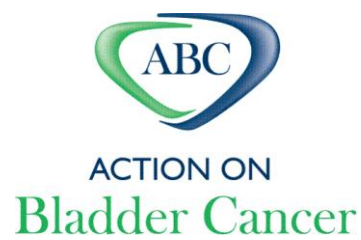


Survival in patients treated by cystectomy for bladder cancer

Urological Cancers SSCRG



Background

Bladder cancer is the second-most common cancer of the urinary tract, with over 8,700 new cases diagnosed in 2008. The majority of new cases are in men with about 6,300 in 2008 compared to just over 2,400 in women. The difference in number is linked to risk factors such as smoking and historic industrial exposure.

There are several treatment options, depending on the stage of the nature of the tumour. These include excision of the lesion, radiotherapy, chemotherapy and cystectomy, which is complete removal of the bladder. Cystoprostatectomy is removal of bladder and prostate in the same operation and is the standard operation in men. For cases diagnosed in the time period 2005-2007, just under 11% of malignant bladder cancers (ICD-10 C67) and just under 2% of uncertain (ICD-10 D41.4) and carcinoma in situ (ICD10 D09.0) tumours were treated with radical cystectomy or radical cystoprostatectomy.

In the Department of Health's publication 'Improving Outcomes in Urological Cancers', there was a recommendation that:

- Teams undertaking cystectomy perform at least 50 cystectomies and/or prostatectomies each year;
- Surgeons who perform less than five procedures per year should transfer their workload to colleagues, to start a transition period of building up workload to the 50+ procedures level;
- Centres should audit outcomes with the aim of achieving 30-day mortality of 3.5% or less.

The aim of all the Improving Outcomes guidance (IOG) was to improve standards in all aspects of patient care, including survival. It is now possible to compare the survival of patients being treated by cystectomy before publication of IOG, and in a period of time far enough after the IOG publication to allow implementation of recommendations.

The South West Public Health Observatory (SWPHO) is the lead registry for urological cancers, with access to national cancer registry data, Hospital Episode Statistics (HES), British Association of Urological Surgeons (BAUS) audit data and Office for National Statistics (ONS) deaths records. Using these data sources it is possible to identify people diagnosed with bladder cancer and treated by cystectomy, and follow up their status for a set period of time.

This analysis has been undertaken to determine if the survival of patients after cystectomy for bladder cancer has changed over the period 1999 to 2007, which may be affected by IOG.

Method

The two time periods chosen for analysis were 1999-2001 and 2005-2007. The period 1999-2001 immediately precedes IOG so represents the latest clinical practice without any IOG influence. There is recognition in IOG that implementation of recommendations will take a period of time, so 2005-2007 was chosen as it is the most recent data available from the National Cancer Data Repository (NCDR), and allows two years implementation.

Patients on NCDR were included for analysis if they were registered with a cancer registry during the two time periods with any of the following:

- Malignant neoplasm of bladder, ICD-10 code C67
- Carcinoma in situ of bladder, ICD-10 code D09.0
- Neoplasm of uncertain or unknown behaviour of the bladder, ICD-10 code D41.4

These patients were linked to Hospital Episode Statistics (HES) records using NHS number as an identifier. HES records are complete up to the end of the 2009/2010 financial year, so any treatment up to that date is considered for analysis. Patients are placed into the final analysis cohort if they have a record on HES of one of the following procedures:

- Cystoprostatectomy, OPCS code M34.1
- Cystourethrectomy, OPCS code M34.2
- Cystectomy (not elsewhere classified), OPCS code M34.3
- Simple cystectomy, OPCS code M34.4
- Other specified total excision of bladder, OPCS code M34.8
- Unspecified total excision of bladder, OPCS code M34.9

Cohort characteristics are examined in terms of age at treatment, sex, income deprivation, and volume of procedures performed at the trust. Patients are classified into income deprivation quintiles by linking postcode on the HES record to a Lower Super Output Area (LSOA). All LSOAs in England are ranked according to their score in the Income domain of the Indices of Deprivation 2007, and grouped into quintiles which give equally sized population groups, as far as is possible. Stage of disease is determined from the tumour size (T), nodes (N) and metastases (M) values for each patient. These fields are not fully complete on the NCDR and thus patients are matched to the British Association of Urological Surgeons (BAUS) audit database via NHS number, sex and cancer type. If NHS number is missing, then matching on date of birth, year of diagnosis and postcode is required. TNM data is then extracted from the BAUS data where available. Overall stage is calculated using the UICC TNM fifth edition rules. The assumption is made that when N and M values are blank or missing, they are counted as zero. This allows the inclusion of more patients into staging, albeit at the risk of misclassification of some tumours.

