

Supplementary analysis for patients starting treatment for skin cancer

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

There was no significant association between gender and waiting over 104 days for melanoma or non-melanoma skin cancer (NMSC) (Tables 1 & 7). Those in the younger age groups were less likely and those in the older age groups more likely to be long waiters compared to those aged 60–69 for melanoma. The only association for NMSC was for those aged 80+ who were more likely to be long waiters. Patients in more deprived quintiles were more likely to be long waiters for melanoma and NMSC compared to those in the least deprived quintile. There were large increases in the likelihood of being a long waiter by financial year of treatment start for both melanoma and NMSC, with adjusted odds ratio (AOR) of 6.19 and 6.49 respectively for the original analysis and 5.39 and 4.39 for the rapid cancer registration dataset (RCRD) linked analysis. There was a large increase in the likelihood of being a long waiter with increasing stage for melanoma (those diagnosed at stage 4 had AOR of 4.92 compared to those diagnosed at stage 1). Those with a comorbidity score of 1 were more likely to be long waiters compared to those with a score of 0 for melanoma, and those with scores of 1, 2 or 3+ more likely to be long waiters for NMSC.

The longest median subinterval for melanoma and NMSC patients who waited over 104 days from referral to treatment (Tables 2 & 8) was from referral to informed of diagnosis, although the median interval from DTT to treatment was among the longest by site at around 30 days for both sites in Q1 & Q2 2022/2023. There was a median of 24 days between informed of diagnosis and DTT for melanoma patients and 20 days for NMSC patients.

The most common reason for delay between referral and treatment for those who waited over 104 days (Tables 3 & 9) was healthcare provider-initiated delay for both melanoma and NMSC, with this forming over 50% of delay reasons for both in the latest year. 22.2% met the 28-day standard from referral to informed of diagnosis for melanoma, and 16.1% for NMSC. The percentage who met the 31-day decision to treat (DTT) to treatment standard was relatively low and decreased with time for melanoma from 90.9% to 59.7% and from 65.1% to 53.6% for NMSC.

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

The associations between characteristic and waiting over 62 days were very similar to those seen for waiting over 104 days (Tables 4 & 10), although those of female gender were less likely to wait over 62 days for non-melanoma skin cancer compared to those of male gender. The delay findings were also similar, although the percentage meeting each standard was higher (Tables 6 & 12). However, the interval findings showed that those waiting over 62 days had a shorter median time from referral to informed of diagnosis and from informed of diagnosis to DTT compared to those waiting over 104 days (Tables 5 & 11).

Table 1: Regression analysis for likelihood of waiting over 104 days by characteristic for melanoma skin cancer. Results presented for both the original and Rapid Cancer Registration Dataset 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 (0.83-1.18)	1.1 (0.92-1.31)	0.93 (0.77-1.12)	1.04 (0.86-1.25)	1.09 (0.9-1.31)
	Male (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
Age group	19-49	0.59 (0.41-0.85)*	0.6 (0.42-0.86)*	0.54 (0.36-0.8)*	0.54 (0.36-0.79)*	0.57 (0.39-0.85)*
	50-59	0.64 (0.45-0.93)	0.65 (0.46-0.94)	0.65 (0.44-0.95)	0.65 (0.45-0.94)	0.67 (0.46-0.98)
	60-69 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
	70-79	1.6 (1.22-2.1)*	1.59 (1.21-2.07)*	1.62 (1.22-2.15)*	1.63 (1.23-2.16)*	1.5 (1.13-1.99)*
	80+	2.65 (2.04-3.45)*	2.6 (2-3.38)*	2.61 (1.98-3.44)*	2.56 (1.95-3.38)*	2.15 (1.61-2.86)*
Deprivation quintile	1 - most deprived	1.47 (1.09-1.98)	1.6 (1.17-2.19)*	1.48 (1.09-2.01)	1.61 (1.16-2.22)*	1.5 (1.08-2.08)
	2	1.26 (0.95-1.67)	1.52 (1.14-2.02)*	1.32 (0.99-1.76)	1.63 (1.21-2.18)*	1.55 (1.16-2.09)*
	3	1.16 (0.89-1.5)	1.31 (1.01-1.71)	1.07 (0.81-1.41)	1.22 (0.92-1.62)	1.2 (0.91-1.6)
	4	1.16 (0.9-1.49)	1.25 (0.97-1.6)	1.11 (0.86-1.45)	1.2 (0.92-1.57)	1.17 (0.9-1.53)
	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	3.03 (2.14-4.29)*	3.13 (2.22-4.42)*	2.29 (1.63-3.21)*	2.3 (1.65-3.21)*	2.27 (1.62-3.17)*
	2021/2022	3.71 (2.67-5.15)*	3.85 (2.78-5.33)*	3.02 (2.21-4.12)*	3.1 (2.28-4.22)*	3.31 (2.42-4.52)*
	Q1 & Q2 2022/2023	5.62 (4.01-7.85)*	6.19 (4.44-8.63)*	4.57 (3.32-6.29)*	4.86 (3.54-6.68)*	5.39 (3.91-7.42)*
Stage	1 (ref)			1 (ref)		1 (ref)
	2			2.04 (1.58-2.63)*		1.42 (1.09-1.83)*
	3			2.98 (1.96-4.53)*		2.16 (1.4-3.32)*
	4			6.08 (3.63-10.18)*		4.92 (2.86-8.46)*
	Not known			3.34 (2.65-4.2)*		2.88 (2.23-3.73)*
Comorbidity	0 (ref)			1 (ref)		1 (ref)
	1			2.01 (1.51-2.67)*		1.5 (1.12-2.02)*
	2			1.76 (1.17-2.65)*		1.32 (0.87-2)
	3+			2.52 (1.78-3.55)*		1.52 (1.06-2.19)

