

The Daffodil Centre

# Findings from the International Partnership for Resilience in Cancer Systems (I-PaRCS)

**Eleonora Feletto**

The Daffodil Centre



# COVID-19 and Cancer Global Modelling Consortium (CCGMC) → now I-PaRCS

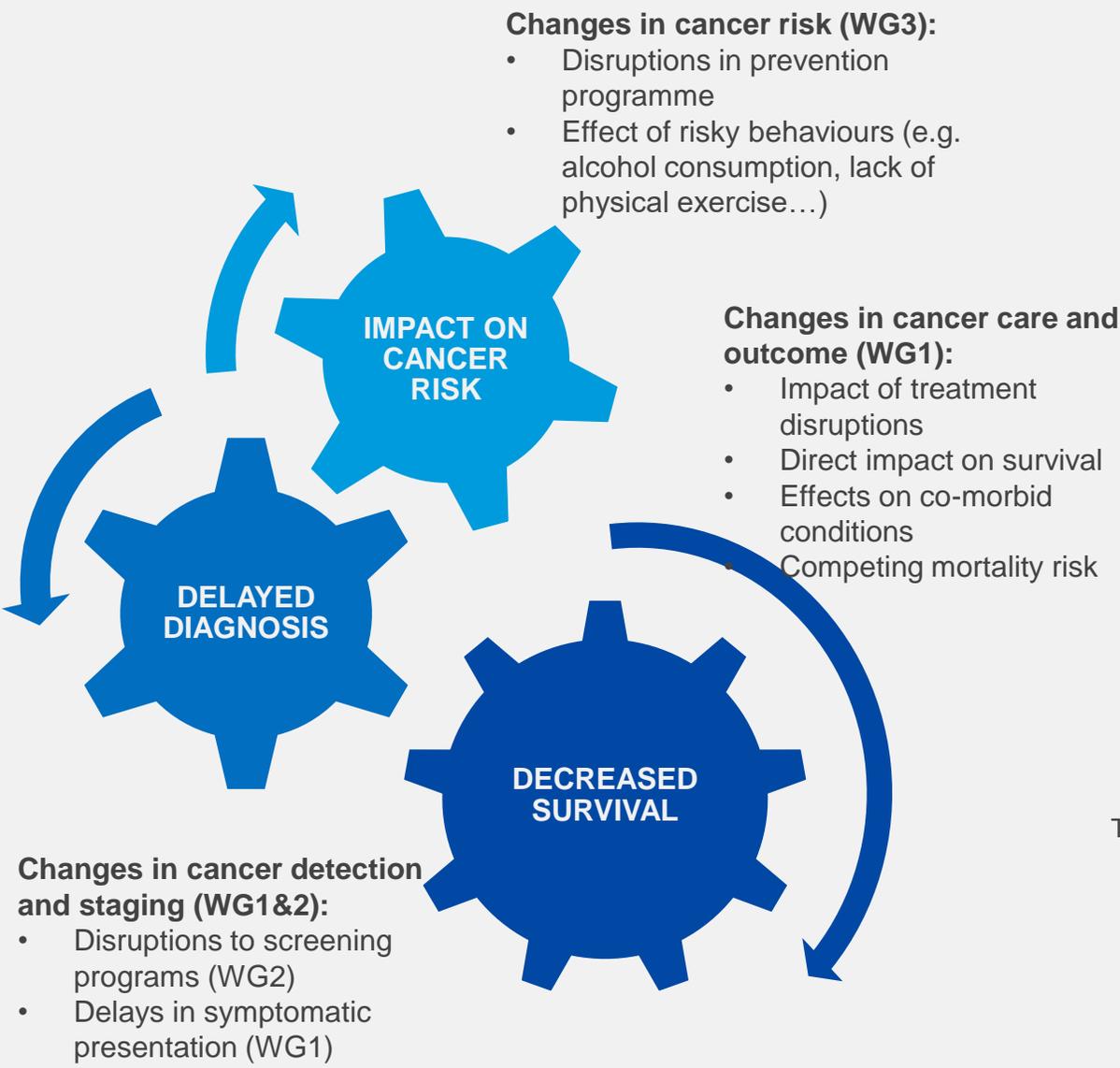


**I-PaRCS**  
International Partnership for  
Resilience in Cancer Systems

- To reflect the full breadth of research activities that have come under this banner, not exclusively modelling
- Our ultimate goal is to strengthen cancer control systems globally



# I-PaRCs structure



Three main work streams: impact on cancer treatment and outcomes, screening and cancer prevention.

