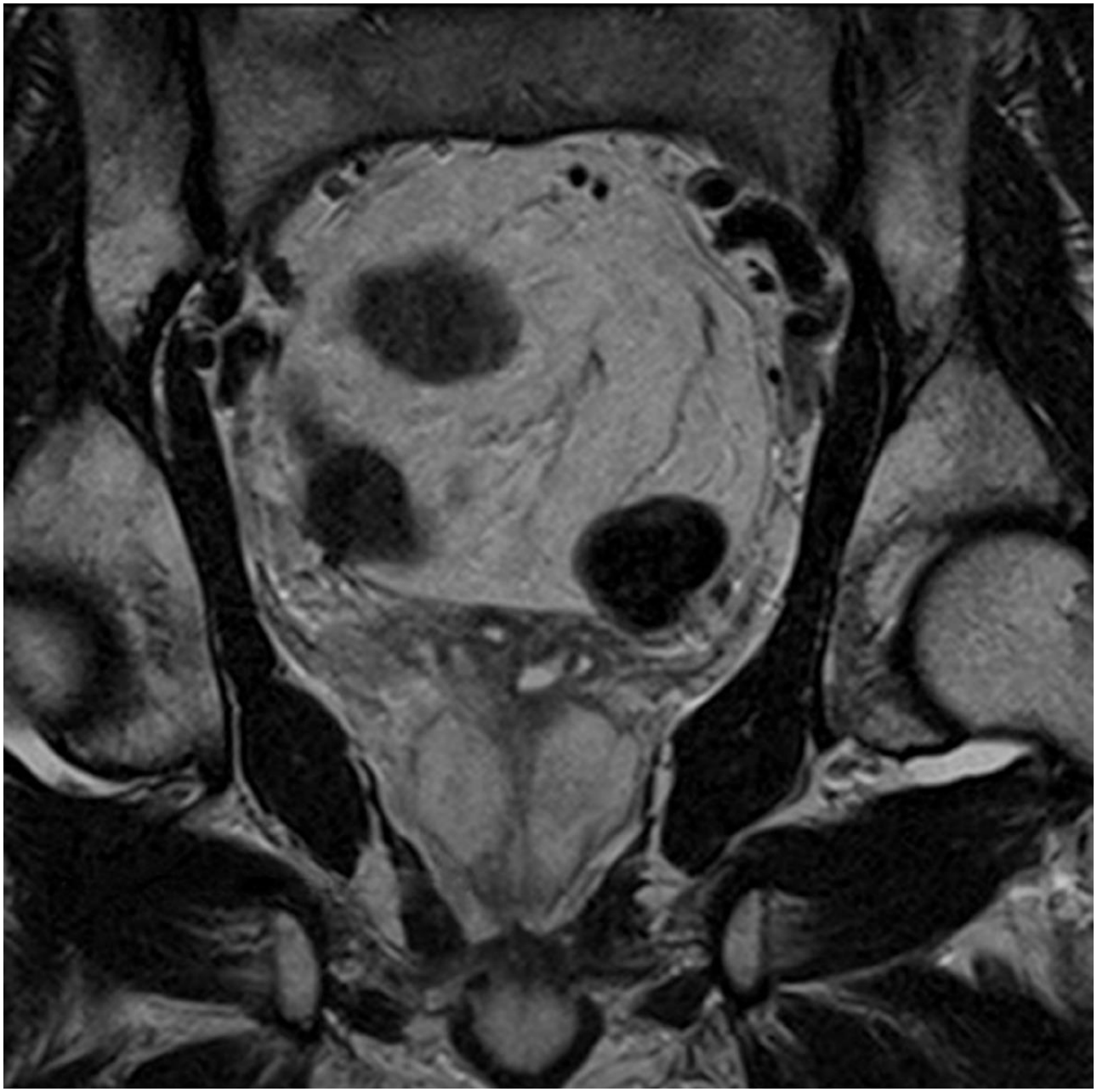
NPCA
National Prostate Cancer Audit

NPCA State of the Nation Report 2023

Methodology supplement



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Contents

Background

In this report, we make use of the 'gold-standard' National Cancer Registration Dataset (NCRD) and the Rapid Cancer Registration Dataset (RCRD) for England as well as the NPCA dataset from Wales (described below) to describe process and outcome measures from selected aspects of the care pathway for men with prostate cancer.

