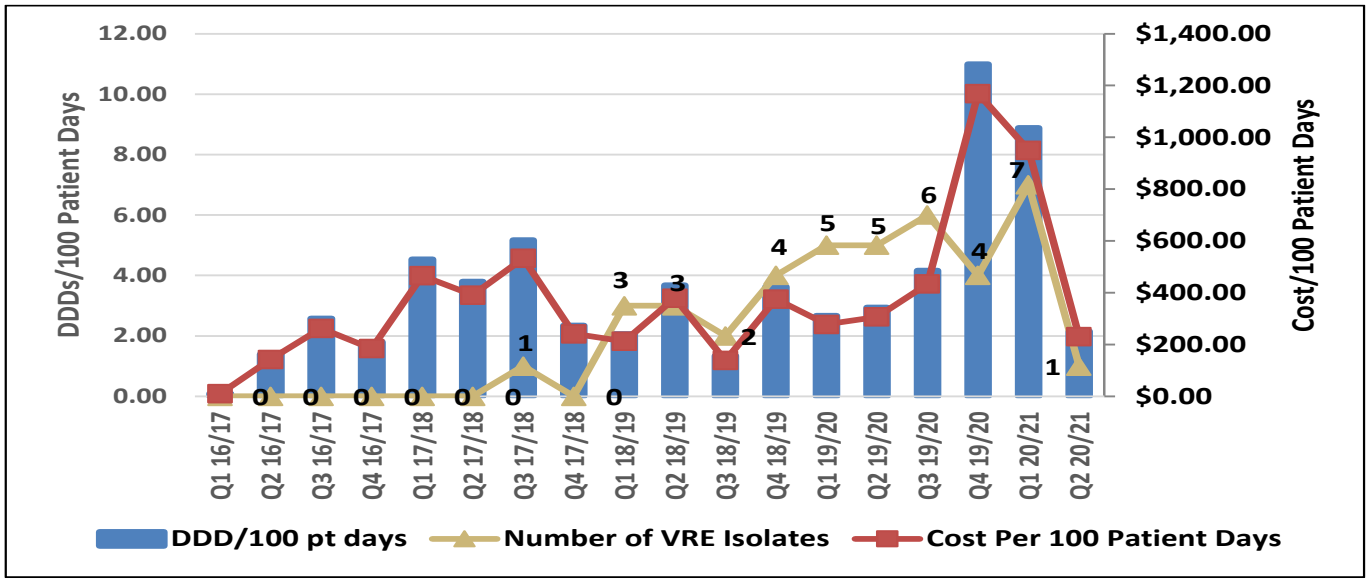
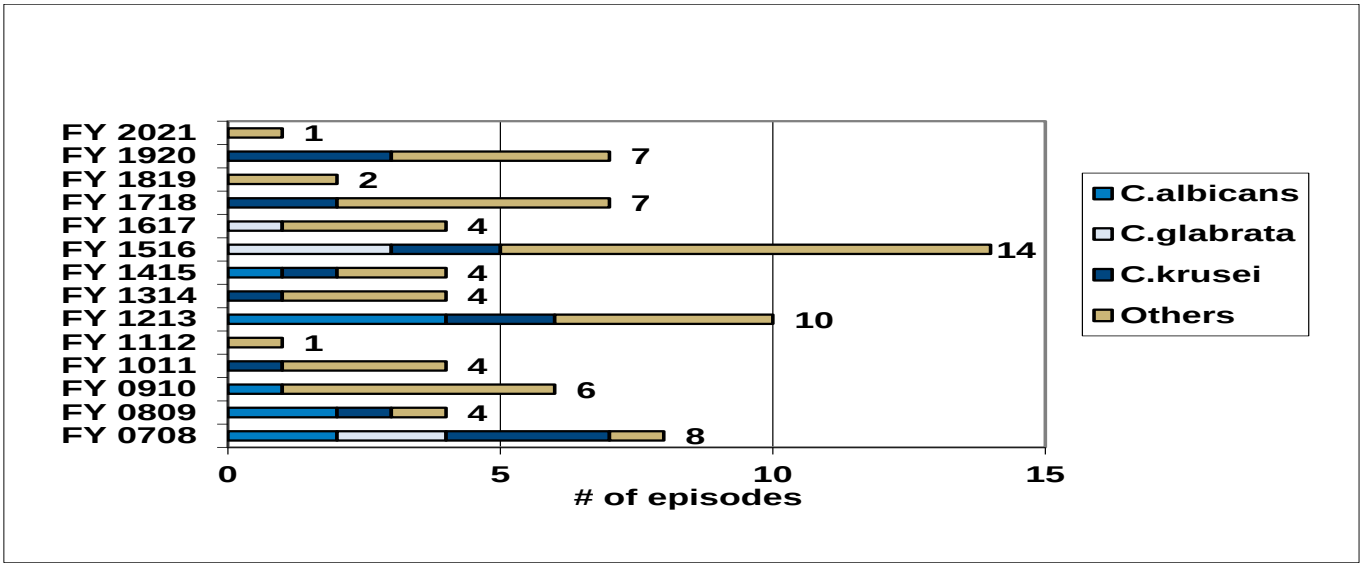
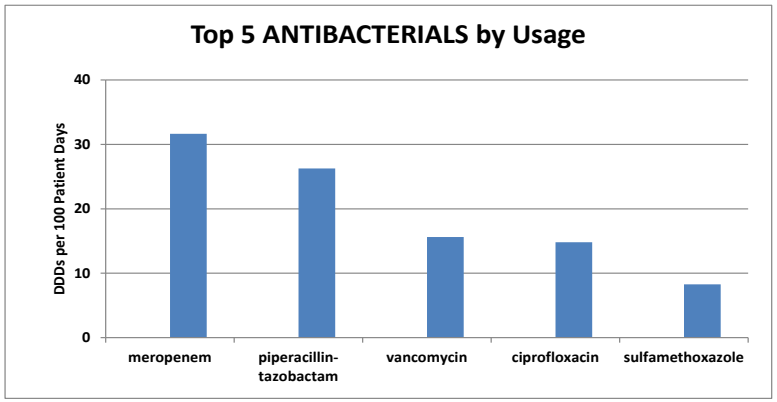


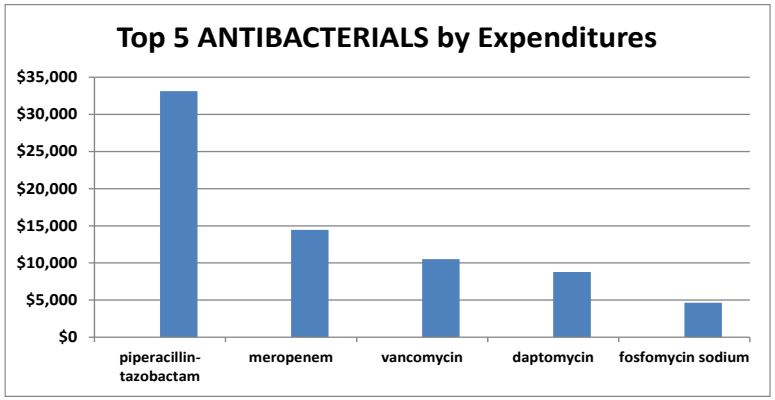
Table 24: Yeast Species Isolated in Blood – Princess Margaret Cancer Centre: Leukemia Service

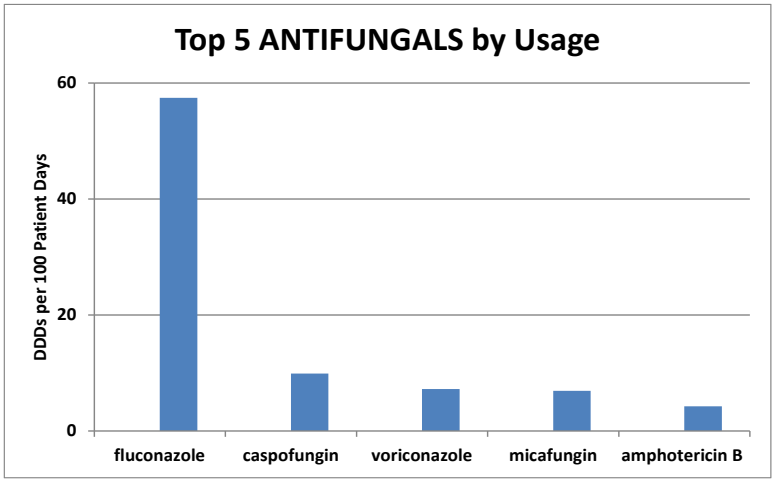


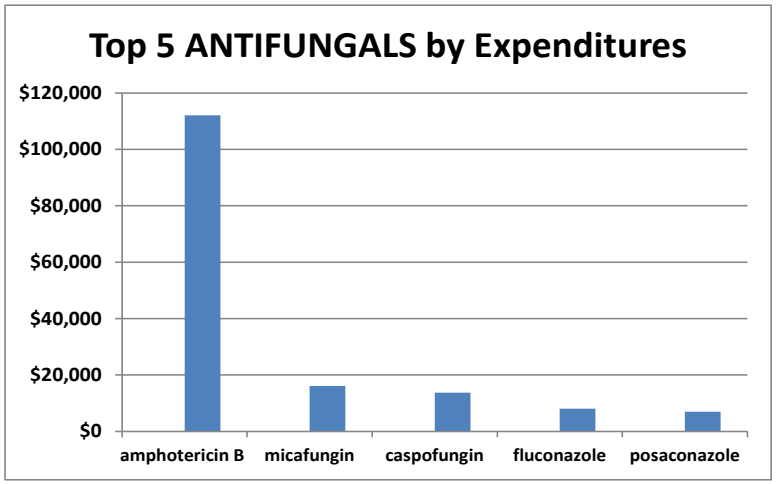
NB: In past Quarterly Reports, if a patient had more than one culture of different organisms, it was counted as 0.5 each. Starting with the Q3 2017/18 Quarterly Report and moving forward, it will be counted as 1.

