Covid-19 and Cancer Global Modelling Consortium

Overview of the Covid-19 and Cancer Global Modelling Consortium (CCGMC) efforts in relation to cervical cancer
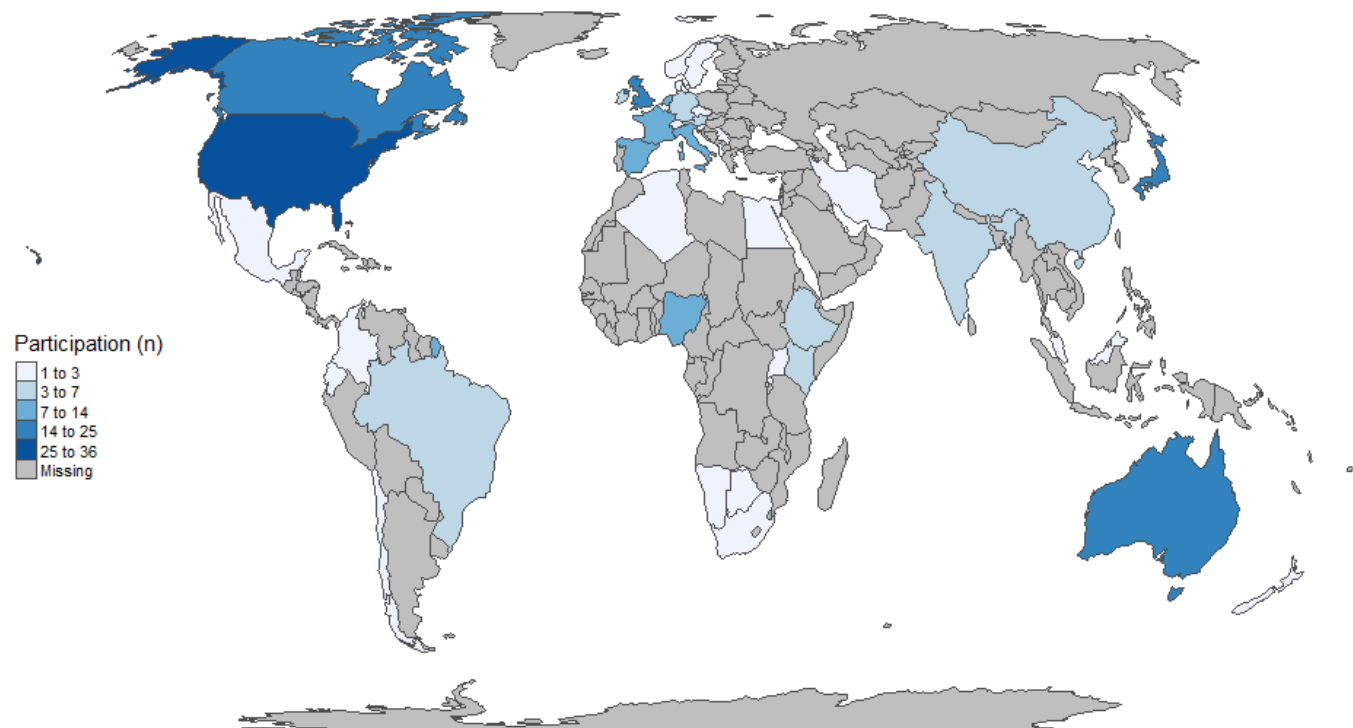
HPV Prevention & Control Board/ CCGMC Technical Meeting
November 12-13, 2020.

