**Supplementary Table T2. Interrupted time series model results with maximum auto-correlation lag 2**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | pre-trend | | level change | | trend change | | spring | | summer | | autumn | |
|  | estimate (95% CI) | p | estimate (95% CI) | p | estimate (95% CI) | p | estimate (95% CI) | p | estimate (95% CI) | p | estimate (95% CI) | p |
| Hip Admissions | 0.995 (0.986,1.004) | 0.300 | 1.055 (0.912,1.221) | 0.469 | 0.991 (0.977,1.006) | 0.239 | 1.19 (1.034,1.37) | 0.015 | 1.207 (1.094,1.332) | 0.000 | 1.101 (0.982,1.234) | 0.099 |
| Hip Average Age | -0.015 (-0.102,0.072) | 0.737 | 1.571 (-0.1,3.242) | 0.065 | -0.06 (-0.175,0.055) | 0.307 | 1.52 (-0.07,3.111) | 0.061 | 2.09 (0.811,3.368) | 0.001 | 1.031 (-0.598,2.66) | 0.215 |
| Hip Prop Women | 0.999 (0.995,1.003) | 0.582 | 0.966 (0.861,1.083) | 0.549 | 1.007 (0.999,1.016) | 0.089 | 1.023 (0.941,1.111) | 0.596 | 1.088 (1.001,1.183) | 0.048 | 0.981 (0.888,1.083) | 0.700 |
| Hip Prop 2+ Charlson | 0.994 (0.982,1.007) | 0.380 | 1.411 (1.064,1.873) | 0.017 | 1.01 (0.994,1.027) | 0.220 | 1.195 (0.982,1.455) | 0.075 | 1.306 (1.096,1.557) | 0.003 | 1.003 (0.788,1.276) | 0.982 |
| Hip Prop High Deprivation | 1.003 (0.993,1.013) | 0.587 | 1.027 (0.869,1.214) | 0.754 | 1.004 (0.986,1.022) | 0.660 | 0.937 (0.815,1.076) | 0.358 | 0.877 (0.752,1.022) | 0.093 | 0.996 (0.84,1.18) | 0.963 |
| Hip LoS | -0.006 (-0.034,0.021) | 0.660 | 0.312 (-0.193,0.818) | 0.225 | -0.014 (-0.047,0.02) | 0.425 | 0.502 (0.214,0.79) | 0.001 | 0.135 (-0.194,0.463) | 0.422 | 0.1 (-0.288,0.488) | 0.613 |
| Hip LoS Age 16-59 | -0.003 (-0.028,0.021) | 0.788 | 0.379 (-0.094,0.851) | 0.116 | -0.026 (-0.065,0.013) | 0.190 | 0.223 (-0.156,0.602) | 0.249 | 0.384 (0.065,0.703) | 0.018 | 0.219 (-0.183,0.622) | 0.285 |
| Hip LoS Age 60-69 | -0.004 (-0.034,0.026) | 0.818 | 0.013 (-0.807,0.832) | 0.976 | 0 (-0.053,0.052) | 0.988 | 0.107 (-0.44,0.654) | 0.702 | 0.158 (-0.468,0.783) | 0.621 | 0.162 (-0.487,0.811) | 0.625 |
| Hip LoS Age 70-79 | 0.006 (-0.058,0.069) | 0.862 | -0.753 (-2.003,0.497) | 0.238 | 0.007 (-0.06,0.073) | 0.847 | -0.433 (-1.416,0.549) | 0.387 | -0.842 (-1.93,0.246) | 0.129 | -0.865 (-1.991,0.262) | 0.132 |
| Hip LoS Age 80+ | -0.068 (-0.171,0.036) | 0.199 | 2.109 (0.683,3.535) | 0.004 | -0.002 (-0.128,0.123) | 0.971 | 1.506 (0.515,2.497) | 0.003 | 0.222 (-0.773,1.217) | 0.662 | 1.003 (-0.229,2.235) | 0.111 |
| Hip LoS Men | -0.007 (-0.055,0.041) | 0.776 | 0.347 (-0.583,1.278) | 0.464 | -0.02 (-0.083,0.043) | 0.536 | 0.293 (-0.126,0.712) | 0.170 | 0.289 (-0.196,0.774) | 0.243 | 0.458 (-0.111,1.026) | 0.114 |
| Hip LoS Women | -0.004 (-0.041,0.033) | 0.842 | 0.235 (-0.308,0.778) | 0.396 | -0.014 (-0.055,0.027) | 0.505 | 0.693 (0.309,1.077) | 0.000 | 0.009 (-0.428,0.446) | 0.966 | -0.203 (-0.728,0.323) | 0.449 |
| Hip LoS Charlson 0 | -0.011 (-0.042,0.019) | 0.469 | 0.297 (-0.288,0.882) | 0.319 | -0.005 (-0.042,0.031) | 0.782 | 0.912 (0.549,1.276) | 0.000 | 0.178 (-0.148,0.503) | 0.285 | 0.222 (-0.065,0.509) | 0.129 |
| Hip LoS Charlson 1 | 0.034 (-0.012,0.08) | 0.146 | 0.238 (-0.709,1.184) | 0.623 | -0.077 (-0.145,-0.01) | 0.024 | 0.191 (-0.418,0.801) | 0.538 | 0.312 (-0.405,1.029) | 0.393 | 0.014 (-0.578,0.606) | 0.963 |
| Hip LoS Charlson 2+ | -0.123 (-0.259,0.013) | 0.077 | 0.172 (-2.224,2.569) | 0.888 | 0.116 (-0.016,0.249) | 0.085 | -0.789 (-2.141,0.563) | 0.253 | -0.783 (-2.087,0.521) | 0.239 | 0.188 (-2.051,2.427) | 0.869 |
| Hip LoS Dep 1 | 0.004 (-0.032,0.04) | 0.829 | 0.553 (-0.391,1.496) | 0.251 | -0.017 (-0.068,0.035) | 0.529 | 0.784 (0.107,1.462) | 0.023 | 0.42 (-0.024,0.863) | 0.064 | 0.299 (-0.358,0.956) | 0.373 |
