

Supplementary analysis for patients starting treatment for urological cancer

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

Those of female gender were less likely to be long waiters for kidney cancer, but there was no significant difference at the 1% confidence level for bladder or urinary tract cancer. There were substantial differences in the associations between age and likelihood of being a long waiter (Tables 1, 7, 13 & 19). Similar associations were seen for kidney and prostate with those in the older age groups less likely to be long waiters compared to those aged 60–69, and those in the younger age groups less likely for kidney cancer. However, those aged 80+ for bladder cancer were more likely to be long waiters compared to those aged 60–69, with no significant associations for urinary tract cancer. Those in the most deprived quintile were more likely to be long waiters compared to those in the least deprived quintile for bladder, kidney and prostate cancer, but gradients were only present for kidney and prostate cancer. All sites saw increases in the likelihood of being a long waiter with increasing financial year; however, the magnitude of this increase was far larger for bladder cancer compared to the other sites. For Q1 & Q2 2022/2023 those with bladder cancer were 28.61 times more likely to be a long waiter compared to 2017/2018, while for kidney, prostate, and urinary tract this ranged from 3.13 to 3.41 times more likely.

There was variation in the association by stage across urological cancer. There was increased likelihood of being a long waiter for higher stages compared to stage 1 for bladder cancer, although the adjusted odds ratios (AOR) for higher stages were similar. However, there was reduced likelihood of being a long waiter at higher stages for kidney cancer, although the lowest AOR was seen for stage 2. For prostate, there was increased likelihood of being a long waiter for stages 2 and 3, but then a very low likelihood for those at stage 4 (AOR 0.26). The likelihood of being a long waiter was higher for those with a comorbidity score of 1 or 2 for bladder cancer but there were no significant associations between comorbidity and being a long waiter for kidney, prostate and urinary tract cancer.

The longest subinterval for all sites was from referral to informed of diagnosis (Tables 2, 8, 14 & 20). In Q1 & Q2 2022/2023 the median time from decision to treat (DTT) to treatment was longest for kidney cancer, at around 32 days and around 20 days for bladder and urinary tract cancer but was 0 days from 2020/2021 for prostate cancer. In Q1 & Q2 2022/2023 there was a median interval from informed of diagnosis to DTT of around 25 days for prostate cancer and urinary tract, 32 days for kidney and 41 days for bladder cancer.

The most common reason for delay from referral to treatment was healthcare provider-initiated delay for bladder, kidney, prostate and urinary tract cancer (Tables 3, 9, 15 & 21). The percentage who met the 28-day standard from referral to informed of diagnosis in Q1 & Q2 2022/2023 was highest for bladder cancer (19%) and lowest for prostate (3%). The percentage who met the 31-day standard from DTT to

treatment decreased for bladder, kidney and urinary tract (from 79% in 2017/2018 to 73% in Q1 & Q2 2022/2023, 71% to 50% and 83% to 65%) but increased for prostate (77% to 84%).

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

The findings for likelihood of patients waiting over 62 days were very similar to those for patients waiting over 104 days (Tables 4, 10, 16 & 22). Exceptions included there being no consistent association with age for bladder cancer, no associations with gender for kidney cancer and no deprivation gradient seen for prostate cancer. In addition, those aged 19–49 or 80+ with urinary tract cancer were less likely to wait over 62 days compared to those aged 60–69.

Similar interval findings were present for those waiting over 62 days (Tables 5, 11, 17, & 23), with the time from DTT to treatment largely similar, except for kidney cancer where this interval was shorter. The median time from referral to informed of diagnosis was shorter for those waiting over 62 days as was the median time from informed of diagnosis to DTT. Similar findings for reasons for delay from referral to treatment were seen (Tables 6, 12, 18 & 24), but there tended to be higher percentages meeting the 28- and 31-day standards.

Table 1: Regression analysis for likelihood of waiting over 104 days by characteristic for bladder 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	0.98 (0.87-1.1)	0.91 (0.8-1.04)	0.95 (0.84-1.08)	0.89 (0.77-1.02)	0.85 (0.74-0.98)
	Male (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
Age group	19-49	1.13 (0.79-1.62)	1.05 (0.7-1.56)	0.96 (0.64-1.45)	0.88 (0.56-1.38)	0.89 (0.57-1.4)
	50-59	0.87 (0.69-1.1)	0.79 (0.61-1.02)	0.93 (0.73-1.18)	0.85 (0.65-1.1)	0.88 (0.68-1.15)
	60-69 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
	70-79	1.15 (0.99-1.33)	1.16 (0.99-1.37)	1.14 (0.98-1.33)	1.17 (0.99-1.38)	1.15 (0.97-1.37)
	80+	1.3 (1.13-1.51)*	1.4 (1.19-1.64)*	1.31 (1.12-1.53)*	1.38 (1.16-1.64)*	1.36 (1.14-1.62)*
Deprivation quintile	1 - most deprived	1.52 (1.3-1.77)*	1.49 (1.24-1.79)*	1.57 (1.33-1.85)*	1.5 (1.24-1.83)*	1.47 (1.21-1.8)*
	2	0.87 (0.74-1.03)	1.03 (0.85-1.24)	0.87 (0.73-1.03)	1 (0.82-1.22)	0.98 (0.8-1.2)
	3	0.9 (0.77-1.06)	1.02 (0.86-1.22)	0.91 (0.77-1.08)	1.03 (0.85-1.24)	0.99 (0.82-1.2)
	4	0.99 (0.85-1.15)	1.02 (0.86-1.2)	1 (0.85-1.17)	1.03 (0.86-1.23)	1.04 (0.86-1.25)
	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	9.37 (7.21-12.19)*	11.88 (9.1-15.52)*	8.02 (6.1-10.55)*	10.15 (7.68-13.42)*	10.07 (7.61-13.32)*
	2021/2022	14.45 (11.18-18.68)*	18.72 (14.41-24.32)*	13.91 (10.66-18.14)*	18.2 (13.88-23.87)*	17.94 (13.66-23.56)*
	Q1 & Q2 2022/2023	20.66 (15.85-26.91)*	28.61 (21.77-37.59)*	20.74 (15.78-27.25)*	28.79 (21.72-38.18)*	28.94 (21.79-38.44)*
Stage	1 (ref)			1 (ref)		1 (ref)
	2			2.07 (1.79-2.4)*		2.05 (1.73-2.42)*
	3			2.55 (2.1-3.09)*		2.36 (1.88-2.96)*
	4			2.2 (1.66-2.93)*		2.01 (1.45-2.79)*
	Not known			1.03 (0.89-1.19)		1.14 (0.96-1.35)
Comorbidity	0 (ref)			1 (ref)		1 (ref)
	1			1.33 (1.13-1.57)*		1.44 (1.19-1.74)*
	2			1.41 (1.14-1.74)*		1.58 (1.24-2.02)*
	3+			1.4 (1.14-1.72)*		1.35 (1.07-1.72)

