Supplementary Table S1: A description of the multiple linked databases housed at ICES which were used for this study

Data regarding sex and death was captured through the Registered Persons Database (RPDB) Database which helped define the decedent cohort. Furthermore, information regarding: postal code, income quintile and rurality was captured through the Vital Statistics Database in conjunction with Statistics Canada census data. Information regarding physician delivered palliative care was captured through billing information contained in the Ontario Health Insurance Plan (OHIP) database. Information regarding approach to care during hospitalization was captured through the Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD). Data regarding physician practice/training demographics was captured using the Physician Service Databases (IPDB) whilst information on physicians rostering decedents was captured using the Client Agency Program Enrollment (CAPE). Decedents with recent immigrance to Canada were identified through a registry maintained by Immigration, Refugees and Citizenship Canada (IRCC). Decedents were categorized into three end-of-life illness trajectories: organ failure, terminal illness and frailty on the basis of their listed cause of death. Please see supplementary materials for further details on qualifying ICD codes. Data regarding decedents inclusion in chronic disease prevalent cohorts was also captured. This method of categorizing decedents into disease prevalent groups is achieved through previously described and validated cohorting algorithms developed at ICES.(1–4)

Supplementary Table S2: Information regarding linked clinical/health administrative databases located at ICES (Institute for Clinical Evaluative Sciences) that were used as part of this study

Database	Description
Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD)	**Contains detailed diagnostic and procedural information for all hospital admissions in Canada. Information regarding hospitalization, and specifically the methods described for categorizing approach to palliative care rely on data captured in this database** **DAD records have been demonstrated to have excellent agreement (over 99%) for demographic and administrative data. Regarding diagnoses, median agreement between original DAD records and re-abstracted records for the 50 most common most responsible diagnoses was noted to be 81% (Sensitivity 82%; Specificity 82%). The corresponding median agreement for the 50**

	most frequently performed surgical procedures was 92% (sensitivity 95%, positive predictive value 91%).(5)
Ontario Health Insurance Plan (OHIP)	**Identifies physician billing claims and specialty on all services provided by fee-for-service physicians in Ontario and "shadow billings" for physicians paid under alternate payment plans. It also identified referring physicians for all consultations. Physician delivered palliative care was identified using billing codes found in this database**
Registered Persons Database (RPDB)	**Registry of all Ontarians eligible to receive insured health services in the province and contains detailed demographic information as well as the Local Health Integration Networks (LHIN), which defines Ontario's 14 regional areas within which people received most of their hospital care from local hospitals. Information regarding decedent characteristics included sex, rurality, income quintile etc.**
Client Agency Program Enrolment (CAPE)	**This dataset indicates the enrolment of an individual in a program with a specific practitioner and group. A new record is created when a Registered Person enrols in a program. The individual must be eligible for Ontario Health Insurance at the time of rostering. This**

ICES Physician Database (IPDB)	**This database contains information regarding physicians demographics for physicians registered in the province of Ontario billing within the provincial health insurance for patient services. Data on referring physician demographics such as sex, and location of training was captured using this database**
Immigration, Refugees and Citizenship Canada (IRCC/CIC):	**This dataset includes immigration application records for people who initially applied to land in Ontario. Records date from 1985. The data contains permanent residents' demographic information such as country of citizenship, level of education, mother tongue, and landing date. This is a protected database with special permissions. Immigrant status for decedent cohort was identified using this database**

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Supplementary Table S3: Identification and Coding of decedents in different trajectories of death (based on cause of death)