| Hip LoS Dep 2 | -0.038 (-0.083,0.006) | 0.092 | 0.822 (-0.392,2.035) | 0.184 | -0.015 (-0.086,0.055) | 0.670 | 1.509 (0.759,2.258) | 0.000 | 0.66 (-0.246,1.567) | 0.154 | 0.589 (-0.417,1.594) | 0.251 |
| Hip LoS Dep 3 | -0.034 (-0.107,0.038) | 0.353 | 0.617 (-0.897,2.131) | 0.424 | 0.01 (-0.076,0.095) | 0.827 | -0.216 (-1.224,0.792) | 0.675 | -0.424 (-1.378,0.53) | 0.384 | -0.701 (-1.536,0.135) | 0.100 |
| Hip LoS Dep 4 | 0.081 (-0.005,0.166) | 0.064 | -0.473 (-2.181,1.236) | 0.588 | -0.112 (-0.215,-0.009) | 0.034 | -0.374 (-1.65,0.903) | 0.566 | -1.204 (-2.351,-0.057) | 0.040 | -0.491 (-1.918,0.935) | 0.500 |
| Hip LoS Dep 5 | 0.015 (-0.086,0.116) | 0.773 | -0.72 (-2.059,0.62) | 0.292 | 0 (-0.098,0.099) | 0.999 | 0.621 (-0.084,1.327) | 0.084 | 0.689 (-0.31,1.689) | 0.176 | 0.816 (-0.784,2.416) | 0.317 |
| Hip Bed Occ | 0.997 (0.987,1.008) | 0.643 | 1 (0.844,1.186) | 0.997 | 0.987 (0.97,1.005) | 0.149 | 1.291 (1.11,1.501) | 0.001 | 1.283 (1.125,1.463) | 0.000 | 1.146 (0.988,1.328) | 0.071 |
| Hip Public Private | 1.013 (0.985,1.041) | 0.377 | 0.477 (0.29,0.782) | 0.003 | 0.981 (0.951,1.011) | 0.218 | 0.992 (0.809,1.217) | 0.939 | 1.361 (1.166,1.589) | 0.000 | 1.038 (0.847,1.273) | 0.718 |
| Knee Admissions | 0.995 (0.99,1.001) | 0.106 | 0.843 (0.728,0.976) | 0.022 | 1.005 (0.996,1.014) | 0.256 | 1.308 (1.157,1.479) | 0.000 | 1.26 (1.138,1.396) | 0.000 | 1.286 (1.164,1.42) | 0.000 |
| Knee Average Age | -0.078 (-0.157,0.001) | 0.054 | -1.632 (-2.988,-0.276) | 0.018 | 0.211 (0.117,0.305) | 0.000 | 0.926 (-0.112,1.965) | 0.080 | 0.953 (-0.021,1.927) | 0.055 | 0.354 (-0.531,1.24) | 0.433 |
| Knee Prop Women | 1.004 (0.998,1.01) | 0.150 | 0.96 (0.85,1.084) | 0.513 | 0.994 (0.986,1.003) | 0.193 | 1.037 (0.963,1.117) | 0.336 | 1.017 (0.924,1.118) | 0.735 | 1.036 (0.958,1.12) | 0.375 |
| Knee Prop 2+ Charlson | 1.009 (0.993,1.026) | 0.249 | 0.638 (0.455,0.894) | 0.009 | 1.042 (1.017,1.067) | 0.001 | 1.156 (0.911,1.467) | 0.234 | 1.074 (0.849,1.359) | 0.551 | 0.909 (0.628,1.315) | 0.612 |
| Knee Prop High Deprivation | 1.005 (0.997,1.013) | 0.189 | 0.968 (0.786,1.191) | 0.758 | 0.986 (0.974,0.998) | 0.021 | 1.224 (1.077,1.39) | 0.002 | 1.075 (0.942,1.227) | 0.282 | 1.031 (0.902,1.178) | 0.656 |
| Knee LoS | -0.024 (-0.049,0.001) | 0.058 | 0.176 (-0.279,0.63) | 0.449 | -0.008 (-0.036,0.02) | 0.566 | 0.422 (0.073,0.771) | 0.018 | 0.15 (-0.166,0.467) | 0.352 | 0.396 (0.015,0.777) | 0.042 |
| Knee LoS Age 16-59 | -0.016 (-0.037,0.006) | 0.151 | 0.403 (-0.045,0.852) | 0.078 | -0.028 (-0.06,0.005) | 0.096 | 0.484 (0.13,0.839) | 0.007 | 0.422 (-0.021,0.866) | 0.062 | 0.475 (0.19,0.76) | 0.001 |
| Knee LoS Age 16-59 | 0.007 (-0.028,0.043) | 0.684 | -0.295 (-1.015,0.426) | 0.423 | -0.026 (-0.072,0.02) | 0.262 | 0.069 (-0.46,0.599) | 0.797 | -0.194 (-0.687,0.3) | 0.441 | -0.096 (-0.725,0.532) | 0.764 |
| Knee LoS Age 70-79 | -0.009 (-0.057,0.038) | 0.705 | 0.77 (0.002,1.538) | 0.049 | -0.054 (-0.11,0.003) | 0.061 | -0.086 (-0.715,0.542) | 0.787 | -0.552 (-1.163,0.059) | 0.077 | 0.367 (-0.352,1.085) | 0.317 |
| Knee LoS Age 80+ | -0.051 (-0.118,0.015) | 0.131 | -0.562 (-2.298,1.173) | 0.525 | 0.028 (-0.081,0.137) | 0.612 | 1.521 (0.03,3.011) | 0.046 | 1.37 (0.169,2.57) | 0.025 | 1.361 (0.496,2.227) | 0.002 |
| Knee LoS Men | -0.007 (-0.031,0.018) | 0.581 | 0.096 (-0.405,0.597) | 0.708 | -0.033 (-0.068,0.002) | 0.064 | 0.082 (-0.367,0.531) | 0.720 | 0.157 (-0.262,0.575) | 0.464 | 0.205 (-0.221,0.631) | 0.346 |
