

SUPPLEMENTARY MATERIAL

MULTILEVEL MIXED EFFECTS MODELS OF FACTORS ASSOCIATED WITH MORTALITY, DESTINATION AT DISCHARGE, AND LENGTH OF STAY DURING INPATIENT STROKE CARE

TABLE 1. MULTILEVEL MIXED EFFECTS MODEL OF FACTORS ASSOCIATED WITH (ODDS RATIO OR (95% C.I.)) MORTALITY DURING INPATIENT STROKE CARE

Mortality		Physiotherapy	Occupational Therapy	Speech and Language Therapy	Psychology	Any Therapy
		N=96,537 OR(95%C.I.)	N=92,542 OR(95%C.I.)	N=61,206 OR(95%C.I.)	N=6,074 OR(95%C.I.)	N=103,921 OR(95%C.I.)
Admission related factors						
Team Count		0.78(0.68,0.90)	0.89(0.76,1.04)	0.85(0.73,0.99)	1.19(0.72,1.97)	0.83(0.73,0.94)
Time from Entry		0.99(0.98,1.00)	0.99(0.98,1.00)	0.99(0.98,1.00)	0.98(0.94,1.01)	0.99(0.98,1.00)
Day of Entry (Mon)	Tuesday	0.92(0.85,1.00)	0.97(0.88,1.06)	0.93(0.85,1.03)	0.78(0.50,1.23)	0.93(0.86,1.01)
	Wednesday	0.98(0.90,1.06)	0.99(0.90,1.08)	0.95(0.87,1.05)	0.70(0.44,1.12)	0.97(0.89,1.05)
	Thursday	0.91(0.84,0.99)	0.93(0.85,1.03)	0.89(0.81,0.98)	1.02(0.66,1.57)	0.89(0.82,0.96)
	Friday	0.77(0.71,0.84)	0.82(0.74,0.90)	0.78(0.70,0.85)	0.72(0.45,1.16)	0.75(0.69,0.81)
	Saturday	0.90(0.83,0.98)	0.93(0.85,1.03)	0.89(0.81,0.98)	0.85(0.52,1.37)	0.89(0.82,0.96)
	Sunday	0.98(0.89,1.06)	1.002(0.909,1.104)	0.96(0.87,1.06)	0.91(0.57,1.47)	1.001(0.920,1.089)
Time from entry to 1st Stroke Unit		1.000(1.000,1.001)	1.000(1.000,1.001)	1.000(1.000,1.001)	1.002(1.000,1.004)	1.000(1.000,1.000)
Time of Entry(00.00-07.59)	08:00+	0.86(0.80,0.92)	0.83(0.77,0.90)	0.87(0.80,0.94)	0.86(0.59,1.25)	0.83(0.77,0.89)
	16:00+	0.90(0.83,0.97)	0.87(0.80,0.95)	0.88(0.80,0.96)	0.87(0.58,1.31)	0.89(0.83,0.96)
Patient-related factors						
Age		1.01(0.99,1.03)	1.02(1.00,1.05)	1.002(0.978,1.026)	0.99(0.89,1.11)	1.03(1.01,1.05)
Age Squared		1.000(1.000,1.000)	1.000(1.000,1.000)	1.000(1.000,1.000)	1.000(1.000,1.001)	1.000(1.000,1.000)
Gender (Female)	Male	1.42(1.35,1.49)	1.36(1.28,1.43)	1.43(1.35,1.51)	1.50(1.15,1.95)	1.41(1.35,1.48)
Ethnicity (White)	asian, inc. chinese	0.68(0.57,0.80)	0.69(0.57,0.84)	0.61(0.50,0.75)	0.49(0.19,1.28)	0.65(0.55,0.76)
	black	0.80(0.64,1.02)	0.86(0.66,1.11)	0.82(0.64,1.06)	0.85(0.39,1.86)	0.81(0.65,1.01)
	mixed	1.35(0.88,2.09)	1.27(0.78,2.08)	1.05(0.60,1.82)	3.2(0.9,11.7)	1.26(0.82,1.94)
	not known	0.92(0.82,1.03)	0.88(0.77,1.00)	0.89(0.78,1.01)	0.81(0.46,1.44)	0.91(0.81,1.01)

