

# The impact of the COVID-19 pandemic on the diagnosis and treatment of cancer in Northern Portugal

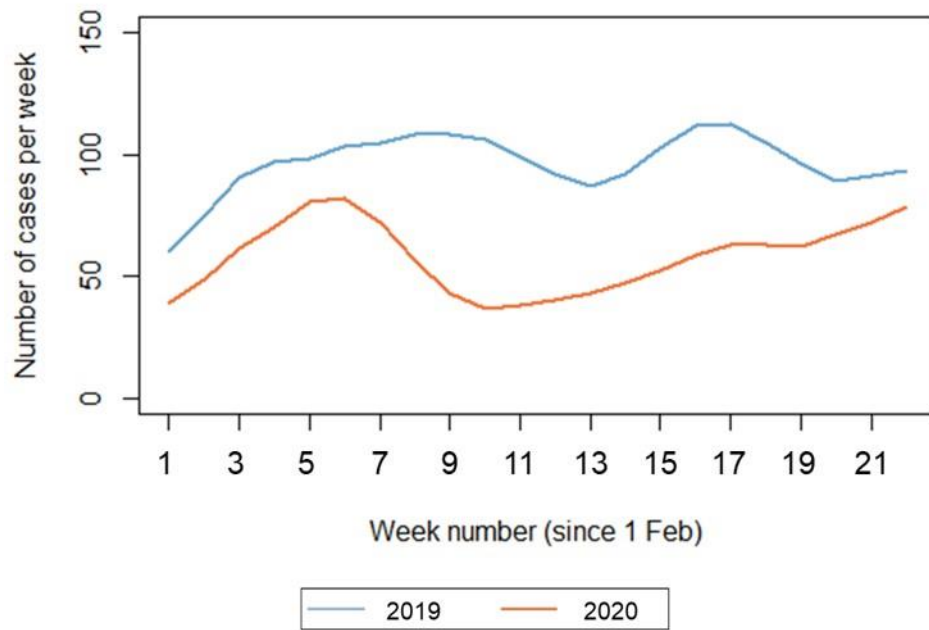
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## COVID-19 plan at IPO-Porto

The key events and recommendations by IPO-Porto during the COVID-19 pandemic are presented in Fig. 1. Following the rapid spread of COVID-19 worldwide in early 2020 (World Health Organization, 2020), as part of the Containment Phase, IPO-Porto published a COVID-19 Contingency Plan on 18 February with a guide on procedures to be followed with any suspected COVID-19 case (Instituto Português de Oncologia do Porto, 2020). The first confirmed COVID-19 cases in Porto, Portugal, were reported on 2 March and the Portuguese Government declared the highest level of alert due to COVID-19 on 12 March with the country entering the Mitigation Phase as community transmission was detected (República Portuguesa, 2020). The first confirmed death due to COVID-19 was recorded in Portugal on 16 March (Direção-Geral da Saúde, 2020). Moreover, IPO-Porto disseminated several recommendations regarding surgeries, outpatient appointments, diagnostic tests and medical procedures, ambulatory care, and cancer-specific emergency service (Instituto Português de Oncologia do Porto, 2020). On the next day (17 March), IPO-Porto suspended the inclusion of new patients in clinical trials (Instituto Português de Oncologia do Porto, 2020). By 18 March, the Portuguese Government declared a State of Emergency (highest exceptional status), which was in place until 2 May when the country entered the State of Contingency (mid-exceptional status) (República Portuguesa, 2020). IPO-Porto revised their Contingency Plan considering the Mitigation Phase of COVID-19 on 19 March and a COVID-19 Crisis Office was created (Instituto Português de Oncologia do Porto, 2020). SARS-CoV-2 screening procedures were introduced at IPO-Porto on 27 March for asymptomatic patients with a scheduled surgery and symptomatic workers; these were extended to asymptomatic patients with scheduled hospitalizations on 6 April, to patients undergoing chemotherapy in the Ambulatory Service on 28 May, and finally, to overnight visitors of hospitalized patients with cancer on 5 June (Instituto Português de Oncologia do Porto, 2020). On 17 April, the Contingency Hospitalization Unit at IPO-Porto began to operate, which allowed for the interim hospitalization of suspected or confirmed COVID-19 patients (Instituto Português de Oncologia do Porto, 2020). Beginning in May, IPO-Porto stated that activity levels should gradually and progressively return to nearly regular; recommendations were published for surgeries, outpatient appointments, diagnostic tests and medical procedures, day hospital, hospitalizations, and the clinical research unit (Instituto Português de Oncologia do Porto, 2020). To accommodate for this, a second cancer-specific emergency service for the evaluation of suspected COVID-19 patients opened between 7 May and 2 June (Instituto Português de Oncologia do Porto, 2020). Guidelines for telemedicine appointments and face-to-face appointments at IPO-Porto were published on 15 June (Instituto Português de Oncologia do Porto, 2020). Finally, Portugal entered the State of Alert (lowest exceptional status) on 1 July (República Portuguesa, 2020). The main measures implemented included: mandatory confinement for patients and those under active surveillance; rules on physical distancing, mask use, respiratory hygiene, indoor and outdoor space capacity, and hours of operation are maintained; gathering limits were increased; alcohol consumption in public outdoor spaces (e.g.: beach, parks) continued to be prohibited (Governo da República Portuguesa - Ministério da Saúde, 2020).