| Knee LoS Women | -0.042 (-0.084,0) | 0.052 | 0.252 (-0.461,0.966) | 0.488 | 0.017 (-0.029,0.063) | 0.478 | 0.635 (0.048,1.223) | 0.034 | 0.15 (-0.397,0.698) | 0.590 | 0.49 (-0.17,1.151) | 0.146 |
| Knee LoS Charlson 0 | -0.021 (-0.046,0.004) | 0.095 | 0.067 (-0.362,0.495) | 0.760 | -0.011 (-0.045,0.024) | 0.545 | 0.645 (0.334,0.956) | 0.000 | 0.193 (-0.111,0.497) | 0.213 | 0.415 (0.069,0.76) | 0.019 |
| Knee LoS Charlson 1 | -0.03 (-0.074,0.015) | 0.191 | 0.47 (-0.391,1.331) | 0.284 | -0.029 (-0.083,0.025) | 0.298 | 0.455 (-0.043,0.953) | 0.073 | 0.324 (-0.297,0.945) | 0.307 | 1.058 (0.367,1.748) | 0.003 |
| Knee LoS Charlson 2+ | -0.04 (-0.107,0.028) | 0.247 | 0.407 (-2.28,3.095) | 0.766 | -0.022 (-0.196,0.151) | 0.802 | -0.627 (-1.698,0.443) | 0.251 | -0.949 (-2.342,0.444) | 0.182 | -1.433 (-2.229,-0.637) | 0.000 |
| Knee LoS Dep 1 | -0.009 (-0.06,0.041) | 0.712 | -0.035 (-0.726,0.656) | 0.920 | -0.008 (-0.073,0.056) | 0.800 | 0.257 (-0.47,0.985) | 0.488 | 0.096 (-0.619,0.811) | 0.793 | -0.127 (-0.725,0.472) | 0.678 |
| Knee LoS Dep 2 | -0.019 (-0.06,0.022) | 0.358 | 0.199 (-0.699,1.097) | 0.664 | -0.043 (-0.098,0.012) | 0.124 | 0.018 (-0.776,0.812) | 0.965 | -0.731 (-1.49,0.029) | 0.059 | 0.05 (-0.822,0.922) | 0.911 |
| Knee LoS Dep 3 | 0.014 (-0.036,0.064) | 0.586 | -0.426 (-1.355,0.503) | 0.369 | -0.036 (-0.106,0.033) | 0.302 | 0.976 (0.061,1.892) | 0.036 | 0.909 (-0.034,1.852) | 0.059 | 0.547 (-0.217,1.312) | 0.160 |
| Knee LoS Dep 4 | -0.064 (-0.123,-0.004) | 0.035 | 0.634 (-0.293,1.56) | 0.180 | 0.033 (-0.039,0.105) | 0.373 | 0.669 (-0.187,1.525) | 0.126 | 0.617 (0.02,1.214) | 0.043 | 0.852 (-0.208,1.912) | 0.115 |
| Knee LoS Dep 5 | -0.035 (-0.09,0.021) | 0.224 | 0.709 (-0.303,1.721) | 0.170 | 0.015 (-0.046,0.076) | 0.628 | 0.123 (-0.73,0.976) | 0.778 | -0.387 (-1.281,0.507) | 0.397 | 1.104 (0.077,2.131) | 0.035 |
| Knee Bed Occ | 0.993 (0.984,1.002) | 0.103 | 0.834 (0.704,0.989) | 0.037 | 1 (0.989,1.011) | 0.993 | 1.42 (1.297,1.556) | 0.000 | 1.373 (1.218,1.547) | 0.000 | 1.465 (1.312,1.635) | 0.000 |
| Knee Public Private | 1.006 (0.98,1.032) | 0.667 | 0.621 (0.358,1.077) | 0.090 | 0.985 (0.961,1.01) | 0.225 | 1.119 (0.915,1.369) | 0.274 | 1.318 (1.035,1.678) | 0.025 | 1.139 (0.931,1.394) | 0.205 |
| Elec Emerg Ratio | 0.995 (0.987,1.002) | 0.171 | 0.725 (0.64,0.821) | 0.000 | 0.984 (0.974,0.995) | 0.003 | 0.992 (0.887,1.109) | 0.886 | 0.948 (0.833,1.08) | 0.424 | 0.973 (0.86,1.1) | 0.661 |

**Supplementary Table T3. Interrupted time series model results with maximum auto-correlation lag 0**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | pre-trend | | level change | | trend change | | spring | | summer | | autumn | |
|  | estimate (95% CI) | p | estimate (95% CI) | p | estimate (95% CI) | p | estimate (95% CI) | p | estimate (95% CI) | p | estimate (95% CI) | p |
| Hip Admissions | 0.995 (0.985,1.005) | 0.323 | 1.055 (0.902,1.235) | 0.503 | 0.991 (0.978,1.005) | 0.220 | 1.19 (1.036,1.367) | 0.014 | 1.207 (1.088,1.339) | 0.000 | 1.101 (0.983,1.234) | 0.098 |
| Hip Average Age | -0.015 (-0.134,0.104) | 0.806 | 1.571 (-0.863,4.004) | 0.206 | -0.06 (-0.208,0.088) | 0.427 | 1.52 (-0.079,3.119) | 0.062 | 2.09 (0.685,3.494) | 0.004 | 1.031 (-0.505,2.567) | 0.188 |
| Hip Prop Women | 0.999 (0.993,1.004) | 0.674 | 0.966 (0.826,1.13) | 0.662 | 1.007 (0.997,1.017) | 0.158 | 1.023 (0.937,1.116) | 0.617 | 1.088 (0.995,1.189) | 0.064 | 0.981 (0.878,1.096) | 0.730 |
| Hip Prop 2+ Charlson | 0.994 (0.98,1.009) | 0.455 | 1.411 (0.969,2.055) | 0.072 | 1.01 (0.989,1.031) | 0.344 | 1.195 (0.971,1.471) | 0.092 | 1.306 (1.043,1.637) | 0.020 | 1.003 (0.734,1.37) | 0.986 |
