

# OncoSim

Translating research to inform policy decisions – the OncoSim experience

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## **Acknowledgements**

OncoSim is led and supported by the Canadian Partnership Against Cancer, with model development by Statistics Canada, and is made possible through funding by Health Canada.

## **Conflict of interest**

I am a consultant for the Canadian Partnership Against Cancer.

## **Disclaimer**

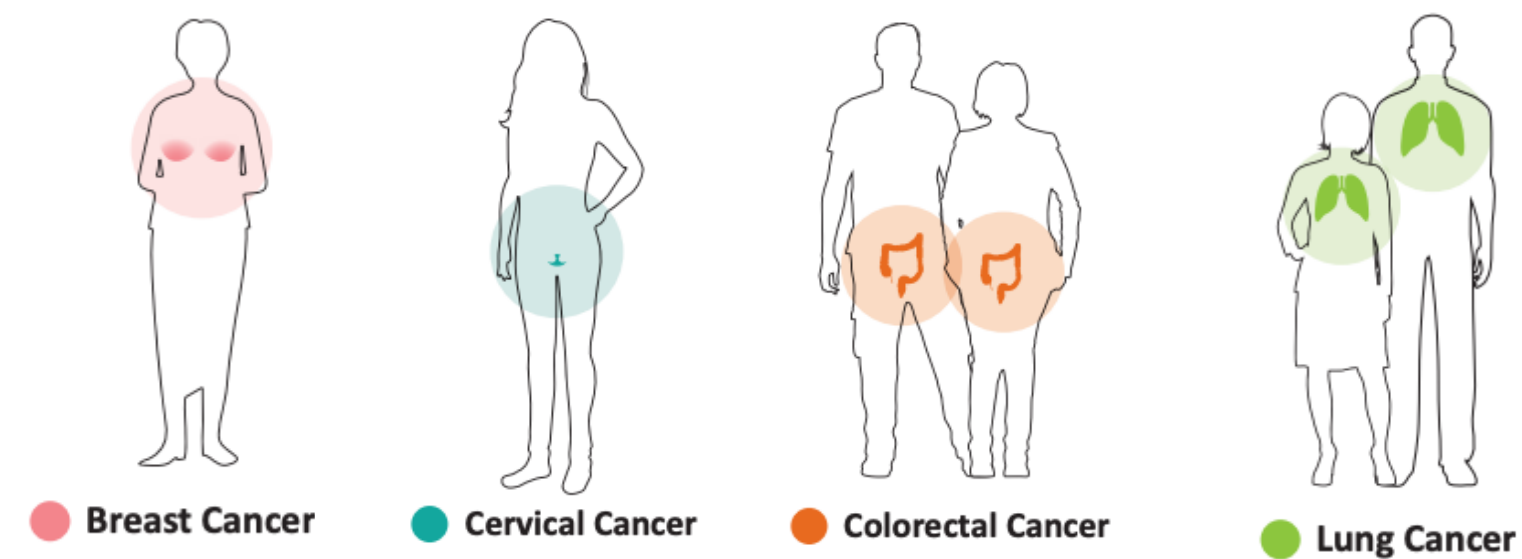
The views expressed here do not represent the view of the Canadian Partnership Against Cancer.

# Rationale

- Simulation models can help inform cancer policy decisions
- Models for early detection of cancer are resource-intensive and take a long time to build
- How about a model that can be re-used to answer different questions?

# ONCOSIM

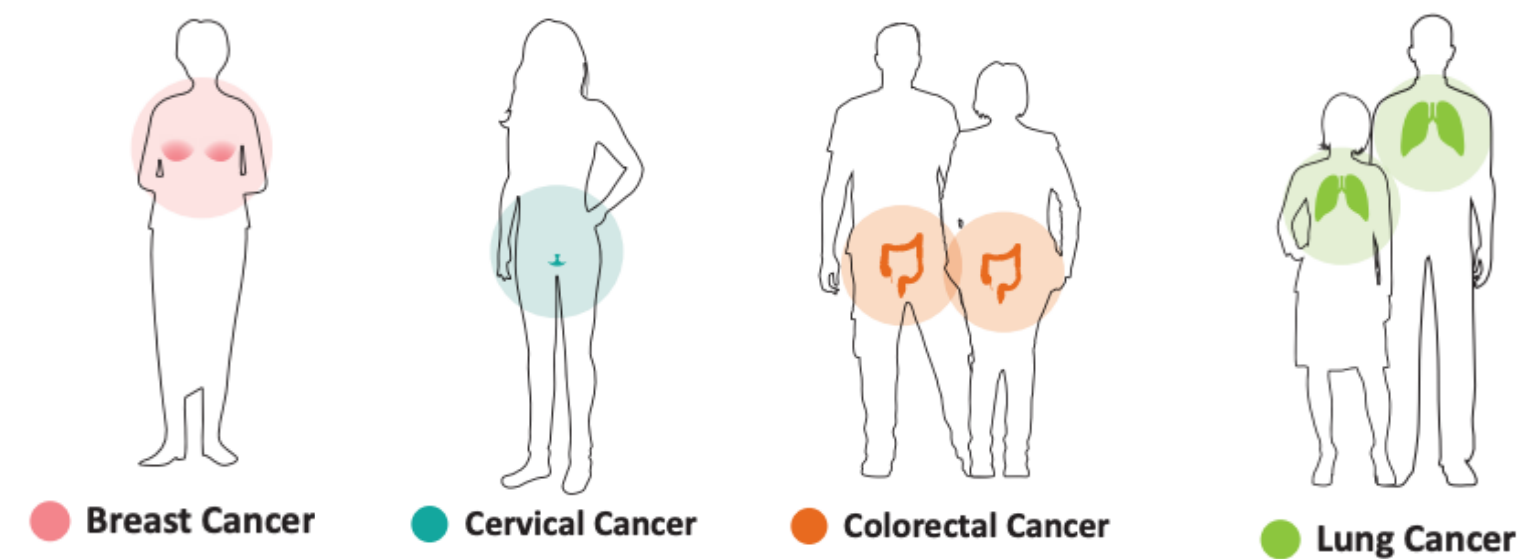
- Projects health and economic outcomes for
- 32 cancers
  - In-depth projections for **4 cancers** and related screening programs
  - High-level projections for 28 other cancer sites





