**Supplemental Digital Content 4: Results from primary regression (per procedure analysis) compared to sensitivity analysis (per patient analysis)**

| Characteristic | *Primary analysis* Per procedure analysis AOR (95% CI) | p-value | *Sensitivity analysis* Per patient analysis AOR (95% CI) | p-value |
|---|---|---|---|---|
| Female | 1.05 (1.04-1.06) | <0.0001 | 1.08 (1.07-1.09) | <0.0001 |
| Age | | | | |
| 18-25 | 1 [reference] | | 1 [reference] | |
| 26-35 | 1.37 (1.32-1.43) | <0.0001 | 1.36 (1.30-1.42) | <0.0001 |
| 36-45 | 1.77 (1.70-1.84) | <0.0001 | 1.78 (1.71-1.86) | <0.0001 |
| 46-55 | 2.04 (1.96-2.11) | <0.0001 | 2.07 (1.99-2.15) | <0.0001 |
| 56-65 | 2.27 (2.19-2.36) | <0.0001 | 2.33 (2.24-2.43) | <0.0001 |
| 66-75 | 2.64 (2.55-2.74) | <0.0001 | 2.75 (2.64-2.86) | <0.0001 |
| 76-85 | 2.90 (2.80-3.01) | <0.0001 | 3.00 (2.88-3.12) | <0.0001 |
| ≥ 85 | 2.98 (2.87-3.10) | <0.0001 | 3.13 (3.00-3.27) | <0.0001 |
| Residence | | | | |
| Urban | 1 [reference] | | 1 [reference] | |
| Rural | 0.71 (0.70-0.73) | <0.0001 | 0.72 (0.70-0.73) | <0.0001 |
| Suburban | 1.00 (0.98-1.01) | 0.44 | 0.99 (0.97-1.00) | 0.11 |
| Missing | 0.64 (0.61-0.68) | <0.0001 | 0.66 (0.62-0.71) | <0.0001 |
| Neighbourhood income quintile | | | | |
| Q1 (lowest) | 1 [reference] | | 1 [reference] | |
| Q2 | 1.00 (0.99-1.02) | 0.59 | 1.00 (0.98-1.01) | 0.70 |
| Q3 | 1.00 (0.99-1.02) | 0.73 | 0.99 (0.98-1.01) | 0.35 |
| Q4 | 1.01 (0.99-1.02) | 0.26 | 1.00 (0.99-1.02) | 0.59 |
| Q5 (highest) | 0.99 (0.97-1.00) | 0.06 | 0.98 (0.96-0.99) | 0.00 |
| Comorbidities | | | | |
| Coronary artery disease | 0.92 (0.90-0.95) | <0.0001 | 0.94 (0.91-0.98) | <0.0001 |
| Atrial fibrillation/flutter | 2.58 (2.51-2.66) | <0.0001 | 2.56 (2.46-2.66) | <0.0001 |
| Other cardiac arrhythmia | 0.91 (0.86-0.95) | <0.0001 | 0.88 (0.83-0.93) | <0.0001 |
| Cardiac valvular disease | 0.89 (0.83-0.94) | 0.0001 | 0.85 (0.79-0.92) | <0.0001 |
| Cerebrovascular disease | 1.15 (1.10-1.20) | <0.0001 | 1.15 (1.09-1.22) | <0.0001 |
| Peripheral vascular disease | 0.94 (0.90-0.99) | 0.01 | 0.96 (0.90-1.02) | 0.17 |
| Venous thromboembolism | 1.96 (1.80-2.15) | <0.0001 | 1.83 (1.63-2.05) | <0.0001 |
| Heart failure | 1.55 (1.52-1.57) | <0.0001 | 1.57 (1.53-1.60) | <0.0001 |
| Myocardial infarction | 0.98 (0.93-1.02) | 0.32 | 0.96 (0.90-1.01) | 0.13 |
| Chronic renal disease | 0.99 (0.95-1.02) | 0.46 | 0.99 (0.95-1.04) | 0.78 |
| Liver disease | 1.69 (1.55-1.84) | <0.0001 | 1.75 (1.57-1.95) | <0.0001 |
| Anemia | 1.41 (1.37-1.44) | <0.0001 | 1.39 (1.35-1.43) | <0.0001 |
| Gastrointestinal bleeds | 1.14 (1.10-1.19) | <0.0001 | 1.12 (1.06-1.17) | <0.0001 |
| Other blood diseases | 1.20 (1.13-1.26) | <0.0001 | 1.20 (1.12-1.29) | <0.0001 |
| Asthma | 1.01 (1.00-1.03) | 0.01 | 1.01 (1.00-1.03) | 0.08 |
| COPD | 1.04 (1.03-1.06) | <0.0001 | 1.05 (1.03-1.06) | <0.0001 |
| Cardiac risk factors | | | | |
| Diabetes | 1.62 (1.60-1.63) | <0.0001 | 1.63 (1.61-1.65) | <0.0001 |

| Characteristic | Primary analysis | | Sensitivity analysis | |
|---|---|---|---|---|
| | Per procedure analysis | | Per patient analysis | |
| | AOR (95% CI) | p-value | AOR (95% CI) | p-value |
| Hypertension | 1.25 (1.24-1.27) | <0.0001 | 1.25 (1.23-1.26) | <0.0001 |
| Hyperlipidemia | 1.09 (1.07-1.11) | <0.0001 | 1.09 (1.07-1.12) | <0.0001 |
| Prior cardiac procedures | | | | |
| Aortic valve replacement | 1.42 (1.34-1.50) | <0.0001 | 1.46 (1.36-1.57) | <0.0001 |
| Mitral valve replacement | 2.33 (2.10-2.58) | <0.0001 | 2.34 (2.05-2.67) | <0.0001 |
| Coronary revascularization | 1.00 (0.98-1.02) | 0.72 | 1.00 (0.98-1.03) | 0.86 |
| Device implantation | 1.66 (1.61-1.71) | <0.0001 | 1.64 (1.57-1.71) | <0.0001 |
| Procedure | | | | |
| Low-risk surgery | 1 [reference] | | 1 [reference] | |
| Ophthalmologic surgery | 1.07 (1.05-1.08) | <0.0001 | 1.11 (1.10-1.13) | <0.0001 |
| Preoperative consultations | | | | |
| Outpatient anesthesia | 1.00 (0.98-1.01) | 0.68 | 0.97 (0.95-0.98) | <0.0001 |
| Medical | 1.68 (1.65-1.71) | <0.0001 | 1.68 (1.64-1.71) | <0.0001 |
| Teaching hospital status | 1.00 (0.97-1.04) | 0.78 | 1.01 (0.97-1.04) | 0.78 |
| Hospital procedure volume | | | | |
| Medium procedure volume | 1.03 (1.00-1.06) | 0.06 | 1.02 (1.00-1.05) | 0.10 |
| High procedure volume | 1.06 (1.01-1.12) | 0.03 | 1.06 (1.00-1.11) | 0.04 |
| Adjusted MOR | 2.43 | | 2.47 | |

AOR = adjusted odds ratio; CI = confidence interval; COPD = chronic obstructive pulmonary disorder; MOR = median odds ratio.