

## Appendix 1: Supplemental tables

**Table S1- ICES Data Sources Used in this Study**

Database name	
<b>Registered Persons Database (RPDB)</b>	Contains demographic information about anyone who has ever received an Ontario health card number, i.e. all Ontarians alive at any time since 1990 (over 16 million records).(1)
<b>Ontario Health Insurance Plan (OHIP)</b>	Contains information on all billing claims submitted by Ontario physicians (consultations and procedures). Fee for service is the primary method of remuneration for 95% of specialist physicians and 50% of primary care physicians in Ontario. However, physicians practicing in non fee-for-service models submit shadow billings to OHIP, which appear as billing claims with a payment value of \$0.(2)
<b>National Ambulatory Care Reporting System (NACRS)</b>	Includes information for all emergency department visits since 2000. A re- abstraction study of diagnostic codes found 85% agreement for the main presenting problem.(3)
<b>Discharge Abstract Database (DAD)</b>	Information on all admissions (excluding designated mental health beds) to acute care hospitals in Ontario. This includes dates of admission as well as diagnostic and procedural codes. Overall, diagnostic codes were found to be 82% sensitive for primary diagnosis when verified against chart abstraction.(4)
<b>Ontario Mental Health Reporting System (OMHRS)</b>	Includes information on all admissions to designated adult inpatient mental health beds in Ontario.(5)
<b>Home Care Database (HCD)</b>	Includes all publicly funded home care services, including the service type (end-of-life or not).(6)
<b>Client Agency Program Enrolment Database (CAPE)</b>	Links physicians to their enrolled patients under several patient enrolment models of clinical practice. These funding models include enhanced fee for service, non-team capitation, and team-based capitation.(7)
<b>Immigration Refugees and Citizenship Canada Permanent Resident Database (IRCC)</b>	Contains information on immigrants who have landed in Ontario since 1985.(8)
<b>Ontario Diabetes Dataset (ODD)</b>	Contains individuals in Ontario with any type of non-gestational diabetes identified since 1991. Combines data from OHIP, RPDB, ODB and DAD. When validated against clinical charts, this was 90% sensitive and 98% specific for a diagnosis of adult diabetes.(9)
<b>Ontario Congestive Heart Failure (CHF) dataset</b>	Contains all Ontario individuals with CHF identified since 1991. This dataset combines data from DAD, OMHRS, OHIP and NACRS. Among adults over age 40, sensitivity was 85% and specificity was 97% when validated against chart review.(10)
<b>Ontario Chronic Obstructive Pulmonary Disease Cohort (COPD)</b>	Contains all Ontario COPD patients identified since 1991. This dataset combines data from DAD and OHIP. Among adults over age 35, sensitivity was 85% and specificity was 78% when validated against chart review.(11)

<b>Ontario Dementia dataset (DEMENTIA)</b>	Includes all Ontario persons who were identified with Alzheimer’s and related dementias in ICES data holdings between the ages of 40 to 110 years. This dataset combines data from DAD, OHIP and prescribed medications from the Ontario Drug Benefit (ODB). Among adults over age 65, sensitivity was 79% and specificity was 99% when validated against chart review. (12)
<b>Ontario Asthma Cohort (ASTHMA)</b>	Contains all Ontario asthma patients identified since 1991. Combines information from DAD and OHIP. In adults, 80% sensitive, 81% specific against chart review. (13) Among those under age 18, 89% sensitive, 72% specific against chart review. (14)
<b>MOMBABY dataset</b>	MOMBABY dataset links the DAD inpatient admission records of delivering mothers and their newborns. (15)

**Table S2A- Volume Incentive Thresholds for Physician Home visits-** applicable to physicians in patient enrolment models of care, for both enrolled and unenrolled patients – copied from Ministry of Health InfoBulletins.(16, 17)

Bonus Level	Home Visits			
	A	B	C	D
Necessary annual criteria	3 or more patients served and	6 or more patients served and	17 or more patients served and	32 or more patients served and
	12 or more encounters	24 or more encounters	68 or more encounters	128 or more encounters
Annual Bonus	\$1,500	\$3,000	\$5,000	\$8,000