Table 25: Princess Margaret Cancer Centre: Leukemia FY 20/21 Q2 Top 5 Antimicrobials by Usage and Expenditures









Princess Margaret Cancer Centre: Allogeneic Bone Marrow Transplant

The FY 20/21 Q2 summary includes:

- Year-to-date (YTD) antimicrobial consumption in defined daily doses (DDDs) per 100 patient days decreased (↓) by 4.3% compared to last year.
- YTD antimicrobial costs per patient day increased (↑) by 14.7% compared to last year:
  - YTD antibacterial costs per patient day increased (↑) by 42.3% compared to last year.
  - YTD antifungal costs per patient day increased (↑) by 8.5% compared to last year.

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

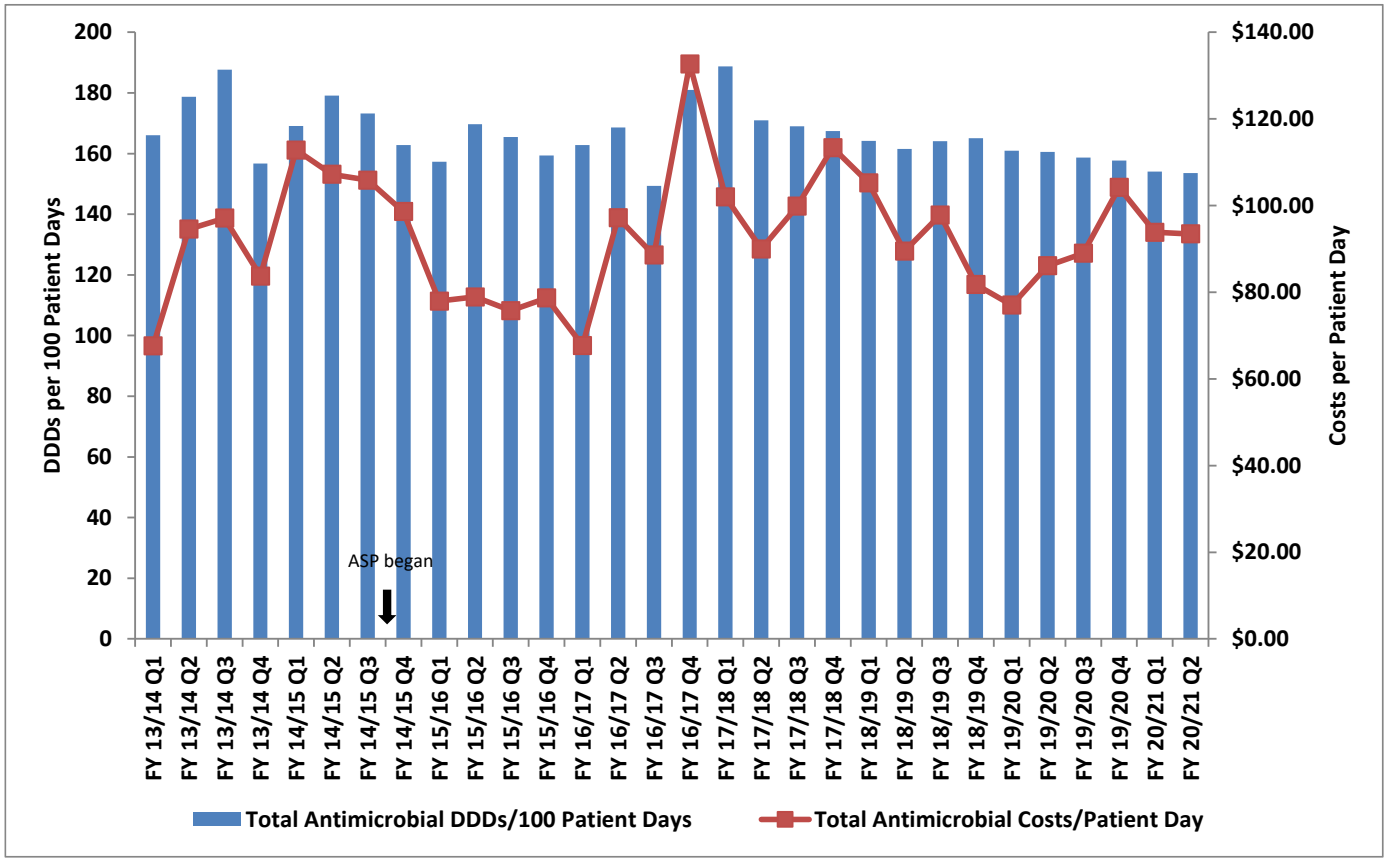


Table 26: Princess Margaret Cancer Centre: Allogeneic Bone Marrow Transplant

Indicators	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	FY 18/19	FY 19/20	FY 20/21 Performance Q1	Q2	Q3	Q4	YTD	YTD of Previous Year
Antimicrobial Usage and Costs													
Total Antimicrobial DDDs/100 Patient Days	**172**	**171**	**163**	**163**	**173**	**164**	**159**	**154**	**154**			**154**	**161**
Systemic Antibacterial DDDs/100 Patient Days	114	104	107	107	123	110	111	98	100			99	112
Systemic Antifungal DDDs/100 Patient Days	59	67	56	56	50	54	48	56	54			55	49
Total Antimicrobial Costs	$416,614	$512,300	$381,633	$381,633	$689,940	$791,632	$766,239	$207,170	$213,008			$420,178	$351,031
Total Antimicrobial Costs/Patient Day	**$85.65**	**$106.13**	**$77.62**	**$77.62**	**$102.50**	**$93.68**	**$89.18**	**$93.83**	**$93.47**			**94**	**$81.65**
Systemic Antibacterial Costs	$75,219	$78,038	$60,088	$60,088	$111,250	$138,437	$162,471	$42,856	$51,968			$94,823	$63,858
Systemic Antibacterial Costs/Patient Day	$15.46	$16.17	$12.22	$12.22	$16.53	$16.38	$18.91	$19.41	$22.80			$21.13	$14.85
Systemic Antifungal Costs	$341,395	$434,261	$321,545	$321,545	$578,690	$653,195	$603,768	$164,314	$161,040			$325,355	$287,173
Systemic Antifungal Costs/Patient Day	$70.19	$89.97	$65.39	$65.39	$85.97	$77.30	$70.27	$74.42	$70.66			$72.51	$66.80
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)	11 (1.3)	20 (2.33)	7 (3.17)	6 (2.63)			13 (2.9)	5 (1.16)

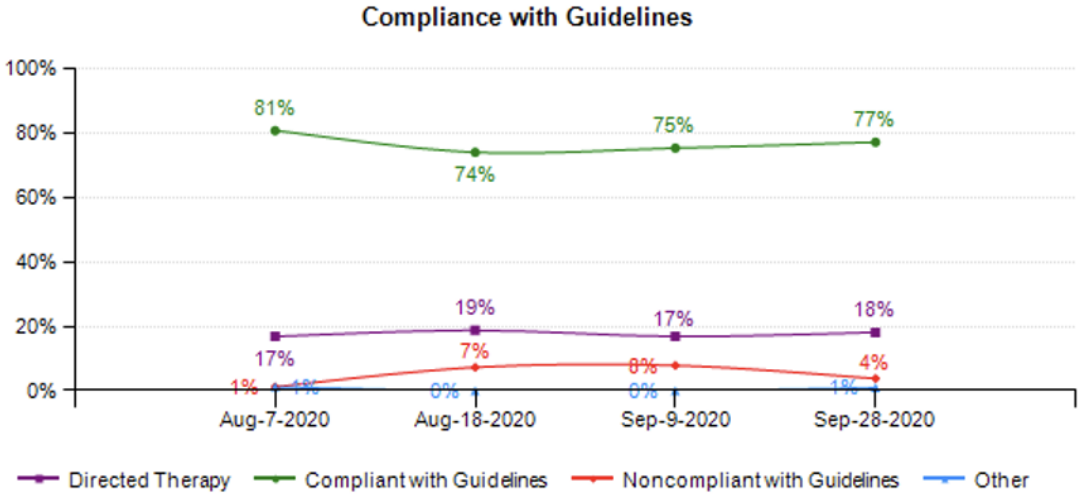
Total Antimicrobial DDDs is the sum of systemic antibacterial DDDs + systemic antifungal DDDs; non-systemic antimicrobials and antivirals are excluded.

