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BC Cancer Agency
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*Advancing Health Economics,
Services, Policy and Ethics*

COMPARING THE COSTS OF CANCER CARE IN BRITISH COLUMBIA AND ONTARIO: A PHASE- BASED APPROACH

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Background

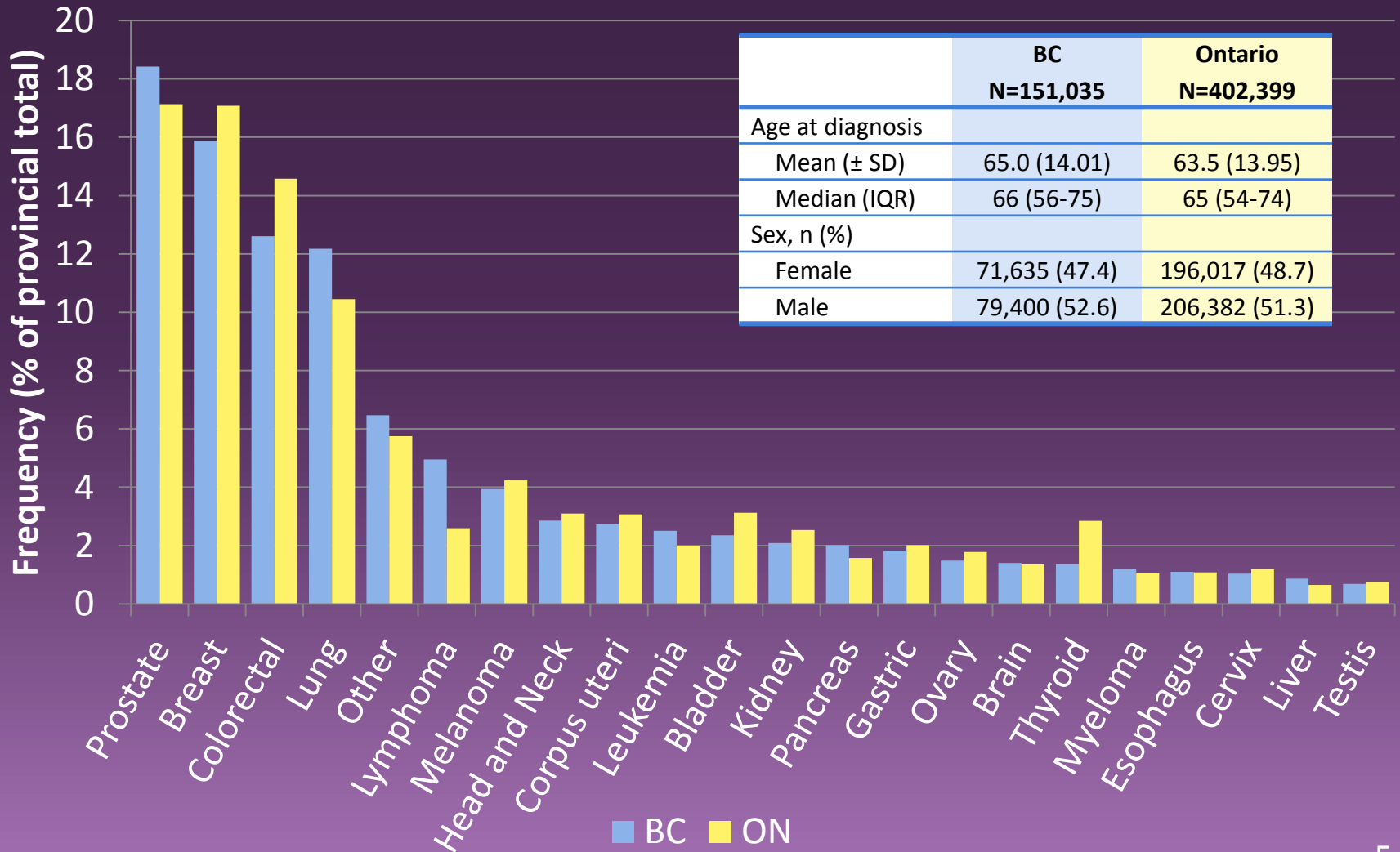
- Objective
 - To estimate direct medical costs and predictors of these costs for 21 common types of cancer and 4 phases of care (pre-diagnosis, initial, continuing care, and terminal), using linked administrative data in BC and Ontario
- Rationale
 - Measure economic burden and better understand cost patterns
 - Generate high quality cost data for future research
- Challenges with longitudinal data
 - Right censoring
 - Health services use and cost change over time