*significant at the p<0.01 level

Table 2: Median and interquartile range for the intervals in the diagnostic and treatment pathway for melanoma skin 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 (9 - 14)	11 (7 - 17)	12 (9 - 17)	13 (8 - 17)
First seen to informed of diagnosis	Data not available	57.5 (31.25 - 88.5)	49.5 (15 - 71.5)	49 (27 - 75)
Informed of diagnosis to decision to treat	Data not available	21 (0 - 47)	20 (0 - 49)	24 (2 - 52)
Decision to treat to treatment start	17.5 (8.75 - 23.75)	23 (13 - 63)	30 (18 - 68)	29 (16.5 - 43.5)
Referral to informed of diagnosis	Data not available	70 (42 - 109)	63.5 (33.5 - 87.75)	69 (41 - 85)
Referral to decision to treat	106 (92.5 - 122.5)	92.5 (69.5 - 115.75)	87 (62.5 - 106.5)	95 (77 - 113.5)
Referral to treatment start	118 (111.75 - 137.25)	121 (111.25 - 141.75)	119 (111 - 137.5)	118 (111 - 136.5)

Table 3: Breakdown of the reasons for delay in each financial year of start of treatment among melanoma skin 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	11 (25.0%)	43 (36.4%)	108 (56.5%)	91 (57.2%)
	Medical reason for diagnosis delay	13 (29.5%)	~15	32 (16.8%)	26 (16.4%)
	Medical reason for treatment delay	<5	<5	<5	5 (3.1%)
	Patient-initiated delay	<5	16 (13.6%)	<10	9 (5.7%)
	Other reason (not listed)	14 (31.8%)	40 (33.9%)	39 (20.4%)	28 (17.6%)
Referral to informed of diagnosis	Healthcare provider-initiated delay	Data not available	16 (26.2%)	31 (27.7%)	35 (43.2%)
	Medical reason for diagnosis delay	Data not available	10 (16.4%)	~10	<5
	Patient-initiated delay	Data not available	<5	<5	<5
	Other reason (not listed)	Data not available	12 (19.7%)	13 (11.6%)	6 (7.4%)
	No delay	Data not available	12 (19.7%)	24 (21.4%)	18 (22.2%)
	Unknown	Data not available	<10	28 (25.0%)	15 (18.5%)
Decision to treat to treatment start	Healthcare provider-initiated delay	<5	20 (16.9%)	77 (40.3%)	49 (30.8%)
	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 (4.2%)	<5	<5
	Other reason (not listed)	<5	18 (15.3%)	9 (4.7%)	6 (3.8%)
	No delay	40 (90.9%)	71 (60.2%)	98 (51.3%)	95 (59.7%)

