

Supplemental materials for:

Kiran T, Moineddin R, Kopp A, Frymire E, Glazier RH. Emergency department use and enrollment in a medical home providing after-hours care. *Ann Fam Med*. 2018;16(5):419-427.

Supplemental Appendix 1. After-hours requirements for medical home physicians practicing in groups and related exemptions

The majority of medical homes require physicians to practice together in a group with a minimum of 3 physicians total and no maximum. These physician groups are required to provide one three-hour after-hours session per week for each physician in the group, initially to a maximum of five sessions per week (four blocks Monday to Thursday, each on a distinct day, and one block on the weekend). Communications to physicians in 2011 clarified that the sessions were supposed to be held at regular times, available to scheduled and non-scheduled patients, advertised to patients, and were not to take the place of regular office hours.¹ Physicians practicing in groups do not need to be co-located or share the same electronic medical record.

Groups were exempted from the enhanced after-hours requirement if more than fifty percent of physicians in the group provided one of the following: hospital emergency room coverage, regular anesthesia services in a hospital, or obstetrical deliveries outside of regular hours. Groups were also exempted if they had nine or fewer physicians or if they were a rural or northern group where more than fifty percent of physicians had active in-hospital privileges.

Medical homes are also known as Patient Enrolment Models and common physician groups include the Family Health Organization, Family Health Network, and Family Health Group.²

References:

¹Ministry of Health and Long-Term Care. *After Hours Service Requirements Update*. 2011.

²Hutchison B, Glazier R. Ontario's Primary Care Reforms Have Transformed The Local Care Landscape, But A Plan Is Needed For Ongoing Improvement. *Health Affairs*.32(4):695-703.

Supplemental Appendix 2. Primary care billing codes used to assign Ontario residents to a primary care physician

We assigned each resident to a most responsible primary care physician defined as the primary care physician who billed the maximum value of the 26 commonly billed primary care codes listed below. In the case of a tie (approximately 8% of occurrences), residents are assigned to the primary care physician with the lowest encrypted identifier. Encrypted identifiers are assigned to physicians randomly. We calculated continuity by dividing the number of visits the patient made to their most responsible provider in a two-year period by the total number of primary care visits made during the same period.

Billing Code	Description
A001	Minor Assessment
A002	18 Month Well Baby Check
A003	General Assessment
A007	Intermediate Assessment
A903	Pre-dental General Assess. FP/GP
E075	Geriatric General Assessment Premium
G212	Allergy-hyposensitization injection (G700+G202) (sole reason visit)
G271	Cardiovascular/Anticoagulation supervision (max one per month)
G372	Injection/infusion intramuscular/subcutaneous/intradermal with visit
G373	Injection/infusion as G372 but sole reason for visit, 1st injection
G365	Pap Tests
G538	Each Individual Injection with non-influenza agents
G539	Injection of unspecified agent - sole reason (first injection)
G590	Influenza agent – with visit
G591	Influenza agent – sole reason
K005	Primary Mental Health Care – Individual Care
K013	Educational Counseling – Individual Care
K017	Annual Health Exam – Child after second birthday
P004	Minor Prenatal Assessment
A261	Minor Assessment – pediatrics
A268	18 Month Well Baby Check – pediatrics
K267	Annual Health Exam – Child after 2 nd birthday, pediatrics
K269	Annual Health Exam – Pediatrics or adolescent, office
K130	Periodic health visit - adolescent
K131	Periodic health visit - adult aged 18 to 64 inclusive
K132	Periodic health visit - adult 65 years of age and older

Supplemental Appendix 3. Full parameter estimates for all models

Time = baseline trend before enrolment in a medical home

Group = level change after enrolment in a medical home

Time after = change in trend after enrolment in a medical home

(Time) + (time after) = trend after enrolment in a medical home

Emergency department visit rate (N=2,945,087 individuals)

