CORA Cork Open Research Archive
Cartlann Taighde Oscailte Chorcaí

Title	International disruptions to cancer diagnosis and stage at presentation during the COVID-19 pandemic in 2020: an International Cancer Benchmarking Partnership (ICBP) population-based study
Authors	Morgan, Eileen;Bardot, Aude;Langselius, Oliver;Rutherford, Mark J.;Elkader, Hazem Abd;Bennett, Damien;Brennan, Aline;Bucher, Oliver;Butler, John;Cameron, David A.;Canfell, Karen;Chiam, Karen;Chiarelli, Anna;Creighton, Nicola;De, Prithwish;Evans, Sue;Fitzpatrick, Deirdre;Guren, Marianne G.;Hannah, Jack;Huws, Dyfed W.;Jackson, Christopher G.C.A.;Kønig, Simon Mathis;Kumar, Eshwar;Larønningen, Siri;Lawler, Mark;Liu, Qinwei;McClure, Carol;Mehmood, Asif;Mitchell, Helen;Morrison, David S.;Murray, Deirdre;Norwood, Todd;Phillips, Karen A.M.;Ransom, David;Shack, Lorraine;Smits, Stephanie;Saint-Jacques, Nathalie;Marvelde, Luc te;Tran, David;Turner, Donna;Ursin, Giske;Vernon, Sally;Walker, Meghan J.;Woods, Ryan R.;Zhang, Bin;Bray, Freddie;Soerjomataram, Isabelle
Publication date	2026-06-01
Original Citation	Morgan, E, Bardot, A, Langselius, O, Rutherford, M J, Elkader, H A, Bennett, D, Brennan, A, Bucher, O, Butler, J, Cameron, D A, Canfell, K, Chiam, K, Chiarelli, A, Creighton, N, De, P, Evans, S, Fitzpatrick, D, Guren, M G, Hannah, J, Huws, D W, Jackson, C G C A, Kønig, S M, Kumar, E, Larønningen, S, Lawler, M, Liu, Q, McClure, C, Mehmood, A, Mitchell, H, Morrison, D S, Murray, D, Norwood, T, Phillips, K A M, Ransom, D, Shack, L, Smits, S, Saint-Jacques, N, Marvelde, L T, Tran, D, Turner, D, Ursin, G, Vernon, S, Walker, M J, Woods, R R, Zhang, B, Bray, F & Soerjomataram, I 2026, 'International disruptions to cancer diagnosis and stage at presentation during the COVID-19 pandemic in 2020: an International Cancer Benchmarking Partnership (ICBP) population-based study', The Lancet Oncology, vol. 27, no. 6, pp. 738-750. https://doi.org/10.1016/S1470-2045(26)00089-6
Type of publication	Article (peer-reviewed)
Link to publisher's version	https://www.scopus.com/pages/publications/105040530684 - 10.1016/S1470-2045(26)00089-6

Rights	© 2026 World Health Organization. Published by Elsevier Ltd. This is an Open Access article published under the CC BY-NC-ND 3.0 IGO license which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. In any use of this article, there should be no suggestion that WHO endorses any specific organisation, products or services. The use of the WHO logo is not permitted. This notice should be preserved along with the article's original URL. - https://creativecommons.org/licenses/by-nc-nd/4.0/
Download date	2026-11-06 20:01:16
Item downloaded from	https://hdl.handle.net/10468/19559



THE LANCET
Oncology

Supplementary appendix

This appendix formed part of the original submission and has been peer reviewed. We post it as supplied by the authors.

Supplement to: Morgan E, Bardot A, Langselius O, et al. International disruptions to cancer diagnosis and stage at presentation during the COVID-19 pandemic in 2020: an International Cancer Benchmarking Partnership (ICBP) population-based study. *Lancet Oncol* 2026; **27:** 738–50.

Supplementary Material

Table of Contents

ICBP Investigators and corresponding jurisdiction/ institution 2

Table S1: New cases included in analysis and quality indicators, 2015-2020, by cancer site and jurisdiction 5

Table S2: Number of new cases diagnosed and age-standardised rates (per 100,000) during April to December in 2020 (predicted and observed), and percentage change in observed cases compared to predicted cases in 2020, by cancer site and jurisdiction 10

Table S3: Number of new cases (predicted and diagnosed) during April to December in 2015-2019 (average) and 2020, and percentage change in cases diagnosed 2020 compared to predicted for each cancer site and jurisdiction, by age group 14

Table S4: Societal lockdowns and pauses in cancer screening services due to Covid-19, 2020*** 23

Table S5: Sensitivity analysis comparing predicted number of cases in 2020 estimated using 1) original approach, 2) Model 1 (using cases in 2019 to predict 2020 cases) and 3) Model 2 (using age-specific annual percentage change rates during 2015-2019. 26

Figure S1. Data collection and harmonization for ICBP COVID-19 commissioned project. 27

Figure S2. Distribution of basis of diagnosis by month of diagnosis and jurisdiction, 2019-2020. 28

Figure S3: Observed and predicted incidence rates (age-standardised) by month of diagnosis by cancer site and jurisdiction. Observed cases (solid line) and predicted cases for the same period based on previous five years (dotted line). Blue shading represents first four months of restrictions 35

Figure S4: Observed and predicted incidence new cases by month of diagnosis by cancer site and country in 2020. Observed cases (solid line) and predicted cases based on previous five years (dotted line). Blue shading represents first four months of restrictions. 42

Figure S5: Observed and predicted new cases by month of diagnosis by cancer site and jurisdiction in 2020. Observed cases (solid line) and predicted cases (dotted line) based on previous five years (2015-2019). Blue shading represents first four months of restrictions. 49

Figure S6: Stage distribution of mapped SEER during April to December in 2020 compared to 2018-2019, by cancer and country 50

ICBP Investigators and corresponding jurisdiction/ institution

Alexa Bishop, Cancer Research UK

Aline Brennan, Ireland

Angela Eckstrand, Canada, Alberta

Anna Chiarelli, Canada, Ontario

Asif Mehmood, Canada, New Brunswick

Aude Bardot, IARC

Bin Zhang, Canada, New Brunswick

Bogdan Pylypenko, Canada, Ontario

Carol McClure, Canada, Prince Edward Island

Christian Finley, Canada, Ontario

Christopher Jackson, New Zealand

Connie Marano, Canada, Ontario

Damien Bennett, UK, Northern Ireland

David Ransom, Australia, Western

David Morrison, UK, Scotland

David Cameron, UK, Scotland

David Tran, Canada, Saskatchewan

Deirdre Murray, Ireland

Deirdre Fitzpatrick, UK, Northern Ireland

Diana Sarfati, New Zealand

Donna Turner, Canada, Manitoba

Duha Gheasuddin, Cancer Research UK

Dyfed Huws, UK, Wales

Eileen Morgan, IARC

Elinor Millar, New Zealand

Eshwar Kumar, Canada, New Brunswick

Freddie Bray, IARC

Giske Ursin, Norway

Grace Liu, Canada, Ontario

Grant McArthur, Australia, Victoria

Greig Stanners, UK, Scotland

Grethe Breie, Norway

Hamza Cakan, Australia, Western

Harriet Hall, Cancer Research UK

Hazem Abd Elkader, New Zealand

Isabelle Soerjomataram, IARC

Jack Hannah, UK, Scotland

Janice Kwon, Canada, British Columbia

Jessica Gugusheff, Australia, New South Wales

John Butler, Cancer Research UK

Jon Kirknes, Norway

Karen Phillips, Canada, Prince Edward Island

Kate Gregory, New Zealand

Kate Green, Cancer Research UK

Kate X. Fleming, UK, England

Kerry Pearson, Cancer Research UK

Kris Ivanova, Australia, Victoria

Laci Davies, Canada, Saskatchewan

Laura Woodings, Australia, Victoria

Leon May, UK, Wales

Lina Steinrud Mørch , Denmark

Lorraine Shack, Canada, Alberta

Luc te Marvelde, Australia, Victoria

Marianne Luettschwager, Canada, Ontario

Marianne Grønlie Guren, Norway

Mark Lawler, UK, Northern Ireland

Mark Rutherford, IARC

Mary Jane King, Canada, Ontario

Maryjane Nweje, Cancer Research UK

Meghan Walker, Canada, Ontario

Micheal MacAskill, New Zealand

Michelle Liu, New Zealand

Nathalie St-Jacques, Canada, Nova Scotia

Nicola Creighton, Australia, New South Wales

Nicole Stanton, New Zealand

Oliver Bucher, Canada, Manitoba

Oliver Langselius, IARC

Paul Cranston, Cancer Research UK

Paula Tierney, Ireland

Prithwish De, Canada, Ontario

Qinwei Liu, New Zealand

Rami Rahal, New Zealand

Raymond Asamoah-Barnieh, Canada, Alberta

Richard Walton, Australia, New South Wales

Ron A. Dewar, Canada, Nova Scotia

Ryan Woods, Canada, British Columbia

Sally Vernon, UK, England

Samantha Harrison, Cancer Research UK

Serena Kozie, Canada, Saskatchewan

Shruthi Poojala, New Zealand

Simon Kønig, Denmark

Siri Larønningen, Norway

Stephanie Smits, UK, Wales

Sue Evans, Australia, Victoria

Tala Barakat, Australia, New South Wales

Todd Norwood, Canada, Ontario

Tom Ferguson, Australia, Western

Tom Børge Johannesen, Norway

Xiaoyi Tian, Canada, Alberta

Table S1: New cases included in analysis and quality indicators, 2015-2020, by cancer site and jurisdiction

Cancer Site/Country	2015-2019						2020					
	Cases	DCO[1]/Autopsy only (%)	MV[2] (%)	Quality control[3]	Multiple cancers	Ineligible age[4]	Cases	DCO[1]/Autopsy only (%)	MV[2] (%)	Quality control[3]	Multiple cancers	Ineligible age[4]
Colon (C18)												
Australia, New South Wales	17,551	0.8	94.8	0	48	208	3,200	0.9	93.7	0	6	37
Australia, Victoria	13,209	2.9	93.1	0	37	141	2,542	2.8	92.1	0	9	35
Australia, Western Australia	4,537	1.9	93.0	71	8	53	814	4.4	91.8	9	5	15
Canada, Alberta	6,943	0.3	95.2	<5	311	52	1,257	0.2	94.4	0	37	9
Canada, British Columbia	10,431	1.0	93.3	0	0	44	1,866	0.6	93.5	0	0	13
Canada, Manitoba	2,804	0.1	94.2	0	149	17	485	0.4	94.8	0	20	<5
Canada, New Brunswick	2,059	0.4	93.5	0	81	5	346	0.6	93.9	0	17	<5
Canada, Ontario	29,802	1.8	93.5	<5	2,050	199	5,554	1.9	93.2	0	371	36
Canada, Prince Edward Island	398	2.3	90.5	0	14	<5	60	1.7	90.0	0	<5	0
Canada, Saskatchewan	2,446	0.4	95.1	0	132	12	408	0.2	95.1	0	19	<5
Denmark	18,059	1.1	96.6	15	349	58	3,205	1.9	96.3	8	73	25
Ireland	9,280	0.8	93.9	0	340	126	1,556	0.7	92.7	0	48	17
New Zealand	10,613	0.7	91.8	<5	30	99	2,285	0.7	92.0	0	9	34
Norway	16,250	1.3	95.3	0	875	98	3,357	1.8	95.1	0	185	19
UK, England	121,585	1.4	84.8	153	2,670	373	23,865	2.9	81.4	10	557	22
UK, Northern Ireland	3,973	0.3	86.5	<5	117	<5	751	0.5	84.7	<5	28	<5
UK, Scotland	13,631	0.2	84.0	<5	502	56	2,420	0.5	77.6	0	77	12
UK, Wales	7,967	0.8	84.9	<5	222	49	1,495	0.6	81.5	0	36	6
Rectum (C19-20)												
Australia, New South Wales	8,035	0.9	96.0	0	9	9	1,616	1.4	93.6	0	<5	<5
Australia, Victoria	6,426	0.7	96.3	0	<5	5	1,095	0.6	96.7	0	<5	<5
Australia, Western Australia	2,203	0.8	96.4	15	<5	7	392	1.5	96.7	<5	0	<5
Canada, Alberta	3,347	0.2	97.9	0	48	<5	560	0.0	97.5	0	9	<5
Canada, British Columbia	5,165	0.6	97.0	0	0	5	865	0.3	96.3	0	0	<5
Canada, Manitoba	1,431	0.0	97.9	0	22	5	271	0.4	95.6	0	<5	0
Canada, New Brunswick	981	0.1	96.8	0	13	<5	198	0.5	97.0	0	<5	0
Canada, Ontario	13,716	1.8	94.8	<5	658	32	2,510	2.0	93.5	0	54	7

Canada, Prince Edward Island	191	1.0	96.9	0	<5	0	25	0.0	96.0	0	<5	<5
Canada, Saskatchewan	1,175	0.4	97.2	0	19	<5	186	0.0	97.8	0	0	0
Denmark	8,037	0.4	98.5	17	<5	5	1,340	1.3	99.1	8	0	<5
Ireland	4,448	0.7	96.4	0	15	<5	758	1.1	94.5	0	5	<5
New Zealand	5,214	0.3	96.1	0	5	6	1,133	0.4	96.4	0	<5	<5
Norway	6,822	0.5	98.1	0	43	5	1,406	0.6	98.5	0	13	<5
UK, England	58,850	1.0	93.5	43	87	49	10,768	2.1	91.0	<5	24	10
UK, Northern Ireland	1,884	0.4	93.2	<5	8	<5	350	1.7	92.6	0	0	0
UK, Scotland	5,929	0.3	91.5	0	27	8	946	0.2	89.1	0	6	0
UK, Wales	4,002	0.4	92.9	0	13	<5	653	0.8	89.7	0	0	0
Trachea, bronchus and lung (C33-34)												
Australia, New South Wales	20,630	2.7	86.2	0	106	16	4,310	3.0	85.6	0	24	<5
Australia, Victoria	15,475	3.8	84.9	0	137	19	3,326	3.3	84.5	0	32	<5
Australia, Western Australia	6,151	3.6	85.1	301	58	9	1,169	9.5	81.5	60	23	<5
Canada, Alberta	11,873	0.2	83.1	<5	650	6	2,393	0.3	81.4	0	146	<5
Canada, British Columbia	17,764	0.8	79.3	<5	0	14	3,469	0.4	79.0	<5	0	<5
Canada, Manitoba	4,642	0.1	76.8	0	257	<5	961	0.5	77.6	0	44	0
Canada, New Brunswick	4,168	0.3	82.0	0	196	<5	822	0.1	82.2	0	67	0
Canada, Ontario	50,843	2.8	85.1	0	2,775	23	9,785	2.8	82.5	0	536	9
Canada, Prince Edward Island	747	1.2	70.3	0	32	<5	151	2.0	77.5	0	5	0
Canada, Saskatchewan	3,973	0.8	79.8	0	136	<5	696	0.4	81.5	0	29	<5
Denmark	24,310	2.8	93.4	15	106	11	5,125	3.4	92.9	11	35	5
Ireland	13,594	0.8	83.0	0	467	11	2,661	0.6	80.8	0	99	<5
New Zealand	11,651	1.8	77.1	<5	74	9	2,520	2.0	77.3	0	19	<5
Norway	16,710	2.7	86.6	5	490	11	3,430	2.4	86.2	0	87	<5
UK, England	198,637	2.1	69.3	1,091	3,277	94	37,768	3.8	64.0	176	853	17
UK, Northern Ireland	6,747	0.5	67.2	35	59	<5	1,321	0.6	62.6	15	14	0
UK, Scotland	26,913	0.4	62.4	106	962	8	5,089	0.6	57.7	13	243	<5
UK, Wales	12,662	1.2	69.0	10	308	<5	2,313	0.6	62.8	<5	62	<5
Melanoma of Skin (C43)												
Australia, New South Wales	24,357	0.1	99.2	0	<5	244	4,924	0.1	99.1	0	<5	42