Relative survival is calculated in *STATA*, using the *strel* program developed by the London School of Hygiene and Tropical Medicine. Relative survival quantifies the excess mortality experienced by a person after diagnosis/treatment, by comparing the observed mortality rate to the mortality rate experienced by the population as a whole. Therefore the relative survival percentage is the number of people surviving to a point as a percentage of the number of people expected to survive to that point, and hence is higher than crude survival. This is especially important in older age groups where there will be high mortality from other causes. To give the most accurate value for relative survival, each person is matched to a background mortality rate based on their age, sex, region of residence and quintile of deprivation. Survival at 30 days, 90 days and three years is the main outcome of interest.

Results

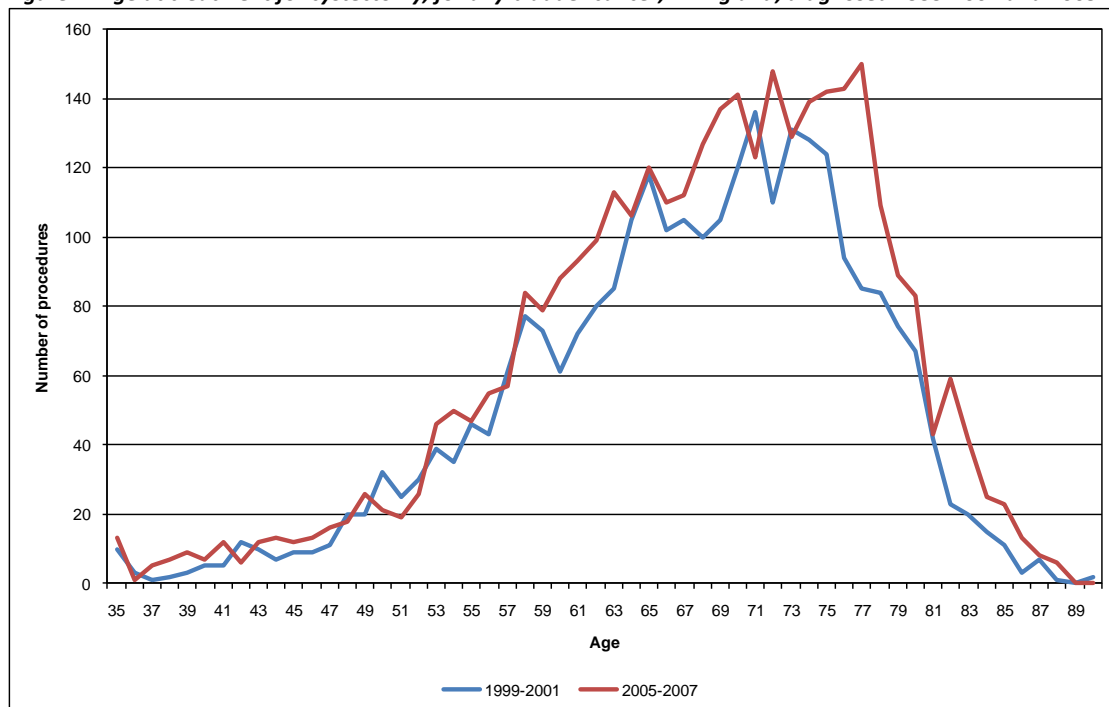
The final cohort was analysed in two groups. The first group included all persons undergoing a cystectomy, while the second group was restricted to 'muscle-invasive' bladder cancers, defined as stage II or higher. Finally, stage-specific survival was calculated.