Conditions Leading to Death	Criteria
Terminal Illness (Cancer)	ICD-10 codes B24, C, D1 - D3, D40 - D48, N18, D022, D090, D010, D051, D075, D001, D015, D020, D042, D045, D059, D069, D070,
Frailty (Dementia)	ICD-10 codes A02 - A04, A08, A09, A37, A48, A49, B01, B02, B37, B95, B96, E4, E5, E60 - E64, E86, E87, E97, F00 - F03, G20 - G26^, G30 - G32, G35 - G37, G81, G82, I21, I25.0, I25.3, I25.4, I25.5, I25.6, I25.8, I25.9, I251, I69, J00 - J06, J10 - J16, J18, J20 - J22, J69, J80, K59,x L89, M00 - M03, M05 - M09, M11 - M19, M32 - M36, M41 - M43, M45, M46, M80 - M85, M91, M92, N30, R54, R63.3, R63.4
Organ Failure	ICD-10 codes A15 - A19, A50 - A53, A80, A81, A86 - A89, B15 - B19, B90 - B94, D5 - D70, D71 - D77, D80 - D84, D86, D89, E00 - E07, E10 - E16, E2, E30 - E35, E65 - E68, E70 - E75.0, E75.1, E75.2, E75.3, E75.4, E75.5, E75.6, E76 - E80, E83 - E85, E88, F1, G0, G10 - G13, G40, G41, G45 - G47, G5, G60 - G64, G70 - G73, G80, G90 - G95, H0 - H8, H91 - H95, I01, I05 - I13, I15, I20, I22 - I24, I25.2, I26 - I28, I3, I4, I50 - I52, I60 - I68, I70 - I74, I77 - I79, I8, I95, I97 - I99, J30.0, J30.1, J30.2, J30.3, J30.4, J31.0, J31.1, J31.2, J32 - J38, J40 - J45, J47, J60 - J68, J70, J81, J82, J84 - J86, J90 - J94, J96, J98, J99, K0, K10 - K14, K20 - K23, K25 - K31, K35 - K38, K40 - K46, K50 - K52, K55 - K58, K60.0, K60.1, K60.2, K60.3, K60.4, K60.5, K61.0, K61.1, K61.2, K61.3, K61.4, K62, K63, K65 - K67, K70 - K73, K74.0, K74.1, K74.2, K74.3, K74.4, K74.5, K74.6, K75 - K77, K80 - K83, K85, K86, K90 - K93, L00, L01.0, L01.1, L02 - L05, L08, L10 - L14, L20 - L27, L28.0, L28.1, L28.2, L29, L30, L40 - L45, L50 - L54, L70 - L74, L93.0, L93.1, L93.2, L94, L95.0, L97 - L99, M10, M22 - M25, M30, M31, M47 - M49, M51, M73, M79, M86 - M90, M93, M94, N00 -

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	N08, N10 - N13, N14.0, N14.1, N14.2, N14.3, N14.4, N15 - N17, N19 - N22, N25 - N29, N31 - N33, N34.0, N34.1, N34.2, N34.3, N35 - N37, N39 - N45, N47 - N51, N60 - N64, N70 - N77, N8, N90 - N96, Q00 - Q07, Q10 - Q18, Q20 - Q28, Q3, Q40 - Q45, Q50 - Q56, Q6 - Q9, J670, L732, J672, J64, J65, J678,
Sudden Death/Other	**Sudden death:** R95, R96, W03, W2 – W9, W11 - W17, X, V, Y0 - Y2, Y30 Y36 **Other:** ICD-10 codes A00, A01, A05 - A07, A20 - A28, A30 - A36, A38 - A44, A46, A54 - A60, A63 - A71, A74 - A79, A82, A85, A91 - A99, B00, B03 - B09, B25 - B27, B30, B33 - B36, B38, B39, B4 - B7, B80 - B83, B85 - B89, B97, B99, F04 - F07, F09, F20 - F25, F28 - F34, F38 - F45, F48, F50 - F55, F59, F6 - F9, G43, G83, G96 - G99, I00, I02, J17, J39, J95, K91, L55 - L68, L80 - L88, L90 - L92, M20, M21, M40, M50, M53, M54, M60 - M63, M65 - M68, M70 - M72, M75 - M77, M95, M96, M99, N46, N97 - N99, O00 - O08, O10 - O16, O21 - O26, O28 - O36, O40 - O48, O6, O70 - O75, O8, O90 - O92, O95 - O99, P00 - P08, P10 - P15, P2, P35 - P39, P5, P60, P61, P70 - P78, P80 - P83, P90 - P96, R0, R1, R20 - R23, R25 - R29, R3, R4, R50 - R53, R55 - R69, R7, R8, R90 - R94, R98, R99, W00 - W02, W04 - W10, W18, W19, Y4 - Y9