| Hip Prop High Deprivation | 1.003 (0.991,1.014) | 0.631 | 1.027 (0.846,1.247) | 0.787 | 1.004 (0.983,1.025) | 0.704 | 0.937 (0.819,1.072) | 0.342 | 0.877 (0.746,1.03) | 0.110 | 0.996 (0.831,1.193) | 0.965 |
| Hip LoS | -0.006 (-0.038,0.026) | 0.704 | 0.312 (-0.262,0.887) | 0.287 | -0.014 (-0.058,0.03) | 0.542 | 0.502 (0.132,0.872) | 0.008 | 0.135 (-0.292,0.562) | 0.537 | 0.1 (-0.287,0.487) | 0.612 |
| Hip LoS Age 16-59 | -0.003 (-0.033,0.026) | 0.821 | 0.379 (-0.165,0.922) | 0.172 | -0.026 (-0.067,0.015) | 0.210 | 0.223 (-0.17,0.617) | 0.266 | 0.384 (0.053,0.715) | 0.023 | 0.219 (-0.168,0.607) | 0.267 |
| Hip LoS Age 60-69 | -0.004 (-0.046,0.039) | 0.871 | 0.013 (-1.026,1.052) | 0.981 | 0 (-0.069,0.068) | 0.990 | 0.107 (-0.592,0.805) | 0.765 | 0.158 (-0.514,0.829) | 0.645 | 0.162 (-0.588,0.912) | 0.672 |
| Hip LoS Age 70-79 | 0.006 (-0.067,0.078) | 0.879 | -0.753 (-2.031,0.525) | 0.248 | 0.007 (-0.069,0.082) | 0.865 | -0.433 (-1.583,0.716) | 0.460 | -0.842 (-2.028,0.344) | 0.164 | -0.865 (-2.164,0.435) | 0.192 |
| Hip LoS Age 80+ | -0.068 (-0.193,0.058) | 0.291 | 2.109 (0.536,3.682) | 0.009 | -0.002 (-0.16,0.155) | 0.977 | 1.506 (-0.007,3.018) | 0.051 | 0.222 (-1.036,1.48) | 0.729 | 1.003 (-0.375,2.38) | 0.154 |
| Hip LoS Men | -0.007 (-0.056,0.042) | 0.783 | 0.347 (-0.58,1.275) | 0.463 | -0.02 (-0.084,0.044) | 0.543 | 0.293 (-0.283,0.87) | 0.319 | 0.289 (-0.314,0.892) | 0.347 | 0.458 (-0.15,1.066) | 0.140 |
| Hip LoS Women | -0.004 (-0.048,0.041) | 0.868 | 0.235 (-0.563,1.033) | 0.564 | -0.014 (-0.071,0.043) | 0.634 | 0.693 (0.164,1.222) | 0.010 | 0.009 (-0.543,0.562) | 0.973 | -0.203 (-0.727,0.322) | 0.448 |
| Hip LoS Charlson 0 | -0.011 (-0.047,0.024) | 0.532 | 0.297 (-0.428,1.023) | 0.422 | -0.005 (-0.049,0.039) | 0.817 | 0.912 (0.522,1.302) | 0.000 | 0.178 (-0.232,0.587) | 0.396 | 0.222 (-0.135,0.579) | 0.223 |
| Hip LoS Charlson 1 | 0.034 (-0.023,0.091) | 0.240 | 0.238 (-0.704,1.179) | 0.621 | -0.077 (-0.157,0.002) | 0.056 | 0.191 (-0.562,0.945) | 0.619 | 0.312 (-0.397,1.022) | 0.388 | 0.014 (-0.544,0.572) | 0.960 |
| Hip LoS Charlson 2+ | -0.123 (-0.266,0.02) | 0.092 | 0.172 (-2.155,2.5) | 0.885 | 0.116 (-0.04,0.273) | 0.144 | -0.789 (-2.218,0.64) | 0.279 | -0.783 (-2.108,0.541) | 0.246 | 0.188 (-1.779,2.156) | 0.851 |
| Hip LoS Dep 1 | 0.004 (-0.039,0.047) | 0.857 | 0.553 (-0.509,1.614) | 0.307 | -0.017 (-0.078,0.045) | 0.599 | 0.784 (0.118,1.451) | 0.021 | 0.42 (-0.084,0.923) | 0.102 | 0.299 (-0.356,0.954) | 0.371 |
| Hip LoS Dep 2 | -0.038 (-0.087,0.01) | 0.124 | 0.822 (-0.528,2.172) | 0.233 | -0.015 (-0.103,0.072) | 0.730 | 1.509 (0.797,2.22) | 0.000 | 0.66 (-0.225,1.546) | 0.144 | 0.589 (-0.26,1.437) | 0.174 |
| Hip LoS Dep 3 | -0.034 (-0.096,0.027) | 0.275 | 0.617 (-1.066,2.3) | 0.472 | 0.01 (-0.09,0.109) | 0.851 | -0.216 (-1.343,0.912) | 0.708 | -0.424 (-1.475,0.627) | 0.429 | -0.701 (-1.667,0.266) | 0.155 |
| Hip LoS Dep 4 | 0.081 (-0.023,0.185) | 0.129 | -0.473 (-2.643,1.698) | 0.670 | -0.112 (-0.258,0.034) | 0.134 | -0.374 (-1.695,0.947) | 0.579 | -1.204 (-2.409,0.001) | 0.050 | -0.491 (-1.978,0.995) | 0.517 |
| Hip LoS Dep 5 | 0.015 (-0.112,0.142) | 0.819 | -0.72 (-2.66,1.221) | 0.467 | 0 (-0.135,0.135) | 0.999 | 0.621 (-0.412,1.655) | 0.239 | 0.689 (-0.485,1.864) | 0.250 | 0.816 (-0.891,2.524) | 0.349 |
| Hip Bed Occ | 0.997 (0.987,1.009) | 0.653 | 1 (0.824,1.215) | 0.997 | 0.987 (0.972,1.002) | 0.097 | 1.291 (1.125,1.48) | 0.000 | 1.283 (1.129,1.458) | 0.000 | 1.146 (0.984,1.334) | 0.080 |
| Hip Public Private | 1.013 (0.985,1.041) | 0.377 | 0.477 (0.29,0.782) | 0.003 | 0.981 (0.951,1.011) | 0.218 | 0.992 (0.809,1.217) | 0.939 | 1.361 (1.166,1.589) | 0.000 | 1.038 (0.847,1.273) | 0.718 |
