

Economics of Prostate Cancer in Canada: A Systematic Review

EE454

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Introduction

- Prostate cancer is the most common cancer and the 3rd leading cause of death by cancer among Canadian men:
 - 1 in 8 Canadian men will develop prostate cancer during their lifetime;
 - 27 900 Canadian men are estimated to develop prostate cancer in 2024 (22% of all new cancer cases in men);
 - 5 000 deaths by prostate cancer in 2024 in Canada (11% of all cancer deaths in men)¹.
- In the last 12 years, treatment costs are increasing for prostate cancer due to the adoption of **novel therapies** like abiraterone or enzalutamide and the early prescription of these novel therapies.
 - In 2014, treatment of advanced prostate cancer costed \$416,3 millions in Canada².
- Advanced prostate cancer is cancer that got out of the prostate and has spread to other parts of the body (metastasis)³.
- There is a need for Canadian economic evaluations to ensure an efficient treatment of prostate cancer in Canada.

Objectives

- Characterize Canadian costs of prostate cancer management
- Characterize Canadian costs of prostate cancer management by cancer stages and lines of treatment
- Characterize resource utilization of prostate cancer management

Methods

Systematic literature review

Research question: What are the Canadian costs of prostate cancer diagnosis and treatment?

Databases: Embase, MEDLINE, Web of Science and CINHAL

Search strategy concepts: Prostate cancer, costs and Canada

Research filters: Economic Evaluations & Models of the Canadian Drug's Agency (CDA) for the costs concept

Inclusion criteria:

- Economic analysis, cost analysis, cost-of-illness studies, cross-sectional studies, cohort studies, case-control studies, clinical trials and health technology assessments
- Direct and indirect Canadian costs
- Prostate cancer treatment, diagnosis and treatment's adverse events

Exclusion criteria:

- Literature reviews, conference abstracts and posters
- Full-text unavailable
- Costs uniquely not Canadian
- Studies published before 2012 or in another language than French or English

Study selection: Two independent reviewers (FM and MB) using Covidence

Data-collection process: Two independent reviewers (FM and MB) using an extraction form developed for our study objectives

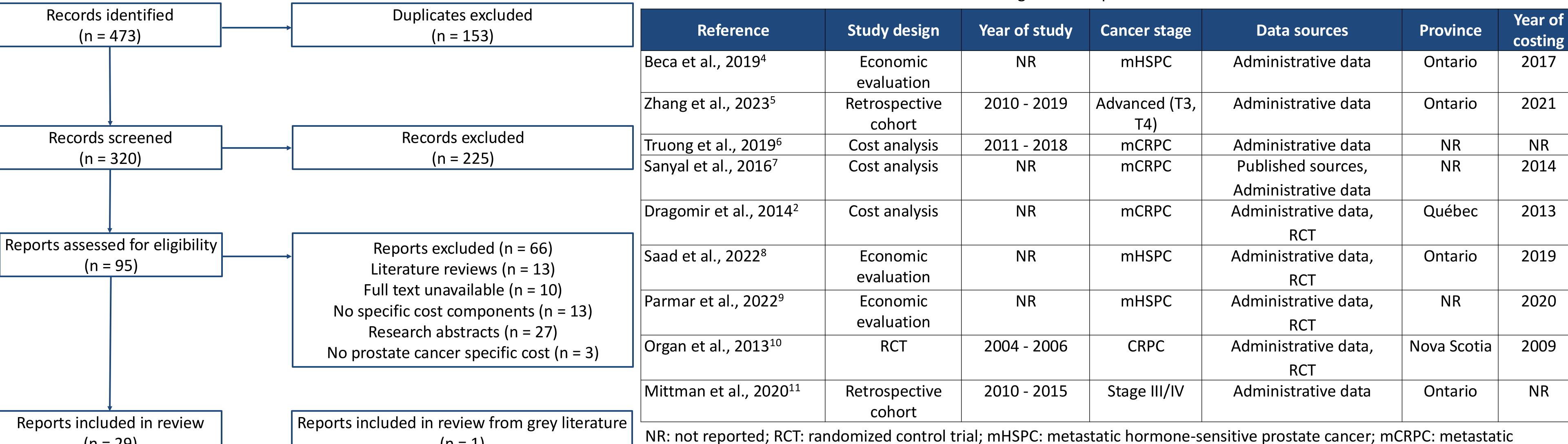
Risk-of-bias assessment: Two independent reviewers (FM and MB) using the Consensus on Health Economic Criteria (CHEC) extended checklist

Cancer de la prostate	1	exp Prostatic Neoplasms/	153396
	2	(prostat* adj (cancer or neoplasm* or tumor*)).tw,kf.	158539
	3	1 or 2	194621

