**Supplementary Table 1. Organization of antibiotics using the WHO AWaRe classification**

|  |  |  |
| --- | --- | --- |
| **Antibiotic Category** | **Antibiotics Included** | **WHO AWaRe Classification\*** |
| penicillin without beta-lactamase inhibitor | amoxicillin  ampicillin  cloxacillin  penicillin v potassium  pivmecillinam | Access |
| penicillin with beta-lactamase inhibitor | amoxicillin-clavulanate | Access |
| first-generation cephalosporins | cefadroxil  cephalexin | Access |
| second- or third-generation cephalosporins | cefaclor  cefdinir  cefixime  cefpodoxime  cefprozil  ceftibuten  cefuroxime | Watch/Reserve |
| second-generation fluoroquinolones | gemifloxacin  ciprofloxacin  norfloxacin  ofloxacin | Watch/Reserve |
| third-generation fluoroquinolones | levofloxacin  moxifloxacin | Watch/Reserve |
| macrolides | azithromycin  clarithromycin  erythromycin  spiramycin  telithromycin | Watch/Reserve |
| trimethoprim and/or sulfonamides | sulfamethoxazole  sulfamethoxazole-trimethoprim  sulfisoxazole  trimethoprim | Access |
| tetracyclines | doxycycline  minocycline  tetracycline | Access |
| lincosamides | clindamycin | Access |
| nitrofurantoin | nitrofurantoin | Access |
| metronidazole | metronidazole | Access |
| others | rifabutin  rifampin  fidaxomicin  fosfomycin  linezolid  methenamine  tedizolid  vancomycin | N/A – not included in the analysis of broad spectrum antibiotics |

**\*Assignment to WHO group was chosen based on the most frequently used drugs within each class**

**Supplementary Table 2. Organization of specialties and subspecialties using the Xponent dataset**

|  |  |
| --- | --- |
| **Specialty Grouping** | **Specialties and Subspecialties Included** |
| family medicine | family medicine and general practice |
| internal medicine & pediatrics | adult cardiology, critical care medicine, endocrinology & infertility, endocrinology & metabolism, gastroenterology, geriatric medicine, general internal medicine, hematology, hepatology, infectious diseases, internal medicine, clinical immunology & allergy, nephrology, medical oncology, adult respirology, rheumatology, neurology, tropical medicine, neonatal-perinatal medicine, adolescent medicine, developmental pediatrics, pediatric endocrinlogy & metabolism, pediatric cardiology, pediatric critical care, pediatrics, pediatric gastroenterology, pediatric emergency medicine, pediatrics nephrology, pediatric general surgery, pediatric hematology/oncology, pediatric neurology, pediatric radiology, pediatric respirology |
| emergency medicine | emergency medicine |
| surgery | colorectal surgery, cardiac surgery, cardiothoracic surgery, cardio-vascular thoracic surgery, general surgical oncology, general surgery, gynecologic oncology, maternal-fetal medicine, neurosurgery, ophthalmology/otolaryngology, obstetrics & gynecology, ophthalmology surgery, ophthalmology, orthopedic surgery, otolaryngology - head and neck surgery, plastic surgery, retinology, thoracic surgery, urology, and vascular surgery |
| other | acupuncture, addiction medicine, administration, alternative medicine, anatomical pathology, anesthesia, aviation medicine, bio-ethics, behavioral therapy, medical biochemistry, child and adolescent psychiatry, clinician investigator, public health and preventive medicine, dermatology, electroencephalography, epidemiology, forensic medicine, forensic pathology, forensic psychiatry, medical genetics, geriatric psychiatry, gyn reproductive endocrinology & infertility, hematological pathology, industrial medicine, insurance medicine, laboratory medicine, laboratory technician, medical microbiology, neuroradiology, nuclear medicine, neuropathology, no primary interest, nutrition, occupational medicine, palliative care, general pathology, clinical pharmacology and toxicology, pathology & laboratory, physical medicine & rehabilitation, pain management, preventative medicine, psychiatry, public health, diagnostic radiology, radiation oncology, radiology technician, therapeutic radiology, sports medicine, transfusion medicine, toxicology, and ultra sound |