Parameter	Estimate	Standard Error	95% Confidence Limits		Z	Pr > Z
Intercept	0.0060	0.0036	-0.0011	0.0132	1.66	0.0970
time	0.0077	0.0006	0.0066	0.0088	13.62	<.0001
group	0.0067	0.0016	0.0037	0.0098	4.29	<.0001
time_after	0.0069	0.0006	0.0057	0.0081	11.33	<.0001
male	0.2282	0.0017	0.2248	0.2315	133.06	<.0001
incq1	0.2734	0.0023	0.2690	0.2778	121.49	<.0001
incq2	0.1594	0.0021	0.1553	0.1635	76.20	<.0001
incq3	0.1062	0.0020	0.1022	0.1101	52.28	<.0001
incq4	0.0647	0.0020	0.0607	0.0686	32.08	<.0001
rub1	-1.2059	0.0040	-1.2138	-1.1980	-298.79	<.0001
rub2	-0.5154	0.0014	-0.5181	-0.5127	-374.21	<.0001
adg0	-3.2058	0.0139	-3.2331	-3.1786	-230.40	<.0001
adg1	-1.5665	0.0022	-1.5708	-1.5621	-707.18	<.0001
adg2	-0.6847	0.0018	-0.6882	-0.6813	-385.72	<.0001
ageg1	0.0326	0.0033	0.0261	0.0392	9.78	<.0001
ageg2	-0.2202	0.0032	-0.2265	-0.2139	-68.10	<.0001
ageg3	-0.3777	0.0032	-0.3840	-0.3714	-117.48	<.0001
ageg4	-0.4374	0.0033	-0.4439	-0.4308	-130.68	<.0001
ageg5	-0.2628	0.0031	-0.2689	-0.2568	-85.17	<.0001

Emergency department visit rates excluding MDs with after-hours exemption
(N=2,804,118 individuals)

Parameter	Estimate	Standard Error	95% Confidence Limits		Z	Pr > Z
Intercept	-0.0210	0.0038	-0.0283	-0.0136	-5.58	<.0001
time	0.0053	0.0006	0.0041	0.0064	8.95	<.0001
group	0.0074	0.0016	0.0042	0.0106	4.50	<.0001
time_after	0.0104	0.0006	0.0092	0.0117	16.42	<.0001
male	0.2365	0.0018	0.2331	0.2400	134.01	<.0001
incq1	0.2756	0.0023	0.2711	0.2802	118.46	<.0001
incq2	0.1584	0.0022	0.1541	0.1626	73.32	<.0001
incq3	0.1020	0.0021	0.0979	0.1061	48.91	<.0001
incq4	0.0612	0.0021	0.0572	0.0652	29.85	<.0001
rub1	-1.2319	0.0043	-1.2403	-1.2236	-289.81	<.0001
rub2	-0.5273	0.0014	-0.5301	-0.5245	-368.30	<.0001
adg0	-3.2636	0.0149	-3.2928	-3.2343	-218.86	<.0001
adg1	-1.5851	0.0023	-1.5896	-1.5806	-689.66	<.0001
adg2	-0.6932	0.0018	-0.6968	-0.6896	-377.68	<.0001
ageg1	0.0280	0.0034	0.0212	0.0347	8.13	<.0001
ageg2	-0.2281	0.0033	-0.2346	-0.2215	-68.33	<.0001
ageg3	-0.3861	0.0033	-0.3926	-0.3796	-116.45	<.0001
ageg4	-0.4469	0.0035	-0.4536	-0.4401	-129.49	<.0001
ageg5	-0.2700	0.0032	-0.2763	-0.2637	-84.60	<.0001

Continuity (N=1,432,994)

Parameter	Estimate	Standard Error	95% Confidence Limits		Z	Pr > Z
Intercept	-0.1414	0.0007	-0.1427	-0.1401	-211.80	<.0001
time	-0.0085	0.0001	-0.0087	-0.0083	-93.03	<.0001
group	-0.0304	0.0002	-0.0309	-0.0300	-133.41	<.0001
time_after	0.0122	0.0001	0.0120	0.0124	114.29	<.0001
male	0.0286	0.0004	0.0278	0.0293	74.19	<.0001
incq1	0.0051	0.0004	0.0044	0.0059	13.60	<.0001
incq2	0.0066	0.0004	0.0059	0.0073	18.61	<.0001
incq3	0.0039	0.0003	0.0032	0.0046	11.28	<.0001
incq4	0.0020	0.0003	0.0014	0.0027	6.12	<.0001
rub1	-0.0014	0.0009	-0.0032	0.0004	-1.57	0.1171
rub2	-0.0003	0.0002	-0.0006	0.0000	-1.66	0.0962
adg0	0.1118	0.0092	0.0937	0.1299	12.10	<.0001
adg1	0.0644	0.0002	0.0639	0.0648	270.19	<.0001
adg2	0.0296	0.0002	0.0293	0.0300	169.06	<.0001
ageg1	-0.2385	0.0007	-0.2400	-0.2371	-322.56	<.0001
ageg2	-0.1565	0.0006	-0.1576	-0.1553	-259.27	<.0001
ageg3	-0.0840	0.0006	-0.0851	-0.0829	-150.89	<.0001
ageg4	-0.0372	0.0005	-0.0383	-0.0362	-69.35	<.0001
ageg5	-0.0099	0.0005	-0.0108	-0.0089	-20.22	<.0001