*significant at the p<0.01 level

Table 2: Median and interquartile range for the intervals in the diagnostic and treatment pathway for bladder 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	10 (7 - 13)	9 (6 - 13)	9 (6 - 13)	11 (7 - 14)
First seen to informed of diagnosis	Data not available	55 (16 - 88)	48 (4 - 75)	55 (32 - 78)
Informed of diagnosis to decision to treat	Data not available	34 (1 - 75)	51 (21 - 83)	41 (19.5 - 75.5)
Decision to treat to treatment start	21 (0 - 30)	22 (11 - 37)	22 (13 - 32)	22 (13 - 33)
Referral to informed of diagnosis	Data not available	63 (25 - 104)	56 (15 - 82.5)	65 (44 - 95)
Referral to decision to treat	105 (89 - 129)	104 (85 - 133)	107 (91 - 129.75)	111.5 (92 - 137)
Referral to treatment start	120 (109 - 141)	128 (115 - 158)	127 (115 - 150)	133 (115 - 161)

Table 3: Breakdown of the reasons for delay in each financial year of start of treatment among bladder 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	~10	172 (37.6%)	303 (42.7%)	203 (44.3%)
	Medical reason for diagnosis delay	21 (32.3%)	92 (20.1%)	200 (28.2%)	129 (28.2%)
	Medical reason for treatment delay	~10	38 (8.3%)	35 (4.9%)	22 (4.8%)
	Patient-initiated delay	<5	22 (4.8%)	28 (3.9%)	14 (3.1%)
	Other reason (not listed)	18 (27.7%)	133 (29.1%)	144 (20.3%)	90 (19.7%)
Referral to informed of diagnosis	Healthcare provider-initiated delay	Data not available	52 (24.0%)	111 (24.4%)	103 (35.4%)
	Medical reason for diagnosis delay	Data not available	44 (20.3%)	57 (12.5%)	48 (16.5%)
	Patient-initiated delay	Data not available	8 (3.7%)	9 (2.0%)	~15
	Other reason (not listed)	Data not available	34 (15.7%)	46 (10.1%)	45 (15.5%)
	No delay (standard met)	Data not available	56 (25.8%)	156 (34.3%)	56 (19.2%)
	Unknown	Data not available	23 (10.6%)	76 (16.7%)	~25
Decision to treat to treatment start	Healthcare provider-initiated delay	8 (12.3%)	74 (16.2%)	116 (16.3%)	103 (22.5%)
	Medical reason for diagnosis delay	<5	~15	21 (3.0%)	7 (1.5%)
	Medical reason for treatment delay	5 (7.7%)	23 (5.0%)	~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	<5	<5	<5	<10
	Other reason (not listed)	<5	27 (5.9%)	26 (3.7%)	<10
	No delay (standard met)	51 (78.5%)	315 (68.9%)	529 (74.5%)	334 (72.9%)

Table 4: Regression analysis for likelihood of waiting over 62 days by characteristic for bladder 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	1.07 (0.99-1.16)	1.05 (0.95-1.15)	1.06 (0.98-1.15)	1.03 (0.93-1.13)	0.99 (0.9-1.09)
	Male (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
Age group	19-49	0.94 (0.73-1.21)	0.81 (0.6-1.09)	0.92 (0.71-1.2)	0.81 (0.59-1.1)	0.8 (0.58-1.09)
	50-59	0.88 (0.76-1.02)	0.77 (0.64-0.92)*	0.88 (0.76-1.03)	0.77 (0.65-0.93)*	0.79 (0.66-0.95)
	60-69 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
	70-79	1.07 (0.97-1.17)	1.03 (0.92-1.16)	1.07 (0.97-1.18)	1.04 (0.93-1.17)	1.03 (0.92-1.16)
	80+	1.11 (1-1.22)	1.12 (1-1.26)	1.1 (0.99-1.22)	1.1 (0.97-1.24)	1.09 (0.96-1.23)
Deprivation quintile	1 - most deprived	1.39 (1.25-1.55)*	1.37 (1.19-1.57)*	1.45 (1.29-1.62)*	1.36 (1.17-1.57)*	1.33 (1.15-1.54)*
	2	1 (0.9-1.12)	1.15 (1.01-1.31)	1.01 (0.9-1.13)	1.11 (0.97-1.28)	1.09 (0.95-1.26)
	3	0.94 (0.84-1.04)	1.02 (0.89-1.16)	0.99 (0.89-1.11)	1.08 (0.95-1.23)	1.05 (0.92-1.2)
	4	1.01 (0.91-1.12)	1.01 (0.89-1.14)	1.04 (0.94-1.16)	1.06 (0.93-1.2)	1.07 (0.94-1.22)
	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	6.01 (5.28–6.84)*	8.48 (7.38–9.76)*	5.23 (4.59–5.96)*	7.2 (6.25–8.3)*	7.21 (6.25–8.31)*
	2021/2022	8.24 (7.26–9.36)*	11.75 (10.24–13.49)*	7.52 (6.62–8.54)*	10.52 (9.16–12.09)*	10.49 (9.12–12.06)*
	Q1 & Q2 2022/2023	11.68 (10.17–13.41)*	18.37 (15.75–21.42)*	10.82 (9.41–12.43)*	16.42 (14.07–19.18)*	16.76 (14.33–19.6)*
Stage	1 (ref)			1 (ref)		1 (ref)
	2			2.01 (1.82–2.22)*		2.1 (1.87–2.37)*
	3			2.57 (2.24–2.95)*		2.59 (2.18–3.07)*
	4			2.05 (1.67–2.52)*		1.74 (1.36–2.23)*
	Not known			1.07 (0.97–1.18)		1.18 (1.05–1.32)*
Comorbidity	0 (ref)			1 (ref)		1 (ref)
	1			1.12 (1–1.26)		1.21 (1.05–1.39)*
	2			1.06 (0.91–1.24)		1.13 (0.94–1.36)
	3+			1.24 (1.07–1.43)*		1.31 (1.1–1.56)*