Australia, Victoria	14,492	0.1	99.5	0	0	104	2,596	0.2	99.6	0	0	17
Australia, Western Australia	7,491	0.2	99.4	113	17	59	1,368	0.6	99.1	30	<5	11
Canada, Alberta	4,152	0.0	100.0	0	285	35	791	0.0	100.0	0	70	8
Canada, British Columbia	6,026	0.2	99.2	0	0	37	1,145	0.1	99.7	0	0	6
Canada, Manitoba	1,369	0.0	99.9	0	80	8	271	0.0	100.0	0	26	<5
Canada, New Brunswick	1,095	0.0	99.9	0	75	8	190	0.0	100.0	0	14	0
Canada, Ontario	19,457	0.2	98.9	0	1,922	151	3,727	0.2	98.2	0	847	18
Canada, Prince Edward Island	321	0.3	99.4	0	16	0	50	0.0	100.0	0	<5	<5
Canada, Saskatchewan	1,038	0.1	99.8	0	75	7	252	0.4	99.2	0	22	<5
Denmark	13,073	0.2	99.9	18	0	187	2,716	0.4	99.9	<5	0	20
Ireland	6,131	0.1	99.8	0	361	72	1,246	0.1	99.7	0	92	9
New Zealand	13,042	0.1	99.7	0	17	69	2,632	0.1	99.7	0	5	11
Norway	12,245	0.0	100.0	0	814	115	2,655	0.0	100.0	0	209	31
UK, England	71,823	0.1	99.4	1,166	1,956	711	12,481	0.3	99.3	103	486	114
UK, Northern Ireland	2,028	0.0	99.8	10	40	37	339	0.3	98.8	16	7	5
UK, Scotland	7,018	0.0	99.8	83	459	89	1,197	0.0	99.9	13	77	17
UK, Wales	4,493	0.0	99.3	<5	210	33	757	0.4	99.1	0	38	7
Breast (C50)												
Australia, New South Wales	29,064	0.5	98.8	0	11	17	5,816	0.6	98.7	0	<5	<5
Australia, Victoria	22,629	0.8	98.4	0	32	15	4,379	0.4	98.9	0	7	<5
Australia, Western Australia	8,949	0.4	98.9	19	22	8	1,854	0.8	99.0	5	<5	<5
Canada, Alberta	14,615	0.1	99.3	<5	1,024	18	2,875	0.1	99.3	0	227	<5
Canada, British Columbia	19,064	0.5	98.6	<5	0	8	3,758	0.5	98.7	0	0	<5
Canada, Manitoba	4,650	0.1	99.0	0	284	<5	912	0.1	99.2	0	61	0
Canada, New Brunswick	3,150	0.4	97.9	0	182	<5	598	0.8	98.7	0	41	0
Canada, Ontario	56,927	0.6	98.3	<5	4,653	55	10,445	0.6	98.4	0	1,038	7
Canada, Prince Edward Island	602	0.0	98.7	0	38	0	113	0.0	100.0	0	<5	0
Canada, Saskatchewan	3,889	0.5	98.4	<5	239	0	729	0.3	98.6	0	48	<5
Denmark	24,782	0.4	99.6	32	306	27	4,895	0.4	99.8	23	65	<5
Ireland	17,992	0.2	99.2	0	1,018	8	3,172	0.2	98.9	0	210	0
New Zealand	16,936	0.4	98.7	0	7	19	3,439	0.3	99.0	<5	<5	<5
Norway	19,336	0.4	99.4	0	1,170	19	3,825	0.6	99.3	0	270	5

UK, England	234,030	0.4	98.4	3,256	9,121	152	40,030	0.9	97.5	316	1,940	35
UK, Northern Ireland	7,394	0.2	99.0	5	447	5	1,355	0.7	98.5	14	75	0
UK, Scotland	24,051	0.1	98.3	<5	1433	14	4,319	0.3	98.0	0	264	0
UK, Wales	14,007	0.5	97.9	<5	822	6	2,323	0.3	97.5	0	159	<5
Ovary (C48.1-2, C56, C57.0)												
Australia, New South Wales	2,810	1.6	92.3	0	<5	57	577	1.6	92.4	0	<5	12
Australia, Victoria	2,022	2.7	91.3	0	<5	44	393	3.3	89.1	0	0	9
Australia, Western Australia	689	2.8	89.7	41	<5	13	107	0.9	92.5	<5	0	<5
Canada, Alberta	1,379	0.2	94.1	<5	10	27	275	0.4	94.2	0	<5	9
Canada, British Columbia	2,064	0.8	92.4	0	0	27	459	0.2	95.2	0	0	<5
Canada, Manitoba	447	0.0	91.7	0	<5	5	101	0.0	95.0	0	0	<5
Canada, New Brunswick	308	0.0	90.9	0	<5	<5	68	0.0	88.2	0	0	0
Canada, Ontario	6,549	1.3	90.7	0	304	93	1,325	1.3	89.9	0	42	20
Canada, Prince Edward Island	70	1.4	91.4	0	0	<5	18	0.0	88.9	0	0	0
Canada, Saskatchewan	395	0.5	89.1	0	<5	7	64	0.0	98.4	0	<5	0
Denmark	2,858	1.5	97.8	10	39	32	591	3.9	97.0	<5	<5	9
Ireland	2,126	1.4	91.0	0	7	20	487	0.6	91.0	0	5	<5
New Zealand	1,575	1.0	91.2	0	<5	33	328	1.2	93.0	0	0	8
Norway	2,429	1.4	95.0	0	12	22	387	2.1	94.3	0	<5	7
UK, England	28,452	1.9	88.7	724	121	334	5,373	4.0	87.2	110	20	60
UK, Northern Ireland	909	0.2	90.1	7	8	8	146	0.7	88.4	5	0	<5
UK, Scotland	2,832	0.2	87.7	39	10	28	539	0.4	86.6	9	0	5
UK, Wales	1,635	1.5	85.7	<5	<5	13	304	1.3	84.9	0	<5	<5
Prostate (C61)												
Australia, New South Wales	33,846	0.8	96.6	0	<5	<5	7,634	0.8	96.9	0	0	0
Australia, Victoria	25,885	1.3	95.8	0	<5	0	5,462	1.0	96.3	0	0	0
Australia, Western Australia	10,595	0.8	96.3	45	<5	0	2,466	1.4	98.1	6	0	0
Canada, Alberta	12,624	0.1	92.9	0	20	<5	2,467	0.1	90.3	0	7	0
Canada, British Columbia	16,146	0.5	92.9	7	0	<5	3,301	0.4	95.2	0	0	0
Canada, Manitoba	3,947	0.2	94.0	0	8	0	925	0.5	95.2	0	<5	0
Canada, New Brunswick	2,817	0.1	96.1	0	0	0	606	0.0	96.2	0	0	<5

Canada, Ontario	43,622	0.6	96.6	0	20	<5	7,501	0.7	95.1	<5	7	0
Canada, Prince Edward Island	530	3.2	95.1	0	<5	0	114	0.9	93.9	0	0	0
Canada, Saskatchewan	3,522	0.6	91.7	<5	8	0	694	0.4	92.5	0	<5	0
Denmark	22,877	0.5	97.6	44	<5	0	4,490	0.5	97.1	14	0	0
Ireland	18,624	0.4	94.5	0	8	<5	3,748	0.3	94.2	0	<5	<5
New Zealand	18,921	1.4	93.5	0	16	<5	4,002	1.0	94.1	0	5	0
Norway	25,592	1.2	94.9	0	<5	7	5,109	1.0	94.4	0	0	<5
UK, England	225,080	0.7	85.2	35	15	6	36,628	1.6	82.3	<5	7	<5
UK, Northern Ireland	6,219	0.3	84.6	<5	<5	0	1,224	0.9	83.8	14	0	<5
UK, Scotland	19,031	0.1	81.3	0	<5	0	3,502	0.2	79.7	0	0	0
UK, Wales	14,564	0.7	86.4	0	<5	<5	2,261	0.9	82.6	0	0	0

[1] DCO = Death Certificate Only cases

[2] MV = Proportion of Morphologically verified cases

[3] Quality Control: These cases were excluded because of missing values or inconsistencies among or between the following variables: dates, basis of diagnosis, vital status, topography, morphology, behavior, sex and age.

[4] Age <25 years

2

Table S2: Number of new cases diagnosed and age-standardised rates (per 100,000) during April to December in 2020 (predicted and observed), and percentage change in observed cases compared to predicted cases in 2020, by cancer site and jurisdiction

	2020 predicted		2020 observed		Perc. change in predicted vs. observed cases 2020			Missed cases (April-Dec)
Cancer type (ICD-10)/jurisdiction	**Cases**	**ASR**	**Cases**	**ASR**	**April-July**	**Aug-Dec**	**April-December**	
Colon (C18)								
Australia,NSW	2699	41.01	2403	36.94	-17	-6	-11	296
Australia,Victoria	2007	39.09	1901	36.59	-12	0	-5	106
Australia,Western	683	34.05	603	30.36	-30	3	-12	80
Canada,Alberta	1009	32.50	919	29.42	-17	-2	-9	90
Canada,BC	1558	31.46	1378	29.35	-19	-5	-12	180
Canada,Manitoba	458	41.31	365	33.34	-34	-10	-20	93
Canada,NBR	321	37.60	258	33.66	-24	-16	-20	63
Canada,Ontario	4330	34.16	4064	31.96	-21	6	-6	266
Canada,PEI	73	45.57	48	33.42	-49	-21	-35	25
Canada,Saskatchewan	349	37.07	305	30.97	-27	0	-13	44
Denmark	2412	42.09	2422	42.59	-7	6	0	-10
Ireland	1371	37.01	1131	30.16	-34	-4	-18	240
New Zealand	1698	41.82	1683	42.21	-4	1	-1	15
Norway	2426	49.90	2513	51.03	3	4	4	-87
UK,England	19690	37.87	17266	33.06	-29	1	-12	2424
UK,N.Ireland	624	37.60	525	31.80	-23	-11	-16	99
UK,Scotland	2289	44.24	1735	32.38	-31	-19	-24	554
UK,Wales	1327	41.46	1062	33.71	-29	-13	-20	265
Rectum (C19-20)								
Australia,NSW	1245	21.79	1215	21.67	-9	3	-2	30
Australia,Victoria	985	22.19	797	18.14	-26	-13	-19	188
Australia,Western	344	19.35	308	16.92	-18	-5	-11	36
Canada,Alberta	446	15.72	408	14.09	-18	-1	-8	38
Canada,BC	706	16.75	605	14.50	-35	4	-14	101
Canada,Manitoba	196	20.04	203	21.11	-8	14	4	-7
Canada,NBR	157	21.64	146	22.13	-5	-8	-7	11
Canada,Ontario	2161	19.23	1799	16.06	-30	-6	-17	362
Canada,PEI	28	23.45	16	15.20	-73	-24	-43	12
Canada,Saskatchewan	172	19.85	135	16.19	-31	-14	-21	37
Denmark	1062	20.88	1003	19.53	-14	1	-6	59
Ireland	692	20.49	548	16.27	-32	-12	-21	144
New Zealand	908	25.58	841	23.72	-10	-6	-7	67
Norway	982	22.95	1066	24.76	-7	21	9	-84
UK,England	9444	20.60	7669	16.73	-39	-3	-19	1775
UK,N.Ireland	324	23.22	271	18.81	-26	-9	-16	53
UK,Scotland	941	19.99	661	13.64	-42	-20	-30	280
UK,Wales	638	22.20	466	16.88	-40	-16	-27	172

Trachea, bronchus and lung (C33-34)								
Australia,NSW	3314	50.39	3251	48.89	-3	-1	-2	63
Australia,Victoria	2625	49.45	2457	46.31	-7	-6	-6	168
Australia,Western	1015	47.98	847	39.39	-12	-20	-17	168
Canada,Alberta	1877	57.17	1786	53.96	-11	0	-5	91
Canada,BC	2924	56.46	2544	49.06	-15	-12	-13	380
Canada,Manitoba	752	63.84	718	62.93	-2	-7	-5	34
Canada,NBR	612	70.76	614	72.22	-5	5	0	-2
Canada,Ontario	7802	59.03	7111	53.93	-16	-3	-9	691
Canada,PEI	118	71.68	114	71.91	2	-8	-4	4
Canada,Saskatchewan	616	59.81	503	51.02	-24	-14	-18	113
Denmark	3791	68.33	3804	68.88	-3	3	0	-13
Ireland	2206	59.87	1928	52.83	-12	-13	-13	278
New Zealand	1832	46.15	1877	46.61	-1	5	2	-45
Norway	2597	54.52	2501	52.09	-10	2	-4	96
UK,England	30745	57.90	27716	52.02	-19	-3	-10	3029
UK,N.Ireland	1063	64.89	956	58.22	-12	-8	-10	107
UK,Scotland	4081	75.08	3720	68.67	-20	0	-9	361
UK,Wales	1913	56.53	1637	49.91	-18	-12	-14	276
Melanoma of Skin (C43)								
Australia,NSW	3809	67.08	3507	60.97	-20	1	-8	302
Australia,Victoria	2088	46.19	1781	39.47	-22	-9	-15	307
Australia,Western	1132	62.32	950	52.15	-19	-14	-16	182
Canada,Alberta	835	29.57	574	19.97	-44	-20	-31	261
Canada,BC	1073	25.21	829	19.87	-40	-8	-23	244
Canada,Manitoba	239	25.20	209	21.70	-13	-12	-12	30
Canada,NBR	182	26.39	145	22.00	-16	-24	-20	37
Canada,Ontario	3400	29.91	2739	24.24	-36	-6	-19	661
Canada,PEI	50	38.78	37	29.34	-61	3	-26	13
Canada,Saskatchewan	177	21.66	190	22.55	-14	27	7	-13
Denmark	2247	54.96	2117	52.16	-6	-5	-6	130
Ireland	1025	31.18	922	27.67	-25	2	-10	103
New Zealand	2076	58.52	1853	52.14	-19	-5	-11	223
Norway	2060	51.99	2022	50.58	-10	5	-2	38
UK,England	12035	29.78	8915	21.97	-40	-15	-26	3120
UK,N.Ireland	318	25.81	213	17.04	-40	-28	-33	105
UK,Scotland	1178	28.23	842	21.54	-42	-18	-29	336
UK,Wales	803	33.05	545	23.50	-45	-22	-32	258
Breast (C50)								
Australia,NSW	4626	177.94	4250	163.33	-20	1	-8	376
Australia,Victoria	3629	173.04	3209	154.94	-26	0	-12	420
Australia,Western	1484	175.22	1368	158.13	-13	-3	-8	116
Canada,Alberta	2510	183.04	2110	150.65	-34	-1	-16	400
Canada,BC	3269	166.75	2748	142.71	-27	-6	-16	521
Canada,Manitoba	798	164.91	665	145.50	-31	-5	-17	133
Canada,NBR	419	126.18	444	137.92	-18	25	6	-25

Canada,Ontario	9215	172.89	7470	142.45	-36	-5	-19	1745
Canada,PEI	98	155.51	85	135.14	-34	4	-14	13
Canada,Saskatchewan	645	161.54	503	123.76	-33	-13	-22	142
Denmark	3954	183.55	3745	174.31	-14	1	-5	209
Ireland	2927	189.76	2207	139.29	-34	-17	-25	720
New Zealand	2709	171.33	2604	165.86	-19	8	-4	105
Norway	3088	174.46	2758	154.38	-24	-1	-11	330
UK,England	36836	184.18	28414	142.77	-41	-8	-23	8422
UK,N.Ireland	1118	173.29	995	153.70	-30	4	-11	123
UK,Scotland	3684	178.22	3062	151.67	-34	-3	-17	622
UK,Wales	2090	172.27	1631	135.40	-37	-9	-22	459
Ovary (C48.1-2, C56, C57.0)								
Australia,NSW	411	13.89	416	14.65	2	1	1	-5
Australia,Victoria	287	12.67	289	12.56	2	0	1	-2
Australia,Western	75	8.17	77	8.46	6	-1	2	-2
Canada,Alberta	228	16.21	205	14.63	-12	-9	-10	23
Canada,BC	291	13.58	347	16.75	15	23	19	-56
Canada,Manitoba	63	13.09	73	15.23	1	30	16	-10
Canada,NBR	59	15.99	48	12.27	-5	-28	-19	11
Canada,Ontario	977	18.02	945	17.71	-14	6	-3	32
Canada,PEI	12	19.83	12	16.75	-66	59	-2	0
Canada,Saskatchewan	49	11.39	50	12.36	13	-4	3	-1
Denmark	402	16.63	440	18.40	14	6	9	-38
Ireland	296	17.90	362	22.51	15	29	22	-66
New Zealand	221	12.69	243	14.36	12	8	10	-22
Norway	320	16.46	267	13.62	-16	-17	-17	53
UK,England	4337	19.19	3933	16.88	-18	-2	-9	404
UK,N.Ireland	133	17.84	103	13.85	-32	-14	-22	30
UK,Scotland	398	16.79	402	17.12	-7	8	1	-4
UK,Wales	227	16.27	221	15.55	-12	4	-3	6
Prostate (C61)								
Australia,NSW	5420	182.80	5776	194.12	2	10	7	-356
Australia,Victoria	5062	221.07	3835	167.96	-25	-24	-24	1227
Australia,Western	1941	205.93	1869	200.27	-9	0	-4	72
Canada,Alberta	2160	148.85	1843	126.58	-30	-2	-15	317
Canada,BC	2876	126.84	2436	107.43	-21	-10	-15	440
Canada,Manitoba	784	149.54	695	132.14	0	-20	-11	89
Canada,NBR	510	139.43	424	116.81	-32	-5	-17	86
Canada,Ontario	6591	112.34	5371	90.61	-37	-3	-19	1220
Canada,PEI	85	119.34	82	117.00	17	-17	-3	3
Canada,Saskatchewan	553	124.51	512	111.78	-34	16	-7	41
Denmark	3370	129.68	3317	125.31	-15	8	-2	53
Ireland	3269	205.74	2684	169.01	-36	-4	-18	585
New Zealand	3556	204.78	3117	179.20	-18	-8	-12	439
Norway	3550	164.13	3663	168.40	-5	10	3	-113
UK,England	38181	165.19	23815	101.19	-56	-22	-38	14366
UK,N.Ireland	1102	149.79	884	120.20	-26	-15	-20	218