 **WG1 Treatment**
 **WG2 Screening**
 **WG3 Prevention**

Infographic created by Cancer Surveillance Branch, IARC

# Colorectal Cancer Screening



- Canada
- OncoSim
- Biennial FIT test
- 50-74



- The Netherlands
- ASCCA & Miscan-Colon
- Biennial FIT test
- 55-75

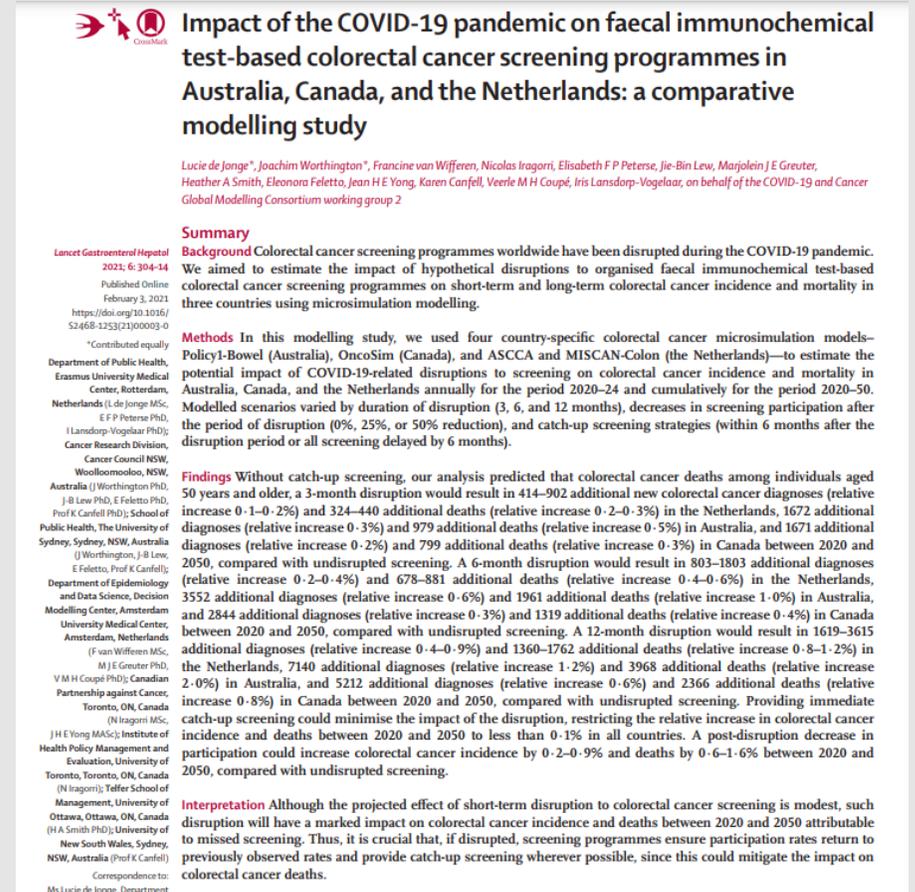


- Australia
- *Policy1-Bowel*
- Biennial FIT test (2-samples)
- 50-74

# I-PaRCS CRC WG 2 Project 1

- **Aims:** To estimate the impact of hypothetical pause to FIT screening programmes
- **Strategies evaluated:** Hypothetical pauses (3, 6, 9, 12 months) to screening in 2020-2021 with/without catch-up screening
- **Key findings:**
  - Long-term impact on CRC cases and deaths due to screening disruption
  - Catch-up screening could mitigate the excess deaths caused by screening disruption

de Jonge L, Worthington J, van Wifferen F, Iragorri N, Peterse EF, Lew JB, Greuter MJ, Smith HA, Feletto E, Yong JH, Canfell , Coupe V, Lansdorp-Vogelaar I. Impact of the COVID-19 pandemic on faecal immunochemical test-based colorectal cancer screening programmes in Australia, Canada, and the Netherlands: a comparative modelling study. *The Lancet Gastroenterology & Hepatology*. 2021 Apr 1;6(4):304-14.



