

Supplementary analysis for patients starting treatment for upper gastrointestinal cancer

Patients waiting over 104 days from urgent suspected cancer referral to starting treatment for upper gastrointestinal cancer

Those of female gender were significantly less likely to be a long waiter for liver cancer compared to those of male gender in the original but not the rapid cancer registration dataset (RCRD) linked cohort and there was no significant variation by gender for oesophageal, pancreatic or stomach cancer (Tables 1, 7, 13 & 19). Those aged 80+ were less likely to be long waiters for oesophageal and pancreatic cancer compared to those aged 60–69, but there was no other consistent significant difference by age. There was no significant variation by deprivation for liver, stomach or pancreatic cancer, but those living in the most deprived quintile were more likely to be long waiters compared to the least for oesophageal cancer in the original analysis. The likelihood of being a long waiter increased with year for all sites, with the largest increases for oesophageal (3.08 for original analyses and 2.86 for RCRD linked) and stomach (3.02 for original analyses and 3.14 for RCRD linked). There was a large reduction in likelihood of being a long waiter with increasing stage for oesophageal, pancreatic and stomach cancer. Those with a comorbidity score of 1 were more likely to be long waiters for oesophageal and stomach cancer compared to those with a score of 0, and those with a score of 1 or 2 were more likely to be long waiters for pancreatic cancer. There were no significant differences by comorbidity for liver cancer.

The longest median subinterval was from referral to informed of diagnosis for liver and pancreatic cancer (Tables 2 & 14), but the median interval from informed of diagnosis to DTT for oesophageal and stomach cancer was longer than from referral to informed of diagnosis (Tables 8 & 20). The median time from DTT to treatment in Q1 & Q2 2022/2023 was 16 days for liver cancer and stomach cancer, 19 for oesophageal cancer, and 10 days for pancreatic cancer. Oesophageal cancer had a median time of 63 days from informed of diagnosis to DTT, with 58 days for stomach, 41 days for pancreatic and 50 days for liver in Q1 & Q2 2022/2023.

The most common reasons for delay between referral and treatment were healthcare provider delay and medical reason for diagnosis delay, with similar proportions, for all sites (Tables 3, 9, 15 & 21). 33% met the 28-day standard in Q1 & Q2 2022/2023 from referral to informed of diagnosis for oesophageal cancer, followed by 30% for stomach, 25% for liver and 22% for pancreatic. The proportion who met the 31-day standard from decision to treat (DTT) to treatment has decreased from 91% in 2017/2018 to 80% in Q1 & Q2 2022/2023 for liver, while remaining similar for oesophageal (91%), pancreatic (90%) and stomach (91%).

Patients waiting over 62 days from urgent suspected cancer referral to starting treatment for upper gastrointestinal cancer

The regression findings for waiting over 62 days were very similar to those for 104 days for liver and pancreatic cancer (Tables 4 & 16). For oesophageal cancer patients (Table 10) those aged 19–49 were also significantly less likely to wait over 62 days compared to those aged 60–69 in addition to those aged 80+, there was no significant variation by deprivation and those with a comorbidity score of 3+ were significantly less likely to wait over 62 days compared

to those with a score of 0. The results for stomach cancer were also very similar to those for patients waiting over 104 days (Table 22), with the exception that those aged 80+ were significantly less likely to wait over 62 days.

The interval findings were similar to those for patients waiting over 104 days (Tables 5, 11, 17, & 23), with the interval from informed of diagnosis and DTT longer than from referral to informed of diagnosis for oesophageal and stomach cancer. The median intervals for referral to informed of diagnosis and informed of diagnosis to DTT were substantially shorter, but the median interval from DTT to treatment only shortened slightly. The delay findings were similar (Tables 6, 12, 18 & 24), but the percentage meeting the standards for the cohort waiting over 62 days was higher than for those waiting over 104 days for each site.

Table 1: Regression analysis for likelihood of waiting over 104 days by characteristic for liver cancer. Results presented for both the original and Rapid Cancer Registration Dataset (RCRD) linked cohort. The results for the original cohort are presented unadjusted and adjusted and results for the RCRD linked cohort are presented unadjusted, with minimal adjustment to align with the original cohort analysis and with full adjustment

		Original cohort		RCRD linked cohort		
Characteristic	Category	Unadjusted odds ratio (95% CIs)	Adjusted odds ratio (95% CIs)	Unadjusted odds ratio (95% CIs)	Adjusted odds ratio (95% CIs) (minimal adjustment)	Adjusted odds ratio (95% CIs) (fully adjusted)
Gender	Female	0.62 (0.49-0.77)*	0.7 (0.55-0.88)*	0.71 (0.56-0.89)*	0.76 (0.6-0.97)	0.77 (0.6-0.98)
	Male (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
Age group	19-49	0.66 (0.34-1.3)	0.7 (0.35-1.41)	0.75 (0.39-1.43)	0.79 (0.4-1.55)	0.83 (0.42-1.64)
	50-59	0.8 (0.55-1.18)	0.88 (0.58-1.32)	0.88 (0.59-1.32)	0.93 (0.61-1.42)	0.94 (0.61-1.44)
	60-69 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
	70-79	1.06 (0.84-1.35)	1.13 (0.87-1.45)	1 (0.78-1.29)	1.07 (0.82-1.4)	1.07 (0.81-1.4)
	80+	0.62 (0.48-0.82)*	0.76 (0.57-1.01)	0.6 (0.45-0.8)*	0.71 (0.53-0.97)	0.7 (0.52-0.95)
Deprivation quintile	1 - most deprived	1.36 (1-1.85)	1.23 (0.88-1.71)	1.07 (0.78-1.48)	0.94 (0.66-1.33)	0.92 (0.65-1.31)
	2	1.17 (0.86-1.6)	1.13 (0.81-1.58)	0.98 (0.71-1.36)	0.96 (0.68-1.36)	0.96 (0.67-1.35)
	3	1.27 (0.93-1.73)	1.25 (0.9-1.73)	1.14 (0.83-1.57)	1.19 (0.85-1.66)	1.17 (0.84-1.64)
	4	1.18 (0.87-1.6)	1.13 (0.82-1.56)	0.99 (0.72-1.35)	0.97 (0.7-1.35)	0.97 (0.69-1.35)
	5 - least deprived (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)

		Original cohort		RCRD linked cohort		
Characteristic	Category	Unadjusted odds ratio (95% CIs)	Adjusted odds ratio (95% CIs)	Unadjusted odds ratio (95% CIs)	Adjusted odds ratio (95% CIs) (minimal adjustment)	Adjusted odds ratio (95% CIs) (fully adjusted)
Financial year	Base year (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
	2020/2021	1.11 (0.85-1.46)	1.1 (0.83-1.45)	1.35 (1.01-1.81)	1.42 (1.05-1.93)	1.42 (1.05-1.93)
	2021/2022	1.47 (1.14-1.9)*	1.56 (1.19-2.04)*	1.75 (1.32-2.31)*	2 (1.49-2.68)*	2.02 (1.5-2.71)*
	Q1 & Q2 2022/2023	1.89 (1.41-2.53)*	1.86 (1.37-2.54)*	2.33 (1.71-3.18)*	2.44 (1.76-3.39)*	2.47 (1.78-3.43)*
Comorbidity	0 (ref)			1 (ref)		1 (ref)
	1			1.18 (0.86-1.61)		1.24 (0.89-1.74)
	2			1.41 (0.98-2.03)		1.56 (1.05-2.3)
	3+			0.94 (0.67-1.32)		1 (0.7-1.43)

*significant at the $p < 0.01$ level

Table 2: Median and interquartile range for the intervals in the diagnostic and treatment pathway for liver cancer patients who waited over 104 days from referral to treatment in each financial year of start of treatment