Data analyses in this report are presented in two sections: Impact of Covid-19, presented at national and cancer alliance level; Performance indicators, presented at SMDT or provider level.

Data receipt and processing

Routine data collection

In England, the National Prostate Cancer Audit (NPCA) works with the National Disease Registration Service (NDRS), NHS England, as a data collection partner. NDRS collects patient-level data from all NHS acute providers using a range of national data-feeds. This includes the Cancer Outcomes and Services Dataset (COSD), which specifies the data items that need to be submitted. Data are submitted to the National Cancer Data Repository (NCDR) on a monthly basis via MDT (Multidisciplinary Team) electronic data collection systems. Clinical sign-off of data submitted to NDRS is not mandated in England. For this annual report NCRAS provided data from the 'gold-standard' National Cancer Registration Dataset (NCRD) and the Rapid Cancer Registration Dataset (RCRD).

The NPCA's data collection partner in Wales is the Wales Cancer Network (WCN), Public Health Wales. The NPCA dataset (see below) is captured through a national system, Cancer Information System Cymru (CaNISC), after identification by hospital cancer services and uploaded via electronic MDT data collection systems. Prior to submission of NPCA data to the WCN, each patient record is validated (frequently by an MDT coordinator) and signed off by a designated clinician. Patient records are signed off when all key data items have been completed. For this annual report, WCN have provided, as usual, Cancer Network Information System Cymru (CaNISC), Patient Episode Database for Wales (PEDW) and Office for National Statistics (ONS) data in Wales.

We urge centres to work with their data collection leads to ensure prostate cancer data is collected as completely as possible as the audit is only as accurate as the data we receive.

This report presents results from the prospective audit for men diagnosed with, or treated for, prostate cancer between January 2019 and January 2023 in England and between January 2019 and March 2022 in Wales. For England, diagnoses were linked to data from Hospital Episode Statistics (HES), the Radiotherapy Dataset (RTDS) and the Systemic Anti-Cancer Therapy dataset (SACT). For Wales, data are captured through Cancer Network Information System Cymru (CaNISC) and linked to additional data items from the Patient Episode Database for Wales (PEDW), Office for National Statistics (ONS) and CaNISC.

National Cancer Registration Dataset (NCRD) and Rapid Cancer Registration Dataset (RCRD)

This year, we return to using the NCRD to report on five of our six performance indicators and use the RCRD for one performance indicator and for the national picture/recovery from Covid section of the report. The NCRD undergoes more processing to improve its data completeness compared to the RCRD. The NCRD also contains a broader range of variables including Gleason Score which is essential to risk stratifying patients which is an important step in some of our analyses. On the other hand, the RCRD has the advantage that it is available to us much more quickly after a patient is diagnosed so we can conduct more timely analyses. The RCRD captures approximately 90% of cancer diagnoses that are seen in the NCRD dataset, with consistent completeness of data collection across trusts. A comparison of the NCRD with the RCRD for four NPCA performance indicators can be found here.

Rationale for using both NCRD and RCRD in the SotN:

- Some indicators require risk stratification using the Gleason score, which is not currently available in the RCRD. For those medium-term indicators following radiotherapy and surgical treatment we have used the NCRD.
- Short term indicators such as 90-day readmissions following surgery do not require risk stratification and can therefore be calculated from the RCRD. A previous analysis has shown that results using the RCRD closely match those from the NCRD.

Patient inclusion

Patients are eligible for inclusion in the prospective audit if they have newly diagnosed prostate cancer using the ICD-10 diagnostic code of "C61" (malignant neoplasm of the prostate).

A patient is included in the prospective audit in England if he has a record of newly diagnosed prostate cancer in the National Cancer Registration Dataset (or Rapid Cancer Registration Dataset). A patient is included in the prospective audit in Wales if a completed NPCA record was submitted and the Wales Cancer Network (WCN) can assign that record to a diagnosing Health Board.

Data quality

The completeness of four key data items (performance status, PSA, Gleason score and TNM) in England and additionally biopsy performed in Wales provides a marker of data quality (Table 1).