Table 4: Regression analysis for likelihood of waiting over 62 days by characteristic for melanoma skin 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	0.98 (0.9-1.06)	1.08 (0.99-1.18)	0.92 (0.85-1)	1.03 (0.94-1.12)	1.06 (0.97-1.16)
	Male (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
Age group	19-49	0.61 (0.52-0.72)*	0.61 (0.51-0.72)*	0.58 (0.49-0.69)*	0.57 (0.48-0.68)*	0.59 (0.5-0.7)*
	50-59	0.8 (0.68-0.93)*	0.82 (0.7-0.96)	0.77 (0.66-0.9)*	0.77 (0.65-0.9)*	0.79 (0.67-0.92)*
	60-69 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
	70-79	1.48 (1.31-1.68)*	1.48 (1.3-1.69)*	1.45 (1.28-1.65)*	1.46 (1.28-1.66)*	1.39 (1.22-1.59)*
	80+	2.29 (2.02-2.59)*	2.34 (2.06-2.67)*	2.27 (2-2.57)*	2.32 (2.03-2.66)*	2.11 (1.84-2.43)*
Deprivation quintile	1 - most deprived	1.25 (1.09-1.44)*	1.4 (1.2-1.64)*	1.23 (1.07-1.42)*	1.39 (1.18-1.63)*	1.33 (1.14-1.57)*
	2	1.02 (0.9-1.17)	1.21 (1.05-1.4)*	1.02 (0.89-1.17)	1.23 (1.06-1.42)*	1.2 (1.04-1.39)
	3	0.99 (0.88-1.12)	1.1 (0.97-1.25)	0.98 (0.87-1.11)	1.09 (0.96-1.25)	1.08 (0.95-1.24)
	4	1.05 (0.93-1.17)	1.09 (0.97-1.24)	1 (0.89-1.13)	1.06 (0.94-1.2)	1.05 (0.92-1.19)
	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	2.66 (2.28-3.1)*	2.79 (2.38-3.27)*	2.2 (1.9-2.55)*	2.25 (1.94-2.63)*	2.27 (1.94-2.64)*
	2021/2022	3.71 (3.22-4.29)*	4.18 (3.6-4.85)*	3.08 (2.69-3.52)*	3.41 (2.96-3.92)*	3.64 (3.16-4.19)*
	Q1 & Q2 2022/2023	4.65 (4-5.41)*	5.61 (4.79-6.57)*	3.83 (3.32-4.42)*	4.49 (3.87-5.22)*	4.9 (4.21-5.71)*
Stage	1 (ref)			1 (ref)		1 (ref)
	2			1.66 (1.48-1.85)*		1.2 (1.06-1.35)*
	3			2.87 (2.39-3.44)*		2.23 (1.82-2.73)*
	4			5.49 (4.27-7.05)*		4.91 (3.67-6.55)*
	Not known			2.2 (1.98-2.44)*		1.84 (1.62-2.09)*
Comorbidity	0 (ref)			1 (ref)		1 (ref)
	1			1.64 (1.42-1.88)*		1.29 (1.11-1.51)*
	2			1.49 (1.22-1.83)*		1.21 (0.98-1.5)
	3+			1.98 (1.66-2.36)*		1.27 (1.04-1.55)

*significant at the p<0.01 level

Table 5: Median and interquartile range for the intervals in the diagnostic and treatment pathway for melanoma skin 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	12 (8 - 14)	13 (8 - 16)	13 (9 - 18)	13 (8 - 21)
First seen to informed of diagnosis	Data not available	32 (13 - 58)	30 (9 - 51)	32.5 (1 - 55)
Informed of diagnosis to decision to treat	Data not available	13 (0 - 33)	15 (0 - 35)	14.5 (0 - 33)
Decision to treat to treatment start	16 (7.5 - 26)	21 (12 - 38)	26 (14 - 48)	24 (11 - 40)
Referral to informed of diagnosis	Data not available	43 (27 - 70)	45 (26 - 67)	49 (29 - 70)
Referral to decision to treat	64 (53 - 81)	58 (43 - 76)	56 (34 - 75)	62 (42 - 80)
Referral to treatment start	80 (70 - 94.5)	82 (69 - 100)	83 (72 - 99)	83 (70.5 - 102)