	other	0.76(0.60,0.96)	0.77(0.59,1.00)	0.81(0.62,1.05)	1.003(0.406,2.477)	0.85(0.68,1.06)
Social Deprivation Highest to Lowest (1)	2	0.99(0.93,1.07)	1.01(0.93,1.09)	0.98(0.91,1.06)	0.59(0.40,0.87)	1.003(0.938,1.074)
	3	1.03(0.96,1.10)	1.06(0.97,1.14)	1.006(0.928,1.090)	0.82(0.57,1.20)	1.05(0.98,1.12)
	4	1.004(0.931,1.082)	1.02(0.93,1.11)	1.002(0.920,1.091)	0.91(0.63,1.32)	1.03(0.96,1.11)
	Missing	0.85(0.73,0.99)	0.78(0.64,0.94)	0.78(0.65,0.93)	0.28(0.12,0.63)	0.78(0.67,0.91)
Comorbidities						
Congestive Heart Failure	Yes	1.53(1.41,1.66)	1.52(1.39,1.66)	1.55(1.42,1.70)	1.48(0.97,2.26)	1.57(1.45,1.69)
Hypertension	Yes	0.94(0.90,0.98)	0.95(0.91,1.01)	0.95(0.90,1.00)	0.96(0.74,1.24)	0.95(0.91,0.99)
Atrial Fibrillation	Yes	1.37(1.31,1.44)	1.36(1.29,1.44)	1.38(1.30,1.46)	1.36(1.03,1.79)	1.37(1.31,1.44)
Diabetes	Yes	1.21(1.14,1.28)	1.16(1.09,1.24)	1.19(1.12,1.27)	1.05(0.77,1.45)	1.16(1.10,1.23)
Previous Stroke/TIA?	Yes	0.90(0.85,0.94)	0.88(0.83,0.93)	0.89(0.84,0.94)	1.37(1.04,1.81)	0.89(0.85,0.94)
Disability at transfer from previous team (mRS) or on admission (mapped from NIHSS) (0)	1	0.54(0.17,1.75)	0.51(0.15,1.68)	0.31(0.09,1.10)	0.59(0.03,10.59)	0.42(0.16,1.11)
	2	0.97(0.41,2.30)	0.81(0.33,1.98)	0.92(0.41,2.10)	0.41(0.05,3.63)	0.91(0.46,1.82)
	3	1.41(0.60,3.30)	1.08(0.45,2.63)	0.99(0.44,2.21)	0.38(0.05,3.11)	1.48(0.75,2.93)
	4	2.21(0.95,5.14)	1.56(0.65,3.75)	1.35(0.60,3.01)	0.46(0.06,3.71)	2.35(1.19,4.64)
	5	4.2(1.8,9.9)	2.7(1.1,6.5)	2.32(1.04,5.18)	0.72(0.09,5.87)	4.5(2.3,8.9)
Pre-morbid disability (mRS, 0)	1	1.34(1.25,1.44)	1.27(1.17,1.37)	1.35(1.24,1.46)	1.39(0.96,2.02)	1.28(1.20,1.37)
	2	1.59(1.48,1.72)	1.49(1.37,1.62)	1.60(1.47,1.74)	1.70(1.14,2.53)	1.47(1.37,1.58)
	3	1.68(1.57,1.80)	1.39(1.29,1.50)	1.70(1.57,1.84)	2.17(1.49,3.14)	1.45(1.35,1.55)
	4	1.65(1.52,1.80)	1.25(1.13,1.37)	1.70(1.55,1.87)	1.31(0.75,2.28)	1.30(1.20,1.41)
	5	1.28(1.11,1.47)	0.90(0.77,1.06)	1.29(1.10,1.50)	1.36(0.43,4.36)	0.90(0.79,1.03)
Stroke Type (Infarction)	Haemorrhage	1.45(1.36,1.55)	1.29(1.19,1.40)	1.25(1.15,1.35)	0.93(0.64,1.35)	1.45(1.36,1.55)
Stroke Severity (NIHSS, Mild)	Moderate(5-14)	1.92(1.55,2.38)	1.76(1.39,2.23)	1.85(1.47,2.35)	1.78(0.88,3.62)	1.95(1.60,2.38)
	Severe(15-20)	3.0(2.4,3.8)	2.32(1.80,2.99)	2.7(2.1,3.5)	1.47(0.64,3.37)	2.9(2.4,3.6)
	Very Severe(>20)	2.6(2.0,3.3)	1.91(1.45,2.51)	2.35(1.79,3.08)	1.59(0.67,3.81)	2.4(1.9,3.1)
Stroke Impairment Categories (Motor Only)	Loss-Con		1.58(1.37,1.81)	1.42(1.23,1.64)	1.97(0.98,3.99)	1.63(1.45,1.83)
	Mo-Co-Se	1.22(1.10,1.34)	1.16(1.04,1.30)	1.13(1.01,1.27)	1.41(0.85,2.33)	1.20(1.09,1.32)
	Mo-Co	1.17(1.06,1.29)	1.02(0.92,1.14)	1.04(0.93,1.16)	1.12(0.67,1.87)	1.13(1.03,1.25)
	Mo-Se	0.86(0.75,0.97)	0.89(0.77,1.02)	0.88(0.75,1.03)	0.95(0.51,1.77)	0.85(0.75,0.96)
	No-Mo	0.86(0.75,1.00)	0.80(0.68,0.94)	0.78(0.65,0.93)	1.30(0.67,2.54)	0.83(0.73,0.95)
	None	1.88(1.66,2.14)	1.55(1.34,1.79)	1.92(1.64,2.24)	0.99(0.45,2.20)	1.60(1.41,1.80)

