**Supplemental materials for:** Fleming-Dutra et al.Characteristics of primary care physicians associated with high outpatient antibiotic prescribing volume

Modeling methods:

We considered each factor as a primary exposure and performed univariate and multivariate regression analyses. In multivariate analyses, when a factor was the primary exposure, the other factors were considered as potential confounders. For each primary exposure, first, we created a full model using all potential confounders (i.e. the other four factors). Then, we compared this full model to all other possible subsets of potential confounders. Initially, we chose models with PRs of primary exposure (adjusted prevalence ratios) that were within 10% change from the full model. We then chose the best model with adjusted prevalence ratio that is closest to the estimate from the full model and confidence interval that was more precise. However, when adjusted estimates from the other subset models are similar but do not result to substantial increase in precision compared to the full model, we considered the full model as the best model. We computed adjusted PRs and 95% confidence intervals (CIs) for these associations.

**Supplemental Table 1.** Number of physicians, by specialty, meeting exclusion and inclusion criteria by specialty—QuintilesIMS Xponent and AMA Physician Professional Data, 2011

|  |  |
| --- | --- |
| **Criteria** | **Number of Physicians by Specialty** |
|  | **Family practice** | **Internal medicine** | **Pediatrics** |
| Location in the 50 U.S. States (excluding territories) | 95344 | 113301 | 60201 |
| Engaged in direct patient care as primary professional activity | 80032 | 88385 | 48503 |
| Office-based physicians | 73412 | 77610 | 43372 |
| Primary specialty in Quintiles IMS and AMA database matched | 70205 | 66957 | 41189 |
| Age 30 to <65 years | 63146 | 60612 | 36900 |
| Years after graduation >5 | 60692 | 58918 | 35575 |
| 2 or fewer offices | 60212 | 58606 | 35169 |
| Less than 1% of time spent in hospitals  | 43410 | 41383 | 24417 |
| Not in a residency training program | 43410 | 41383 | 24417 |
| Doctor of medicine (MD) degree | 43410 | 41383 | 24417 |
| Without presumed dead flag | 43410 | 41383 | 24417 |
| Antibiotic prescriptions only in one state | 43402 | 41373 | 24411 |
| Antibiotic prescriptions captured | 43350 | 41313 | 24380 |
| **Final number of providers for analysis** | **43350** | **41313** | **24380** |

**Supplementary Table 2.** Unadjusted prevalence ratio for outcome of being a high-volume antibiotic prescriber (in top 25%) for primary care physicians by specialty — United States, 2011

|  |  |
| --- | --- |
|  | **Unadjusted prevalence ratio (95% CI)** |
| **Provider characteristics** | **Family practitioners** | **Internists** | **Pediatricians** |
| **Age group (years)** |
| 30-<40  | Referent | Referent | Referent |
| 40-<50  | 1.25 (1.20, 1.31) | 2.31 (2.18, 2.45) | 1.55 (1.46, 1.64) |
| 50-<65  | 1.32 (1.26, 1.38) | 2.73 (2.58, 2.89) | 1.68 (1.58, 1.78) |
| **Sex** |  |  |  |
| Male | 1.95 (1.88, 2.03) | 1.67 (1.61, 1.73) | 1.62 (1.55, 1.69) |
| Female | Referent | Referent | Referent |
| **Medical school location** |
| Other | Referent | Referent | Referent |
| U.S. State | 1.10 (1.06, 1.14) | 0.97 (0.94, 1.01) | 0.74 (0.71, 0.78) |
| **Region** |
| West | Referent | Referent | Referent |
| Midwest | 1.95 (1.85, 2.06) | 1.50 (1.42, 1.59) | 1.93 (1.78, 2.09) |
| Northeast | 1.09 (1.01, 1.17) | 1.32 (1.25, 1.40) | 1.33 (1.22, 1.44) |
| South | 2.42 (2.30, 2.54) | 1.90 (1.81, 2.00) | 2.56 (2.38, 2.75) |
| **Primary present employmentc** |
| Solo or two-physician practice | 1.26 (1.22, 1.31) | 1.62 (1.56, 1.68) | 1.61 (1.54, 1.70) |
| Group | Referent | Referent | Referent |
| Other | 0.48 (0.41, 0.56) | 0.34 (0.28, 0.42) | 0.25 (0.19, 0.34) |
| Missing | 0.57 (0.54, 0.60) | 0.38 (0.36, 0.40) | 0.45 (0.41, 0.48) |

**Supplemental Table 3.**Top 5 antibiotic agents and classes by specialty—family practice, internal medicine, and pediatrics—for high-volume prescribers and non-high-volume prescribers—United States, 2011

|  |  |  |
| --- | --- | --- |
|  | **Physicians in top 25% of antibiotic prescribers by volume** | **Physicians below top 25% of antibiotic prescribers by volume** |
| **Family practitioners** |  |  |
|  Top 5 antibiotic agents | AzithromycinAmoxicillinAmoxicillin/clavulanic acidCiprofloxacinTrimethoprim-sulfamethoxazole | AzithromycinAmoxicillinTrimethoprim-sulfamethoxazoleCiprofloxacinAmoxicillin/clavulanic acid |
|  Top 5 antibiotic classes | MacrolidesPenicillinsCephalosporinsFluoroquinolonesBeta-lactams, increased activity | MacrolidesPenicillinsFluoroquinolonesCephalosporinsTrimethoprim-sulfamethoxazole |
| **Internists** |  |  |
|  Top 5 antibiotic agents | AzithromycinCiprofloxacinAmoxicillinAmoxicillin/clavulanic acidTrimethoprim-sulfamethoxazole | AzithromycinCiprofloxacinAmoxicillin/clavulanic acidAmoxicillinTrimethoprim-sulfamethoxazole |
|  Top 5 antibiotic classes | MacrolidesFluoroquinolonesPenicillinsCephalosporinsBeta-lactams, increased activity | MacrolidesFluoroquinolonesPenicillinsBeta-lactams, increased activityCephalosporins |
| **Pediatricians** |  |  |
|  Top 5 antibiotic agents | AmoxicillinAzithromycinAmoxicillin/clavulanic acidCefdinirCephalexin | AmoxicillinAzithromycinAmoxicillin/clavulanic acidCefdinirCephalexin |
|  Top 5 antibiotic classes | PenicillinsCephalosporinsMacrolidesBeta-lactams, increased activity Trimethoprim-sulfamethoxazole | PenicillinsCephalosporinsMacrolidesBeta-lactams, increased activityTrimethoprim-sulfamethoxazole |