

SUPPLEMENTAL MATERIAL

Title: The impact of the COVID-19 pandemic on cancer diagnosis based on pathology notifications: A comparison across the Nordic countries during 2020

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Supplementary References

Supplementary Table S1. Overview of COVID-19 strategies in the Nordic countries Jan-Dec 2020

	Denmark	Norway	Sweden	Finland	Iceland	Faro Islands
Jan			31 Jan: First case in Sweden	29 Jan: First case in Finland		
Feb	27 Feb: First case in Denmark	26 Feb: First case in Norway			28 Feb: First case in Iceland	
Mar	11 Mar: Strict societal restrictions ("lockdown") 13 Mar: Hospitals reprioritize to free resources for COVID-19 patients	12 Mar: Strict societal restrictions ("lockdown") 12 Mar: Invitations/reminders to screening halted (breast, cervical) 14 Mar: Travel abroad should be avoided	11 Mar: Assembly ban of 500 persons 16 Mar: Elderly >70 recommended to avoid social contacts ("personal lockdown"), work-from-home policy 17 Mar: Schools (age 17+) and universities change to remote teaching 19 Mar: Avoid unnecessary travel (national/international) 27 Mar: Assembly ban of 50 30 Mar: Visitor ban to elderly care homes Cancer screening halted in some regions	16 Mar: State of emergency declared Assembly ban of 10 persons, work-from-home policy, remote teaching of schools and universities. Travel to Finland restricted. Uusimaa-region closed from internal traffic between 27 March and 15 April – only limited access allowed.	1 Mar: Extensive testing, tracing of all cases and quarantine for cases and those potentially infected. 10 Mar: Cancer screening halted in some regions 13 Mar: Assembly ban of 100 persons, school restrictions 24 Mar: Assembly ban of 20, all screening halted , work-from-home policy	3 Mar: First case in Faroes 12 Mar: Strict societal restrictions ("lockdown"), schools and daycare close, quarantine for arriving travelers. Visitor ban to elderly care homes. 16 Mar: Assembly ban of 10 persons. Only essential shops open.
Apr	15 Apr: Gradual reopening of society (until Jun)	7 Apr: Gradual opening of kindergartens, schools and universities	Reprioritization of healthcare to free resources for COVID-19 patients	Restaurants closed	3 Apr: Travel restrictions within Iceland	20 Apr: Childcare and schools open 30 Apr: Workplaces open, including non-essential shops. Assembly ban of 50 persons
May		2 May: Reminders to cervical screening are reinstated 11 May: Invitations to breast cancer screening are resumed, fully operational in Aug 11 May: Schools open for all pupils	Cancer screening resumed albeit with large regional differences	Schools reopen	4 May: Cancer screening resumes , less school restrictions, assembly ban of 50 25 May: Assembly ban of 200	8 May: Visits to elderly care homes allowed 14 May: All schools open. Assembly ban of 100 persons
Jun		15 Jun: Additional exceptions to societal restrictions	Travel restrictions within Sweden eased 15 Jun: General testing and self-testing available nationwide	16 Jun: State of emergency ended Assembly ban of 50 persons Restaurants open with restrictions	15 Jun: Assembly ban of 500, COVID-19 tests required for travel to Iceland	15 Jun: Travel to the Faroes allowed, negative COVID-19 test required
Jul		15 Jul: Travel from Schengen/EEC to Norway allowed.		Assembly ban of 500 persons	No registered COVID-19 infections 3-22 July	
Aug	15 Aug: Last steps of reopening is not implemented, with some restrictions maintained 22 Aug: Requirement of face masks in public transport	7 Aug: Government decides on slower opening of society 12 Aug: Travel abroad should be avoided 14 Aug: Regional recommendations of face masks in public transport	Mid-Aug: Schools for age 17+ re-opens	Face mask use recommended in most of the country	30 Jul: Assembly ban of 100, recommendation for face masks in public if social distancing cannot be maintained	3 Aug: General COVID-19 testing available 6 Aug: Visits to elderly care homes limited, but reopen again 19 Aug
Sep	18 Sep: New societal restrictions, including assembly ban of 50 and work-from-home policy			Regional recommendations for work-from-home, remote teaching and assembly bans	7 Sep: Assembly ban of 200 18 Sep: Work-from-home policy, bars closed, increased use of face masks	
Oct	23 Oct: Assembly ban of 10 persons	26 Oct: New national restrictions, assembly ban of 50 in public houses, recommended no more than 5 guests at home	Increasing rates of COVID-19 with pressure on healthcare and ICU		5 Oct: Assembly ban of 10, face masks obligatory	
Nov		5 Nov: New national and local restrictions. Strict stay-at-home-	Assembly ban of 8 persons		18 Nov: Less school restrictions	13 Nov: Assembly ban of 20 persons