		Organisation- related factors				
Clinical Assessment						
72hr Swallow assess (No)	Yes	1.59(1.47,1.71)	1.19(1.08,1.30)	1.74(1.60,1.89)	1.54(1.06,2.25)	1.39(1.30,1.48)
72hr Clinical Assessment(No)	Yes	1.43(1.29,1.60)	1.15(1.04,1.29)	1.16(1.06,1.26)		
No. any assessments (0-3)		0.76(0.73,0.79)	0.98(0.93,1.03)	0.77(0.74,0.81)	0.87(0.75,1.02)	0.86(0.83,0.88)
Average Min Therapy per Day of Stay		0.97(0.97,0.98)	0.88(0.88,0.89)	0.94(0.94,0.95)	0.84(0.79,0.91)	0.96(0.96,0.96)
Thrombolysis available (24hrs day)	Non-24hrs/UA	0.92(0.73,1.15)	0.81(0.60,1.09)	0.79(0.63,1.00)	1.58(0.88,2.82)	0.95(0.75,1.21)
Ward Round 7d per wk	Yes	0.91(0.79,1.05)	0.93(0.76,1.12)	0.86(0.74,1.00)	0.71(0.50,1.01)	0.92(0.79,1.07)
Median Length of stay in Unit		1.02(1.01,1.04)	1.02(0.99,1.04)	1.02(1.01,1.04)	1.03(1.00,1.06)	1.02(1.00,1.04)
Team Type (RATa)	RATc	1.05(0.92,1.20)	0.95(0.80,1.14)	1.03(0.89,1.18)	1.04(0.69,1.58)	1.01(0.88,1.17)
	NRAT	0.92(0.66,1.26)	1.03(0.68,1.56)	0.95(0.68,1.33)	0.70(0.32,1.54)	0.97(0.69,1.36)
	NAIT	0.11(0.03,0.38)	0.26(0.06,1.12)	0.12(0.03,0.41)		0.23(0.06,0.88)
Qualified Nurses (WTE/ 10bds)		0.96(0.94,0.98)	0.97(0.94,1.00)	0.96(0.94,0.98)	0.998(0.942,1.058)	0.97(0.95,1.00)
Nurse support workers (WTE/ 10bds)		1.04(1.01,1.08)	1.03(0.99,1.08)	1.05(1.01,1.08)	1.02(0.94,1.11)	1.03(1.00,1.07)
Qualified Therapists (WTE/ 10bds)		0.97(0.84,1.13)	1.54(1.27,1.87)	1.02(0.81,1.28)	0.62(0.33,1.17)	
Therapy support worker (WTE/ 10bds)		1.30(1.03,1.65)	1.20(0.95,1.52)	1.37(0.95,1.99)	1.62(0.34,7.76)	
No. Therapies available 6/7 days/ wk (0)	1	1.12(0.92,1.36)	1.04(0.80,1.34)	1.12(0.92,1.37)	1.23(0.77,1.95)	1.18(0.96,1.46)
	2 or more	0.98(0.85,1.12)	1.04(0.86,1.25)	0.99(0.86,1.14)	0.83(0.58,1.18)	1.12(0.97,1.30)
Access to Social Wk in 5days (Yes)	No	0.82(0.57,1.17)	0.84(0.51,1.37)	0.83(0.57,1.19)	1.66(0.83,3.31)	0.76(0.51,1.12)
Access to ESD Team	Non-spec ESD	0.96(0.75,1.22)	1.02(0.74,1.41)	1.08(0.85,1.38)	1.84(1.12,3.01)	1.01(0.78,1.31)
	None	1.01(0.85,1.20)	0.99(0.79,1.25)	0.97(0.81,1.15)	0.99(0.59,1.67)	1.02(0.85,1.22)
Access to CRT	Yes	0.96(0.84,1.10)	1.04(0.87,1.24)	1.006(0.879,1.151)	0.56(0.40,0.80)	1.01(0.88,1.17)
Constant		0.004(0.001,0.015)	0.006(0.002,0.026)	0.01(0.00,0.05)	0.01(0.00,1.15)	0.009(0.003,0.026)
Team	Var(Cons)	0.13	0.25	0.13	0.00	0.16

TABLE 2. MULTILEVEL MIXED EFFECTS MODEL OF FACTORS ASSOCIATED (ODDS RATIO OR (95% C.I.)) ON DESTINATION ON DISCHARGE FROM INPATIENT STROKE CARE

Destination on Discharge (home)	Physiotherapy	Occupational Therapy	Speech and Language Therapy	Psychology	Any Therapy
	N=96,537	n=92,542	N=61,206	N=6,074	N=103,921

