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Prioritisation by FIT to mitigate the impact of delays in the 2-week wait colorectal cancer referral pathway during the COVID-19 pandemic: a UK modelling study [FULL TEXT LINK]

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Colorectal cancer can result in high mortality. Delays in urgent referral of symptomatic patients and bottlenecks in endoscopy have potential to cause high attributable deaths and lost life years. FIT triage at 10 µg Hb/g offers opportunity to mitigate 89% of these deaths and reduce exposure of patients to nosocomial COVID-19 infection.

Table 3 Impact of per-patient average delays in CRC diagnostic pathway of 2/4/6 months and impact of mitigation via FIT triage

Reference period of disruption (months)	12		
Duration of background delay (months)	2	4	6
No FIT prioritisation			
CRC cases	11 226		
Deaths attributable to delay	653	1419	2250
Life years lost attributable to delay	9214	20315	32 799
Urgent 2WW colonoscopies required	511 394		
Prioritisation out of delay of individuals with FIT >2 µg Hb/g Sensitivity: 96.2% Specificity: 64.3%			
FIT-positive cases	10 777		
FIT-negative cases	449		
Deaths attributable to delay	26	57	90
Deaths mitigated by FIT prioritisation	627	1363	2160
Life years lost attributable to delay	369	813	1312
Lost life years mitigated by FIT prioritisation	8846	19502	31 487
Urgent 2WW colonoscopies required	189 216		
Prioritisation out of delay of individuals with FIT >10 µg Hb/g Sensitivity: 89.4% Specificity: 83.5%			
FIT-positive cases	9991		
FIT-negative cases	1235		
Deaths attributable to delay	72	156	248
Deaths mitigated by FIT prioritisation	581	1263	2003
Life years lost attributable to delay	1014	2235	3608
Lost life years mitigated by FIT prioritisation	8201	18 080	29 191
Urgent 2WW colonoscopies required	92 051		
Prioritisation out of delay of individuals with FIT >150 µg Hb/g Sensitivity: 65.9% Specificity: 94.9%			
FIT-positive cases	7409		
FIT-negative cases	3817		
Deaths attributable to delay	222	482	765
Deaths mitigated by FIT prioritisation	431	937	1485
Life years lost attributable to delay	3132	6907	11 152
Lost life years mitigated by FIT prioritisation	6081	13 408	21 648
Urgent 2WW colonoscopies required	35 798		

Assumptions: FIT is applied promptly at presentation in primary care and individuals who are FIT-positive are prioritised such that they experience no pathway delay; individuals who are FIT-negative experience the specified 'background' pathway delay ahead of being diagnosed.

Table 1 Average reduction in 10-year net CRC survival by age and stage consequent from per-patient delay of 2/4/6 months in the diagnostic pathway (assuming no prioritisation based on FIT)

Age band	CRC stage	Average per-patient delay in diagnosis Average reduction in 10-year net survival		
		2 months	4 months	6 months
30–39 years	Stage 1	0.4%	1.1%	1.9%
	Stage 2	5.1%	11.7%	20.1%
	Stage 3	9.1%	20.0%	32.2%
40–49 years	Stage 1	1.6%	3.9%	7.0%
	Stage 2	5.2%	12.0%	20.7%
	Stage 3	9.7%	21.1%	33.5%
50–59 years	Stage 1	1.7%	4.1%	7.5%
	Stage 2	4.9%	11.3%	19.5%
	Stage 3	9.3%	20.5%	32.8%
60–69 years	Stage 1	1.7%	4.3%	8.0%
	Stage 2	5.3%	12.4%	21.4%
	Stage 3	9.5%	20.8%	33.1%
70–79 years	Stage 1	2.7%	6.8%	12.5%
	Stage 2	6.5%	15.0%	25.5%
	Stage 3	11.0%	23.2%	35.0%
80+ years	Stage 1	7.5%	17.2%	28.7%
	Stage 2	8.2%	18.5%	30.4%
	Stage 3	11.5%	22.0%	29.7%

Red shading indicates greater impact on survival; blue shading indicates lesser impact on survival.

METHODS

Age-stratified reductions in CRC survival / life years lost from 2–6 months delays in the 2WW patient pathway were modelled to provide Individual-level CRC survival change v's age-specific nosocomial COVID-19 related fatality per patient undergoing colonoscopy. Mitigation strategies using FIT threshold triage at 2 or 10 or 150 µg Hb/g to prioritise 2WW colonoscopy referrals were modelled using 10-year net CRC survival for England 2008–2017, 2WW pathway CRC case and referral volumes and per-day-delay Hazard Ratios generated from observational studies of diagnosis-to- treatment interval.

RESULTS

Delay of 2/4/6 months across all 11,266 patients with CRC diagnosed per typical year via 2WW pathway were estimated to risk 653/1419/2250 attributable deaths and loss of 9214/20 315/32 799 life years. Risk– benefit from such urgent referrals is particularly sensitive to nosocomial COVID-19 rates for patients aged >60. Prioritisation out of delay for the 18% of symptomatic referrals with FIT >10 µg Hb/g would avoid 89% of these deaths attributable to presentation /diagnostic delay while reducing immediate requirement for colonoscopy by >80%.

BACKGROUND

COVID-19 pandemic placed unprecedented pressure on healthcare. Necessitating staff redeployment and deprioritisation of non-COVID-19 -non-emergency clinical services. 'Elective' surgery was compromised by competition for anaesthetic and critical care staff. Rapid access '2-week wait' (2WW) urgent referral pathway for patients with specified 'red-flag' cancer symptoms, typically diagnose 32% of colorectal Cancers (CRCs). Significant COVID-19–related disruption at multiple points in the CRC pathway resulted.

British Society of Gastroenterology, in March 2020, indicated safety concerns, recommending routine endoscopy be suspended, effectively halting all routes to CRC diagnosis including the National Bowel Cancer Screening programme. Routine laparoscopic bowel resections were also discontinued due to risk of aerosol generation. All symptomatic patients were recommended to undergo Faecal immunochemical testing (FIT), with only those with FIT >10 µg Hb/g referred into secondary care and those with FIT >150 µg Hb/g prioritised for colonoscopy – the likely effect of this policy was unknown.

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