# ONCOSIM

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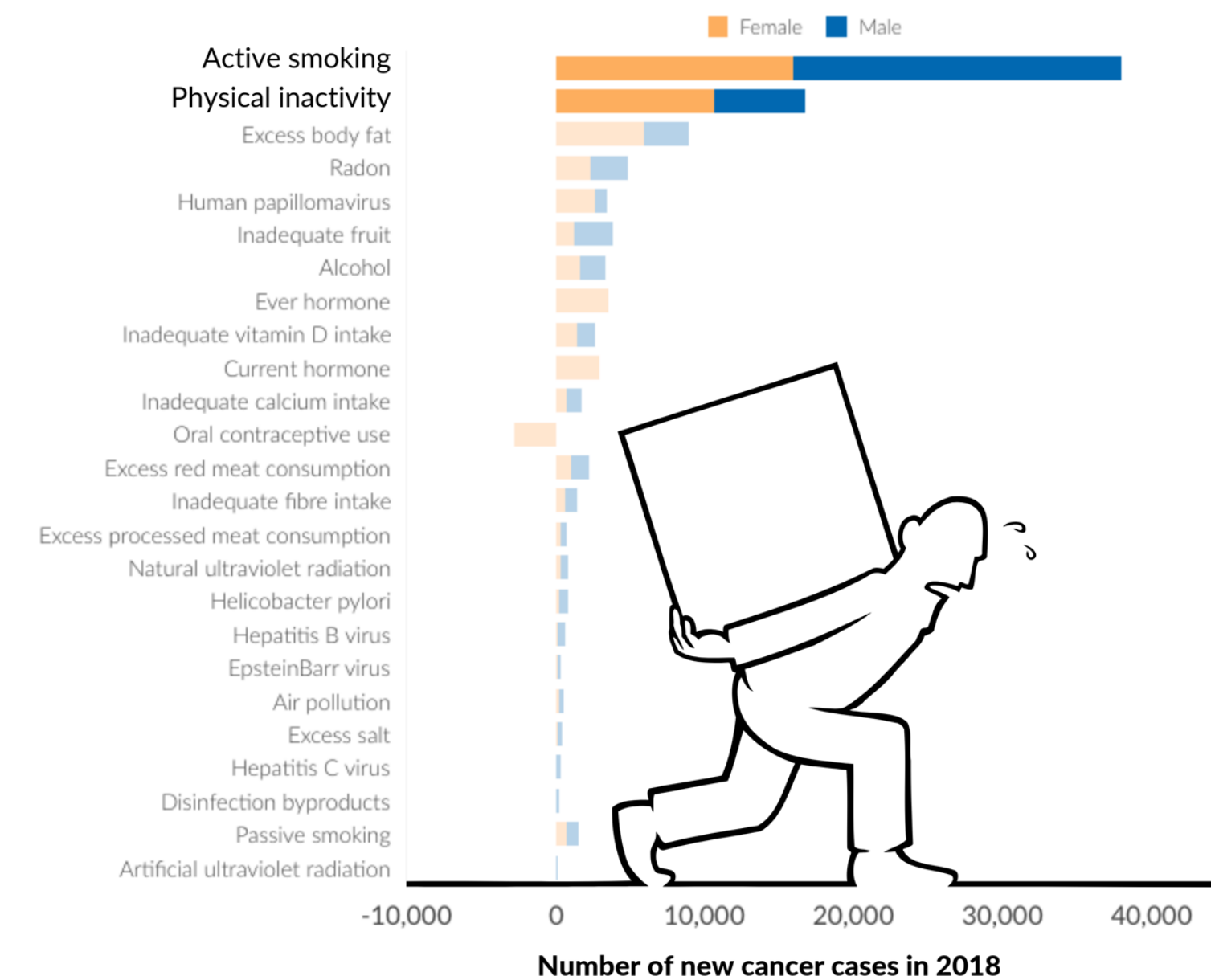
## Attributes cancer burden to different risk factors



In 2018, active smoking and physical inactivity accounted for

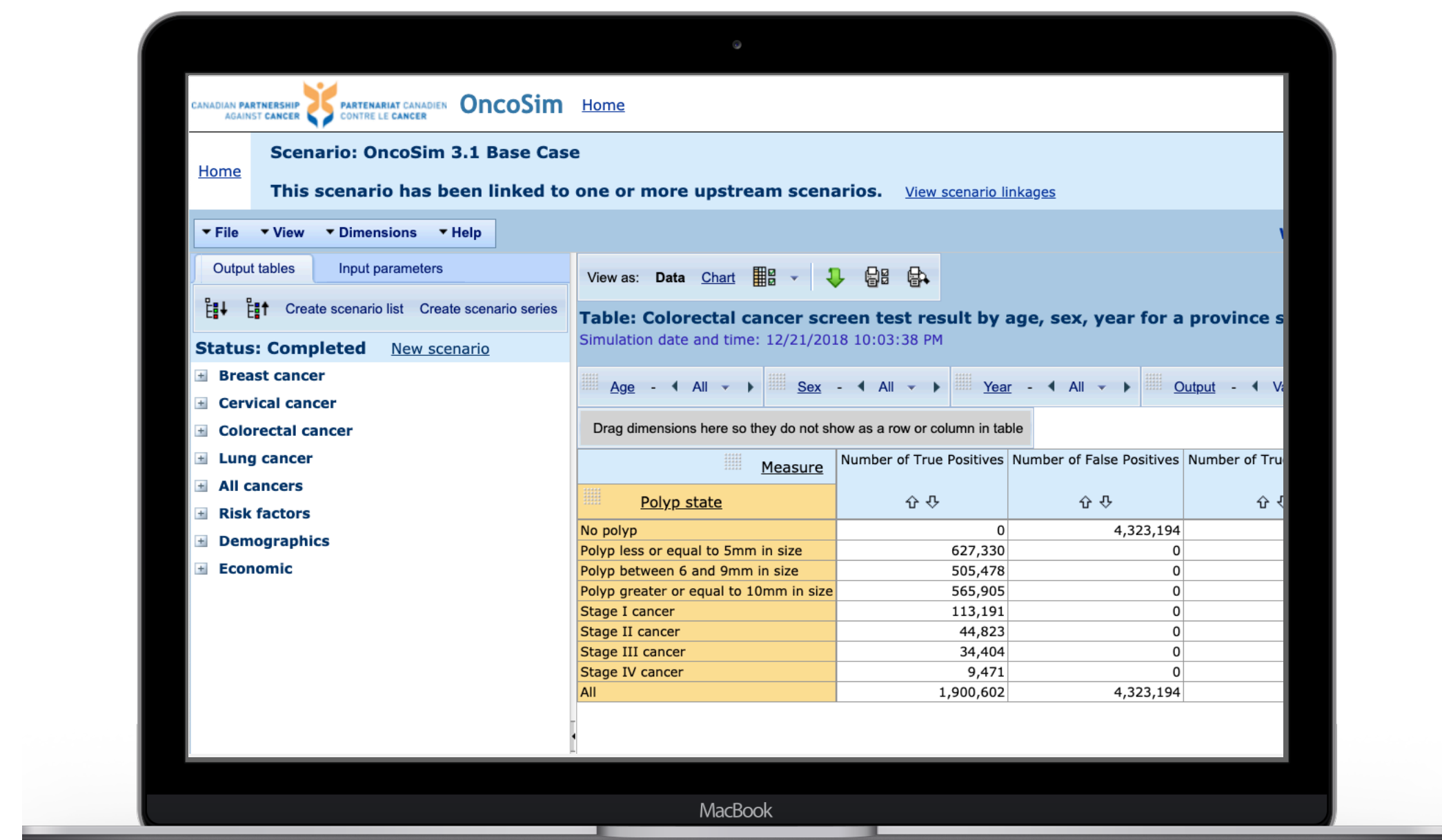
new cancer cases	cancer deaths	cancer-related direct healthcare costs
<b>55,000</b>	<b>32,000</b>	<b>\$2.6 B</b>

in Canada.



