NKCA
National Kidney Cancer Audit

NATCAN
National Cancer Audit Collaborating Centre

National Kidney Cancer Audit
State of the Nation Report

An audit of care received by people diagnosed with kidney cancer in England (01.01.2018-31.12.2022) and Wales (01.01.2022-31.12.2023). National time trends in kidney cancer diagnoses and treatments in England (01.01.2019-30.09.2024) and Wales (01.01.2022-31.12.2023).

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Acknowledgements

The National Kidney Cancer Audit (NKCA) is part of the National Cancer Audit Collaborating Centre (NATCAN), a national centre of excellence to strengthen NHS cancer services by looking at treatments and outcomes for people diagnosed with cancer in multiple cancer types across England and Wales. NATCAN is commissioned by the Healthcare Quality Improvement Partnership (HQIP) on behalf of NHS England and the Welsh Government as part of the National Clinical Audit and Patient Outcomes Programme (NCAPOP).

Clinical leadership of the National Kidney Cancer Audit is provided by representatives from the British Association of Urological Surgeons (BAUS) and British Uro-Oncology Group (BUG). The audit is a collaboration between the Clinical Effectiveness Unit (CEU) at the Royal College of Surgeons of England (RCS), BAUS and BUG. We would like to thank British Association of Urological Surgeons and British Uro-Oncology Group for their continued professional guidance and for raising awareness amongst urological and uro-oncological colleagues.

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We would also like to thank all urologists, uro-oncologists along with their clinical and non-clinical teams at NHS Trusts in England and Local Health Boards in Wales who collected and submitted data for the audit. Your support is vital to enable the NKCA evaluate the care that men receive following a diagnosis of kidney cancer in England and Wales and whether this care reflects national standards of care.

The NKCA compares NHS services in England and Wales and provides these results to underpin quality improvement activities. We are grateful to the National Cancer Registration and Analysis Service (NCRAS) which is part of the National Disease Registration Service, NHS England (NHSE) and the Wales Cancer Network, Public Health Wales for supporting routine cancer data submissions from Trusts and Local Health Boards and for supplying data for this report.

We would also like to thank all members of the NKCA Patient and Public Involvement (PPI) Forum, Action Kidney Cancer, and Kidney Cancer UK, for working with us to ensure that the voice of people who have had a kidney cancer diagnosis is central to the direction of the NKCA. A lay report summarising the key results will be developed in consultation with the NKCA PPI Forum and published in September 2025.

Supplementary tables

Table A1. Patient characteristics for people newly diagnosed with kidney cancer in England over the period of 1 January 2020 - 31 December 2022.