All patients

The total number of patients counted for the 1999-2001 period of diagnosis was 3,291. The mean age when cystectomy was performed was 67 years old, and the median age was 68 (Figure 1). Men were dominant in the group, with 3.3 men for each woman. When grouped by deprivation quintile, there was no statistically significant gradient in procedures as a proportion of diagnoses (Figure 2). In terms of volume of procedures, the 3,291 procedures performed for diagnoses from 1999-2001 were undertaken at 187 trusts. The average per trust is thus 17.6, with a range from 1 to 129 operations.

The total number of patients counted for the 2005-2007 period of diagnosis was 4,070. This is a 23% increase in numbers from the earlier time period. The mean age when cystectomy was performed remained at 67 years old, and the median age was 68, with no change in the distribution of procedures by age (Figure 1). The ratio of men to women was unchanged at 3.3 men for each woman. When grouped by deprivation quintile, the least deprived quintile had a higher number of procedures as a proportion of diagnoses when compared to quintiles 3, 4 and 5 (the most deprived) (Figure 2), although the quintile which contained most procedures was the second to least deprived. The 4,070 procedures for diagnoses in 2005-2007 were performed at 129 trusts. The average per trust increased to 31.5, with a range from 1 to 176.

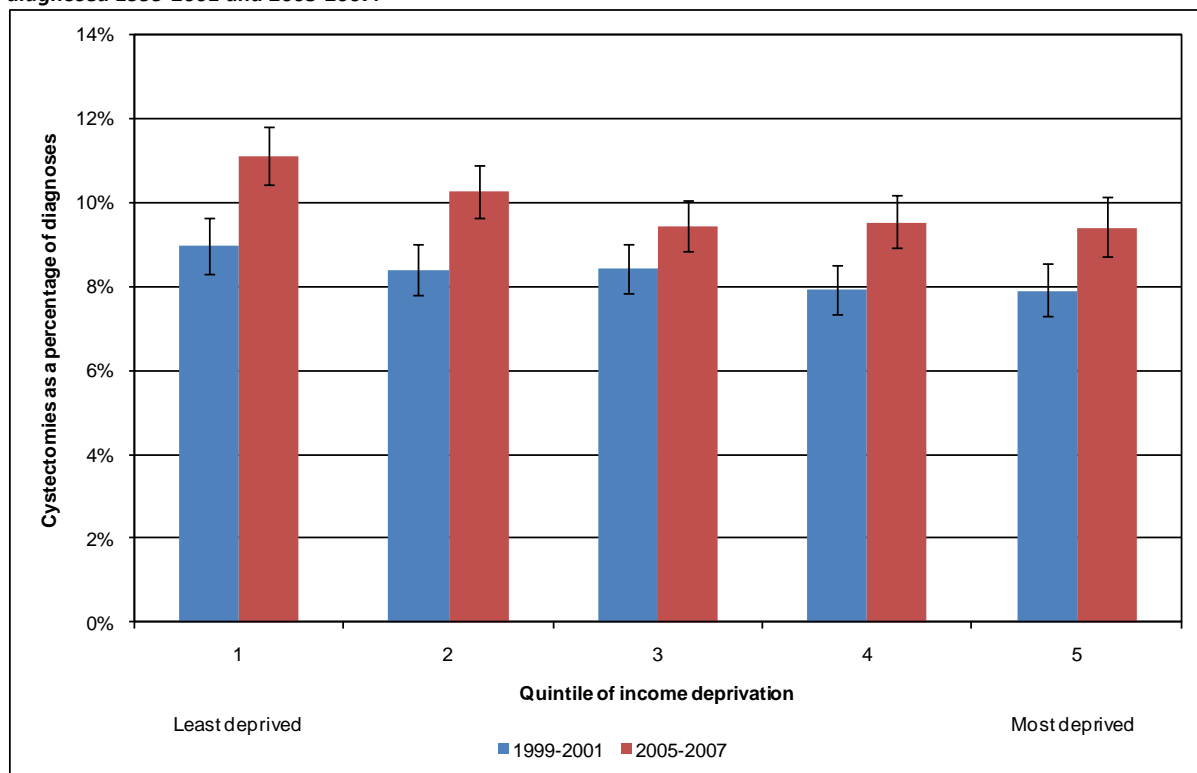
Figure 1: Age at treatment for cystectomy, for any bladder cancer, in England, diagnosed 1999-2001 and 2005-2007.