*significant at the $p < 0.01$ level

Table 5: Median and interquartile range for the intervals in the diagnostic and treatment pathway for bladder 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 (8 - 14)	9 (6 - 13)	9 (6 - 13)	10 (7 - 14)
First seen to informed of diagnosis	Data not available	42 (6 - 65.75)	38 (1 - 61)	47 (17.5 - 65)
Informed of diagnosis to decision to treat	Data not available	15 (0 - 49)	33 (6 - 63)	28 (0.5 - 54)
Decision to treat to treatment start	22 (7 - 37)	20 (8 - 31)	20 (11 - 29)	20 (10 - 30)
Referral to informed of diagnosis	Data not available	54 (16.75 - 76)	48 (15 - 71.75)	56 (27.5 - 77.5)
Referral to decision to treat	62 (41 - 83.5)	72 (53.5 - 95)	77 (61 - 102)	81 (62 - 107)
Referral to treatment start	82 (71 - 99)	92 (76 - 118)	99 (80 - 124)	101 (82 - 130)

Table 6: Breakdown of the reasons for delay in each financial year of start of treatment among bladder 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	78 (24.4%)	512 (41.2%)	772 (46.8%)	494 (50.1%)
	Medical reason for diagnosis delay	60 (18.8%)	247 (19.9%)	401 (24.3%)	219 (22.2%)
	Medical reason for treatment delay	79 (24.7%)	81 (6.5%)	84 (5.1%)	45 (4.6%)
	Patient-initiated delay	25 (7.8%)	59 (4.7%)	64 (3.9%)	40 (4.1%)
	Other reason (not listed)	78 (24.4%)	344 (27.7%)	328 (19.9%)	188 (19.1%)
Referral to informed of diagnosis	Healthcare provider-initiated delay	Data not available	158 (25.0%)	233 (22.7%)	218 (36.2%)
	Medical reason for diagnosis delay	Data not available	115 (18.2%)	120 (11.7%)	83 (13.8%)
	Patient-initiated delay	Data not available	16 (2.5%)	23 (2.2%)	~15
	Other reason (not listed)	Data not available	89 (14.1%)	102 (9.9%)	78 (12.9%)
	No delay (standard met)	Data not available	194 (30.7%)	370 (36.1%)	154 (25.5%)
	Unknown	Data not available	60 (9.5%)	178 (17.3%)	~55
Decision to treat to treatment start	Healthcare provider-initiated delay	31 (9.7%)	171 (13.8%)	246 (14.9%)	184 (18.7%)
	Medical reason for diagnosis delay	<5	24 (1.9%)	30 (1.8%)	15 (1.5%)
	Medical reason for treatment delay	45 (14.1%)	35 (2.8%)	35 (2.1%)	8 (0.8%)

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	14 (1.1%)	11 (0.7%)	<10
	Other reason (not listed)	14 (4.4%)	59 (4.7%)	42 (2.5%)	<10
	No delay (standard met)	225 (70.5%)	940 (75.6%)	1285 (77.9%)	761 (77.2%)

Table 7: Regression analysis for likelihood of waiting over 104 days by characteristic for kidney 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	0.85 (0.76-0.94)*	0.88 (0.79-0.98)	0.85 (0.76-0.95)*	0.87 (0.78-0.98)	0.84 (0.74-0.94)*
	Male (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
Age group	19-49	0.8 (0.66-0.98)	0.72 (0.59-0.89)*	0.87 (0.71-1.07)	0.79 (0.64-0.98)	0.78 (0.63-0.97)
	50-59	0.79 (0.68-0.92)*	0.76 (0.65-0.89)*	0.84 (0.72-0.99)	0.81 (0.69-0.96)	0.82 (0.69-0.97)
	60-69 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
	70-79	1.07 (0.94-1.21)	1.09 (0.96-1.25)	1.01 (0.88-1.15)	1.04 (0.9-1.2)	1.03 (0.89-1.19)
	80+	0.62 (0.52-0.73)*	0.66 (0.56-0.79)*	0.6 (0.5-0.71)*	0.67 (0.55-0.8)*	0.65 (0.54-0.79)*
Deprivation quintile	1 - most deprived	1.57 (1.34-1.84)*	1.62 (1.36-1.93)*	1.58 (1.33-1.87)*	1.65 (1.37-1.99)*	1.65 (1.37-1.99)*
	2	1.29 (1.1-1.51)*	1.33 (1.12-1.58)*	1.29 (1.09-1.53)*	1.3 (1.09-1.56)*	1.3 (1.08-1.55)*
	3	1.14 (0.97-1.33)	1.12 (0.94-1.32)	1.13 (0.95-1.34)	1.13 (0.95-1.35)	1.14 (0.95-1.36)
	4	1.19 (1.02-1.39)	1.17 (0.99-1.38)	1.13 (0.96-1.34)	1.08 (0.91-1.29)	1.07 (0.9-1.28)
	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	1.52 (1.31-1.77)*	1.57 (1.34-1.83)*	1.2 (1.02-1.41)	1.25 (1.06-1.47)*	1.26 (1.07-1.49)*
	2021/2022	2.13 (1.85-2.45)*	2.22 (1.92-2.57)*	1.83 (1.59-2.11)*	1.95 (1.68-2.26)*	1.95 (1.68-2.26)*
	Q1 & Q2 2022/2023	3.17 (2.72-3.69)*	3.41 (2.91-4)*	2.97 (2.54-3.47)*	3.26 (2.76-3.84)*	3.29 (2.79-3.88)*
Stage	1 (ref)			1 (ref)		1 (ref)
	2			0.49 (0.37-0.64)*		0.45 (0.33-0.6)*
	3			0.69 (0.59-0.8)*		0.62 (0.53-0.73)*
	4			0.59 (0.48-0.73)*		0.51 (0.41-0.64)*
	Not known			0.87 (0.77-0.99)		0.76 (0.66-0.88)*
Comorbidity	0 (ref)			1 (ref)		1 (ref)
	1			1.23 (1.04-1.47)		1.27 (1.06-1.52)
	2			1.25 (0.98-1.6)		1.41 (1.08-1.84)
	3+			1.09 (0.84-1.42)		1.12 (0.84-1.48)

