

*Appendix B*

**Table A1.** Regression output of the association between patient characteristics and In-hospital mortality per year

Dep. var. In-hospital mortality (logistic regression)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
<b>Female</b>	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference
<b>Male</b>	1.503 (0.480)	1.047 (0.309)	1.153 (0.427)	1.509 (0.484)	2.816** (1.147)	3.057*** (0.964)	2.054** (0.611)	2.284*** (0.555)	1.667* (0.449)	1.804** (0.500)	1.451 (0.376)
<b>Age 0-14</b>	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference
<b>Age 15-24</b>	0.062*** (0.052)		0.136** (0.121)	1.371 (1.717)			0.078** (0.088)	0.034*** (0.038)	0.052** (0.060)	0.222* (0.203)	0.161 (0.228)
<b>Age 25-34</b>	0.078*** (0.061)	0.092*** (0.069)	0.107** (0.096)	1.433 (1.719)	0.598 (0.575)	0.151*** (0.107)	0.460 (0.295)	0.138*** (0.088)	0.278* (0.184)	0.886 (0.560)	0.514 (0.576)
<b>Age 35-44</b>	0.064*** (0.050)	0.086*** (0.062)	0.165** (0.133)	1.875 (2.120)	0.324 (0.312)	0.083*** (0.062)	0.413 (0.268)	0.447* (0.219)	0.468 (0.270)	0.539 (0.348)	1.297 (1.368)
<b>Age 45-54</b>	0.096*** (0.075)	0.182** (0.124)	0.107** (0.099)	1.331 (1.532)	0.299 (0.291)	0.166*** (0.103)	0.507 (0.311)	0.183*** (0.098)	0.245** (0.143)	0.527 (0.319)	1.433 (1.544)
<b>Age 55-64</b>	0.302 (0.223)	0.377 (0.240)	0.480 (0.406)	4.070 (4.523)	0.568 (0.519)	0.224** (0.151)	0.474 (0.311)	0.291** (0.155)	0.277** (0.158)	0.630 (0.359)	1.306 (1.469)
<b>Age 65-74</b>	0.504 (0.346)	0.713 (0.432)	1.156 (0.944)	3.113 (3.528)	0.499 (0.476)	0.266** (0.169)	0.520 (0.347)	0.746 (0.337)	0.180** (0.121)	0.153** (0.127)	1.592 (1.809)
<b>Age 75-84</b>	0.692 (0.465)	1.663 (0.888)	2.179 (1.708)	1.633 (1.920)	1.829 (1.500)	0.800 (0.418)	1.203 (0.733)	0.506 (0.274)	0.322* (0.189)	1.213 (0.633)	3.656 (4.065)