UK,Scotland	3110	127.98	2336	95.52	-41	-13	-25	774
UK,Wales	2390	167.48	1381	95.22	-55	-32	-42	1009

Table S3: Number of new cases (predicted and diagnosed) during April to December in 2015-2019 (average) and 2020, and percentage change in cases diagnosed 2020 compared to predicted for each cancer site and jurisdiction, by age group

	Age Group	2015-2019 cases	2020 predicted cases	2020 observed cases	Perc. change in cases predicted vs. observed cases 2020		Missed cases
			April-December		April-July	April-December	April-December
Colon (C18)							
Australia,NSW	<75 years	1498	1534	1379	-15	-10	155
	+75 years	1133	1157	1024	-19	-12	133
Australia,Victoria	<75 years	1115	1168	1093	-14	-7	75
	+75 years	873	826	808	-9	-2	18
Australia,Western	<75 years	426	427	363	-33	-15	64
	+75 years	268	253	240	-23	-5	13
Canada,Alberta	<75 years	672	663	565	-25	-15	98
	+75 years	355	344	354	-3	3	-10
Canada,BC	<75 years	903	847	795	-16	-6	52
	+75 years	665	720	583	-24	-19	137
Canada,Manitoba	<75 years	251	279	219	-35	-21	60
	+75 years	172	179	146	-31	-18	33
Canada,NBR	<75 years	176	171	148	-28	-14	23
	+75 years	130	150	110	-20	-27	40
Canada,Ontario	<75 years	2602	2562	2310	-24	-10	252
	+75 years	1862	1755	1754	-17	0	1
Canada,PEI	<75 years	36	42	26	-51	-39	16
	+75 years	24	31	22	-44	-28	9
Canada,Saskatchewan	<75 years	210	211	173	-34	-18	38
	+75 years	160	137	132	-14	-4	5
Denmark	<75 years	1609	1303	1279	-8	-2	24

	+75 years	1081	1124	1143	-6	2	-19
Ireland	<75 years	791	763	600	-35	-21	163
	+75 years	573	597	498	-35	-17	99
New Zealand	<75 years	845	931	933	-2	0	-2
	+75 years	752	757	750	-5	-1	7
Norway	<75 years	1301	1297	1266	-4	-2	31
	+75 years	1131	1128	1247	11	11	-119
UK,England	<75 years	9592	10434	8952	-32	-14	1482
	+75 years	8789	9200	8314	-26	-10	886
UK,N.Ireland	<75 years	327	334	282	-18	-16	52
	+75 years	275	291	243	-29	-16	48
UK,Scotland	<75 years	1141	1310	894	-39	-32	416
	+75 years	928	963	841	-18	-13	122
UK,Wales	<75 years	636	697	565	-27	-19	132
	+75 years	560	626	497	-31	-21	129
Rectum (C19-20)							
Australia,NSW	<75 years	860	893	875	-9	-2	18
	+75 years	359	348	340	-7	-2	8
Australia,Victoria	<75 years	691	716	595	-25	-17	121
	+75 years	284	264	202	-29	-24	62
Australia,Western	<75 years	252	266	225	-23	-15	41
	+75 years	86	76	83	6	9	-7
Canada,Alberta	<75 years	381	348	297	-24	-15	51
	+75 years	114	94	111	4	18	-17
Canada,BC	<75 years	556	517	429	-42	-17	88
	+75 years	212	188	176	-16	-6	12
Canada,Manitoba	<75 years	154	144	147	-11	2	-3
	+75 years	59	51	56	-2	10	-5
Canada,NBR	<75 years	107	110	106	-3	-4	4
	+75 years	40	48	40	-16	-16	8

Canada,Ontario	<75 years	1460	1531	1244	-33	-19	287
	+75 years	602	623	555	-22	-11	68
Canada,PEI	<75 years	22	21	16	-63	-23	5
	+75 years	8	7	0	0	0	0
Canada,Saskatchewan	<75 years	123	122	101	-27	-17	21
	+75 years	50	48	34	-39	-30	14
Denmark	<75 years	813	677	633	-17	-7	44
	+75 years	381	386	370	-10	-4	16
Ireland	<75 years	468	472	372	-29	-21	100
	+75 years	192	221	162	-41	-27	59
New Zealand	<75 years	563	654	588	-14	-10	66
	+75 years	236	247	253	3	2	-6
Norway	<75 years	680	652	687	-6	5	-35
	+75 years	332	329	379	-7	15	-50
UK,England	<75 years	5610	6099	4898	-40	-20	1201
	+75 years	3245	3288	2771	-35	-16	517
UK,N.Ireland	<75 years	185	228	176	-36	-23	52
	+75 years	98	94	95	5	1	-1
UK,Scotland	<75 years	585	618	411	-44	-34	207
	+75 years	317	315	250	-36	-21	65
UK,Wales	<75 years	374	407	313	-40	-23	94
	+75 years	229	226	153	-39	-32	73
Trachea, bronchus and lung (C33-34)							
Australia,NSW	<75 years	1885	2068	1951	-6	-6	117
	+75 years	1176	1238	1300	3	5	-62
Australia,Victoria	<75 years	1395	1543	1426	-7	-8	117
	+75 years	955	1084	1031	-8	-5	53
Australia,Western	<75 years	568	615	496	-8	-19	119
	+75 years	368	399	351	-18	-12	48
Canada,Alberta	<75 years	1099	1115	1060	-9	-5	55

	+75 years	688	771	726	-15	-6	45
Canada,BC	<75 years	1529	1621	1412	-12	-13	209
	+75 years	1155	1306	1132	-17	-13	174
Canada,Manitoba	<75 years	416	437	448	1	3	-11
	+75 years	284	323	270	-9	-16	53
Canada,NBR	<75 years	401	381	379	-4	-1	2
	+75 years	228	234	235	-8	1	-1
Canada,Ontario	<75 years	4642	4759	4372	-14	-8	387
	+75 years	2980	3044	2739	-19	-10	305
Canada,PEI	<75 years	64	64	72	4	13	-8
	+75 years	46	54	42	2	-22	12
Canada,Saskatchewan	<75 years	347	345	316	-10	-8	29
	+75 years	253	276	187	-41	-32	89
Denmark	<75 years	2398	2312	2341	-2	1	-29
	+75 years	1289	1491	1463	-5	-2	28
Ireland	<75 years	1275	1309	1169	-9	-11	140
	+75 years	741	846	648	-21	-23	198
New Zealand	<75 years	1098	1153	1141	-1	-1	12
	+75 years	670	678	736	-1	9	-58
Norway	<75 years	1567	1560	1512	-10	-3	48
	+75 years	924	1050	989	-12	-6	61
UK,England	<75 years	16435	16515	14784	-18	-11	1731
	+75 years	13567	14288	12932	-20	-10	1356
UK,N.Ireland	<75 years	601	612	536	-13	-12	76
	+75 years	425	452	420	-11	-7	32
UK,Scotland	<75 years	2315	2267	2090	-19	-8	177
	+75 years	1779	1825	1630	-22	-11	195
UK,Wales	<75 years	1061	1005	903	-13	-10	102
	+75 years	844	919	734	-24	-20	185

Melanoma of Skin (C43)

Australia,NSW	<75 years	2476	2670	2395	-21	-10	275
	+75 years	1005	1136	1112	-18	-2	24
Australia,Victoria	<75 years	1479	1453	1228	-26	-16	225
	+75 years	590	642	553	-16	-14	89
Australia,Western	<75 years	782	819	680	-18	-17	139
	+75 years	281	312	272	-22	-13	40
Canada,Alberta	<75 years	497	633	419	-47	-34	214
	+75 years	146	201	155	-34	-23	46
Canada,BC	<75 years	637	705	569	-37	-19	136
	+75 years	292	372	260	-46	-30	112
Canada,Manitoba	<75 years	152	177	148	-8	-17	29
	+75 years	61	63	61	-27	-3	2
Canada,NBR	<75 years	125	122	109	-6	-11	13
	+75 years	45	63	36	-38	-43	27
Canada,Ontario	<75 years	2092	2295	1828	-35	-20	467
	+75 years	926	1101	911	-37	-17	190
Canada,PEI	<75 years	36	31	27	-61	-13	4
	+75 years	15	20	10	-67	-50	10
Canada,Saskatchewan	<75 years	122	124	137	-16	10	-13
	+75 years	38	58	53	-19	-8	5
Denmark	<75 years	1576	1646	1576	-2	-4	70
	+75 years	460	610	541	-19	-11	69
Ireland	<75 years	672	688	594	-24	-14	94
	+75 years	266	342	313	-30	-9	29
New Zealand	<75 years	1331	1421	1288	-18	-9	133
	+75 years	584	663	565	-21	-15	98
Norway	<75 years	1333	1396	1374	-7	-2	22
	+75 years	540	683	648	-18	-5	35
UK,England	<75 years	7891	8372	6135	-40	-27	2237
	+75 years	3198	3699	2780	-39	-25	919

UK,N.Ireland	<75 years	233	238	152	-42	-36	86
	+75 years	79	78	61	-33	-22	17
UK,Scotland	<75 years	765	802	603	-36	-25	199
	+75 years	319	388	239	-57	-38	149
UK,Wales	<75 years	477	540	387	-41	-28	153
	+75 years	211	263	158	-53	-40	105
Breast (C50)							
Australia,NSW	<75 years	3582	3766	3434	-22	-9	332
	+75 years	801	865	816	-16	-6	49
Australia,Victoria	<75 years	2794	2977	2631	-27	-12	346
	+75 years	610	654	578	-23	-12	76
Australia,Western	<75 years	1129	1207	1093	-15	-10	114
	+75 years	237	279	275	-11	-2	4
Canada,Alberta	<75 years	1802	2073	1677	-37	-19	396
	+75 years	400	428	433	-21	1	-5
Canada,BC	<75 years	2277	2594	2146	-29	-17	448
	+75 years	606	667	602	-19	-10	65
Canada,Manitoba	<75 years	540	613	517	-36	-16	96
	+75 years	159	186	148	-16	-21	38
Canada,NBR	<75 years	369	314	338	-20	8	-24
	+75 years	113	107	106	-13	-1	1
Canada,Ontario	<75 years	6825	7206	5768	-38	-20	1438
	+75 years	1829	2016	1702	-32	-16	314
Canada,PEI	<75 years	68	67	66	-21	-2	1
	+75 years	23	31	19	-60	-40	12
Canada,Saskatchewan	<75 years	450	493	380	-34	-23	113
	+75 years	140	153	123	-31	-20	30
Denmark	<75 years	2849	2864	2763	-12	-4	101
	+75 years	931	1098	1016	-17	-8	82
Ireland	<75 years	2172	2320	1653	-38	-29	667

	+75 years	509	605	532	-20	-12	73
New Zealand	<75 years	2124	2212	2143	-20	-3	69
	+75 years	470	498	461	-18	-7	37
Norway	<75 years	2281	2430	2117	-31	-13	313
	+75 years	576	664	641	4	-4	23
UK,England	<75 years	26780	27619	20797	-45	-25	6822
	+75 years	8660	9234	7617	-30	-18	1617
UK,N.Ireland	<75 years	858	854	756	-36	-11	98
	+75 years	258	259	239	-9	-8	20
UK,Scotland	<75 years	2768	2833	2288	-39	-19	545
	+75 years	862	840	786	-16	-6	54
UK,Wales	<75 years	1570	1525	1169	-39	-23	356
	+75 years	544	568	462	-35	-19	106
Ovary (C48.1-2, C56, C57.0)							
Australia,NSW	<75 years	288	282	295	8	5	-13
	+75 years	118	132	121	-14	-8	11
Australia,Victoria	<75 years	219	210	198	-9	-6	12
	+75 years	87	76	91	35	19	-15
Australia,Western	<75 years	73	55	56	9	2	-1
	+75 years	29	20	21	-6	4	-1
Canada,Alberta	<75 years	150	181	159	-10	-12	22
	+75 years	42	46	46	-14	-1	0
Canada,BC	<75 years	225	207	248	6	20	-41
	+75 years	78	88	99	29	13	-11
Canada,Manitoba	<75 years	54	44	53	24	20	-9
	+75 years	14	20	20	-42	2	0
Canada,NBR	<75 years	32	43	29	-32	-32	14
	+75 years	13	16	19	73	16	-3
Canada,Ontario	<75 years	744	754	710	-17	-6	44
	+75 years	233	223	235	-2	5	-12

Canada,PEI	<75 years	7	8	9	-70	11	-1
	+75 years	<5	<5	<5	-55	-28	1
Canada,Saskatchewan	<75 years	39	34	41	28	21	-7
	+75 years	17	16	9	-32	-43	7
Denmark	<75 years	306	275	296	13	8	-21
	+75 years	120	126	144	17	14	-18
Ireland	<75 years	232	222	256	8	15	-34
	+75 years	82	78	81	1	4	-3
New Zealand	<75 years	169	166	182	3	10	-16
	+75 years	63	55	61	41	11	-6
Norway	<75 years	266	239	195	-19	-19	44
	+75 years	96	80	72	-6	-10	8
UK,England	<75 years	2841	2879	2539	-17	-12	340
	+75 years	1421	1462	1395	-19	-5	67
UK,N.Ireland	<75 years	94	91	70	-42	-23	21
	+75 years	43	43	33	-11	-23	10
UK,Scotland	<75 years	289	272	263	-8	-3	9
	+75 years	144	125	139	-3	11	-14
UK,Wales	<75 years	158	147	137	-13	-7	10
	+75 years	88	82	84	-14	3	-2
Prostate (C61)							
Australia,NSW	<75 years	3814	3889	4154	5	7	-265
	+75 years	1387	1541	1622	-5	5	-81
Australia,Victoria	<75 years	2947	3695	2806	-24	-24	889
	+75 years	1037	1365	1029	-27	-25	336
Australia,Western	<75 years	1227	1428	1377	-5	-4	51
	+75 years	411	515	492	-20	-4	23
Canada,Alberta	<75 years	1492	1681	1416	-32	-16	265
	+75 years	423	476	427	-24	-10	49
Canada,BC	<75 years	1691	2004	1695	-21	-15	309