*significant at the $p < 0.01$ level

Table 8: Median and interquartile range for the intervals in the diagnostic and treatment pathway for kidney 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	10 (7 - 13)	9 (6 - 13)	9 (7 - 13)	10 (7 - 14)
First seen to informed of diagnosis	Data not available	54 (23 - 91)	58 (27 - 88)	62 (29 - 92)
Informed of diagnosis to decision to treat	Data not available	30 (0.25 - 67.25)	27 (0 - 57)	32 (2 - 70)
Decision to treat to treatment start	22 (7 - 36)	28 (6 - 67)	32 (14 - 60)	31.5 (14 - 59)
Referral to informed of diagnosis	Data not available	62 (31.25 - 100)	68 (36 - 99.25)	76 (42 - 103)
Referral to decision to treat	112 (90 - 136)	108 (76 - 140)	102 (76.5 - 128.5)	106 (81 - 139)
Referral to treatment start	128 (114 - 157)	143 (118 - 181)	134 (116 - 162.5)	139 (121 - 172)

Table 9: Breakdown of the reasons for delay in each financial year of start of treatment among kidney 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	116 (32.5%)	180 (42.8%)	305 (46.0%)	235 (50.6%)
	Medical reason for diagnosis delay	110 (30.8%)	92 (21.9%)	213 (32.1%)	118 (25.4%)
	Medical reason for treatment delay	26 (7.3%)	18 (4.3%)	9 (1.4%)	~10
	Patient-initiated delay	15 (4.2%)	19 (4.5%)	17 (2.6%)	~20
	Other reason (not listed)	90 (25.2%)	112 (26.6%)	119 (17.9%)	83 (17.9%)
Referral to informed of diagnosis	Healthcare provider-initiated delay	Data not available	51 (24.3%)	82 (24.1%)	75 (30.6%)
	Medical reason for diagnosis delay	Data not available	40 (19.0%)	73 (21.5%)	51 (20.8%)
	Patient-initiated delay	Data not available	<5	7 (2.1%)	<10
	Other reason (not listed)	Data not available	46 (21.9%)	50 (14.7%)	45 (18.4%)
	No delay (standard met)	Data not available	47 (22.4%)	55 (16.2%)	~35
	Unknown	Data not available	~25	73 (21.5%)	~35
Decision to treat to treatment start	Healthcare provider-initiated delay	54 (15.1%)	105 (24.9%)	259 (39.1%)	196 (42.2%)
	Medical reason for diagnosis delay	<5	6 (1.4%)	18 (2.7%)	<5
	Medical reason for treatment delay	21 (5.9%)	13 (3.1%)	11 (1.7%)	14 (3.0%)

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	7 (1.7%)	10 (1.5%)	<10
	Other reason (not listed)	26 (7.3%)	59 (14.0%)	34 (5.1%)	~10
	No delay (standard met)	254 (71.1%)	231 (54.9%)	331 (49.9%)	232 (50.0%)

Table 10: Regression analysis for likelihood of waiting over 62 days by characteristic for kidney 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	0.9 (0.83-0.97)*	0.95 (0.87-1.03)	0.92 (0.85-1)	0.96 (0.89-1.05)	0.95 (0.87-1.04)
	Male (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
Age group	19-49	0.96 (0.83-1.11)	0.9 (0.77-1.05)	1 (0.86-1.17)	0.95 (0.81-1.12)	0.93 (0.79-1.1)
	50-59	0.85 (0.76-0.96)*	0.83 (0.74-0.94)*	0.88 (0.78-0.99)	0.86 (0.76-0.98)	0.85 (0.75-0.96)
	60-69 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
	70-79	1.04 (0.94-1.15)	1.05 (0.94-1.17)	1 (0.9-1.11)	1.02 (0.91-1.14)	1.04 (0.93-1.16)
	80+	0.55 (0.49-0.62)*	0.56 (0.5-0.64)*	0.54 (0.48-0.61)*	0.57 (0.5-0.65)*	0.61 (0.53-0.7)*
Deprivation quintile	1 - most deprived	1.42 (1.25-1.61)*	1.43 (1.24-1.64)*	1.31 (1.15-1.48)*	1.28 (1.11-1.48)*	1.29 (1.12-1.49)*
	2	1.29 (1.15-1.46)*	1.33 (1.17-1.52)*	1.24 (1.1-1.41)*	1.24 (1.09-1.42)*	1.25 (1.09-1.43)*
	3	1.2 (1.07-1.35)*	1.19 (1.05-1.35)*	1.09 (0.97-1.23)	1.09 (0.96-1.24)	1.09 (0.96-1.25)
	4	1.28 (1.14-1.44)*	1.28 (1.13-1.45)*	1.23 (1.09-1.38)*	1.21 (1.06-1.37)*	1.21 (1.06-1.37)*
	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	1.5 (1.35-1.67)*	1.55 (1.39-1.73)*	1.2 (1.07-1.33)*	1.23 (1.1-1.38)*	1.24 (1.1-1.38)*
	2021/2022	2.04 (1.85-2.25)*	2.18 (1.96-2.42)*	1.66 (1.5-1.83)*	1.77 (1.59-1.97)*	1.78 (1.6-1.98)*
	Q1 & Q2 2022/2023	2.92 (2.58-3.3)*	3.24 (2.85-3.69)*	2.51 (2.22-2.84)*	2.79 (2.44-3.18)*	2.81 (2.46-3.2)*
Stage	1 (ref)			1 (ref)		1 (ref)
	2			0.71 (0.59-0.85)*		0.67 (0.55-0.81)*
	3			0.94 (0.84-1.05)		0.89 (0.79-1)
	4			0.92 (0.8-1.06)		0.8 (0.68-0.93)*
	Not known			0.78 (0.71-0.86)*		0.64 (0.57-0.72)*
Comorbidity	0 (ref)			1 (ref)		1 (ref)
	1			0.97 (0.85-1.11)		1 (0.87-1.15)
	2			0.96 (0.79-1.17)		1.12 (0.91-1.39)
	3+			0.73 (0.6-0.9)*		0.8 (0.64-1)

