Comparing costs of end-of-life care for colorectal cancer patients in Ontario and the United States using health administrative data

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Background

- Both Canada and US have public health care insurance for residents ≥65 years old
- International studies indicate EOL costs in US are high, with high use of aggressive and advanced services
- Comparative costing studies can inform policy regarding optimal care at the end of life

Objectives

To compare health care utilization and costs during the last 12 months of life for elderly colorectal cancer (CRC) patients in Ontario and the US

Methods

Cohort selection

Ontario: from the Ontario Cancer Registry**,** linked to health administrative data

US: from the linked Surveillance Epidemiology & End Results (SEER)-Medicare data

Inclusion criteria:

- diagnosis of CRC with no other primary cancer in 2007-2013
- died at age ≥ 66 years of any cancer in 2007-2013
- Medicare Part A/B fee-for-service or OHIP for 360 days before death or diagnosis to death

Exclusion criteria:

- invalid histology code, unknown stage at diagnosis, missing/invalid sex, survived <30 days after CRC diagnosis

Health care resources and costs

We estimated publicly-paid costs (2015 US$) (Ontario Ministry of Health and Long-Term Care, US Medicare) in the last 360 days of life by month (30-day periods)

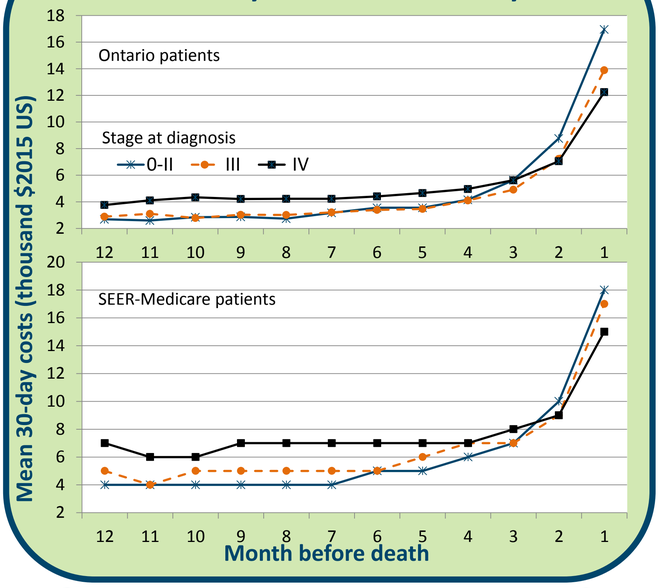
Resources: inpatient hospitalization ● emergency department (ED) ambulatory procedures ● advanced imaging tests (CT, MRI, PET) outpatient chemotherapy ● physician services ● home care hospice (US) ● skilled nursing facilities (US) ● complex continuing care (Ontario).

Excluded: radiation therapy, outpatient prescription drugs, laboratory tests, standard diagnostic tests (e.g., X-rays, ultrasound)

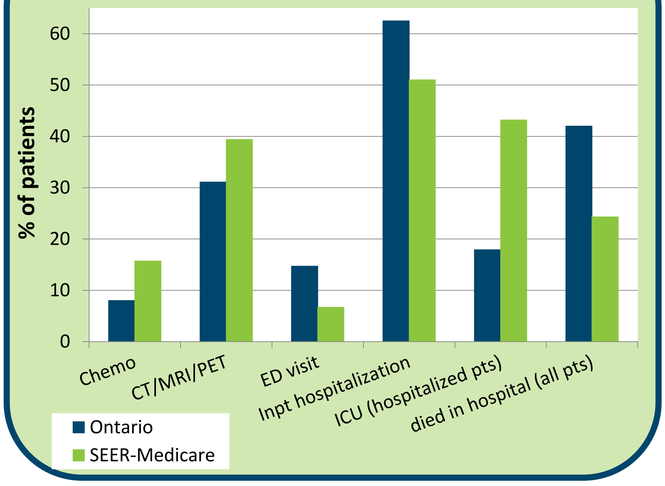
RESULTS 1: Cohort Characteristics

Characteristic	Ontario (N=6,587)	SEER-Medicare (N=16,565)
Age in years (mean (SD))		
At diagnosis	77.5 (7.6)	78.0 (8.2)
At death	78.9 (7.4)	79.4 (7.9)
Sex (%)		
Female	47.4	53.3
Type of cancer (%)		
Colon	71.3	75.2
Rectal	28.7	24.8
Stage at diagnosis (%)		
0-II	24.6	27.2
III	27.5	25.4
IV	47.9	47.4

RESULTS 2: 30-day costs in last 360 days of life



RESULTS 3: Resource use in last 30 days of life



RESULTS 4: Resource use and costs in last 30 days

	Stage 0-II		Stage III		Stage IV	
	Ontario (1,619)	SEER-Med (4,506)	Ontario (1,815)	SEER-Med (4,214)	Ontario (3,153)	SEER-Med (7,845)
Days of inpatient hospitalization						
Mean days (all patients)	10.2	6.3	8.9	5.6	8.1	5.1
Mean days (hospitalized pts)	15.1	12.2	14.3	11.1	13.4	10.2
Palliative Care and Hospice (% users)						
Palliative care services (Ont)	77.5	-	86.3	-	93.0	-
Enrolled in hospice (SEER-Med)	-	63.6	-	66.3	-	71.1
Mean costs						
Inpatient hospitalization	$12,840	$13,318	$9,586	$11,661	$7,598	$9,693
Cost per hospital day	$1,261	$2,479	$1,080	$2,454	$934	$2,235
Outpatient chemotherapy	$54	$204	$185	$345	$247	$496
Physician services	$1,747	$1,618	$1,431	$1,415	$1,165	$1,246
Total for all resources	$17,312	$19,354	$13,914	$17,682	$12,034	$15,881
Total + Pt Responsibility	-	$20,465	-	$18,663	-	$17,002

Conclusions

- **Health care costs increased in the last 2 months of life, and were consistently higher in the US than Ontario.**
- **Chemotherapy: higher rates of use and higher cost in the US, over the entire year before death.**
- **Advanced imaging: higher rates in the US, but differences were less than we expected.**
- **Despite higher hospitalization rates and more hospital days per patient in Ontario, hospitalization costs higher in US.**
- **Higher rate of ICU admission in the US might be a factor in higher hospitalization costs.**
- **Designing optimal EOL care requires consideration of cost, in addition to health outcomes and patient perspectives.**

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