**Supplementary Table 3. Change in selection of oral antibiotic prescriptions among Ontario physicians between the pre-pandemic and pandemic period**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |
|  | **Prescribing of Broad Spectrum Antibiotics (%)** | | | **Unadjusted Model** | | **Adjusted Model\*** | |
| Variables | **2019** | **2020/21** | **Change** | **Mean Difference + CI** | **p value** | **Mean Difference + CI** | **p value** |
| Total | 28.8 | 24.1 | -4.7 (-16.3%) |  | - |  | - |
| Physician Variables |  |  |  |  |  |  |  |
| Sex |  |  |  |  |  |  |  |
| *Female* | 26.5 | 21.8 | -4.7 (-17.7%) | *Ref* |  | *Ref* |  |
| *Male* | 30.7 | 25.9 | -4.8 (-15.6%) | -0.1 [-0.4, 0.2] | 0.600 | 0.2 [-0.1, 0.5] | 0.22 |
| Career Stage |  |  |  |  |  |  |  |
| *Early* | 23.1 | 19.5 | -3.6 (-15.6%) | *Ref* |  | *Ref* |  |
| *Mid* | 26.6 | 22.5 | -4.1 (-15.4%) | -0.5 [-0.9, 0] | 0.036 | -0.7 [-1.1, -0.2] | 0.007 |
| *Late* | 32.2 | 26.6 | -5.6 (-17.4%) | -2 [-2.4, -1.6] | < .001 | -1.8 [-2.3, -1.3] | < .001 |
| Specialty |  |  |  |  |  |  |  |
| *Family Medicine* | 30.0 | 24.2 | -5.8 (-19.3%) | *Ref* |  | *Ref* |  |
| *Internal Medicine or Pediatrics* | 33.1 | 29.9 | -3.2 (-9.7%) | 2.6 [2.1, 3.0] | < .001 | 2.2 [1.7, 2.7] | < .001 |
| *Emergency Medicine* | 24.4 | 19.8 | -4.6 (-18.9%) | 1.2 [0.1, 2.2] | 0.025 | 1.0 [0, 2.0] | 0.054 |
| *Surgery* | 20.5 | 19.2 | -1.3 (-6.3%) | 4.5 [4.0, 4.9] | < .001 | 4.2 [3.7, 4.7] | < .001 |
| *Other* | 15.5 | 14.4 | -1.1 (-7.1%) | 4.7 [3.8, 5.7] | < .001 | 4.3 [3.3, 5.3] | < .001 |
| Practice Variables |  |  |  |  |  |  |  |
| Geography |  |  |  |  |  |  |  |
| *Rural* | 26.9 | 22.1 | -4.8 (-17.8%) | *Ref* |  | *Ref* |  |
| *Urban* | 28.9 | 24.2 | -4.7 (-16.3%) | 0.1 [-0.6, 0.7] | 0.844 | -0.8 [-1.5, -0.2] | 0.013 |
| Patient Age |  |  |  |  |  |  |  |
| *<18 Years* | 28.6 | 23.5 | -5.1 (-17.8%) | *Ref* |  | *Ref* |  |
| *18 - 64 Years* | 30.3 | 24.8 | -5.5 (-18.2%) | 0.6 [-0.3, 1.5] | 0.196 | -0.6 [-1.6, 0.5] | 0.289 |
| *65+ Years* | 12.5 | 11.0 | -1.5 (-12%) | -2.9 [-3.8, -2] | < .001 | -4.6 [-5.7, -3.5] | < .001 |
| Patient Sex |  |  |  |  |  |  |  |
| *Female* | 31.1 | 25.9 | -5.2 (-16.7%) | *Ref* |  | *Ref* |  |
| *Male* | 27.6 | 22.5 | -5.1 (-18.5%) | 0.5 [-0.6, 1.5] | 0.369 | -1 [-2.2, 0.1] | 0.082 |
| Patient Comorbidity Index |  |  |  |  |  |  |  |
| *Low* | 27.0 | 22.1 | -4.9 (-18.1%) | *Ref* |  | *Ref* |  |
| *Medium* | 29.6 | 24.0 | -5.6 (-18.9%) | -0.7 [-1.1, -0.3] | < .001 | 0.3 [-0.1, 0.7] | 0.148 |
| *High* | 29.9 | 25.9 | -4.0 (-13.4%) | 0.9 [0.5, 1.3] | < .001 | 1.2 [0.7, 1.7] | < .001 |
| *Missing* | 24.4 | 21.3 | -3.1 (-12.7%) | 1.8 [0.9, 2.6] | < .001 | 1.6 [0.7, 2.5] | 0.001 |
| Prescriptions to New Patients |  |  |  |  |  |  |  |
| *Low* | 26.9 | 23.5 | -3.4 (-12.6%) | *Ref* |  | *Ref* |  |
| *Medium* | 27.5 | 22.9 | -4.6 (-16.7%) | -1.3 [-1.7, -0.9] | < .001 | -0.3 [-0.8, 0.1] | 0.094 |
| *High* | 31.5 | 25.5 | -6.0 (-19%) | -2.7 [-3, -2.3] | < .001 | -1.1 [-1.5, -0.7] | < .001 |
| *Missing* | 27.9 | 24.9 | -3.0 (-10.8%) | 0.3 [-2.3, 2.9] | 0.823 | 0.5 [-2.1, 3.2] | 0.697 |

**\*Model adjusted for physician sex, physician career stage, physician specialty, practice geography, patient age, patient sex, patient comorbidity index, and prescriptions to new patients.**