**Figure S1.** Cancer cases diagnosed between 1 February and 1 July in 2019 and 2020 by weeks among all cancer cases diagnosed at the Portuguese Oncology Institute of Porto.

**Table S1.** Sociodemographic, clinical and treatment characteristics of cancer cases diagnosed in February 2019 and February 2020.

	Cancer diagnosis		<i>p</i> -value	Proportional variation % (95% CI)*
	February 2019 <i>N</i> (%)	February 2020 <i>N</i> (%)		
	320	298		-6.9 (-20.5, +9.0)
<b>Sex</b>				
Male	174 (54.4)	142 (47.6)	0.095	-18.4 (-34.6, +1.9)
Female	146 (45.6)	156 (52.4)		6.8 (-14.7, +33.9)
<b>Age (years)</b>				
<55	78 (24.4)	78 (26.2)	0.723	0.0 (-26.9, +36.9)
55-64	83 (25.9)	68 (22.8)		-18.1 (-40.5, +12.9)
65-74	96 (30.0)	86 (28.9)		-10.4 (-33.0, +19.8)
>74	63 (19.7)	66 (22.1)		4.8 (-25.8, +48.0)
<b>Place of residence<sup>†</sup></b>				
Porto Metropolitan Area	163 (50.9)	157 (52.7)	0.664	-3.7 (-22.6, +19.9)
Outside the Porto Metropolitan Area	157 (49.1)	141 (47.3)		-10.2 (-28.4, +12.7)
<b>Cancer site<sup>††</sup></b>				
Esophagus	6 (1.9)	5 (1.7)	0.155	-16.7 (-74.6, +173.0)
Stomach	49 (15.3)	31 (10.4)		-36.7 (-59.5, -0.8)
Colon and rectum	56 (17.5)	48 (16.1)		-14.3 (-41.7, +26.0)
Pancreas	4 (1.2)	11 (3.7)		175.0 (-12.4, +765.8)
Lung <sup>‡</sup>	41 (12.8)	49 (16.4)		19.5 (-21.1, +81.0)
Skin-melanoma	19 (5.9)	19 (6.4)		0.0 (-47.0, +88.9)
Breast <sup>‡</sup>	67 (20.9)	69 (23.1)		3.0 (-26.4, +44.1)
Cervix	8 (2.5)	2 (0.7)		-75.0 (-94.7, +17.8)
Prostate	47 (14.7)	36 (12.1)		-23.4 (-50.4, +18.2)
Non-Hodgkin lymphoma	19 (5.9)	20 (6.7)		5.3 (-43.8, +97.2)
Leukemia	4 (1.2)	8 (2.7)		100.0 (-39.8, +564.2)

95% CI – 95% Confidence Interval; COVID-19 – Coronavirus disease 2019.

\* Calculated using *Poisson* regression.

<sup>†</sup> Porto Metropolitan Area includes the following municipalities: Arouca, Espinho, Gondomar, Maia, Matosinhos, Oliveira de Azeméis, Paredes, Porto, Póvoa de Varzim, Santa Maria da Feira, Santo Tirso, São João da Madeira, Trofa, Vale de Cambra, Valongo, Vila Nova de Gaia, Vila do Conde.

<sup>††</sup> International Statistical Classification of Diseases and Related Health Problems 10th Revision:(World Health Organization, 1992) esophagus – C15; stomach – C16; colon and rectum – C18-20; pancreas – C25; lung – C34; skin-melanoma – C43; breast – C50; cervix – C53; prostate – C61; non-Hodgkin lymphoma – C82-86, C96; leukemia – C91-95.

<sup>‡</sup> Lung: 14 left, 24 right, 3 unknowns/missing and 17 left, 8 right, 4 unknowns/missing; breast: 43 left, 23 right and 34 left, 33 right, 2 unknowns/missing; in February 2019 and February 2020, respectively.

**Table S2.** Sociodemographic, clinical and treatment characteristics of cancer cases diagnosed and treated before and after the onset of COVID-19 by month of diagnosis in 2019 and 2020 (March to June).