Data variable	**England**							
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Time period covered	***1 Jan 2020 - 31 Dec 2022***		***2020***		***2021***		***2022***	
No. of people with new diagnosis of kidney cancer	28,485		8,662		9,886		9,937	
Age								
<45	1,405	5%	412	5%	508	5%	485	5%
45-54	3,356	12%	1,013	12%	1,194	12%	1,149	12%
55-64	6,241	22%	1,881	22%	2,158	22%	2,202	22%
65-74	8,269	29%	2,528	29%	2,845	29%	2,896	29%
75-84	6,687	23%	2,046	24%	2,270	23%	2,371	24%
>85	2,527	9%	782	9%	911	9%	834	8%
Total	28,485	100%	8,662	100%	9,886	100%	9,937	100%
Missing	*0*	*(0%)*	*0*	*(0%)*	*0*	*(0%)*	*0*	*(0%)*
Gender (Self-stated gender at diagnosis)								
Male	18,347	64%	5,550	64%	6,422	65%	6,375	64%
Female	10,138	36%	3,112	36%	3,464	35%	3,562	36%
Total	28,485	100%	8,662	100%	9,886	100%	9,937	100%
Missing	*0*	*(0%)*	*0*	*(0%)*	*0*	*(0%)*	*0*	*(0%)*
Performance status*								
0	7,276	59%	2,008	57%	2,492	59%	2,776	60%
1-2	4,325	35%	1,308	37%	1,455	34%	1,562	34%
≥3	803	6%	222	6%	301	7%	280	6%
Total	12,404	100%	3,538	100%	4,248	100%	4,618	100%
Missing	*16,081*	*(56%)*	*5,124*	*(59%)*	*5,638*	*(57%)*	*5,319*	*(54%)*
Number of co-morbidities (Charlson score)								
0	14,895	52%	4,502	52%	5,160	52%	5,233	53%
1	8,013	28%	2,470	29%	2,792	28%	2,751	28%
≥2	5,577	20%	1,690	20%	1,934	20%	1,953	20%
Total	28,485	100%	8,662	100%	9,886	100%	9,937	100%
Missing	*0*	*(0%)*	*0*	*(0%)*	*0*	*(0%)*	*0*	*(0%)*
Stage								
I	11,403	51%	3,531	50%	3,837	51%	4,035	52%
II	1,426	6%	443	6%	483	6%	500	6%
III	4,592	21%	1,437	20%	1,544	21%	1,611	21%
IV	4,899	22%	1,605	23%	1,620	22%	1,674	21%
Total	22,320	100%	7,016	100%	7,484	100%	7,820	100%
Missing	*6,165*	*(22%)*	*1,646*	*(19%)*	*2,402*	*(24%)*	*2,117*	*(21%)*
T stage								
T1	13,524	59%	4,171	59%	4,634	59%	4,719	60%

Data variable	England							
	N	%	N	%	N	%	N	%
Time period covered	***1 Jan 2020 - 31 Dec 2022***		***2020***		***2021***		***2022***	
T2	2,254	10%	691	10%	773	10%	790	10%
T3	6,332	28%	1,965	28%	2,196	28%	2,171	27%
T4	722	3%	240	3%	232	3%	250	3%
Total	22,832	100%	7,067	100%	7,835	100%	7,930	100%
Missing	*5,653*	*(20%)*	*1,595*	*(18%)*	*2,051*	*(21%)*	*2,007*	*(20%)*
N stage								
N0	19,053	90%	5,914	90%	6,441	90%	6,698	91%
N1	2,037	10%	679	10%	699	10%	659	9%
Total	21,090	100%	6,593	100%	7,140	100%	7,357	100%
Missing	*7,395*	*(26%)*	*2,069*	*(24%)*	*2,746*	*(28%)*	*2,580*	*(26%)*
M stage								
M0	17,817	79%	5,541	79%	6,009	80%	6,267	80%
M1	4,647	21%	1,517	21%	1,548	20%	1,582	20%
Total	22,464	100%	7,058	100%	7,557	100%	7,849	100%
Missing	*6,021*	*(21%)*	*1,604*	*(19%)*	*2,329*	*(24%)*	*2,088*	*(21%)*
Ethnicity								
Asian or Asian British	939	4%	272	3%	334	4%	333	4%
Black, Black British, Caribbean or African	620	2%	165	2%	237	3%	218	2%
Mixed or multiple ethnic groups	163	1%	45	1%	66	1%	52	1%
White	24,352	92%	7,666	93%	8,594	92%	8,092	91%
Other	465	2%	132	2%	150	2%	183	2%
Total	26,539	100%	8,280	100%	9,381	100%	8,878	100%
Missing	*1,946*	*(7%)*	*382*	*(4%)*	*505*	*(5%)*	*1,059*	*(11%)*
Indices of multiple deprivation (IMD) of LSOA								
1 (least deprived)	5,820	20%	1,769	20%	2,016	20%	2,035	20%
2	6,037	21%	1,831	21%	2,102	21%	2,104	21%
3	5,890	21%	1,789	21%	2,032	21%	2,069	21%
4	5,442	19%	1,699	20%	1,853	19%	1,890	19%
5 (most deprived)	5,296	19%	1,574	18%	1,883	19%	1,839	19%
Total	28,485	100%	8,662	100%	9,886	100%	9,937	100%
Missing	*0*	*(0%)*	*0*	*(0%)*	*0*	*(0%)*	*0*	*(0%)*

LSOA, Lower Layer Super Output Areas.