	+75 years	734	861	741	-20	-14	120
Canada,Manitoba	<75 years	420	543	467	-4	-14	76
	+75 years	186	241	228	9	-5	13
Canada,NBR	<75 years	364	424	347	-35	-18	77
	+75 years	72	86	77	-18	-11	9
Canada,Ontario	<75 years	4813	4685	3720	-38	-21	965
	+75 years	1734	1912	1651	-34	-14	261
Canada,PEI	<75 years	63	68	63	32	-7	5
	+75 years	15	16	19	-29	18	-3
Canada,Saskatchewan	<75 years	387	409	352	-36	-14	57
	+75 years	143	144	160	-27	11	-16
Denmark	<75 years	2389	2247	2147	-19	-5	100
	+75 years	1028	1127	1170	-8	4	-43
Ireland	<75 years	2211	2568	2093	-35	-19	475
	+75 years	536	665	543	-40	-18	122
New Zealand	<75 years	2271	2823	2456	-17	-13	367
	+75 years	637	720	661	-19	-8	59
Norway	<75 years	2614	2451	2530	-7	3	-79
	+75 years	1059	1104	1133	-3	3	-29
UK,England	<75 years	22052	24894	14960	-58	-40	9934
	+75 years	11860	13122	8855	-52	-33	4267
UK,N.Ireland	<75 years	616	735	573	-25	-22	162
	+75 years	327	363	311	-28	-14	52
UK,Scotland	<75 years	1919	2034	1504	-43	-26	530
	+75 years	981	1078	832	-37	-23	246
UK,Wales	<75 years	1447	1652	940	-55	-43	712
	+75 years	741	720	441	-55	-39	279

Table S4: Societal lockdowns and pauses in cancer screening services due to Covid-19, 2020***

		2020 (national) societal lockdowns, start-end date				Cancer screening services pause, start-end date**		
Country	**Jurisdiction**	**First**	**Second**	**Third**	**Source for societal lockdown**	**Colorectal**	**Breast**	**Source for screening data**
Australia	New South Wales	16/03/2020-15/05/2020	-	-	https://www.parliament.nsw.gov.au/researchpapers/Documents/NSW%20public%20health%20restrictions%20to%20deal%20with%20the%20COVID-19%20pandemic.pdf	-	01/03/2020-31/05/2020	https://www.phrp.com.au/issues/online-early/the-impact-of-the-2020-covid-19-related-suspension-of-breastscreen-nsw-on-breast-cancer-tumour-size-and-treatment/
	Victoria	30/03/2020-12/05/2020	08/07/2020-27/10/2020	-	Source from cancer registries	-	03/2020-05/2020	
	Western Australia	23/03/2020-26/04/2020	-	-	COVID-19 in WA bulletin (health.wa.gov.au); https://www.healthywa.wa.gov.au/~/media/Corp/Documents/Reports-and-publications/COVID19-in-Western-Australia/COVID19-in-WA-Bulleltin-1-Impact-on-Lifestyle.pdf; https://www.aph.gov.au/About_Parliament/Parliamentary_departments/Parliamentary_Library/pubs/rp/rp2021/Chronologies/COVID-19StateTerritoryGovernmentAnnouncements#_Toc52275801	-	27/03/2020-29/04/2020	June-July2020_BSWA_newsletter_FINAL.pdf (health.wa.gov.au)
Canada	Alberta	17/03/2020-15/06/2020	27/11/2020-end*	-	https://www.cihi.ca/en/canadian-covid-19-intervention-timeline	03/2020-06/2020	03/2020-06/2020	**https://cancer.ca/en/get-involved/advocacy/what-we-are-doing/covid-19-response**
	British Columbia	18/03/2020-end*	-	-	https://www.cihi.ca/en/canadian-covid-19-intervention-timeline	03/2020-06/2020	03/2020-06/2020	**https://cancer.ca/en/get-involved/advocacy/what-we-are-doing/covid-19-response**
	Manitoba	20/03/2020-end*	-	-	https://www.cihi.ca/en/canadian-covid-19-intervention-timeline	03/2020-06/2020	03/2020-06/2020	**https://cancer.ca/en/get-involved/advocacy/what-we-are-doing/covid-19-response**

	New Brunswick	2020-03-19 - 2021-07-30	-	-	https://www.cihi.ca/en/canadian-covid-19-intervention-timeline	03/2020-06/2020	03/2020-06/2020	https://cancer.ca/en/get-involved/advocacy/what-we-are-doing/covid-19-response
	Ontario	17/03/2020-24/07/2020	-	-	https://www.cihi.ca/en/canadian-covid-19-intervention-timeline	23/03/2020-26/05/2020	23/03/2020-26/05/2020	Source from cancer registries
	Prince Edward Island	16/03/2020-end*	-	-	https://www.cihi.ca/en/canadian-covid-19-intervention-timeline	03/2020-06/2020	03/2020-06/2020	https://cancer.ca/en/get-involved/advocacy/what-we-are-doing/covid-19-response
	Saskatchewan	18/03/2020-11/07/2020	-	-	https://www.cihi.ca/en/canadian-covid-19-intervention-timeline	03/2020-06/2020	03/2020-06/2020	https://cancer.ca/en/get-involved/advocacy/what-we-are-doing/covid-19-response
Ireland	Ireland	27/03/2020-18/05/2020	18/09/2020-12/01/2020	31/12/2020-end*	First year of the COVID-19 pandemic in Ireland.pdf (hpsc.ie)	03/2020-08/2020	16/03/2020-27/10/2020	BreastCheck: Recovery from COVID - Corporate (hse.ie) Covid-19 and cervical screening in Ireland: a coordinated approach to minimising harm - Corporate (hse.ie) Communication with the cancer registry (march to August 2020)
New Zealand	New Zealand	23/03/2020-20/04/2020	-	-	Cancer Control Agency: https://covid19.govt.nz/about-our-covid-19-response/history-of-the-covid-19-alert-system/	-03/2020-06/2020	03/2020-04/2020	Source from cancer registries
Norway	Norway	12/03/20200 7/04/2020	05/11/2020-end*	-	DOI: 10.1002/ijc.34029	No nation-wide screening programme during the study period	12/03/2020-11/05/2020	
United Kingdom	England	23/03/2020-06/2020	05/11/2020-02/12/2020	-	Institute for Government analysis	04/2020-06/2020	03/2020-07/2020	
	Northern Ireland	23/03/2020-06/2020	16/10/2020-02/12/2020	-	Institute for Government analysis	16/03/2020 - 17/08/2020	16/03/2020 - 17/07/2020	https://cancerscreening.hscni.net/bowel-screening/overview/#:~:text=The%20bowel%20cancer%20screening%20programme%20was%20paused%20in%20March%202020,waiting%20list%20for%20this%20investigation. https://cancerscreening.hscni.net/breast-screening/overview/
	Scotland	23/03/2020-06/2020	05/11/2020-02/12/2020	-	Institute for Government analysis	03/2020-10/2020	03/2020-08/2020	

	Wales	23/03/2020-06/2020	23/10/2020-09/11/2020	16/12/2020-end*	Institute for Government analysis; https://research.senedd.wales/research-articles/coronavirus-timeline-welsh-and-uk-governments-response/; https://www.nature.com/articles/s41416-022-01830-6	03/2020-10/2020	03/2020-08/2020	
Denmark	Denmark	11/03/2020-15/04/2020	07/12/2020-end*	-	DOI: 10.1002/ijc.34029	-	-	

*End of lockdown measures outside the study period

** Cervical cancer screening pauses were excluded as changes in incidence were not examined in this manuscript.

***The information collected for this table comes from review of government, public health websites, published articles and stakeholder information that should be interpreted with caution

Table S5: Sensitivity analysis comparing predicted number of cases in 2020 estimated using 1) original approach, 2) Model 1 (using cases in 2019 to predict 2020 cases) and 3) Model 2 (using age-specific annual percentage change rates during 2015-2019.

		Predicted number of cases, 2020			Ratio, alternative model: original model	
Country	**Cancer**	**Original approach**	**Model 1**	**Model 2**	**Model 1: original**	**Model 2: original**
Canada	Breast (C50)	16948	16839	16940	0.99	1.00
	Colon (C18)	8096	8379	8072	1.03	1.00
	Melanoma of Skin (C43)	5946	5877	5974	0.99	1.00
	Ovary (C48.1-2, C56, C57.0)	1679	1707	1688	1.02	1.01
	Prostate (C61)	13537	13438	13566	0.99	1.00
	Rectum (C19-20)	3856	3970	3830	1.03	0.99
	Trachea, bronchus and lung (C33-34)	14694	14983	14720	1.02	1.00
Ireland	Breast (C50)	2927	2904	2937	0.99	1.00
	Colon (C18)	1371	1420	1375	1.03	1.00
	Melanoma of Skin (C43)	1025	1042	1034	1.02	1.01
	Ovary (C48.1-2, C56, C57.0)	296	308	296	1.04	1.00
	Prostate (C61)	3269	3177	3272	0.97	1.00
	Rectum (C19-20)	692	707	696	1.02	1.01
	Trachea, bronchus and lung (C33-34)	2206	2222	2210	1.01	1.00
UK	Breast (C50)	40042	40019	40075	1.00	1.00
	Colon (C18)	21639	21567	21576	1.00	1.00
	Melanoma of Skin (C43)	13149	12982	13216	0.99	1.01
	Ovary (C48.1-2, C56, C57.0)	4697	4765	4693	1.01	1.00
	Prostate (C61)	41672	40251	41432	0.97	0.99
	Rectum (C19-20)	10407	10308	10311	0.99	0.99
	Trachea, bronchus and lung (C33-34)	33718	34050	33807	1.01	1.00
Australia	Breast (C50)	9736	9773	9751	1.00	1.00
	Colon (C18)	5387	5490	5332	1.02	0.99
	Melanoma of Skin (C43)	7021	7028	7035	1.00	1.00
	Ovary (C48.1-2, C56, C57.0)	774	801	774	1.03	1.00
	Prostate (C61)	12395	12249	12439	0.99	1.00
	Rectum (C19-20)	2575	2623	2552	1.02	0.99
	Trachea, bronchus and lung (C33-34)	6953	6943	6938	1.00	1.00
New Zealand	Breast (C50)	2709	2715	2707	1.00	1.00
	Colon (C18)	1698	1713	1680	1.01	0.99
	Melanoma of Skin (C43)	2076	2072	2080	1.00	1.00
	Ovary (C48.1-2, C56, C57.0)	221	230	221	1.04	1.00
	Prostate (C61)	3556	3367	3538	0.95	0.99
	Rectum (C19-20)	908	901	901	0.99	0.99
	Trachea, bronchus and lung (C33-34)	1832	1864	1832	1.02	1.00

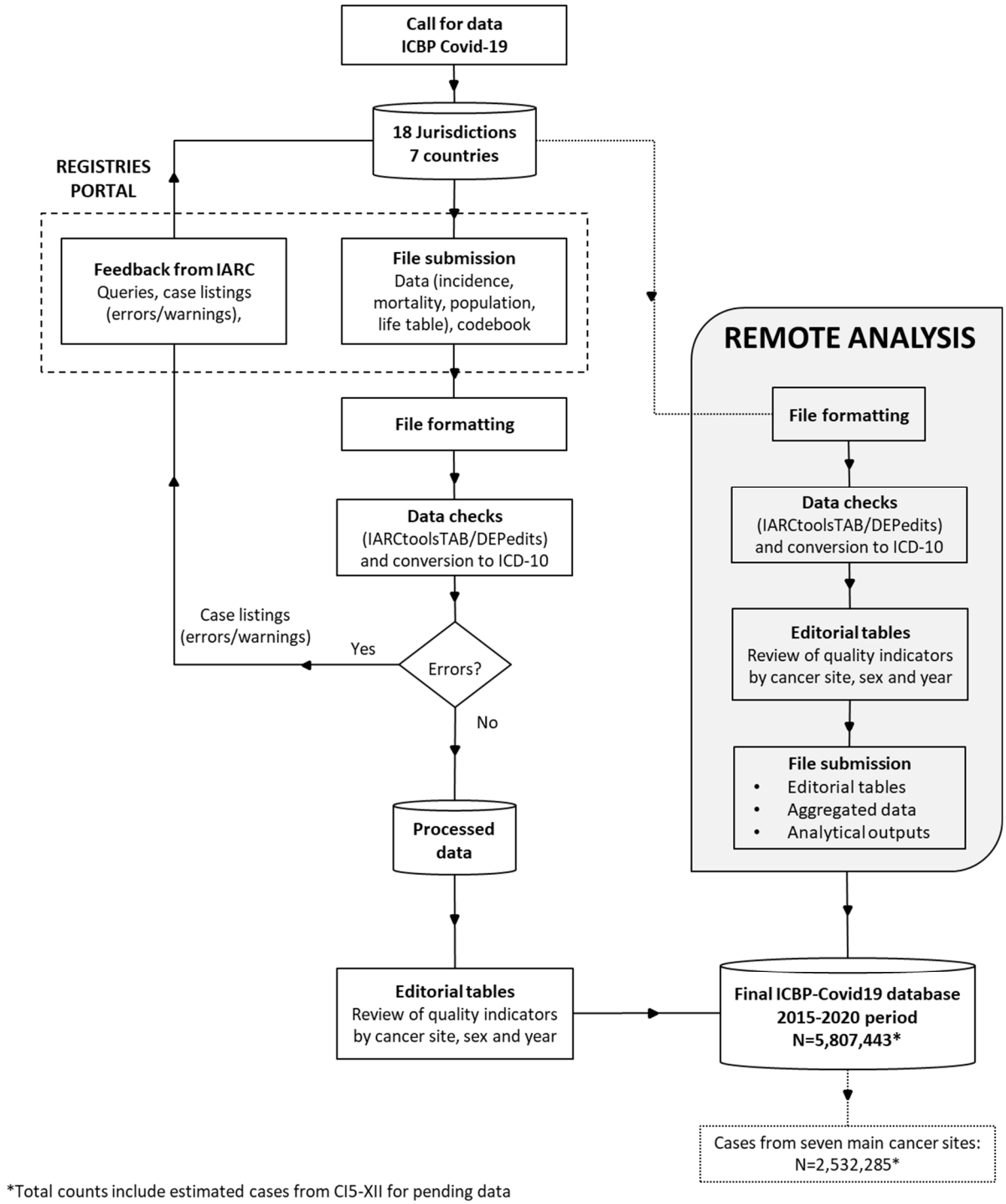


Figure S1. Data collection and harmonization for ICBP COVID-19 commissioned project.