Data Sources

- Cases from BC Cancer Registry and Ontario Cancer Registry diagnosed in 1997-2007
- Follow up to the end of 2009
- In BC:
 - BC Cancer Agency, BC Ministry of Health, PharmaNet, and BC Vital Statistics Agency approved data access and use
 - Facilitated by Population Data BC
- In Ontario:
 - Data from Cancer Care Ontario and the Ontario Ministry of Health and Long-Term Care
 - Linkage and analysis conducted by Institute for Clinical Evaluative Sciences

	British Columbia	Ontario
Hospitalization	CIHI Discharge Abstract Database	CIHI Discharge Abstract Database
Physician services	BC Medical Services Plan (MSP) claims; BC Cancer Agency (BCCA) Schedule data	Ontario Health Insurance Plan (OHIP) claims
Outpatient prescription drugs	BC PharmaCare	Ontario Drug Benefit (ODB) Program
Chemotherapy	BCCA Provincial Systemic Therapy Program	New Drug Funding Program, OHIP, ODB, National Ambulatory Care Reporting System (NACRS)
Radiotherapy	BCCA Radiotherapy database	Cancer Care Ontario Activity Level Reporting System
Home and Community Care	BC Continuing Care Data Warehouse	ON Home Care Database, Continuing Care Reporting System, ODB database
Diagnostics	MSP claims, BCCA Schedule and Document data	OHIP claims