Source: United Kingdom Association of Cancer Registries; Hospital Episode Statistics

The proportion of procedures performed on tumours registered as D09.0 (Carcinoma in situ of bladder) and D41.4 (Neoplasm of uncertain or unknown behaviour of the bladder) was different in 2005-07 compared to 1999-01. There was an increase in these categories for men, with a corresponding decrease in the procedures for C61 (Malignant neoplasm of bladder) registered tumours ($p < 0.05$). In women the only statistically significant change was an increase in the proportion of procedures performed on D41.4 tumours.

Figure 2: Cystectomies as a proportion of diagnoses by deprivation quintile, for any bladder cancer, in England, diagnosed 1999-2001 and 2005-2007.



Source: United Kingdom Association of Cancer Registries; Hospital Episode Statistics; Department of Communities and Local Government

Relative survival for patients treated by cystectomy for bladder cancer, diagnosed in 1999-2001 is shown in table 1. Table 2 illustrates the same data for diagnoses in 2005-2007.

When comparing patients diagnosed in 2005-2007 with those diagnosed in 1999-2001 there has been a statistically significant increase in relative survival at all times after diagnosis. At 30 days after treatment relative survival increased by an absolute percentage of 1.8%, at 90 days after treatment it increased by an absolute percentage of 3.1%, and at three years it increased by an absolute percentage of 6.8%. Survival curves are shown in Figure 3.

Several changes in practice took place during the period under study which may have contributed to these differences. These include an increasing use of cystectomy in non muscle invasive bladder cancer, the use of systemic chemotherapy in muscle invasive disease, the beginning of centralisation of surgery and improved imaging.

Table 1: Relative survival for patients treated by cystectomy, for any bladder cancer, in England, diagnosed 1999-2001.

Interval		Crude Survival	Relative Survival		
Start	End	Percentage	Percentage	LCI	UCI
0	1 month	95.5	95.8	95.0	96.5
1 month	2 months	92.6	93.2	92.3	94.1
2 months	3 months	90.0	90.8	89.7	91.8
3 months	4 months	87.8	88.7	87.5	89.8
4 months	5 months	84.9	86.0	84.7	87.2
5 months	6 months	82.7	84.0	82.6	85.3
6 months	7 months	80.2	81.7	80.2	83.0
7 months	8 months	78.4	80.1	78.6	81.5
8 months	9 months	76.4	78.2	76.7	79.7
9 months	10 months	74.4	76.4	74.8	77.9
10 months	11 months	72.8	74.9	73.3	76.4
11 months	1 year	71.5	73.8	72.1	75.3
1 year	1.5 years	63.8	66.8	65.0	68.4
1.5 years	2 years	58.2	61.8	60.0	63.6
2 years	2.5 years	53.6	57.9	56.1	59.8
2.5 years	3 years	50.6	55.5	53.6	57.4