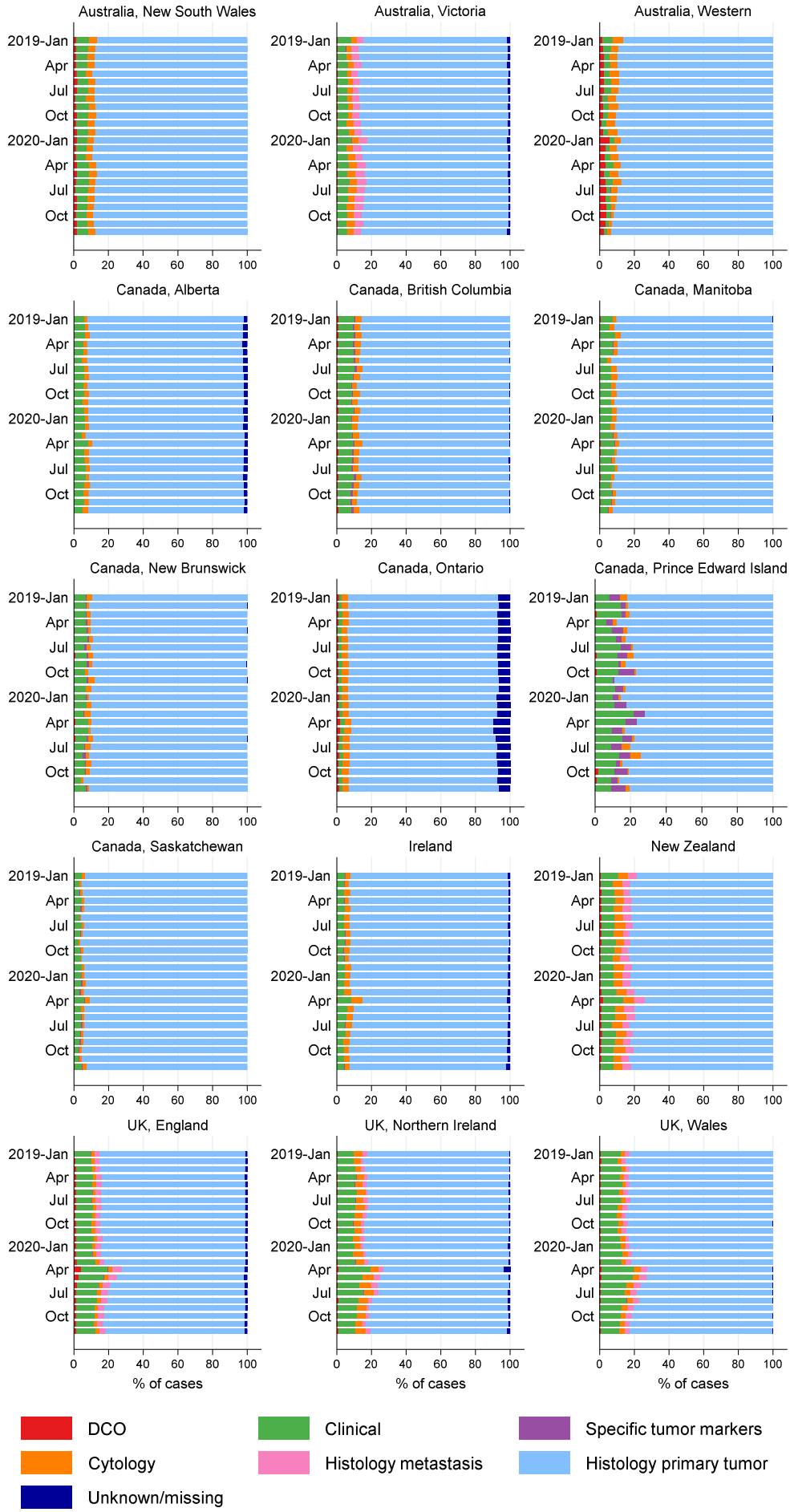
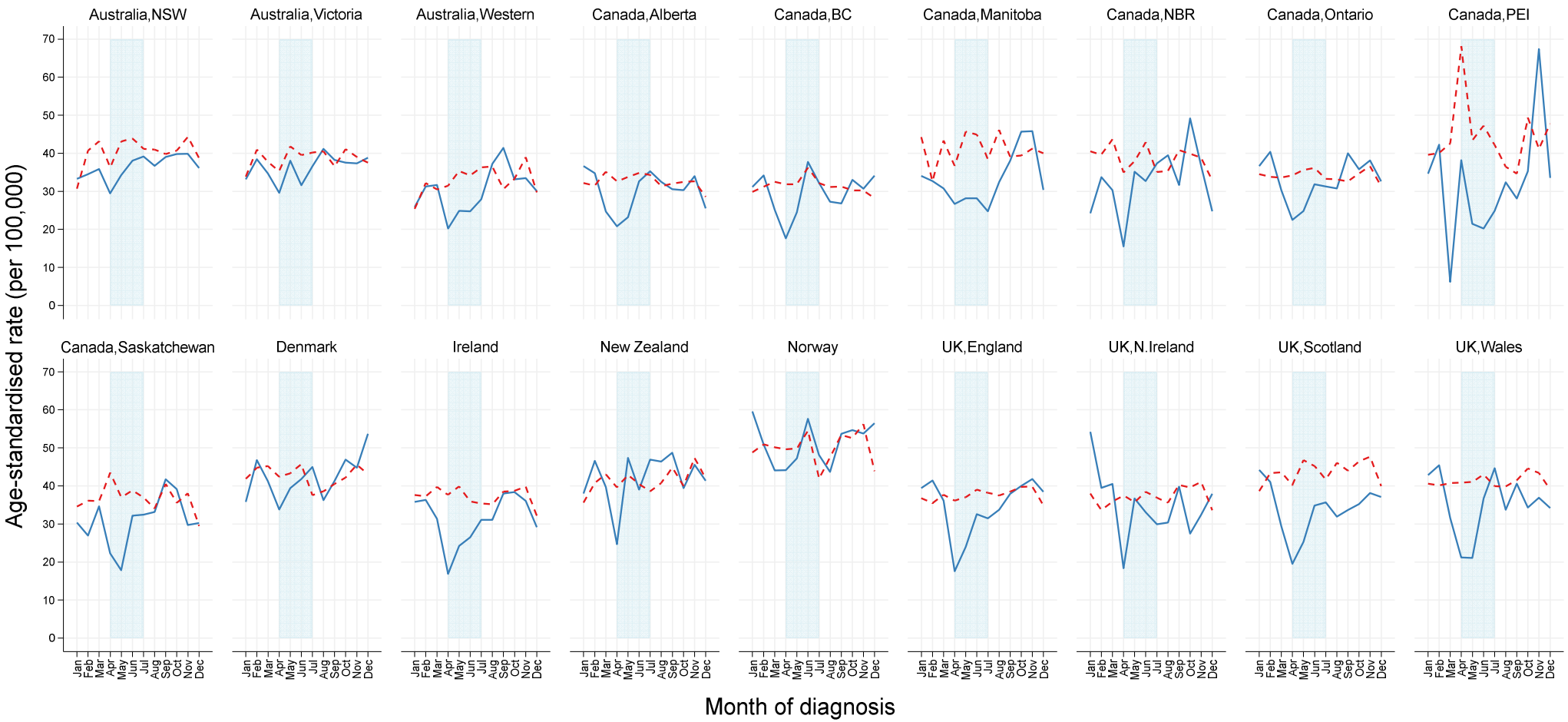
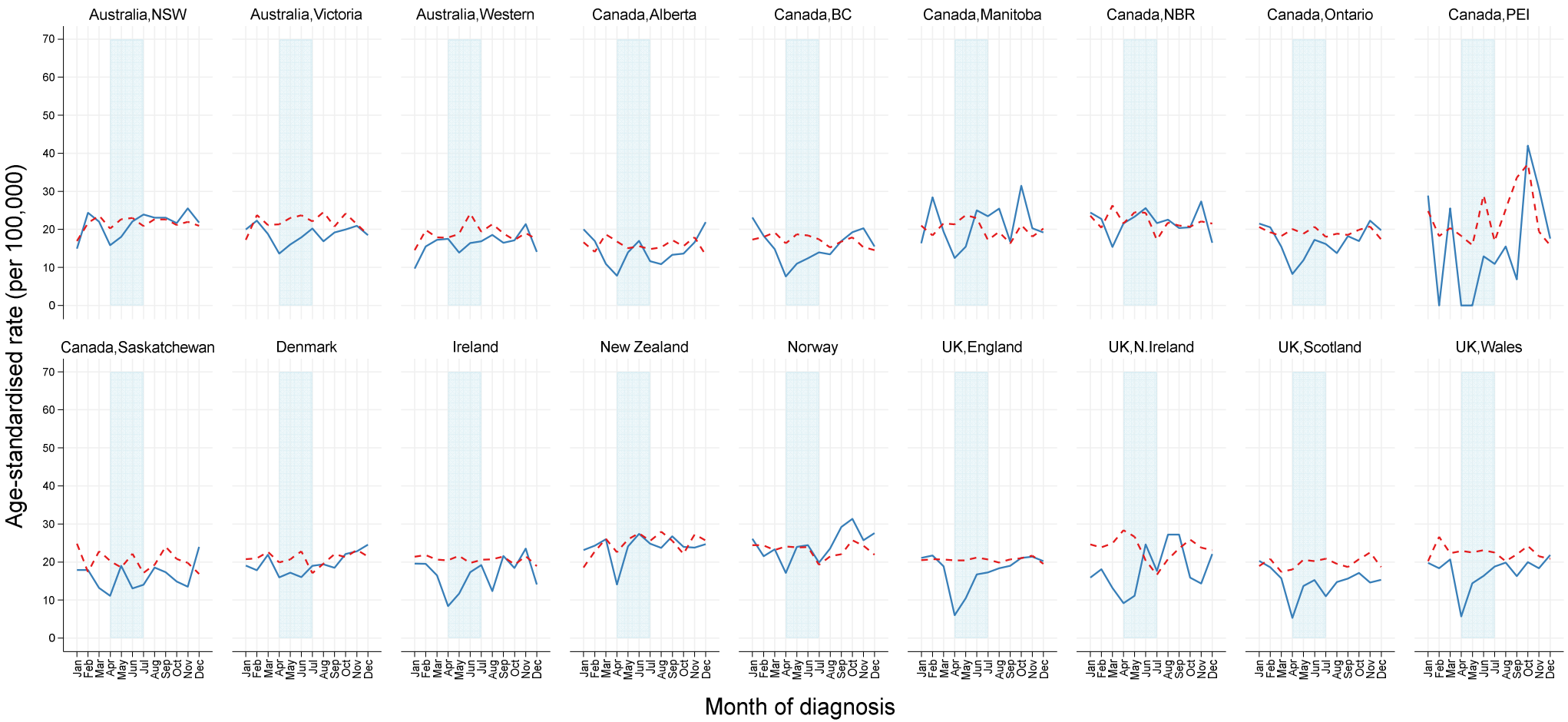


Figure S2. Distribution of basis of diagnosis by month of diagnosis and jurisdiction, 2019-2020.

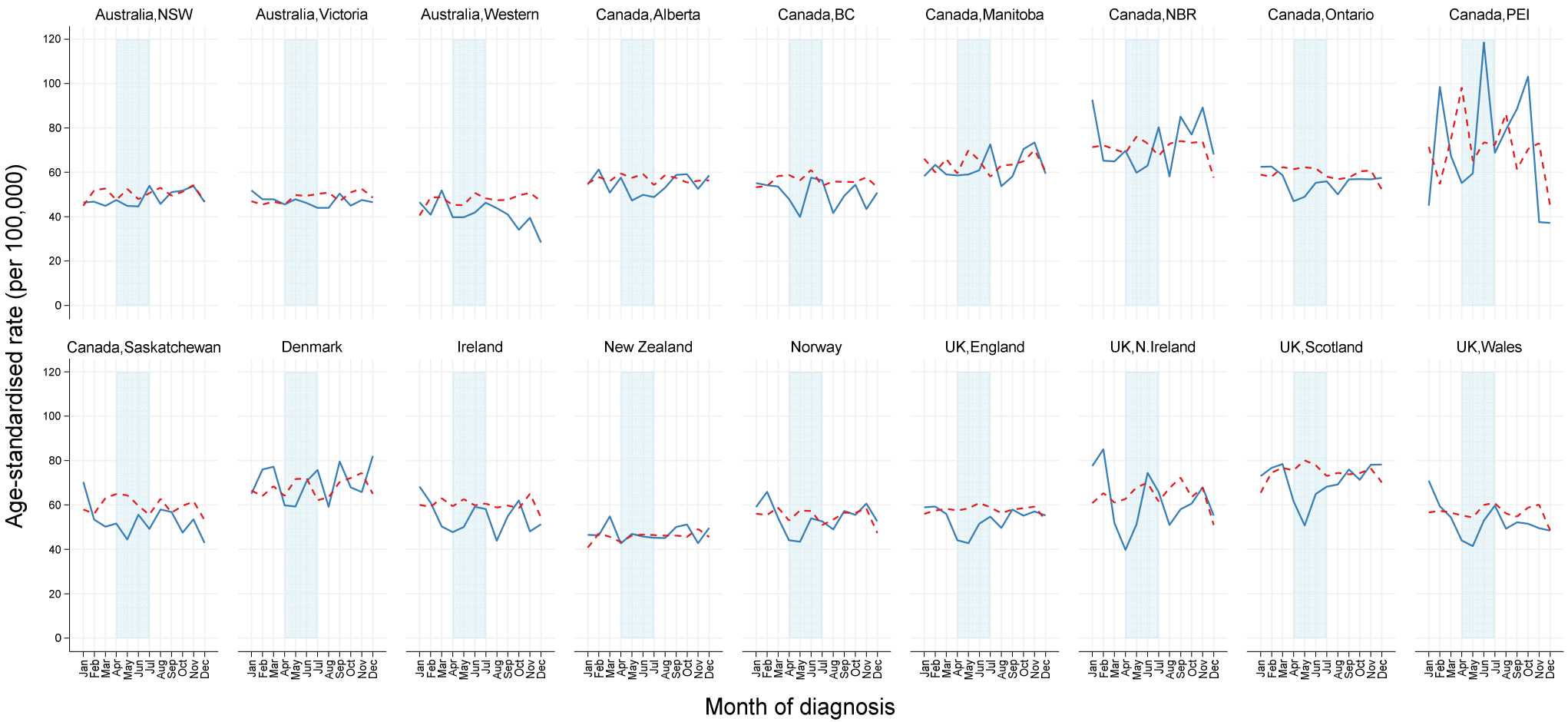
a) Colon


Australia,NSW
Australia,Victoria
Australia,Western
Canada,Alberta
Canada,BC
Canada,Manitoba
Canada,NBR
Canada,Ontario
Canada,PEI
Canada,Saskatchewan
Denmark
Ireland
New Zealand
Norway
UK,England
UK,N.Ireland
UK,Scotland
UK,Wales
Age-standardised rate (per 100,000)
0
10
20
30
40
50
60
70
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Month of diagnosis

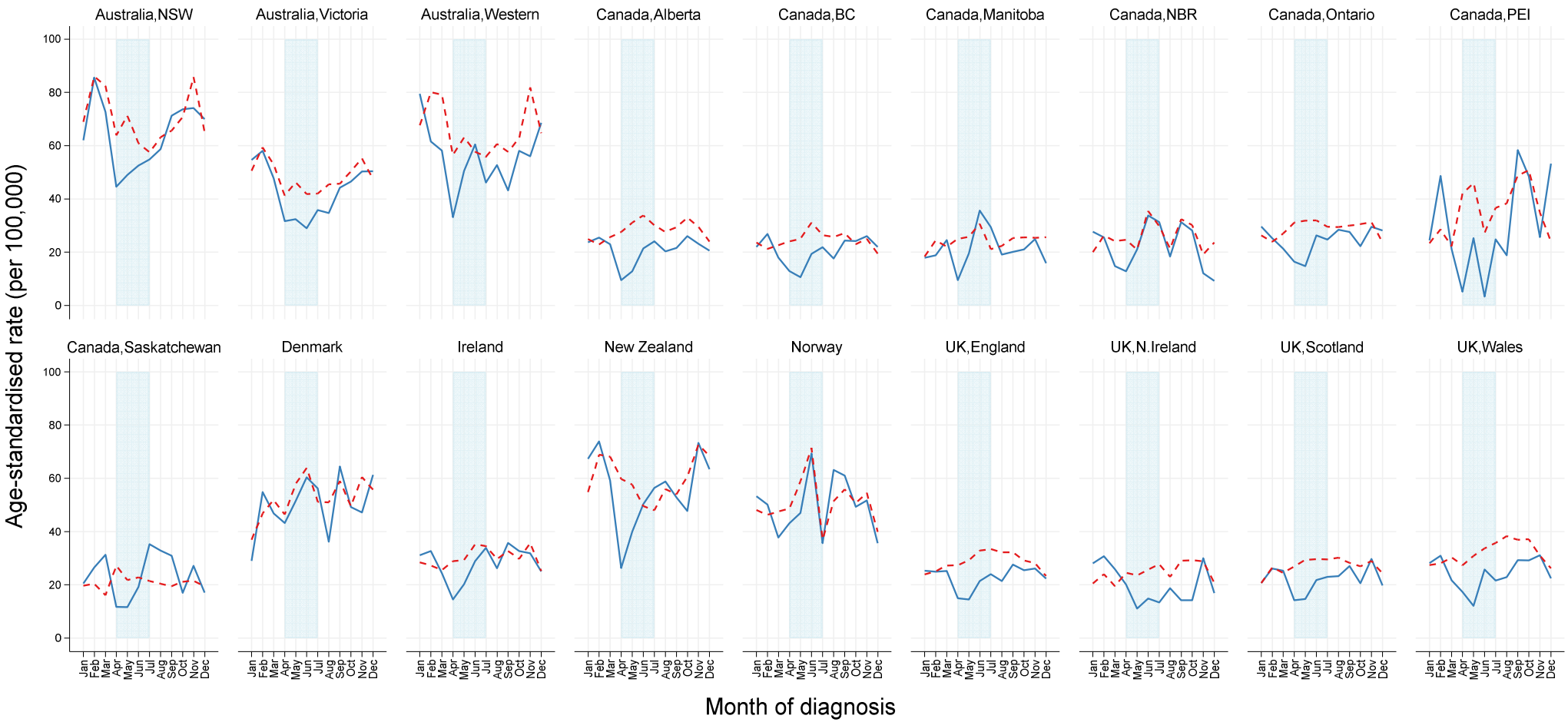
b) Rectum


Australia,NSW
Australia,Victoria
Australia,Western
Canada,Alberta
Canada,BC
Canada,Manitoba
Canada,NBR
Canada,Ontario
Canada,PEI
Canada,Saskatchewan
Denmark
Ireland
New Zealand
Norway
UK,England
UK,N.Ireland
UK,Scotland
UK,Wales
Age-standardised rate (per 100,000)
0
10
20
30
40
50
60
70
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Month of diagnosis