*Performance status: 0 = Able carry out all normal activity without restriction; 1 = Restricted in physically strenuous activity, but able to walk and do light work; 2 = Able to walk and capable of all self care, but unable to carry out any work. Up and about more than 50% of waking hours; 3 = Capable of only limited self care, confined to bed or chair more than 50% of waking hours; 4 = Completely disabled. Cannot carry on any self care. Totally confined to bed or chair.

Table A2. Performance indicators for people with kidney cancer diagnosed and treated in England by year from 2019 to 2022.

	2019	2020	2021	2022
PI1: Percentage of people with kidney cancer with the data completeness measure recorded for MDT meeting	83%	82%	81%	83%
PI2: Percentage of people with kidney cancer consented for a clinical trial	2%	1%	2%	1%
PI3: Percentage of people with a small renal mass who have a biopsy	22%	19%	21%	21%
PI4: Percentage of people with a T3+ and/or 10cm+ and/or N1 and M0 RCC** who had a radical nephrectomy within 31 days of decision to treat	76%	73%	69%	63%
PI5: Percentage of people with T1b-3NxM0 RCC** who have surgery 1 month prior and 12 months following diagnosis*	81%	76%	78%	78%
PI6: Percentage of people with T1aN0M0 RCC** who undergo nephron sparing treatment 1 month prior and 12 months following diagnosis*	68%	66%	72%	70%
PI7: Percentage of people with metastatic RCC receiving initial SACT within 12 months of diagnosis*	48%	48%	52%	50%
PI8: Percentage of people with kidney cancer who die within 30 days of SACT treatment	3%	2%	3%	4%

MDT: multi-disciplinary team; RCC: renal cell carcinoma; SACT: systemic anti-cancer therapy. *12 months following diagnosis was measured to capture all people with kidney cancer who underwent treatment. Timeframe to treatment was not assessed in these performance indicators. Data were impacted by the COVID-19 pandemic and so will be atypical to some degree during 2020-2021.

T3+ and/or 10cm+ and/or N1 and M0 RCC	Tumour extends into major veins or perinephric tissues or invades beyond Gerota fascia and/or tumour more than 10cm in size and/or metastasis in regional lymph node(s) with no distant metastasis
T1b-3NxM0 RCC	Tumour is more than 4cm in size or tumour extends into major veins or perinephric tissues with no distant metastasis
T1aN0M0 RCC	Tumour is less than or equal to 4cm in size with no regional lymph node metastasis and no distant metastasis

** UICC TNM8 Kidney Cancer

Table A3. Patient characteristics for people newly diagnosed with kidney cancer in Wales over the period of 1 January 2022 - 31 December 2023.