<b>Age 85+</b>											3.288 (3.737)
<b>Charlson Comorbidity Index =0</b>	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference
<b>Charlson Comorbidity Index =1</b>	2.036 (0.968)	1.497 (0.712)	1.422 (0.709)	1.753 (0.891)	2.607** (1.233)	1.151 (0.565)	2.716*** (0.974)	2.498*** (0.746)	3.276*** (1.143)	3.040*** (1.143)	2.531*** (0.906)
<b>Charlson Comorbidity Index =2</b>	2.534 (1.587)	2.591* (1.376)	1.664 (1.105)	10.51*** (5.081)	1.608 (1.389)	2.950** (1.437)	3.241** (1.679)	2.400* (1.078)	5.032*** (2.278)	6.524*** (3.073)	2.597** (1.242)
<b>Charlson Comorbidity Index =3</b>	3.538 (2.750)	6.734*** (3.864)	2.126 (1.691)	20.56*** (13.29)		4.261** (2.710)	7.221*** (3.980)	2.920* (1.696)	5.085** (3.271)	13.64*** (6.937)	5.439*** (2.872)
<b>Charlson Comorbidity Index =4</b>		4.152* (3.245)		6.496* (6.826)	12.43*** (10.54)	3.495 (3.104)	7.532*** (5.352)	7.298*** (4.017)	7.825*** (5.887)	8.255*** (5.844)	4.142** (2.696)
<b>Charlson Comorbidity Index =5</b>	35.79*** (29.72)	5.500 (6.431)	9.950*** (8.158)	25.25*** (28.63)	12.83** (16.25)	4.174 (5.004)		9.463*** (7.186)			4.656* (3.731)
<b>Charlson Comorbidity Index =6+</b>	1.571 (1.683)	7.375*** (3.526)	2.061 (1.762)	24.68*** (15.80)	7.583** (6.431)	4.760** (3.112)	9.093*** (5.611)	9.644*** (4.643)	28.58*** (14.73)	17.15*** (10.18)	5.349*** (3.180)
<b>IMD quintile 5 - Most deprived</b>	1.261 (0.858)	0.787 (0.604)	0.642 (0.330)	0.386** (0.175)	1.091 (0.801)	0.609 (0.286)	0.935 (0.458)	0.782 (0.343)	1.516 (0.870)	0.958 (0.509)	1.203 (0.577)
<b>IMD quintile 4</b>	1.454 (1.018)	2.882 (1.871)	0.447 (0.263)	0.319** (0.161)	1.035 (0.781)	0.410* (0.213)	0.648 (0.357)	0.982 (0.417)	2.345 (1.334)	0.970 (0.550)	1.310 (0.630)
<b>IMD quintile 3</b>	0.689 (0.512)	2.208 (1.484)	0.669 (0.362)	0.414* (0.199)	1.070 (0.812)	0.727 (0.344)	0.777 (0.418)	0.744 (0.338)	2.351 (1.336)	1.428 (0.766)	0.993 (0.501)
<b>IMD quintile 2</b>	1.853 (1.293)	1.978 (1.371)	0.389 (0.281)	0.582 (0.299)	0.982 (0.780)	0.522 (0.304)	1.816 (0.926)	1.290 (0.587)	1.102 (0.730)	2.213 (1.170)	1.319 (0.674)
<b>IMD quintile 1 - Less deprived</b>	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference
<b>Number previous admissions</b>	0.398 (0.348)	0.530 (0.281)	0.524 (0.289)	1.032 (0.0541)	0.694 (0.167)	0.775 (0.137)	0.817 (0.130)	0.770* (0.113)	0.558** (0.135)	0.720* (0.128)	0.606** (0.119)

<b>N</b>	9,888	8,623	11,140	10,879	10,955	12,646	14,961	14,921	13,750	13,809	14,966
<b>Pseudo R-squared</b>	0.162	0.230	0.141	0.171	0.098	0.133	0.108	0.130	0.132	0.130	0.107
<b>Hospital FE</b>	No	No	No	No	No	No	No	No	No	No	No

Note: Significance levels: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1; Odds ratios reported and standard errors reported in parenthesis.

**Table A2.** Regression output of the association between patient characteristics and LoS per year

Dep. var.: LoS (OLS)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
<b>Female</b>	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference
<b>Male</b>	0.020 (0.071)	-0.031 (0.067)	-0.003 (0.0663)	-0.065 (0.063)	-0.072 (0.050)	-0.133*** (0.045)	-0.067 (0.043)	-0.012 (0.042)	-0.033 (0.041)	0.004 (0.039)	-0.067** (0.034)
<b>Age 0-14</b>	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference
<b>Age 15-24</b>	-0.396*** (0.092)	-0.554*** (0.107)	-0.331*** (0.103)	-0.372*** (0.114)	-0.173* (0.103)	-0.113 (0.072)	-0.106* (0.060)	-0.114 (0.081)	-0.161* (0.084)	-0.0854 (0.073)	-0.211** (0.102)
<b>Age 25-34</b>	-0.372*** (0.101)	-0.327*** (0.115)	-0.199* (0.119)	-0.318** (0.124)	-0.178 (0.109)	-0.0641 (0.077)	-0.0969 (0.066)	-0.222*** (0.084)	-0.143 (0.088)	-0.0673 (0.074)	-0.174* (0.105)
<b>Age 35-44</b>	-0.183* (0.102)	-0.212* (0.116)	-0.0867 (0.116)	-0.219* (0.126)	-0.00694 (0.111)	0.00647 (0.080)	-0.00671 (0.070)	-0.0232 (0.088)	-0.096 (0.088)	-0.028 (0.077)	-0.039 (0.107)
<b>Age 45-54</b>	0.0108 (0.127)	-0.116 (0.126)	-0.097 (0.121)	-0.076 (0.135)	0.0533 (0.114)	0.139* (0.082)	0.0774 (0.073)	0.0263 (0.091)	-0.0131 (0.090)	0.115 (0.081)	-0.0967 (0.107)
<b>Age 55-64</b>	0.221 (0.173)	0.331* (0.170)	0.419*** (0.157)	0.158 (0.159)	0.376*** (0.136)	0.281*** (0.108)	0.208** (0.094)	0.393*** (0.117)	0.234** (0.109)	0.172* (0.093)	0.0529 (0.116)