**Impact of the COVID-19 pandemic on faecal immunochemical test-based colorectal cancer screening programmes in Australia, Canada, and the Netherlands: a comparative modelling study**

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**Summary**  
**Background** Colorectal cancer screening programmes worldwide have been disrupted during the COVID-19 pandemic. We aimed to estimate the impact of hypothetical disruptions to organised faecal immunochemical test-based colorectal cancer screening programmes on short-term and long-term colorectal cancer incidence and mortality in three countries using microsimulation modelling.

**Methods** In this modelling study, we used four country-specific colorectal cancer microsimulation models—Policy1-Bowel (Australia), OncoSim (Canada), and ASCCA and MISCAN-Colon (the Netherlands)—to estimate the potential impact of COVID-19-related disruptions to screening on colorectal cancer incidence and mortality in Australia, Canada, and the Netherlands annually for the period 2020–24 and cumulatively for the period 2020–50. Modelled scenarios varied by duration of disruption (3, 6, and 12 months), decreases in screening participation after the period of disruption (0%, 25%, or 50% reduction), and catch-up screening strategies (within 6 months after the disruption period or all screening delayed by 6 months).

**Findings** Without catch-up screening, our analysis predicted that colorectal cancer deaths among individuals aged 50 years and older, a 3-month disruption would result in 414–902 additional new colorectal cancer diagnoses (relative increase 0·1–0·2%) and 324–440 additional deaths (relative increase 0·2–0·3%) in the Netherlands, 1672 additional diagnoses (relative increase 0·3%) and 979 additional deaths (relative increase 0·5%) in Australia, and 1671 additional diagnoses (relative increase 0·2%) and 799 additional deaths (relative increase 0·3%) in Canada between 2020 and 2050, compared with uninterrupted screening. A 6-month disruption would result in 803–1803 additional diagnoses (relative increase 0·2–0·4%) and 678–881 additional deaths (relative increase 0·4–0·6%) in the Netherlands, 3552 additional diagnoses (relative increase 0·6%) and 1961 additional deaths (relative increase 1·0%) in Australia, and 2844 additional diagnoses (relative increase 0·3%) and 1319 additional deaths (relative increase 0·4%) in Canada between 2020 and 2050, compared with uninterrupted screening. A 12-month disruption would result in 1619–3615 additional diagnoses (relative increase 0·4–0·9%) and 1360–1762 additional deaths (relative increase 0·8–1·2%) in the Netherlands, 7140 additional diagnoses (relative increase 1·2%) and 3968 additional deaths (relative increase 2·0%) in Australia, and 5212 additional diagnoses (relative increase 0·6%) and 2366 additional deaths (relative increase 0·8%) in Canada between 2020 and 2050, compared with uninterrupted screening. Providing immediate catch-up screening could minimise the impact of the disruption, restricting the relative increase in colorectal cancer incidence and deaths between 2020 and 2050 to less than 0·1% in all countries. A post-disruption decrease in participation could increase colorectal cancer incidence by 0·2–0·9% and deaths by 0·6–1·6% between 2020 and 2050, compared with uninterrupted screening.

**Interpretation** Although the projected effect of short-term disruption to colorectal cancer screening is modest, such disruption will have a marked impact on colorectal cancer incidence and deaths between 2020 and 2050 attributable to missed screening. Thus, it is crucial that, if disrupted, screening programmes ensure participation rates return to previously observed rates and provide catch-up screening wherever possible, since this could mitigate the impact on colorectal cancer deaths.