# More than just a model...

OncoSim is a tool that policy makers can use to answer complex questions.



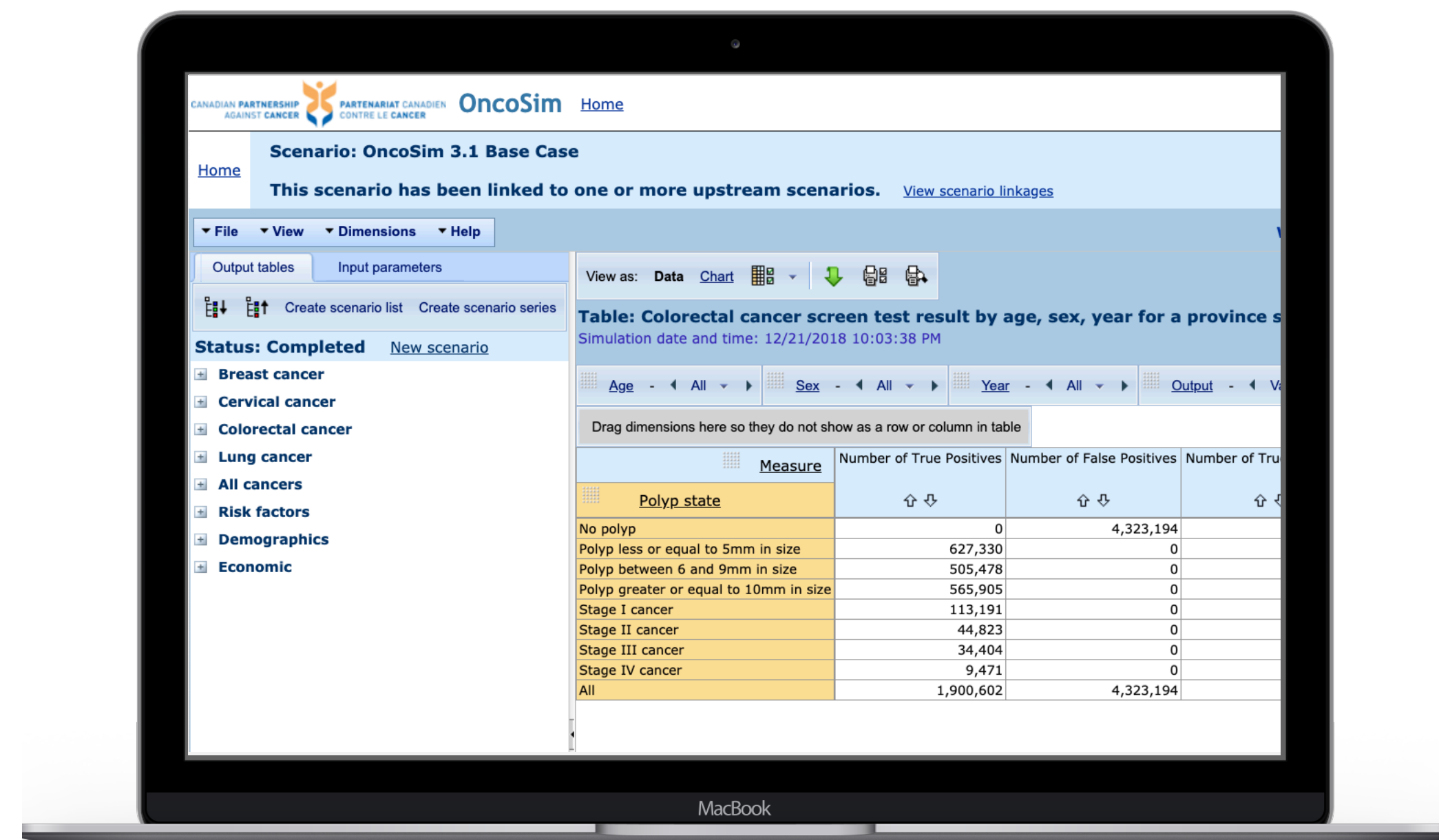
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## Inputs