		OR(95%C.I.)	OR(95%C.I.)	OR(95%C.I.)	OR(95%C.I.)	OR(95%C.I.)
Admission related factors						
Team Count		1.19(1.07,1.32)	1.10(0.99,1.22)	1.12(0.98,1.27)	1.18(0.88,1.59)	1.15(1.05,1.27)
Time from Entry		0.98(0.98,0.99)	0.98(0.98,0.99)	0.98(0.98,0.99)	0.999(0.982,1.016)	0.99(0.98,0.99)
Day of Entry (Mon)	Tuesday	0.99(0.93,1.05)	0.997(0.941,1.056)	0.99(0.92,1.07)	1.20(0.96,1.50)	0.99(0.94,1.05)
	Wednesday	0.94(0.89,1.00)	0.97(0.91,1.02)	0.98(0.91,1.05)	1.09(0.87,1.36)	0.95(0.90,1.00)
	Thursday	1.11(1.05,1.18)	1.15(1.09,1.22)	1.13(1.05,1.21)	1.03(0.82,1.30)	1.13(1.07,1.19)
	Friday	1.16(1.09,1.22)	1.20(1.13,1.27)	1.16(1.08,1.25)	1.07(0.86,1.34)	1.20(1.13,1.26)
	Saturday	0.997(0.940,1.058)	1.02(0.96,1.08)	0.98(0.91,1.06)	0.98(0.77,1.24)	1.02(0.96,1.08)
	Sunday	0.96(0.90,1.02)	0.95(0.90,1.01)	0.96(0.89,1.04)	1.09(0.86,1.37)	0.96(0.91,1.02)
	Time from entry to 1st Stroke Unit	1.000(0.999,1.000)	1.000(0.999,1.000)	1.000(1.000,1.001)	0.999(0.998,1.000)	0.999(0.999,1.000)
Time of Entry(00.00-07.59)	08:00+	1.15(1.10,1.22)	1.19(1.13,1.25)	1.11(1.04,1.18)	1.01(0.84,1.22)	1.19(1.13,1.25)
	16:00+	1.08(1.02,1.14)	1.09(1.03,1.15)	1.02(0.95,1.09)	0.83(0.68,1.01)	1.09(1.04,1.15)
Patient related factors						
Age		1.06(1.05,1.07)	1.05(1.04,1.06)	1.07(1.06,1.08)	1.04(1.01,1.07)	1.05(1.05,1.06)
Age Squared		0.999(0.999,0.999)	0.999(0.999,1.000)	0.999(0.999,0.999)	1.000(0.999,1.000)	0.999(0.999,0.999)
Gender (Female)	Male	0.97(0.94,1.00)	0.97(0.94,1.00)	0.95(0.92,0.99)	0.89(0.78,1.01)	0.97(0.94,1.00)
Ethnicity (White)	asian, inc. chinese	1.42(1.29,1.57)	1.42(1.29,1.56)	1.58(1.40,1.79)	1.51(1.09,2.08)	1.39(1.27,1.53)
	black	1.02(0.89,1.16)	1.02(0.89,1.16)	1.14(0.98,1.34)	1.14(0.82,1.58)	1.003(0.887,1.135)
	mixed	0.96(0.73,1.26)	0.91(0.69,1.20)	1.19(0.82,1.72)	2.14(1.00,4.59)	0.93(0.71,1.20)
	not known	0.95(0.88,1.02)	0.94(0.88,1.02)	0.96(0.88,1.06)	0.92(0.72,1.17)	0.95(0.89,1.02)
	other	1.27(1.10,1.45)	1.23(1.07,1.41)	1.29(1.08,1.54)	1.13(0.73,1.73)	1.21(1.07,1.38)

Social Deprivation Highest to Lowest (1)	2	1.02(0.98,1.07)	1.02(0.98,1.07)	0.99(0.93,1.05)	1.03(0.86,1.25)	1.02(0.98,1.07)
	3	1.006(0.958,1.056)	1.01(0.96,1.06)	0.99(0.93,1.06)	1.16(0.95,1.42)	1.01(0.96,1.06)
	4	1.07(1.01,1.12)	1.05(1.00,1.11)	1.05(0.98,1.12)	1.15(0.94,1.43)	1.06(1.01,1.11)
	Missing	1.31(1.17,1.47)	1.35(1.21,1.51)	1.22(1.05,1.41)	1.28(0.86,1.92)	1.32(1.19,1.47)
Congestive Heart Failure	Yes	0.96(0.90,1.03)	0.99(0.92,1.06)	0.93(0.85,1.01)	1.03(0.78,1.36)	0.97(0.91,1.04)
Hypertension	Yes	1.04(1.01,1.08)	1.04(1.00,1.07)	1.04(1.00,1.09)	0.98(0.86,1.12)	1.05(1.01,1.08)
Atrial Fibrillation	Yes	0.97(0.93,1.01)	1.001(0.962,1.042)	0.98(0.94,1.03)	0.92(0.78,1.08)	0.98(0.94,1.01)
Diabetes	Yes	0.95(0.91,0.99)	0.96(0.93,1.00)	0.97(0.92,1.02)	0.95(0.81,1.11)	0.94(0.91,0.98)
Previous Stroke/TIA?	Yes	1.12(1.08,1.16)	1.12(1.08,1.16)	1.10(1.05,1.16)	1.02(0.88,1.18)	1.11(1.08,1.15)
Disability at transfer from previous team (mRS) or on admission (mapped from NIHSS) (0)	1	1.21(0.84,1.77)	1.14(0.79,1.65)	1.37(0.86,2.16)	0.85(0.25,2.91)	1.12(0.82,1.54)
	2	1.13(0.82,1.56)	1.07(0.78,1.47)	1.14(0.78,1.68)	0.95(0.33,2.72)	0.99(0.75,1.30)
	3	0.78(0.56,1.07)	0.72(0.53,0.99)	0.83(0.57,1.22)	0.55(0.20,1.54)	0.64(0.49,0.85)
	4	0.57(0.41,0.78)	0.54(0.39,0.73)	0.59(0.40,0.86)	0.46(0.17,1.28)	0.45(0.34,0.60)
	5	0.38(0.27,0.52)	0.38(0.28,0.53)	0.45(0.30,0.66)	0.27(0.10,0.78)	0.30(0.22,0.40)
Pre-morbid disability (mRS, 0)	1	0.86(0.82,0.90)	0.88(0.84,0.92)	0.88(0.83,0.93)	0.81(0.68,0.96)	0.86(0.83,0.90)
	2	0.72(0.69,0.76)	0.76(0.72,0.80)	0.75(0.70,0.80)	0.80(0.65,0.98)	0.72(0.69,0.76)
	3	0.61(0.57,0.64)	0.68(0.64,0.72)	0.64(0.59,0.68)	0.61(0.49,0.77)	0.60(0.57,0.64)
	4	0.51(0.48,0.55)	0.59(0.55,0.64)	0.60(0.54,0.65)	0.72(0.52,0.99)	0.52(0.48,0.56)
	5	0.48(0.41,0.56)	0.61(0.52,0.71)	0.64(0.54,0.76)	1.29(0.62,2.67)	0.52(0.45,0.60)
Stroke Type (Infarction)	Haemorrhage	0.64(0.61,0.68)	0.65(0.62,0.69)	0.66(0.62,0.71)	0.80(0.67,0.96)	0.62(0.59,0.65)
Stroke Severity (NIHSS, Mild)	Moderate(5-14)	0.70(0.64,0.78)	0.72(0.65,0.80)	0.67(0.59,0.76)	0.95(0.72,1.26)	0.69(0.63,0.76)
	Severe(15-20)	0.45(0.39,0.51)	0.49(0.43,0.55)	0.47(0.40,0.55)	0.63(0.43,0.92)	0.44(0.39,0.49)
	Very Severe(>20)	0.42(0.35,0.49)	0.45(0.39,0.53)	0.42(0.35,0.51)	0.70(0.45,1.09)	0.41(0.35,0.48)
Stroke Impairment Categories (Motor Only)	Loss-Con	0.88(0.78,0.98)	1.009(0.901,1.130)	0.97(0.85,1.10)	1.06(0.69,1.62)	0.87(0.78,0.96)
	Mo-Co-Se	0.94(0.89,0.99)	0.99(0.93,1.04)	0.98(0.91,1.05)	1.04(0.84,1.29)	0.97(0.92,1.02)
	Mo-Co	0.97(0.92,1.02)	1.06(1.01,1.12)	1.10(1.03,1.18)	1.12(0.90,1.38)	1.02(0.97,1.07)
	Mo-Se	1.13(1.06,1.19)	1.11(1.05,1.18)	1.07(0.98,1.17)	1.18(0.94,1.48)	1.12(1.06,1.18)
	No-Mo	1.12(1.05,1.19)	1.23(1.16,1.31)	1.17(1.07,1.28)	1.22(0.94,1.59)	1.21(1.14,1.28)
	None	1.11(1.03,1.19)	1.25(1.16,1.34)	0.89(0.79,0.99)	1.26(0.91,1.74)	1.20(1.12,1.28)