| Knee Admissions | 0.995 (0.987,1.004) | 0.274 | 0.843 (0.702,1.013) | 0.068 | 1.005 (0.993,1.017) | 0.422 | 1.308 (1.154,1.483) | 0.000 | 1.26 (1.114,1.426) | 0.000 | 1.286 (1.147,1.441) | 0.000 |
| Knee Average Age | -0.078 (-0.157,0.001) | 0.053 | -1.632 (-3.299,0.035) | 0.055 | 0.211 (0.102,0.32) | 0.000 | 0.926 (-0.129,1.981) | 0.085 | 0.953 (-0.257,2.163) | 0.123 | 0.354 (-0.777,1.485) | 0.540 |
| Knee Prop Women | 1.004 (0.998,1.011) | 0.182 | 0.96 (0.84,1.097) | 0.551 | 0.994 (0.986,1.003) | 0.184 | 1.037 (0.939,1.146) | 0.474 | 1.017 (0.908,1.138) | 0.776 | 1.036 (0.928,1.157) | 0.529 |
| Knee Prop 2+ Charlson | 1.009 (0.988,1.031) | 0.384 | 0.638 (0.392,1.037) | 0.070 | 1.042 (1.008,1.077) | 0.015 | 1.156 (0.891,1.501) | 0.276 | 1.074 (0.829,1.393) | 0.589 | 0.909 (0.636,1.299) | 0.600 |
| Knee Prop High Deprivation | 1.005 (0.997,1.014) | 0.237 | 0.968 (0.784,1.195) | 0.761 | 0.986 (0.974,0.998) | 0.023 | 1.224 (1.099,1.363) | 0.000 | 1.075 (0.956,1.209) | 0.225 | 1.031 (0.911,1.166) | 0.631 |
| Knee LoS | -0.024 (-0.052,0.004) | 0.089 | 0.176 (-0.352,0.703) | 0.515 | -0.008 (-0.041,0.025) | 0.625 | 0.422 (0.117,0.726) | 0.007 | 0.15 (-0.174,0.475) | 0.364 | 0.396 (0.027,0.765) | 0.036 |
| Knee LoS Age 16-59 | -0.016 (-0.048,0.017) | 0.352 | 0.403 (-0.286,1.093) | 0.252 | -0.028 (-0.074,0.019) | 0.246 | 0.484 (0.111,0.857) | 0.011 | 0.422 (-0.111,0.956) | 0.121 | 0.475 (0.056,0.893) | 0.026 |
| Knee LoS Age 16-59 | 0.007 (-0.026,0.041) | 0.664 | -0.295 (-1.22,0.63) | 0.532 | -0.026 (-0.085,0.033) | 0.384 | 0.069 (-0.465,0.604) | 0.799 | -0.194 (-0.754,0.366) | 0.497 | -0.096 (-0.673,0.48) | 0.743 |
| Knee LoS Age 70-79 | -0.009 (-0.072,0.054) | 0.775 | 0.77 (-0.267,1.807) | 0.145 | -0.054 (-0.128,0.02) | 0.154 | -0.086 (-0.782,0.609) | 0.808 | -0.552 (-1.267,0.163) | 0.130 | 0.367 (-0.528,1.261) | 0.421 |
| Knee LoS Age 80+ | -0.051 (-0.154,0.051) | 0.327 | -0.562 (-2.568,1.443) | 0.583 | 0.028 (-0.105,0.161) | 0.678 | 1.521 (-0.076,3.118) | 0.062 | 1.37 (-0.178,2.918) | 0.083 | 1.361 (-0.071,2.794) | 0.063 |
| Knee LoS Men | -0.007 (-0.037,0.023) | 0.656 | 0.096 (-0.512,0.704) | 0.758 | -0.033 (-0.075,0.009) | 0.121 | 0.082 (-0.382,0.547) | 0.729 | 0.157 (-0.272,0.585) | 0.474 | 0.205 (-0.265,0.675) | 0.392 |
| Knee LoS Women | -0.042 (-0.088,0.004) | 0.071 | 0.252 (-0.495,1) | 0.508 | 0.017 (-0.036,0.07) | 0.536 | 0.635 (0.107,1.164) | 0.019 | 0.15 (-0.365,0.666) | 0.567 | 0.49 (-0.022,1.003) | 0.061 |
| Knee LoS Charlson 0 | -0.021 (-0.054,0.012) | 0.214 | 0.067 (-0.49,0.624) | 0.814 | -0.011 (-0.056,0.034) | 0.643 | 0.645 (0.278,1.013) | 0.001 | 0.193 (-0.146,0.533) | 0.265 | 0.415 (-0.078,0.907) | 0.099 |
| Knee LoS Charlson 1 | -0.03 (-0.081,0.022) | 0.260 | 0.47 (-0.741,1.681) | 0.447 | -0.029 (-0.093,0.036) | 0.384 | 0.455 (-0.111,1.021) | 0.115 | 0.324 (-0.426,1.074) | 0.398 | 1.058 (0.262,1.854) | 0.009 |
| Knee LoS Charlson 2+ | -0.04 (-0.111,0.032) | 0.276 | 0.407 (-2.137,2.951) | 0.754 | -0.022 (-0.184,0.14) | 0.788 | -0.627 (-1.883,0.628) | 0.327 | -0.949 (-2.145,0.247) | 0.120 | -1.433 (-2.278,-0.589) | 0.001 |
| Knee LoS Dep 1 | -0.009 (-0.064,0.045) | 0.733 | -0.035 (-0.918,0.847) | 0.937 | -0.008 (-0.082,0.066) | 0.826 | 0.257 (-0.443,0.958) | 0.471 | 0.096 (-0.699,0.89) | 0.813 | -0.127 (-0.786,0.532) | 0.706 |
| Knee LoS Dep 2 | -0.019 (-0.065,0.026) | 0.413 | 0.199 (-1.031,1.429) | 0.751 | -0.043 (-0.116,0.031) | 0.253 | 0.018 (-0.822,0.858) | 0.967 | -0.731 (-1.538,0.077) | 0.076 | 0.05 (-0.819,0.919) | 0.910 |