		policy, assembly ban of 20 persons. Local rules stricter 9 Nov: Travel to Norway require negative COVID-19 test				
Dec	7-21 Dec: Gradual closing of society, by 21 Dec Denmark is almost as closed as in spring 2020. Only daycare, food stores and healthcare remain open. By end of 2020 assembly ban was still 10 persons	21 Dec: Travel ban from the UK 27 Dec: First COVID-19 vaccination in Norway By end of 2020 assembly ban was still 20 persons	21 Dec: Travel ban from the UK and Denmark By end of 2020 assembly ban was still 8 persons	By end of 2020 regional assembly bans were still in place	27 Dec: First COVID-19 vaccination in Iceland By end of 2020 assembly ban was still 10 persons	By end of 2021 assembly ban was still 20 persons
	Cancer screening was never reduced or halted, although attendance was lower			No national restrictions on cancer screening, but some municipalities have temporarily suspended cancer screening programs		Cancer screening was never reduced or halted.
<i>SUMMARY</i>						
	Denmark	Norway	Sweden	Finland	Iceland	Faroe Islands
	Strict lockdown during first surge (Mar-Apr) of COVID-19. Continued restrictions on big gatherings in the summer. In the autumn restrictions increased with use of facemasks and working from home. In late December strict restrictions were implemented with closing of schools, shops and restaurants. However, restrictions during the first wave were more severe than during the second wave.	Strict lockdown both during first (Mar-Apr) and second wave (schools and workplaces in general closed), with stricter escalating restrictions from 5 Nov. Workplaces in general closed late autumn as well (variations across country). Recommendations against any unnecessary travel both in the spring and also nationally towards the end of the year.	Restrictions and recommendations based on individual responsibility, but no full lockdown during first surge (Mar-Apr). Schools kept open for children under the age of 16 throughout 2020. Strong compliance by employers/employees to work-from-home policy. In late fall restrictions more similar to other Nordic countries were implemented, yet based on recommendations.	Strict national lockdown during first wave (Mar-Apr), and regional restrictions during the second wave (Nov-Dec).	Strict lockdown during first surge (Mar-Apr) plus extensive testing, tracing and quarantine. ¹ Work-from-home policy widely applied, school restrictions and recommendations against unnecessary travel. No registered new COVID-19 cases in mid-July, and a surge in Sep-Oct, which led to resumed restrictions.	Strict lockdown and travel restrictions to the Faroe Islands during first wave. Periods of no new cases, and a surge in Aug that led to resumed restrictions in early autumn.

Supplementary Table S2. Number of new COVID-19 cases by month and the mortality rate from COVID-19 in the year 2020 in the Nordic countries.

	Denmark	Norway	Sweden	Finland	Iceland	Faroe Islands
Monthly new cases COVID-19 in 2020^a	N	N	N	N	N	N
Jan	0	0	0	1	0	0
Feb	3	21	14	8	1	0
Mar	3173	5086	4820	1788	1219	174
Apr	6383	2678	16770	3625	578	13
May	2168	651	17054	1564	8	0
Jun	1095	454	29206	283	12	0
Jul	1098	414	9077	216	50	4
Aug	3298	1648	7456	764	152	157
Sep	11620	3214	9441	2153	607	61
Oct	19730	6986	38194	6151	1959	23
Nov	34559	15474	129006	9548	428	7
Dec	80352	13525	193727	10552	235	107
Total cases, Jan-Dec 2020	163479	50151	454765	36653	5249	680
COVID-19 related deaths², Jan-Dec 2020	1298	461	9814	629	29	1
Total population 2020³	5,792,203	5,421,242	10,099,270	5,540,718	341,250	52,305
Deaths per 100,000, Jan-Dec 2020	22.4	8.5	97.2	11.4	8.5	1.9