	Month and year of cancer diagnosis*											
	March			April			May			June		
	2019	2020	<i>p</i> -value	2019	2020	<i>p</i> -value	2019	2020	<i>p</i> -value	2019	2020	<i>p</i> -value
	<i>N</i> (%)	<i>N</i> (%)		<i>N</i> (%)	<i>N</i> (%)		<i>N</i> (%)	<i>N</i> (%)		<i>N</i> (%)	<i>N</i> (%)	
	323	240		347	145		414	206		319	268	
<b>Sex</b>												
Male	162 (50.1)	117 (48.7)		190 (54.8)	71 (49.0)		213 (51.4)	99 (48.1)		173 (54.2)	131 (48.9)	
Female	161 (49.9)	123 (51.2)	0.742	157 (45.2)	74 (51.0)	0.241	201 (48.5)	107 (51.9)	0.426	146 (45.8)	137 (51.1)	0.196
<b>Age (years)</b>												
<55	83 (25.7)	67 (27.9)		92 (26.5)	41 (28.3)		93 (22.5)	46 (22.3)		75 (23.5)	63 (23.5)	
55-64	85 (26.3)	53 (22.1)		83 (23.9)	30 (20.7)		101 (24.4)	55 (26.7)		83 (26.0)	63 (23.5)	
65-74	97 (30.0)	68 (28.3)		101 (29.1)	48 (33.1)		136 (32.8)	61 (29.6)		93 (29.1)	71 (26.5)	
>74	58 (18.0)	52 (21.7)	0.500	71 (20.5)	26 (17.9)	0.693	84 (20.3)	44 (21.4)	0.844	68 (21.3)	71 (26.5)	0.496
<b>Place of residence<sup>†</sup></b>												
Porto Metropolitan Area	179 (55.4)	117 (48.7)		164 (47.3)	80 (55.2)		212 (51.2)	108 (52.4)		148 (46.4)	128 (47.8)	
Outside the Porto Metropolitan Area	144 (44.6)	123 (51.3)	0.117	183 (52.7)	65 (44.8)	0.110	202 (48.8)	98 (47.6)	0.775	171 (53.6)	140 (52.2)	0.741
<b>Cancer site<sup>††</sup></b>												
Esophagus	4 (1.2)	6 (2.5)		9 (2.6)	3 (2.1)		7 (1.7)	3 (1.5)		6 (1.9)	4 (1.5)	
Stomach	33 (10.2)	22 (9.2)		43 (12.4)	7 (4.8)		36 (8.7)	14 (6.8)		31 (9.7)	38 (14.2)	
Colon and rectum	40 (12.4)	24 (10.0)		43 (12.4)	16 (11.0)		53 (12.8)	27 (13.1)		47 (14.7)	48 (17.9)	
Pancreas	9 (2.8)	10 (4.2)		11 (3.2)	10 (6.9)		12 (2.9)	8 (3.9)		7 (2.2)	9 (3.4)	
Lung	48 (14.9)	45 (18.7)		54 (15.6)	34 (23.4)		56 (13.5)	45 (21.8)		46 (14.4)	39 (14.5)	
Skin-melanoma	16 (4.9)	15 (6.2)		18 (5.2)	7 (4.8)		23 (5.6)	16 (7.8)		23 (7.2)	18 (6.7)	
Breast	91 (21.2)	66 (27.5)		87 (25.1)	36 (24.8)		109 (26.3)	56 (27.2)		77 (24.1)	66 (24.6)	
Cervix	7 (2.2)	4 (1.7)		10 (2.9)	2 (1.4)		9 (2.2)	0 (0.0)		8 (2.5)	3 (1.1)	
Prostate	48 (14.9)	26 (10.8)		55 (15.8)	9 (6.2)		76 (18.4)	15 (7.3)		48 (15.0)	16 (6.0)	
Non-Hodgkin lymphoma	19 (5.9)	16 (6.7)		15 (4.3)	19 (13.1)		29 (7.0)	17 (8.2)		18 (5.6)	22 (8.2)	
Leukemia	8 (2.5)	6 (2.5)	0.765	2 (0.6)	2 (1.4)	<0.001	4 (1.0)	5 (2.4)	0.003	8 (2.5)	5 (1.9)	0.047
<b>Stage<sup>¶</sup></b>												
I	102 (34.5)	60 (27.5)		112 (33.9)	36 (29.0)		147 (38.6)	54 (29.4)		91 (31.1)	65 (27.0)	
II	66 (22.3)	48 (22.0)		70 (21.2)	11 (8.9)		73 (19.2)	39 (21.2)		66 (22.5)	52 (21.6)	
III	53 (17.9)	36 (16.5)		61 (18.5)	21 (16.9)		70 (18.4)	23 (12.5)		60 (20.5)	33 (13.7)	
IV	69 (23.3)	61 (28.0)		79 (23.9)	48 (38.7)		76 (19.9)	49 (26.6)		67 (22.9)	58 (24.1)	
Missing	6 (2.0)	13 (6.0)	0.078	8 (2.4)	8 (6.4)	0.001	15 (3.9)	19 (10.3)	0.002	9 (3.1)	33 (13.7)	<0.001
<b>Symptomatic</b>												
No	114 (35.3)	68 (28.3)		128 (36.9)	31 (21.4)		163 (39.4)	64 (31.1)		114 (35.7)	61 (22.8)	
Yes	190 (58.8)	153 (63.8)		199 (57.3)	104 (71.7)		216 (52.2)	133 (64.6)		185 (58.0)	190 (70.9)	
Unknown	19 (5.9)	19 (7.9)	0.178	20 (5.8)	10 (6.9)	0.004	35 (8.4)	9 (4.4)	0.008	20 (6.3)	17 (6.3)	0.002