Karen Canfell
Director, Cancer Research Division, Cancer Council NSW
Adjunct Professor, School of Public Health, University of Sydney
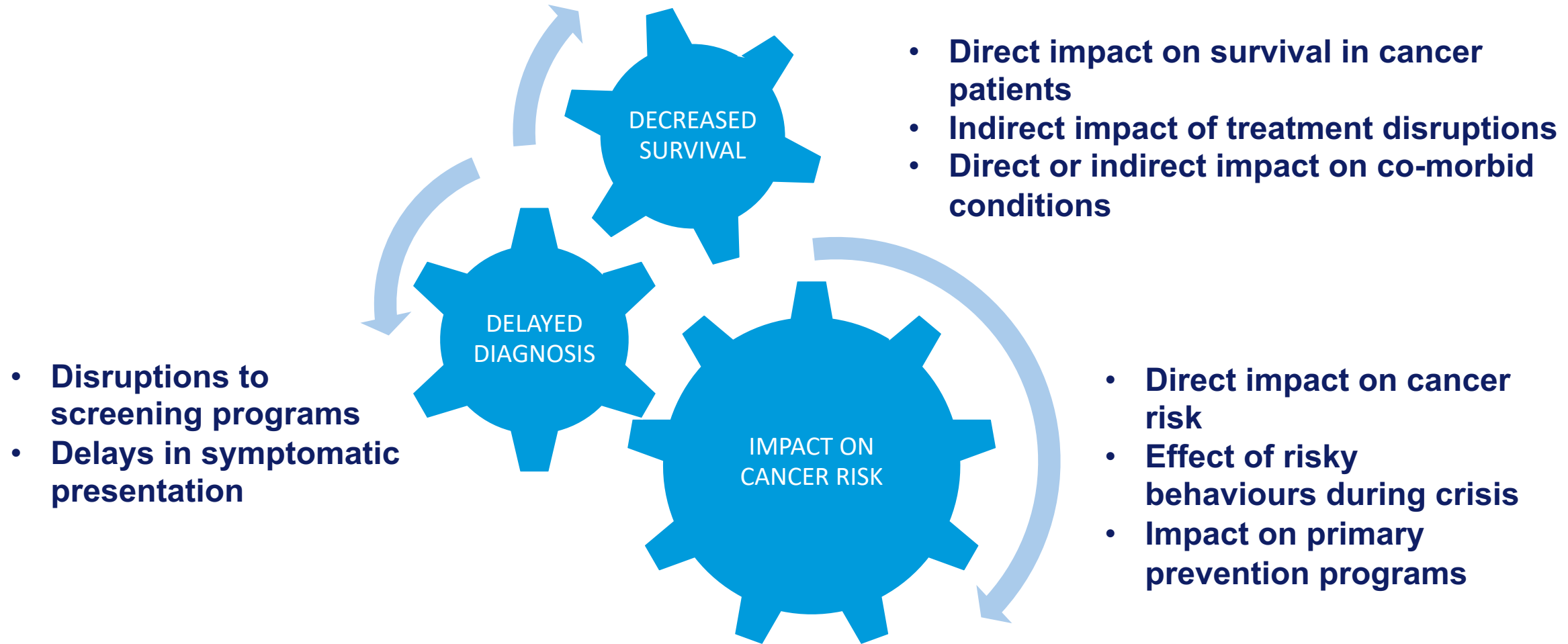**Adjunct Professor, Prince of Wales Clinical School, UNSW Australia**

Policy-relevant questions driving the CCGMC activities

- What is the quantified impact of the long term impact of the crisis on cancer outcomes?
  - How does this supplement our understanding of the full (not just the acute) health impact of the crisis?

- What are the optimal mitigation/recovery strategies after disruption?
  - How should finite resources be prioritised in the recovery (e.g. limited colposcopy or treatment services capacity)

- What is the potential impact and cost-effectiveness of the accelerated adoption of innovative recovery strategies or new technologies (i.e. 'silver linings')?

Potential impacts of COVID-19 on cancer

DECREASED SURVIVAL

DELAYED DIAGNOSIS

IMPACT ON CANCER RISK

- **Direct impact on survival in cancer patients**
- **Indirect impact of treatment disruptions**
- **Direct or indirect impact on co-morbid conditions**

- **Disruptions to screening programs**
- **Delays in symptomatic presentation**

- **Direct impact on cancer risk**
- **Effect of risky behaviours during crisis**
- **Impact on primary prevention programs**

Modelling: a formal evidence synthesis

Data inputs

Cancer control effectiveness:
- **Survival according to treatment delivery**
- **Screening effectiveness (test accuracy, etc)**
- **Primary prevention reach & effectiveness**

Pre-pandemic treatment delivery, screening participation & prevention behaviours (*'status quo'*)

Scenarios for timing and extent of disruptions in health services

Pre-existing detailed & calibrated model of cancer development and outcomes in the population