<b>Age 65-74</b>	1.618*** (0.333)	0.861*** (0.280)	0.389** (0.189)	0.645*** (0.239)	0.788*** (0.208)	0.667*** (0.184)	0.602*** (0.169)	0.455*** (0.158)	0.349** (0.146)	0.518*** (0.138)	0.317** (0.149)
<b>Age 75-84</b>	1.754*** (0.416)	1.897*** (0.423)	2.104*** (0.407)	0.937*** (0.308)	1.370*** (0.298)	1.242*** (0.270)	0.770*** (0.218)	1.108*** (0.255)	1.059*** (0.243)	0.769*** (0.196)	0.466** (0.187)
<b>Age 85+</b>	3.439*** (0.779)	1.643*** (0.540)	1.239** (0.497)	1.943*** (0.523)	1.148*** (0.326)	1.889*** (0.434)	1.100*** (0.312)	1.421*** (0.367)	1.264*** (0.338)	1.000*** (0.313)	0.372 (0.236)
<b>Charlson Comorbidity Index =0</b>	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference
<b>Charlson Comorbidity Index =1</b>	0.422*** (0.118)	0.233*** (0.089)	0.253*** (0.091)	0.271*** (0.077)	0.157** (0.065)	0.255*** (0.064)	0.133** (0.055)	0.178*** (0.058)	0.125** (0.056)	0.182*** (0.051)	0.148*** (0.045)
<b>Charlson Comorbidity Index =2</b>	0.584** (0.285)	0.543* (0.301)	0.243 (0.216)	0.975*** (0.238)	0.577*** (0.206)	0.320** (0.139)	0.658*** (0.153)	0.373*** (0.137)	0.136 (0.116)	0.282** (0.117)	0.258*** (0.098)
<b>Charlson Comorbidity Index =3</b>	2.157*** (0.727)	1.086** (0.531)	0.542 (0.424)	1.106** (0.487)	1.234*** (0.413)	0.926*** (0.290)	0.532** (0.231)	0.321 (0.227)	0.751*** (0.248)	0.549*** (0.209)	0.348* (0.191)
<b>Charlson Comorbidity Index =4</b>	2.901** (1.287)	1.047 (1.061)	2.009** (0.878)	2.363*** (0.766)	0.899 (0.570)	2.069*** (0.654)	1.262*** (0.468)	1.013** (0.466)	0.599 (0.379)	0.802** (0.354)	0.427* (0.233)
<b>Charlson Comorbidity Index =5</b>	7.592*** (2.626)	-0.0809 (1.407)	3.950** (1.649)	2.812 (1.836)	1.167 (0.992)	2.031* (1.204)	2.300* (1.176)	1.595** (0.626)	0.311 (0.501)	0.368 (0.355)	0.667 (0.542)
<b>Charlson Comorbidity Index =6+</b>	0.777 (0.537)	1.170** (0.574)	1.250** (0.502)	0.802 (0.551)	0.149 (0.315)	0.653* (0.341)	1.278*** (0.399)	0.579 (0.371)	0.403 (0.266)	0.652* (0.373)	0.241 (0.206)
<b>IMD quintile 5 - Most deprived</b>	-0.302* (0.155)	-0.090 (0.140)	0.027 (0.132)	-0.162 (0.130)	0.0217 (0.096)	0.012 (0.090)	-0.113 (0.088)	-0.021 (0.088)	-0.112 (0.083)	-0.052 (0.078)	0.003 (0.060)
<b>IMD quintile 4</b>	-0.113 (0.157)	-0.165 (0.142)	0.039 (0.134)	-0.232* (0.132)	-0.100 (0.097)	0.0231 (0.093)	-0.107 (0.086)	0.0198 (0.090)	-0.067 (0.086)	-0.073 (0.078)	0.034 (0.058)
<b>IMD quintile 3</b>	-0.272* (0.158)	-0.019 (0.144)	-0.181 (0.134)	-0.170 (0.136)	-0.035 (0.101)	0.037 (0.092)	-0.103 (0.087)	0.019 (0.086)	-0.087 (0.084)	-0.025 (0.079)	0.032 (0.063)
<b>IMD quintile 2</b>	-0.120 (0.173)	-0.243 (0.151)	0.047 (0.148)	-0.127 (0.153)	0.119 (0.115)	0.120 (0.105)	-0.077 (0.099)	-0.011 (0.095)	0.014 (0.093)	0.006 (0.086)	0.029 (0.067)