Referral pathway												
Doctor	155 (48.0)	139 (57.9)		179 (51.6)	70 (48.3)		217 (52.4)	118 (57.3)		168 (52.7)	156 (58.2)	
Another hospital	108 (33.4)	70 (29.2)		117 (33.7)	53 (36.5)		143 (34.5)	58 (28.2)		110 (34.5)	75 (28.0)	
Organized screening	43 (13.3)	14 (5.8)		37 (10.7)	5 (3.4)		39 (9.4)	10 (4.8)		23 (7.2)	9 (3.4)	
Opportunistic screening	8 (2.5)	6 (2.5)		9 (2.6)	1 (0.7)		5 (1.2)	4 (1.9)		9 (2.8)	5 (1.9)	
Appointment	8 (2.5)	7 (2.9)		4 (1.1)	13 (9.0)		10 (2.4)	14 (6.8)		8 (2.5)	20 (7.5)	
Missing	1 (0.3)	4 (1.7)	<b>0.016</b>	1 (0.3)	3 (2.1)	<b>&lt;0.001</b>	0 (0.0)	2 (1.0)	<b>0.004</b>	1 (0.3)	3 (1.1)	<b>0.006</b>
First treatment												
Surgery	127 (39.3)	78 (32.5)		134 (38.6)	35 (24.1)		132 (31.9)	59 (28.6)		114 (35.7)	46 (17.2)	
Radiotherapy	40 (12.4)	14 (5.8)		56 (16.1)	15 (10.3)		74 (17.9)	9 (4.4)		32 (10.0)	12 (4.5)	
Brachytherapy	4 (1.2)	5 (2.1)		5 (1.4)	0 (0.0)		9 (2.2)	0 (0.0)		8 (2.5)	0 (0.0)	
Systemic treatment												
Chemotherapy	78 (24.1)	59 (24.6)		66 (19.0)	32 (22.1)		73 (17.6)	45 (21.8)		63 (19.7)	51 (19.0)	
Chemoradiotherapy	6 (1.9)	1 (0.4)		5 (1.4)	0 (0.0)		9 (2.2)	0 (0.0)		6 (1.9)	2 (0.7)	
Immunotherapy	1 (0.3)	1 (0.4)		2 (0.6)	1 (0.7)		0 (0.0)	2 (1.0)		1 (0.3)	2 (0.7)	
Targeted therapy	3 (0.9)	5 (2.1)		3 (0.9)	10 (6.9)		4 (1.0)	4 (1.9)		2 (0.6)	5 (1.9)	
Hormone therapy	19 (5.9)	1 (0.4)		18 (5.2)	6 (4.1)		20 (4.8)	9 (4.4)		21 (6.6)	8 (3.0)	
Other	1 (0.3)	1 (0.4)		0 (0.0)	0 (0.0)		0 (0.0)	0 (0.0)		0 (0.0)	2 (0.7)	
None (as of July 1 <sup>st</sup> ) <sup>§</sup>	44 (13.6)	59 (24.6)	<b>&lt;0.001</b>	58 (16.7)	46 (31.7)	<b>&lt;0.001</b>	93 (22.5)	78 (37.9)	<b>&lt;0.001</b>	72 (22.6)	140 (52.2)	<b>&lt;0.001</b>
Complications												
Anastomotic dehiscence (Yes) <sup>  </sup>	4 (3.1)	1 (1.3)	0.400	3 (2.2)	1 (2.9)	0.830	1 (0.8)	0 (0.0)	0.503	2 (1.7)	0 (0.0)	0.366
Clavien-Dindo Classification <sup>  </sup>	(Clavien <i>et al.</i> , 2009)											
None	113 (89.0)	69 (88.5)		114 (85.1)	33 (94.3)		115 (87.1)	57 (96.6)		104 (91.2)	40 (87.0)	
I-II	9 (7.1)	5 (6.4)		11 (8.2)	1 (2.9)		11 (8.3)	1 (1.7)		6 (5.3)	5 (10.9)	
III-V	5 (3.9)	4 (5.1)	0.909	9 (6.7)	1 (2.9)	0.352	6 (4.5)	1 (1.7)	0.124	4 (3.5)	1 (2.2)	0.416
Cancer-specific emergency visits (Yes) <sup>#</sup>	59 (18.3)	55 (23.4)	0.142	66 (19.3)	37 (25.9)	0.106	38 (9.4)	29 (14.2)	0.074	10 (3.1)	10 (3.8)	0.689
Hospitalizations (Yes) <sup>#</sup>	157 (48.8)	98 (41.7)	0.099	124 (36.3)	50 (35.0)	0.787	47 (11.6)	38 (18.6)	<b>0.019</b>	13 (4.1)	17 (6.4)	0.213

COVID-19 – Coronavirus disease 2019.

\* Twenty-seven cases diagnosed on 1 July 2019 and seven cases diagnosed on 1 July 2020 not included.

<sup>†</sup> Porto Metropolitan Area includes the following municipalities: Arouca, Espinho, Gondomar, Maia, Matosinhos, Oliveira de Azeméis, Paredes, Porto, Póvoa de Varzim, Santa Maria da Feira, Santo Tirso, São João da Madeira, Trofa, Vale de Cambra, Valongo, Vila Nova de Gaia, Vila do Conde.

<sup>††</sup> International Statistical Classification of Diseases and Related Health Problems 10th Revision: (World Health Organization, 1992) esophagus – C15; stomach – C16; colon and rectum – C18-20; pancreas – C25; lung – C34; skin-melanoma – C43; breast – C50; cervix – C53; prostate – C61; non-Hodgkin lymphoma – C82-86, C96; leukemia – C91-95.

<sup>‡</sup> Solid tumors only.