Table 1. Data completeness for selected data items for men newly diagnosed with prostate cancer in England between 1st April 2020 and 31st March 2021 and in Wales between 1st April 2021 and 31st March 2022.

Data variable	**England**		**Wales**	
	N	**%**	**N**	**%**
Time period covered	*1 Apr 2020 - 31 March 2021*		*1 Apr 2021 - 31 March 2022*	
Diagnostic and staging variables				
No. of men with new diagnosis of prostate cancer	31,775 [NCRD]		2,286 [NPCA]	
Performance status completed	18,902 [NCRD]	59%	2,286 [NPCA]	100%
Biopsy performed	† - [HES APC]	-	2,283 [NPCA]	100%
PSA completed	19,285 [NCRD]	61%	1,930 [NPCA]	84%
Gleason score completed	24,833 [NCRD]	78%	1,930 [NPCA]	84%
TNM completed	23,765 [NCRD]	75%	1,648 [NPCA]	72%

Acronyms: COSD = Cancer Outcome and Services Dataset; NCRD = National Cancer Registration Dataset; NPCA = National Prostate Cancer Audit dataset; PSA = Prostate Specific Antigen; TNM = Tumour, Nodes, Metastases Classification of Malignant Tumours.

† Data completeness not applicable to England as biopsy performed is sourced from HES APC which doesn't allow calculation of data completeness.

Preparation for analysis

The NPCA Project Team, based at the Clinical Effectiveness Unit (CEU)[1] receives the national data from the NDRS and WCN. Once the data is received, a series of steps are performed to prepare the complex and large datasets for analysis.

Specifically, using specialised statistical software[2], the project team:

- Clean the datasets received
- Check the datasets for discrepancies
- Perform data augmentation (combining multiple sources of information)

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Merge the relevant datasets.

This involves restructuring the English and Welsh datasets so that they have the same format and can be analysed simultaneously.

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Where necessary, derive new information (data items) by combining different data items.

For example, the risk group and the Charlson comorbidity index are calculated using patient diagnosis information in HES and PEDW.

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Conduct analyses and present audit results.

In aggregated tables and graphs for annual reports and other outputs (such as peer reviewed articles and papers).

Definition of variables

Comorbidity and socioeconomic status

The presence of comorbidities is not captured within a single data item by the national registration services but is available as a data item in the RCRD. The NPCA team uses the Royal College of Surgeons of England (RCS) modified Charlson Comorbidity Index (CCI)[3] to describe these where they are not otherwise available.

The CCI is a commonly used scoring system for medical comorbidities. It consists of a grouped score that is calculated based on the absence (0) and presence (≥1) of 14 pre-specified medical conditions. The CCI was calculated using

[1] The CEU is an academic collaboration between The Royal College of Surgeons of England and the London School of Hygiene and Tropical Medicine, and undertakes national clinical audits and research. Since its inception in 1998, the CEU has become a national centre of expertise in methods, organisation, and logistics of large-scale studies of the quality of surgical care.

[2] Stata® is a statistical package for data analysis, data management, and graphics (https://www.stata.com/)

[3] Armitage JN, van der Meulen JH, Royal College of Surgeons Co-morbidity Consensus G. Identifying co-morbidity in surgical patients using administrative data with the Royal College of Surgeons Charlson Score. *Br J Surg.* 2010;97(5):772-81.

information on secondary diagnoses (ICD-10 codes) in the hospital admission data (HES/PEDW) recorded within the 12-month period prior to a patient's diagnosis (see Appendix 1).

The Index of Multiple Deprivation (IMD) was used to categorise patients into five socioeconomic groups (1=least deprived; 5=most deprived) based on the small areas in which they lived (LSOAs, containing ~1500 people). The five categories were fifths of the national IMD ranking of these areas.