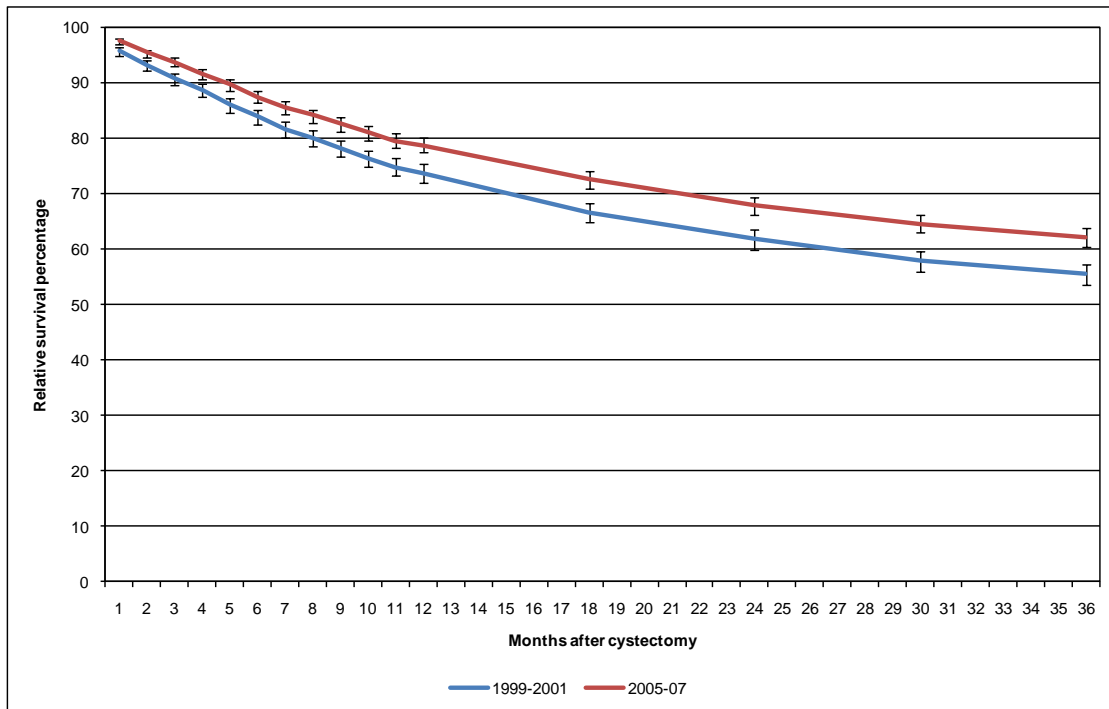
Source: United Kingdom Association of Cancer Registries; Hospital Episode Statistics; Department of Communities and Local Government

Table 2: Relative survival for patients treated by cystectomy, for any bladder cancer, in England, diagnosed 2005-2007.

Interval		Crude Survival	Relative Survival		
Start	End	Percentage	Percentage	LCI	UCI
0	1 month	97.3	97.6	97.0	98.0
1 month	2 months	95.0	95.5	94.7	96.1
2 months	3 months	93.1	93.8	93.0	94.6
3 months	4 months	90.7	91.6	90.6	92.4
4 months	5 months	88.6	89.7	88.6	90.6
5 months	6 months	86.3	87.5	86.4	88.6
6 months	7 months	84.2	85.6	84.4	86.7
7 months	8 months	82.6	84.1	82.9	85.3
8 months	9 months	80.8	82.6	81.3	83.8
9 months	10 months	79.2	81.1	79.8	82.3
10 months	11 months	77.6	79.6	78.3	80.9
11 months	1 year	76.6	78.9	77.5	80.2
1 year	1.5 years	69.6	72.6	71.1	74.0
1.5 years	2 years	64.2	67.9	66.3	69.4
2 years	2.5 years	60.3	64.7	63.0	66.3
2.5 years	3 years	57.3	62.3	60.6	63.9

Source: United Kingdom Association of Cancer Registries; Hospital Episode Statistics; Department of Communities and Local Government