<sup>§</sup> Reasons for no treatment: March – 23 and 36 cases awaiting treatment to begin; 3 and 5 cases with cancer too advanced for treatment; 5 and 7 cases cannot undergo treatment due to current physical condition; 6 and 3 cases currently under surveillance; 7 and 8 cases died before any treatment in 2019 and 2020, respectively. April – 26 and 31 cases awaiting treatment to begin; 6 and 4 cases with cancer too advanced for treatment; 12 and 6 cases cannot undergo treatment due to current physical condition; 7 and 3 cases currently under surveillance; 7 and 2 cases died before any treatment in 2019 and 2020, respectively. May – 58 and 61 cases awaiting treatment to begin; 7 and 6 cases with cancer too advanced for treatment; 6 and 6 cases cannot undergo treatment due to current physical condition; 18 and 2 cases currently under surveillance; 4 and 3 cases died before any treatment in 2019 and 2020, respectively. June – 44 and 122 cases awaiting treatment to begin; 6 and 5 cases with cancer too advanced for treatment; 1 and 6 cases cannot undergo treatment due to current physical condition; 8 and 1 cases currently under surveillance; 13 and 6 cases died before any treatment in 2019 and 2020, respectively.

<sup>||</sup> Among those who underwent surgery as first treatment (127 in March, 134 in April, 132 in May, 114 in June 2019; 78 in March, 35 in April, 59 in May, 46 in June 2020).

<sup>#</sup> Among 322 patients with cancer in March, 342 in April, 405 in May, 317 in June 2019, and 235 patients with cancer in March, 143 in April, 204 in May, 266 in June 2020.

**Table S3.A.** Median time in days from onset of symptoms, first medical exam and first appointment to diagnosis before and after the onset of COVID-19 (2 March to 1 July 2019 and 2 March to 1 July 2020 with follow-up to 1 July 2019 or 2020, respectively), according to sociodemographic and clinical characteristics, and month of diagnosis.

		Onset of symptoms and diagnosis			First medical exam and diagnosis			First appointment and diagnosis		
		Total (N)	Median (P25-P75)	p-value	Total (N)	Median (P25-P75)	p-value	Total (N)	Median (P25-P75)	p-value
<b>ALL</b>	<i>Before</i>	567	84 (41-150)		1254	39 (14-64)		364	36 (15-46)	
	<i>After</i>	448	71 (39-129)	<b>0.020</b>	788	21 (8-53)	<b>&lt;0.001</b>	243	16 (8-36)	<b>&lt;0.001</b>
<b>SEX</b>	<b>Males</b>									
	<i>Before</i>	283	90 (41-146)		648	39 (13-77)		138	26 (8-50)	
	<i>After</i>	202	75 (40-129)	0.312	381	24 (7-61)	<b>0.001</b>	108	20 (7-42)	0.136
	<b>Females</b>									
	<i>Before</i>	284	80 (44-168)		606	39 (14-57)		226	36 (23-44)	
	<i>After</i>	246	71 (38-127)	<b>0.025</b>	407	20 (9-47)	<b>&lt;0.001</b>	135	15 (9-28)	<b>&lt;0.001</b>
<b>AGE (years)</b>	<b>&lt;55</b>									
	<i>Before</i>	165	73 (39-150)		303	29 (10-53)		95	35 (12-46)	
	<i>After</i>	126	60 (34-106)	0.119	201	16 (6-34)	<b>0.029</b>	60	15 (6-22)	<b>0.001</b>
	<b>55-64</b>									
	<i>Before</i>	120	93 (50-151)		320	48 (19-64)		106	39 (28-45)	
	<i>After</i>	98	72 (38-125)	0.078	182	24 (8-55)	<b>0.001</b>	61	15 (8-30)	<b>&lt;0.001</b>
	<b>65-74</b>									
	<i>Before</i>	154	82 (39-146)		374	44 (16-69)		108	35 (13-47)	
	<i>After</i>	121	75 (44-132)	0.469	233	24 (9-58)	<b>0.003</b>	73	18 (7-38)	0.281
	<b>&gt;74</b>									
	<i>Before</i>	130	96 (48-168)		257	33 (14-67)		55	24 (12-42)	
	<i>After</i>	103	80 (46-160)	0.574	172	21 (7-63)	0.231	46	28 (12-45)	0.532
<b>RESIDENCE*</b>	<b>Porto Metropolitan Area</b>									
	<i>Before</i>	283	80 (40-147)		627	37 (13-63)		169	35 (13-48)	
	<i>After</i>	237	72 (39-127)	0.144	398	22 (8-55)	<b>0.001</b>	138	16 (8-36)	<b>0.004</b>
	<b>Outside the Porto Metropolitan Area</b>									
	<i>Before</i>	284	85 (48-158)		627	40 (14-64)		195	36 (17-45)	
	<i>After</i>	211	71 (40-132)	0.080	390	21 (8-52)	<b>&lt;0.001</b>	105	15 (8-36)	<b>0.024</b>
	<b>Esophagus</b>									
	<i>Before</i>	20	90 (41-124)		25	12 (2-35)		2	14 (14-34)	
	<i>After</i>	13	68 (39-145)	0.875	17	7 (1-22)	0.210	2	8 (8-24)	0.433
	<b>Stomach</b>									
<i>Before</i>	74	69 (36-129)		140	6 (2-19)		12	84 (7-105)		
<i>After</i>	46	65 (49-95)	0.993	75	8 (2-20)	0.867	8	14 (6-32)	<b>0.014</b>	
<b>Colon and rectum</b>										
<i>Before</i>	85	94 (55-159)		174	10 (3-41)		11	42 (12-55)		
<i>After</i>	71	80 (50-161)	0.841	112	10 (3-36)	0.828	17	29 (10-69)	0.697	
<b>Pancreas</b>										
<i>Before</i>	30	71 (39-144)		34	50 (27-123)		20	36 (15-50)		
<i>After</i>	28	75 (29-160)	0.928	33	22 (13-49)	0.085	13	11 (8-19)	<b>0.036</b>	
<b>Lung</b>										
<i>Before</i>	115	95 (46-144)		194	39 (18-63)		79	26 (8-48)		
<i>After</i>	84	89 (40-150)	0.962	151	28 (9-71)	0.841	68	28 (13-44)	0.342	
<b>Skin-melanoma</b>										
<i>Before</i>	20	73 (28-205)		58	15 (5-23)		4	10 (8-11)		
<i>After</i>	11	129 (94-375)	0.214	45	73 (49-239)	<b>0.007</b>	4	12 (1-103)	0.221	