**Table S2B- Volume Incentive Thresholds for Physician Home visits-** applicable to fee-for-service physicians– copied from Ministry of Health InfoBulletin.(18)

Bonus Level	Home Visits	
	A	B
Necessary annual criteria	3 or more patients served and	6 or more patients served and
	12 or more encounters	24 or more encounters
Annual Bonus	\$1,500	\$3,000

**Table S3- Codes Used to Identify Palliative Care and Not Palliative Home Visits. Home visits were first classified as palliative if any palliative codes were present.**

Type of Home Visit	Code	Descriptor of code
<b>Palliative care</b>	B998	Palliative Home Visit- Special visit premium daytime/evenings/weekend
	B997	Palliative Home Visit- Special visit premium nights
	B966	Palliative Home Visit- Travel premium
	A945	GEN./FAM.PRACT.SPECIAL PALLIATIVE CARE CONSULTATION
	A905	GENERAL/FAMILY PRACTICE-LIMITED CONSULTATION
	G512	Palliative care case management fee
	K700	PALLIATIVE CARE OUT-PATIENT CASE CONFERENCE
<b>Not palliative</b> (used for home care services group and “other” group)	A902	House call-to pronounce death
	A901	House call assessment (in FP/GP section)
	A900	Complex house call assessment- for “frail elderly or housebound”
	B960, B990, B961, B992	Home visit Special visit premiums daytime
	B962, B994, B964, B996	Home visit Special visit premiums evenings and nights
B963, B993	Home visit Special visit premiums Weekends and holidays	

**Table S4- Operational Definitions for all Variables**

Variable	Data Source	Definition
Home visit physician billing costs	OHIP	Obtained from the monetary value (variable TOTPAID) of all billing codes from physician home visits.
Age	RPDB	Categorized as <18 years (children) 18-39 years (young adult) 40-64 years (middle aged) 65-79 years (younger seniors) 80+ years (older seniors)
Sex	RPDB	Male Female
Residence setting	RPDB	Postal code converted to RIO score (19) 0-9 : large urban 10-39: small urban 40+: rural
Neighborhood income quintile	RPDB, Census	Nearest census-based income quintile based on postal code (based on 2016 census).(20)
Comorbidity count	DAD, NACRS, OHIP	Count of ACG System Aggregated Diagnosis Groups (ADGs), per the Johns Hopkins ACG® System Version 7, in 2 years prior to the index date.(21) Categorized as: Low 0-5 Moderate 6-9 High 10+
Healthcare Utilization	DAD, NACRS, OHIP	Using Resource Utilization Bands (RUBs), per the Johns Hopkins ACG® System Version 7, in 2 years prior to the index date.(21) Categorized as: Low (0-2) Moderate (3) High (4-5)
Pediatric Chronic Medical Condition (Pediatric subgroup only)	DAD	For pediatric (under age 18 group), diagnostic code of a chronic medical condition or any procedure either inpatient or office, per the definition use by the Canadian Institute for Health Information.(22)
Recent emergency department visit	DAD	At least one emergency department in the previous 30 days.
Recent hospital discharge	DAD	Discharged from an acute care facility within the previous 30-day period.
Previous office physician visits	OHIP	Count of all visits in previous year that occurred in an office setting (location="O"). Exclude codes that start with: X, J, L, E, Q0**, Q1**, Q2**. Combine all codes by same physician, on same day, with same patient into 1, to avoid double counting office visits.
Homecare service visits in previous month	HCD	Number of home care visits in the 30 days before the home visit (restrict to only visits with CARESITE=21 (household).