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.

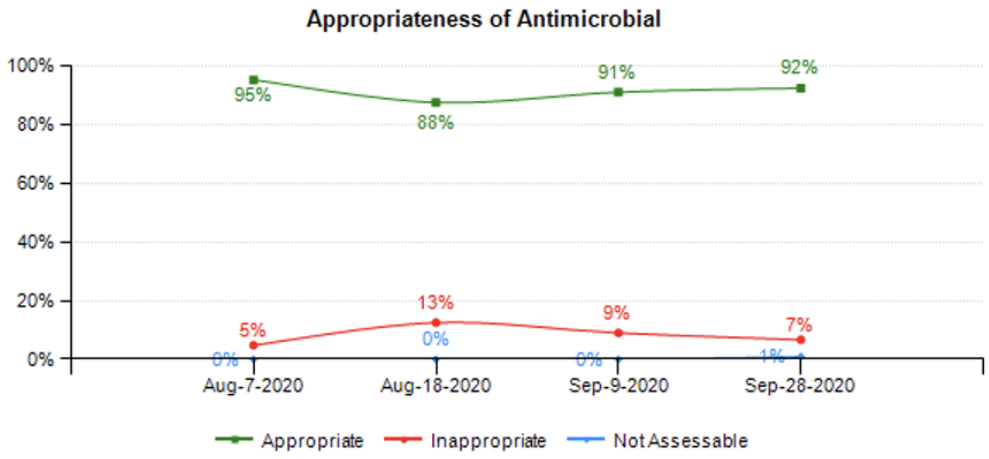
Antimicrobial Prescribing Survey in Leukemia Service

August and September 2020 NAPS Dashboard Report

Compliance with High Risk Febrile Neutropenia Guideline and Directed Therapy



Appropriate use = Compliance with guidelines + Directed Therapy



HOSPITAL NAPS National Antimicrobial Prescribing Survey

Hospital NAPS appropriateness definitions

GUIDANCE NCAS

			If endorsed guidelines are present	If endorsed guidelines are absent
Appropriate	1	Optimal[1]	Antimicrobial prescription follows endorsed local/ regional/ provincial guidelines *optimally*, including antimicrobial choice, dosage, route and duration[2]	The antimicrobial prescription has been reviewed and endorsed by an infectious diseases clinician or a clinical microbiologist **OR** The prescribed antimicrobial will cover the likely causative or cultured pathogens ***and*** there is not a narrower spectrum or more appropriate antimicrobial choice, dosage, route or duration[2] available
	2	Adequate	Antimicrobial prescription does not optimally follow the endorsed local/ regional/ provincial guidelines (including antimicrobial choice, dosage, route or duration[2]) however, is a ***reasonable*** alternative choice for the likely causative or cultured pathogens **OR** For surgical prophylaxis, as above ***and*** duration[2] is less than 24 hours	Antimicrobial prescription (including antimicrobial choice, dosage, route and duration[2]) is not the most optimal, however, is a ***reasonable*** alternative choice for the likely causative or cultured pathogens **OR** For surgical prophylaxis, as above ***and*** duration[2] is less than 24 hours
Inappropriate	3	Suboptimal	There may be a mild or non-life-threatening allergy mismatch **OR** Antimicrobial prescription (including antimicrobial choice, dosage, route and duration[2]) is an ***unreasonable*** choice for the likely causative or cultured pathogens, including: • spectrum excessively broad, unnecessary overlap in spectrum of activity, dosage excessively high or duration excessively long • failure to appropriately de-escalate with microbiological results	
	4	Inadequate	Antimicrobial prescription (including antimicrobial choice, dosage, route or duration[2]) is ***unlikely*** to treat the likely causative or cultured pathogens **OR** The documented or presumed indication does not require ***any*** antimicrobial treatment **OR** There may be a severe or possibly life-threatening allergy mismatch, or the potential risk of toxicity due to drug interaction **OR** For surgical prophylaxis, the duration[2] is greater than 24 hours (except where local guidelines endorse this)	
	5	Not assessable	The indication is not documented and unable to be determined from the notes **OR** The notes are not comprehensive enough to assess appropriateness **OR** The patient is too complex due to multiple co-morbidities, allergies or microbiology results, *etc.*	

[1] Taking into account acceptable changes due to the patient's weight or renal function, if this information is available

[2] Duration should only be assessed if the guidelines state a recommended duration and the antimicrobial has already been dispensed for longer than this, or if there is a clear planned 'end date' documented

Table 27: Daptomycin Use – Princess Margaret Cancer Centre: Allogeneic Bone Marrow Transplant

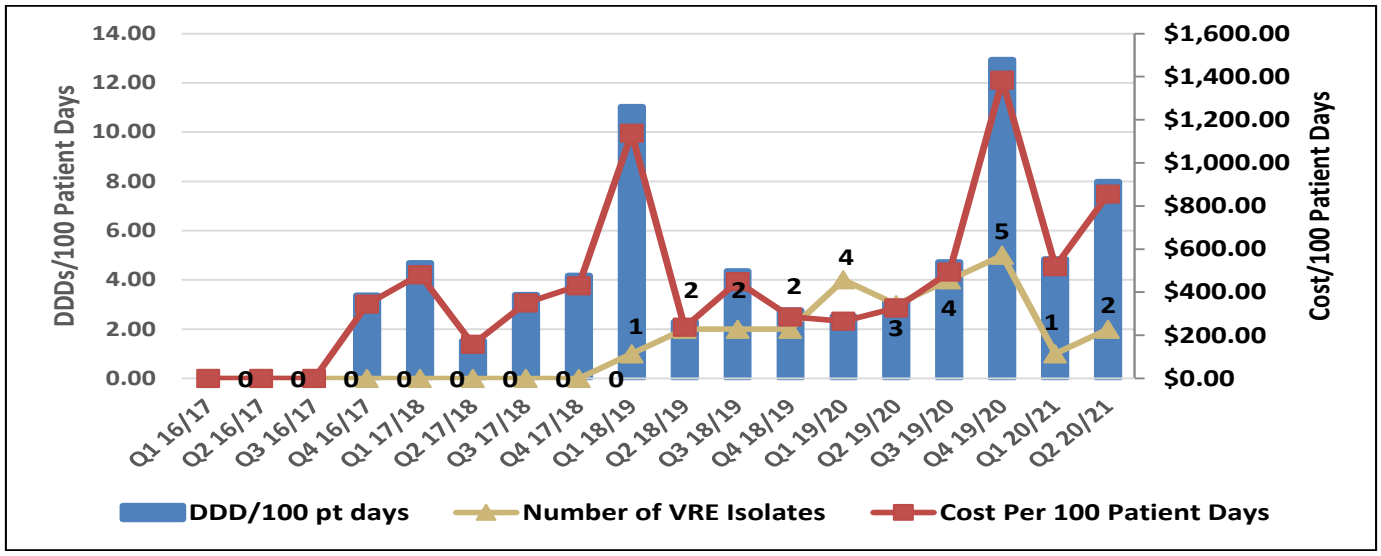
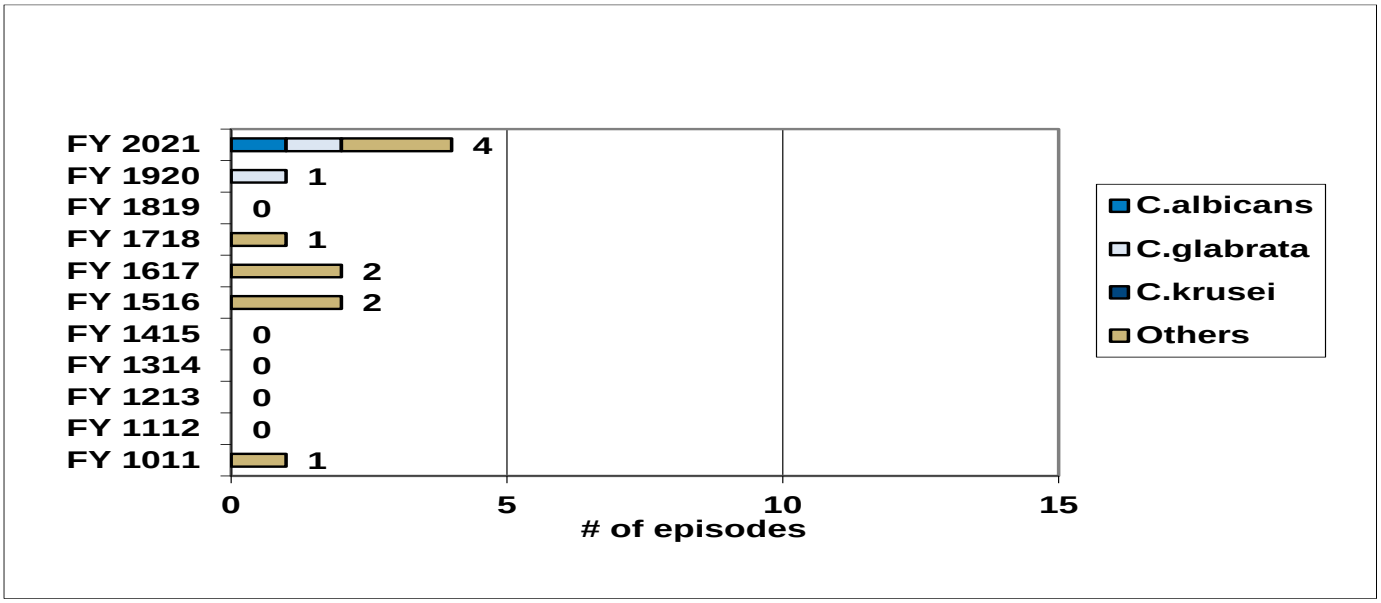
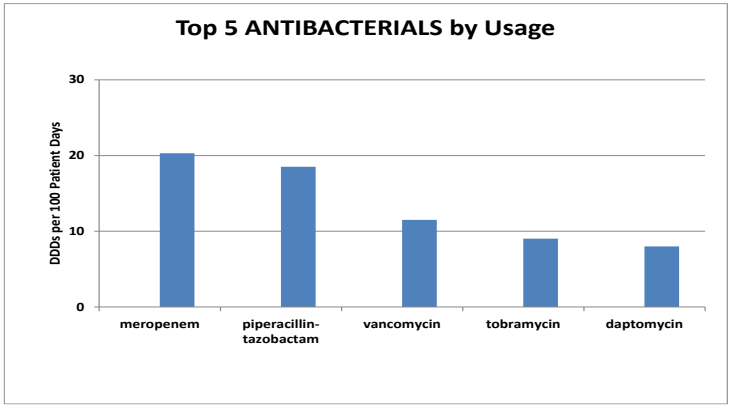