*significant at the $p < 0.01$ level

Table 11: Median and interquartile range for the intervals in the diagnostic and treatment pathway for kidney 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	9 (7 - 13)	9 (6 - 13)	9 (6 - 13)	10 (7 - 13)
First seen to informed of diagnosis	Data not available	39 (20 - 63)	41 (21 - 64)	44 (23 - 70)
Informed of diagnosis to decision to treat	Data not available	15 (0 - 38)	16 (0 - 39)	20 (0 - 43)
Decision to treat to treatment start	20 (6.5 - 29)	21 (5 - 36)	23.5 (9 - 39)	26 (9 - 41.75)
Referral to informed of diagnosis	Data not available	49 (28 - 75)	50.5 (30 - 75)	55 (33 - 83)
Referral to decision to treat	72 (55 - 93.5)	70 (51 - 93)	70 (53 - 95)	73 (54 - 103)
Referral to treatment start	90 (76 - 112)	92 (74 - 122)	94 (77 - 124)	99 (79 - 136)

Table 12: Breakdown of the reasons for delay in each financial year of start of treatment among kidney 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	447 (39.1%)	563 (47.0%)	891 (53.1%)	580 (57.2%)
	Medical reason for diagnosis delay	254 (22.2%)	236 (19.7%)	409 (24.4%)	219 (21.6%)
	Medical reason for treatment delay	74 (6.5%)	40 (3.3%)	36 (2.1%)	~15
	Patient-initiated delay	53 (4.6%)	53 (4.4%)	68 (4.1%)	~35
	Other reason (not listed)	315 (27.6%)	306 (25.5%)	274 (16.3%)	167 (16.5%)
Referral to informed of diagnosis	Healthcare provider-initiated delay	Data not available	133 (21.1%)	209 (23.3%)	167 (32.1%)
	Medical reason for diagnosis delay	Data not available	140 (22.2%)	177 (19.8%)	105 (20.2%)
	Patient-initiated delay	Data not available	10 (1.6%)	20 (2.2%)	~10
	Other reason (not listed)	Data not available	118 (18.7%)	115 (12.8%)	84 (16.2%)
	No delay (standard met)	Data not available	165 (26.2%)	208 (23.2%)	105 (20.2%)
	Unknown	Data not available	64 (10.2%)	167 (18.6%)	~45
Decision to treat to treatment start	Healthcare provider-initiated delay	144 (12.6%)	225 (18.8%)	468 (27.9%)	333 (32.8%)
	Medical reason for diagnosis delay	<5	12 (1.0%)	28 (1.7%)	9 (0.9%)
	Medical reason for treatment delay	34 (3.0%)	24 (2.0%)	18 (1.1%)	19 (1.9%)

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	13 (1.1%)	17 (1.0%)	~10
	Other reason (not listed)	53 (4.6%)	83 (6.9%)	49 (2.9%)	~15
	No delay (standard met)	909 (79.5%)	841 (70.2%)	1098 (65.4%)	628 (61.9%)

Table 13: Regression analysis for likelihood of waiting over 104 days by characteristic for prostate 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)
Age group	19-49	0.93 (0.76-1.13)	0.95 (0.77-1.17)	0.82 (0.67-1)	0.83 (0.67-1.02)	0.83 (0.67-1.03)
	50-59	1.08 (1.02-1.16)	1.07 (1-1.15)	1.14 (1.07-1.21)*	1.13 (1.07-1.21)*	1.12 (1.05-1.2)*
	60-69 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
	70-79	0.64 (0.61-0.67)*	0.64 (0.61-0.67)*	0.61 (0.58-0.63)*	0.61 (0.58-0.64)*	0.64 (0.6-0.67)*
	80+	0.18 (0.16-0.2)*	0.19 (0.17-0.21)*	0.17 (0.15-0.19)*	0.17 (0.15-0.19)*	0.21 (0.19-0.24)*
Deprivation quintile	1 - most deprived	1.25 (1.16-1.35)*	1.17 (1.08-1.27)*	1.18 (1.1-1.26)*	1.1 (1.01-1.18)	1.12 (1.04-1.21)*
	2	1.25 (1.17-1.34)*	1.16 (1.08-1.25)*	1.18 (1.1-1.25)*	1.13 (1.05-1.21)*	1.15 (1.07-1.23)*
	3	1.21 (1.13-1.28)*	1.14 (1.07-1.22)*	1.13 (1.07-1.2)*	1.09 (1.02-1.16)	1.09 (1.02-1.17)*
	4	1.11 (1.04-1.18)*	1.09 (1.02-1.16)	1.06 (1-1.12)	1.06 (0.99-1.12)	1.05 (0.99-1.12)
	5 - least deprived (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
Financial year	Base year (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
	2020/2021	1.62 (1.51-1.73)*	1.78 (1.66-1.91)*	0.95 (0.9-1.01)	1.03 (0.96-1.09)	1.07 (1-1.14)

		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)
	2021/2022	1.45 (1.36-1.54)*	1.67 (1.56-1.78)*	0.91 (0.87-0.96)*	1.04 (0.98-1.1)	1.07 (1.01-1.13)
	Q1 & Q2 2022/2023	2.61 (2.45-2.78)*	3.13 (2.92-3.35)*	1.74 (1.64-1.83)*	2.03 (1.92-2.16)*	2.07 (1.95-2.2)*
Stage	1 (ref)			1 (ref)		1 (ref)
	2			1.33 (1.25-1.42)*		1.43 (1.34-1.54)*
	3			1.09 (1.04-1.15)*		1.13 (1.06-1.19)*
	4			0.23 (0.2-0.25)*		0.26 (0.23-0.29)*
	Not known			0.6 (0.57-0.64)*		0.59 (0.55-0.63)*
Comorbidity	0 (ref)			1 (ref)		1 (ref)
	1			0.91 (0.85-0.99)		1.07 (0.99-1.16)
	2			0.83 (0.74-0.93)*		1.11 (0.99-1.25)
	3+			0.63 (0.55-0.73)*		1.01 (0.87-1.17)

*significant at the $p < 0.01$ level

Table 14: Median and interquartile range for the intervals in the diagnostic and treatment pathway for prostate 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	10 (7 - 13)	8 (5 - 12)	9 (6 - 13)	10 (6 - 14)
First seen to informed of diagnosis	Data not available	72 (42 - 106)	74 (49 - 104)	86 (56 - 112)
Informed of diagnosis to decision to treat	Data not available	21 (1.75 - 47)	26 (0 - 48)	23 (0 - 48)
Decision to treat to treatment start	16 (0 - 31)	0 (0 - 34)	0 (0 - 25)	0 (0 - 20)
Referral to informed of diagnosis	Data not available	83 (51 - 114.25)	84 (57 - 112)	98 (67 - 122)
Referral to decision to treat	110 (92 - 129)	118 (100.5 - 147)	117 (105 - 137)	122 (108 - 145)
Referral to treatment start	125 (112 - 146)	135 (117 - 169.5)	126 (113 - 150)	132 (117 - 155.75)