Table 6: Breakdown of the reasons for delay in each financial year of start of treatment among melanoma skin 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	83 (34.2%)	243 (43.9%)	619 (61.9%)	444 (65.4%)
	Medical reason for diagnosis delay	45 (18.5%)	83 (15.0%)	138 (13.8%)	64 (9.4%)
	Medical reason for treatment delay	<10	13 (2.4%)	13 (1.3%)	15 (2.2%)
	Patient-initiated delay	~25	46 (8.3%)	39 (3.9%)	38 (5.6%)
	Other reason (not listed)	83 (34.2%)	168 (30.4%)	191 (19.1%)	118 (17.4%)
Referral to informed of diagnosis	Healthcare provider-initiated delay	Data not available	93 (32.0%)	154 (30.3%)	133 (42.1%)
	Medical reason for diagnosis delay	Data not available	36 (12.4%)	39 (7.7%)	21 (6.6%)
	Patient-initiated delay	Data not available	10 (3.4%)	13 (2.6%)	17 (5.4%)
	Other reason (not listed)	Data not available	42 (14.4%)	56 (11.0%)	32 (10.1%)
	No delay	Data not available	80 (27.5%)	145 (28.5%)	78 (24.7%)
	Unknown	Data not available	30 (10.3%)	102 (20.0%)	35 (11.1%)
Decision to treat to treatment start	Healthcare provider-initiated delay	16 (6.6%)	95 (17.2%)	334 (33.4%)	174 (25.6%)
	Medical reason for diagnosis delay	<5	6 (1.1%)	<10	<10
	Medical reason for treatment delay	<5	11 (2.0%)	<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 %)
	Patient-initiated delay	7 (2.9%)	15 (2.7%)	16 (1.6%)	9 (1.3%)
	Other reason (not listed)	<5	47 (8.5%)	26 (2.6%)	29 (4.3%)
	No delay	214 (88.1%)	379 (68.5%)	610 (61.0%)	453 (66.7%)

Table 7: Regression analysis for likelihood of waiting over 104 days by characteristic for non-melanoma skin 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	0.88 (0.8–0.97)	0.92 (0.84–1.02)	0.98 (0.86–1.1)	1 (0.89–1.13)	1.02 (0.91–1.16)
	Male (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
Age group	19–49	1.37 (0.88–2.13)	1.31 (0.84–2.04)	1.27 (0.8–2.02)	1.24 (0.78–1.97)	1.3 (0.81–2.07)
	50–59	1.06 (0.77–1.47)	1.06 (0.76–1.46)	1.06 (0.74–1.5)	1.06 (0.75–1.5)	1.08 (0.76–1.54)
	60–69 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
	70–79	1.15 (0.95–1.41)	1.1 (0.9–1.35)	1.08 (0.86–1.36)	1.04 (0.83–1.31)	1 (0.79–1.25)
	80+	1.99 (1.65–2.38)*	1.85 (1.54–2.22)*	1.97 (1.6–2.43)*	1.84 (1.49–2.27)*	1.67 (1.35–2.07)*
Deprivation quintile	1 – most deprived	1.56 (1.33–1.82)*	1.56 (1.32–1.84)*	1.5 (1.23–1.83)*	1.47 (1.19–1.82)*	1.39 (1.13–1.72)*
	2	1.33 (1.16–1.54)*	1.47 (1.27–1.71)*	1.37 (1.14–1.65)*	1.56 (1.29–1.88)*	1.51 (1.25–1.83)*
	3	1.14 (1–1.31)	1.2 (1.05–1.39)*	1.17 (0.98–1.4)	1.24 (1.04–1.49)	1.22 (1.01–1.46)
	4	1.24 (1.09–1.41)*	1.25 (1.09–1.42)*	1.16 (0.98–1.38)	1.19 (1–1.42)	1.18 (0.99–1.4)
	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	2.5 (2.08-3.02)*	2.7 (2.24-3.26)*	1.63 (1.33-2)*	1.77 (1.44-2.17)*	1.78 (1.45-2.18)*
	2021/2022	3.87 (3.24-4.63)*	4.18 (3.49-4.99)*	2.48 (2.05-2.99)*	2.67 (2.21-3.22)*	2.68 (2.22-3.25)*
	Q1 & Q2 2022/2023	5.81 (4.83-6.98)*	6.49 (5.39-7.81)*	3.95 (3.24-4.83)*	4.36 (3.57-5.33)*	4.39 (3.59-5.36)*
Comorbidity	0 (ref)			1 (ref)		1 (ref)
	1			1.44 (1.21-1.72)*		1.37 (1.14-1.63)*
	2			1.79 (1.47-2.18)*		1.62 (1.32-1.97)*
	3+			1.9 (1.6-2.25)*		1.65 (1.39-1.97)*