CANCER GROUP <sup>††</sup>	<b>Breast</b>									
	<i>Before</i>	119	70 (37-154)		340	42 (16-57)		177	38 (29-43)	
	<i>After</i>	110	56 (34-99)	<b>0.015</b>	207	20 (12-38)	<b>0.002</b>	88	15 (12-21)	<b>&lt;0.001</b>
	<b>Cervix</b>									
	<i>Before</i>	19	122 (50-177)		24	28 (12-71)		2	16 (16-48)	
	<i>After</i>	5	37 (27-94)	<b>0.037</b>	7	19 (9-58)	0.555	1	--	--
	<b>Prostate</b>									
	<i>Before</i>	12	118 (49-249)		173	71 (36-123)		27	68 (23-110)	
	<i>After</i>	4	90 (68-105)	0.159	54	61 (28-88)	0.055	11	12 (10-48)	<b>0.025</b>
	<b>Non-Hodgkin lymphoma</b>									
<i>Before</i>	54	73 (45-150)		73	40 (18-67)		23	15 (6-23)		
<i>After</i>	49	65 (41-134)	0.337	70	21 (8-40)	<b>0.018</b>	23	9 (4-21)	0.795	
<b>Leukemia</b>										
<i>Before</i>	5	24 (10-80)		19	24 (2-30)		7	2 (1-3)		
<i>After</i>	2	34 (24-68)	0.521	17	3 (1-21)	<b>0.031</b>	8	1 (1-1)	<b>0.016</b>	
STAGE <sup>††</sup>	<b>Digestive</b>									
	<i>Before</i>	346	89 (42-146)		373	12 (3-47)		45	42 (15-75)	
	<i>After</i>	205	75 (47-152)	0.825	237	12 (3-31)	0.312	40	14 (8-36)	<b>0.005</b>
	<b>Lymphoid, hematopoietic and related tissue</b>									
	<i>Before</i>	59	69 (35-150)		92	32 (14-59)		30	8 (2-21)	
	<i>After</i>	51	61 (34-115)	0.134	87	16 (5-38)	<b>0.008</b>	31	6 (1-16)	0.620
	<b>I</b>									
	<i>Before</i>	259	80 (41-192)		408	47 (18-63)		172	39 (29-48)	
	<i>After</i>	126	55 (25-123)	0.129	203	27 (12-78)	0.391	71	20 (13-52)	0.339
	<b>II</b>									
<i>Before</i>	210	87 (35-151)		239	44 (18-72)		54	39 (22-49)		
<i>After</i>	104	63 (38-106)	0.155	137	21 (9-61)	<b>0.018</b>	41	13 (8-22)	<b>0.011</b>	
<b>III</b>										
<i>Before</i>	208	103 (49-175)		218	39 (15-66)		34	32 (10-52)		
<i>After</i>	84	71 (39-147)	0.103	104	21 (7-37)	<b>0.004</b>	28	18 (13-45)	0.767	
<b>IV</b>										
<i>Before</i>	214	84 (45-144)		273	26 (7-56)		70	21 (8-41)		
<i>After</i>	145	78 (44-143)	0.903	201	23 (8-44)	0.152	67	16 (8-30)	0.096	
MONTH OF DIAGNOSIS <sup>§</sup>	<b>March</b>									
	<i>Before</i>	138	74 (41-150)		292	41 (12-67)		113	40 (16-48)	
	<i>After</i>	115	63 (34-119)	0.605	216	26 (14-58)	0.132	68	18 (10-39)	<b>0.029</b>
	<b>April</b>									
	<i>Before</i>	147	90 (38-145)		314	40 (12-61)		100	35 (21-47)	
	<i>After</i>	79	74 (40-115)	0.208	130	28 (9-60)	0.192	48	22 (8-38)	0.067
	<b>May</b>									
	<i>Before</i>	155	90 (47-151)		359	39 (16-61)		93	35 (12-42)	
	<i>After</i>	102	74 (50-143)	0.480	130	18 (8-63)	<b>0.006</b>	58	14 (8-33)	0.109
	<b>June</b>									
<i>Before</i>	123	93 (42-167)		279	34 (14-61)		58	31 (13-40)		
<i>After</i>	146	73 (39-129)	<b>0.014</b>	245	15 (6-33)	<b>&lt;0.001</b>	67	14 (8-25)	<b>0.047</b>	

COVID-19 – Coronavirus disease 2019; P25-P75 – Percentiles 25 and 75.