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# I-PaRCS CRC WG 2 Project 2

Original Article

## Prioritisation of colonoscopy services in colorectal cancer screening programmes to minimise impact of COVID-19 pandemic on predicted cancer burden: A comparative modelling study

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Veerle M.H. Coupé<sup>1</sup>, on behalf of the COVID-19 and Cancer Global Modelling  
Consortium (CCGMC) working group 2

### Abstract

**Objectives:** Colorectal cancer (CRC) screening with a faecal immunochemical test (FIT) has been disrupted in many countries during the COVID-19 pandemic. Performing catch-up of missed screens while maintaining regular screening services requires additional colonoscopy capacity that may not be available. This study aimed to compare strategies that clear the screening backlog using limited colonoscopy resources.

**Methods:** A range of strategies were simulated using four country-specific CRC natural-history models: Adenoma and Serrated pathway to Colorectal Cancer (ASCCA) and Microsimulation Screening ANalysis for CRC (MISCAN-Colon) (both in the Netherlands), Policy I-Bowel (Australia) and OncoSim (Canada). Strategies assumed a 3-month screening disruption with varying recovery period lengths (6, 12, and 24 months) and varying FIT thresholds for diagnostic colonoscopy. Increasing the FIT threshold reduces the number of referrals to diagnostic colonoscopy. Outcomes for each strategy were colonoscopy demand and excess CRC-related deaths due to the disruption.

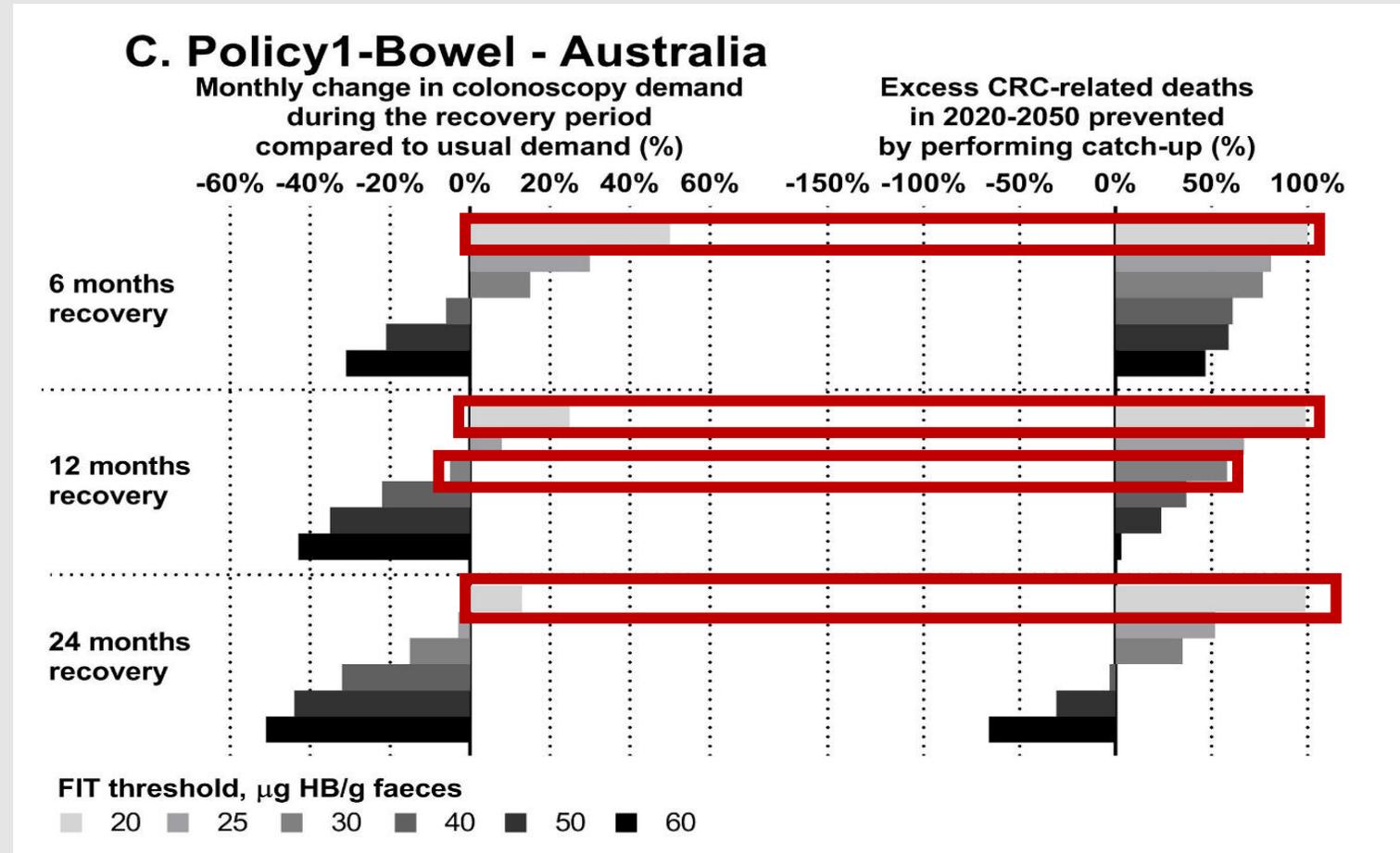
**Results:** Performing catch-up using the regular FIT threshold in 6, 12 and 24 months could prevent most excess CRC-related deaths, but required 50%, 25% and 12.5% additional colonoscopy demand, respectively. Without exceeding usual colonoscopy demand, up to 60% of excess CRC-related deaths can be prevented by increasing the FIT threshold for 12 or 24 months. Large increases in FIT threshold could lead to additional deaths rather than preventing them.