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Supplementary Table S4: Physician claims fee codes used to identify delivery of palliative care including location

Outpatient	A945 (without and with B codes): Special palliative care consultation in clinic, office, home; minimum 50 min · K015 (if no other fee code combination below was met): Counselling of relatives -on behalf of catastrophically or terminally ill patient · K023 (if no other fee code combination below was met): Palliative care support in half-hour increments; may be used to add time for longer consultations following a code for A945, or for any PC support visit. Exclude if patient is in hospital, long-term care (LTC), complex continuing care (CCC), or rehabilitation
Home-based	· A900 with (B966, B998, B997): Complex house call assessment · A901 with (B966, B998, B997): House call assessment · A945 with any B code: Special palliative care consultation · K023 with A900 A901 or any B code: Palliative care support · K015 with A900 A901 or any B code: Counselling of relatives -on behalf of catastrophically or terminally ill patient

	· B966: Palliative care home visit; travel premium – weekdays daytime · B998: Palliative care home visit; special visit premium – weekdays daytime, first-person seen · B997: Palliative care home visit; special visit premium – nights, first-person seen · A900 A901 B960 B961 B962 B963 B964 B986 B987 B988 B990 B992 B993 B994 B996 within the last 3 months prior to death
Hospital inpatient	· C945: Special palliative care consultation · C882: Palliative care; Non-emergency subsequent visits by the MRP following transfer from an Intensive Care Area · C982: Palliative care; Emergency subsequent visits by the MRP following transfer from an Intensive Care Area · K015 with (C945 C882 C982): Counselling of relatives -on behalf of catastrophically or terminally ill patient · K023 with (C945 C882 C982): Palliative care support in half-hour increments; may be used to add time for longer consultations following code for A945, or for any PC support visit.
Subacute care	· W882: Palliative care; Long-term care subsequent visit

	· W982: Palliative care; Long-term care subsequent visit (for community medicine practitioners) · K015 with (W882 W982): Counselling of relatives -on behalf of catastrophically or terminally ill patient · K023 with (W882 W982): Palliative care support in half-hour increments; may be used to add time for longer consultations following a code for A945, or for any PC support visit.
Third-party encounters	· G511: Telephone services to a patient receiving PC at home (max. 2/week) · G512: Weekly care case management from palliative primary care management (Monday–Sunday) · K700: Palliative care outpatient case conference

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Supplementary Table S5A: Definition of Approach to In-Patient Palliative Care

Level of involvement	Definition	Example(s) of patient typology
Palliative Intent Likely (High Involvement)	Hospitalizations in which palliative care was the **most responsible diagnosis** *and* the **most responsible service provider**.	Patients admitted to inpatient palliative care units.
Palliative Intent Likely (Medium Involvement)	Hospitalizations in which palliative care was the **most responsible diagnosis** *or* the **most responsible service provider** *or* hospitalizations with involvement from a **palliative care specialist**.	Patients admitted primarily for palliative care purposes, but under the care of non-palliative care service providers, such as oncologists or general internists. Patients who received care from a palliative care specialist (e.g., palliative care team was consulted), regardless of their admission diagnoses or most responsible service provider.

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Palliative Intent Unlikely	Hospitalizations in which **palliative care was a component of care** provided during the hospitalization, but not the primary reason for the admission (palliative care was secondary diagnosis), or hospitalizations with involvement from a **palliative care generalist**.	Patients admitted primarily for non-palliative care purposes, but for whom palliative care was a component of care. Patients who received care from a palliative care generalist (e.g., internist), regardless of their admission diagnoses or most responsible service provider.
No palliative care	Hospitalizations in which **no palliative care** indicator was identified in the administrative databases.	Patients with no indication of palliative care involvement during the admission (i.e. no palliative care diagnosis, no palliative care service provider, no palliative care physician billing claim).