\* Porto Metropolitan Area includes the following municipalities: Arouca, Espinho, Gondomar, Maia, Matosinhos, Oliveira de Azeméis, Paredes, Porto, Póvoa de Varzim, Santa Maria da Feira, Santo Tirso, São João da Madeira, Trofa, Vale de Cambra, Valongo, Vila Nova de Gaia, Vila do Conde.

† International Statistical Classification of Diseases and Related Health Problems 10th Revision: (World Health Organization, 1992) esophagus – C15; stomach – C16; colon and rectum – C18-20; pancreas – C25; lung – C34; skin-melanoma – C43; breast – C50; cervix – C53; prostate – C61; non-Hodgkin lymphoma – C82-86, C96; leukemia – C91-95.

†† Digestive (C15, C16, C18-20, C25); Lymphoid, hematopoietic and related tissue (C82-86, C91-96).

†† Solid tumors only.

§ Twenty-seven cases diagnosed on 1 July 2019 and seven cases diagnosed on 1 July 2020 not included.



**Table S3.B.** Median time in days from diagnosis to first appointment, multidisciplinary tumor board meeting and first treatment before and after the onset of COVID-19 (2 March to 1 July 2019 and 2 March to 1 July 2020 with follow-up to 1 July 2019 or 2020, respectively), according to sociodemographic and clinical characteristics, and month of diagnosis.

		Diagnosis and first appointment			Diagnosis and multidisciplinary tumor board meeting*			Diagnosis and first treatment		
		Total (N)	Median (P25-P75)	p-value	Total (N)	Median (P25-P75)	p-value	Total (N)	Median (P25-P75)	p-value
ALL	Before	1066	34 (20-..)		1398	46 (24-98)		1430	84 (57-..)	
	After	623	22 (14-..)	<0.001	856	35 (18-63)	<0.001	866	80 (51-..)	<0.001
SEX	<b>Males</b>									
	Before	615	42 (21-..)		735	61 (31-114)		786	117 (62-..)	
	After	310	24 (14-..)	<0.001	405	36 (20-74)	<0.001	418	89 (45-..)	0.001
	<b>Females</b>									
	Before	451	27 (18-..)		663	36 (18-67)		677	72 (54-112)	
	After	313	21 (13-..)	<0.001	441	34 (16-58)	0.117	448	76 (57-115)	<0.001
AGE (years)	<b>&lt;55</b>									
	Before	254	23 (15-..)		340	40 (20-68)		349	71 (49-113)	
	After	160	20 (13-28)	0.008	214	34 (15-62)	0.328	220	78 (54-115)	0.001
	<b>55-64</b>									
	Before	252	35 (20-..)		354	50 (24-88)		358	86 (61-..)	
	After	140	24 (13-..)	0.001	201	34 (18-63)	<0.001	201	71 (47-..)	0.421
	<b>65-74</b>									
	Before	326	40 (22-..)		425	49 (25-109)		434	90 (57-..)	
	After	175	24 (15-..)	<0.001	245	35 (20-65)	<0.001	251	87 (48-..)	0.001
	<b>&gt;74</b>									
	Before	234	38 (22-..)		279	56 (28-..)		289	110 (61-..)	
	After	148	25 (13-..)	<0.001	186	37 (18-70)	<0.001	194	89 (62-..)	0.005
RESIDENCE†	<b>Porto Metropolitan Area</b>									
	Before	545	34 (18-..)		697	48 (25-102)		714	84 (56-..)	
	After	300	21 (13-..)	<0.001	423	31 (17-58)	<0.001	438	73 (47-..)	0.113
	<b>Outside Porto Metropolitan Area</b>									
	Before	521	34 (21-..)		701	45 (23-91)		716	89 (58-..)	
	After	323	23 (14-..)	<0.001	423	39 (21-66)	0.006	428	88 (57-..)	<0.001
	<b>Esophagus</b>									
	Before	25	13 (8-34)		27	48 (41-74)		27	.. (83-..)	
	After	16	29 (10-..)	0.206	18	53 (35-70)	0.752	18	88 (68-..)	0.589
	<b>Stomach</b>									
Before	135	28 (17-45)		141	45 (35-75)		147	89 (66-..)		
After	73	15 (10-28)	<0.001	79	29 (18-45)	<0.001	81	75 (56-..)	0.418	
<b>Colon and rectum</b>										
Before	173	21 (14-..)		176	38 (28-55)		184	69 (51-95)		
After	98	15 (9-..)	<0.001	110	26 (18-41)	<0.001	115	67 (44-89)	0.429	
<b>Pancreas</b>										
Before	21	20 (14-34)		37	28 (14-59)		41	67 (57-..)		
After	24	24 (9-..)	0.403	33	24 (17-58)	0.703	37	94 (93-..)	0.303	
<b>Lung</b>										
Before	130	34 (25-..)		203	39 (17-68)		209	76 (47-95)		
After	96	28 (19-53)	0.116	161	34 (18-66)	0.644	164	68 (41-89)	0.025	
<b>Skin-melanoma</b>										
Before	77	43 (28-..)		77	87 (53-92)		81	110 (110-..)		
After	52	32 (21-43)	0.056	52	.. (72-..)	0.227	56	.. (108-..)	<0.001	
CANCER SITE††	<b>Breast</b>									
	Before	193	24 (17-..)		368	28 (14-56)		370	70 (54-112)	
	After	139	18 (13-28)	0.001	225	30 (14-54)	0.709	227	78 (65-111)	<0.001

