Results. Because observed/expected ratios based on expected rates that were adjusted for differences in age, sex, and race/ethnicity demonstrated residual confounding by race/ethnicity, we performed race-stratified analyses. *Among white beneficiaries, adjustment for demographic, socioeconomic, and clinical characteristics increased the proportion of variation explained by 1.2% among Health Referral Regions, compared to adjustment for age and sex alone.* However, substantial variation remained, with observed/expected ratios that ranged from 0.61 in Newark NJ to 1.82 in Idaho Falls ID. Ratios above 1.2 were primarily located in the upper Midwest, Great Plains, and mountain west, while ratios below 0.8 were more common in large urban centers. Observed/expected ratios were higher in more rural areas, and were directly related to orthopedic surgeon density. Rates of primary TKA among beneficiaries with dementia, peripheral vascular disease, and leg ulcers were also higher in Health Referral Regions with high observed/expected ratios, as were rates among younger beneficiaries with no comorbidities. Among black beneficiaries, observed/expected ratios in 42 Health Referral Regions ranged from 0.71 to 1.2.