Disease status and risk stratification

In England (NCRD) and Wales, cancer stage was defined using "T category (pre-treatment)", "N category (pre-treatment)" and "M category (pre-treatment)". Where pre-treatment information was missing for T or N or M, the corresponding pathological staging items were used if available. Men were assigned to a prostate cancer risk according to a modified D'Amico classification, which is a three-tiered disease status category, assigned according to their TNM stage, Gleason score and PSA, using an adapted version of an algorithm previously developed by the NPCA.[4] This year, the algorithm was adapted to broaden the inclusion criteria of the low-risk group so that anyone T stage 1 or 2, and M stage 0 or missing, and N stage 0 or missing, with a combined Gleason score of 6 or less was classified as low-risk. The underlining above highlights the expansion of the criteria.

In England, the RCRD did not contain information on Gleason grade or PSA which precluded using our risk-stratification algorithm to assign a risk group, however it did contain individual T, N and M variables. Disease staging (stage I-IV) was derived by NDRS from TNM status.

Treatment allocation

A patient was considered to have undergone radical prostate cancer therapy if he was identified as having received a radical prostatectomy, radical external beam radiotherapy or brachytherapy within 12 months of his diagnosis date.

Radical prostatectomy

HES and PEDW records, for England and Wales respectively, were used to identify patients who had undergone a radical prostatectomy using the OPCS-4 procedure code "M61". Where information on radical prostatectomy was missing in the PEDW data for Wales, this information was added from the NPCA dataset.

Radical radiotherapy

For England, the RTDS data-item "treatment modality" was used to identify men who received external beam radiotherapy and/or brachytherapy. Men receiving radiotherapy for metastases or radiotherapy with palliative intent were excluded.

For Wales, CaNISC was used in a similar way to the RTDS to identify men receiving curative radiotherapy and to exclude those receiving palliative radiotherapy.

Systemic therapy

SACT was used to identify the men receiving docetaxel, enzalutamide, abiraterone or apalutamide and was only available for men in England. Docetaxel is a chemotherapy agent. Enzalutamide, abiraterone and apalutamide are Novel Hormonal Therapies (NHT). An example of where these systemic therapies can be offered, in addition to androgen deprivation therapy (ADT), is for patients with metastatic hormone-sensitive prostate cancer.

[4] NPCA Annual Report 2016. Download from: https://www.npca.org.uk/reports/npca-annual-report-2016/

Analysis of the impact of COVID-19

The COVID impact section of the report covers:

Diagnoses

- overall, (and broken down by RCRD disease stage for England)

Radical prostatectomy procedures

- all types (laparoscopic, robotic or open)

Radiotherapy treatments initiated

- overall, and broken down into conventional (2Gy per fraction) therapy, hypofractionated and ultrahypofractionated regimens. This was defined based on the doses documented in the Radiotherapy Dataset (RTDS).

Systemic treatments (for England only)

- use of docetaxel, enzalutamide, abiraterone and apalutamide, given to men with prostate cancer.

Methods

For England, we report on the impact of and recovery from the COVID-19 pandemic, presenting data on the diagnosis and treatment of men with prostate cancer during 2022 compared with the 'usual' patterns of care in 2019, and to the situation in 2020 and 2021. For Wales we report on the impact of the COVID-19 pandemic on the diagnosis and treatment of men with prostate cancer during 2021/22 compared with the 'usual' patterns of care in 2019, and to the situation in 2020.

For England data are presented nationally and at cancer alliance level. Data for Wales are presented nationally. Each quarter of the 2020, 2021 and 2022 calendar years is presented as a percentage of the same quarter in 2019. No formal significance tests have been done comparing different time periods.

For England, data from the RCRD were used to identify prostate cancer diagnoses between 1 January 2019 and 31 December 2022. These were linked to data from Hospital Episode Statistics (HES), the Radiotherapy Dataset (RTDS) and the Systemic Anti-Cancer Therapy dataset (SACT). As noted above, the RCRD captures approximately 90% of cancer diagnoses that are seen in the 'gold standard' NCRD, with relatively consistent completeness across trusts. A full comparison of the two datasets can be found here.

We identified all patients in England newly diagnosed with prostate cancer between 1 January 2019 and 31 December 2022 according to the RCRD. We also used a number of *procedure-based cohorts* including patients with prostate cancer who had a radical prostatectomy (RP), radiotherapy (RT) or chemotherapy between 1 January 2019 and 31 December 2022.