Modifiable



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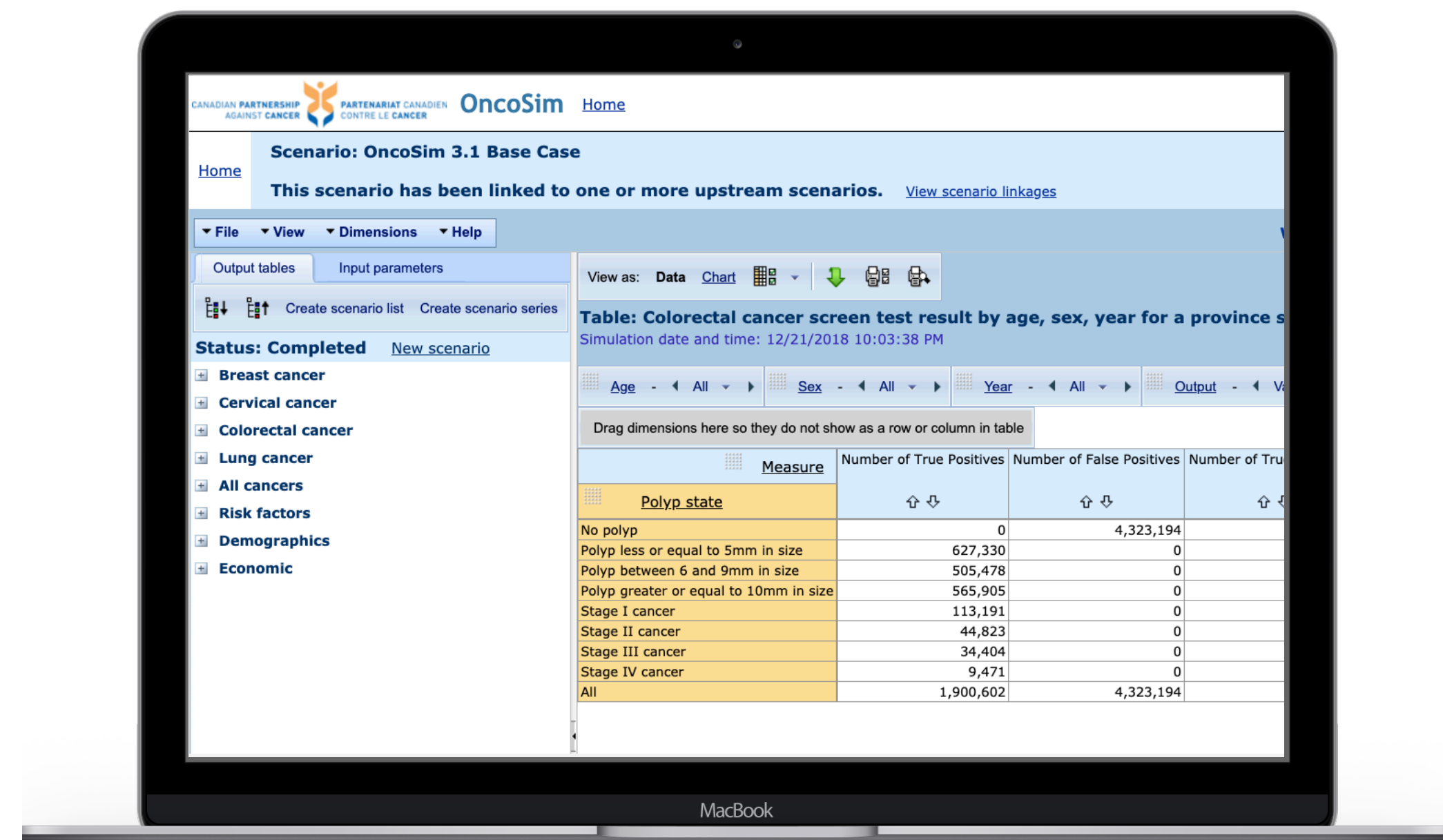
## Inputs

Modifiable



## Projections

Population level,  
by year, sex, age,  
province, etc.



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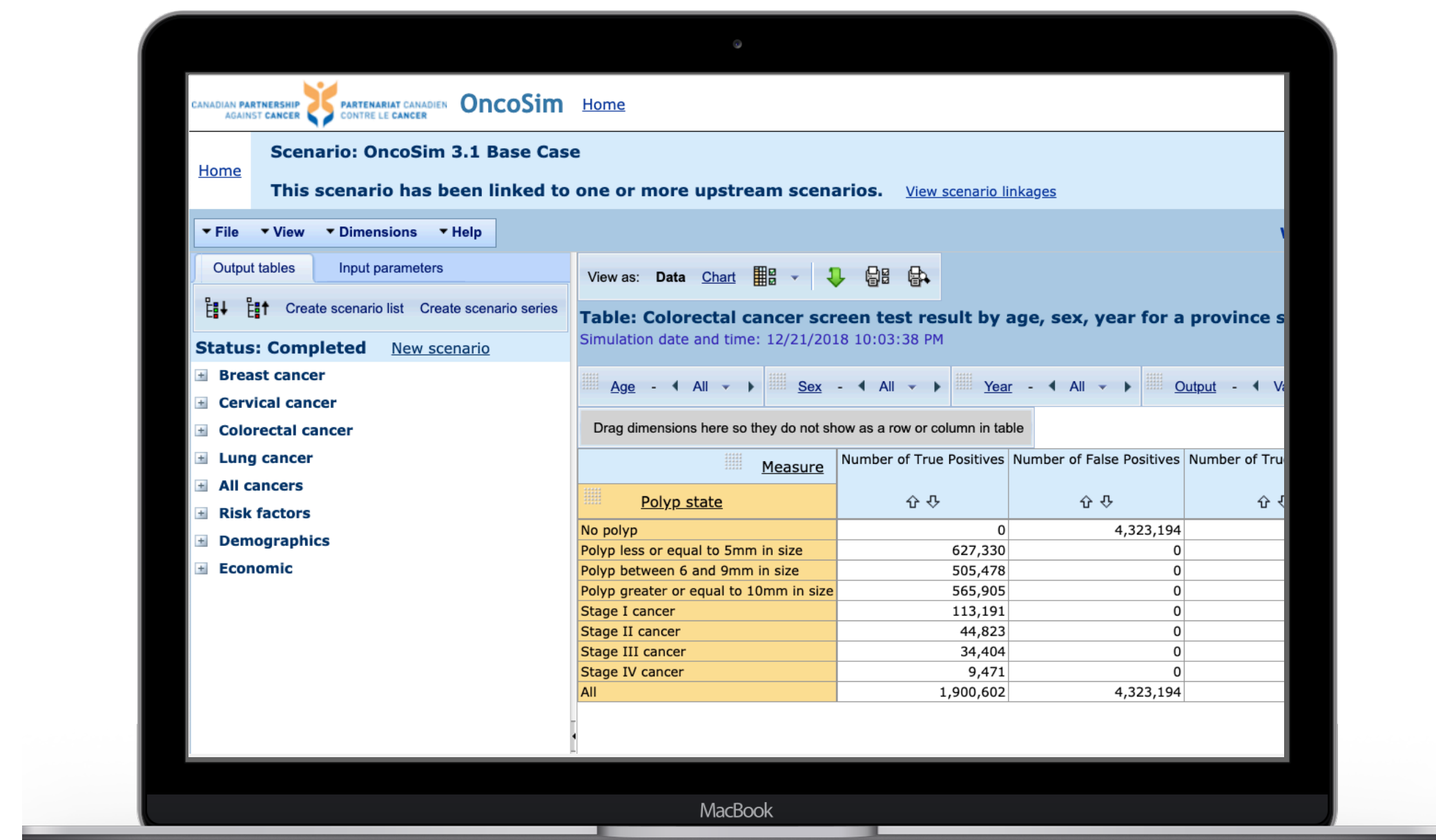
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## Scenarios