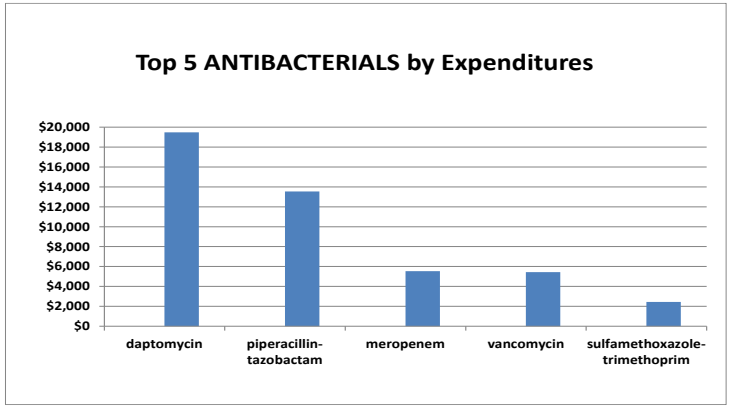
Table 28: Yeast Species Isolated in Blood – Princess Margaret Cancer Centre: Allogeneic Bone Marrow Transplant

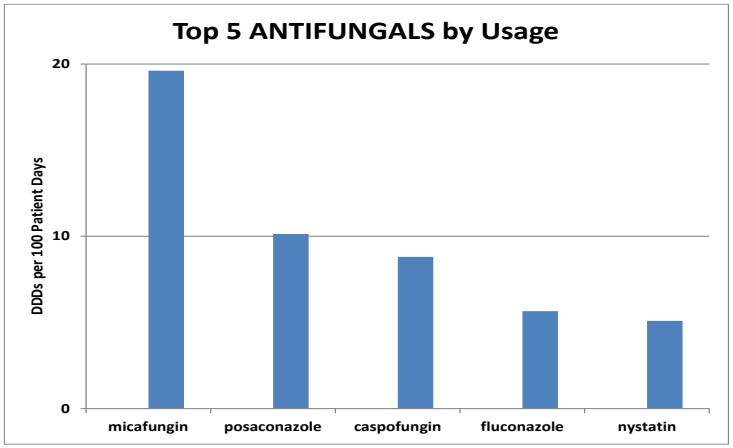


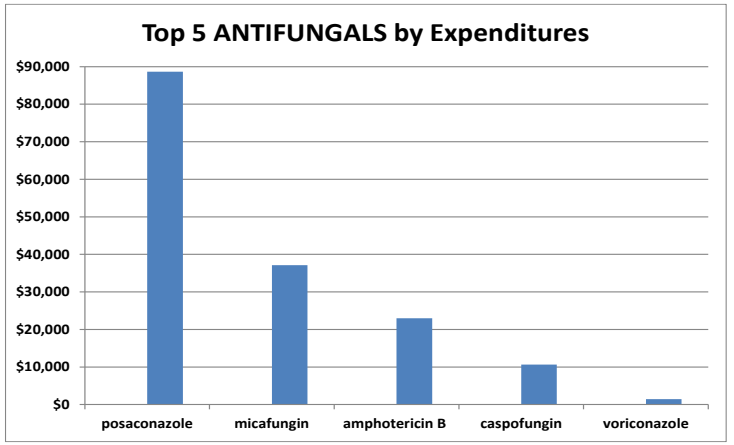
NB: In past Quarterly Reports, if a patient had more than one culture of different organisms, it was counted as 0.5 each. Starting with the Q3 2017/18 Quarterly Report and moving forward, it will be counted as 1.

Table 29: Princess Margaret Cancer Centre: Allogeneic Bone Marrow Transplant 20/21 Q2 Top 5 Antimicrobials by Usage (DDDs per 100 patient days) and Expenditures









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

The FY 20/21 Q2 summary includes:

- Year-to-date (YTD) antimicrobial consumption in defined daily doses (DDDs) per 100 patient days decreased (↓) by 7.5% compared to last year.
- YTD antimicrobial costs per patient day increased (↑) by 7.3% compared to last year:
  - YTD antibacterial costs per patient day increased (↑) by 16.9% compared to last year.
  - YTD antifungal costs per patient day decreased (↓) by 10.0% compared to last year.

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

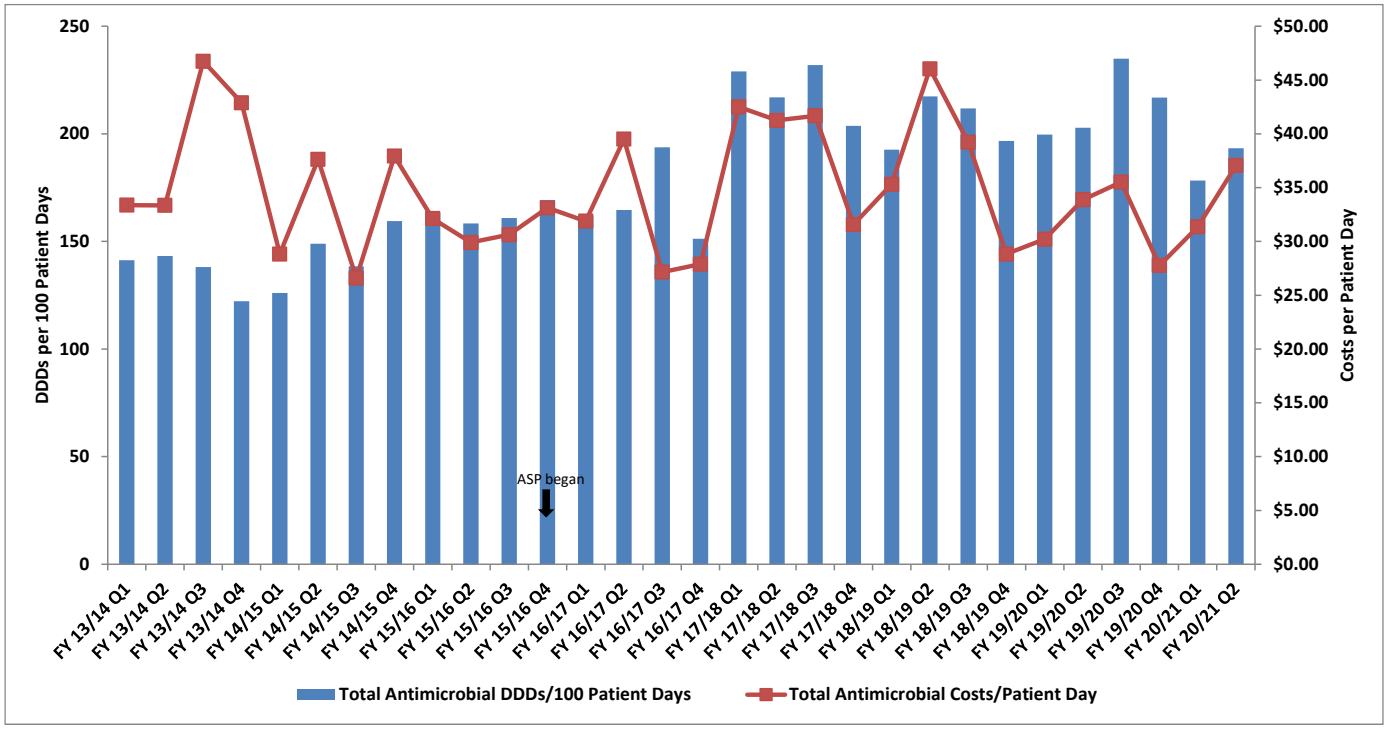


Table 30: Toronto General Hospital: Multi-Organ Transplant Program (MOTP)