**Supplementary Table 4. Change in duration of oral antibiotic prescriptions among Ontario physicians between the pre-pandemic and pandemic period**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |
|  | **Prescribing of Long Duration Antibiotics (%)** | | | **Unadjusted Model** | | **Adjusted Model** | |
| Variables | **2019** | **2020/21** | **Change** | **Mean Difference + CI** | **p value** | **Mean Difference + CI** | **p value** |
| Total | 34.1 | 33.1 | -1.0 (-2.9%) |  |  |  |  |
| Physician Variables |  |  |  |  |  |  |  |
| Sex |  |  |  |  |  |  |  |
| *Female* | 32.6 | 31.1 | -1.5 (-4.6%) | *Ref* |  | *Ref* |  |
| *Male* | 35.4 | 34.7 | -0.7 (-2%) | 0.7 [0.4, 1.1] | < .001 | 0.4 [0, 0.8] | 0.068 |
| Career Stage |  |  |  |  |  |  |  |
| *Early* | 28.6 | 27.3 | -1.3 (-4.5%) | *Ref* |  | *Ref* |  |
| *Mid* | 32.6 | 32.1 | -0.5 (-1.5%) | 0.8 [0.2, 1.4] | 0.007 | 0.3 [-0.3, 0.9] | 0.264 |
| *Late* | 37.0 | 35.6 | -1.4 (-3.8%) | 0 [-0.6, 0.5] | 0.900 | -0.3 [-0.9, 0.3] | 0.305 |
| Specialty |  |  |  |  |  |  |  |
| *Family Medicine* | 31.0 | 29.3 | -1.7 (-5.5%) | *Ref* |  | *Ref* |  |
| *Internal Medicine or Pediatrics* | 46.9 | 47.8 | 0.9 (1.9%) | 2.6 [2.1, 3.2] | < .001 | 2.7 [2, 3.4] | < .001 |
| *Emergency Medicine* | 26.7 | 26.2 | -0.5 (-1.9%) | 1.3 [0, 2.6] | 0.055 | 0.7 [-0.6, 2] | 0.301 |
| *Surgery* | 33.8 | 34.3 | 0.5 (1.5%) | 2.3 [1.7, 2.9] | < .001 | 1 [0.3, 1.6] | 0.003 |
| *Other* | 56.0 | 57.2 | 1.2 (2.1%) | 3.0 [1.7, 4.2] | < .001 | 2.2 [0.9, 3.4] | 0.001 |
| Practice Variables |  |  |  |  |  |  |  |
| Geography |  |  |  |  |  |  |  |
| *Rural* | 33.2 | 31.5 | -1.7 (-5.1%) | *Ref* |  | *Ref* |  |
| *Urban* | 34.2 | 33.2 | -1 (-2.9%) | 0.7 [-0.1, 1.5] | 0.086 | 0.08 [-0.7, 0.9] | 0.841 |
| Patient Age |  |  |  |  |  |  |  |
| *<18 Years* | 30.8 | 25.8 | -5 (-16.2%) | *Ref* |  | *Ref* |  |
| *18 - 64 Years* | 34.1 | 33.0 | -1.1 (-3.2%) | 4.9 [3.8, 6] | < .001 | 6.7 [5.4, 7.9] | < .001 |
| *65+ Years* | 28.6 | 28.1 | -0.5 (-1.7%) | 7.6 [6.5, 8.8] | < .001 | 7.6 [6.2, 9] | < .001 |
| Patient Sex |  |  |  |  |  |  |  |
| *Female* | 32.1 | 30.2 | -1.9 (-5.9%) | *Ref* |  | *Ref* |  |
| *Male* | 38.7 | 38.4 | -0.3 (-0.8%) | 2.9 [1.6, 4.1] | < .001 | 1.2 [-0.2, 2.7] | 0.103 |
| Patient Comorbidity Index |  |  |  |  |  |  |  |
| *Low* | 33.3 | 31.5 | -1.8 (-5.4%) | *Ref* |  | *Ref* |  |
| *Medium* | 34.6 | 33.0 | -1.6 (-4.6%) | 0.2 [-0.3, 0.7] | 0.376 | -0.3 [-0.8, 0.2] | 0.238 |
| *High* | 35.0 | 35.1 | 0.1 (0.3%) | 2.0 [1.5, 2.5] | < .001 | 0 [-0.6, 0.6] | 0.982 |
| *Missing* | 27.1 | 26.8 | -0.3 (-1.1%) | 1.5 [0.4, 2.6] | 0.007 | -0.9 [-2.1, 0.2] | 0.110 |
| Prescriptions to New Patients |  |  |  |  |  |  |  |
| *Low* | 37.5 | 38.0 | 0.5 (1.3%) | *Ref* |  | *Ref* |  |
| *Medium* | 33.7 | 32.6 | -1.1 (-3.3%) | -1.6 [-2.1, -1.1] | < .001 | -0.6 [-1.1, -0.1] | 0.014 |
| *High* | 32.3 | 29.7 | -2.6 (-8%) | -3.1 [-3.6, -2.6] | < .001 | -1.6 [-2.1, -1] | < .001 |
| *Missing* | 4.5 | 29.1 | 24.6 (546.7%) | 24.0 [20.7, 27.2] | < .001 | 25.6 [22.3, 28.9] | < .001 |

**\*Model adjusted for physician sex, physician career stage, physician specialty, practice geography, patient age, patient sex, patient comorbidity index, and prescriptions to new patients.**