Supplementary Table S5B: Crriterion for categorizing the above A-D

1) Most Responsible Diagnosis of palliative care identified through the International Classification of Disease and Related Health Problems 10th revision (ICD-10) diagnosis code of Z51.5

2) The most responsible service provider was palliative care, identified through the main patient service in CIHI-DAD (PATSERV = 58).

3) A physician involved in the patient's care claimed a palliative care fee code during the course of the patient's hospitalization, identified through fee codes in the Ontario Health Insurance Program (OHIP) claims database.

   a) Fee codes specific to inpatient setting:
   C945: Special palliative care consultation in hospital (50 minutes); may add a K023 for more time.
   C882: Family medicine palliative care, routine hospital inpatient service.
   C982: Specialist palliative care, routine hospital inpatient service.

   b) Codes that are not setting specific:
   Any of the following fee codes if the billing physician also billed for any fee code starting with C for the same patient, during the patient's hospitalization (C codes identify care provided in an inpatient setting):
   A945: Special palliative care consultation in clinic, office, home (50 minutes); may add a K023 for more time.
   K015: Counseling of relatives—on behalf of catastrophically or terminally ill patient.
   K023: Palliative care support to individual, 30 minutes (may follow an A945, C945, or for any palliative care support).

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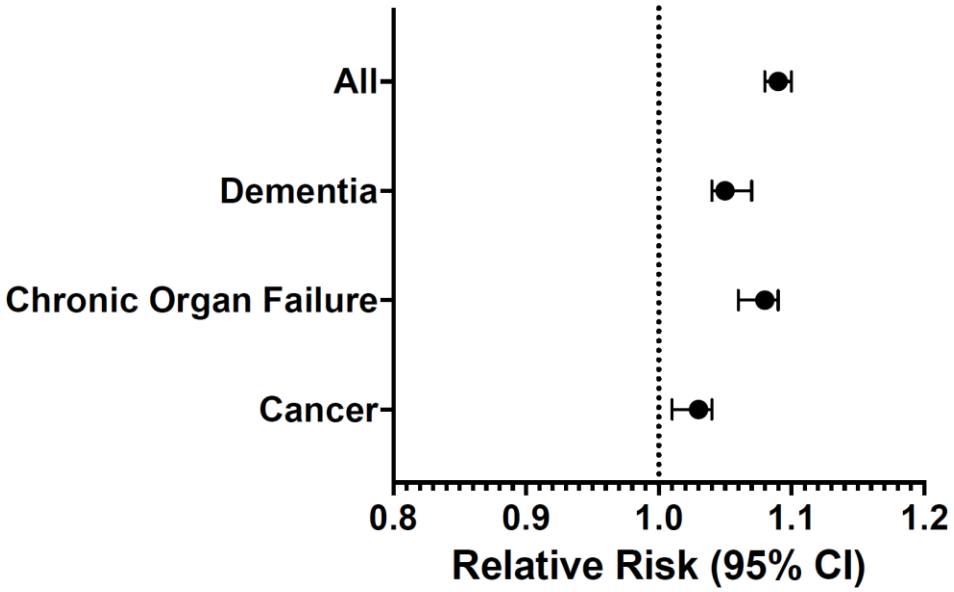
Supplementary Figure S1: Relative risk of receiving physician delivered palliative care in the last year of life according for female patients compared to male patients among 706,722 adults who died between 2010 and 2018 in Ontario, Canada. Models were adjusted for age and chronic conditions.



Supplementary Table S6: Relative risk of receiving physician delivered palliative care in the last year of life according for female patients compared to male patients among 706,722 adults who died between 2010 and 2018 in Ontario, Canada. Models were adjusted for age and chronic conditions.