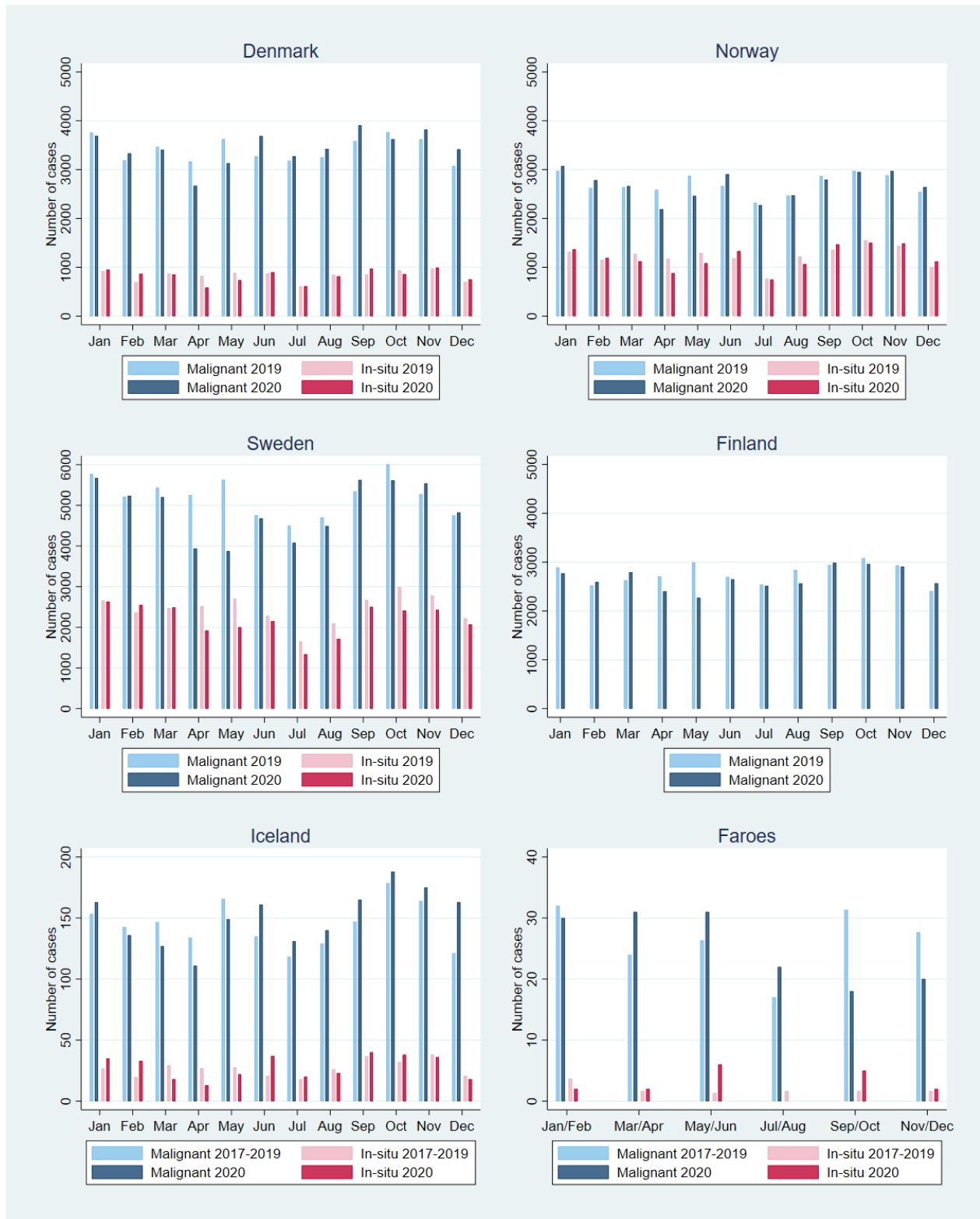
Supplementary Table S3. Data sources of newly diagnosed cancer cases and inclusion and exclusion criteria used by each Nordic country.

	Denmark	Norway	Sweden	Finland	Iceland	Faroe Islands
Data source	Pathology reports to the Danish Cancer Registry	Pathology reports to the Cancer Registry of Norway	Notifications: Electronic pathology reports from 15 of 31 labs at the six Regional Cancer Centers covering 55% of Swedish population New cases: Pathology and/or clinical notifications to six Regional Tumour Registers, covering 100% of population	Pathology reports to the Finnish Cancer Registry	Pathology reports to the Icelandic Cancer Registry	Pathology reports at the National Hospital of the Faroe Islands
Diagnosis coding system	NORPAT/SNOMED	NORPAT/SNOMED	ICD-O-3 ^a	ICD-O-3	ICD-O-3	ICD-O-3
Inclusion criteria 'number of notifications'	All notifications per month in 2019 and 2020	All notifications per month in 2019 and 2020	All notifications per month in 2019 and 2020	All notifications per month in 2019 and 2020	All notifications per month in 2017-2019 and 2020	All notifications per month in 2017-2019 and 2020
Exclusions 'number of notifications'	No exclusions	No exclusions	No exclusions	No exclusions	No exclusions	No exclusions
Inclusion criteria 'number of new cases'	First notification per individual in 2019-2020	First notification per individual in 2019-2020	First notification per individual in 2019-2020	First notification per individual in 2019-2020	First notification per individual in 2017-2020	First notification per individual in 2017-2020
Exclusions 'number of new cases'	A prior record of pathology notification within five years prior to notification in 2019-2020	A prior record of pathology notification within five years prior to notification in 2019-2020	A prior record of pathology /clinical notification within five years prior to notification in 2019-2020	A prior record of pathology notification within two years prior to notification in 2019-2020 ^b	A prior record in the Icelandic incidence register within five years prior to notification in 2017-2020	A prior record of pathology notification within five years prior to notification in 2017-2020