Prior model validation

Demonstrate that the outputs for the pre-pandemic *status quo* align with existing evidence

Projected outputs

- **Cancer incidence**
- **Cancer mortality**
- **Health services utilisation e.g. number of screening tests and treatment procedures**
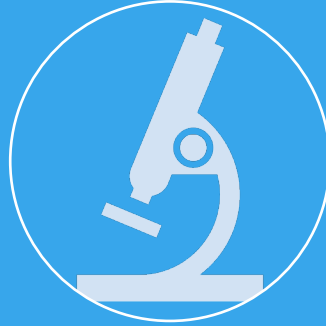- **Costs and cost-effectiveness, HALYs**

Cancer Council
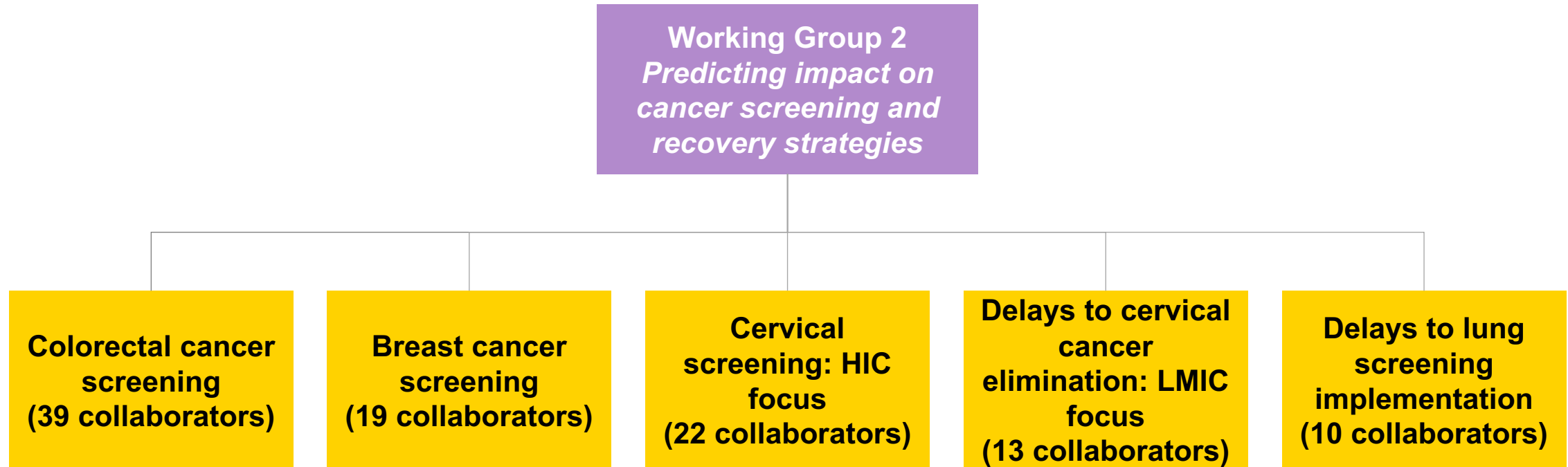
The CCGMC has close links with two other modelling consortia

NATIONAL CANCER INSTITUTE
Cancer Intervention and Surveillance Modeling Network

CIS NET

CISNET is a consortium of NCI-sponsored investigators who use simulation modeling to improve our understanding of cancer control interventions and guide public health research and priorities.