Indicators	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	FY 18/19	FY 19/20	FY 20/21 Performance Q1	Q2	Q3	Q4	YTD	YTD of Previous Year
Antimicrobial Usage and Costs													
Total Antimicrobial DDDs/100 Patient Days	**136**	**143**	**211**	**156**	**220**	**205**	**213**	**178**	**193**			**186**	**201**
Systemic Antibacterial DDDs/100 Patient Days	93	98	112	108	155	143	142	121	123			122	142
Systemic Antifungal DDDs/100 Patient Days	43	45	99	48	65	62	71	58	71			65	60
Total Antimicrobial Costs	$837,263	$725,411	$709,892	$904,028	$859,544	$765,566	$651,061	$122,217	$160,748			$282,965	$332,355
Total Antimicrobial Costs/Patient Day	**$39.16**	**$32.69**	**$31.47**	**$31.57**	**$40.78**	**$37.52**	**$31.89**	**$31.36**	**$37.06**			**$34.36**	**$32.02**
Systemic Antibacterial Costs	$327,831	$379,748	$342,941	$452,266	$519,656	$470,402	$445,722	$97,334	$101,174			$198,508	$214,063
Systemic Antibacterial Costs/Patient Day	$15.33	$17.11	$15.20	$15.79	$24.66	$23.05	$21.83	$24.98	$23.32			$24.11	$20.62
Systemic Antifungal Costs	$509,433	$345,664	$366,951	$451,762	$339,887	$295,164	$205,339	$24,883	$59,574			$84,457	$118,292
Systemic Antifungal Costs/Patient Day	$23.82	$15.58	$16.26	$15.78	$16.13	$14.47	$10.06	$6.39	$13.73			$10.26	$11.40
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)	16 (0.78)	18 (0.88)	3 (0.77)	6 (1.38)			9 (1.09)	9 (0.87)

Table 31: Daptomycin Use – Toronto General Hospital: Multi-Organ Transplant Program (MOTP)

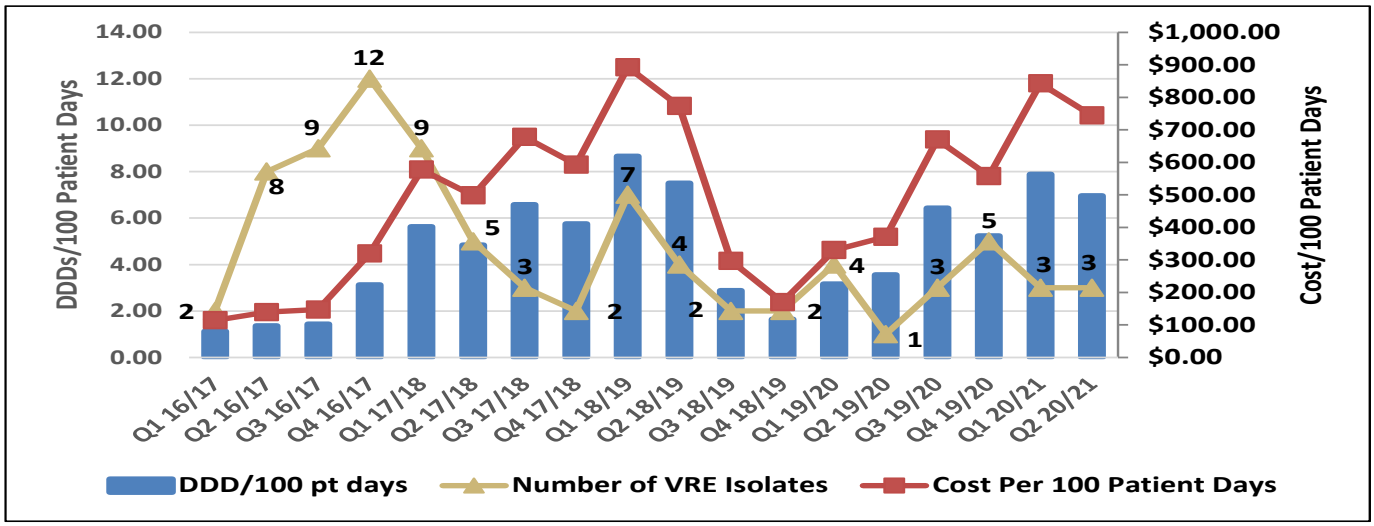
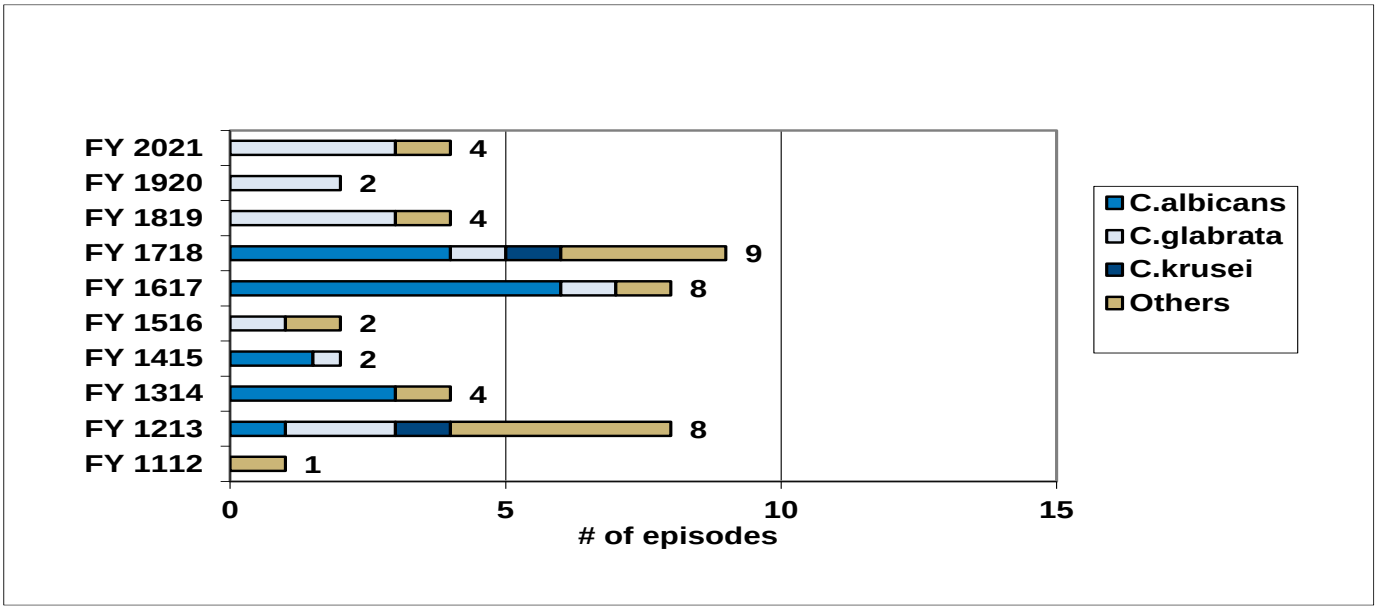


Table 32: Yeast Species Isolated in Blood – Toronto General Hospital: Multi-Organ Transplant Program (MOTP)



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 20/21 Q2 summary includes:

- Antimicrobial consumption (using defined daily doses (DDDs) per 100 patient days) increased (↑) by 54.2% compared to YTD last year.
- Antimicrobial costs per patient day increased (↑) by 152.4% compared to YTD last year:
  - Antibacterial costs per patient day increased (↑) by 19.2% compared to YTD last year.
  - Antifungal costs per patient day increased (↑) by 4893.2% compared to YTD last year.