Home at Discharge		Organisational related factors				
72hr Swallow Assess (No)	Yes	0.77(0.73,0.80)	0.88(0.83,0.93)	0.67(0.63,0.72)	0.82(0.69,0.97)	0.75(0.72,0.78)
72hr Clinical Assess (No)	Yes	1.21(1.12,1.31)	1.24(1.16,1.32)	1.16(1.08,1.24)		
No. any assessments (0-3)		1.003(0.975,1.032)	0.91(0.88,0.94)	1.10(1.06,1.15)	1.01(0.93,1.10)	1.04(1.02,1.07)
Average Min Therapy per Day of Stay		0.99(0.98,0.99)	1.02(1.01,1.02)	1.004(1.002,1.007)	1.03(1.01,1.04)	0.999(0.998,1.000)
Thrombolysis Available (24hrs day)	Non-24hrs/UA	0.68(0.44,1.06)	0.67(0.42,1.06)	0.72(0.45,1.14)	0.51(0.24,1.09)	0.66(0.42,1.02)
Ward Round 7d per wk	Yes	1.29(0.96,1.73)	1.32(0.97,1.80)	1.37(1.01,1.86)	1.49(0.92,2.41)	1.27(0.95,1.70)
Median Length of stay in Unit		1.03(1.00,1.06)	1.04(1.01,1.07)	1.03(1.00,1.06)	1.02(0.98,1.07)	1.03(1.01,1.06)
No. Type 1 Beds		0.96(0.93,0.99)	0.95(0.93,0.98)	0.95(0.93,0.98)	0.93(0.88,0.98)	0.95(0.93,0.98)
No. Type 2 Beds		1.005(0.992,1.018)	1.008(0.995,1.022)	1.003(0.990,1.017)	0.996(0.976,1.017)	1.005(0.992,1.018)
No. Type 3 Beds		0.996(0.982,1.010)	0.999(0.984,1.014)	0.997(0.982,1.012)	0.99(0.97,1.01)	0.997(0.982,1.011)
Team Type (RATa)	RATc	0.99(0.83,1.17)	1.007(0.848,1.198)	1.12(0.92,1.37)	1.27(0.85,1.89)	1.03(0.88,1.20)
	NRAT	0.97(0.57,1.65)	0.86(0.49,1.50)	1.02(0.57,1.80)	1.16(0.46,2.92)	0.87(0.51,1.47)
	NAIT	0.27(0.06,1.31)	0.16(0.03,0.84)	0.29(0.06,1.52)	0.98(0.91,1.06)	0.23(0.05,1.13)
Qual Nurse (WTE per 10bds)		0.98(0.93,1.03)	0.98(0.93,1.03)	0.97(0.92,1.02)		0.97(0.92,1.01)
Sup Nurse (WTE pre 10bds)		1.02(0.95,1.08)	1.02(0.95,1.09)	1.03(0.96,1.10)	0.97(0.87,1.09)	1.03(0.96,1.10)
Qual Speciality Therap (WTE per 10bds)		0.69(0.51,0.94)	0.66(0.49,0.89)	0.76(0.47,1.22)	1.41(0.54,3.72)	1.08(0.74,1.59)
Sup Specialist Therap (WTE per 10bds)		2.32(1.44,3.76)	1.37(0.94,1.99)	1.52(0.70,3.27)	1.19(0.12,12.00)	
No. Therapy Disciplines available 6/7 days wk (0)	1	1.14(0.77,1.69)	1.14(0.76,1.71)	1.16(0.77,1.74)	1.04(0.56,1.94)	
	2 or more	1.01(0.76,1.34)	0.94(0.70,1.27)	1.01(0.76,1.35)	1.15(0.72,1.84)	0.98(0.74,1.30)
Access to Social Wk in 5ds (Yes)	No	0.64(0.30,1.37)	0.62(0.28,1.37)	0.65(0.30,1.42)	0.51(0.14,1.78)	0.66(0.31,1.41)
Access to ESD Team (ESD with Neuro)	Non-spec ESD	1.48(0.91,2.39)	1.54(0.93,2.53)	1.58(0.96,2.59)	2.04(1.03,4.02)	1.62(1.00,2.61)
	None	2.07(1.48,2.91)	2.13(1.49,3.05)	2.07(1.45,2.95)	3.0(1.7,5.5)	2.07(1.48,2.91)
Access to CRT	Yes	0.87(0.66,1.14)	0.85(0.64,1.13)	0.88(0.66,1.16)	0.76(0.48,1.18)	0.84(0.64,1.10)
Constant		0.57(0.22,1.46)	0.54(0.21,1.39)	0.19(0.07,0.51)	0.57(0.07,4.46)	0.63(0.27,1.51)
Team	Var(Cons)	0.66	0.73	0.70	0.85	0.67