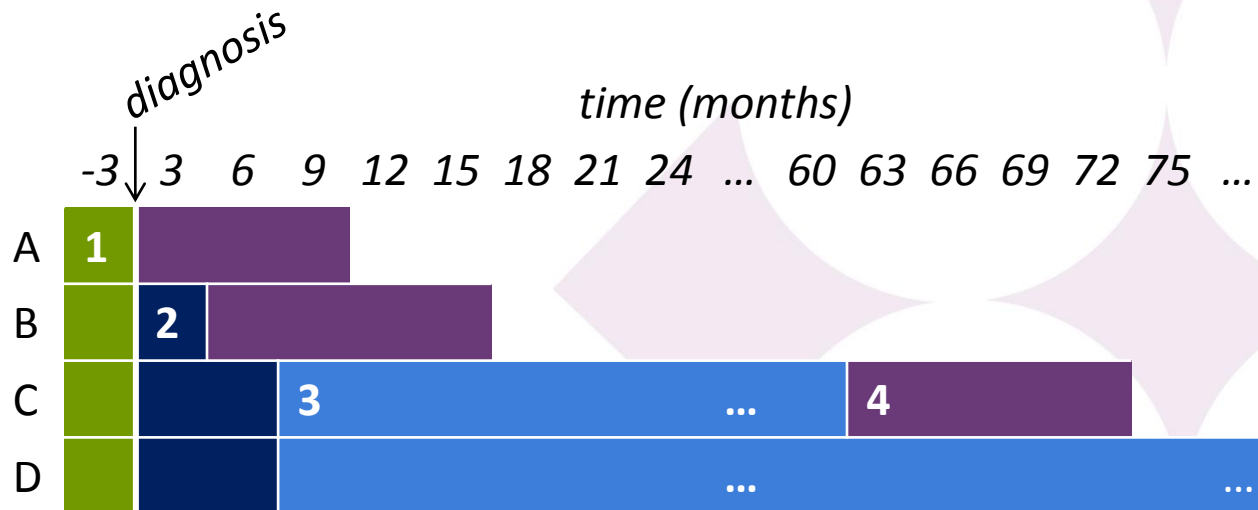
Study Cohorts



Phase-based costing

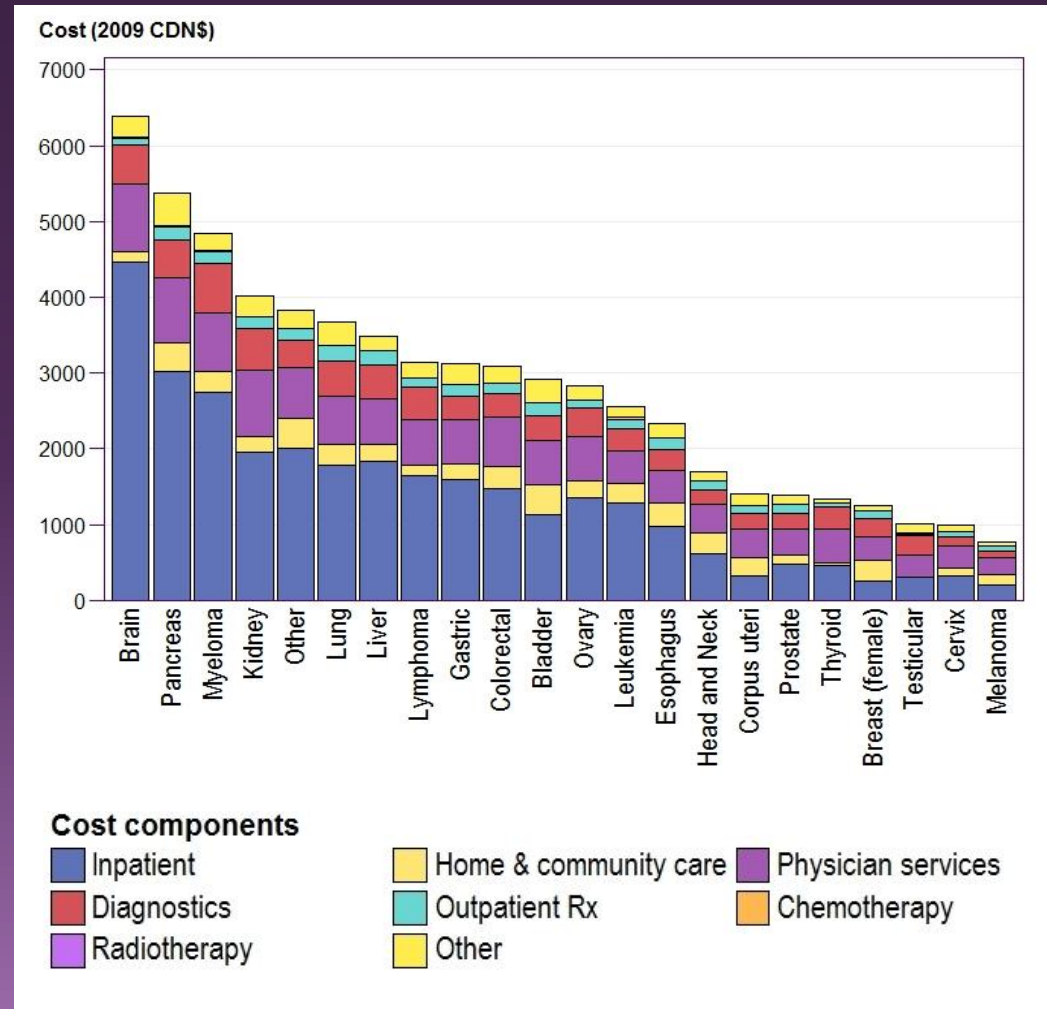
- Course of disease divided into distinct phases
- Observation time after diagnosis is allocated to phases hierarchically:

Terminal Phase (12 mo) > Initial Phase (6 mo) > Continuing Care Phase



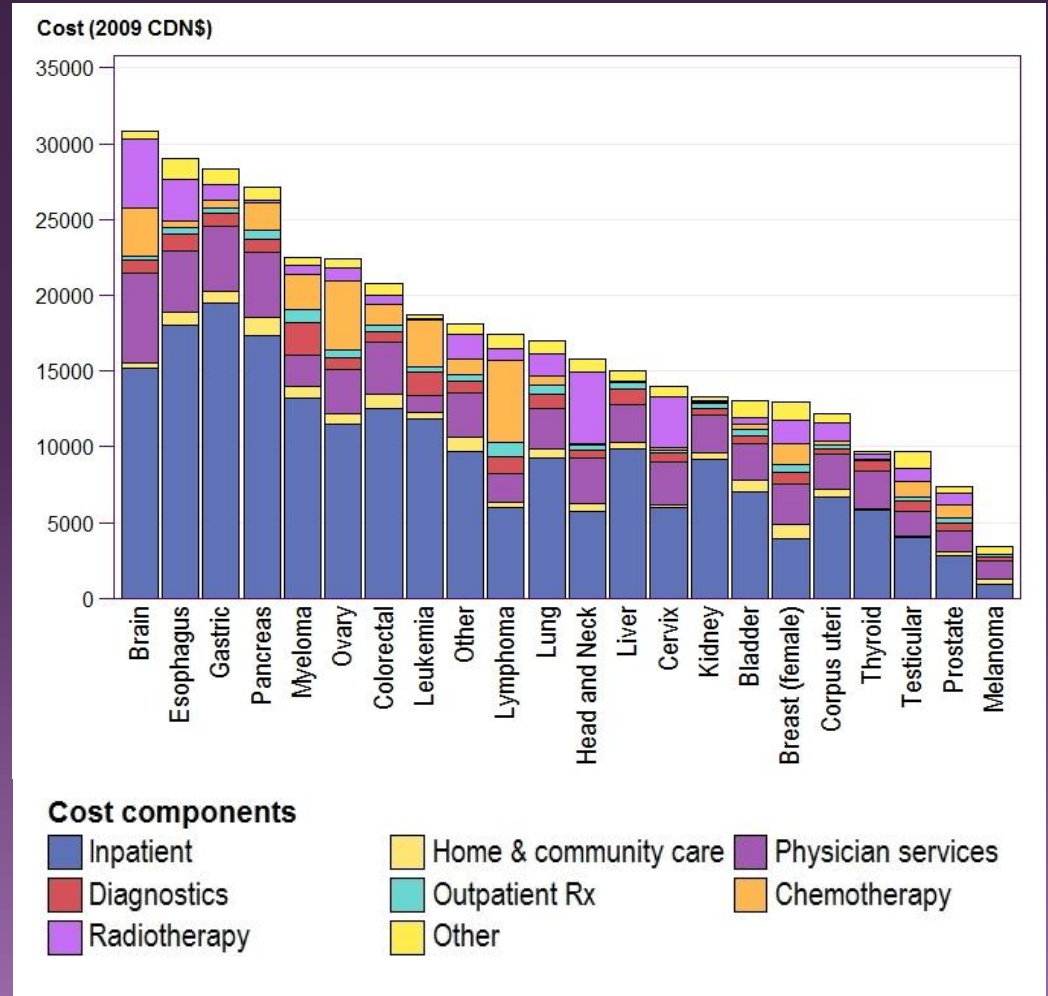
Pre-diagnosis Phase

Cancer Site	BC	Ontario
Bladder	\$2,912	\$2,244
Brain	\$6,392	\$2,701
Breast	\$1,255	\$1,632
Cervix	\$987	\$1,212
Colorectal	\$3,095	\$2,324
Corpus uteri	\$1,404	\$1,695
Esophagus	\$2,337	\$2,051
Gastric	\$3,121	\$2,465
Head and Neck	\$1,699	\$1,514
Kidney	\$4,008	\$2,733
Leukemia	\$2,559	\$2,275
Liver	\$3,491	\$3,981
Lung	\$3,670	\$2,899
Lymphoma	\$3,143	\$2,479
Melanoma	\$777	\$966
Myeloma	\$4,844	\$4,167
Other	\$3,827	\$2,739
Ovary	\$2,822	\$2,246
Pancreas	\$5,370	\$3,228
Prostate	\$1,383	\$1,536
Testicular	\$1,007	\$1,267
Thyroid	\$1,339	\$1,254