	<b>Cervix</b>								
	<i>Before</i>	33	63 (28-..)		35	63 (38-..)		35	.. (61-..)
	<i>After</i>	8	62 (17-68)	0.292	9	41 (35-68)	0.221	9	87 (73-..)
	<b>Prostate</b>								
	<i>Before</i>	206	80 (50-..)		232	109 (87-..)		233	.. (..-..)
	<i>After</i>	55	45 (24-..)	<0.001	66	77 (29-115)	<0.001	66	.. (106-..)
	<b>Non-Hodgkin lymphoma</b>								
	<i>Before</i>	58	27 (16-..)		80	48 (27-71)		81	51 (20-..)
	<i>After</i>	52	23 (15-34)	0.135	75	35 (21-50)	0.028	75	41 (25-70)
	<b>Leukemia</b>								
	<i>Before</i>	15	2 (2-..)		22	23 (16-26)		22	28 (7-..)
	<i>After</i>	10	3 (3-..)	0.830	8	16 (6-27)	0.442	18	13 (2-43)
<b>CANCER GROUP<sup>¶</sup></b>	<b>Digestive</b>								
	<i>Before</i>	354	23 (14-..)		381	42 (29-63)		399	74 (57-..)
	<i>After</i>	211	17 (9-29)	<0.001	240	29 (18-49)	<0.001	251	84 (53-..)
	<b>Lymphoid, hematopoietic and related tissue</b>								
	<i>Before</i>	73	27 (16-..)		102	42 (21-71)		103	51 (17-..)
	<i>After</i>	62	23 (14-34)	0.130	93	34 (20-47)	0.025	93	40 (21-64)
<b>STAGE<sup>§</sup></b>	<b>I</b>								
	<i>Before</i>	283	30 (21-..)		438	39 (17-73)		455	74 (59-112)
	<i>After</i>	145	21 (15-34)	<0.001	204	31 (15-62)	0.090	216	88 (71-..)
	<b>II</b>								
	<i>Before</i>	228	45 (21-..)		277	63 (32-..)		282	.. (69-..)
	<i>After</i>	110	21 (14-50)	<0.001	149	56 (25-77)	0.006	151	89 (72-..)
	<b>III</b>								
	<i>Before</i>	212	42 (18-..)		242	50 (29-91)		246	85 (57-..)
	<i>After</i>	85	20 (10-27)	<0.001	112	37 (18-60)	<0.001	113	72 (51-106)
	<b>IV</b>								
	<i>Before</i>	227	29 (16-..)		294	43 (24-75)		297	82 (46-..)
	<i>After</i>	152	22 (13-..)	0.005	215	28 (18-50)	<0.001	219	65 (40-..)
<b>MONTH OF DIAGNOSIS<sup>  </sup></b>	<b>March</b>								
	<i>Before</i>	210	28 (16-62)		310	38 (17-74)		323	76 (54-..)
	<i>After</i>	172	24 (14-47)	0.119	234	41 (20-70)	0.998	240	84 (58-..)
	<b>April</b>								
	<i>Before</i>	247	31 (20-51)		336	44 (22-87)		347	.. (56-..)
	<i>After</i>	97	21 (13-39)	0.001	141	29 (18-51)	<0.001	145	70 (40-..)
<b>May</b>									
<i>Before</i>	321	39 (18-..)		409	.. (28-..)		414	.. (..-..)	
<i>After</i>	148	21 (11-30)	<0.001	202	29 (16-53)	<0.001	206	.. (49-..)	
<b>June</b>									
<i>Before</i>	261	.. (24-..)		316	.. (..-..)		319	.. (..-..)	
<i>After</i>	201	.. (14-..)	<0.001	262	.. (..-..)	0.009	268	.. (..-..)	

COVID-19 – Coronavirus disease 2019; P25-P75 – Percentiles 25 and 75.

.. – Not yet available.

\* 32 and 20 cancer cases had a multidisciplinary tumor board meeting before diagnosis in 2019 and 2020, respectively.

† Porto Metropolitan Area includes the following municipalities: Arouca, Espinho, Gondomar, Maia, Matosinhos, Oliveira de Azeméis, Paredes, Porto, Póvoa de Varzim, Santa Maria da Feira, Santo Tirso, São João da Madeira, Trofa, Vale de Cambra, Valongo, Vila Nova de Gaia, Vila do Conde.

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¶ Digestive (C15, C16, C18-20, C25); Lymphoid, hematopoietic and related tissue (C82-86, C91-96).

§ Solid tumors only.

|| Twenty-seven cases diagnosed on 1 July 2019 and seven cases diagnosed on 1 July 2020 not included.

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