Dementia	DEMEN TIA, RAI- HC	Code as 1 if either of: - presence in “DEMENTIA” dataset at ICES. - RAI-HC component (J1G or J1H)=yes in 5-year look-back from index date.
Mental health visits	OHIP/N ACRS/D AD/OM HRS	Coded as 1 if any admission, emergency department visits, or office visit for a mental health-related condition in previous 2 years. The detailed algorithm and codes used have been described elsewhere: - ED/admissions using NACRS, DAD and OMHRS data(23) - office visits using OHIP data(24)
Chronic obstructive pulmonary disease (COPD)	COPD	Presence in COPD database
Congestive heart failure (CHF)	CHF	Presence in CHF database
Asthma	ASTHM A	Presence in ASTHMA database
Post-partum	MOMBA BY	Presence in “MOM-BABY” dataset with baby date of birth up to 90 days before index home visit date. (B_BDATE-index date ≤ 90 days) If yes then code as 1. Otherwise code as 0.
Diabetes	ODD	Presence in ODD
Limited proficiency in English or French	IRCC	CAN_LANG=4 in IRCC database
Immigrant status	IRCC	Present in IRCC database(8)
Primary care attachment	CAPE, OHIP	%getpcprovider macro using the methods described by Stukel et al.(25) - formally enrolled(ROSTERED=1) - other primary care physician (ROSTERED=2) - no primary care (ROSTERED=0)
Same as enrolled primary care provider	CAPE	%getpcprovider macro using the methods described by Stukel et al.(25) Code as yes if the home visit MD is the same MD as enrolled MD ('ROSTERED'=1)
Another physician in same group as enrolled primary care provider	CAPE	Use macro %getpcprovider If “ROSTERED”=1 then Compare patient’s enrolling “groupnum” to groupnum(s) of home visit physician on index date. If patient rostered=1 and physnums are different, but groupnums are the same, then code as 1.
Either same as enrolled primary care provider or same group	CAPE	Use macro %getpcprovider If “ROSTERED”=1 then Compare patient’s enrolling “groupnum” to groupnum(s) of home visit physician on index date. If patient rostered=1 and groupnum is the same code as 1
Known to patient from a visit in the previous year	OHIP	Home visit MD had least 1 previous visit (in any setting) with this patient in the previous 365 days

Repeat home visits in subsequent year	HCD	Count of repeat home visits (combined multiple home visits in one day into one home visit) in subsequent 365 days after the first.
Repeat home visits with same MD in subsequent year	OHIP	Subsequent MD home visits with the same physician as the first home visit.
Office visit within 30 days	OHIP	Count of office physician visit in the <b>30 days</b> following the home visit- include the day of the home visit.  Code as office visit if there is at least one visit that is assigned to location = "O" (office), excluding OHIP codes starting with: X, J, L, E, Q0**, Q1**, Q2**
Emergency department visit within 30 days	NACRS	Code as 1 if visit to the emergency department within 30 days of home visit. Start count on the day of the index home visit date
Urgent hospitalization within 30 days	DAD	Code as 1 if urgent admission (ADMCAT="U") to an acute care hospital within 30 days of home visit. Start the count on the day of the index home visit date.
<b>Subgroup with RAI-HC completed within 6 months prior to index physician home visit</b>		
Hearing impaired	RAI-HC	C1_RAIHC=(2 or 3) or D3=(2, 3, or 4) Corresponds to "Hearing" is either "hears in special situations only" or "highly impaired"
Vision impaired	RAI-HC	D1_RAIHC or D4=(2, 3, or 4) Corresponds to "Vision" is "impaired" (sees large print only) or "moderately impaired" or "highly impaired" or "severely impaired"
Caregiver in home	RAI-HC	Score as 1 if either (G1EA_RAIHC or G1EB_RAIHC)=0 (in form 0=yes) Corresponds to "Informal helpers (primary and secondary)" and "lives with client" for each of "primary" and "secondary."
Assistive Device	RAI-HC	Coded as 1 if (H4A or H4B) = (1,2,3,4) Corresponds to "Primary modes of locomotion" any of: "cane", "walker/crutch", "scooter", or "wheelchair"
Dependent on others for locomotion	RAI-HC	Not independent, if (G2f or H2C)=(1,2,3,4,5,6,8) Corresponds to "Locomotion in home" within "ADL self-performance" anything other than "independent" (includes "setup help only", "supervision", limited assistance", "extensive assistance", "maximal assistance", "total dependence" and "activity did not occur").
Homebound Status	RAI-HC	Not homebound (0)= H6A ("Stamina-Days") is 0-1 Borderline homebound (1)= H6A ("Stamina-Days") is 2 Homebound (2)= H6A ("Stamina-Days") is 3 or G4b=0