Interval	2017/2018 (Median and IQR)	2020/2021 (Median and IQR)	2021/2022 (Median and IQR)	Q1 & Q2 2022/2023 (Median and IQR)
Referral to first seen	12 (8 - 14)	9 (6 - 13)	10 (7 - 13.5)	9 (6 - 13)
First seen to informed of diagnosis	Data not available	53 (31 - 88)	57 (35 - 85)	52 (21 - 81.5)
Informed of diagnosis to decision to treat	Data not available	33 (13 - 70)	40 (23 - 69)	50 (20 - 88)
Decision to treat to treatment start	18.5 (6.75 - 26)	14 (0 - 26)	19 (0 - 30)	16 (5 - 29)
Referral to informed of diagnosis	Data not available	62 (41 - 97)	66 (44 - 95)	62 (32 - 89)
Referral to decision to treat	119 (100.5 - 145)	111.5 (94.75 - 132.25)	112 (95 - 139)	113 (97 - 138)
Referral to treatment start	133 (118 - 160.25)	125 (113.75 - 146.25)	128 (117 - 156)	131 (116 - 154)

Table 3: Breakdown of the reasons for delay in each financial year of start of treatment among liver cancer patients who waited over 104 days from referral to treatment, with delay overall between referral and treatment, from referral to informed of diagnosis or from decision to treat to treatment

Delay interval	Reason for delay	2017/2018 (Number and %)	2020/2021 (Number and %)	2021/2022 (Number and %)	Q1 & Q2 2022/2023 (Number and %)
Referral to treatment start	Healthcare provider-initiated delay	27 (21.8%)	45 (34.1%)	61 (35.7%)	43 (39.4%)
	Medical reason for diagnosis delay	47 (37.9%)	60 (45.5%)	73 (42.7%)	38 (34.9%)
	Medical reason for treatment delay	<5	<5	<10	<5
	Patient-initiated delay	~10	<5	<10	<10
	Other reason (not listed)	37 (29.8%)	23 (17.4%)	25 (14.6%)	19 (17.4%)
Referral to informed of diagnosis	Healthcare provider-initiated delay	Data not available	14 (20.3%)	18 (17.1%)	19 (26.0%)
	Medical reason for diagnosis delay	Data not available	31 (44.9%)	37 (35.2%)	23 (31.5%)
	Patient-initiated delay	Data not available	<5	<5	<5
	Other reason (not listed)	Data not available	10 (14.5%)	16 (15.2%)	<10
	No delay	Data not available	<10	<10	18 (24.7%)
	Unknown	Data not available	<10	21 (20.0%)	<10
Decision to treat to treatment start	Healthcare provider-initiated delay	<10	8 (6.1%)	31 (18.1%)	16 (14.7%)
	Medical reason for diagnosis delay	<5	<10	<10	<5
	Medical reason for treatment delay	<5	<5	<5	<5

Delay interval	Reason for delay	2017/2018 (Number and %)	2020/2021 (Number and %)	2021/2022 (Number and %)	Q1 & Q2 2022/2023 (Number and %)
	Patient-initiated delay	<5	<5	<5	<5
	Other reason (not listed)	<5	<10	<5	<5
	No delay	113 (91.1%)	111 (84.1%)	133 (77.8%)	87 (79.8%)

Table 4: Regression analysis for likelihood of waiting over 62 days by characteristic for liver cancer. Results presented for both the original and RCRD linked cohort. The results for the original cohort are presented unadjusted and adjusted and results for the RCRD linked cohort are presented unadjusted, with minimal adjustment to align with the original cohort analysis and with full adjustment

		Original cohort		RCRD linked cohort		
Characteristic	Category	Unadjusted odds ratio (95% CIs) (95% CIs)	Adjusted odds ratio (95% CIs) (95% CIs)	Unadjusted odds ratio (95% CIs)	Adjusted odds ratio (95% CIs) (minimal adjustment)	Adjusted odds ratio (95% CIs) (fully adjusted)
Gender	Female	0.6 (0.51-0.71)*	0.69 (0.57-0.83)*	0.72 (0.61-0.85)*	0.8 (0.66-0.97)	0.8 (0.66-0.97)
	Male (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
Age group	19-49	0.63 (0.38-1.03)	0.62 (0.36-1.09)	0.88 (0.54-1.43)	0.87 (0.51-1.5)	0.9 (0.52-1.54)
	50-59	0.71 (0.52-0.96)	0.72 (0.51-1.01)	0.78 (0.57-1.08)	0.75 (0.53-1.08)	0.75 (0.53-1.08)
	60-69 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
	70-79	0.95 (0.78-1.16)	1.05 (0.84-1.31)	0.87 (0.7-1.07)	0.97 (0.77-1.22)	0.97 (0.76-1.22)
	80+	0.5 (0.4-0.61)*	0.61 (0.48-0.77)*	0.44 (0.35-0.55)*	0.52 (0.41-0.67)*	0.52 (0.4-0.67)*
Deprivation quintile	1 - most deprived	1.02 (0.8-1.31)	0.9 (0.68-1.19)	0.96 (0.74-1.23)	0.78 (0.58-1.04)	0.77 (0.57-1.03)
	2	1.12 (0.88-1.42)	1.06 (0.81-1.4)	1.02 (0.79-1.3)	1 (0.75-1.34)	1 (0.75-1.34)
	3	1.07 (0.84-1.36)	1.03 (0.78-1.35)	0.97 (0.76-1.25)	1.01 (0.76-1.35)	1 (0.75-1.33)
	4	1.03 (0.81-1.3)	0.96 (0.73-1.25)	0.88 (0.69-1.13)	0.85 (0.64-1.12)	0.85 (0.64-1.12)
	5 - least deprived (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)

		Original cohort		RCRD linked cohort		
Characteristic	Category	Unadjusted odds ratio (95% CIs) (95% CIs)	Adjusted odds ratio (95% CIs) (95% CIs)	Unadjusted odds ratio (95% CIs)	Adjusted odds ratio (95% CIs) (minimal adjustment)	Adjusted odds ratio (95% CIs) (fully adjusted)
Financial year	Base year (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
	2020/2021	1.15 (0.94-1.41)	1.11 (0.89-1.4)	1.24 (1.01-1.54)	1.38 (1.09-1.75)*	1.38 (1.09-1.75)*
	2021/2022	1.46 (1.19-1.78)*	1.59 (1.27-1.99)*	1.53 (1.24-1.89)*	1.89 (1.49-2.41)*	1.9 (1.49-2.41)*
	Q1 & Q2 2022/2023	1.98 (1.55-2.52)*	2.08 (1.58-2.74)*	2.25 (1.75-2.9)*	2.73 (2.05-3.63)*	2.74 (2.06-3.64)*
Comorbidity	0 (ref)			1 (ref)		1 (ref)
	1			1 (0.78-1.29)		1.1 (0.82-1.46)
	2			1.21 (0.89-1.64)		1.46 (1.02-2.07)
	3+			0.79 (0.6-1.02)		0.83 (0.61-1.11)

*significant at the $p < 0.01$ level

Table 5: Median and interquartile range for the intervals in the diagnostic and treatment pathway for liver cancer patients who waited over 62 days from referral to treatment in each financial year of start of treatment

Interval	2017/2018 (Median and IQR)	2020/2021 (Median and IQR)	2021/2022 (Median and IQR)	Q1 & Q2 2022/2023 (Median and IQR)
Referral to first seen	11 (7 - 13)	9 (6 - 13)	9 (6 - 13)	8 (5 - 12)
First seen to informed of diagnosis	Data not available	42 (25.5 - 62.5)	42 (23 - 64)	38 (20 - 61)
Informed of diagnosis to decision to treat	Data not available	21.5 (8 - 42.5)	28 (10 - 48)	37.5 (13 - 57)
Decision to treat to treatment start	14 (1 - 25)	11 (0 - 21)	14 (0 - 25)	13 (0 - 24)
Referral to informed of diagnosis	Data not available	50.5 (34.75 - 70)	53 (34.5 - 73.5)	52 (27 - 71.25)
Referral to decision to treat	81 (66 - 114)	80 (64.5 - 105)	84 (68 - 109.25)	84 (67 - 112)
Referral to treatment start	97 (77 - 126)	96 (77 - 120.5)	100 (81 - 126)	103 (82 - 130)

Table 6: Breakdown of the reasons for delay in each financial year of start of treatment among liver cancer patients who waited over 62 days from referral to treatment, with delay overall between referral and treatment, from referral to informed of diagnosis or from decision to treat to treatment