The RCRD also provided information on age at diagnosis, ethnicity, tumour stage ranging from stage I (cancer contained within prostate) to stage IV (cancer spread to lymph nodes or other parts of the body)[5], Charlson Comorbidity Index, and the Index of Deprivation (IMD).

[5] Prostate cancer stages. American Cancer Society. https://www.cancer.org/cancer/prostate-cancer/detection-diagnosis-staging/staging.html

The RTDS provided information on the fractionation regimen (conventional, hypofractionation, or ultra-hypofractionation on the basis of United Kingdom RT dose fractionation guidance)[6].

The SACT dataset was used to identify men who received systemic treatment with docetaxel, enzalutamide, abiraterone, or apalutamide in England. Linkage of SACT to the RCRD identified men who had treatment within 16 weeks of diagnosis.

For Wales, data from the CaNISC were used to identify prostate cancer diagnoses between 1 January 2019 and 31 March 2022. These were linked to data from Patient Episode Database for Wales (PEDW).

We identified all patients in Wales newly diagnosed with prostate cancer between 1 January 2019 and 31 March 2022 according to CaNISC. We also used a number of *procedure-based cohorts* including patients with prostate cancer who had a radical prostatectomy (RP) or radiotherapy (RT) between 1 January 2019 and 31 March 2022.

CaNISC provided information on the fractionation regimen (conventional, hypofractionation, or ultra-hypofractionation on the basis of United Kingdom RT dose fractionation guidance)[6].

Each quarter of the 2020, 2021 and 2022 calendar years are compared to the same quarter of 2019 (Q1: January-March, Q2: April-June, Q3: July-September and Q4: October-December).

NPCA performance indicators

Using the NCRD and RCRD for England and the data from Wales we report specific information for performance indicators relating to diagnosis, staging and treatment. These include one disease presentation indicator, two related to treatment allocation and two treatment-outcome performance indicators for both England and Wales. The patient inclusion dates for these indicators can be found in the table below.

Using the RCRD for England and the data from Wales we report on one performance indicator relating to treatment outcome (90-day re-admission rates) between 1st April 2021 and 31st March 2022, for England and Wales.

	England	**Wales**
Performance indicator (PI)		
Disease presentation: • Diagnosed with metastatic disease (PI1) Treatment allocation: • Over treatment (PI2) • Under treatment (PI3)	NCRD Patients diagnosed between: 01.04.20-31.03.21	NPCA Patients diagnosed between: 01.04.21-31.03.22
Outcomes of treatment: short-term: • Readmission within 90 days (PI4)	RCRD Patients who underwent a radical prostatectomy between: 01.04.21-31.03.22	NPCA Patients who underwent a radical prostatectomy between: 01.04.21-31.03.22

[6] The Royal College of Radiologists. Radiology dose fractionation, third edition. London: The Royal College of Radiologist, 2019. https://www.rcr.ac.uk/our-services/all-our-publications/clinical-oncology-publications/radiotherapy-dose-fractionation-third-edition/

Outcomes of treatment: medium-term: • Genitourinary (GU) complication (PI5) • Gastrointestinal (GI) complication (PI6)	NCRD Patients who received radical treatment between: 01.09.19-31.08.20	NPCA Patients who received radical treatment between: 01.09.19-31.08.20

Medium-term indicators require longer follow-up (up to two years' post-treatment), so the diagnostic period is earlier, reporting for patients undergoing treatment during the period 1st September 2019 to 30th August 2020.

Statistical analyses

All statistical analyses were performed using Stata version 17.0.

Most results in the Annual Report are descriptive. The results of categorical data items are reported as percentages (%). The denominator of these proportions is, in most cases, the number of patients for whom the value of the data item was not missing. Results are typically grouped by Trust/Health Board (for Wales) or by specialist MDT (SMDT).

Centres which performed fewer than 10 procedures/treatments per year were excluded.

Adjusted outcomes

Multivariable logistic regression was carried out for performance indicators 2-6. This was used to estimate the probability of a patient having an event, at trust level the individual probabilities were summed to give the expected number of events, and the number of events was then divided by the expected.