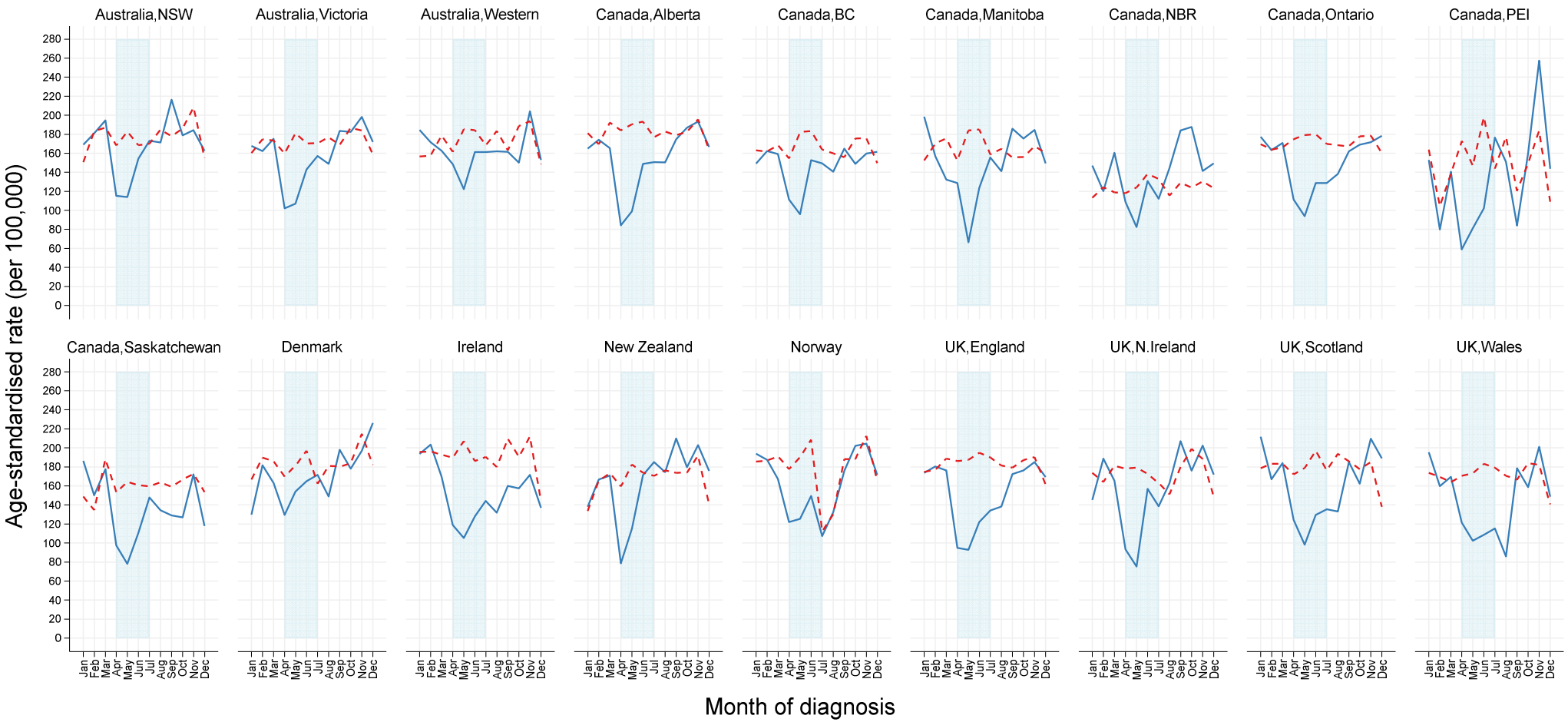
c) Trachea, bronchus and lung (C33-34)



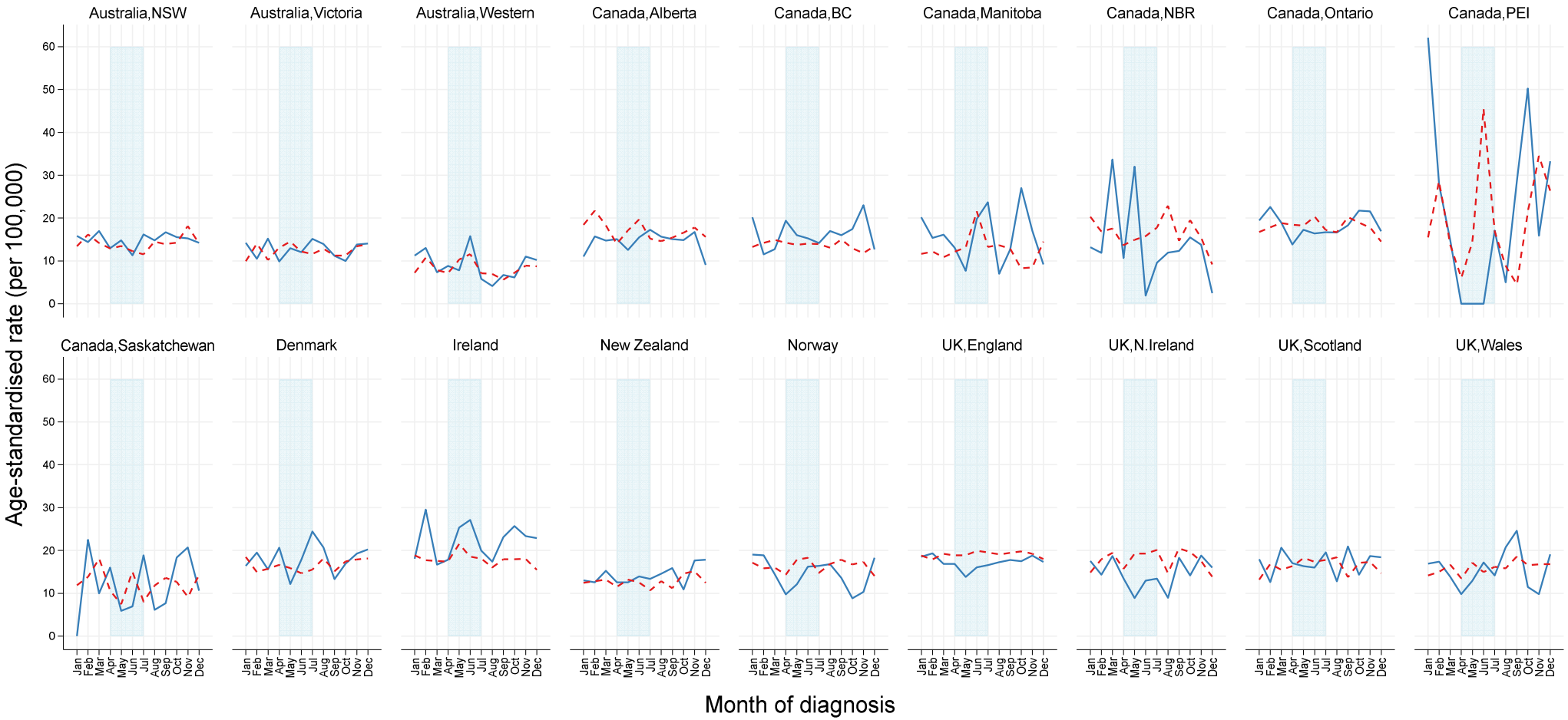
d) Melanoma of Skin



e) Breast (C50)


Australia,NSW
Australia,Victoria
Australia,Western
Canada,Alberta
Canada,BC
Canada,Manitoba
Canada,NBR
Canada,Ontario
Canada,PEI
Canada,Saskatchewan
Denmark
Ireland
New Zealand
Norway
UK,England
UK,N.Ireland
UK,Scotland
UK,Wales
Age-standardised rate (per 100,000)
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Month of diagnosis

f) Ovary (C48.1-2, C56, C57.0)



g) Prostate (C61)

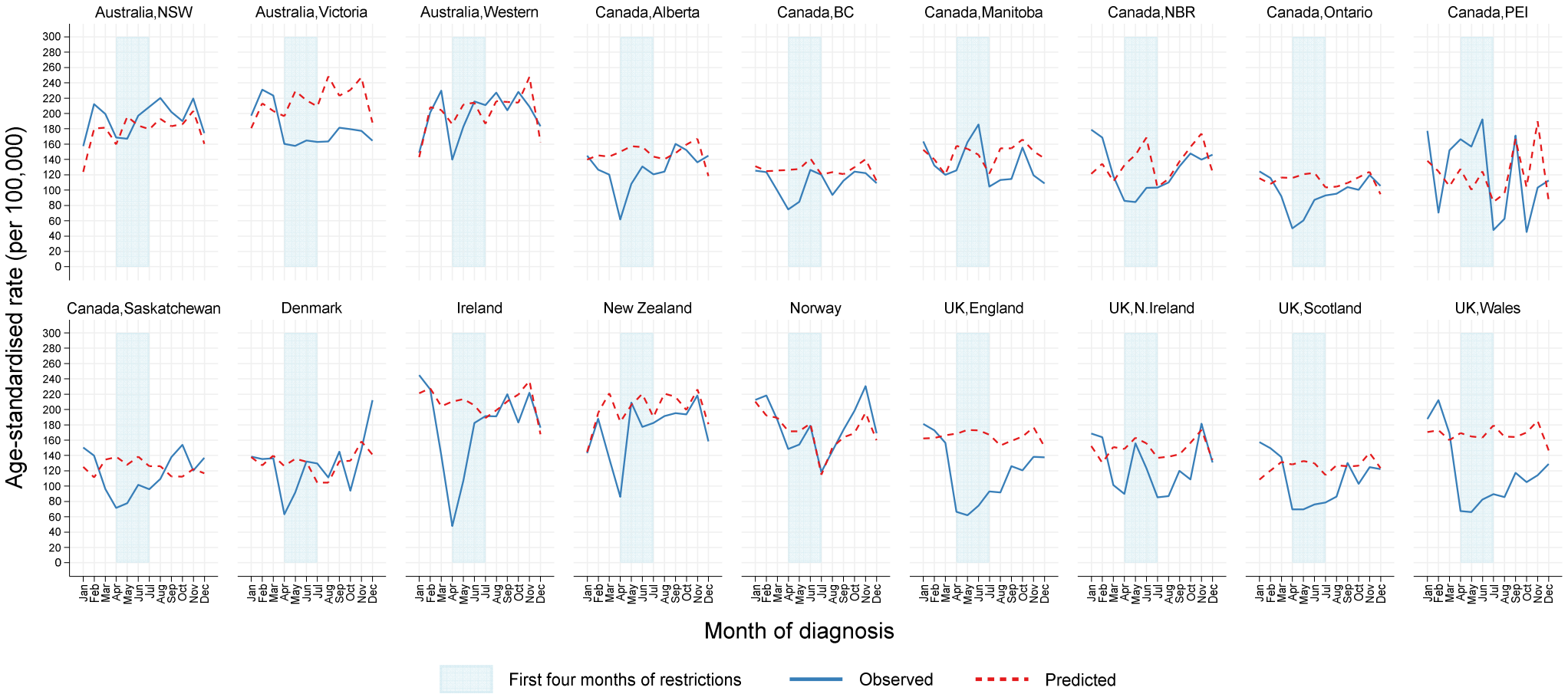
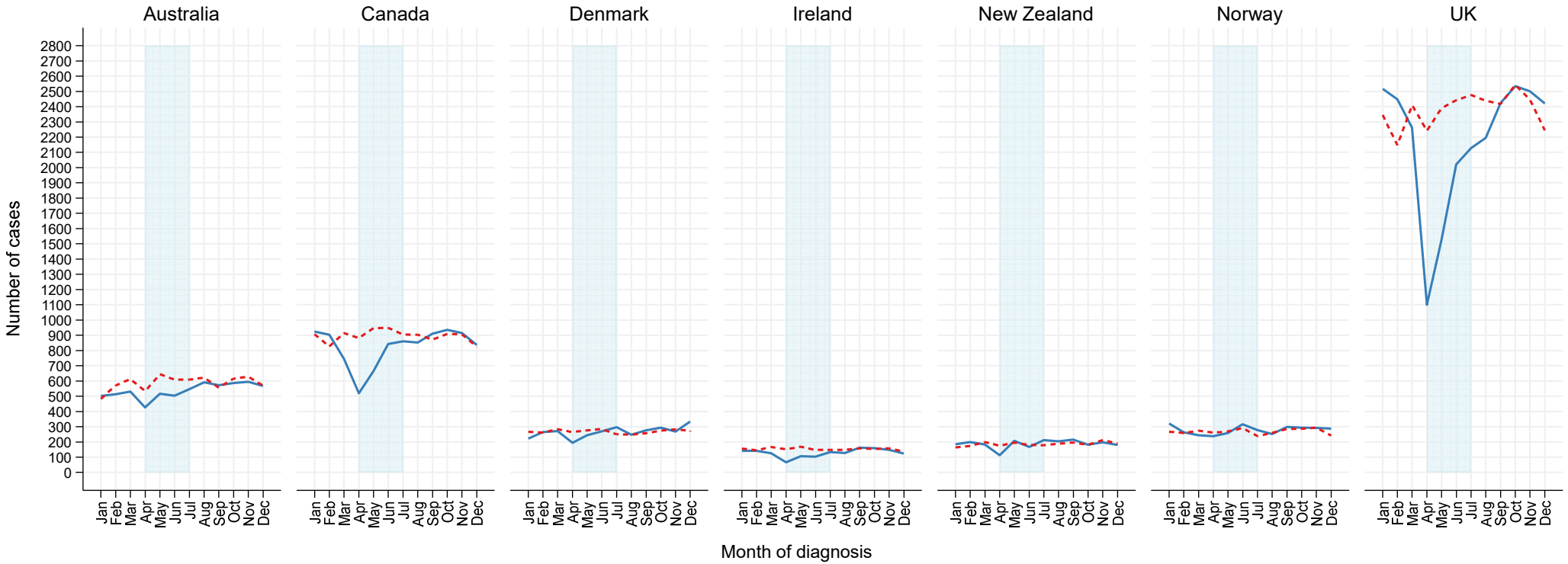


Figure S3: Observed and predicted incidence rates (age-standardised) by month of diagnosis by cancer site and jurisdiction. Observed cases (solid line) and predicted cases for the same period based on previous five years (dotted line). Blue shading represents first four months of restrictions.