**Table S5- Top 10 Most Common Diagnoses Claimed for Home Visits to Patients in the Palliative Group**

Diagnosis code	Description	N (%)
162	Malignant neoplasm - bronchus, lung	10,719 ( 13.6% )
199	Other malignant neoplasms	5,508 ( 6.99% )
290	Senile dementia, presenile dementia	3,497 ( 4.44% )
428	Congestive heart failure	3,388 ( 4.30% )
157	Malignant neoplasm - pancreas	3,330 ( 4.22% )
153	Malignant neoplasm - large intestine, excluding rectum	3,325 ( 4.22% )
174	Malignant neoplasm - female breast	3,309 ( 4.20% )
185	Malignant neoplasm - prostate	2,461 ( 3.12% )
198	Metastatic or secondary malignant neoplasm, carcinomatosis	1,967 ( 2.50% )
799	Other ill-defined conditions	1,954 ( 2.48% )

**Table S6- Top 10 Most Common Diagnoses Claimed for Home Visits to Patients in the Homecare Recipient Group**

Diagnosis code	Description	N (%)
290	Senile dementia, presenile dementia	8,693 ( 10.5% )
428	Congestive heart failure	3,093 ( 3.72% )
401	Essential, benign hypertension	2,921 ( 3.51% )
799	Other ill-defined conditions	2,785 ( 3.35% )
460	Acute nasopharyngitis, common cold	2,574 ( 3.09% )
250	Diabetes mellitus, including complications	2,483 ( 2.98% )
781	Leg cramps, leg pain, muscle pain, joint pain, arthralgia, joint swelling, masses	2,308 ( 2.77% )
682	Cellulitis, abscess	2,302 ( 2.77% )
300	Anxiety neurosis, hysteria, neurasthenia, obsessive compulsive neurosis, reactive depression	2,301 ( 2.77% )
466	Acute bronchitis	2,208 ( 2.65% )

**Table S7- Top 10 Most Common Diagnoses Claimed for Home Visits to Patients in the “Other” group**

Diagnosis code	Description	N (%)
460	Acute nasopharyngitis, common cold	36,397 (14.5)
466	Acute bronchitis	11,825 (4.7)
300	Anxiety neurosis, hysteria, neurasthenia, obsessive compulsive neurosis, reactive depression	10,929 (4.3)
290	Senile dementia, presenile dementia	9,671 (3.8)
401	Essential, benign hypertension	7,398 (2.9)
787	Anorexia, nausea and vomiting, heartburn, dysphagia, hiccup, hematemesis, jaundice, ascites, abdominal pain, melena, masses	7,383 (2.9)
009	Diarrhea, gastro-enteritis, viral gastro-enteritis	7,131 (2.8)
781	Leg cramps, leg pain, muscle pain, joint pain, arthralgia, joint swelling, masses	6,356 (2.5)
079	Other viral diseases	6,228 (2.5)
799	Other ill-defined conditions	6,042 (2.4)

**Table S8- Top 10 Most Common Diagnoses Claimed for Home Visits to Patients Under Age 18 in the “Other” group**

Diagnosis code	Description	N (%)
460	Acute nasopharyngitis, common cold	17,331 (32.8)
079	Other viral diseases	3,186 (6.0)
381	Serous otitis media, eustachian tube disorders	2,745 (5.2)
009	Diarrhea, gastro-enteritis, viral gastro-enteritis	2,488 (4.7)
466	Acute bronchitis	1,865 (3.5)
382	Suppurative otitis media	1,649 (3.1)
691	Eczema, atopic dermatitis, neurodermatitis	1,622 (3.1)
034	Streptococcal sore throat, scarlet fever	1,603 (3.0)
787	Anorexia, nausea and vomiting, heartburn, dysphagia, hiccup, hematemesis, jaundice, ascites, abdominal pain, melena, masses	1,599 (3.0)
463	Acute tonsillitis	1,232 (2.3)

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