Indicators 2 and 3 were adjusted for patient age and comorbidity. Indicator 4 was adjusted for patient age, comorbidity, socio-economic status and disease stage. Indicators 5 and 6 were adjusted for patient age, comorbidity, socio-economic status and prostate cancer risk (see above). Indicator 4 was adjusted for stage as opposed to prostate cancer risk as prostate cancer risk cannot be calculated using RCRD as Gleason score is unavailable.

Funnel plots

Funnel plots are used to make comparisons, and graphically display variation, between Trusts/Health Boards or between specialist MDTs. The plots are generated by plotting the rate for each Trust/Health Board/SMDT against the total number of patients used to estimate the rate. The 'target' is specified as the average rate across all Trusts/Health Boards/SMDTs.

The funnel plots generated for the performance indicators use control limits defining differences corresponding to two standard deviations (inner limits) and three standard deviations (outer limits) from the national average. These limits get wider where hospitals have a lower volume of patients and narrower where there is higher volume, reflecting the increased variability in results when there are fewer patients per hospital.

Funnel plots are displayed in the State of the Nation Report for treatment outcome measures across England and Wales (performance indicators 4-6).

The six performance indicators presented in this report are summarised in the table below.

Table 2. NPCA Performance Indicators.

Performance indicator		Description
For England and Wales		
Disease presentation		
1	Proportion of men diagnosed with metastatic disease (presented at the level of the SMDT).	This *process* indicator provides information on the variation of the proportion of men diagnosed with metastatic prostate cancer, at a point at which they are normally beyond curative treatment. This could potentially indicate a late diagnosis. The numerator is the number of men diagnosed with metastatic disease between 1 April 2020 and 31 March 2021 for England, and 1 April 2021 and 31 March 2022 for Wales; the denominator is the number of men whose disease status has been determined. It is an unadjusted measure. Where metastatic status (M stage) was missing, non-metastatic status could sometimes be inferred based on T stage, N stage, Gleason score and PSA score based on the principles of the D'Amico classification and the Cambridge Prognostic Group system.
Treatment allocation		
2	Proportion of men with low-risk localised prostate cancer undergoing radical prostate cancer therapy (presented at the level of the SMDT).	This *process* indicator provides information about the potential "over-treatment" of men with low-risk prostate cancer. This indicator was derived from linkage with HES (England)/PEDW (Wales) data for men undergoing radical treatment between 1 April 2020 and 31 March 2021 in England, and 1 April 2021 and 31 March 2022 in Wales. The denominator is the number of men with low-risk localised prostate cancer, the numerator is the number of these having radical prostatectomy, radiotherapy or brachytherapy within 12 months of diagnosis.
3	Proportion of men with high-risk/locally advanced disease receiving radical prostate cancer therapy (presented at the level of the SMDT).	This *process* indicator provides information about potential "under-treatment" of men with high-risk/locally advanced disease. This indicator was derived from linkage with HES (England)/PEDW (Wales) data for men undergoing radical treatment between 1 April 2020 and 31 March 2021 in England, and 1 April 2021 and 31 March 2022 in Wales. The denominator is the number of men with high-risk/locally advanced disease, the numerator is the number of these having radical prostatectomy, radiotherapy, or brachytherapy within 12 months of diagnosis.
Outcomes of treatment: short-term		
4	Proportion of patients who had an emergency readmission within 90 days of radical prostate cancer surgery (presented at the level of the surgery centre).	This *outcome* indicator may reflect that patients experienced a complication related to radical prostate cancer surgery after discharge from hospital. This indicator was derived from linkage with HES/PEDW admissions for men undergoing radical prostatectomy between 1 April 2021 and 31 March 2022. To create a variable for those patients who had an emergency readmission within 90 days of a radical prostatectomy: we identify those patients who had a radical prostatectomy, calculate the difference in days between the given discharge date after prostatectomy and any readmission date, and find those patients with a code indicating an emergency readmission (see Appendix 2) which is recorded within 90 days of discharge. An emergency readmission code indicates that "admission was unpredictable and at short notice because of clinical need" (from the HES data dictionary). An overnight stay is not required for a patient to fall into this category.
Outcomes of treatment: medium-term		