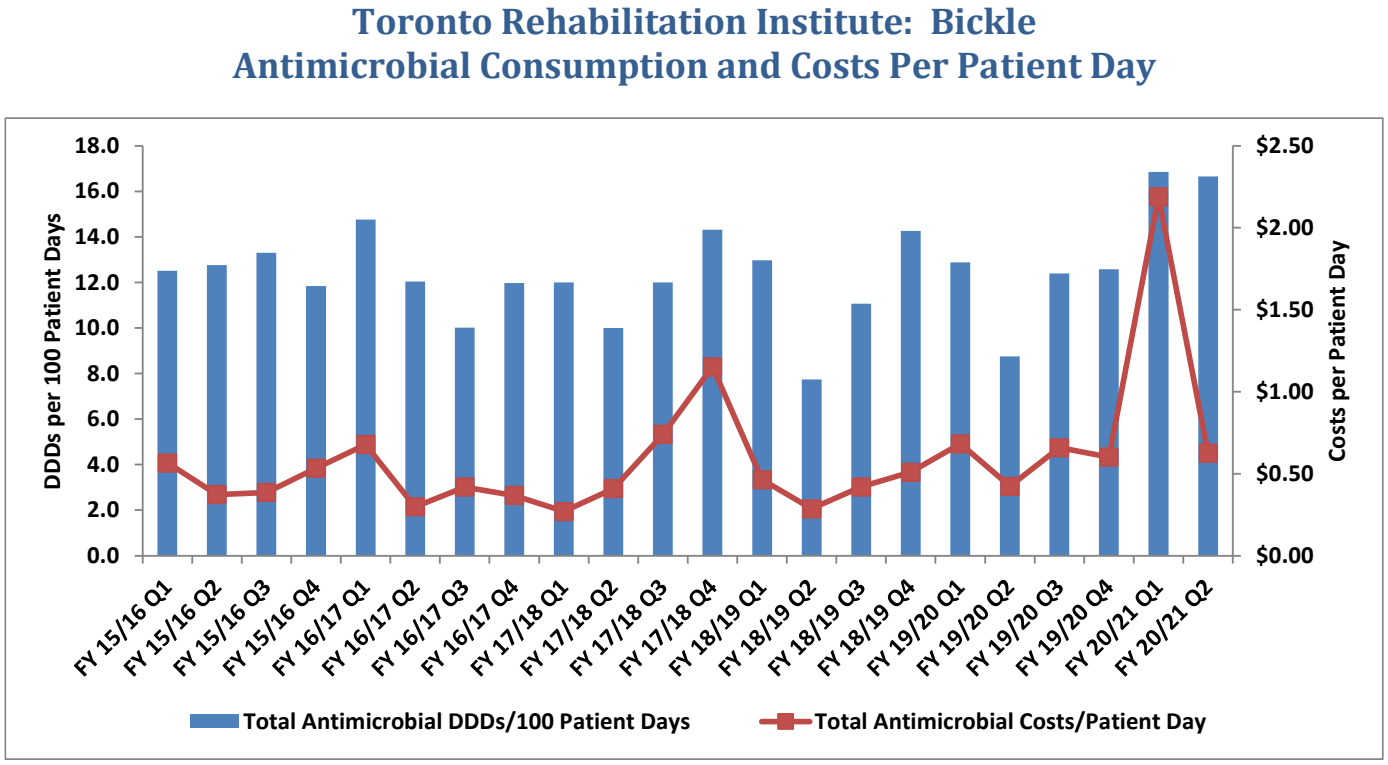


Table 33: Toronto Rehabilitation Institute: Bickle

Indicators	FY 15/16	FY 16/17	FY 17/18	FY 18/19	FY 19/20	FY20/21 Performance Q1	Q2	Q3	Q4	YTD	YTD of Previous Year
Antimicrobial Usage and Costs											
Total Antimicrobial DDDs/100 Patient Days	**13**	**12**	**12**	**11**	**12**	**17**	**17**			**17**	**11**
Systemic Antibacterial DDDs/100 Patient Days	11	11	11	11	11	15	15			15	10
Systemic Antifungal DDDs/100 Patient Days	2	2	1	1	1	2	1			2	1
Total Antimicrobial Costs	$31,326	$28,952	$38,119	$26,945	$37,344	$36,593	$10,568			$47,161	$17,828
Total Antimicrobial Costs/Patient Day	**$0.46**	**$0.44**	**$0.63**	**$0.43**	**$0.59**	**$2.19**	**$0.63**			**$1.40**	**$0.56**
Systemic Antibacterial Costs	$29,933	$23,571	$26,056	$26,265	$36,289	$11,829	$9,845			$21,674	$17,341
Systemic Antibacterial Costs/Patient Day	$0.44	$0.36	$0.43	$0.42	$0.58	$0.71	$0.58			$0.64	$0.54
Systemic Antifungal Costs	$1,393	$5,381	$12,063	$679	$1,055	$24,764	$723			$25,487	$487
Systemic Antifungal Costs/Patient Day	$0.02	$0.08	$0.20	$0.01	$0.02	$1.48	$0.04			$0.76	$0.02
Patient Care Outcomes											
Hospital-Acquired C. Difficile Cases (rate per 1,000 patient days)	7 (0.10)	7 (0.11)	4 (0.07)	1 (0.02)	1 (0.02)	1 (0.06)	3 (0.18)			4 (0.12)	0 (0)

Toronto Rehabilitation Institute: Lyndhurst

The FY 20/21 Q2 summary includes:

- Antimicrobial consumption (using defined daily doses (DDDs) per 100 patient days) decreased (↓) by 25.1% compared to YTD last year.
- Antimicrobial costs per patient day increased (↑) by 139.8% compared to YTD last year:
  - Antibacterial costs per patient day increased (↑) by 140.5% compared to YTD last year.
  - Antifungal costs per patient day increased (↑) by 14.2% compared to YTD last year.

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

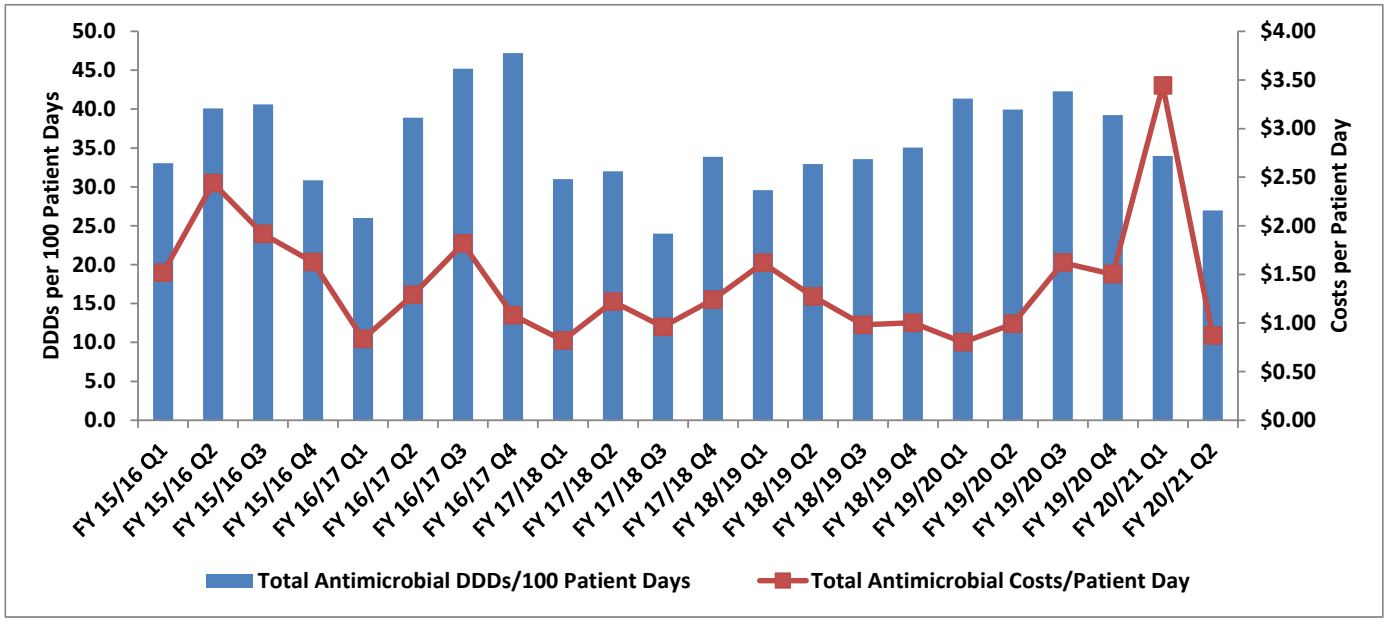


Table 34: Toronto Rehabilitation Institute: Lyndhurst

Indicators	FY 15/16	FY 16/17	FY 17/18	FY 18/19	FY 19/20	FY20/21 Performance Q1	Q2	Q3	Q4	YTD	YTD of Previous Year
Antimicrobial Usage and Costs											
Total Antimicrobial DDDs/100 Patient Days	**36**	**39**	**30**	**33**	**41**	**34**	**27**			**30**	**41**
Systemic Antibacterial DDDs/100 Patient Days	34	38	30	32	40	34	26			30	40
Systemic Antifungal DDDs/100 Patient Days	2	1	1	0	1	0	1			1	1
Total Antimicrobial Costs	$35,817	$23,520	$19,991	$23,262	$23,828	$16,461	$4,184			$20,646	$8,736
Total Antimicrobial Costs/Patient Day	**$1.88**	**$1.26**	**$1.06**	**$1.22**	**$1.23**	**$3.44**	**$0.87**			**$2.15**	**$0.90**
Systemic Antibacterial Costs	$35,473	$23,404	$18,691	$21,813	$22,712	$16,457	$4,132			$20,590	$8,686
Systemic Antibacterial Costs/Patient Day	$1.86	$1.26	$0.99	$1.14	$1.17	$3.44	$0.86			$2.14	$0.89
Systemic Antifungal Costs	$344	$116	$1,300	$1,450	$1,116	$4	$52			$56	$50
Systemic Antifungal Costs/Patient Day	$0.02	$0.01	$0.07	$0.08	$0.06	$0.00	$0.01			$0.01	$0.01
Patient Care Outcomes											
Hospital-Acquired C. Difficile Cases (rate per 1,000 patient days)	3 (0.16)	1 (0.05)	1 (0.05)	1 (0.05)	2 (0.1)	1 (0.21)	0 (0)			3 (0.31)	0 (0)

Toronto Rehabilitation Institute: University Centre

The FY 20/21 Q2 summary includes:

- Antimicrobial consumption (using defined daily doses (DDDs) per 100 patient days) increased (↑) by 4.0% compared to YTD last year.
- Antimicrobial costs per patient day increased (↑) by 103.9% compared to YTD last year:
  - Antibacterial costs per patient day increased (↑) by 90.4% compared to YTD last year.
  - Antifungal costs per patient day increased (↑) by 114.7% compared to YTD last year.