*N.Ireland: Northern Ireland; NSW: New South Wales, PEI: Prince Edward Island, UK: United Kingdom

a) Colon


Australia
Canada
Denmark
Ireland
New Zealand
Norway
UK
Number of cases
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000
2100
2200
2300
2400
2500
2600
2700
2800
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Month of diagnosis

b) Rectum


Australia
Canada
Denmark
Ireland
New Zealand
Norway
UK
Number of cases
0
50
100
150
200
250
300
350
400
450
500
550
600
650
700
750
800
850
900
950
1000
1050
1100
1150
1200
1250
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Month of diagnosis

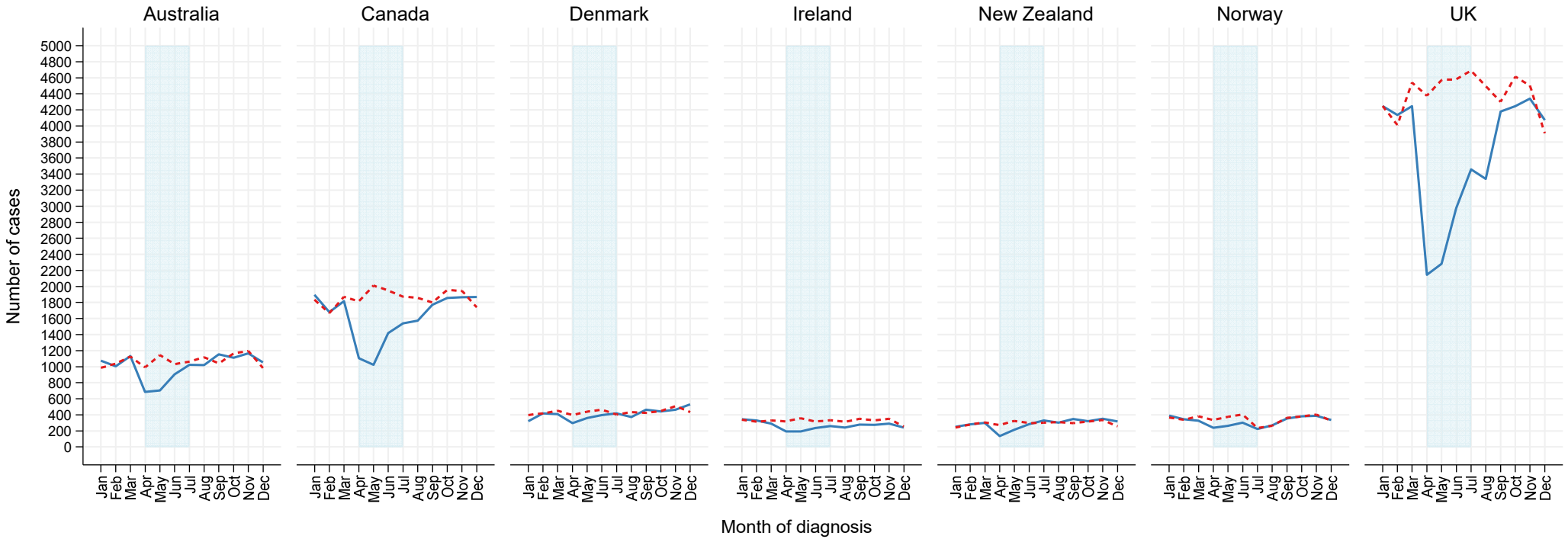
c) Lung


Australia
Canada
Denmark
Ireland
New Zealand
Norway
UK
Number of cases
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
2800
3000
3200
3400
3600
3800
4000
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Month of diagnosis

d) Melanoma


Australia
Canada
Denmark
Ireland
New Zealand
Norway
UK
Number of cases
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1600
1700
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Month of diagnosis

e) Breast


Australia
Canada
Denmark
Ireland
New Zealand
Norway
UK
Number of cases
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
2800
3000
3200
3400
3600
3800
4000
4200
4400
4600
4800
5000
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Month of diagnosis

f) Ovary


Australia
Canada
Denmark
Ireland
New Zealand
Norway
UK
Number of cases
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
360
380
400
420
440
460
480
500
520
540
560
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Month of diagnosis

g) Prostate

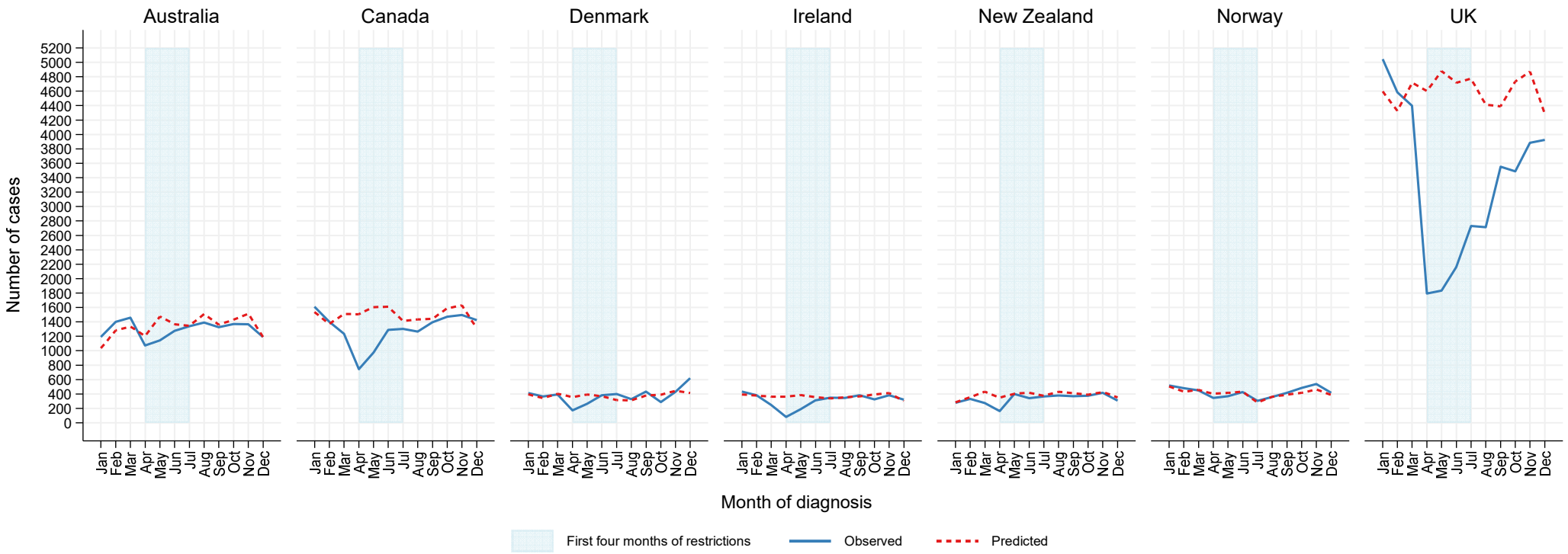
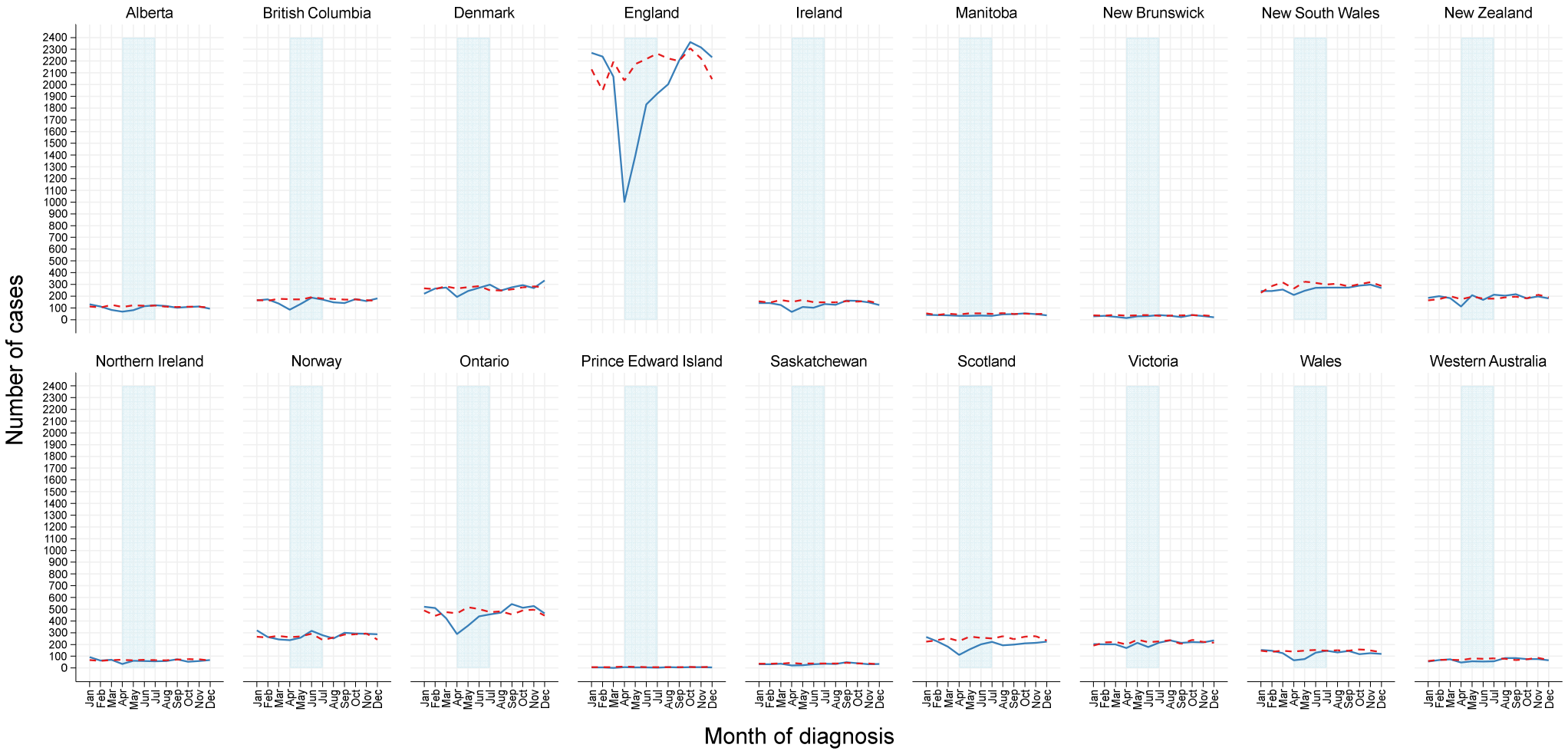
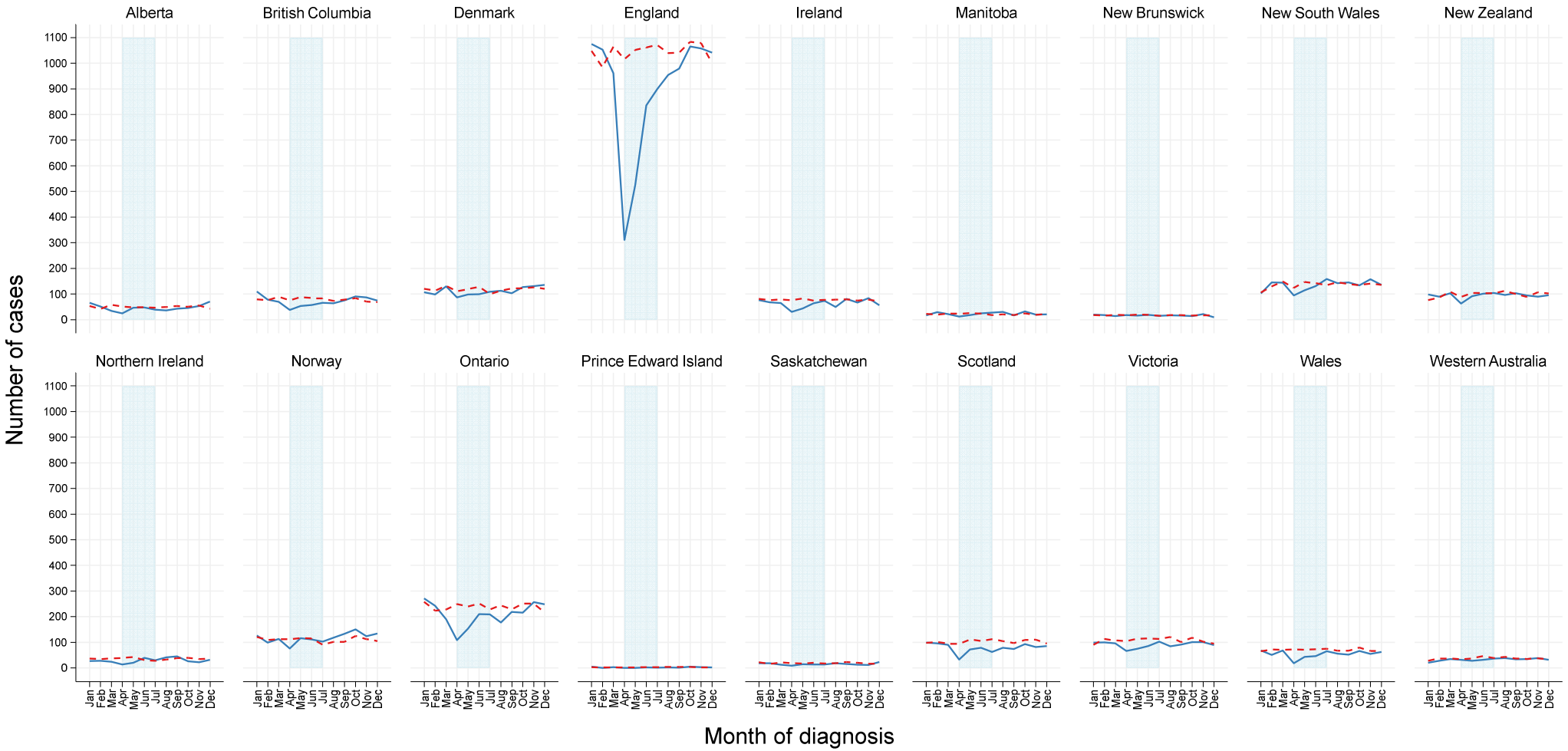


Figure S4: Observed and predicted incidence new cases by month of diagnosis by cancer site and country in 2020. Observed cases (solid line) and predicted cases based on previous five years (dotted line). Blue shading represents first four months of restrictions.

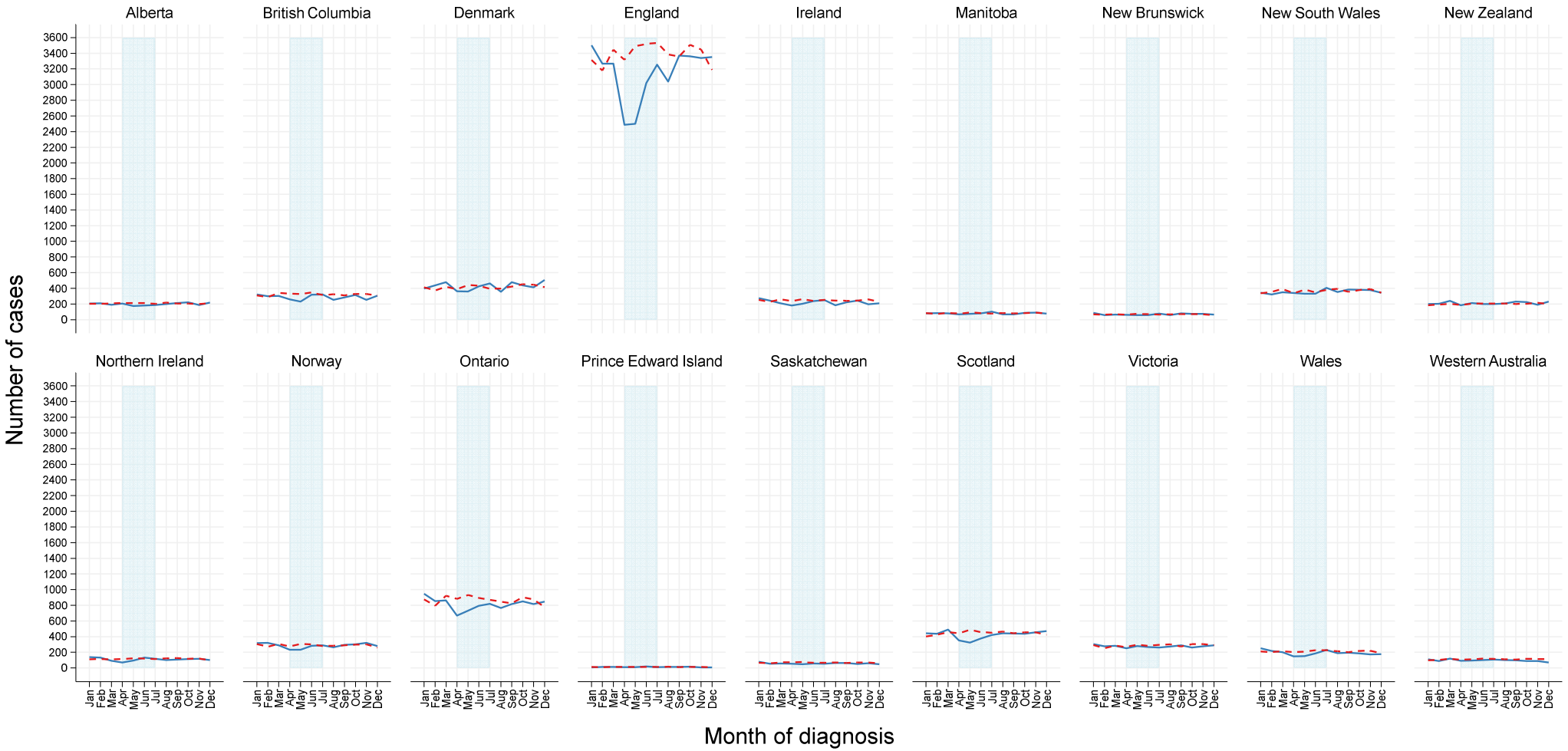
a) Colon


Alberta
British Columbia
Denmark
England
Ireland
Manitoba
New Brunswick
New South Wales
New Zealand
Northern Ireland
Norway
Ontario
Prince Edward Island
Saskatchewan
Scotland
Victoria
Wales
Western Australia
Number of cases
Month of diagnosis
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