World Health Organization — International Agency for Research on Cancer, World Health Organization — Cancer Council NSW — HARVARD T.H. CHAN SCHOOL OF PUBLIC HEALTH — UNIVERSITÉ LAVAL
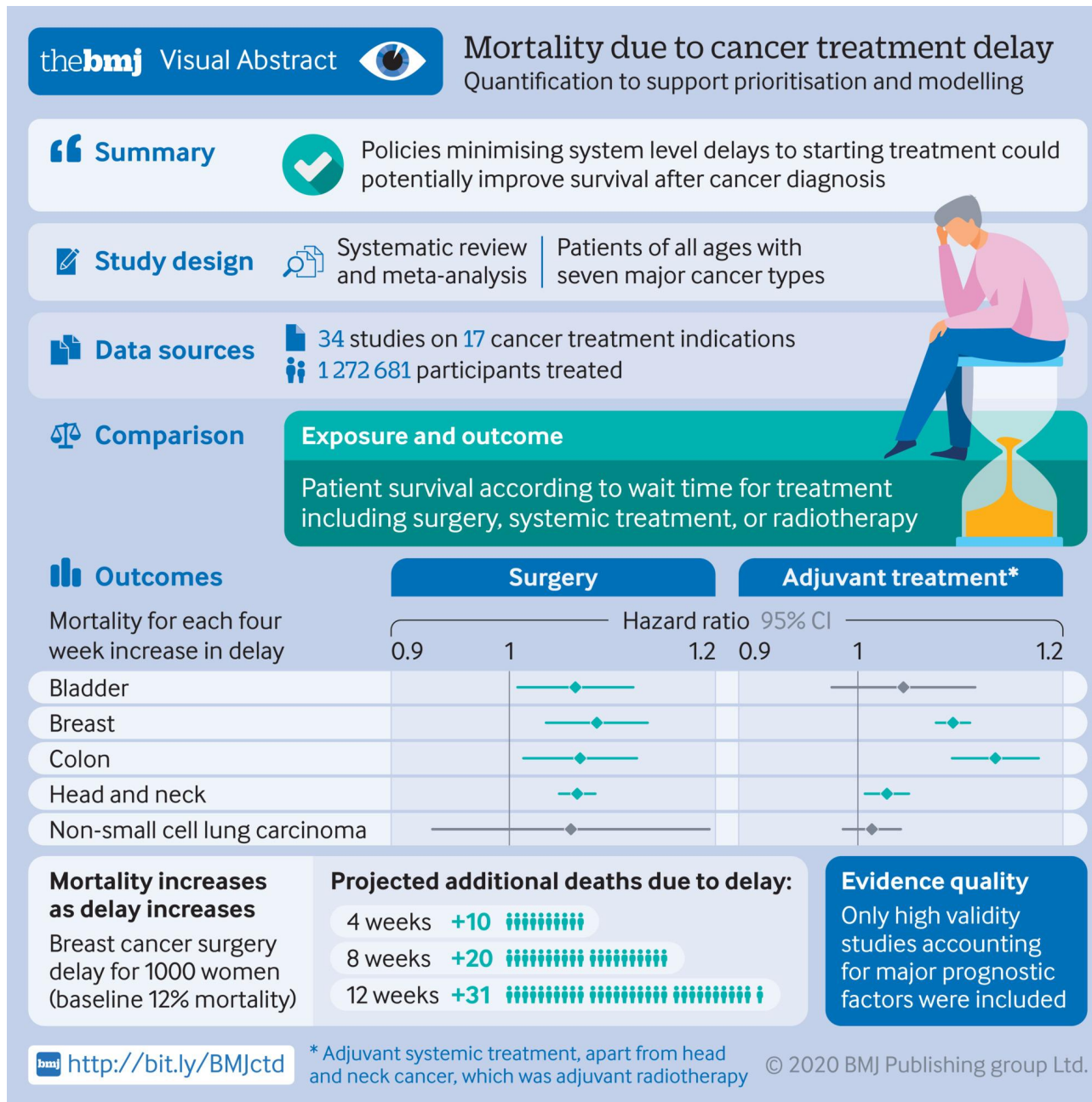
WHO Cervical Cancer Elimination Modelling Consortium (CCEMC)

Impact and cost-effectiveness modelling for 78 LMIC

Timeline

Terms of Reference endorsed by Steering Group

- Weekly CCGMC WG2 Cervical cancer project team meetings commenced
- Weekly CCGMC/IARC technical discussion meetings

- CCGMC WG2 – Breast cancer project team meetings commenced

May

July - August

October

March – April 2020

- Establishment of the COVID-19 and Cancer Taskforce
- **Launched the EOI for CCGMC**

- Establishment of the CCGMC
- 1ˢᵗ Consortium-wide calls
- WG2 Colorectal cancer technical meetings commenced

June

- 1ˢᵗ WG2 (Screening) group meeting
- 1ˢᵗ WG1&3 (Treatment & Prevention) group meeting
- **Monthly Steering Group meetings established**