| Knee LoS Dep 3 | 0.014 (-0.05,0.078) | 0.670 | -0.426 (-1.892,1.04) | 0.569 | -0.036 (-0.116,0.043) | 0.369 | 0.976 (-0.09,2.043) | 0.073 | 0.909 (-0.134,1.952) | 0.088 | 0.547 (-0.408,1.503) | 0.261 |
| Knee LoS Dep 4 | -0.064 (-0.143,0.015) | 0.113 | 0.634 (-0.591,1.858) | 0.310 | 0.033 (-0.057,0.123) | 0.474 | 0.669 (-0.193,1.531) | 0.128 | 0.617 (-0.032,1.266) | 0.063 | 0.852 (-0.138,1.842) | 0.092 |
| Knee LoS Dep 5 | -0.035 (-0.116,0.047) | 0.405 | 0.709 (-0.701,2.119) | 0.324 | 0.015 (-0.076,0.106) | 0.745 | 0.123 (-0.882,1.128) | 0.810 | -0.387 (-1.379,0.606) | 0.445 | 1.104 (-0.268,2.476) | 0.115 |
| Knee Bed Occ | 0.993 (0.984,1.001) | 0.074 | 0.834 (0.711,0.979) | 0.027 | 1 (0.989,1.011) | 0.993 | 1.42 (1.269,1.59) | 0.000 | 1.373 (1.217,1.548) | 0.000 | 1.465 (1.287,1.667) | 0.000 |
| Knee Public Private | 1.006 (0.98,1.032) | 0.667 | 0.621 (0.358,1.077) | 0.090 | 0.985 (0.961,1.01) | 0.225 | 1.119 (0.915,1.369) | 0.274 | 1.318 (1.035,1.678) | 0.025 | 1.139 (0.931,1.394) | 0.205 |
| Elec Emerg Ratio | 0.995 (0.987,1.002) | 0.167 | 0.725 (0.637,0.825) | 0.000 | 0.984 (0.975,0.994) | 0.001 | 0.992 (0.889,1.106) | 0.884 | 0.948 (0.84,1.07) | 0.392 | 0.973 (0.879,1.076) | 0.591 |

**Supplementary Table T4. Interrupted time series model results with maximum auto-correlation lag 5**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | pre-trend | | level change | | trend change | | spring | | summer | | autumn | |
|  | estimate (95% CI) | p | estimate (95% CI) | p | estimate (95% CI) | p | estimate (95% CI) | p | estimate (95% CI) | p | estimate (95% CI) | p |
| Hip Admissions | 0.995 (0.987,1.003) | 0.249 | 1.055 (0.917,1.215) | 0.454 | 0.991 (0.978,1.005) | 0.217 | 1.19 (1.04,1.362) | 0.012 | 1.207 (1.104,1.32) | 0.000 | 1.101 (0.993,1.221) | 0.069 |
| Hip Average Age | -0.015 (-0.094,0.065) | 0.714 | 1.571 (0.241,2.901) | 0.021 | -0.06 (-0.168,0.048) | 0.277 | 1.52 (-0.178,3.218) | 0.079 | 2.09 (0.818,3.361) | 0.001 | 1.031 (-0.639,2.701) | 0.226 |
| Hip Prop Women | 0.999 (0.995,1.002) | 0.503 | 0.966 (0.895,1.042) | 0.367 | 1.007 (1.001,1.014) | 0.027 | 1.023 (0.932,1.122) | 0.636 | 1.088 (1,1.184) | 0.051 | 0.981 (0.879,1.094) | 0.727 |
| Hip Prop 2+ Charlson | 0.994 (0.985,1.004) | 0.261 | 1.411 (1.116,1.785) | 0.004 | 1.01 (1,1.02) | 0.042 | 1.195 (0.979,1.459) | 0.079 | 1.306 (1.111,1.535) | 0.001 | 1.003 (0.792,1.27) | 0.981 |
| Hip Prop High Deprivation | 1.003 (0.994,1.012) | 0.551 | 1.027 (0.883,1.195) | 0.729 | 1.004 (0.99,1.018) | 0.577 | 0.937 (0.805,1.091) | 0.400 | 0.877 (0.752,1.022) | 0.092 | 0.996 (0.847,1.171) | 0.961 |
| Hip LoS | -0.006 (-0.029,0.017) | 0.605 | 0.312 (-0.12,0.745) | 0.157 | -0.014 (-0.042,0.015) | 0.346 | 0.502 (0.286,0.718) | 0.000 | 0.135 (-0.191,0.461) | 0.418 | 0.1 (-0.332,0.532) | 0.650 |
| Hip LoS Age 16-59 | -0.003 (-0.026,0.02) | 0.773 | 0.379 (-0.046,0.803) | 0.080 | -0.026 (-0.062,0.01) | 0.152 | 0.223 (-0.113,0.559) | 0.193 | 0.384 (0.09,0.679) | 0.011 | 0.219 (-0.191,0.63) | 0.295 |
| Hip LoS Age 60-69 | -0.004 (-0.031,0.024) | 0.799 | 0.013 (-0.766,0.791) | 0.975 | 0 (-0.051,0.05) | 0.987 | 0.107 (-0.33,0.543) | 0.632 | 0.158 (-0.451,0.766) | 0.611 | 0.162 (-0.352,0.676) | 0.537 |
| Hip LoS Age 70-79 | 0.006 (-0.054,0.065) | 0.853 | -0.753 (-1.944,0.438) | 0.215 | 0.007 (-0.056,0.069) | 0.836 | -0.433 (-1.343,0.476) | 0.350 | -0.842 (-1.91,0.226) | 0.122 | -0.865 (-2.063,0.334) | 0.157 |
| Hip LoS Age 80+ | -0.068 (-0.147,0.012) | 0.097 | 2.109 (0.803,3.414) | 0.002 | -0.002 (-0.111,0.107) | 0.967 | 1.506 (0.499,2.513) | 0.003 | 0.222 (-0.799,1.243) | 0.670 | 1.003 (-0.111,2.116) | 0.078 |