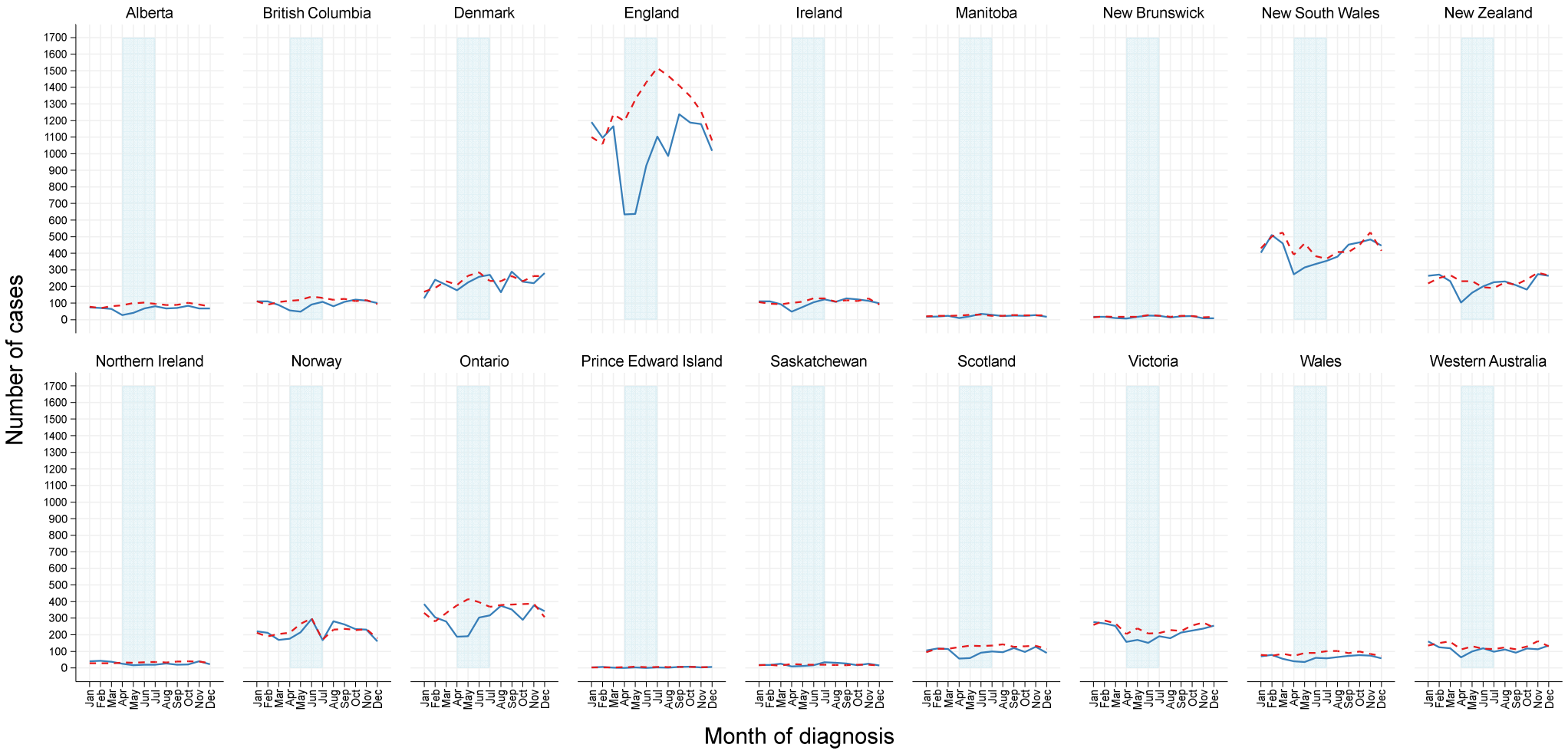
b) Rectum


Alberta
British Columbia
Denmark
England
Ireland
Manitoba
New Brunswick
New South Wales
New Zealand
Northern Ireland
Norway
Ontario
Prince Edward Island
Saskatchewan
Scotland
Victoria
Wales
Western Australia
Number of cases
0
100
200
300
400
500
600
700
800
900
1000
1100
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Month of diagnosis

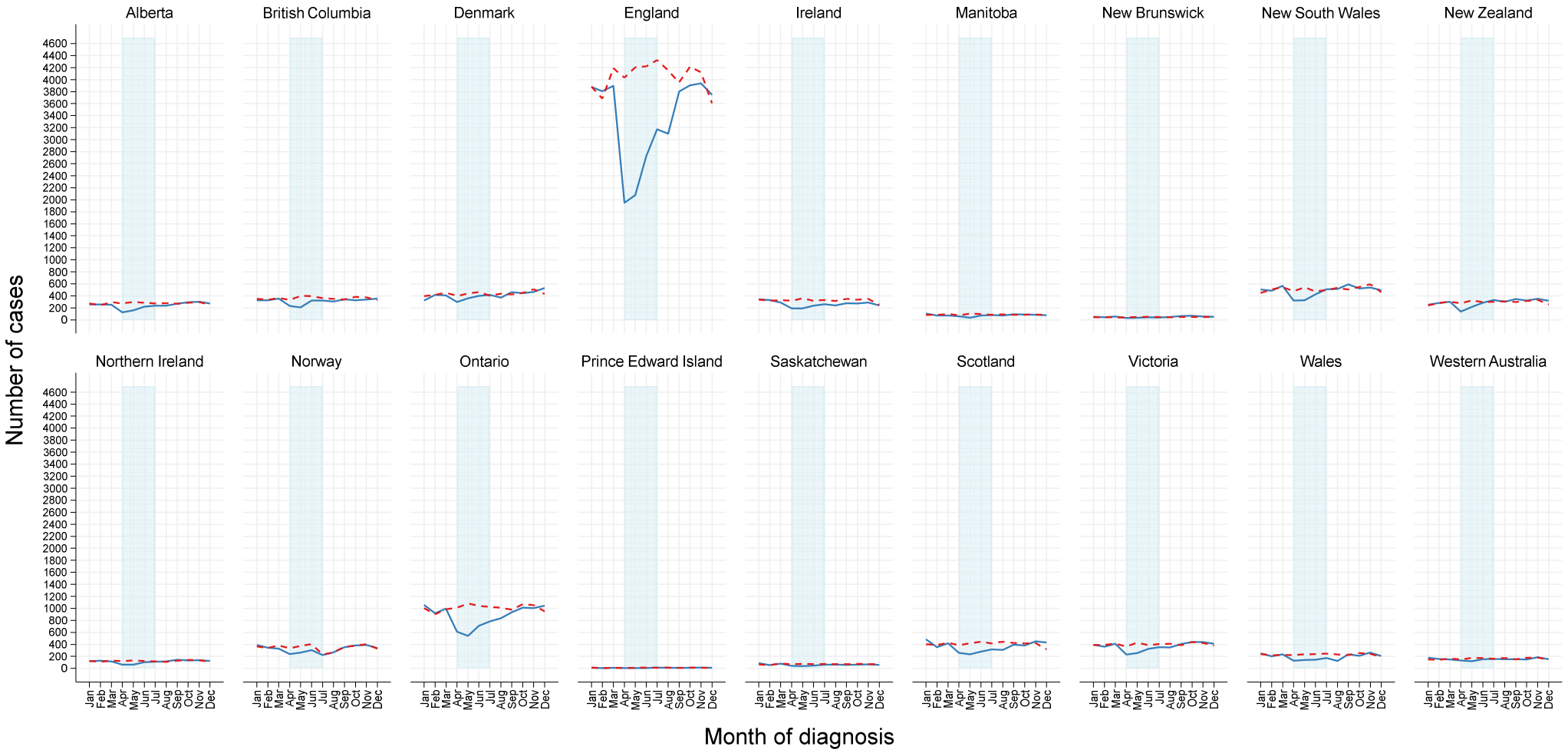
c) Trachea, bronchus and lung (C33-34)



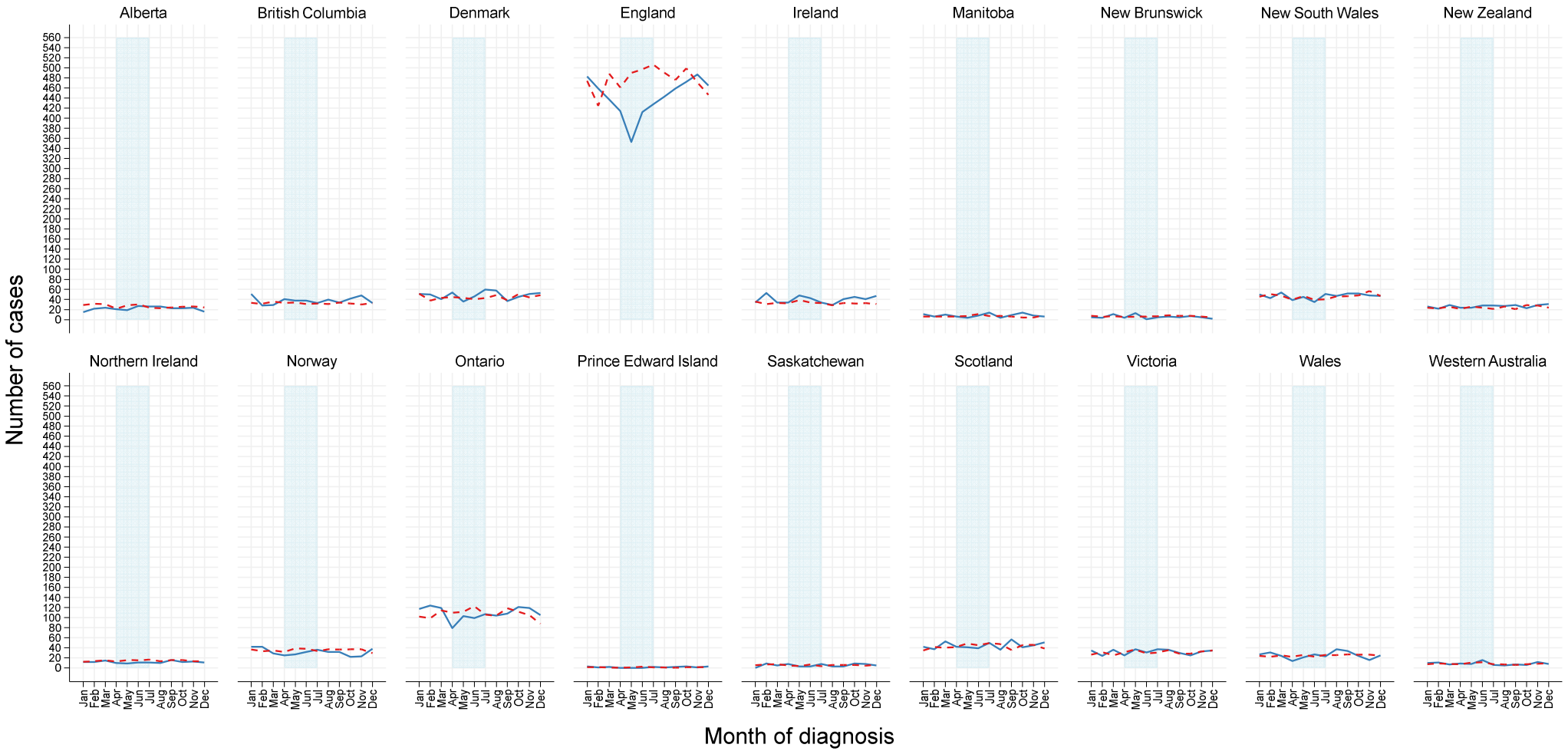
d) Melanoma of Skin



e) Breast (C50)


Alberta
British Columbia
Denmark
England
Ireland
Manitoba
New Brunswick
New South Wales
New Zealand
Northern Ireland
Norway
Ontario
Prince Edward Island
Saskatchewan
Scotland
Victoria
Wales
Western Australia
Number of cases
Month of diagnosis
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

f) Ovary (C48.1-2, C56, C57.0)



g) Prostate (C61)

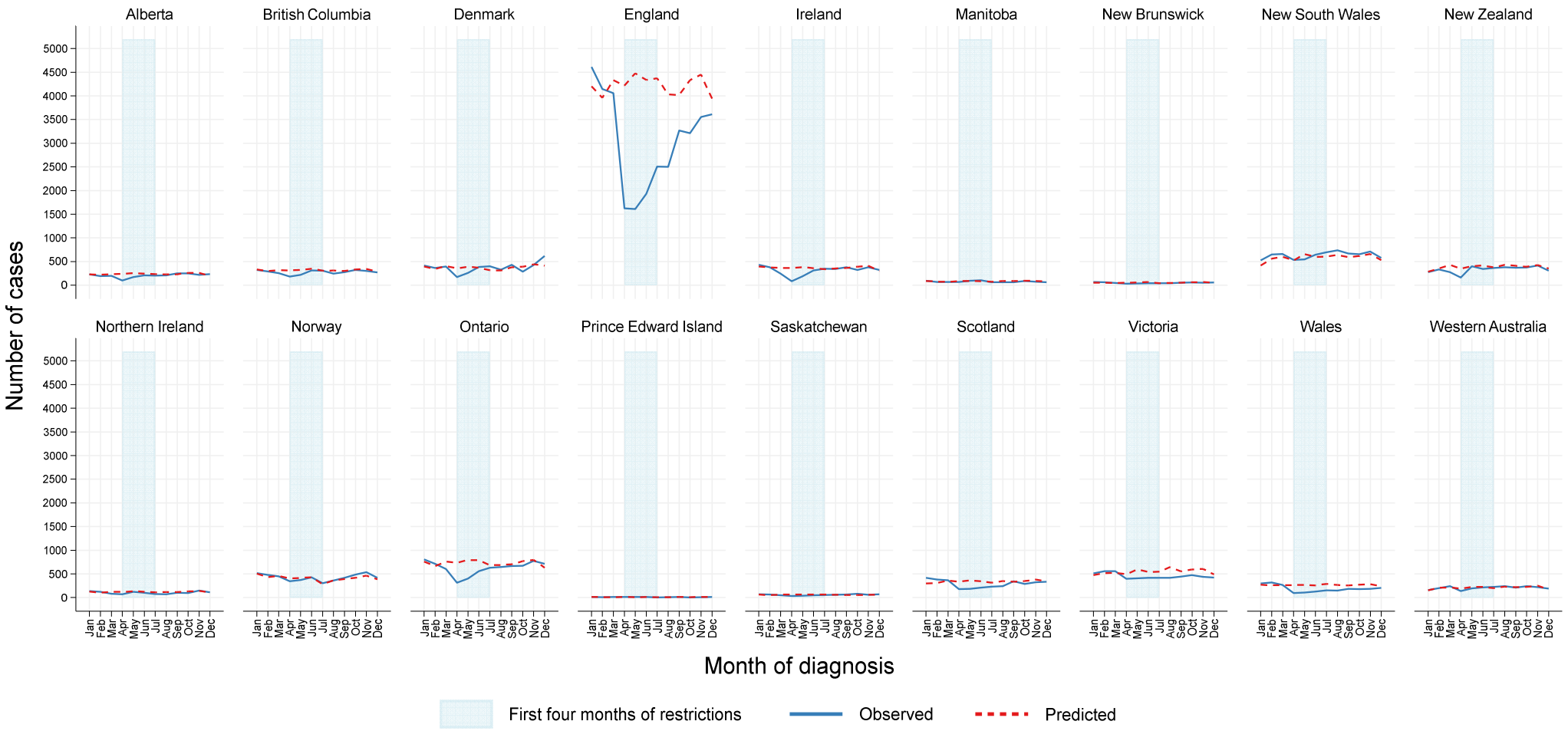


Figure S5: Observed and predicted new cases by month of diagnosis by cancer site and jurisdiction in 2020. Observed cases (solid line) and predicted cases (dotted line) based on previous five years (2015-2019). Blue shading represents first four months of restrictions.



Figure S6: Stage distribution of mapped SEER during April to December in 2020 compared to 2018-2019, by cancer and country