Data variable	**Wales**					
	N	**%**	**N**	**%**	**N**	**%**
Time period covered	***1 Jan 2022 - 31 Dec 2023***		***2022***		***2023***	
No. of people with new diagnosis of kidney cancer	986		488		496	
Age						
<45	43	4%	18	4%	25	5%
45-54	97	10%	44	9%	53	11%
55-64	238	24%	110	23%	127	26%
65-74	293	30%	143	29%	149	30%
75-84	245	25%	132	27%	113	23%
>85	69	7%	41	8%	28	6%
Total	985	100%	488	100%	495	100%
Missing	*1*	*(<1%)*	*0*	*(0%)*	*1*	*(<1%)*
Sex						
Male	623	64%	308	65%	313	64%
Female	344	36%	169	35%	175	36%
Total	967	100%	477	100%	488	100%
Missing	*19*	*(2%)*	*11*	*(2%)*	*8*	*(2%)*
Performance status*						
0	364	45%	161	47%	203	44%
1-2	365	46%	142	41%	223	49%
≥3	73	9%	41	12%	32	7%
Total	802	100%	344	100%	458	100%
Missing	*184*	*(19%)*	*144*	*(30%)*	*38*	*(8%)*
Number of co-morbidities (Charlson score)						
0	578	59%	278	57%	298	60%
1	249	25%	133	27%	116	23%
≥2	159	16%	77	16%	82	17%
Total	986	100%	488	100%	496	100%
Missing	*0*	*(0%)*	*0*	*(0%)*	*0*	*(0%)*
Stage						
I	377	45%	162	43%	215	46%
II	95	11%	41	11%	54	11%
III	194	23%	95	25%	99	21%
IV	179	21%	76	20%	103	22%
Total	845	100%	374	100%	471	100%
Missing	*141*	*(14%)*	*114*	*(23%)*	*25*	*(5%)*
T stage						
T1	390	47%	168	46%	222	48%
T2	125	15%	54	15%	71	15%
T3	247	30%	116	32%	131	29%
T4	61	7%	26	7%	35	8%
Total	823	100%	364	100%	459	100%

Data variable	Wales					
	N	%	N	%	N	%
Time period covered	***1 Jan 2022 - 31 Dec 2023***		***2022***		***2023***	
Missing	*163*	*(17%)*	*124*	*(25%)*	*37*	*(7%)*
N stage						
N0	622	83%	278	84%	344	83%
N1	123	17%	52	16%	71	17%
Total	745	100%	330	100%	415	100%
Missing	*241*	*(24%)*	*158*	*(32%)*	*81*	*(16%)*
M stage						
M0	557	77%	247	79%	310	76%
M1	164	23%	67	21%	97	24%
Total	721	100%	314	100%	407	100%
Missing	*265*	*(27%)*	*174*	*(36%)*	*89*	*(18%)*
Ethnicity						
All other ethnic groups combined**	13	2%	8	3%	5	2%
White	521	98%	275	97%	244	98%
Total	534	100%	283	100%	249	100%
Missing	452	*(46%)*	*205*	*(42%)*	*247*	*(50%)*
Indices of multiple deprivation (IMD) of LSOA						
1 (least deprived)	174	19%	86	19%	88	19%
2	190	21%	86	19%	104	23%
3	207	23%	108	24%	99	22%
4	189	21%	99	22%	89	19%
5 (most deprived)	153	17%	73	16%	79	17%
Total	913	100%	452	100%	459	100%
Missing	*73*	*(7%)*	*36*	*(7%)*	*37*	*(7%)*

LSOA, Lower Layer Super Output Areas.

*Performance status: 0 = Able carry out all normal activity without restriction; 1 = Restricted in physically strenuous activity, but able to walk and do light work; 2 = Able to walk and capable of all self care, but unable to carry out any work. Up and about more than 50% of waking hours; 3 = Capable of only limited self care, confined to bed or chair more than 50% of waking hours; 4 = Completely disabled. Cannot carry on any self care. Totally confined to bed or chair.

** All other ethnic groups combined includes, Asian or Asian British, Black, Black British, Caribbean or African, Mixed or multiple ethnic groups and Other ethnicity groups. Individual ethnic groups were collapsed due to small numbers.