| Hip LoS Men | -0.007 (-0.047,0.033) | 0.732 | 0.347 (-0.44,1.135) | 0.387 | -0.02 (-0.073,0.033) | 0.458 | 0.293 (-0.117,0.704) | 0.161 | 0.289 (-0.193,0.771) | 0.239 | 0.458 (-0.163,1.079) | 0.149 |
| Hip LoS Women | -0.004 (-0.035,0.028) | 0.816 | 0.235 (-0.271,0.741) | 0.362 | -0.014 (-0.046,0.018) | 0.391 | 0.693 (0.395,0.991) | 0.000 | 0.009 (-0.421,0.439) | 0.966 | -0.203 (-0.762,0.357) | 0.477 |
| Hip LoS Charlson 0 | -0.011 (-0.039,0.016) | 0.418 | 0.297 (-0.242,0.837) | 0.280 | -0.005 (-0.035,0.025) | 0.738 | 0.912 (0.617,1.208) | 0.000 | 0.178 (-0.123,0.478) | 0.247 | 0.222 (-0.066,0.51) | 0.131 |
| Hip LoS Charlson 1 | 0.034 (0.003,0.065) | 0.030 | 0.238 (-0.604,1.08) | 0.580 | -0.077 (-0.137,-0.018) | 0.011 | 0.191 (-0.385,0.767) | 0.515 | 0.312 (-0.431,1.056) | 0.410 | 0.014 (-0.563,0.591) | 0.962 |
| Hip LoS Charlson 2+ | -0.123 (-0.239,-0.007) | 0.038 | 0.172 (-1.97,2.314) | 0.875 | 0.116 (0.005,0.228) | 0.040 | -0.789 (-2.189,0.611) | 0.269 | -0.783 (-2.119,0.553) | 0.250 | 0.188 (-2.176,2.552) | 0.876 |
| Hip LoS Dep 1 | 0.004 (-0.029,0.037) | 0.814 | 0.553 (-0.303,1.408) | 0.206 | -0.017 (-0.065,0.032) | 0.501 | 0.784 (0.131,1.437) | 0.019 | 0.42 (-0.034,0.874) | 0.070 | 0.299 (-0.401,0.999) | 0.402 |
| Hip LoS Dep 2 | -0.038 (-0.083,0.006) | 0.092 | 0.822 (-0.167,1.81) | 0.103 | -0.015 (-0.078,0.047) | 0.630 | 1.509 (0.737,2.28) | 0.000 | 0.66 (-0.202,1.522) | 0.133 | 0.589 (-0.461,1.638) | 0.272 |
| Hip LoS Dep 3 | -0.034 (-0.102,0.033) | 0.319 | 0.617 (-0.789,2.023) | 0.390 | 0.01 (-0.072,0.091) | 0.819 | -0.216 (-1.011,0.579) | 0.595 | -0.424 (-1.293,0.445) | 0.339 | -0.701 (-1.351,-0.05) | 0.035 |
| Hip LoS Dep 4 | 0.081 (0.017,0.144) | 0.013 | -0.473 (-1.858,0.913) | 0.504 | -0.112 (-0.189,-0.035) | 0.004 | -0.374 (-1.59,0.842) | 0.547 | -1.204 (-2.355,-0.053) | 0.040 | -0.491 (-1.989,1.007) | 0.520 |
| Hip LoS Dep 5 | 0.015 (-0.056,0.085) | 0.682 | -0.72 (-1.647,0.208) | 0.128 | 0 (-0.07,0.07) | 0.998 | 0.621 (-0.104,1.347) | 0.093 | 0.689 (-0.25,1.629) | 0.150 | 0.816 (-0.696,2.329) | 0.290 |
| Hip Bed Occ | 0.997 (0.987,1.008) | 0.627 | 1 (0.862,1.161) | 0.996 | 0.987 (0.97,1.004) | 0.128 | 1.291 (1.116,1.492) | 0.001 | 1.283 (1.14,1.444) | 0.000 | 1.146 (0.99,1.326) | 0.068 |
| Hip Public Private | 1.013 (0.985,1.041) | 0.377 | 0.477 (0.29,0.782) | 0.003 | 0.981 (0.951,1.011) | 0.218 | 0.992 (0.809,1.217) | 0.939 | 1.361 (1.166,1.589) | 0.000 | 1.038 (0.847,1.273) | 0.718 |
| Knee Admissions | 0.995 (0.992,0.999) | 0.016 | 0.843 (0.761,0.934) | 0.001 | 1.005 (0.998,1.012) | 0.170 | 1.308 (1.154,1.482) | 0.000 | 1.26 (1.16,1.369) | 0.000 | 1.286 (1.178,1.403) | 0.000 |
| Knee Average Age | -0.078 (-0.152,-0.005) | 0.037 | -1.632 (-2.825,-0.439) | 0.007 | 0.211 (0.128,0.293) | 0.000 | 0.926 (-0.072,1.924) | 0.069 | 0.953 (0.077,1.829) | 0.033 | 0.354 (-0.422,1.13) | 0.371 |
| Knee Prop Women | 1.004 (0.999,1.009) | 0.086 | 0.96 (0.861,1.071) | 0.465 | 0.994 (0.987,1.001) | 0.097 | 1.037 (0.973,1.105) | 0.260 | 1.017 (0.922,1.121) | 0.743 | 1.036 (0.966,1.111) | 0.319 |
| Knee Prop 2+ Charlson | 1.009 (0.993,1.026) | 0.250 | 0.638 (0.468,0.869) | 0.004 | 1.042 (1.021,1.064) | 0.000 | 1.156 (0.931,1.436) | 0.190 | 1.074 (0.841,1.372) | 0.567 | 0.909 (0.626,1.321) | 0.617 |
| Knee Prop High Deprivation | 1.005 (0.999,1.011) | 0.107 | 0.968 (0.835,1.122) | 0.664 | 0.986 (0.977,0.995) | 0.003 | 1.224 (1.082,1.384) | 0.001 | 1.075 (0.95,1.217) | 0.251 | 1.031 (0.924,1.149) | 0.586 |
| Knee LoS | -0.024 (-0.047,-0.001) | 0.042 | 0.176 (-0.2,0.551) | 0.360 | -0.008 (-0.031,0.015) | 0.490 | 0.422 (0.033,0.81) | 0.033 | 0.15 (-0.199,0.499) | 0.398 | 0.396 (-0.011,0.803) | 0.057 |