Delay interval	Reason for delay	2017/2018 (Number and %)	2020/2021 (Number and %)	2021/2022 (Number and %)	Q1 & Q2 2022/2023 (Number and %)
Referral to treatment start	Healthcare provider-initiated delay	77 (25.6%)	117 (36.7%)	142 (37.8%)	99 (43.2%)
	Medical reason for diagnosis delay	104 (34.6%)	125 (39.2%)	136 (36.2%)	74 (32.3%)
	Medical reason for treatment delay	6 (2.0%)	8 (2.5%)	~10	9 (3.9%)
	Patient-initiated delay	29 (9.6%)	13 (4.1%)	~20	12 (5.2%)
	Other reason (not listed)	85 (28.2%)	56 (17.6%)	66 (17.6%)	35 (15.3%)
Referral to informed of diagnosis	Healthcare provider-initiated delay	Data not available	37 (20.1%)	42 (16.5%)	42 (26.9%)
	Medical reason for diagnosis delay	Data not available	72 (39.1%)	85 (33.3%)	46 (29.5%)
	Patient-initiated delay	Data not available	<5	<10	<5
	Other reason (not listed)	Data not available	26 (14.1%)	~30	~10
	No delay	Data not available	29 (15.8%)	44 (17.3%)	43 (27.6%)
	Unknown	Data not available	~15	46 (18.0%)	12 (7.7%)
Decision to treat to treatment start	Healthcare provider-initiated delay	<10	13 (4.1%)	43 (11.4%)	26 (11.4%)
	Medical reason for diagnosis delay	<5	<10	<10	<5
	Medical reason for treatment delay	<5	<5	<5	<5

Delay interval	Reason for delay	2017/2018 (Number and %)	2020/2021 (Number and %)	2021/2022 (Number and %)	Q1 & Q2 2022/2023 (Number and %)
	Patient-initiated delay	<5	<5	<5	<5
	Other reason (not listed)	<5	<10	<5	<5
	No delay	285 (94.7%)	288 (90.3%)	323 (85.9%)	195 (85.2%)

Table 7: Regression analysis for likelihood of waiting over 104 days by characteristic for oesophageal cancer. Results presented for both the original and RCRD linked cohort. The results for the original cohort are presented unadjusted and adjusted and results for the RCRD linked cohort are presented unadjusted, with minimal adjustment to align with the original cohort analysis and with full adjustment

		Original cohort		RCRD linked cohort		
Characteristic	Category	Unadjusted odds ratio (95% CIs)	Adjusted odds ratio (95% CIs)	Unadjusted odds ratio (95% CIs)	Adjusted odds ratio (95% CIs) (minimal adjustment)	Adjusted odds ratio (95% CIs) (fully adjusted)
Gender	Female	0.95 (0.84-1.09)	1.01 (0.88-1.15)	0.93 (0.82-1.06)	0.99 (0.86-1.13)	0.94 (0.82-1.08)
	Male (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
Age group	19-49	0.58 (0.37-0.91)	0.56 (0.36-0.87)	0.67 (0.43-1.04)	0.64 (0.41-1)	0.71 (0.45-1.1)
	50-59	0.95 (0.78-1.17)	0.92 (0.75-1.13)	1.06 (0.86-1.29)	1.03 (0.84-1.26)	1.1 (0.89-1.36)
	60-69 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
	70-79	1.1 (0.95-1.27)	1.12 (0.97-1.3)	1.16 (1.01-1.35)	1.18 (1.02-1.37)	1.14 (0.98-1.32)
	80+	0.68 (0.57-0.81)*	0.72 (0.6-0.87)*	0.67 (0.56-0.8)*	0.71 (0.59-0.85)*	0.65 (0.54-0.79)*
Deprivation quintile	1 - most deprived	1.46 (1.21-1.76)*	1.31 (1.08-1.6)*	1.38 (1.14-1.67)*	1.24 (1.01-1.52)	1.23 (1-1.51)
	2	1.23 (1.01-1.49)	1.22 (1-1.49)	1.19 (0.98-1.45)	1.19 (0.98-1.46)	1.19 (0.97-1.46)
	3	1.09 (0.9-1.32)	1.13 (0.93-1.37)	1.05 (0.86-1.27)	1.1 (0.9-1.34)	1.09 (0.89-1.33)
	4	1.22 (1.01-1.47)	1.2 (1-1.46)	1.17 (0.97-1.42)	1.17 (0.97-1.42)	1.16 (0.95-1.41)
	5 - least deprived (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)

		Original cohort		RCRD linked cohort		
Characteristic	Category	Unadjusted odds ratio (95% CIs)	Adjusted odds ratio (95% CIs)	Unadjusted odds ratio (95% CIs)	Adjusted odds ratio (95% CIs) (minimal adjustment)	Adjusted odds ratio (95% CIs) (fully adjusted)
Financial year	Base year (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
	2020/2021	2.24 (1.87-2.69)*	2.33 (1.94-2.8)*	1.97 (1.64-2.35)*	2.09 (1.75-2.51)*	2.21 (1.84-2.65)*
	2021/2022	2.37 (1.98-2.84)*	2.49 (2.08-2.99)*	2.01 (1.69-2.4)*	2.17 (1.81-2.59)*	2.21 (1.84-2.65)*
	Q1 & Q2 2022/2023	2.9 (2.38-3.53)*	3.08 (2.53-3.76)*	2.52 (2.08-3.06)*	2.76 (2.27-3.37)*	2.86 (2.34-3.5)*
Stage	1 (ref)			1 (ref)		1 (ref)
	2			0.31 (0.23-0.42)*		0.29 (0.21-0.41)*
	3			0.22 (0.16-0.3)*		0.2 (0.15-0.28)*
	4			0.11 (0.08-0.15)*		0.1 (0.07-0.14)*
	Not known			0.17 (0.12-0.23)*		0.17 (0.12-0.24)*
Comorbidity	0 (ref)			1 (ref)		1 (ref)
	1			1.49 (1.25-1.78)*		1.54 (1.28-1.85)*
	2			1.32 (1.03-1.68)		1.27 (0.99-1.64)
	3+			0.86 (0.64-1.15)		0.87 (0.64-1.18)

*significant at the $p < 0.01$ level

Table 8: Median and interquartile range for the intervals in the diagnostic and treatment pathway for oesophageal cancer patients who waited over 104 days from referral to treatment in each financial year of start of treatment

Interval	2017/2018 (Median and IQR)	2020/2021 (Median and IQR)	2021/2022 (Median and IQR)	Q1 & Q2 2022/2023 (Median and IQR)
Referral to first seen	11 (7 - 13)	10 (6.5 - 14)	10 (7 - 14)	11 (7 - 14)
First seen to informed of diagnosis	Data not available	33 (15 - 61.5)	26 (12 - 49)	28 (13 - 54.25)
Informed of diagnosis to decision to treat	Data not available	53.5 (35 - 71)	63 (42 - 84)	63 (37 - 78)
Decision to treat to treatment start	17 (8 - 23)	16 (11 - 22)	18 (11 - 25)	19 (12 - 27)
Referral to informed of diagnosis	Data not available	47 (29.75 - 78.25)	37 (24 - 63.75)	39 (24 - 67)
Referral to decision to treat	104 (92 - 118)	105 (93 - 120)	105 (92 - 122)	105 (93.25 - 122)
Referral to treatment start	118 (110 - 132)	119 (111 - 136)	120 (111 - 139)	121 (112 - 140)

Table 9: Breakdown of the reasons for delay in each financial year of start of treatment among oesophageal cancer patients who waited over 104 days from referral to treatment, with delay overall between referral and treatment, from referral to informed of diagnosis or from decision to treat to treatment