**Conclusions:** Clearing the screening backlog in 24 months could avert most excess CRC-related deaths due to a 3-month disruption but would require a small increase in colonoscopy demand. Increasing the FIT threshold slightly over 24 months could ease the pressure on colonoscopy resources.

- Aims: Compare strategies that clear the screening backlog using limited colonoscopy resources.
- Strategies evaluated: 3-month screening disruption with varying recovery period lengths (6, 12, and 24 months) and varying FIT thresholds for diagnostic colonoscopy referral

van Wifferen F, de Jonge L, Worthington J, Greuter MJ, Lew JB, Nadeau C, van den Puttelaar R, Feletto E, Yong JH, Lansdorp-Vogelaar I, Canfell K, Coupe V. Prioritisation of colonoscopy services in colorectal cancer screening programmes to minimise impact of COVID-19 pandemic on predicted cancer burden: A comparative modelling study. *Journal of medical screening*. 2022 Jun;29(2):72-83.

# Project 2: *Policy1-Bowel* results



# Project 2: Key findings

- Optimal strategies are setting-specific, however:
- Catch-up screening could mitigate the excess CRC deaths due to a 3-month disruption over a 24-month period
  - This would require a small increase in diagnostic colonoscopy demand after a positive FIT.
- Increasing the FIT threshold slightly over a long recovery period could ease the pressure on colonoscopy resources.