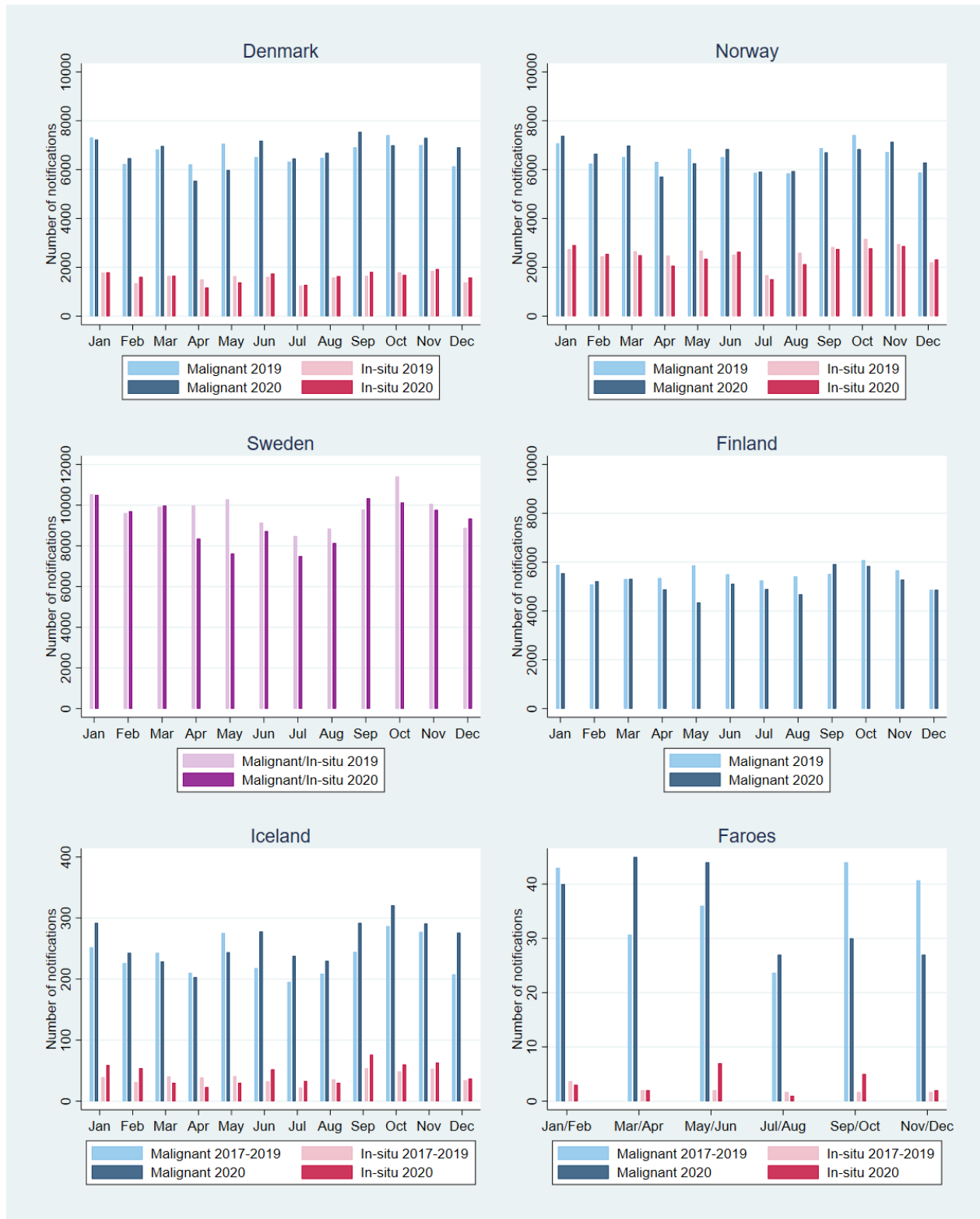
^a For Sweden, data extraction was based on a variable for benign/malignant diagnoses (Appendix 1 in the coding instruction of the Swedish Cancer Registry) which is defined according to underlying ICD-O-3 topology and morphology codes for malignant and in-situ diagnoses, and excluding basalioma (i.e. corresponding to the ICD-O-3 definitions given in the Methods section in the main text).⁴

^b For Finland, due to technical changes made in the pathology notification database in 2017, the count of new cases excluded those with prior notifications within 2 years of 2019-2020.

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Supplementary Figure S2. Number of notifications to the Nordic cancer registries, 2020 vs 2019 (vs average 2017-2019 for Iceland/Faroes). Both men and women, ages 18+.



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