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

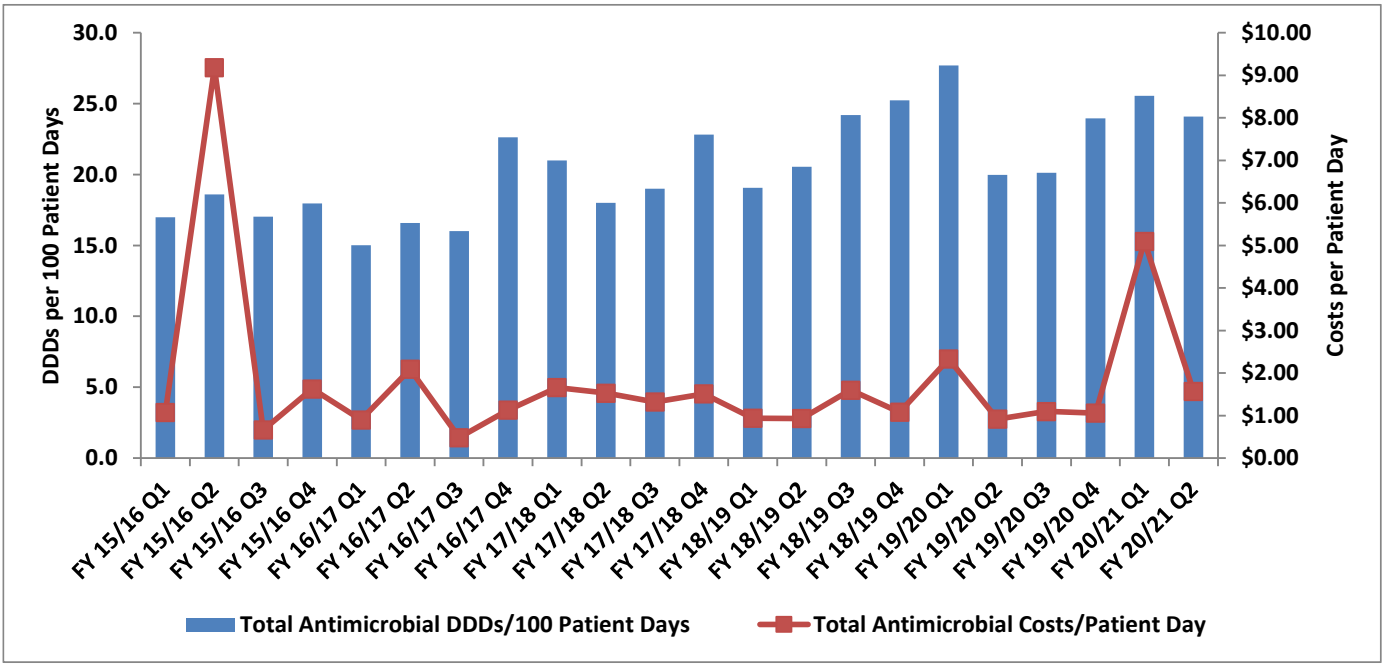
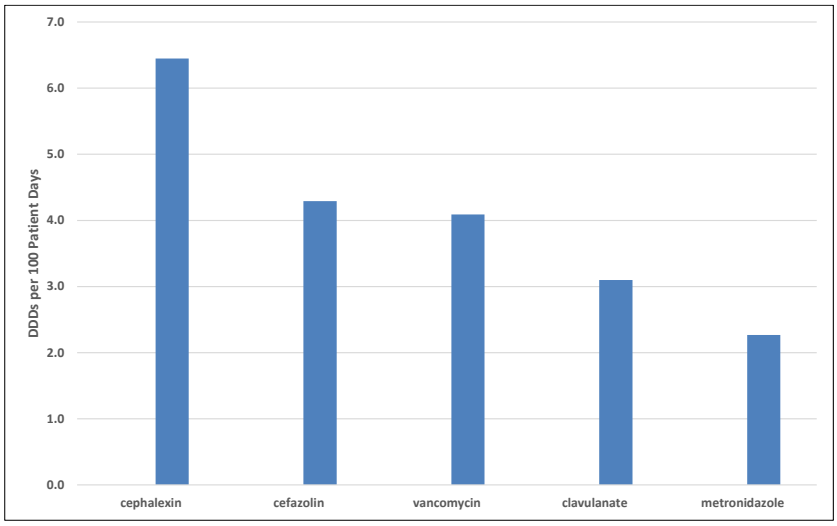


Table 35: Toronto Rehabilitation Institute: University Centre

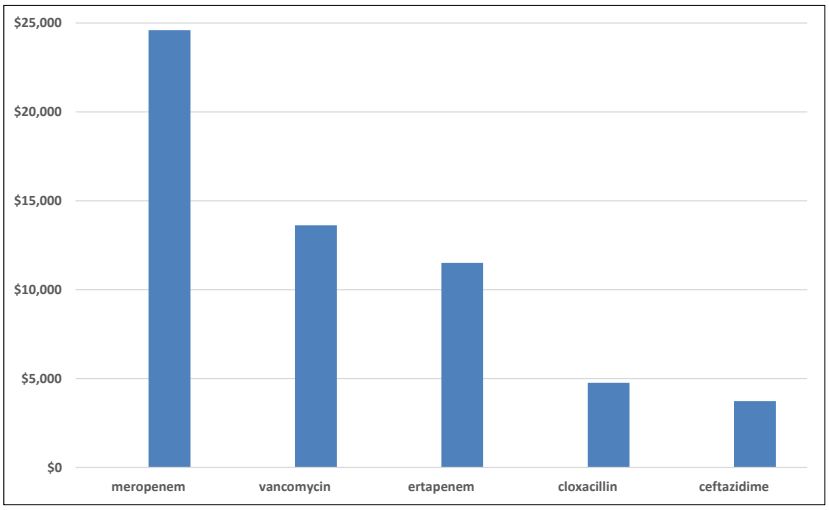
Indicators	FY 15/16	FY 16/17	FY 17/18	FY 18/19	FY 19/20	FY20/21 Performance Q1	Q2	Q3	Q4	YTD	YTD of Previous Year
Antimicrobial Usage and Costs											
Total Antimicrobial DDDs/100 Patient Days	**18**	**18**	**18**	**22**	**23**	**26**	**24**			**25**	**24**
Systemic Antibacterial DDDs/100 Patient Days	16	15	15	19	19	22	20			21	20
Systemic Antifungal DDDs/100 Patient Days	1	3	3	4	4	3	4			4	4
Total Antimicrobial Costs	$154,345	$58,364	$58,364	$59,142	$70,519	$56,696	$17,848			$74,544	$42,777
Total Antimicrobial Costs/Patient Day	**$3.09**	**$1.14**	**$1.14**	**$1.14**	**$1.36**	**$5.09**	**$1.57**			**$3.31**	**$1.63**
Systemic Antibacterial Costs	$52,505	$30,908	$30,908	$43,669	$36,357	$20,488	$10,501			$30,989	$19,039
Systemic Antibacterial Costs/Patient Day	$1.05	$0.60	$0.60	$0.84	$0.70	$1.84	$0.92			$1.38	$0.72
Systemic Antifungal Costs	$1,840	$27,456	$27,456	$15,473	$34,162	$36,208	$7,348			$43,555	$23,738
Systemic Antifungal Costs/Patient Day	$0.04	$0.54	$0.54	$0.30	$0.66	$3.25	$0.65			$1.94	$0.90
Patient Care Outcomes											
Hospital-Acquired C. Difficile Cases (rate per 1,000 patient days)	2 (0.04)	2 (0.04)	2 (0.04)	4 (0.08)	2 (0.04)	4 (0.36)	2 (0.18)			6 (0.27)	1 (0.04)

Bridgepoint Health: Hospital-Wide

Bridgepoint Health: Hospital-Wide Top 5 ANTIBACTERIALS by Usage 2020/21 YTD



Bridgepoint Health: Hospital-Wide Top 5 ANTIBACTERIALS by Expenditures 2020/21 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 continuously review and update 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. Drs. Linda Dresser and Mark McIntyre are the course coordinators, with contributions from other ASP team members.
- The SH-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. Dr. Morris co-chairs an initiative through the Public Health Agency of Canada to develop a National AMR Network.

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 Past-Chair of SHEA's Antimicrobial Stewardship and Resistance Committee.