# I-PaRCS CRC WG 2 Project 3

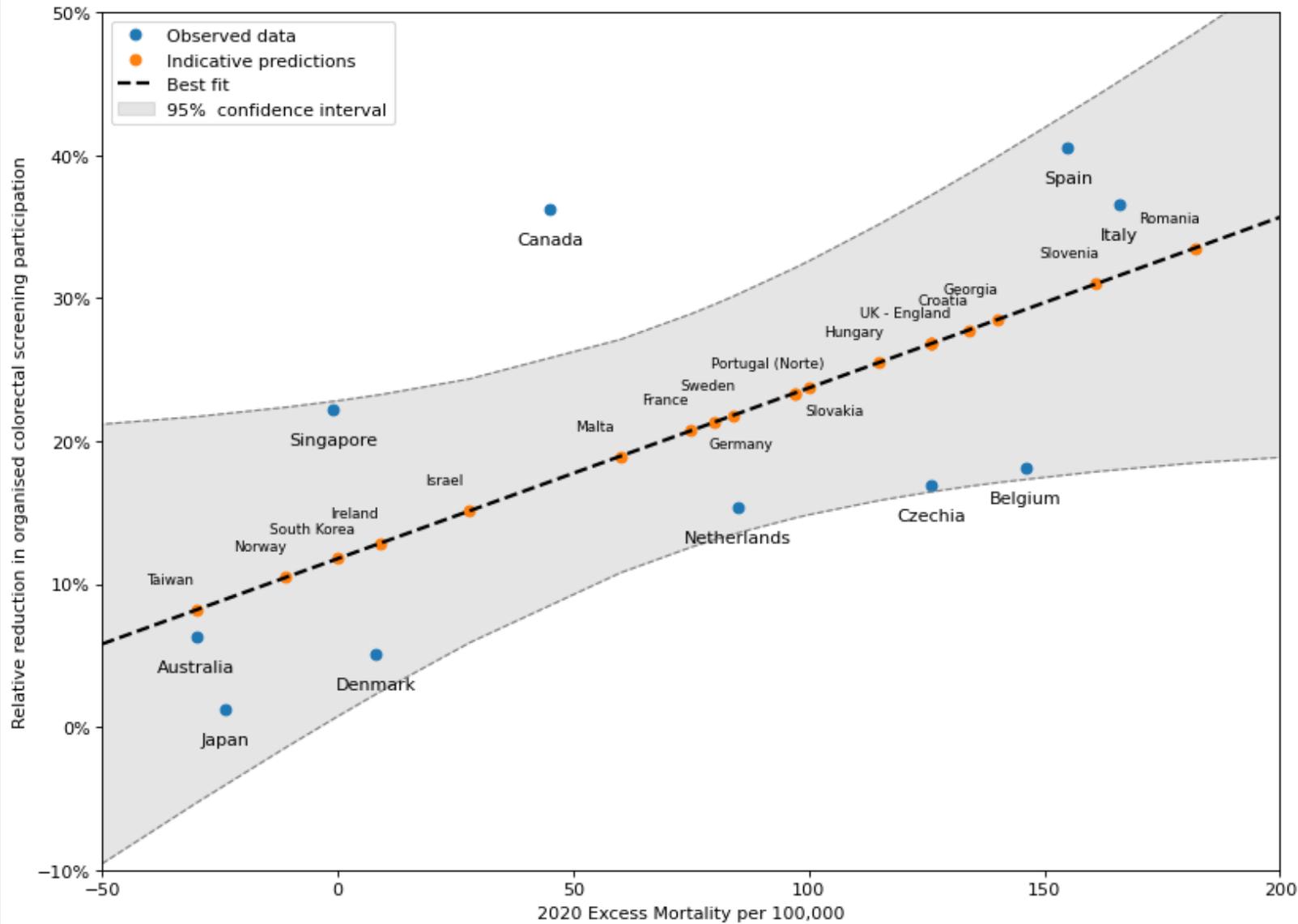
We aimed to estimate the global impact of screening decreases on CRC outcomes, and potential effects of catch-up screening.

# Project 3: Global screening data

- Harness the opportunity to use real-world data.
  - Scientific literature (peer-reviewed and reports from key stakeholders)
  - Other collaborative efforts: ICSN, CanSCREEN, Time to Act Data Navigator
  - Working Group members (via a survey)
- **30 countries have established organised or high-penetration opportunistic approaches to CRC screening**

# Project 3: Global screening programs

- Many programs experienced disruptions in the context of COVID-19, either due to program pauses, or decreased participation, or both.
- Identified the details of existing organised colorectal cancer screening programs, including:
  - Program details – establishment, coverage etc
  - Program design – test technology, target age range, frequency
  - Program performance – primary screening participation, diagnostic assessment uptake



Source: World Health Organization. The true death toll of COVID-19: Estimating global excess mortality.