Delay interval	Reason for delay	2017/2018 (Number and %)	2020/2021 (Number and %)	2021/2022 (Number and %)	Q1 & Q2 2022/2023 (Number and %)
Referral to treatment start	Healthcare provider-initiated delay	21 (11.6%)	123 (32.2%)	137 (32.2%)	95 (36.3%)
	Medical reason for diagnosis delay	66 (36.5%)	118 (30.9%)	164 (38.6%)	99 (37.8%)
	Medical reason for treatment delay	9 (5.0%)	9 (2.4%)	11 (2.6%)	8 (3.1%)
	Patient-initiated delay	10 (5.5%)	16 (4.2%)	21 (4.9%)	11 (4.2%)
	Other reason (not listed)	75 (41.4%)	116 (30.4%)	92 (21.6%)	49 (18.7%)
Referral to informed of diagnosis	Healthcare provider-initiated delay	Data not available	67 (27.0%)	59 (19.0%)	56 (28.4%)
	Medical reason for diagnosis delay	Data not available	46 (18.5%)	57 (18.4%)	38 (19.3%)
	Patient-initiated delay	Data not available	11 (4.4%)	17 (5.5%)	12 (6.1%)
	Other reason (not listed)	Data not available	49 (19.8%)	34 (11.0%)	13 (6.6%)
	No delay	Data not available	60 (24.2%)	109 (35.2%)	64 (32.5%)
	Unknown	Data not available	15 (6.0%)	34 (11.0%)	14 (7.1%)
Decision to treat to treatment start	Healthcare provider-initiated delay	<5	15 (3.9%)	16 (3.8%)	17 (6.5%)
	Medical reason for diagnosis delay	<5	<5	<5	<5
	Medical reason for treatment delay	<5	<5	~10	<5

Delay interval	Reason for delay	2017/2018 (Number and %)	2020/2021 (Number and %)	2021/2022 (Number and %)	Q1 & Q2 2022/2023 (Number and %)
	Patient-initiated delay	<5	<5	<5	<5
	Other reason (not listed)	<5	<5	<10	<5
	No delay	168 (92.8%)	356 (93.2%)	383 (90.1%)	238 (90.8%)

Table 10: Regression analysis for likelihood of waiting over 62 days by characteristic for oesophageal cancer. Results presented for both the original and RCRD linked cohort. The results for the original cohort are presented unadjusted and adjusted and results for the RCRD linked cohort are presented unadjusted, with minimal adjustment to align with the original cohort analysis and with full adjustment

		Original cohort		RCRD linked cohort		
Characteristic	Category	Unadjusted odds ratio (95% CIs)	Adjusted odds ratio (95% CIs)	Unadjusted odds ratio (95% CIs)	Adjusted odds ratio (95% CIs) (minimal adjustment)	Adjusted odds ratio (95% CIs) (fully adjusted)
Gender	Female	0.86 (0.8-0.92)*	0.94 (0.87-1.02)	0.86 (0.8-0.93)*	0.95 (0.88-1.03)	0.91 (0.84-0.98)
	Male (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
Age group	19-49	0.72 (0.59-0.89)*	0.7 (0.56-0.87)*	0.69 (0.56-0.85)*	0.64 (0.51-0.8)*	0.65 (0.52-0.82)*
	50-59	0.89 (0.8-1)	0.87 (0.77-0.98)	0.91 (0.82-1.02)	0.88 (0.78-1)	0.9 (0.79-1.02)
	60-69 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
	70-79	0.94 (0.87-1.02)	0.95 (0.87-1.04)	0.95 (0.87-1.03)	0.95 (0.87-1.04)	0.92 (0.84-1.01)
	80+	0.45 (0.41-0.49)*	0.46 (0.41-0.51)*	0.41 (0.37-0.45)*	0.42 (0.38-0.46)*	0.38 (0.34-0.43)*
Deprivation quintile	1 - most deprived	1.28 (1.15-1.42)*	1.08 (0.96-1.21)	1.29 (1.16-1.44)*	1.09 (0.96-1.23)	1.1 (0.97-1.24)
	2	1.17 (1.06-1.3)*	1.12 (1-1.25)	1.18 (1.06-1.31)*	1.11 (0.99-1.25)	1.13 (1-1.27)
	3	1.11 (1-1.22)	1.1 (0.99-1.23)	1.12 (1.01-1.24)	1.13 (1.01-1.26)	1.15 (1.02-1.28)
	4	1.19 (1.08-1.32)*	1.18 (1.06-1.32)*	1.14 (1.03-1.26)	1.11 (1-1.24)	1.12 (1-1.25)
	5 - least deprived (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)

		Original cohort		RCRD linked cohort		
Characteristic	Category	Unadjusted odds ratio (95% CIs)	Adjusted odds ratio (95% CIs)	Unadjusted odds ratio (95% CIs)	Adjusted odds ratio (95% CIs) (minimal adjustment)	Adjusted odds ratio (95% CIs) (fully adjusted)
Financial year	Base year (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
	2020/2021	1.78 (1.63-1.95)*	1.91 (1.73-2.1)*	1.47 (1.34-1.61)*	1.57 (1.43-1.73)*	1.67 (1.51-1.84)*
	2021/2022	2.06 (1.88-2.25)*	2.29 (2.09-2.52)*	1.68 (1.54-1.83)*	1.88 (1.71-2.07)*	1.93 (1.75-2.12)*
	Q1 & Q2 2022/2023	2.49 (2.24-2.76)*	2.85 (2.55-3.18)*	2.04 (1.83-2.26)*	2.34 (2.09-2.61)*	2.44 (2.17-2.74)*
Stage	1 (ref)			1 (ref)		1 (ref)
	2			0.48 (0.36-0.65)*		0.49 (0.35-0.67)*
	3			0.39 (0.29-0.52)*		0.37 (0.27-0.51)*
	4			0.18 (0.14-0.24)*		0.15 (0.11-0.21)*
	Not known			0.2 (0.15-0.27)*		0.2 (0.15-0.28)*
Comorbidity	0 (ref)			1 (ref)		1 (ref)
	1			1.07 (0.96-1.2)		1.16 (1.02-1.3)
	2			0.88 (0.76-1.02)		0.92 (0.78-1.08)
	3+			0.67 (0.57-0.78)*		0.76 (0.63-0.9)*

*significant at the $p < 0.01$ level

Table 11: Median and interquartile range for the intervals in the diagnostic and treatment pathway for oesophageal cancer patients who waited over 62 days from referral to treatment in each financial year of start of treatment

Interval	2017/2018 (Median and IQR)	2020/2021 (Median and IQR)	2021/2022 (Median and IQR)	Q1 & Q2 2022/2023 (Median and IQR)
Referral to first seen	10 (7 - 13)	11 (7 - 14)	10 (7 - 13)	10 (7 - 14)
First seen to informed of diagnosis	Data not available	20 (9 - 35)	15 (5 - 28)	14 (4 - 28)
Informed of diagnosis to decision to treat	Data not available	36 (24 - 50)	41 (27 - 55)	42 (29 - 57)
Decision to treat to treatment start	14 (8 - 20)	14 (8 - 21)	15 (9 - 21)	15 (10 - 23)
Referral to informed of diagnosis	Data not available	32 (21 - 47)	26 (17 - 38.5)	26 (16 - 40)
Referral to decision to treat	68 (58 - 80.75)	70 (59 - 88)	69 (58 - 85)	70 (58 - 85)
Referral to treatment start	81 (72 - 94)	84 (73 - 102)	84 (73 - 101)	85 (74 - 102)

Table 12: Breakdown of the reasons for delay in each financial year of start of treatment among oesophageal cancer patients who waited over 62 days from referral to treatment, with delay overall between referral and treatment, from referral to informed of diagnosis or from decision to treat to treatment