TABLE 3. MULTILEVEL MIXED EFFECTS MODEL OF FACTORS ASSOCIATED (RATE RATIO RR (95% C.I.)) WITH LENGTH OF INPATIENT STAY.

Length of Inpatient Stay		Physiotherapy	Occupational Therapy	Speech and Language Therapy	Psychology	Any Therapy
		N=96,537 RR(95% C.I.)	N=92,542 RR(95% C.I.)	N=61,206 RR(95% C.I.)	N=6,074 RR(95% C.I.)	N=103,921 RR(95% C.I.)
Admission related factors						
Team Count		1.02(0.98,1.05)	1.05(1.01,1.08)	1.03(0.99,1.07)	0.92(0.85,0.99)	1.02(0.99,1.05)
Time from Entry		1.008(1.006,1.010)	1.007(1.005,1.009)	1.006(1.004,1.009)	1.007(1.002,1.011)	1.008(1.006,1.010)
Day of Entry (Mon)	Tuesday	1.02(1.00,1.04)	1.02(1.00,1.04)	1.001(0.979,1.023)	1.007(0.951,1.066)	1.02(1.00,1.04)
	Wednesday	1.03(1.01,1.05)	1.01(1.00,1.03)	1.003(0.981,1.026)	0.99(0.94,1.05)	1.02(1.01,1.04)
	Thursday	0.97(0.95,0.99)	0.96(0.94,0.98)	0.95(0.93,0.97)	0.99(0.93,1.04)	0.97(0.95,0.99)
	Friday	0.95(0.93,0.97)	0.94(0.92,0.96)	0.96(0.94,0.98)	1.003(0.946,1.063)	0.95(0.93,0.97)
	Saturday	0.98(0.96,1.00)	0.97(0.95,0.99)	0.97(0.95,1.00)	1.02(0.96,1.08)	0.97(0.95,0.99)
	Sunday	0.998(0.979,1.018)	0.999(0.980,1.019)	0.999(0.976,1.022)	0.99(0.93,1.05)	0.997(0.977,1.016)
Time from entry to 1st Stroke Unit		1.001(1.000,1.001)	1.000(1.000,1.001)	1.000(1.000,1.000)	1.000(1.000,1.001)	1.001(1.001,1.001)
Time of Entry (00.00-07.59)	08:00+	0.94(0.92,0.95)	0.93(0.92,0.95)	0.96(0.94,0.98)	0.91(0.86,0.95)	0.93(0.92,0.95)
	16:00+	0.95(0.93,0.97)	0.95(0.93,0.97)	0.98(0.96,1.00)	0.94(0.89,0.99)	0.94(0.93,0.96)
Age		1.01(1.01,1.01)	1.01(1.01,1.01)	1.02(1.01,1.02)	1.01(1.00,1.02)	1.01(1.01,1.02)
Age Squared		1.000(1.000,1.000)	1.000(1.000,1.000)	1.000(1.000,1.000)	1.000(1.000,1.000)	1.000(1.000,1.000)
Gender (Female)	Male	1.01(1.00,1.02)	1.001(0.991,1.012)	1.01(1.00,1.02)	1.02(0.98,1.05)	1.003(0.993,1.013)
Ethnicity (White)	Asian including Chinese	0.998(0.968,1.029)	0.98(0.95,1.01)	0.999(0.963,1.037)	0.998(0.913,1.090)	0.99(0.96,1.02)
	black	1.08(1.04,1.13)	1.09(1.05,1.13)	1.06(1.01,1.11)	1.09(1.00,1.19)	1.10(1.05,1.14)
	mixed	1.11(1.01,1.21)	1.10(1.01,1.20)	1.17(1.05,1.30)	1.002(0.812,1.235)	1.12(1.03,1.22)
	not known	0.995(0.971,1.019)	0.99(0.97,1.02)	1.005(0.977,1.034)	0.98(0.92,1.05)	0.99(0.97,1.02)
	other	1.01(0.97,1.06)	0.99(0.95,1.04)	1.02(0.97,1.07)	1.05(0.94,1.17)	1.008(0.967,1.051)
Social Deprivation Highest to Lowest (1)	2	0.99(0.98,1.01)	0.996(0.981,1.012)	1.001(0.983,1.020)	0.996(0.949,1.045)	0.99(0.98,1.01)
	3	0.98(0.97,1.00)	0.99(0.97,1.00)	0.99(0.97,1.01)	1.003(0.952,1.057)	0.98(0.97,1.00)
	4	0.99(0.97,1.00)	0.99(0.97,1.01)	1.002(0.981,1.022)	1.03(0.97,1.08)	0.99(0.97,1.00)
	Missing	0.94(0.91,0.98)	0.93(0.90,0.97)	0.93(0.89,0.98)	0.90(0.81,1.00)	0.92(0.89,0.96)