Table 15: Breakdown of the reasons for delay in each financial year of start of treatment among prostate 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	635 (37.7%)	996 (44.6%)	1560 (54.9%)	1824 (63.5%)
	Medical reason for diagnosis delay	212 (12.6%)	278 (12.4%)	413 (14.5%)	296 (10.3%)
	Medical reason for treatment delay	42 (2.5%)	54 (2.4%)	42 (1.5%)	27 (0.9%)
	Patient-initiated delay	214 (12.7%)	181 (8.1%)	230 (8.1%)	211 (7.3%)
	Other reason (not listed)	582 (34.5%)	726 (32.5%)	594 (20.9%)	516 (18.0%)
Referral to informed of diagnosis	Healthcare provider-initiated delay	Data not available	613 (39.4%)	767 (37.5%)	1233 (55.6%)
	Medical reason for diagnosis delay	Data not available	163 (10.5%)	255 (12.5%)	203 (9.2%)
	Patient-initiated delay	Data not available	84 (5.4%)	124 (6.1%)	144 (6.5%)
	Other reason (not listed)	Data not available	422 (27.1%)	368 (18.0%)	300 (13.5%)
	No delay (standard met)	Data not available	97 (6.2%)	79 (3.9%)	73 (3.3%)
	Unknown	Data not available	177 (11.4%)	454 (22.2%)	265 (11.9%)
Decision to treat to treatment start	Healthcare provider-initiated delay	273 (16.2%)	299 (13.4%)	441 (15.5%)	417 (14.5%)
	Medical reason for diagnosis delay	<5	<10	<10	<10
	Medical reason for treatment delay	40 (2.4%)	42 (1.9%)	11 (0.4%)	<10

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	~25	~15	~20	~20
	Other reason (not listed)	51 (3.0%)	216 (9.7%)	82 (2.9%)	20 (0.7%)
	No delay (standard met)	1293 (76.7%)	1659 (74.2%)	2274 (80.1%)	2403 (83.6%)

Table 16: Regression analysis for likelihood of waiting over 62 days by characteristic for prostate 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)
Age group	19-49	0.95 (0.83-1.09)	1.04 (0.89-1.21)	0.86 (0.75-0.99)	0.91 (0.79-1.06)	0.9 (0.77-1.05)
	50-59	1.06 (1.01-1.11)	1.06 (1.01-1.12)	1.05 (1-1.09)	1.05 (1-1.1)	1.03 (0.98-1.09)
	60-69 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
	70-79	0.73 (0.71-0.76)*	0.71 (0.68-0.73)*	0.71 (0.69-0.74)*	0.69 (0.67-0.71)*	0.72 (0.69-0.74)*
	80+	0.23 (0.21-0.24)*	0.2 (0.19-0.22)*	0.22 (0.21-0.23)*	0.19 (0.18-0.21)*	0.24 (0.22-0.25)*
Deprivation quintile	1 - most deprived	1.1 (1.05-1.15)*	0.99 (0.93-1.05)	1.06 (1.01-1.11)	0.94 (0.89-0.99)	0.97 (0.92-1.03)
	2	1.13 (1.09-1.18)*	1.02 (0.97-1.07)	1.12 (1.07-1.17)*	1.02 (0.97-1.07)	1.05 (1-1.1)
	3	1.12 (1.07-1.16)*	1.04 (1-1.09)	1.09 (1.05-1.14)*	1.01 (0.96-1.05)	1.02 (0.97-1.07)
	4	1.07 (1.03-1.11)*	1.04 (0.99-1.08)	1.05 (1.01-1.09)	1.01 (0.97-1.06)	1.02 (0.98-1.07)
	5 - least deprived (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
Financial year	Base year (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
	2020/2021	1.36 (1.31-1.42)*	1.49 (1.43-1.56)*	0.88 (0.84-0.91)*	0.93 (0.89-0.97)*	0.96 (0.92-1)

		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)
	2021/2022	1.57 (1.51-1.63)*	1.82 (1.75-1.9)*	1.04 (1-1.08)	1.17 (1.13-1.22)*	1.19 (1.14-1.23)*
	Q1 & Q2 2022/2023	2.62 (2.51-2.73)*	3.26 (3.11-3.42)*	1.77 (1.7-1.84)*	2.13 (2.04-2.22)*	2.15 (2.06-2.25)*
Stage	1 (ref)			1 (ref)		1 (ref)
	2			1.21 (1.16-1.27)*		1.29 (1.23-1.36)*
	3			1 (0.96-1.03)		1.02 (0.98-1.06)
	4			0.26 (0.24-0.27)*		0.26 (0.25-0.28)*
	Not known			0.59 (0.57-0.61)*		0.58 (0.56-0.61)*
Comorbidity	0 (ref)			1 (ref)		1 (ref)
	1			0.89 (0.85-0.94)*		1.03 (0.97-1.09)
	2			0.78 (0.72-0.83)*		1 (0.92-1.09)
	3+			0.63 (0.58-0.68)*		0.95 (0.86-1.04)

*significant at the $p < 0.01$ level

Table 17: Median and interquartile range for the intervals in the diagnostic and treatment pathway for prostate 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)	8 (5 - 12)	9 (6 - 13)	9 (6 - 13)
First seen to informed of diagnosis	Data not available	58 (39 - 77)	60 (42 - 75)	64 (49 - 84)
Informed of diagnosis to decision to treat	Data not available	13 (0 - 29)	7 (0 - 28)	0 (0 - 29)
Decision to treat to treatment start	0 (0 - 22)	0 (0 - 10.5)	0 (0 - 2)	0 (0 - 0)
Referral to informed of diagnosis	Data not available	68 (48 - 85)	70 (52 - 84)	74 (61 - 93)
Referral to decision to treat	78 (67 - 97)	83 (70 - 106)	82 (70 - 102)	87 (73 - 112)
Referral to treatment start	88 (76 - 109)	91 (75 - 120)	87 (73 - 110)	92 (76 - 120)