Delay interval	Reason for delay	2017/2018 (Number and %)	2020/2021 (Number and %)	2021/2022 (Number and %)	Q1 & Q2 2022/2023 (Number and %)
Referral to treatment start	Healthcare provider-initiated delay	244 (20.3%)	657 (37.7%)	773 (38.6%)	480 (42.0%)
	Medical reason for diagnosis delay	391 (32.5%)	510 (29.2%)	721 (36.0%)	407 (35.6%)
	Medical reason for treatment delay	46 (3.8%)	59 (3.4%)	43 (2.1%)	24 (2.1%)
	Patient-initiated delay	100 (8.3%)	83 (4.8%)	95 (4.7%)	56 (4.9%)
	Other reason (not listed)	421 (35.0%)	435 (24.9%)	371 (18.5%)	175 (15.3%)
Referral to informed of diagnosis	Healthcare provider-initiated delay	Data not available	215 (17.0%)	192 (12.3%)	135 (14.6%)
	Medical reason for diagnosis delay	Data not available	188 (14.8%)	178 (11.4%)	126 (13.6%)
	Patient-initiated delay	Data not available	32 (2.5%)	53 (3.4%)	25 (2.7%)
	Other reason (not listed)	Data not available	208 (16.4%)	99 (6.4%)	61 (6.6%)
	No delay	Data not available	557 (44.0%)	896 (57.5%)	530 (57.4%)
	Unknown	Data not available	66 (5.2%)	141 (9.0%)	47 (5.1%)
Decision to treat to treatment start	Healthcare provider-initiated delay	13 (1.1%)	26 (1.5%)	47 (2.3%)	36 (3.2%)
	Medical reason for diagnosis delay	<5	<5	<10	<10
	Medical reason for treatment delay	<10	11 (0.6%)	~15	<5

Delay interval	Reason for delay	2017/2018 (Number and %)	2020/2021 (Number and %)	2021/2022 (Number and %)	Q1 & Q2 2022/2023 (Number and %)
	Patient-initiated delay	<10	<10	<10	<10
	Other reason (not listed)	<10	10 (0.6%)	~10	7 (0.6%)
	No delay	1172 (97.5%)	1688 (96.8%)	1915 (95.6%)	1085 (95.0%)

Table 13: Regression analysis for likelihood of waiting over 104 days by characteristic for pancreatic cancer. Results presented for both the original and RCRD linked cohort. The results for the original cohort are presented unadjusted and adjusted and results for the RCRD linked cohort are presented unadjusted, with minimal adjustment to align with the original cohort analysis and with full adjustment

		Original cohort		RCRD linked cohort		
Characteristic	Category	Unadjusted odds ratio (95% CIs)	Adjusted odds ratio (95% CIs)	Unadjusted odds ratio (95% CIs)	Adjusted odds ratio (95% CIs) (minimal adjustment)	Adjusted odds ratio (95% CIs) (fully adjusted)
Gender	Female	0.99 (0.84-1.15)	1.01 (0.86-1.19)	1.04 (0.88-1.23)	1.09 (0.92-1.29)	1.1 (0.92-1.3)
	Male (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
Age group	19-49	1.34 (0.86-2.09)	1.21 (0.77-1.91)	1.06 (0.65-1.72)	0.97 (0.59-1.6)	1 (0.6-1.65)
	50-59	1.21 (0.92-1.58)	1.18 (0.89-1.54)	1.06 (0.8-1.41)	1.05 (0.79-1.39)	1.08 (0.81-1.44)
	60-69 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
	70-79	0.91 (0.75-1.11)	0.95 (0.78-1.16)	0.85 (0.69-1.04)	0.89 (0.72-1.09)	0.83 (0.67-1.02)
	80+	0.42 (0.32-0.54)*	0.47 (0.37-0.61)*	0.34 (0.26-0.45)*	0.38 (0.29-0.5)*	0.33 (0.25-0.44)*
Deprivation quintile	1 - most deprived	1.37 (1.05-1.77)	1.16 (0.88-1.53)	1.42 (1.09-1.85)*	1.28 (0.97-1.69)	1.22 (0.92-1.62)
	2	1.1 (0.85-1.42)	1.02 (0.78-1.33)	1 (0.76-1.31)	0.95 (0.72-1.25)	0.95 (0.72-1.26)
	3	1.21 (0.96-1.53)	1.21 (0.95-1.55)	1.15 (0.9-1.47)	1.19 (0.92-1.53)	1.16 (0.9-1.49)
	4	0.98 (0.77-1.25)	0.99 (0.77-1.26)	0.92 (0.71-1.18)	0.94 (0.73-1.21)	0.91 (0.7-1.17)
	5 - least deprived (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)

		Original cohort		RCRD linked cohort		
Characteristic	Category	Unadjusted odds ratio (95% CIs)	Adjusted odds ratio (95% CIs)	Unadjusted odds ratio (95% CIs)	Adjusted odds ratio (95% CIs) (minimal adjustment)	Adjusted odds ratio (95% CIs) (fully adjusted)
Financial year	Base year (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
	2020/2021	1.1 (0.87-1.39)	1.13 (0.89-1.43)	0.94 (0.73-1.2)	0.96 (0.75-1.23)	0.92 (0.72-1.18)
	2021/2022	1.66 (1.33-2.07)*	1.76 (1.4-2.2)*	1.56 (1.24-1.95)*	1.65 (1.31-2.07)*	1.63 (1.29-2.06)*
	Q1 & Q2 2022/2023	2.01 (1.56-2.58)*	2 (1.55-2.58)*	1.91 (1.48-2.46)*	1.91 (1.47-2.48)*	1.89 (1.45-2.46)*
Stage	1 (ref)			1 (ref)		1 (ref)
	2			0.53 (0.37-0.75)*		0.5 (0.34-0.72)*
	3			0.49 (0.35-0.68)*		0.49 (0.35-0.7)*
	4			0.24 (0.18-0.32)*		0.23 (0.17-0.32)*
	Not known			0.43 (0.33-0.57)*		0.43 (0.31-0.58)*
Comorbidity	0 (ref)			1 (ref)		1 (ref)
	1			1.37 (1.07-1.77)		1.56 (1.2-2.03)*
	2			1.48 (1.07-2.04)		1.85 (1.31-2.6)*
	3+			1.26 (0.88-1.8)		1.49 (1.02-2.18)

*significant at the $p < 0.01$ level

Table 14: Median and interquartile range for the intervals in the diagnostic and treatment pathway for pancreatic cancer patients who waited over 104 days from referral to treatment in each financial year of start of treatment

Interval	2017/2018 (Median and IQR)	2020/2021 (Median and IQR)	2021/2022 (Median and IQR)	Q1 & Q2 2022/2023 (Median and IQR)
Referral to first seen	9 (7 - 13)	10 (7 - 13)	9 (6 - 13)	11 (6 - 14)
First seen to informed of diagnosis	Data not available	79 (46.75 - 104)	55 (32 - 85)	61 (38 - 89)
Informed of diagnosis to decision to treat	Data not available	27.5 (8.5 - 65.5)	38.5 (14 - 71.25)	41 (20.75 - 69.25)
Decision to treat to treatment start	11 (0 - 21)	10 (0 - 21)	14 (0 - 25)	9.5 (0 - 21)
Referral to informed of diagnosis	Data not available	90.5 (62.5 - 113)	67 (43 - 94.25)	74.5 (49.75 - 104.25)
Referral to decision to treat	116 (98 - 130.25)	121 (106 - 146)	112 (97 - 132)	120.5 (104.5 - 147)
Referral to treatment start	123.5 (112 - 141.25)	133 (116 - 156)	125 (113 - 149.75)	131 (117.25 - 157)

Table 15: Breakdown of the reasons for delay in each financial year of start of treatment among pancreatic cancer patients who waited over 104 days from referral to treatment, with delay overall between referral and treatment, from referral to informed of diagnosis or from decision to treat to treatment

Delay interval	Reason for delay	2017/2018 (Number and %)	2020/2021 (Number and %)	2021/2022 (Number and %)	Q1 & Q2 2022/2023 (Number and %)
Referral to treatment start	Healthcare provider-initiated delay	18 (13.2%)	42 (25.5%)	67 (29.6%)	48 (35.8%)
	Medical reason for diagnosis delay	62 (45.6%)	78 (47.3%)	93 (41.2%)	51 (38.1%)
	Medical reason for treatment delay	<5	5 (3.0%)	<5	<5
	Patient-initiated delay	<10	6 (3.6%)	<10	<10
	Other reason (not listed)	44 (32.4%)	34 (20.6%)	57 (25.2%)	28 (20.9%)
Referral to informed of diagnosis	Healthcare provider-initiated delay	Data not available	15 (15.6%)	31 (22.8%)	22 (25.0%)
	Medical reason for diagnosis delay	Data not available	44 (45.8%)	45 (33.1%)	33 (37.5%)
	Patient-initiated delay	Data not available	<5	6 (4.4%)	<5
	Other reason (not listed)	Data not available	15 (15.6%)	17 (12.5%)	12 (13.6%)
	No delay	Data not available	<10	22 (16.2%)	14 (15.9%)
	Unknown	Data not available	14 (14.6%)	15 (11.0%)	<10
Decision to treat to treatment start	Healthcare provider-initiated delay	<5	7 (4.2%)	17 (7.5%)	9 (6.7%)
	Medical reason for diagnosis delay	<5	<5	<10	<5
	Medical reason for treatment delay	<5	<10	<10	<5