Length of Inpatient Stay		Patient related factors				
Congestive Heart Failure	Yes	0.98(0.96,1.00)	0.98(0.96,1.00)	0.98(0.96,1.01)	0.999(0.933,1.071)	0.97(0.95,0.99)
Hypertension	Yes	1.02(1.01,1.03)	1.02(1.01,1.03)	1.03(1.01,1.04)	1.04(1.00,1.07)	1.02(1.01,1.03)
Atrial Fibrillation	Yes	1.02(1.00,1.03)	1.01(1.00,1.02)	1.008(0.993,1.023)	1.02(0.98,1.06)	1.01(1.00,1.03)
Diabetes	Yes	1.03(1.02,1.04)	1.03(1.02,1.04)	0.99(0.98,1.01)	1.04(1.00,1.08)	1.03(1.02,1.04)
Previous Stroke/TIA?	Yes	0.98(0.97,0.99)	0.98(0.97,0.99)	0.98(0.97,1.00)	0.97(0.93,1.01)	0.98(0.97,0.99)
Disability at transfer from previous team (mRS) or on admission (mapped from NIHSS) (0)	1	0.68(0.60,0.78)	0.68(0.60,0.77)	0.69(0.59,0.81)	0.76(0.56,1.05)	0.70(0.62,0.79)
	2	0.86(0.77,0.96)	0.89(0.80,0.99)	0.94(0.83,1.08)	1.001(0.765,1.309)	0.96(0.87,1.07)
	3	0.99(0.88,1.11)	1.02(0.91,1.13)	1.04(0.92,1.19)	1.13(0.87,1.48)	1.10(1.00,1.22)
	4	1.14(1.02,1.28)	1.18(1.06,1.31)	1.15(1.01,1.31)	1.25(0.96,1.62)	1.27(1.15,1.40)
	5	1.33(1.18,1.49)	1.34(1.20,1.49)	1.31(1.15,1.49)	1.40(1.08,1.83)	1.44(1.30,1.59)
Pre-morbid disability (mRS, 0)	1	1.05(1.04,1.07)	1.05(1.03,1.06)	1.01(1.00,1.03)	1.05(1.00,1.10)	1.05(1.03,1.07)
	2	1.08(1.06,1.10)	1.06(1.04,1.08)	1.03(1.01,1.06)	0.99(0.94,1.05)	1.08(1.06,1.10)
	3	1.08(1.07,1.10)	1.04(1.02,1.06)	1.009(0.989,1.030)	1.04(0.99,1.10)	1.07(1.05,1.09)
	4	1.01(0.99,1.04)	0.97(0.95,0.99)	0.94(0.92,0.96)	1.05(0.97,1.14)	0.99(0.97,1.01)
	5	0.93(0.89,0.97)	0.87(0.84,0.91)	0.84(0.81,0.88)	0.85(0.70,1.03)	0.89(0.86,0.92)
Stroke Type (Infarction)	Haemorrhage	1.21(1.19,1.23)	1.20(1.18,1.22)	1.13(1.11,1.15)	1.08(1.03,1.13)	1.20(1.18,1.21)
Stroke Severity (NIHSS, Mild)	Moderate(5-14)	1.27(1.23,1.32)	1.26(1.22,1.30)	1.23(1.18,1.29)	1.17(1.08,1.26)	1.30(1.25,1.34)
	Severe(15-20)	1.44(1.38,1.51)	1.40(1.34,1.46)	1.42(1.35,1.49)	1.33(1.21,1.46)	1.46(1.40,1.53)
	Very Severe(>20)	1.34(1.28,1.41)	1.32(1.26,1.38)	1.36(1.29,1.43)	1.27(1.14,1.42)	1.35(1.29,1.42)
Stroke Impairment Categories (Motor Only)	Loss-Con	0.93(0.90,0.96)	0.92(0.89,0.95)	0.96(0.93,1.00)	1.09(0.98,1.20)	0.89(0.86,0.92)
	Mo-Co-Se	1.03(1.01,1.05)	1.02(1.00,1.04)	1.04(1.02,1.07)	1.06(1.01,1.13)	1.03(1.02,1.05)
	Mo-Co	0.998(0.981,1.016)	0.98(0.97,1.00)	1.009(0.987,1.031)	1.04(0.99,1.10)	1.004(0.987,1.022)
	Mo-Se	0.94(0.92,0.96)	0.94(0.93,0.96)	0.98(0.95,1.01)	0.98(0.92,1.04)	0.93(0.92,0.95)
	No-Mo	0.90(0.88,0.92)	0.90(0.88,0.92)	0.92(0.89,0.95)	0.93(0.86,1.00)	0.90(0.88,0.92)
	None	0.998(0.973,1.024)	0.97(0.95,1.00)	1.15(1.11,1.20)	1.09(0.99,1.19)	0.99(0.97,1.01)