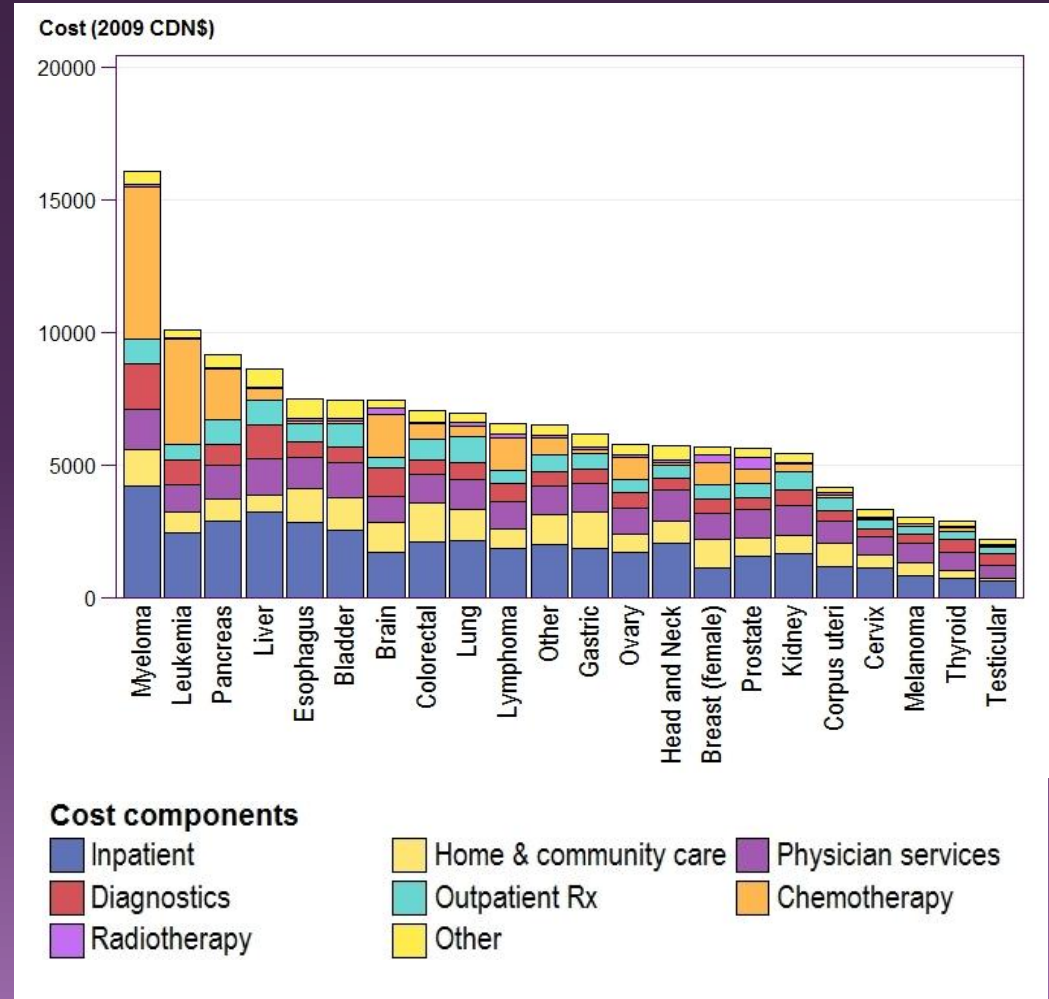
Initial Care Phase

Cancer Site	BC	Ontario
Bladder	\$13,033	\$10,703
Brain	\$30,849	\$21,077
Breast	\$12,922	\$11,943
Cervix	\$13,988	\$12,723
Colorectal	\$20,742	\$21,729
Corpus uteri	\$12,135	\$11,318
Esophagus	\$29,056	\$26,148
Gastric	\$28,296	\$22,322
Head and Neck	\$15,801	\$17,255
Kidney	\$13,308	\$13,986
Leukemia	\$18,744	\$15,948
Liver	\$15,001	\$17,529
Lung	\$17,003	\$15,512
Lymphoma	\$17,443	\$16,911
Melanoma	\$3,436	\$4,787
Myeloma	\$22,514	\$19,957
Other	\$18,145	\$15,848
Ovary	\$22,426	\$18,752
Pancreas	\$27,090	\$19,549
Prostate	\$7,364	\$8,191
Testicular	\$9,711	\$10,003
Thyroid	\$9,723	\$8,154