Create and compare





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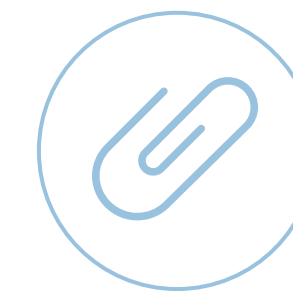
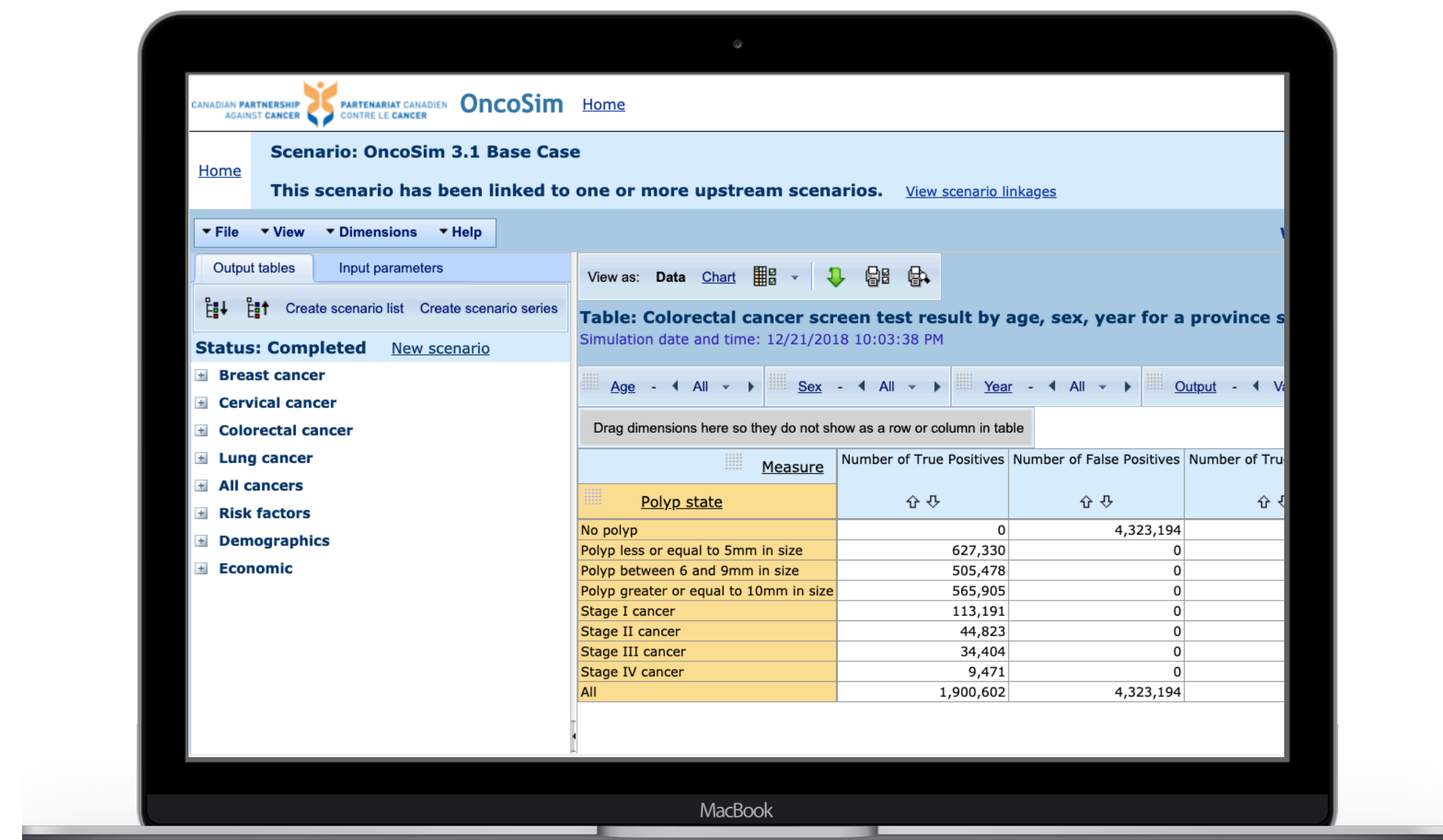
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## Projections

Population level,  
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## Scenarios

Create and compare



## User support

- Detailed documentations
- Training & technical support
- Conduct analyses for jurisdictions with limited resources

## ONCOSIM IN NUMBERS

OncoSim is the most widely used model across Canada to support cancer policy decisions.