| Knee LoS Age 16-59 | -0.016 (-0.032,0.001) | 0.068 | 0.403 (0.008,0.799) | 0.046 | -0.028 (-0.059,0.003) | 0.081 | 0.484 (0.198,0.77) | 0.001 | 0.422 (-0.01,0.855) | 0.056 | 0.475 (0.216,0.734) | 0.000 |
| Knee LoS Age 16-59 | 0.007 (-0.018,0.033) | 0.571 | -0.295 (-0.854,0.265) | 0.302 | -0.026 (-0.062,0.009) | 0.147 | 0.069 (-0.455,0.593) | 0.795 | -0.194 (-0.652,0.265) | 0.407 | -0.096 (-0.713,0.52) | 0.759 |
| Knee LoS Age 70-79 | -0.009 (-0.045,0.027) | 0.616 | 0.77 (0.101,1.439) | 0.024 | -0.054 (-0.096,-0.012) | 0.012 | -0.086 (-0.736,0.563) | 0.794 | -0.552 (-1.116,0.012) | 0.055 | 0.367 (-0.3,1.034) | 0.281 |
| Knee LoS Age 80+ | -0.051 (-0.097,-0.006) | 0.026 | -0.562 (-1.849,0.724) | 0.391 | 0.028 (-0.062,0.119) | 0.541 | 1.521 (0.119,2.923) | 0.034 | 1.37 (0.391,2.349) | 0.006 | 1.361 (0.617,2.106) | 0.000 |
| Knee LoS Men | -0.007 (-0.028,0.014) | 0.514 | 0.096 (-0.297,0.488) | 0.633 | -0.033 (-0.062,-0.004) | 0.024 | 0.082 (-0.416,0.58) | 0.746 | 0.157 (-0.244,0.558) | 0.444 | 0.205 (-0.149,0.559) | 0.256 |
| Knee LoS Women | -0.042 (-0.079,-0.005) | 0.027 | 0.252 (-0.356,0.861) | 0.416 | 0.017 (-0.018,0.052) | 0.350 | 0.635 (-0.036,1.307) | 0.064 | 0.15 (-0.454,0.754) | 0.625 | 0.49 (-0.258,1.239) | 0.199 |
| Knee LoS Charlson 0 | -0.021 (-0.044,0.002) | 0.077 | 0.067 (-0.312,0.446) | 0.730 | -0.011 (-0.036,0.015) | 0.419 | 0.645 (0.331,0.959) | 0.000 | 0.193 (-0.129,0.516) | 0.240 | 0.415 (0.075,0.754) | 0.017 |
| Knee LoS Charlson 1 | -0.03 (-0.064,0.005) | 0.092 | 0.47 (-0.199,1.139) | 0.169 | -0.029 (-0.067,0.01) | 0.145 | 0.455 (-0.097,1.007) | 0.106 | 0.324 (-0.341,0.988) | 0.340 | 1.058 (0.384,1.731) | 0.002 |
| Knee LoS Charlson 2+ | -0.04 (-0.092,0.012) | 0.134 | 0.407 (-1.956,2.771) | 0.736 | -0.022 (-0.184,0.14) | 0.789 | -0.627 (-1.625,0.37) | 0.218 | -0.949 (-2.374,0.476) | 0.192 | -1.433 (-2.175,-0.691) | 0.000 |
| Knee LoS Dep 1 | -0.009 (-0.05,0.031) | 0.644 | -0.035 (-0.656,0.586) | 0.911 | -0.008 (-0.059,0.043) | 0.750 | 0.257 (-0.541,1.056) | 0.527 | 0.096 (-0.581,0.772) | 0.782 | -0.127 (-0.724,0.47) | 0.677 |
| Knee LoS Dep 2 | -0.019 (-0.055,0.017) | 0.300 | 0.199 (-0.57,0.968) | 0.612 | -0.043 (-0.086,0) | 0.049 | 0.018 (-0.731,0.767) | 0.962 | -0.731 (-1.507,0.046) | 0.065 | 0.05 (-0.887,0.987) | 0.917 |
| Knee LoS Dep 3 | 0.014 (-0.031,0.059) | 0.544 | -0.426 (-1.102,0.25) | 0.217 | -0.036 (-0.095,0.022) | 0.220 | 0.976 (0.281,1.672) | 0.006 | 0.909 (-0.067,1.886) | 0.068 | 0.547 (-0.12,1.215) | 0.108 |
| Knee LoS Dep 4 | -0.064 (-0.127,-0.001) | 0.047 | 0.634 (-0.165,1.432) | 0.120 | 0.033 (-0.04,0.106) | 0.380 | 0.669 (-0.076,1.414) | 0.079 | 0.617 (0.007,1.227) | 0.047 | 0.852 (-0.274,1.978) | 0.138 |
| Knee LoS Dep 5 | -0.035 (-0.087,0.018) | 0.194 | 0.709 (-0.225,1.643) | 0.137 | 0.015 (-0.042,0.072) | 0.606 | 0.123 (-0.701,0.947) | 0.770 | -0.387 (-1.304,0.531) | 0.409 | 1.104 (0.188,2.02) | 0.018 |
| Knee Bed Occ | 0.993 (0.986,0.999) | 0.032 | 0.834 (0.728,0.956) | 0.009 | 1 (0.991,1.009) | 0.991 | 1.42 (1.308,1.542) | 0.000 | 1.373 (1.213,1.553) | 0.000 | 1.465 (1.318,1.627) | 0.000 |
| Knee Public Private | 1.006 (0.98,1.032) | 0.667 | 0.621 (0.358,1.077) | 0.090 | 0.985 (0.961,1.01) | 0.225 | 1.119 (0.915,1.369) | 0.274 | 1.318 (1.035,1.678) | 0.025 | 1.139 (0.931,1.394) | 0.205 |
| Elec Emerg Ratio | 0.995 (0.987,1.003) | 0.198 | 0.725 (0.635,0.828) | 0.000 | 0.984 (0.974,0.995) | 0.004 | 0.992 (0.898,1.095) | 0.872 | 0.948 (0.835,1.077) | 0.414 | 0.973 (0.849,1.114) | 0.690 |