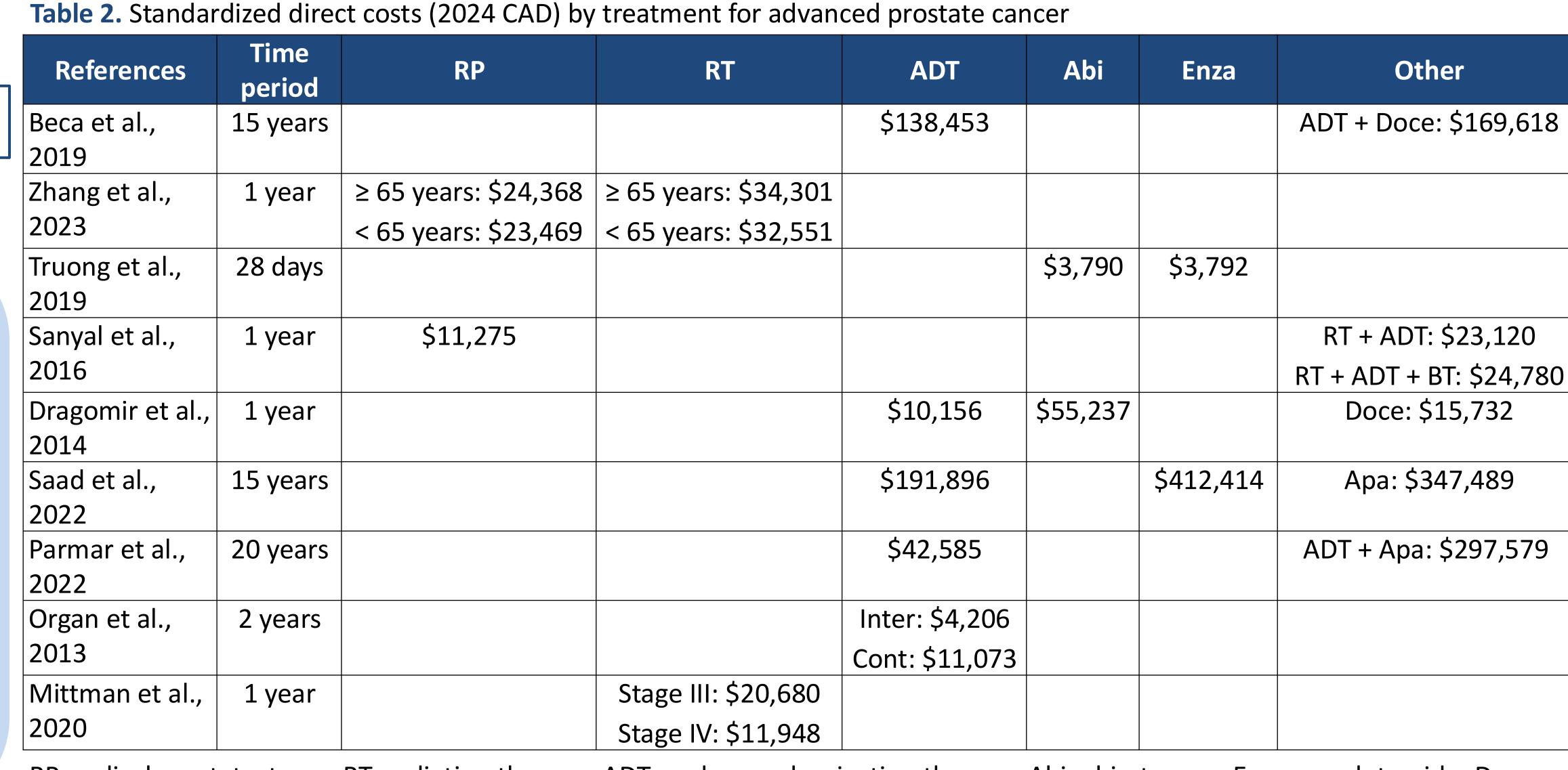
Figure 1: Example of a concept from the search strategy

Results

Table 1. Characteristics of retained studies concerning advanced prostate cancer



castration-resistant prostate cancer; CRPC: castration-resistant prostate cancer



RP: radical prostatectomy; RT: radiation therapy; ADT: androgen deprivation therapy; Abi: abiraterone; Enza: enzalutamide; Doce: docetaxel; Apa: apalutamide; BT: brachytherapy; Inter: intermittent; Cont: continuous

Discussion

(n = 1)

Last systematic review of prostate cancer treatment costs in Canada published in **2013** by Sanyal et al.⁵

- Costs information only for radical prostatectomy, radiation therapy, brachytherapy and androgen deprivation therapy
- Reports costs from other countries than Canada which are less accurate to represent the Canadian setting

Our review's strengths:

(n = 29)

cancer

analysis (Table 1)

- Captures the novel therapies developed and adopted through the last 12 years like abiraterone and enzalutamide
- Reports costs from solely Canadian settings which are the most accurate to represent the Canadian health system
- Follows a methodology in accordance with PRISMA guidelines and PROSPERO standards

References included in review

(n = 30)

Figure 2: PRISMA flow diagram

Of the 30 references included in the review, 12 addressed advanced prostate

• 9 references on advanced prostate cancer treatment costs are reported in this

• The most common treatment reported is androgen deprivation therapy (ADT)

with 5 references reporting ADT costs for advanced prostate cancer treatment

1 focused on health states costs (Krahn, 2013)

1 focused on adverse events costs (Saad, 2018)

Administrative data are used in all 9 references included in this analysis

3 of these references are not reported in this analysis:

1 focused on labor costs (Xie, 2014)

Limitations:

- Canadian literature on prostate cancer treatment costs is relatively sparse and concentrated in Ontario
- Literature's heterogeneity complexifies results comparison between the included studies and risk-of-bias assessment

Research perspectives:

New Canadian economic evaluations of prostate cancer treatment to improve its efficiency

New cost analysis to improve our understanding of the economic burden of prostate cancer treatment in Canada

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