10,000+

Scenarios ran in OncoSim



20+

Institutions, agencies and networks across Canada have used OncoSim

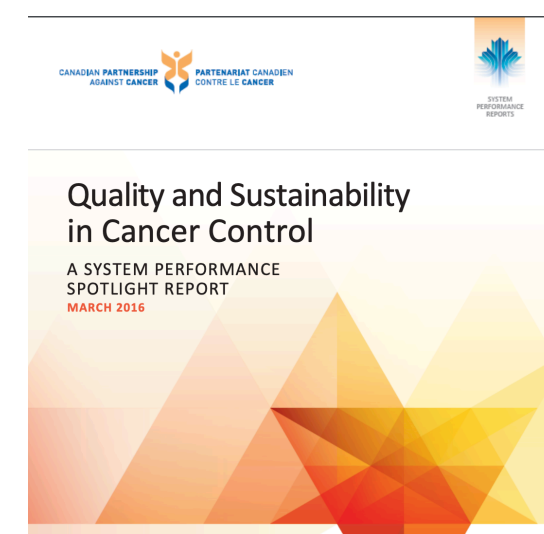
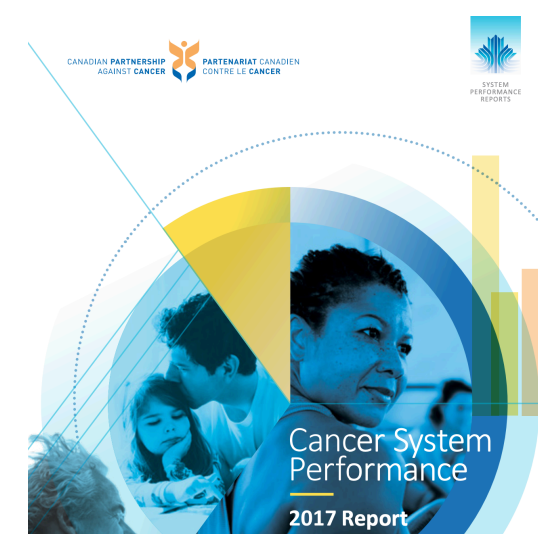
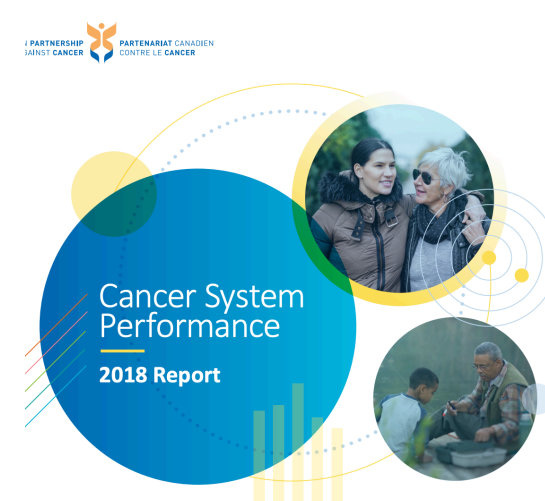
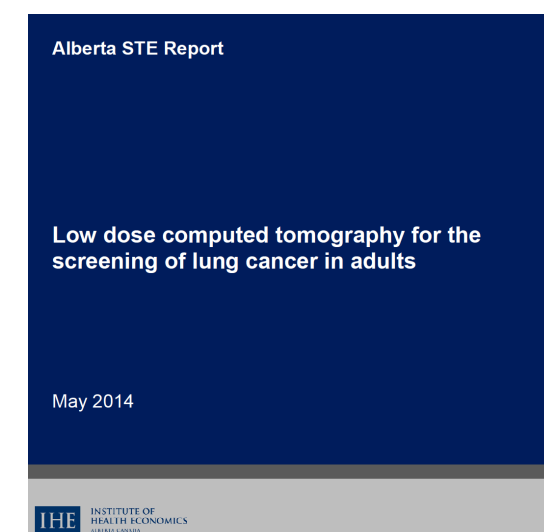
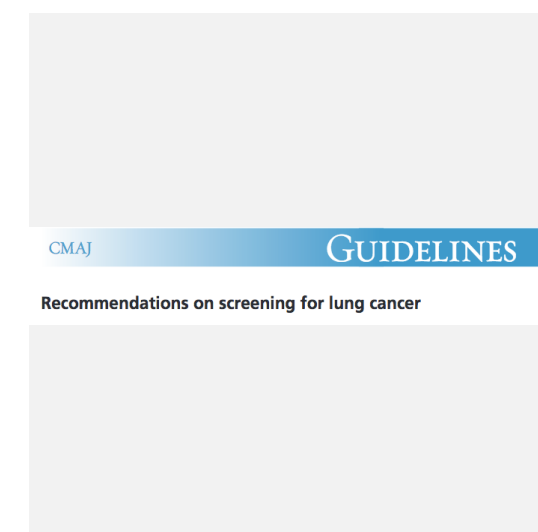
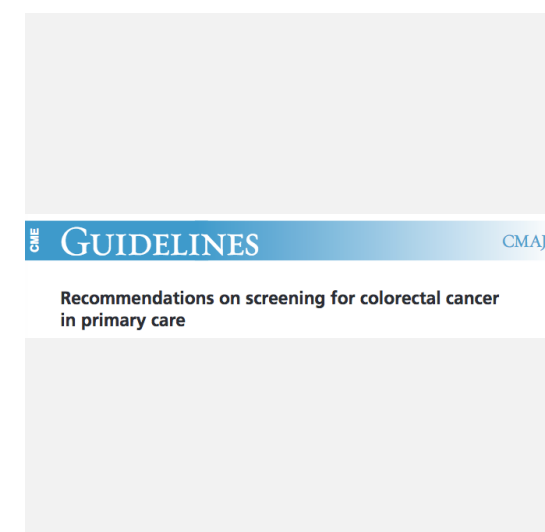
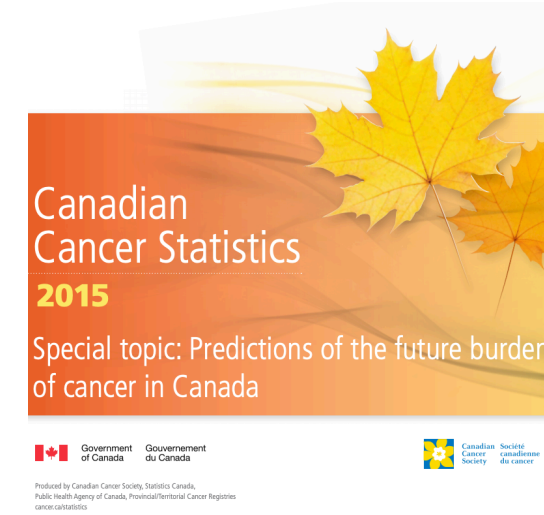
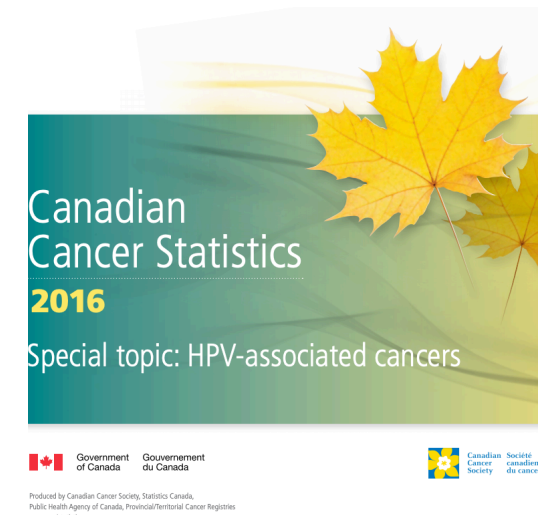


50+

Reports, papers, technical briefs, conference abstracts have used OncoSim







# Examples of OncoSim use case

## Cancer statistics

OncoSim projected in-depth health and economic outcomes for lung, colorectal and cervical cancers and compared HPV DNA test vs. cytology.

## Alberta STE\* report

The Institute of Health Economics used OncoSim to assess the cost-effectiveness and budget impact of lung cancer screening in Alberta.

\* Social and System Demographics Analysis, Technology Effects and Effectiveness, Economic Analysis

## Clinical guidelines

The Canadian Task Force on Preventive Health Care Guidelines, 2016, used OncoSim for evidence base.

## System performance

OncoSim's projections were cited in Cancer System Performance reports in 2016-2018.