		Organisation related factors				
72hr Swallow assess (No)	Yes	1.16(1.14,1.18)	1.07(1.05,1.09)	1.23(1.20,1.25)	1.13(1.08,1.19)	1.18(1.16,1.20)
72hr Clinical Assessment(No)	Yes	0.80(0.78,0.82)	0.73(0.72,0.75)	0.96(0.94,0.98)		
No. any assessments (0-3)		0.996(0.987,1.005)	1.05(1.04,1.06)	0.92(0.91,0.93)	0.97(0.95,0.99)	0.99(0.98,1.00)
Average Min Therapy per Day of Stay		0.99(0.99,1.00)	0.98(0.98,0.98)	0.97(0.97,0.97)	0.93(0.93,0.94)	0.996(0.996,0.996)
Thrombolysis available (24hrs day)	Non-24hrs/UA	1.13(0.97,1.32)	1.11(0.95,1.30)	1.09(0.93,1.29)	1.23(0.97,1.55)	1.09(0.94,1.27)
Ward Round 7d per wk	Yes	1.04(0.94,1.15)	1.06(0.95,1.17)	1.04(0.93,1.16)	1.04(0.89,1.21)	1.03(0.93,1.14)
Median Length of stay in Unit		1.03(1.02,1.04)	1.03(1.02,1.04)	1.03(1.02,1.04)	1.02(1.00,1.03)	1.03(1.02,1.04)
Team Type (RATa)	RATc	1.12(1.05,1.18)	1.11(1.05,1.17)	1.12(1.05,1.19)	1.29(1.15,1.45)	1.06(1.00,1.12)
	NRAT	0.90(0.75,1.08)	0.92(0.76,1.11)	0.98(0.80,1.20)	1.08(0.82,1.43)	0.87(0.73,1.04)
	NAIT	0.84(0.49,1.46)	0.999(0.571,1.747)	1.15(0.64,2.07)	0.75(0.33,1.70)	0.88(0.51,1.52)
Qualified Nurses (WTE per 10bds)		0.97(0.96,0.99)	0.97(0.95,0.99)	0.98(0.96,0.99)	0.99(0.97,1.01)	0.97(0.96,0.99)
Nurse support workers (WTE/ 10bds)		1.05(1.02,1.07)	1.05(1.02,1.07)	1.05(1.02,1.08)	1.07(1.03,1.11)	1.05(1.02,1.07)
Qualified Therapists (WTE per 10bds)		0.97(0.87,1.08)	1.06(0.96,1.17)	0.95(0.80,1.13)	0.91(0.67,1.23)	
Therapy support workers (WTE per 10bds)		1.12(0.95,1.33)	1.10(0.97,1.25)	1.17(0.89,1.54)	1.37(0.65,2.86)	
No. Therapies available 6/7 days/ wk (0)	1	1.08(0.94,1.24)	1.08(0.95,1.24)	1.10(0.95,1.27)	1.06(0.87,1.29)	1.09(0.95,1.24)
	2 or more	0.98(0.89,1.08)	0.99(0.90,1.10)	0.99(0.90,1.10)	1.16(1.00,1.34)	0.99(0.90,1.09)
Access to Social Wk in 5days (Yes)	No	0.93(0.71,1.21)	0.98(0.75,1.28)	0.94(0.71,1.24)	0.88(0.59,1.32)	0.90(0.70,1.17)
Access to ESD Team	Non-spec ESD	0.98(0.83,1.16)	1.02(0.86,1.21)	1.02(0.85,1.22)	0.87(0.70,1.07)	1.02(0.87,1.20)
	None	1.07(0.95,1.21)	1.06(0.94,1.19)	1.09(0.96,1.23)	0.95(0.79,1.14)	1.08(0.96,1.21)
Access to CRT	Yes	0.99(0.90,1.08)	0.97(0.89,1.07)	0.98(0.88,1.08)	0.92(0.80,1.06)	0.98(0.90,1.08)
Constant	Cut Point 1	8.1(5.8,11.3)	8.6(6.3,11.8)	9.5(6.8,13.4)	10.2(5.7,18.4)	5.8(4.3,7.8)
	ln(Alpha)	-0.53		-0.63	-1.07	-0.50
Team	Var(Cons)	0.08		0.09	0.10	0.08