<b>IMD quintile 1 - Less deprived</b>	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference
<b>Number previous admissions</b>	-0.075 (0.048)	-0.039 (0.030)	-0.009 (0.027)	-0.028* (0.014)	-0.021 (0.016)	-0.014 (0.015)	-0.016 (0.013)	-0.022** (0.011)	0.011 (0.009)	0.005 (0.010)	-0.019*** (0.004)
<b>N</b>	10,077	10,873	11,384	11,040	13,956	15,896	15,292	15,143	14,010	14,100	14,810
<b>R-squared</b>	0.565	0.610	0.608	0.611	0.538	0.550	0.570	0.439	0.419	0.379	0.378
<b>Hospital FE</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: Significance levels: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1; Marginal effects reported and standard errors reported in parenthesis; OLS – ordinary least squares. Patients who died are not included.

**Table A3.** Regression output of the association between patient characteristics and 30-day readmission per year

Dep. var.: 30-day readmission (logistic regression)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
<b>Female</b>	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference
<b>Male</b>	0.984 (0.060)	0.987 (0.057)	1.075 (0.061)	1.153*** (0.063)	1.074 (0.051)	1.089* (0.049)	1.061 (0.048)	0.978 (0.045)	1.036 (0.048)	1.158*** (0.055)	1.030 (0.047)
<b>Age 0-14</b>	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference
<b>Age 15-24</b>	1.760** (0.473)	1.829** (0.508)	1.833** (0.448)	2.364*** (0.635)	2.291*** (0.500)	2.068*** (0.412)	1.477** (0.274)	2.885*** (0.692)	1.505** (0.275)	1.955*** (0.409)	1.395* (0.253)
<b>Age 25-34</b>	2.287*** (0.609)	2.465*** (0.681)	1.972*** (0.481)	2.651*** (0.708)	2.092*** (0.457)	2.278*** (0.453)	1.810*** (0.331)	2.834*** (0.680)	1.584** (0.287)	2.214*** (0.461)	1.585** (0.286)
<b>Age 35-44</b>	2.782*** (0.738)	3.110*** (0.855)	2.260*** (0.549)	2.724*** (0.727)	2.463*** (0.536)	2.185*** (0.435)	1.873*** (0.341)	3.340*** (0.800)	1.440** (0.262)	2.196*** (0.457)	1.511** (0.273)