## Methods

- We identified data on relative changes to participation in 2020 for ten countries
- Decreases relative to previous year(s) ranged from 1.3% to 40.5%
- Drops in participation were correlated with the WHO estimated all-cause excess mortality due in 2020 ( $R=0.66$ )
- For countries where 2020 data was not available, this correlation was used to generate indicative approximate screening decreases

# Project 3: Modelled evaluation

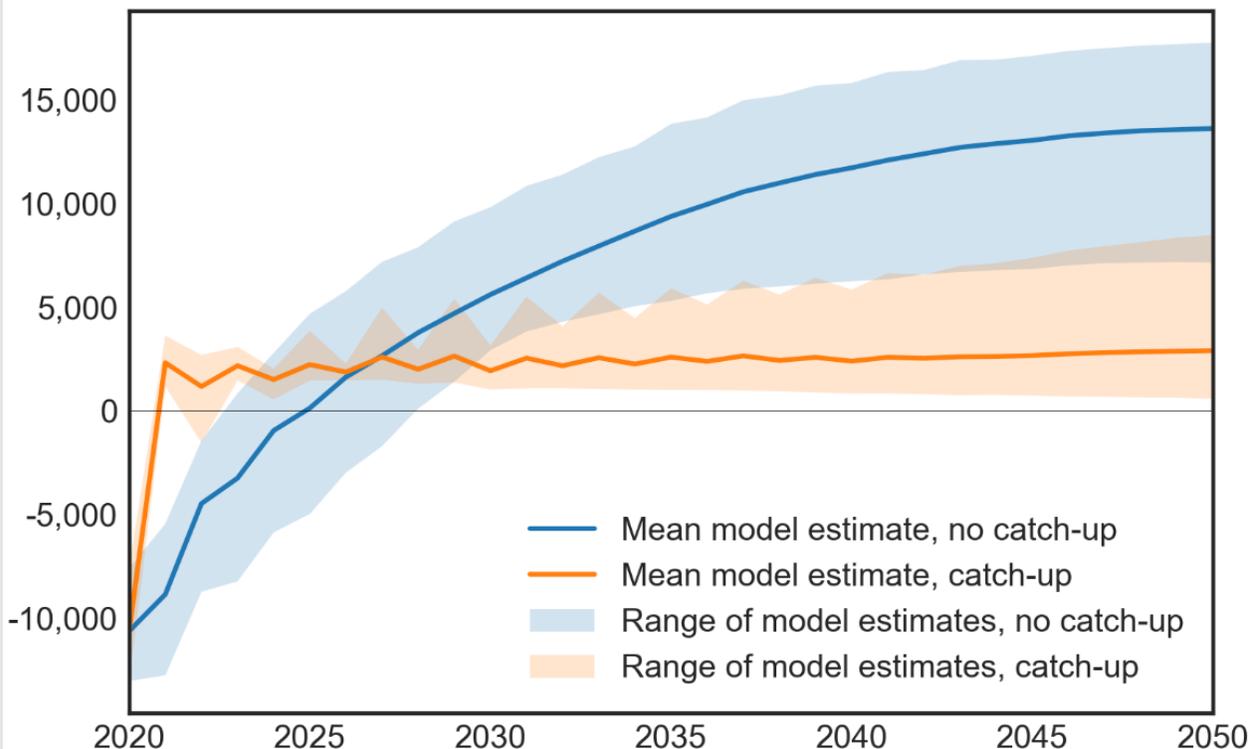
- **Comparator:** screening in 2020 occurred at “status quo” participation rates observed before 2020
- **Scenario A:** assumed changes were either those observed in each country or proportional to 2020 excess mortality.