5	Proportion of patients experiencing at least one genitourinary (GU) complication requiring a procedural/surgical intervention within 2 years of radical prostatectomy (presented at the level of the surgical centre).	This outcome indicator may reflect the quality of the surgical procedure received. This indicator includes men undergoing a radical prostatectomy between 1 September 2019 and 31 August 2020. It was derived using a coding-framework based on OPCS-4 procedure codes to capture genitourinary complications that required an intervention (see Appendix 3).[7] These included complications of the urinary tract as opposed to those related to sexual dysfunction. Men with an associated diagnosis of bladder cancer (ICD-10 "C67" code) or who received post-operative radiotherapy were excluded.
6	Proportion of patients receiving a procedure of the large bowel and a diagnosis indicating radiation toxicity (gastrointestinal (GI) complication) up to 2 years following radical prostate radiotherapy (presented at the level of the radiotherapy centre).	This *outcome* indicator may reflect the quality of the radiotherapy interventions received. This indicator includes men undergoing radical radiotherapy between 1 September 2019 and 31 August 2020 and assesses the percentage of men at each radiotherapy centre who experienced at least one gastrointestinal (GI) complication within 2 years of their radiotherapy, using procedure (OPCS-4) and diagnostic codes (ICD-10) derived from patient-level linked administrative hospital data (see Appendix 4). A toxicity event requires evidence of both a diagnostic endoscopic procedure (e.g. colonoscopy or sigmoidoscopy) in addition to a diagnostic code consistent with radiation toxicity equivalent to Grade 2 toxicity or above according to the National Cancer Institute Common Toxicity Criteria for Adverse Events (CTCAE). These indicators have been validated and used to compare the effectiveness of different treatment modalities and processes of care in prostate cancer radiotherapy.[8] Men with an associated diagnosis of bladder cancer, those who received additional brachytherapy and those who had received a radical prostatectomy prior to radiotherapy were excluded.

[7] More detail about the development of this indicator can be found here: Sujenthiran A, Charman S, Parry M et al. Quantifying severe urinary complications after radical prostatectomy: the development and validation of a surgical performance indicator using hospital administrative data. *BJU int* (2017); 120:219-225

[8] More detail about this indicator can be found here: Sujenthiran A, Parry M, Nossiter J et al. Comparison of Treatment-Related Toxicity With Hypofractionated or Conventionally Fractionated Radiation Therapy for Prostate Cancer: A National Population-Based Study. *Clin Oncol.* (2020); 32(8): 501-508; Parry M, Nossiter J, Sujenthiran A et al. Impact of high-dose rate and low-dose rate brachytherapy boost on toxicity, functional and cancer outcomes in patients receiving external beam radiation therapy for prostate cancer: a national population-based study. *Int J Radiat Oncol Biol Phys* (2020); S0360-3016(20)34545-4

Appendix 1: Charlson Comorbidity Index

Pre-specified conditions included in the assignment of Charlson Comorbidity Index score

Conditions			
Myocardial infarction	Dementia	Diabetes mellitus	Metastatic solid tumour
Congestive cardiac failure	Chronic pulmonary disease	Hemiplegia or paraplegia	AIDS/HIV infection
Peripheral vascular disease	Rheumatological disease	Renal disease	
Cerebrovascular disease	Liver disease	Any malignancy	

Appendix 2: Coding for emergency readmissions

Performance indicator 4: *Proportion of patients who had an emergency readmission within 90 days of radical prostate cancer surgery (presented at the level of the surgery centre).*

Patients are coded as having an emergency readmission if:

- they were readmitted between 1 and 90 days since discharge following radical prostatectomy
- they have an "admimeth" code starting with a “2” indicating emergency admission, as shown below (from the HES data dictionary)
- an overnight stay is not required to qualify as readmission

Emergency Admission, when admission is unpredictable and at short notice because of clinical need:
21 = Accident and emergency or dental casualty department of the Health Care Provider
22 = General Practitioner: after a request for immediate admission has been made direct to a Hospital Provider, i.e. not through a Bed bureau, by a General Practitioner: or deputy
23 = Bed bureau
24 = Consultant Clinic, of this or another Health Care Provider
25 = Admission via Mental Health Crisis Resolution Team (available from 2013/14)
2A = Accident and Emergency Department of another provider where the patient had not been admitted (available from 2013/14)
2B = Transfer of an admitted patient from another Hospital Provider in an emergency (available from 2013/14)
2C = Baby born at home as intended (available from 2013/14)
2D = Other emergency admission (available from 2013/14)
28 = Other means, examples are: - Admitted from the Accident and Emergency Department of another provider where they had not been admitted - Transfer of an admitted patient from another Hospital Provider in an emergency