<b>Age 45-54</b>	2.575*** (0.701)	3.271*** (0.912)	2.370*** (0.582)	2.674*** (0.723)	2.350*** (0.516)	2.463*** (0.492)	1.908*** (0.350)	3.095*** (0.744)	1.517** (0.277)	1.866*** (0.392)	1.484** (0.270)
<b>Age 55-64</b>	2.844*** (0.819)	3.272*** (0.947)	2.751*** (0.712)	2.803*** (0.791)	2.811*** (0.639)	2.355*** (0.497)	1.978*** (0.384)	3.210*** (0.796)	1.436* (0.275)	1.975*** (0.428)	1.097 (0.210)
<b>Age 65-74</b>	3.061*** (0.950)	2.587*** (0.833)	2.505*** (0.700)	1.814* (0.560)	2.452*** (0.602)	2.269*** (0.523)	2.060*** (0.428)	3.506*** (0.904)	1.309 (0.274)	2.458*** (0.559)	1.478* (0.297)
<b>Age 75-84</b>	3.499*** (1.123)	2.633*** (0.850)	2.663*** (0.758)	3.312*** (1.012)	2.559*** (0.657)	2.117*** (0.516)	1.961*** (0.435)	2.919*** (0.794)	2.056*** (0.441)	2.507*** (0.602)	1.369 (0.295)
<b>Age 85+</b>	3.001*** (1.116)	2.460** (0.909)	3.118*** (0.999)	3.220*** (1.084)	3.308*** (0.895)	2.422*** (0.630)	1.827** (0.453)	3.295*** (0.930)	2.077*** (0.479)	2.657*** (0.677)	1.246 (0.299)
<b>Charlson Comorbidity Index =0</b>	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference
<b>Charlson Comorbidity Index =1</b>	1.206** (0.110)	1.238*** (0.099)	1.395*** (0.105)	1.492*** (0.105)	1.352*** (0.084)	1.447*** (0.082)	1.368*** (0.078)	1.288*** (0.074)	1.311*** (0.077)	1.284*** (0.076)	1.581*** (0.088)
<b>Charlson Comorbidity Index =2</b>	1.557** (0.274)	1.906*** (0.282)	1.574*** (0.223)	2.142*** (0.283)	2.046*** (0.225)	1.870*** (0.193)	1.424*** (0.144)	1.799*** (0.173)	1.861*** (0.179)	1.693*** (0.168)	2.247*** (0.205)
<b>Charlson Comorbidity Index =3</b>	2.361*** (0.613)	1.968*** (0.470)	2.387*** (0.512)	1.553* (0.357)	2.075*** (0.355)	2.341*** (0.377)	1.832*** (0.280)	2.061*** (0.286)	2.266*** (0.301)	1.981*** (0.283)	2.392*** (0.306)
<b>Charlson Comorbidity Index =4</b>	1.392 (0.634)	2.199* (0.887)	3.485*** (1.144)	1.759* (0.557)	1.725** (0.474)	2.293*** (0.534)	1.398 (0.333)	3.064*** (0.626)	2.938*** (0.545)	2.502*** (0.456)	2.181*** (0.401)
<b>Charlson Comorbidity Index =5</b>	1.490 (0.967)	13.64*** (7.582)	1.291 (0.749)	0.861 (0.697)	0.863 (0.559)	2.039* (0.843)	3.737*** (1.374)	2.340*** (0.667)	3.074*** (0.906)	2.220*** (0.640)	2.940*** (0.734)
<b>Charlson Comorbidity Index =6+</b>	1.671* (0.519)	2.107*** (0.524)	2.604*** (0.630)	2.084*** (0.501)	2.241*** (0.517)	1.450* (0.320)	1.739** (0.379)	2.236*** (0.446)	1.392 (0.295)	1.885*** (0.357)	2.459*** (0.453)
<b>IMD quintile 5 - Most deprived</b>	1.135 (0.154)	1.087 (0.132)	0.994 (0.117)	1.149 (0.140)	1.193* (0.120)	1.130 (0.103)	1.149 (0.111)	1.131 (0.109)	1.373*** (0.130)	1.107 (0.104)	1.212** (0.110)
<b>IMD quintile 4</b>	1.173 (0.161)	1.091 (0.133)	1.014 (0.120)	1.103 (0.136)	1.253** (0.128)	0.993 (0.092)	1.227** (0.118)	1.146 (0.110)	1.183* (0.116)	1.134 (0.107)	1.051 (0.096)

<b>IMD quintile 3</b>	1.060 (0.146)	1.011 (0.126)	0.878 (0.106)	1.166 (0.145)	1.221* (0.125)	1.003 (0.093)	1.263** (0.122)	1.207* (0.116)	1.200* (0.117)	1.188* (0.112)	1.076 (0.099)
<b>IMD quintile 2</b>	1.061 (0.160)	1.094 (0.146)	0.907 (0.121)	1.023 (0.139)	0.983 (0.113)	0.844 (0.089)	1.129 (0.121)	1.056 (0.111)	1.100 (0.117)	0.988 (0.103)	1.003 (0.100)
<b>IMD quintile 1 - Less deprived</b>	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference	Reference
<b>Number previous admissions</b>	2.405*** (0.197)	1.639*** (0.086)	1.694*** (0.077)	1.521*** (0.076)	1.467*** (0.052)	1.455*** (0.035)	1.355*** (0.028)	1.413*** (0.035)	1.283*** (0.026)	1.281*** (0.027)	1.256*** (0.035)
<b>N</b>	9,909	10,784	11,340	11,033	14,013	15,976	15,388	15,207	14,111	14,218	14,913
<b>R-squared</b>	0.091	0.091	0.083	0.075	0.067	0.073	0.066	0.076	0.065	0.064	0.074
<b>Hospital FE</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: Significance levels: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1; Odds ratios reported and standard errors reported in parenthesis.