# Project 3: Results

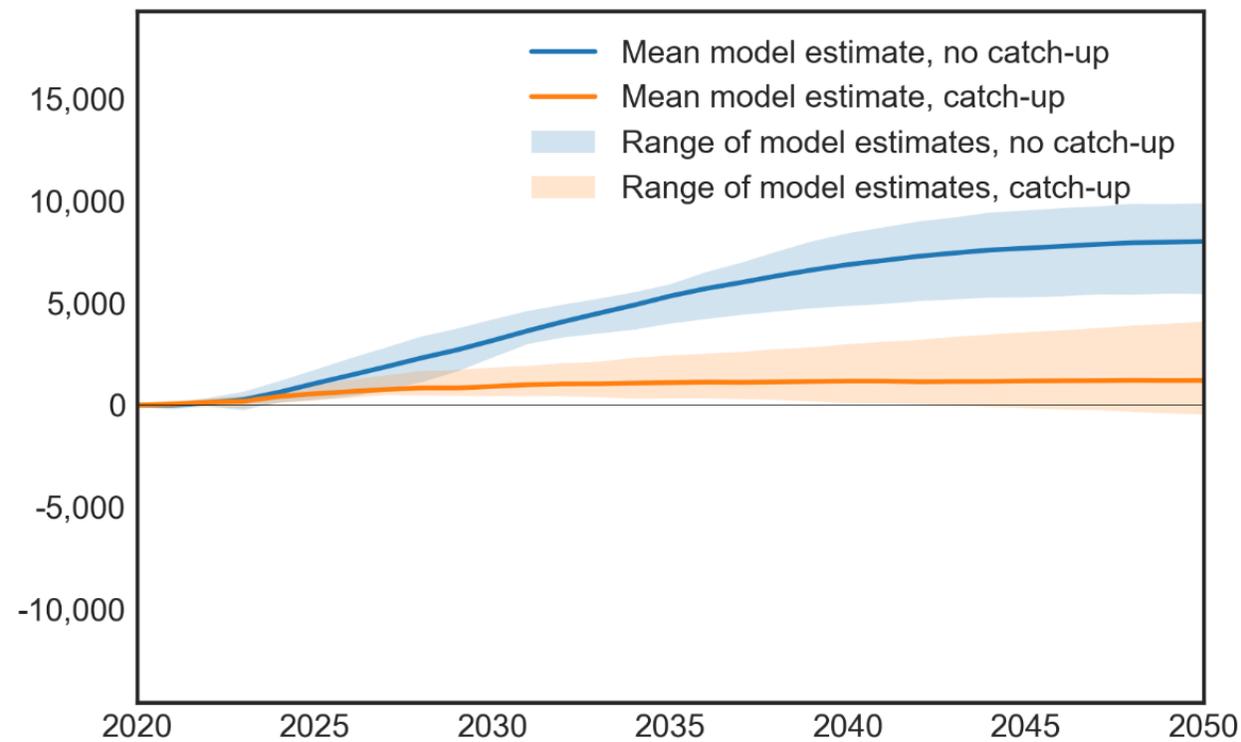
		Scenario A
		Inferred COVID-related screening decrease in 2020
	Screens missed, 2020	7,400,000
<b>No catch-up</b>	Additional incidence, 2020-2050	<b>14,000</b> (7,100, 18,000)
	Additional mortality, 2020-2050	<b>8,000</b> (5,400, 9,900)
<b>Full catch-up</b>	Additional incidence, 2020-2050	<b>2,900</b> (570, 8,500)
	Additional mortality, 2020-2050	<b>1,200</b> (-480, 4,100)

Results are additional incidence/mortality numbers vs the comparator (status quo screening participation in 2020)  
 Results are *the average between the four models (model minimum, model maximum)*  
 All results to two significant figures

## Cumulative additional CRC Cases



## Cumulative additional CRC Deaths



# Project 3: Key findings

- CRC screening disruptions in 2020 due to COVID-19 could lead to additional cases and deaths over the longer term
- However, delivery of catch-up screening to those that missed screening in 2020 can mitigate much of the impact
- Out-of-program screening, such as colonoscopy screening conducted in private practice, may have also been impacted
- Careful monitoring will be necessary over the next period.

# Acknowledgements

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- Thank you to all members, especially the co-chairs Dr. I. Lansdorp-Vogelaar and Professor Karen Canfell and the technical modelling teams.
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