Table 18: Breakdown of the reasons for delay in each financial year of start of treatment among prostate 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	2226 (38.6%)	3241 (52.5%)	5658 (59.3%)	5231 (66.4%)
	Medical reason for diagnosis delay	669 (11.6%)	789 (12.8%)	1163 (12.2%)	714 (9.1%)
	Medical reason for treatment delay	~105	~95	~95	~65
	Patient-initiated delay	829 (14.4%)	532 (8.6%)	866 (9.1%)	675 (8.6%)
	Other reason (not listed)	1931 (33.5%)	1509 (24.5%)	1761 (18.5%)	1193 (15.1%)
	Unknown	<5	<5	<5	<5
Referral to informed of diagnosis	Healthcare provider-initiated delay	Data not available	1918 (43.1%)	3002 (40.3%)	3414 (54.4%)
	Medical reason for diagnosis delay	Data not available	494 (11.1%)	811 (10.9%)	530 (8.5%)
	Patient-initiated delay	Data not available	256 (5.8%)	476 (6.4%)	411 (6.6%)
	Other reason (not listed)	Data not available	997 (22.4%)	1223 (16.4%)	935 (14.9%)
	No delay (standard met)	Data not available	310 (7.0%)	404 (5.4%)	303 (4.8%)
	Unknown	Data not available	472 (10.6%)	1529 (20.5%)	677 (10.8%)
Decision to treat to treatment start	Healthcare provider-initiated delay	409 (7.1%)	389 (6.3%)	600 (6.3%)	507 (6.4%)
	Medical reason for diagnosis delay	<5	<10	~10	<10

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	63 (1.1%)	47 (0.8%)	16 (0.2%)	<10
	Patient-initiated delay	~35	~15	~25	~25
	Other reason (not listed)	79 (1.4%)	241 (3.9%)	98 (1.0%)	26 (0.3%)
	No delay (standard met)	5172 (89.8%)	5468 (88.6%)	8796 (92.2%)	7308 (92.7%)

Table 19: Regression analysis for likelihood of waiting over 104 days by characteristic for urinary tract 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	0.84 (0.67-1.05)	0.81 (0.64-1.04)	0.99 (0.77-1.27)	0.95 (0.73-1.25)	0.96 (0.73-1.25)
	Male (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
Age group	19-49	0.34 (0.14-0.81)	0.31 (0.12-0.76)	0.31 (0.11-0.9)	0.25 (0.09-0.75)	0.26 (0.09-0.76)
	50-59	0.79 (0.52-1.2)	0.83 (0.53-1.3)	0.95 (0.6-1.49)	0.93 (0.58-1.51)	0.94 (0.58-1.52)
	60-69 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
	70-79	1.36 (1.03-1.82)	1.41 (1.04-1.92)	1.42 (1.04-1.94)	1.43 (1.02-2.01)	1.42 (1.01-1.99)
	80+	0.96 (0.71-1.32)	1.01 (0.72-1.42)	0.9 (0.63-1.27)	0.91 (0.63-1.33)	0.9 (0.61-1.31)
Deprivation quintile	1 - most deprived	0.95 (0.66-1.37)	0.98 (0.66-1.47)	0.78 (0.51-1.2)	0.8 (0.51-1.27)	0.79 (0.5-1.26)
	2	1.26 (0.89-1.77)	1.29 (0.89-1.87)	1.49 (1.03-2.17)	1.57 (1.05-2.35)	1.57 (1.05-2.35)
	3	1.46 (1.05-2.03)	1.48 (1.03-2.13)	1.41 (0.98-2.03)	1.37 (0.93-2.04)	1.38 (0.93-2.05)
	4	1.33 (0.96-1.85)	1.33 (0.93-1.89)	1.45 (1-2.09)	1.37 (0.92-2.03)	1.38 (0.93-2.04)
	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	1.75 (1.28-2.4)*	1.86 (1.33-2.61)*	1.32 (0.93-1.85)	1.4 (0.98-2.02)	1.41 (0.98-2.03)
	2021/2022	2.11 (1.56-2.86)*	2.23 (1.6-3.09)*	1.73 (1.25-2.4)*	1.92 (1.36-2.73)*	1.93 (1.36-2.74)*
	Q1 & Q2 2022/2023	2.83 (2-4.01)*	3.16 (2.17-4.6)*	2.51 (1.74-3.62)*	2.85 (1.91-4.24)*	2.85 (1.91-4.25)*
Comorbidity	0 (ref)			1 (ref)		1 (ref)
	1			1.09 (0.74-1.6)		1.1 (0.73-1.66)
	2			1.05 (0.61-1.81)		1.09 (0.6-1.97)
	3+			1.12 (0.68-1.86)		1.17 (0.67-2.03)

*significant at the $p < 0.01$ level

Table 20: Median and interquartile range for the intervals in the diagnostic and treatment pathway for urinary tract 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	10 (7 - 14)	9.5 (7 - 13)	10 (7 - 13)	11 (7 - 13)
First seen to informed of diagnosis	Data not available	79 (57 - 114)	60 (30.5 - 100)	72 (36 - 107)
Informed of diagnosis to decision to treat	Data not available	25 (0 - 42.5)	34 (7 - 69)	26 (0 - 61)
Decision to treat to treatment start	21 (8 - 29)	19 (8 - 30.25)	27.5 (16 - 43)	23 (11 - 45)
Referral to informed of diagnosis	Data not available	90 (66.5 - 122)	69 (41 - 107)	86 (55 - 116)
Referral to decision to treat	112 (94 - 133)	113 (93 - 144.25)	109 (89 - 129.25)	116 (89 - 139)
Referral to treatment start	138 (118 - 155)	141 (115 - 162.25)	134 (119 - 166.25)	142 (124 - 182)