Appendix 3: Coding for genitourinary complications

Performance indicator 5: *Proportion of patients experiencing at least one genitourinary (GU) complication requiring a procedural/surgical intervention within 2 years of radical prostatectomy (presented at the level of the surgical centre).*

Patients are coded as having a genitourinary complication if:

- they had a radical prostatectomy between 1 September 2019 and 31 August 2020
- they had not had radical radiotherapy
- they do not have a record of bladder cancer
- they have a record of one of the following OPCS-4 procedure codes

Men who are both diagnosed and treated between 1 September 2019 and 31 August 2020 are included in this indicator for England, and all those treated between 1 September 2019 and 31 August 2020 are included for Wales.

OPCS-4 Procedure Code and Definition	
M444	Endoscopic removal of blood clot from bladder
M448-9	Other specified/unspecified other therapeutic endoscopic operations on bladder
M455	Diagnostic endoscopic examination of bladder using rigid cystoscope
M458-9	Other specified/unspecified diagnostic endoscopic examination of bladder
M471	Urethral irrigation of bladder
M478-9	Other specified/unspecified urethral catheterisation of bladder
M481	Suprapubic aspiration of bladder
M512	Endoscopic suspension of neck of bladder
M642	Implantation of artificial urinary sphincter into outlet of male bladder
M643	Insertion of prosthetic collar around outlet of male bladder
M646	Reconstruction of neck of male bladder NEC
M648-9	Other specified/unspecified other open operations on outlet of male bladder
M651-5,8-9	Endoscopic resection of prostate/outlet of male bladder
M662	Endoscopic incision of outlet of male bladder NEC
M668-9	Other specified/unspecified other therapeutic endoscopic operations on outlet of male bladder
M679	Unspecified other therapeutic endoscopic operations on prostate
M763	Optical urethrotomy
M764	Endoscopic dilation of urethra
M768-9	Other specified/unspecified therapeutic endoscopic operations on urethra
M792	Dilation of urethra NEC
M793	Calibration of urethra
M794	Internal urethrotomy NEC

Appendix 4: Coding for gastrointestinal complications

Performance indicator 6: *Proportion of patients receiving a procedure of the large bowel and a diagnosis indicating radiation toxicity (gastrointestinal (GI) complication) up to 2 years following radical prostate radiotherapy (presented at the level of the radiotherapy centre).*

Patients are coded as having a gastrointestinal complication if:

- they had a radical radiotherapy between 1 September 2019 and 31 August 2020
- they had not had radical prostatectomy
- they had not had additional brachytherapy
- they do not have a record of bladder cancer
- they have a record of one of the following OPCS-4 procedure or OCD-10 diagnosis codes

Men who are both diagnosed and treated between 1 September 2019 and 31 August 2020 are included in this indicator for England, and all those treated between 1 September 2019 and 31 August 2020 are included for Wales.

OPCS-4 Procedure Code and Definition	
H201-4,H206,H208-9,H212,H221, H228-9	Endoscopy of colon
H231-6,H238-9,H242,H248-9,H251,H258-9	Sigmoidoscopy of lower bowel
H261-9,H271,H279,H281,H288-9	Sigmoidoscopy of sigmoid colon
H541	Anorectal stretch
H564	Excision of anal fissure
H626	Proctoscopy
M372	Repair of vesicocolic fistula
M375	Repair of fistula of bladder NEC
ICD-10 Diagnosis Code and Definition	
K520	Gastroenteritis and colitis due to radiation
K528-9	Other specified/unspecified noninfective gastroenteritis and colitis
K603-4	Anal/rectal fistula
K624-6	Stenosis/haemorrhage/ulcer of anus and rectum
K627	Radiation proctitis
K628-9	Other specified/unspecified disease of rectum and anus
K632	Intestinal fistula
N321	Vesicointestinal fistula