September

- CCGMC WG1 comparative modelling meetings commenced
- CCGMC WG2 Colorectal cancer project team meetings commenced
- CCGMC WG3 (Prevention) Planning meeting

November

2ⁿᵈ Consortium-wide calls

The CCGMC is connected with groups centrally collating relevant data

the bmj Visual Abstract

Mortality due to cancer treatment delay
Quantification to support prioritisation and modelling

Summary — Policies minimising system level delays to starting treatment could potentially improve survival after cancer diagnosis

Study design — Systematic review and meta-analysis | Patients of all ages with seven major cancer types

Data sources — 34 studies on 17 cancer treatment indications | 1 272 681 participants treated

Comparison

Exposure and outcome

Patient survival according to wait time for treatment including surgery, systemic treatment, or radiotherapy

Outcomes

Mortality for each four week increase in delay — Hazard ratio 95% CI

	Surgery	Adjuvant treatment*
	0.9 — 1 — 1.2	0.9 — 1 — 1.2
Bladder		
Breast		
Colon		
Head and neck		
Non-small cell lung carcinoma		

Mortality increases as delay increases

Breast cancer surgery delay for 1000 women (baseline 12% mortality)

Projected additional deaths due to delay:

4 weeks +10
8 weeks +20
12 weeks +31

Evidence quality
Only high validity studies accounting for major prognostic factors were included

http://bit.ly/BMJctd

* Adjuvant systemic treatment, apart from head and neck cancer, which was adjuvant radiotherapy

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the bmj

Timothy P Hanna et al. BMJ 2020;371:bmj.m4087

The elimination launch

Nov 17th 2020

2020

Vaccination & 2 lifetime screens

Cervical cancer incidence distribution

Low income	2.9 %	11.8 %
Lower middle income	4.5 %	15.9 %
East Asia & Pacific	0.0 %	8.3 %
Europe & Central Asia	0.0 %	16.7 %
Latin America & Caribbean	0.0 %	0.0 %
Middle East & North Africa	42.9 %	71.4 %
South Asia	0.0 %	42.9 %
Sub-Saharan Africa	0.0 %	2.4 %

(per 100,000 woman-years)

0-4	4-10	10-15	15-30	30-45	44-60	60+

Cervical cancer incidence (per 100,000 woman-years)