Primary care visit rate (N=2,945,087)

Parameter	Estimate	Standard Error	95% Confidence Limits		Z	Pr > Z
Intercept	2.8991	0.0016	2.8960	2.9022	1824.40	<.0001
time	0.0062	0.0002	0.0059	0.0065	40.69	<.0001
group	0.0286	0.0003	0.0280	0.0292	92.68	<.0001
time_after	-0.0285	0.0002	-0.0288	-0.0281	-157.26	<.0001
male	-0.1546	0.0008	-0.1561	-0.1530	-195.93	<.0001
incq1	0.0359	0.0006	0.0348	0.0371	60.92	<.0001
incq2	0.0289	0.0005	0.0279	0.0300	53.03	<.0001
incq3	0.0229	0.0005	0.0219	0.0239	43.70	<.0001
incq4	0.0135	0.0005	0.0125	0.0145	27.19	<.0001
rub1	-0.5135	0.0005	-0.5144	-0.5125	-1073.4	<.0001
rub2	-0.0700	0.0003	-0.0705	-0.0694	-238.28	<.0001
adg0	-1.6024	0.0013	-1.6049	-1.5999	-1243.8	<.0001
adg1	-0.5466	0.0005	-0.5475	-0.5457	-1210.5	<.0001
adg2	-0.1867	0.0004	-0.1874	-0.1859	-512.95	<.0001
ageg1	-0.3390	0.0015	-0.3420	-0.3360	-220.18	<.0001
ageg2	-0.2758	0.0015	-0.2787	-0.2729	-187.16	<.0001
ageg3	-0.1928	0.0014	-0.1956	-0.1899	-134.10	<.0001
ageg4	-0.0833	0.0014	-0.0860	-0.0806	-60.35	<.0001
ageg5	-0.0080	0.0012	-0.0104	-0.0057	-6.61	<.0001

Proportion of all primary care visits that are A888 (N=2,945,087)

Parameter	Estimate	Standard Error	95% Confidence Limits		Z	Pr > Z
Intercept	-5.7224	0.0104	-5.7428	-5.7020	-550.26	<.0001
time	0.0470	0.0008	0.0454	0.0485	57.61	<.0001
group	-0.3125	0.0024	-0.3173	-0.3077	-127.72	<.0001
time_after	0.0348	0.0009	0.0331	0.0366	38.83	<.0001
male	0.1337	0.0024	0.1290	0.1383	56.38	<.0001
incq1	0.0165	0.0033	0.0101	0.0229	5.03	<.0001
incq2	0.0529	0.0031	0.0468	0.0590	16.89	<.0001
incq3	0.0986	0.0030	0.0926	0.1045	32.43	<.0001
incq4	0.0703	0.0029	0.0645	0.0760	23.98	<.0001
rub1	0.1626	0.0060	0.1508	0.1745	26.99	<.0001
rub2	0.1339	0.0021	0.1298	0.1380	64.30	<.0001
adg0	-2.8583	0.1070	-3.0681	-2.6485	-26.70	<.0001
adg1	-0.2524	0.0030	-0.2583	-0.2465	-84.12	<.0001
adg2	-0.1491	0.0024	-0.1537	-0.1444	-62.77	<.0001
ageg1	1.6775	0.0099	1.6580	1.6970	168.72	<.0001
ageg2	1.4710	0.0099	1.4516	1.4905	148.54	<.0001
ageg3	1.0724	0.0100	1.0528	1.0920	107.21	<.0001
ageg4	0.5428	0.0104	0.5224	0.5632	52.22	<.0001
ageg5	0.2057	0.0103	0.1856	0.2258	20.04	<.0001