Supplementary figures

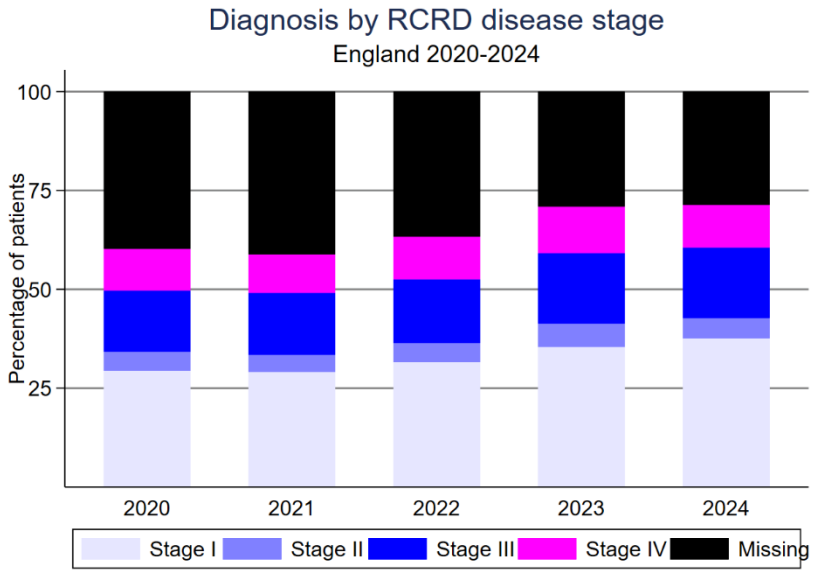

Figure A1. Diagnosis by RCRD disease stage in England 2020 - 2024

Footnote: 2024 data includes patients diagnosed until 31st Oct 2024.

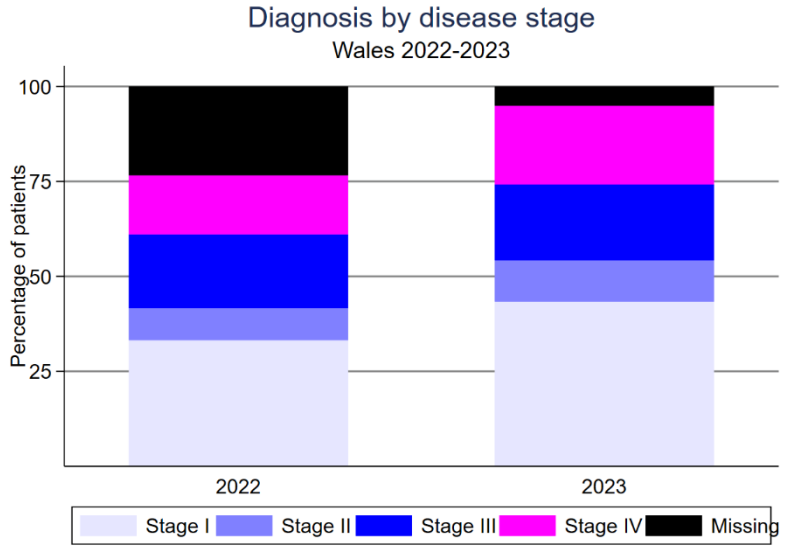

Figure A2. Diagnosis by disease stage in Wales in 2022-2023

TNM (Tumour Node Metastasis) definitions

Table A3. TNM Stage adapted from UICC TNM 8 - UICC TNM staging for kidney cancer and EAU RCC Guidelines - TNM staging for kidney cancer

T – Primary tumour	
T0	No Evidence of primary tumour
T1a	Tumour less than or equal to 4cm
T1b	Tumour more than 4cm but less than or equal to 7cm
T2a	Tumour more than 7cm but less than or equal to 10cm
T2b	Tumour more than 10cm but limited to the kidney
T3	Tumour extends into major veins or perinephric tissues but not into ipsilateral adrenal gland and not beyond Gerota fascia
T4	Tumour invades beyond Gerota fascia (including contiguous extension into the ipsilateral adrenal gland)
N- Regional Lymph Nodes	
N0	No regional lymph node metastasis
N1	Metastasis in regional lymph node(s)
M – Distant metastasis	
M0	No distant metastasis
M1	Distant metastasis