*significant at the $p < 0.01$ level

Table 8: Median and interquartile range for the intervals in the diagnostic and treatment pathway for non-melanoma skin 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	11.5 (8 - 14)	12 (7 - 14)	13 (10 - 20)	13 (9 - 21)
First seen to informed of diagnosis	Data not available	51 (15 - 88)	56 (21 - 79.25)	56 (28.5 - 83)
Informed of diagnosis to decision to treat	Data not available	19 (0 - 49)	19 (0 - 52.75)	20 (0 - 44)
Decision to treat to treatment start	25 (13.25 - 42.75)	29 (16.25 - 71)	27 (17 - 47)	29 (18 - 53.5)
Referral to informed of diagnosis	Data not available	64 (29 - 103)	73.5 (39 - 102.75)	73 (46 - 98)
Referral to decision to treat	94.5 (76 - 110.5)	93 (60 - 119)	97 (77 - 119)	93 (73.5 - 120)
Referral to treatment start	120 (111 - 132)	126 (113 - 154)	125 (113 - 146)	125 (113 - 149)

Table 9: Breakdown of the reasons for delay in each financial year of start of treatment among non-melanoma skin 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	48 (32.9%)	161 (34.3%)	443 (57.0%)	335 (62.2%)
	Medical reason for diagnosis delay	14 (9.6%)	63 (13.4%)	85 (10.9%)	49 (9.1%)
	Medical reason for treatment delay	15 (10.3%)	34 (7.2%)	26 (3.3%)	21 (3.9%)
	Patient-initiated delay	15 (10.3%)	48 (10.2%)	70 (9.0%)	45 (8.3%)
	Other reason (not listed)	54 (37.0%)	164 (34.9%)	153 (19.7%)	89 (16.5%)
Referral to informed of diagnosis	Healthcare provider-initiated delay	Data not available	87 (34.9%)	165 (36.7%)	90 (34.5%)
	Medical reason for diagnosis delay	Data not available	11 (4.4%)	17 (3.8%)	18 (6.9%)
	Patient-initiated delay	Data not available	16 (6.4%)	14 (3.1%)	18 (6.9%)
	Other reason (not listed)	Data not available	48 (19.3%)	47 (10.4%)	37 (14.2%)
	No delay	Data not available	62 (24.9%)	83 (18.4%)	42 (16.1%)
	Unknown	Data not available	25 (10.0%)	124 (27.6%)	56 (21.5%)
Decision to treat to treatment start	Healthcare provider-initiated delay	27 (18.5%)	105 (22.3%)	242 (31.1%)	190 (35.3%)
	Medical reason for diagnosis delay	<5	13 (2.8%)	7 (0.9%)	7 (1.3%)

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	9 (6.2%)	29 (6.2%)	21 (2.7%)	24 (4.5%)
	Patient-initiated delay	<5	12 (2.6%)	22 (2.8%)	14 (2.6%)
	Other reason (not listed)	12 (8.2%)	54 (11.5%)	32 (4.1%)	15 (2.8%)
	No delay	95 (65.1%)	257 (54.7%)	453 (58.3%)	289 (53.6%)

Table 10: Regression analysis for likelihood of waiting over 62 days by characteristic for non-melanoma skin 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	0.83 (0.79-0.87)*	0.85 (0.81-0.89)*	0.86 (0.81-0.91)*	0.88 (0.83-0.93)*	0.89 (0.84-0.95)*
	Male (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
Age group	19-49	1.12 (0.9-1.39)	1.13 (0.9-1.42)	1.16 (0.92-1.45)	1.19 (0.94-1.5)	1.22 (0.96-1.55)
	50-59	1.02 (0.88-1.19)	1.02 (0.87-1.19)	1.03 (0.87-1.21)	1.04 (0.88-1.23)	1.05 (0.89-1.25)
	60-69 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
	70-79	1.24 (1.13-1.36)*	1.2 (1.09-1.32)*	1.22 (1.1-1.36)*	1.2 (1.07-1.33)*	1.16 (1.04-1.3)*
	80+	1.79 (1.65-1.95)*	1.73 (1.59-1.89)*	1.81 (1.64-2)*	1.76 (1.59-1.96)*	1.66 (1.49-1.84)*
Deprivation quintile	1 - most deprived	1.31 (1.21-1.42)*	1.31 (1.2-1.43)*	1.36 (1.23-1.49)*	1.3 (1.16-1.44)*	1.25 (1.12-1.39)*
	2	1.13 (1.06-1.22)*	1.24 (1.15-1.34)*	1.16 (1.06-1.27)*	1.26 (1.14-1.39)*	1.24 (1.12-1.36)*
	3	1.17 (1.1-1.24)*	1.21 (1.13-1.3)*	1.19 (1.09-1.29)*	1.2 (1.1-1.31)*	1.18 (1.08-1.29)*
	4	1.14 (1.07-1.21)*	1.13 (1.06-1.21)*	1.1 (1.01-1.19)	1.09 (1-1.19)	1.08 (0.99-1.18)
	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	1.67 (1.55-1.8)*	1.82 (1.68-1.97)*	1.45 (1.33-1.6)*	1.58 (1.44-1.74)*	1.59 (1.44-1.75)*
	2021/2022	2.76 (2.57-2.97)*	3.14 (2.91-3.38)*	2.41 (2.21-2.63)*	2.72 (2.49-2.97)*	2.73 (2.5-2.99)*
	Q1 & Q2 2022/2023	3.73 (3.45-4.03)*	4.48 (4.13-4.86)*	3.36 (3.06-3.69)*	3.98 (3.61-4.39)*	4.01 (3.63-4.42)*
Comorbidity	0 (ref)			1 (ref)		1 (ref)
	1			1.3 (1.19-1.41)*		1.25 (1.14-1.37)*
	2			1.46 (1.32-1.62)*		1.36 (1.22-1.51)*
	3+			1.61 (1.48-1.76)*		1.43 (1.31-1.57)*