	Approach to palliative care (Female vs. Male)	RR Estimate	95% CI Lower	95% CI Upper
All	Palliative care intent likely	1.1403	1.1236	1.157
	Palliative care intent unlikely	1.0135	0.9997	1.0272
	No palliative care intent	0.9791	0.9762	0.982
Dementia (Frailty)	Palliative care intent likely	1.0460	1.0064	1.0856
	Palliative care intent unlikely	0.9956	0.9677	1.0236
	No palliative care intent	0.9970	0.9918	1.0022
Organ Failure	Palliative care intent likely	1.1345	1.1014	1.1676
	Palliative care intent unlikely	0.9943	0.9727	1.0158
	No palliative care intent	0.9901	0.9859	0.9943
Cancer (Terminal Illness)	Palliative care intent likely	1.1178	1.0977	1.1378
	Palliative care intent unlikely	1.0493	1.0257	1.0728
	No palliative care intent	0.9587	0.9527	0.9648

Supplementary Table S7: Probability of a female patient being referred to palliative care by a female physician compared to male patients (patient-physician sex concordance). Models were adjusted for patient age and chronic conditions, physician sex, location of practice, and location of medical training. (RR>1, F>M)

	Referral to Palliative Care RR (95% CI)
Total Cohort	1.18 (1.17-1.19)
Dementia	1.12 (1.10-1.14)
Chronic Organ Failure	1.15 (1.13-1.16)
Cancer	1.25 (1.23-1.26)

Supplementary Table S8: Probability of a male patient being referred to palliative care by a male physician compared to female patients (patient-physician sex concordance). Models were adjusted for patient age and chronic conditions, physician sex, location of practice, and location of medical training. (RR>1, M>F)

	Referral to Palliative Care RR (95% CI)
Total Cohort	1.20 (1.19-1.21)
Dementia	1.15 (1.13-1.17)
Chronic Organ Failure	1.17 (1.16-1.19)
Cancer	1.24 (1.23-1.26)

Supplementary Table S9: Prevalent users (those receiving physician delivered palliative care within 720 days to 360 days of death) stratified by patient sex

Sex	Frequency	Percent
F	21438	54.58
M	17843	45.42

Supplementary Table S10: Cohort characteristics of decedents who received at least 1 instance of physician-delivered palliative care within their last year of life

CHARACTERISTICS		Female	Male	STANDARDIZED DIFFERENCE
Total Patients		N=192,022	N=185,476	
Age	Mean ± SD	78.44 ± 13.33	75.48 ± 12.60	0.23
	Median (IQR)	81 (70-88)	78 (67-85)	0.27
	30-39	1,288 (0.7%)	1,087 (0.6%)	0.01
	40-49	4,504 (2.3%)	4,264 (2.3%)	0
	50-59	13,172 (6.9%)	15,758 (8.5%)	0.06
	60-69	25,465 (13.3%)	32,741 (17.7%)	0.12
	70-79	40,552 (21.1%)	49,181 (26.5%)	0.13
	80-89	66,765 (34.8%)	61,610 (33.2%)	0.03
	90-99	37,828 (19.7%)	19,829 (10.7%)	0.25
	100-109	1,989 (1.0%)	448 (0.2%)	0.1
	>=110	*1 - 5	0 (0.0%)	0.01
Rural Residence	missing	330 (0.2%)	289 (0.2%)	0
	N	168,773 (87.9%)	160,239 (86.4%)	0.04
	Y	22,919 (11.9%)	24,948 (13.5%)	0.05
Neighbourhood Income Quintile	missing	841 (0.4%)	718 (0.4%)	0.01
	1	46,233 (24.1%)	40,620 (21.9%)	0.05