0 4 10 15 30 45 60 75 90 105 120
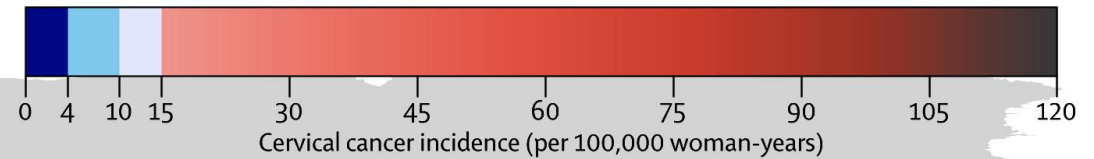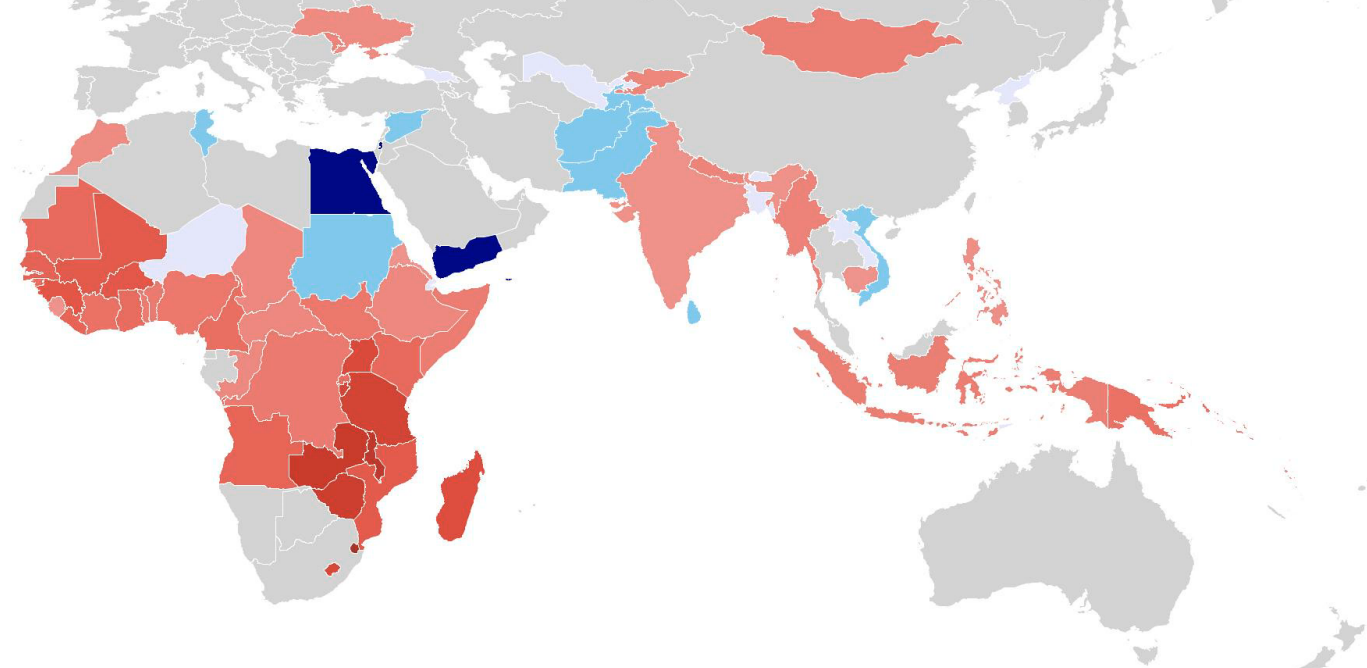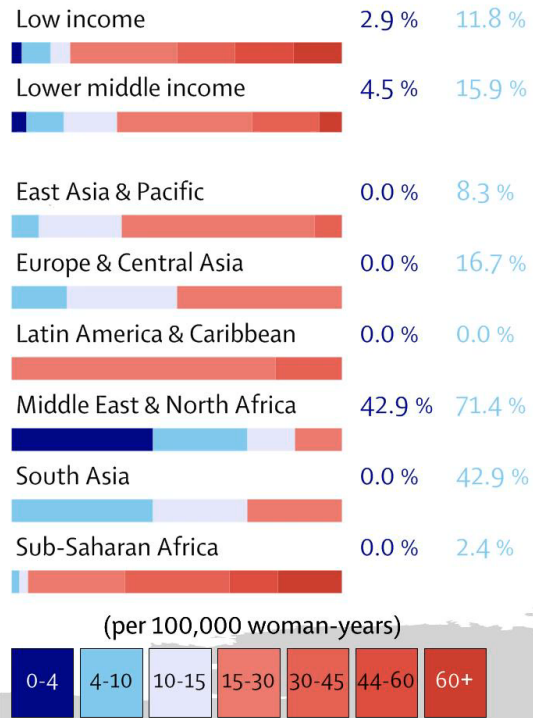
Brisson M/Kim JJ/Canfell K et al., Lancet Jan 30 2020

World Health Organization

International Agency for Research on Cancer
World Health Organization

Cancer Council NSW

HARVARD T.H. CHAN SCHOOL OF PUBLIC HEALTH

UNIVERSITÉ LAVAL

Elimination:
Broader implications for cancer control in LMIC

UICC: Addressing Cancer Control within Universal Health Coverage. Policy Brief launched at WCLS 2019, Kazakhstan

COVID-19 and Cancer Global Modelling Consortium

ccgmc.org

WHO Cervical Cancer Elimination Modelling Consortium (CCEMC)

Impact and cost-effectiveness modelling for 78 LMIC

Thank you
Karen.Canfell@nswcc.org.au

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CISNET is a consortium of NCI-sponsored investigators who use simulation modeling to improve our understanding of cancer control interventions and guide public health research and priorities.

C4
Centre of Research Excellence in Cervical Cancer Control

This is a multi-institutional agreement in partnership with:

Cancer Council NSW · VCS · Kirby Institute · THE UNIVERSITY OF MELBOURNE