*significant at the $p < 0.01$ level

Table 11: Median and interquartile range for the intervals in the diagnostic and treatment pathway for non-melanoma skin 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	12 (8 - 14)	12 (7.75 - 14)	13 (10 - 21)	13 (9 - 21)
First seen to informed of diagnosis	Data not available	34 (4 - 55)	33 (5 - 56)	35 (6 - 56)
Informed of diagnosis to decision to treat	Data not available	10 (0 - 30)	7 (0 - 29)	7 (0 - 29)
Decision to treat to treatment start	20.5 (12 - 30)	24 (13 - 42)	24 (14 - 39.75)	25 (14 - 42)
Referral to informed of diagnosis	Data not available	46 (22 - 68)	52 (29 - 73)	50 (29 - 70)
Referral to decision to treat	61 (48 - 74)	57 (39 - 75)	60 (41 - 76)	59 (41 - 79)
Referral to treatment start	79 (70 - 94)	81 (70 - 100)	82 (71 - 100)	83 (71 - 104)

Table 12: Breakdown of the reasons for delay in each financial year of start of treatment among non-melanoma skin 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	452 (43.8%)	1028 (47.5%)	2380 (64.9%)	1535 (69.1%)
	Medical reason for diagnosis delay	~75	180 (8.3%)	267 (7.3%)	147 (6.6%)
	Medical reason for treatment delay	87 (8.4%)	~120	~110	~50
	Patient-initiated delay	114 (11.0%)	176 (8.1%)	260 (7.1%)	160 (7.2%)
	Other reason (not listed)	302 (29.3%)	662 (30.6%)	648 (17.7%)	328 (14.8%)
	Unknown	<5	<5	<5	<5
Referral to informed of diagnosis	Healthcare provider-initiated delay	Data not available	390 (33.6%)	614 (32.6%)	399 (38.5%)
	Medical reason for diagnosis delay	Data not available	61 (5.3%)	66 (3.5%)	48 (4.6%)
	Patient-initiated delay	Data not available	38 (3.3%)	45 (2.4%)	39 (3.8%)
	Other reason (not listed)	Data not available	165 (14.2%)	200 (10.6%)	157 (15.1%)
	No delay	Data not available	369 (31.8%)	462 (24.5%)	254 (24.5%)
	Unknown	Data not available	136 (11.7%)	496 (26.3%)	140 (13.5%)
	Healthcare provider-initiated delay	113 (10.9%)	404 (18.7%)	943 (25.7%)	667 (30.0%)

Delay interval	Reason for delay	2017/2018 (Number and %)	2020/2021 (Number and %)	2021/2022 (Number and %)	Q1 & Q2 2022/2023 (Number and %)
Decision to treat to treatment start	Medical reason for diagnosis delay	<5	21 (1.0%)	26 (0.7%)	17 (0.8%)
	Medical reason for treatment delay	37 (3.6%)	78 (3.6%)	72 (2.0%)	46 (2.1%)
	Patient-initiated delay	~25	69 (3.2%)	80 (2.2%)	48 (2.2%)
	Other reason (not listed)	43 (4.2%)	167 (7.7%)	102 (2.8%)	43 (1.9%)
	No delay	814 (78.9%)	1427 (65.9%)	2443 (66.6%)	1400 (63.0%)