Delay interval	Reason for delay	2017/2018 (Number and %)	2020/2021 (Number and %)	2021/2022 (Number and %)	Q1 & Q2 2022/2023 (Number and %)
	Patient-initiated delay	<5	<5	<5	<5
	Other reason (not listed)	<5	<5	<5	<5
	No delay	128 (94.1%)	150 (90.9%)	195 (86.3%)	121 (90.3%)

Table 16: Regression analysis for likelihood of waiting over 62 days by characteristic for pancreatic cancer. Results presented for both the original and RCRD linked cohort. The results for the original cohort are presented unadjusted and adjusted and results for the RCRD linked cohort are presented unadjusted, with minimal adjustment to align with the original cohort analysis and with full adjustment

		Original cohort		RCRD linked cohort		
Characteristic	Category	Unadjusted odds ratio (95% CIs)	Adjusted odds ratio (95% CIs)	Unadjusted odds ratio (95% CIs)	Adjusted odds ratio (95% CIs) (minimal adjustment)	Adjusted odds ratio (95% CIs) (fully adjusted)
Gender	Female	1.03 (0.94-1.14)	1.09 (0.98-1.21)	1 (0.91-1.11)	1.07 (0.96-1.18)	1.07 (0.97-1.19)
	Male (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
Age group	19-49	1.45 (1.08-1.95)	1.44 (1.05-1.96)	1.3 (0.96-1.76)	1.24 (0.9-1.71)	1.27 (0.92-1.76)
	50-59	1.12 (0.94-1.33)	1.09 (0.9-1.3)	1.14 (0.96-1.36)	1.13 (0.94-1.36)	1.14 (0.94-1.37)
	60-69 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
	70-79	0.87 (0.77-0.98)	0.89 (0.78-1.02)	0.87 (0.77-0.99)	0.92 (0.8-1.04)	0.89 (0.78-1.02)
	80+	0.36 (0.31-0.41)*	0.39 (0.33-0.45)*	0.36 (0.31-0.42)*	0.39 (0.34-0.46)*	0.37 (0.32-0.44)*
Deprivation quintile	1 - most deprived	1.16 (0.99-1.37)	0.95 (0.79-1.14)	1.08 (0.92-1.27)	0.93 (0.77-1.12)	0.91 (0.76-1.1)
	2	1.02 (0.87-1.19)	0.94 (0.8-1.12)	0.92 (0.79-1.08)	0.9 (0.76-1.07)	0.91 (0.76-1.08)
	3	1.06 (0.92-1.22)	1.05 (0.9-1.22)	1.05 (0.91-1.21)	1.1 (0.94-1.29)	1.09 (0.93-1.28)
	4	0.94 (0.81-1.08)	0.93 (0.8-1.09)	0.89 (0.77-1.03)	0.91 (0.78-1.07)	0.9 (0.77-1.06)
	5 - least deprived (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)

		Original cohort		RCRD linked cohort		
Characteristic	Category	Unadjusted odds ratio (95% CIs)	Adjusted odds ratio (95% CIs)	Unadjusted odds ratio (95% CIs)	Adjusted odds ratio (95% CIs) (minimal adjustment)	Adjusted odds ratio (95% CIs) (fully adjusted)
Financial year	Base year (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
	2020/2021	1.38 (1.21-1.58)*	1.46 (1.27-1.69)*	1.18 (1.03-1.35)	1.21 (1.05-1.4)*	1.19 (1.03-1.38)
	2021/2022	1.69 (1.47-1.93)*	1.87 (1.62-2.16)*	1.48 (1.29-1.69)*	1.59 (1.38-1.84)*	1.61 (1.39-1.86)*
	Q1 & Q2 2022/2023	2.09 (1.79-2.44)*	2.22 (1.88-2.62)*	1.84 (1.57-2.15)*	1.9 (1.61-2.25)*	1.89 (1.6-2.25)*
Stage	1 (ref)			1 (ref)		1 (ref)
	2			0.76 (0.6-0.98)		0.71 (0.54-0.93)
	3			0.8 (0.64-1.01)		0.77 (0.6-0.99)
	4			0.47 (0.38-0.57)*		0.42 (0.34-0.53)*
	Not known			0.58 (0.48-0.71)*		0.52 (0.42-0.66)*
Comorbidity	0 (ref)			1 (ref)		1 (ref)
	1			1.03 (0.87-1.21)		1.18 (0.99-1.41)
	2			1.25 (1.02-1.54)		1.55 (1.24-1.95)*
	3+			0.84 (0.66-1.06)		1.06 (0.82-1.37)

*significant at the p<0.01 level

Table 17: Median and interquartile range for the intervals in the diagnostic and treatment pathway for pancreatic cancer patients who waited over 62 days from referral to treatment in each financial year of start of treatment

Interval	2017/2018 (Median and IQR)	2020/2021 (Median and IQR)	2021/2022 (Median and IQR)	Q1 & Q2 2022/2023 (Median and IQR)
Referral to first seen	10 (7 - 13)	9 (6 - 13)	9 (6 - 13)	9.5 (6 - 13)
First seen to informed of diagnosis	Data not available	37.5 (19 - 60)	35 (17 - 58)	32.5 (15 - 55)
Informed of diagnosis to decision to treat	Data not available	25.5 (9 - 42)	28 (13 - 45)	35 (13 - 49)
Decision to treat to treatment start	9 (0 - 16)	9 (0 - 19)	12 (0 - 20)	13 (0 - 20)
Referral to informed of diagnosis	Data not available	48.5 (28 - 70)	44 (27 - 67)	43 (25 - 68)
Referral to decision to treat	78 (65 - 97)	76 (64 - 95)	78 (64 - 97)	77 (64 - 103)
Referral to treatment start	89 (76 - 108)	86 (74 - 104)	90 (75.25 - 111.75)	90 (75 - 116)

Table 18: Breakdown of the reasons for delay in each financial year of start of treatment among pancreatic cancer patients who waited over 62 days from referral to treatment, with delay overall between referral and treatment, from referral to informed of diagnosis or from decision to treat to treatment

Delay interval	Reason for delay	2017/2018 (Number and %)	2020/2021 (Number and %)	2021/2022 (Number and %)	Q1 & Q2 2022/2023 (Number and %)
Referral to treatment start	Healthcare provider-initiated delay	107 (22.8%)	199 (29.8%)	249 (34.5%)	142 (34.1%)
	Medical reason for diagnosis delay	165 (35.2%)	243 (36.4%)	273 (37.8%)	156 (37.4%)
	Medical reason for treatment delay	18 (3.8%)	22 (3.3%)	16 (2.2%)	9 (2.2%)
	Patient-initiated delay	31 (6.6%)	33 (4.9%)	32 (4.4%)	13 (3.1%)
	Other reason (not listed)	148 (31.6%)	171 (25.6%)	152 (21.1%)	97 (23.3%)
Referral to informed of diagnosis	Healthcare provider-initiated delay	Data not available	78 (17.5%)	91 (18.1%)	58 (20.1%)
	Medical reason for diagnosis delay	Data not available	139 (31.2%)	134 (26.6%)	82 (28.4%)
	Patient-initiated delay	Data not available	10 (2.2%)	13 (2.6%)	<5
	Other reason (not listed)	Data not available	66 (14.8%)	53 (10.5%)	32 (11.1%)
	No delay	Data not available	115 (25.8%)	146 (29.0%)	94 (32.5%)
	Unknown	Data not available	38 (8.5%)	66 (13.1%)	~20
Decision to treat to treatment start	Healthcare provider-initiated delay	<10	13 (1.9%)	28 (3.9%)	21 (5.0%)
	Medical reason for diagnosis delay	<5	<5	<10	<5
	Medical reason for treatment delay	<5	<10	<10	<5