T3+ and/or 10cm+ and/or N1 M0 RCC	Tumour extends into major veins or perinephric tissues or invades beyond Gerota fascia and/or tumour more than 10cm in size and/or metastasis in regional lymph node(s) with no distant metastasis
T2-3NxM0 RCC	Tumour is more than 7cm in size or tumour extends into major veins or perinephric tissues with no distant metastasis
T1b-3NxM0 RCC	Tumour is more than 4cm in size or tumour extends into major veins or perinephric tissues with no distant metastasis
T1aN0M0 RCC	Tumour is less than or equal to 4cm in size with no regional lymph node metastasis and no distant metastasis

Glossary

Radical Nephrectomy
The surgical removal of an entire kidney to treat kidney cancer. The adrenal gland which is a small triangular shaped gland located on top of each kidney is left behind if not involved with the kidney cancer. It produces hormones to help regulate metabolism.

Partial Nephrectomy
The surgical removal of part of the kidney which contains the kidney cancer. The goal is to remove the diseased portion while preserving as much of the healthy kidney tissue as possible.

Thermal Ablation
Thermal ablation is the used to treat small kidney cancers by using extreme heat or cold to destroy cancer cells. Radiofrequency Ablation (RFA): Uses high-energy radio waves to generate heat that destroys cancer cells. Microwave ablation (MWA): Uses microwave energy to generate heat and destroy cancer cells. Cryoablation: Uses extreme cold to freeze and kill cancer cells.

Nephron Sparing Treatment
Can be used to describe both partial nephrectomy and thermal ablation, as both involvement treatment of the kidney cancer while preserving the healthy kidney tissue.

Renal Biopsy
A procedure where small piece of kidney tissue is removed for examination under a microscope to determine the presence of kidney cancer and help guide treatment.

Metastatic Disease
When cancer has spread from its initial site of development in the kidney (the primary site) to distant sites of the body (the metastatic site(s)). The diagnosis is usually made by imaging tests.

Systemic Therapy
Systemic therapy is anti-cancer drug therapy. This includes novel targeted therapies (i.e. Pembrolizumab, Nivolumab, Ipilimumab, Cabozantinib, Axitinib, Lenvatinib) for kidney cancer.

Radiotherapy
The use of radiation to destroy cancer cells. Since cancer cells grow and divide quickly, radiation disrupts their growth, leading to their destruction. There are different types of radiotherapy, including stereotactic ablative radiotherapy (SABR) and external beam radiotherapy (EBRT). SABR uses high doses of radiation delivered in fewer sessions and can be used to treat kidney cancer in selected situations. EBRT can be used to treat kidney cancer when it has spread to other parts of the body.

Staging/stage

The anatomical extent of a cancer. This indicates whether a cancer is only present in the kidney/primary site (localised disease) or whether it has spread to other areas of the body (metastatic spread). It is usually denoted by the TNM staging process where “T” represents the local stage, “N” the presence of lymph node involvement and “M” represents the presence of metastatic disease.

T1 is divided into T1a and T1b depending on how big the cancer is:

- T1a means the cancer measures 4cm or less
- T1b means the cancer measures between 4cm and 7cm

T2 is divided into T2a and T2b depending on size:

- T2a means the cancer measures between 7cm and 10cm
- T2b means the cancer measures more than 10cm but completely inside the kidney

T3 is divided into T3a, T3b and T3c depending on whether the cancer has grown into surrounding tissues or main blood vessels:

- T3a means the cancer has grown into the nearby tissues or the renal vein.
- T3b means the cancer has grown into the vena cava, but hasn't spread above the diaphragm (sheet of muscle that separates chest and abdominal cavity, which helps us breathe)
- T3c means the cancer has grown into the vena cava and spread above the diaphragm. Or has grown into the wall of the vena cava.

T4 means the cancer has spread beyond the layer of tissue around the kidney (fascia). It might have spread into the adrenal gland above the kidney.
N0 means that the nearby lymph nodes do not contain cancer cells
N1 means there are cancer cells in lymph nodes near the kidney
M0 means the cancer has not spread to other parts of the body
M1 means the cancer has spread to other parts of the body such as the lungs