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	2	41,312 (21.5%)	40,084 (21.6%)	0
	3	37,015 (19.3%)	36,322 (19.6%)	0.01
	4	34,125 (17.8%)	34,590 (18.6%)	0.02
	5	32,496 (16.9%)	33,142 (17.9%)	0.02
Recent Immigrance Status	Not Immigrants	180,452 (94.0%)	174,756 (94.2%)	0.01
	Economic Immigrants	2,128 (1.1%)	2,605 (1.4%)	0.03
	Other immigrants	379 (0.2%)	327 (0.2%)	0
	Resettled Refugee & Protected Person in Canada	1,197 (0.6%)	1,749 (0.9%)	0.04
	Sponsored family Immigrants	7,866 (4.1%)	6,039 (3.3%)	0.04
Myocardial Infarction		20,084 (10.5%)	25,291 (13.6%)	0.1
Congestive Heart Failure		43,298 (22.5%)	42,123 (22.7%)	0
Peripheral Vascular Disease		10,303 (5.4%)	14,706 (7.9%)	0.1
Cerebrovascular Disease		25,736 (13.4%)	23,950 (12.9%)	0.01
Dementia		35,455 (18.5%)	28,875 (15.6%)	0.08
Chronic Obstructive Pulmonary Disease		33,135 (17.3%)	36,270 (19.6%)	0.06
Connective tissue / rheumatic disease		4,526 (2.4%)	2,011 (1.1%)	0.1
Peptic Ulcer Disease		6,350 (3.3%)	8,651 (4.7%)	0.07
Mild Liver Disease		2,827 (1.5%)	4,769 (2.6%)	0.08
Diabetes without complications		13,566 (7.1%)	14,594 (7.9%)	0.03
Diabetes with complications		34,322 (17.9%)	43,215 (23.3%)	0.13

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Hemiplegia or Paraplegia		6,436 (3.4%)	6,427 (3.5%)	0.01
Renal Disease		20,326 (10.6%)	26,497 (14.3%)	0.11
Primary Cancer		29,208 (15.2%)	39,715 (21.4%)	0.16
Moderate or Severe Liver Disease		4,829 (2.5%)	8,234 (4.4%)	0.11
Metastatic Cancer		55,251 (28.8%)	59,581 (32.1%)	0.07
HIV/AIDS		67 (0.0%)	307 (0.2%)	0.04
Frailty Score	0	17,601 (9.2%)	16,997 (9.2%)	0
	0.1-8.9	82,960 (43.2%)	87,401 (47.1%)	0.08
	9+	80,000 (41.7%)	75,287 (40.6%)	0.02
	Missing	11,461 (6.0%)	5,791 (3.1%)	0.14
Cancer prevalent		111,461 (58.0%)	127,528 (68.8%)	0.22
Cirrhosis prevalant		1,039 (0.5%)	3,142 (1.7%)	0.11
CHF prevalent		64,927 (33.8%)	61,881 (33.4%)	0.01
COPD prevalent		44,889 (23.4%)	50,759 (27.4%)	0.09
Coronary prevalent		31,649 (16.5%)	46,731 (25.2%)	0.22
Non-psychotic Mood and Anxiety Disorders prevalent		55,072 (28.7%)	42,635 (23.0%)	0.13
Dementia prevalent		49,365 (25.7%)	35,054 (18.9%)	0.16
Diabetes prevalent		64,200 (33.4%)	73,608 (39.7%)	0.13
Hypertension prevalent		151,682 (79.0%)	141,687 (76.4%)	0.06
(Other) Mental Health Conditions prevalent		28,167 (14.7%)	34,313 (18.5%)	0.1
Renal Disease prevalent		46,778 (24.4%)	55,449 (29.9%)	0.12
Stroke prevalent		22,944 (11.9%)	20,822 (11.2%)	0.02

Secondary Outcome	High Involvement	8,342 (4.3%)	6,993 (3.8%)	0.03
	Medium Involvement	24,708 (12.9%)	23,363 (12.6%)	0.01
	Low involvement	25,080 (13.1%)	24,530 (13.2%)	0
	No Palliative Care	133,892 (69.7%)	130,590 (70.4%)	0.01

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