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

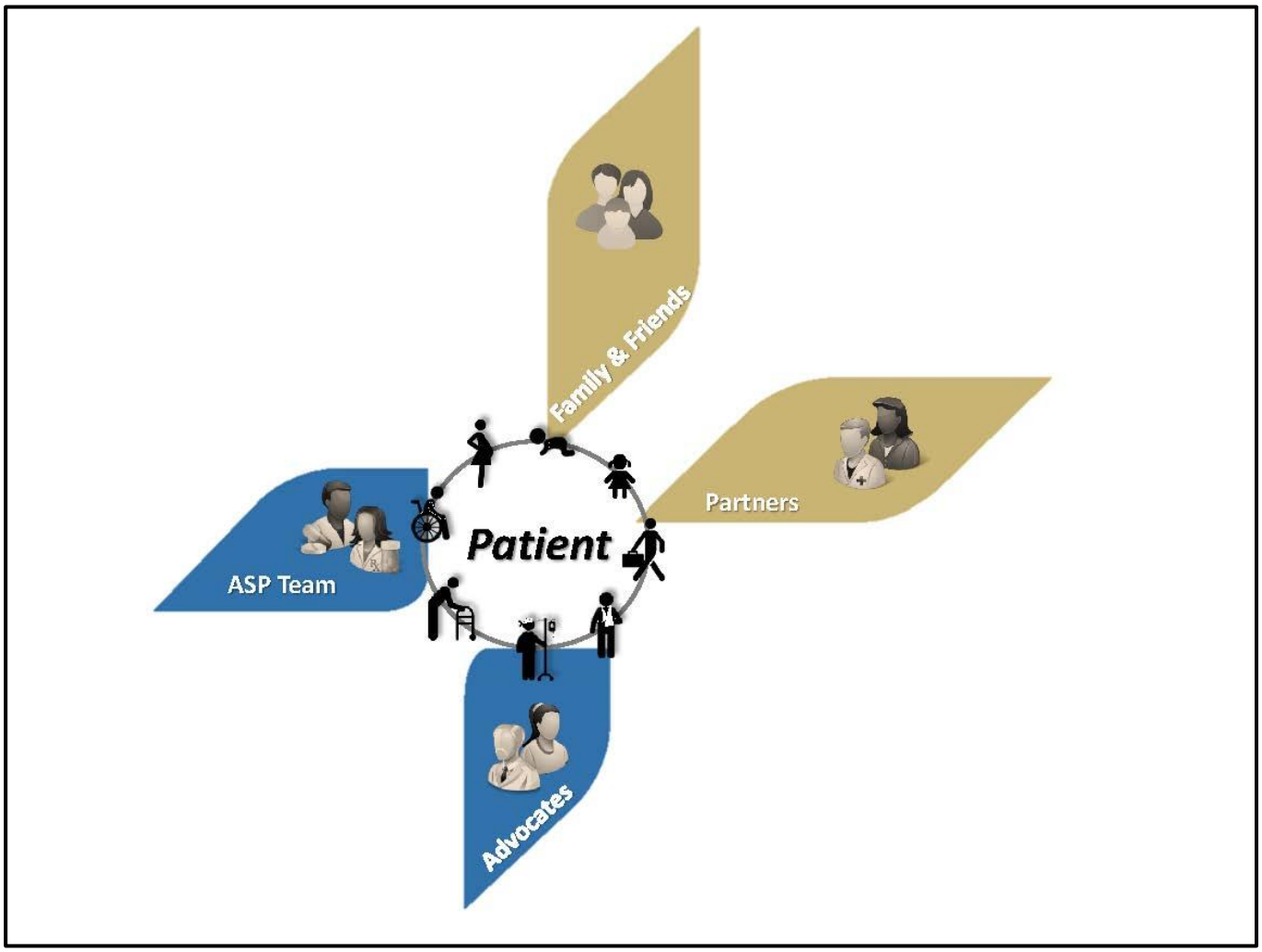
Yoshiko Nakamachi is a member of the Federal/Provincial/Territorial Pan-Canadian Antimicrobial Stewardship Task Group for the development of the Pan-Canadian AMR Framework and AMR Action Plan.

Ontario College of Pharmacists

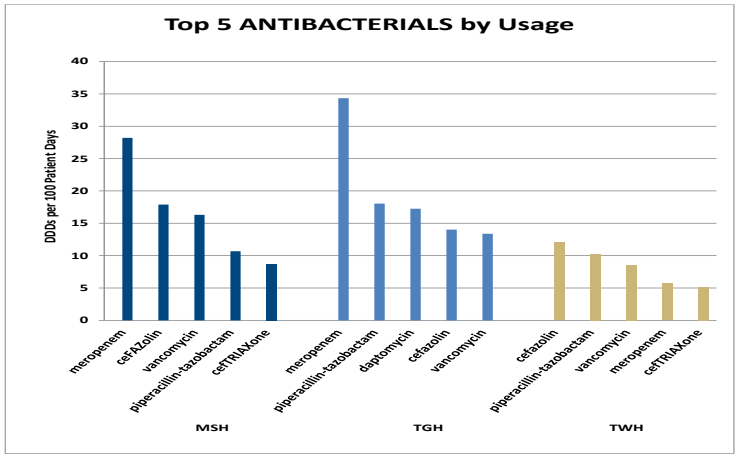
Yoshiko Nakamachi and Drs. Andrew Morris and Mark McIntyre are members of the Minor Ailments Advisory Group, which will provide recommendations that will inform the regulatory submission on expanded scope of practice for Ontario pharmacists.

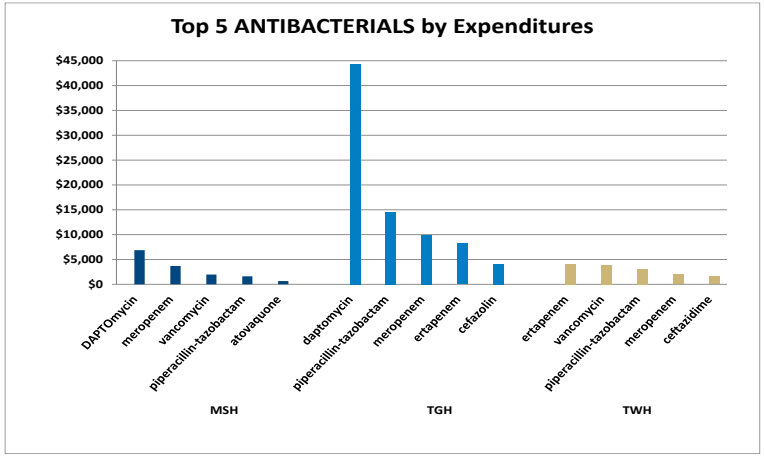
STRATEGIC PLANNING

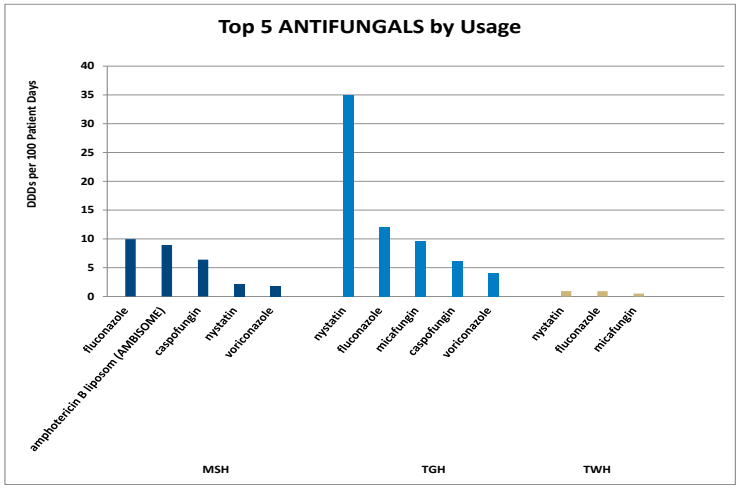
The ASP team developed the SH-UHN ASP Strategic Plan 2016-2019. Please contact Yoshiko Nakamachi (Yoshiko.Nakamachi@uhn.ca) if you would like a copy.

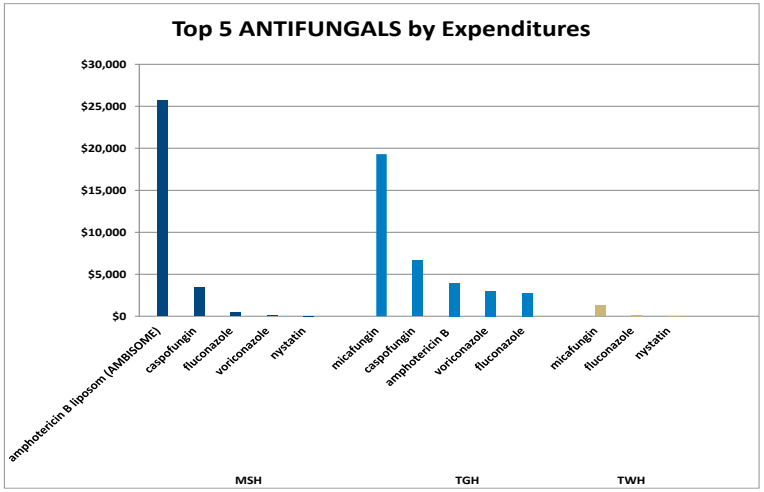


Appendix 1: FY 20/21 Q2 Top 5 Antimicrobials by Usage (DDDs per 100 Patient Days) and Expenditures by ICU Site









Appendix 2: General Internal Medicine FY 20/21 Q2 Top 5 Antimicrobials by Usage (DDDs per 100 patient days) and Expenditures