Table 21: Breakdown of the reasons for delay in each financial year of start of treatment among urinary tract 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	20 (24.7%)	40 (33.3%)	72 (47.4%)	48 (51.6%)
	Medical reason for diagnosis delay	27 (33.3%)	45 (37.5%)	50 (32.9%)	26 (28.0%)
	Medical reason for treatment delay	<5	6 (5.0%)	<10	<5
	Patient-initiated delay	<5	5 (4.2%)	<5	<10
	Other reason (not listed)	29 (35.8%)	24 (20.0%)	23 (15.1%)	13 (14.0%)
Referral to informed of diagnosis	Healthcare provider-initiated delay	Data not available	15 (25.4%)	30 (37.0%)	21 (36.8%)
	Medical reason for diagnosis delay	Data not available	16 (27.1%)	10 (12.3%)	15 (26.3%)
	Patient-initiated delay	Data not available	<10	<5	<5
	Other reason (not listed)	Data not available	10 (16.9%)	<10	<10
	No delay (standard met)	Data not available	<5	12 (14.8%)	<5
	Unknown	Data not available	10 (16.9%)	19 (23.5%)	<10
Decision to treat to treatment start	Healthcare provider-initiated delay	5 (6.2%)	17 (14.2%)	41 (27.0%)	25 (26.9%)
	Medical reason for diagnosis delay	<5	<5	<5	<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)	<10	6 (5.0%)	<10	<5
	No delay (standard met)	67 (82.7%)	92 (76.7%)	96 (63.2%)	60 (64.5%)

Table 22: Regression analysis for likelihood of waiting over 62 days by characteristic for urinary tract 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	0.84 (0.69-1.02)	0.83 (0.67-1.04)	1.1 (0.89-1.37)	1.11 (0.88-1.41)	1.11 (0.88-1.41)
	Male (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
Age group	19-49	0.35 (0.2-0.62)*	0.29 (0.16-0.55)*	0.38 (0.2-0.7)*	0.28 (0.14-0.57)*	0.28 (0.14-0.57)*
	50-59	0.59 (0.42-0.84)*	0.64 (0.43-0.94)	0.71 (0.49-1.03)	0.7 (0.46-1.06)	0.7 (0.46-1.06)
	60-69 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
	70-79	0.95 (0.73-1.23)	0.94 (0.7-1.25)	0.81 (0.61-1.07)	0.75 (0.55-1.02)	0.75 (0.55-1.01)
	80+	0.57 (0.43-0.74)*	0.55 (0.41-0.75)*	0.53 (0.4-0.71)*	0.49 (0.35-0.67)*	0.48 (0.34-0.67)*
Deprivation quintile	1 - most deprived	0.89 (0.66-1.21)	0.82 (0.58-1.17)	0.95 (0.68-1.32)	0.91 (0.62-1.32)	0.9 (0.62-1.31)
	2	0.98 (0.73-1.32)	0.96 (0.69-1.35)	1.4 (1.02-1.94)	1.44 (1-2.06)	1.43 (1-2.05)
	3	1.06 (0.8-1.43)	1 (0.72-1.39)	1.25 (0.91-1.7)	1.17 (0.83-1.66)	1.18 (0.83-1.66)
	4	1.15 (0.86-1.53)	1.08 (0.78-1.5)	1.23 (0.9-1.69)	1.12 (0.79-1.58)	1.11 (0.79-1.58)
	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	1.71 (1.33-2.22)*	1.79 (1.35-2.39)*	1.65 (1.25-2.17)*	1.74 (1.28-2.36)*	1.75 (1.29-2.38)*
	2021/2022	2.24 (1.74-2.88)*	2.37 (1.79-3.14)*	2.04 (1.56-2.68)*	2.21 (1.64-3)*	2.21 (1.63-3)*
	Q1 & Q2 2022/2023	2.84 (2.07-3.89)*	2.97 (2.09-4.21)*	2.69 (1.93-3.77)*	2.96 (2.04-4.29)*	2.97 (2.05-4.32)*
Comorbidity	0 (ref)			1 (ref)		1 (ref)
	1			0.96 (0.69-1.33)		0.97 (0.67-1.4)
	2			0.84 (0.53-1.35)		0.99 (0.58-1.68)
	3+			0.97 (0.63-1.51)		1.18 (0.72-1.93)

*significant at the $p < 0.01$ level

Table 23: Median and interquartile range for the intervals in the diagnostic and treatment pathway for urinary tract 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	9 (7 - 13)	9 (6 - 12)	9 (6 - 13)	10 (7 - 13)
First seen to informed of diagnosis	Data not available	49 (28.5 - 78)	49 (27 - 73)	48 (31.5 - 83)
Informed of diagnosis to decision to treat	Data not available	20 (0 - 37.5)	17 (0 - 41.5)	14 (0 - 36.5)
Decision to treat to treatment start	21 (9 - 29)	17 (7 - 29)	22 (8 - 34)	23 (9.25 - 40.5)
Referral to informed of diagnosis	Data not available	57 (36 - 88)	59 (36.5 - 79)	58 (37 - 91)
Referral to decision to treat	77 (60.25 - 101.75)	84 (63 - 111.75)	78 (61 - 107)	82.5 (57 - 118.75)
Referral to treatment start	96.5 (81 - 123)	102 (83.25 - 137)	100 (80 - 132)	108.5 (81.25 - 144.5)

Table 24: Breakdown of the reasons for delay in each financial year of start of treatment among urinary tract 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	57 (27.7%)	94 (36.4%)	168 (52.7%)	94 (54.0%)
	Medical reason for diagnosis delay	66 (32.0%)	82 (31.8%)	92 (28.8%)	45 (25.9%)
	Medical reason for treatment delay	12 (5.8%)	12 (4.7%)	<10	<5
	Patient-initiated delay	12 (5.8%)	14 (5.4%)	<10	~10
	Other reason (not listed)	59 (28.6%)	56 (21.7%)	42 (13.2%)	22 (12.6%)
Referral to informed of diagnosis	Healthcare provider-initiated delay	Data not available	35 (25.2%)	61 (34.9%)	44 (38.3%)
	Medical reason for diagnosis delay	Data not available	34 (24.5%)	31 (17.7%)	34 (29.6%)
	Patient-initiated delay	Data not available	<10	<10	<10
	Other reason (not listed)	Data not available	24 (17.3%)	~15	~10
	No delay (standard met)	Data not available	20 (14.4%)	29 (16.6%)	12 (10.4%)
	Unknown	Data not available	~20	32 (18.3%)	<10
Decision to treat to treatment start	Healthcare provider-initiated delay	17 (8.3%)	27 (10.5%)	70 (21.9%)	46 (26.4%)
	Medical reason for diagnosis 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 %)
	Medical reason for treatment delay	6 (2.9%)	<10	<5	<5
	Patient-initiated delay	<5	<5	<5	<5
	Other reason (not listed)	~10	12 (4.7%)	<10	<5
	No delay (standard met)	171 (83.0%)	209 (81.0%)	232 (72.7%)	118 (67.8%)