# Cancer System Performance

## 2018 Report



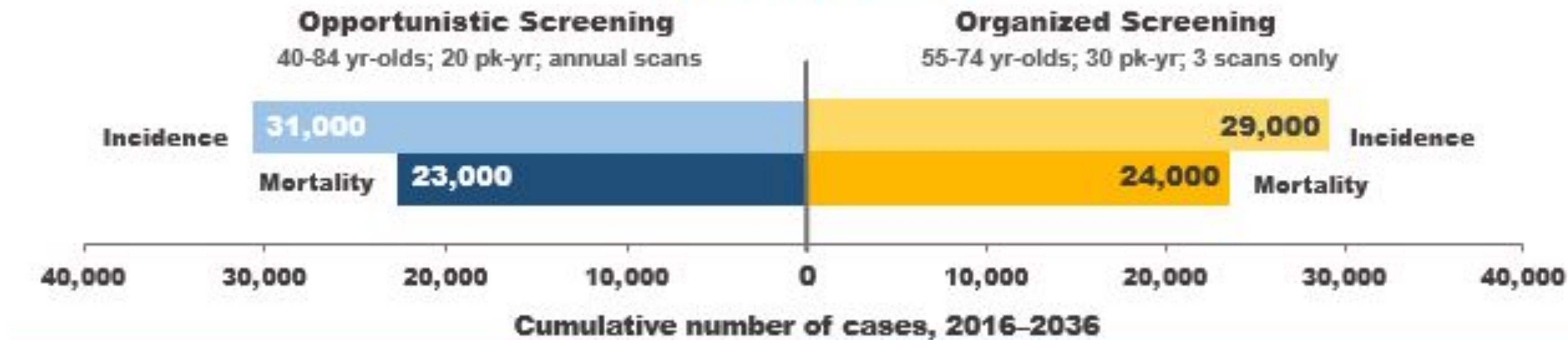
1. An increase in the HPV vaccination rate among Canadian girls from 67% to the national target of 90%
2. An increase in the provincial/territorial HPV vaccination rates among girls, and boys where applicable to the national target of 90%
3. A reduction in the smoking prevalence in Canada from an average of 19% to 5% by 2035
4. What if smoking rate drops to 5% by 2035?
5. A reduction in the smoking prevalence in Canada to match the lowest smoking rate in Canada (British Columbia).



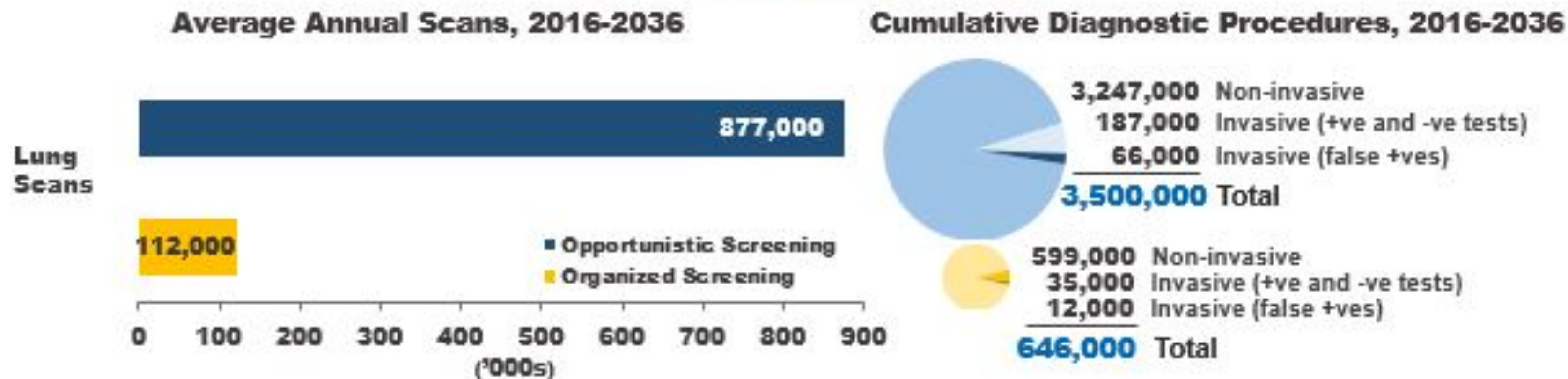
# Health and Health System Impact

## Opportunistic vs. Organized Lung Cancer Screening

### Health Impacts



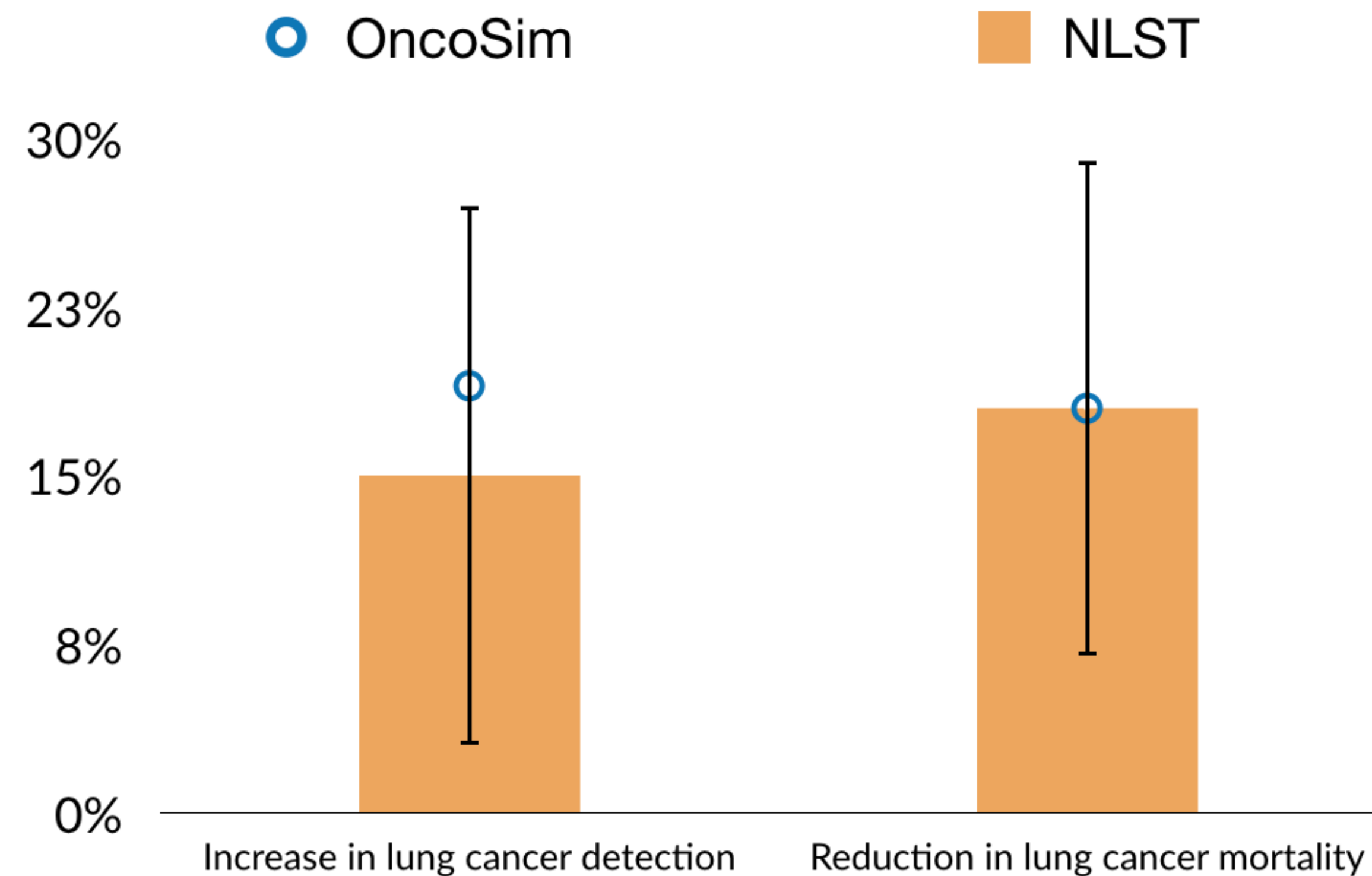
### Health System Impact



## OncoSim vs. Observed Data

### Impact of lung cancer screening

OncoSim reproduced the impact of lung cancer screening using low-dose computed tomography observed in the NLST, the pivotal trial that informs lung cancer screening guidelines.