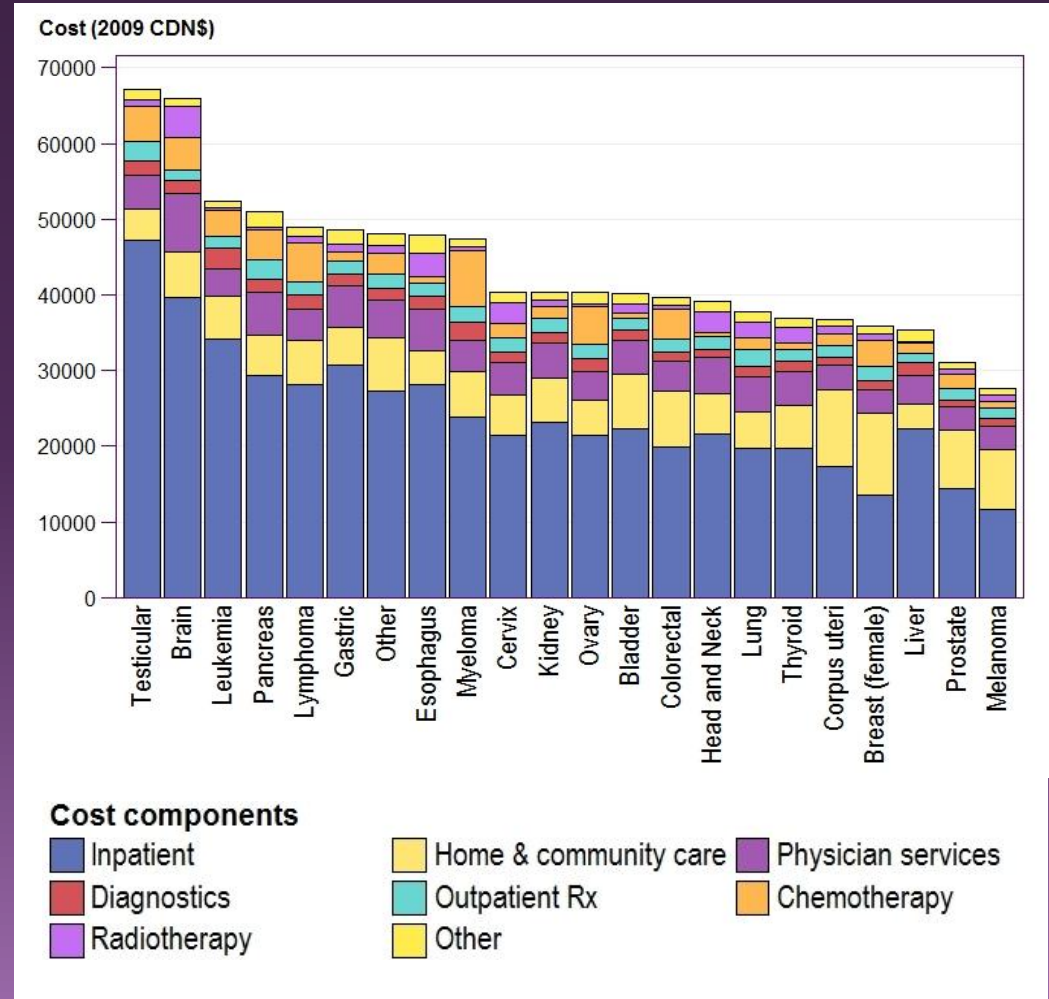
Continuing Care Phase

Cancer Site	BC	Ontario
Bladder	\$7,470	\$4,964
Brain	\$7,444	\$4,718
Breast	\$5,701	\$2,966
Cervix	\$3,331	\$976
Colorectal	\$7,080	\$5,350
Corpus uteri	\$4,178	\$2,326
Esophagus	\$7,494	\$6,729
Gastric	\$6,183	\$4,975
Head and Neck	\$5,727	\$4,044
Kidney	\$5,449	\$3,002
Leukemia	\$10,119	\$3,859
Liver	\$8,620	\$5,811
Lung	\$6,971	\$5,643
Lymphoma	\$6,554	\$2,720
Melanoma	\$3,023	\$1,846
Myeloma	\$16,066	\$10,595
Other	\$6,523	\$4,491
Ovary	\$5,789	\$3,618
Pancreas	\$9,182	\$7,897
Prostate	\$5,610	\$2,907
Testicular	\$2,197	\$222
Thyroid	\$2,870	\$626



Terminal Care Phase

Cancer Site	BC	Ontario
Bladder	\$40,116	\$56,759
Brain	\$65,905	\$85,129
Breast	\$35,816	\$50,398
Cervix	\$40,393	\$55,495
Colorectal	\$39,680	\$57,170
Corpus uteri	\$36,706	\$51,406
Esophagus	\$47,809	\$68,131
Gastric	\$48,628	\$66,344
Head and Neck	\$39,150	\$57,893
Kidney	\$40,356	\$60,365
Leukemia	\$52,436	\$80,341
Liver	\$35,284	\$50,526
Lung	\$37,839	\$56,800
Lymphoma	\$49,008	\$69,008
Melanoma	\$27,578	\$43,761
Myeloma	\$47,429	\$70,706
Other	\$48,047	\$62,706
Ovary	\$40,296	\$58,299
Pancreas	\$50,925	\$67,673
Prostate	\$31,020	\$48,267
Testicular	\$67,116	\$73,014
Thyroid	\$36,802	\$58,042



Conclusions

- Common patterns observed in both provinces
 - Costs vary widely by site and phase of care
 - Melanoma, prostate, thyroid consistently low; myeloma, pancreas, brain generally high
 - Hospitalization tends to be majority of costs
 - Physician services, diagnostics, chemotherapy and radiotherapy also major contributors
- Differences due in part to cohort characteristics and costing methods

Next Steps

- Standardizing populations to compare costs across provinces
- Control matching
 - Calculate net costs attributable to cancer
- Applying phase-based costs
 - Using survival curves, project 5-year and lifetime cost estimates

Thank you

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