Delay interval	Reason for delay	2017/2018 (Number and %)	2020/2021 (Number and %)	2021/2022 (Number and %)	Q1 & Q2 2022/2023 (Number and %)
	Patient-initiated delay	<5	<5	<5	<5
	Other reason (not listed)	<5	<10	<10	<5
	No delay	457 (97.4%)	640 (95.8%)	674 (93.4%)	387 (92.8%)

Table 19: Regression analysis for likelihood of waiting over 104 days by characteristic for stomach cancer. Results presented for both the original and RCRD linked cohort. The results for the original cohort are presented unadjusted and adjusted and results for the RCRD linked cohort are presented unadjusted, with minimal adjustment to align with the original cohort analysis and with full adjustment

		Original cohort		RCRD linked cohort		
Characteristic	Category	Unadjusted odds ratio (95% CIs)	Adjusted odds ratio (95% CIs)	Unadjusted odds ratio (95% CIs)	Adjusted odds ratio (95% CIs) (minimal adjustment)	Adjusted odds ratio (95% CIs) (fully adjusted)
Gender	Female	1.2 (1-1.44)	1.18 (0.97-1.42)	1.2 (0.99-1.45)	1.15 (0.94-1.4)	1.1 (0.9-1.36)
	Male (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
Age group	19-49	0.47 (0.26-0.85)	0.44 (0.24-0.8)*	0.6 (0.34-1.08)	0.55 (0.3-0.98)	0.66 (0.36-1.2)
	50-59	0.83 (0.59-1.17)	0.82 (0.58-1.17)	0.91 (0.64-1.3)	0.9 (0.63-1.29)	0.92 (0.63-1.33)
	60-69 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
	70-79	1 (0.79-1.27)	1.01 (0.79-1.28)	1.05 (0.82-1.35)	1.07 (0.83-1.38)	1.01 (0.78-1.32)
	80+	0.86 (0.67-1.1)	0.87 (0.67-1.13)	0.81 (0.62-1.06)	0.84 (0.63-1.1)	0.77 (0.58-1.02)
Deprivation quintile	1 - most deprived	1.34 (1.01-1.78)	1.4 (1.04-1.89)	1.38 (1.02-1.87)	1.46 (1.05-2.01)	1.46 (1.04-2.03)
	2	1.14 (0.85-1.53)	1.2 (0.89-1.62)	1.23 (0.91-1.67)	1.34 (0.98-1.84)	1.41 (1.02-1.95)
	3	0.99 (0.74-1.34)	1.06 (0.78-1.44)	1.12 (0.81-1.53)	1.17 (0.84-1.61)	1.21 (0.87-1.69)
	4	1.08 (0.8-1.45)	1.11 (0.82-1.5)	1.12 (0.82-1.54)	1.18 (0.86-1.64)	1.28 (0.91-1.78)
	5 - least deprived (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)

		Original cohort		RCRD linked cohort		
Characteristic	Category	Unadjusted odds ratio (95% CIs)	Adjusted odds ratio (95% CIs)	Unadjusted odds ratio (95% CIs)	Adjusted odds ratio (95% CIs) (minimal adjustment)	Adjusted odds ratio (95% CIs) (fully adjusted)
Financial year	Base year (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
	2020/2021	2.15 (1.65-2.8)*	2.22 (1.7-2.91)*	1.93 (1.46-2.55)*	1.96 (1.48-2.59)*	2.08 (1.56-2.77)*
	2021/2022	2.25 (1.74-2.92)*	2.35 (1.81-3.06)*	2.13 (1.63-2.79)*	2.19 (1.67-2.88)*	2.32 (1.75-3.06)*
	Q1 & Q2 2022/2023	2.82 (2.11-3.78)*	3.02 (2.24-4.06)*	2.8 (2.07-3.79)*	2.97 (2.18-4.03)*	3.14 (2.29-4.3)*
Stage	1 (ref)			1 (ref)		1 (ref)
	2			0.56 (0.4-0.78)*		0.57 (0.4-0.81)*
	3			0.36 (0.27-0.5)*		0.35 (0.26-0.49)*
	4			0.12 (0.09-0.17)*		0.12 (0.08-0.17)*
	Not known			0.4 (0.3-0.53)*		0.41 (0.3-0.57)*
Comorbidity	0 (ref)			1 (ref)		1 (ref)
	1			1.67 (1.28-2.17)*		1.49 (1.13-1.98)*
	2			1.15 (0.77-1.72)		1.02 (0.67-1.56)
	3+			1.15 (0.77-1.74)		1.05 (0.68-1.62)

*significant at the $p < 0.01$ level

Table 20: Median and interquartile range for the intervals in the diagnostic and treatment pathway for stomach cancer patients who waited over 104 days from referral to treatment in each financial year of start of treatment

Interval	2017/2018 (Median and IQR)	2020/2021 (Median and IQR)	2021/2022 (Median and IQR)	Q1 & Q2 2022/2023 (Median and IQR)
Referral to first seen	11 (7 - 14)	11 (7 - 14)	12 (8 - 14)	10 (7 - 14)
First seen to informed of diagnosis	Data not available	41 (22 - 85.5)	38 (16.5 - 64)	40 (21 - 62)
Informed of diagnosis to decision to treat	Data not available	45 (19.5 - 73.5)	59 (31.5 - 75.5)	58 (38 - 80)
Decision to treat to treatment start	11 (1 - 21)	16 (6.5 - 25)	16 (7 - 23)	15.5 (6 - 24.5)
Referral to informed of diagnosis	Data not available	57 (37 - 95.5)	50 (29 - 78.5)	52 (35 - 70)
Referral to decision to treat	112 (99 - 127)	113 (96.5 - 132.5)	112 (97 - 126.5)	112 (102 - 147)
Referral to treatment start	121 (111 - 138)	127 (116 - 149.5)	127 (114.5 - 148)	131 (117 - 160.25)

Table 21: Breakdown of the reasons for delay in each financial year of start of treatment among stomach cancer patients who waited over 104 days from referral to treatment, with delay overall between referral and treatment, from referral to informed of diagnosis or from decision to treat to treatment

Delay interval	Reason for delay	2017/2018 (Number and %)	2020/2021 (Number and %)	2021/2022 (Number and %)	Q1 & Q2 2022/2023 (Number and %)
Referral to treatment start	Healthcare provider-initiated delay	15 (15.8%)	49 (30.8%)	55 (30.1%)	43 (39.8%)
	Medical reason for diagnosis delay	39 (41.1%)	55 (34.6%)	70 (38.3%)	37 (34.3%)
	Medical reason for treatment delay	<5	8 (5.0%)	6 (3.3%)	<5
	Patient-initiated delay	<10	7 (4.4%)	16 (8.7%)	<5
	Other reason (not listed)	30 (31.6%)	40 (25.2%)	36 (19.7%)	23 (21.3%)
Referral to informed of diagnosis	Healthcare provider-initiated delay	Data not available	27 (26.2%)	28 (20.7%)	21 (28.8%)
	Medical reason for diagnosis delay	Data not available	24 (23.3%)	28 (20.7%)	19 (26.0%)
	Patient-initiated delay	Data not available	<5	6 (4.4%)	<5
	Other reason (not listed)	Data not available	23 (22.3%)	21 (15.6%)	<10
	No delay	Data not available	18 (17.5%)	33 (24.4%)	14 (19.2%)
	Unknown	Data not available	<10	19 (14.1%)	<10
Decision to treat to treatment start	Healthcare provider-initiated delay	<5	~10	11 (6.0%)	7 (6.5%)
	Medical reason for diagnosis delay	<5	<5	<10	<5
	Medical reason for treatment delay	<5	<5	<5	<5