# Partners for every step

## 1 | DEVELOPMENT

- Technical working groups meet regularly to advise on model.
- Statistics Canada leads the model development and analyzes data to populate model.
- A web platform is maintained to support online use.

>200

Individuals made  
OncoSim possible

# Partners for every step

## 1 | DEVELOPMENT

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Individuals made  
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## 2 | END USERS ENGAGEMENT

- Regular engagement with policy partners
- Help prioritize model development/revisions and knowledge dissemination efforts

# Partners for every step

1 | **DEVELOPMENT**

2 | **END USERS  
ENGAGEMENT**

>200

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**OPERATION** | 3

The Partnership supports  
users, with help from  
Statistics Canada, and  
maintains the web servers.



# Partners for every step

1 | **DEVELOPMENT**

**OPERATION** | 3

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**ANALYSIS** | 4

The Partnership conducts analysis using OncoSim, with advice from the technical working groups, for some policy partners.

# Building and supporting a policy tool

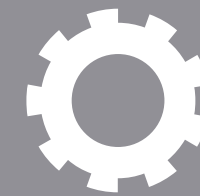
Content experts



User interface



IT infrastructure



User support



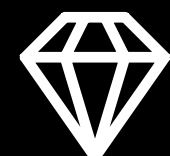
Documentation



Knowledge dissemination



Product management



**Inform  
policy  
decisions**









**PAST**

**FUTURE**





"Alone we can do so little, together we can do so much."  
--*Helen Keller*

# Thank you.



[oncosim@partnershipagainstcancer.ca](mailto:oncosim@partnershipagainstcancer.ca)



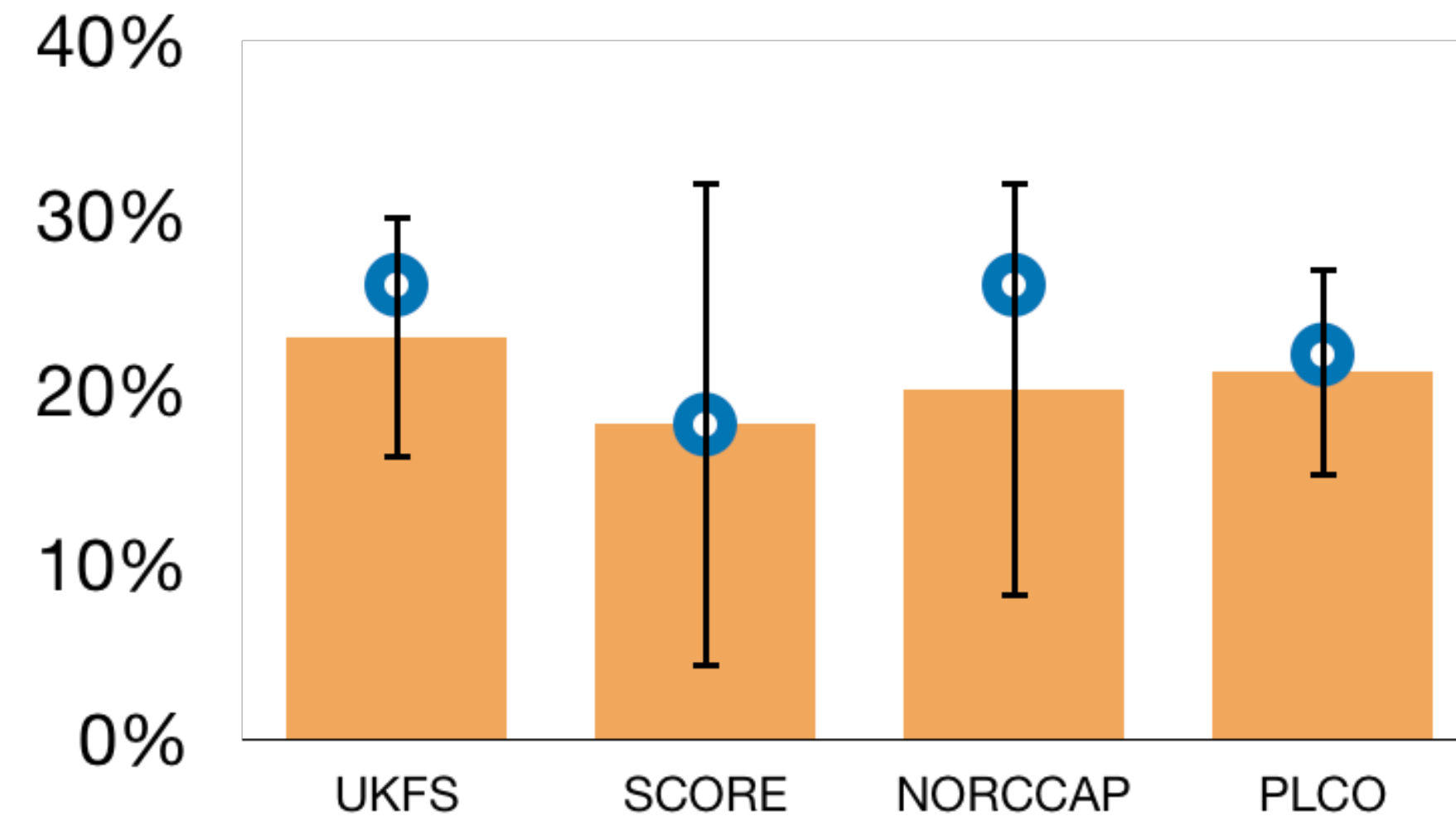
[www.oncosim.ca](http://www.oncosim.ca)

# OncoSim vs. Observed Data

## Impact of colorectal cancer screening

OncoSim reproduced the impact of colorectal cancer (CRC) screening using flexible sigmoidoscopy observed in key randomized clinical trials.

### Reduction in colorectal cancer incidence



### Reduction in colorectal cancer death