Delay interval	Reason for delay	2017/2018 (Number and %)	2020/2021 (Number and %)	2021/2022 (Number and %)	Q1 & Q2 2022/2023 (Number and %)
	Patient-initiated delay	<5	<5	<5	<5
	Other reason (not listed)	<5	<10	<5	<5
	No delay	92 (96.8%)	140 (88.1%)	161 (88.0%)	98 (90.7%)

Table 22: Regression analysis for likelihood of waiting over 62 days by characteristic for stomach cancer. Results presented for both the original and RCRD linked cohort. The results for the original cohort are presented unadjusted and adjusted and results for the RCRD linked cohort are presented unadjusted, with minimal adjustment to align with the original cohort analysis and with full adjustment

		Original cohort		RCRD linked cohort		
Characteristic	Category	Unadjusted odds ratio (95% CIs)	Adjusted odds ratio (95% CIs)	Unadjusted odds ratio (95% CIs)	Adjusted odds ratio (95% CIs) (minimal adjustment)	Adjusted odds ratio (95% CIs) (fully adjusted)
Gender	Female	0.94 (0.83-1.06)	0.95 (0.84-1.09)	0.94 (0.83-1.06)	0.94 (0.82-1.07)	0.93 (0.81-1.07)
	Male (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
Age group	19-49	0.58 (0.42-0.79)*	0.57 (0.41-0.79)*	0.71 (0.51-0.98)	0.66 (0.47-0.92)	0.74 (0.52-1.06)
	50-59	0.88 (0.71-1.09)	0.89 (0.71-1.13)	0.98 (0.78-1.23)	0.97 (0.77-1.23)	0.99 (0.77-1.27)
	60-69 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
	70-79	0.9 (0.77-1.06)	0.92 (0.78-1.09)	0.99 (0.84-1.16)	0.99 (0.83-1.17)	0.93 (0.78-1.12)
	80+	0.46 (0.39-0.54)*	0.48 (0.4-0.57)*	0.49 (0.41-0.58)*	0.52 (0.43-0.62)*	0.46 (0.38-0.56)*
Deprivation quintile	1 - most deprived	1.16 (0.96-1.39)	1.08 (0.88-1.32)	1.18 (0.97-1.43)	1.06 (0.86-1.32)	1.08 (0.86-1.35)
	2	0.89 (0.74-1.07)	0.89 (0.73-1.1)	0.93 (0.77-1.12)	0.93 (0.76-1.15)	0.96 (0.77-1.19)
	3	0.96 (0.8-1.15)	0.96 (0.79-1.18)	1.09 (0.9-1.32)	1.06 (0.86-1.3)	1.07 (0.86-1.32)
	4	0.99 (0.82-1.19)	1.01 (0.82-1.23)	1.04 (0.85-1.26)	1.06 (0.86-1.31)	1.12 (0.9-1.4)
	5 - least deprived (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)

		Original cohort		RCRD linked cohort		
Characteristic	Category	Unadjusted odds ratio (95% CIs)	Adjusted odds ratio (95% CIs)	Unadjusted odds ratio (95% CIs)	Adjusted odds ratio (95% CIs) (minimal adjustment)	Adjusted odds ratio (95% CIs) (fully adjusted)
Financial year	Base year (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
	2020/2021	1.85 (1.58–2.17)*	1.94 (1.64–2.3)*	1.47 (1.25–1.73)*	1.55 (1.3–1.84)*	1.64 (1.37–1.96)*
	2021/2022	2.24 (1.92–2.61)*	2.44 (2.07–2.88)*	1.75 (1.5–2.05)*	1.93 (1.63–2.28)*	2.05 (1.72–2.44)*
	Q1 & Q2 2022/2023	2.85 (2.36–3.45)*	3.21 (2.62–3.92)*	2.32 (1.91–2.81)*	2.63 (2.14–3.23)*	2.86 (2.31–3.54)*
Stage	1 (ref)			1 (ref)		1 (ref)
	2			0.76 (0.58–1.01)		0.74 (0.55–1.01)
	3			0.51 (0.39–0.66)*		0.46 (0.35–0.61)*
	4			0.19 (0.15–0.24)*		0.16 (0.12–0.21)*
	Not known			0.33 (0.26–0.43)*		0.33 (0.25–0.44)*
Comorbidity	0 (ref)			1 (ref)		1 (ref)
	1			1.37 (1.13–1.65)*		1.35 (1.09–1.66)*
	2			1.01 (0.78–1.31)		0.97 (0.72–1.3)
	3+			0.77 (0.59–1.02)		0.83 (0.61–1.13)

*significant at the $p < 0.01$ level

Table 23: Median and interquartile range for the intervals in the diagnostic and treatment pathway for stomach cancer patients who waited over 62 days from referral to treatment in each financial year of start of treatment

Interval	2017/2018 (Median and IQR)	2020/2021 (Median and IQR)	2021/2022 (Median and IQR)	Q1 & Q2 2022/2023 (Median and IQR)
Referral to first seen	11 (7 - 13)	10 (7 - 13)	11 (7 - 14)	10 (7 - 13)
First seen to informed of diagnosis	Data not available	26 (13 - 45)	22 (10 - 41)	23.5 (10 - 44.75)
Informed of diagnosis to decision to treat	Data not available	34 (20 - 48)	40 (26 - 56)	40 (22 - 57)
Decision to treat to treatment start	11 (4.75 - 18)	13 (4 - 20)	14 (4 - 20)	14 (3 - 21)
Referral to informed of diagnosis	Data not available	37 (25 - 55.75)	33 (20 - 51)	34 (20 - 56.75)
Referral to decision to treat	73 (60.75 - 91)	75 (63 - 95.25)	76 (64 - 93)	77 (61 - 100.25)
Referral to treatment start	84.5 (73 - 102)	86 (74 - 113)	89 (75 - 109.25)	90.5 (74 - 112)

Table 24: Breakdown of the reasons for delay in each financial year of start of treatment among stomach cancer patients who waited over 62 days from referral to treatment, with delay overall between referral and treatment, from referral to informed of diagnosis or from decision to treat to treatment

Delay interval	Reason for delay	2017/2018 (Number and %)	2020/2021 (Number and %)	2021/2022 (Number and %)	Q1 & Q2 2022/2023 (Number and %)
Referral to treatment start	Healthcare provider-initiated delay	91 (21.9%)	189 (36.3%)	228 (35.6%)	137 (38.9%)
	Medical reason for diagnosis delay	144 (34.6%)	152 (29.2%)	217 (33.9%)	125 (35.5%)
	Medical reason for treatment delay	~20	~15	~20	<10
	Patient-initiated delay	31 (7.5%)	29 (5.6%)	34 (5.3%)	17 (4.8%)
	Other reason (not listed)	131 (31.5%)	134 (25.8%)	140 (21.9%)	63 (17.9%)
	Unknown	<5	<5	<5	<5
Referral to informed of diagnosis	Healthcare provider-initiated delay	Data not available	85 (23.7%)	74 (14.9%)	55 (20.1%)
	Medical reason for diagnosis delay	Data not available	63 (17.6%)	76 (15.3%)	47 (17.2%)
	Patient-initiated delay	Data not available	11 (3.1%)	20 (4.0%)	9 (3.3%)
	Other reason (not listed)	Data not available	56 (15.6%)	46 (9.2%)	27 (9.9%)
	No delay	Data not available	122 (34.1%)	213 (42.8%)	113 (41.2%)
	Unknown	Data not available	21 (5.9%)	69 (13.9%)	23 (8.4%)
Decision to treat to treatment start	Healthcare provider-initiated delay	<10	~10	19 (3.0%)	16 (4.5%)
	Medical reason for diagnosis delay	<5	<5	<10	<5

Delay interval	Reason for delay	2017/2018 (Number and %)	2020/2021 (Number and %)	2021/2022 (Number and %)	Q1 & Q2 2022/2023 (Number and %)
	Medical reason for treatment delay	<5	<5	<5	<5
	Patient-initiated delay	<5	<5	<5	<5
	Other reason (not listed)	<5	<10	<5	<5
	No delay	408 (98.1%)	494 (95.0%)	605 (94.5%)	333 (94.6%)