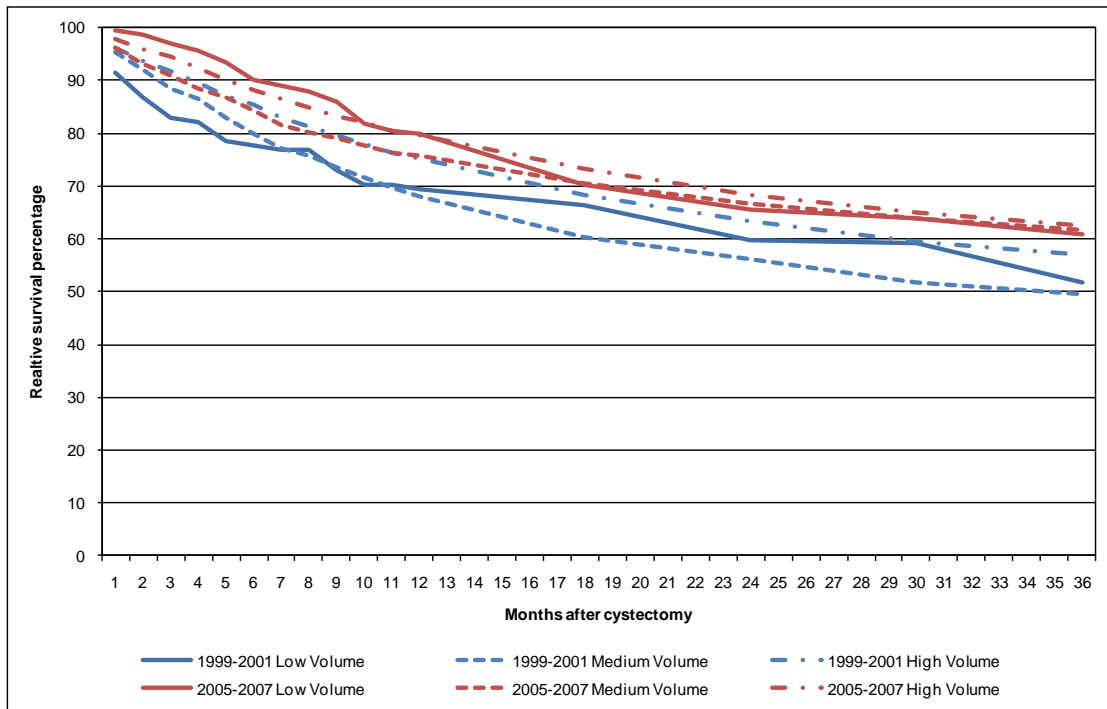
Figure 3: Relative survival for patients treated by cystectomy, for any bladder cancer, in England, diagnosed 1999-2001 and 2005-2007.



Source: United Kingdom Association of Cancer Registries; Hospital Episode Statistics; Department of Communities and Local Government

A volume analysis was undertaken for each time-period, analysing survival for all patients, split into three groups based on the number and range of procedures performed at each centre, and the number of centres in total. Patients diagnosed in 1999-2001 were grouped by centres performing up to five procedures (40 centres, 103 procedures), centres performing six to 15 procedures (62 centres, 641 procedures) and centres performing 16 procedures or more (84 centres, 2,350 procedures). Patients diagnosed in 2005-2007 were grouped by centres performing up to 10 procedures (35 centres, 175 procedures), centres performing 11 to 35 procedures (41 centres, 843 procedures) and centres performing 36 procedures or more (52 centres, 3,042 procedures). The curves of relative survival for different volume groups are close together for patients diagnosed in 2005-2007, with no statistically significant difference between them (Figure 4). In patients diagnosed in 1999-2001 and treated at a 'high-volume' centre, the relative survival is higher than for those treated at a 'medium-volume; centre. Relative survival for those treated at a 'low-volume' centre is not significantly different from either 'high' or 'medium' centres, likely due to the smaller numbers of patients. This does not take into account any difference in stage distribution between centres performing different numbers of procedures.

Figure 4: Relative survival for patients treated by cystectomy, for any bladder cancer, by centre volume, diagnosed 1999-2001 and 2005-2007.



Source: United Kingdom Association of Cancer Registries; Hospital Episode Statistics; Department of Communities and Local Government

Muscle-Invasive bladder cancer

The total number of patients classified with muscle-invasive bladder cancer (stages II, III and IV) in 1999-2001 and treated by cystectomy was 966. The mean age when cystectomy was performed was 66.5 years old, and the median age was 68 (Figure 5). The ratio of men to women in the group was 2.6:1. The number of procedures undertaken, as a proportion of diagnoses, was higher in the least deprived quintile of population compared to the most deprived (Figure 6).

The 966 procedures performed for diagnoses from 1999-2001 were undertaken at 141 trusts. The average per trust is thus 6.9, with a range from 1 to 38 operations.

The total number of patients with muscle-invasive bladder cancer counted for the 2005-2007 period of diagnosis was 1,433. The mean age when cystectomy was performed had increased to 67 years old, and the median age remained at 68, with no obvious change in the distribution of procedures by age (Figure 5). The proportion of men in the group had increased to 2.9 men for each woman. The lowest number of procedures was in the most deprived quintile (Figure 6), and as in 1999-2001 the rate of procedures was higher in the least deprived quintile of population compared to the most deprived.

The 1,433 procedures for diagnoses in 2005-2007 were performed at 104 trusts. The average per trust increased to 13.8, with a range from 1 to 110.

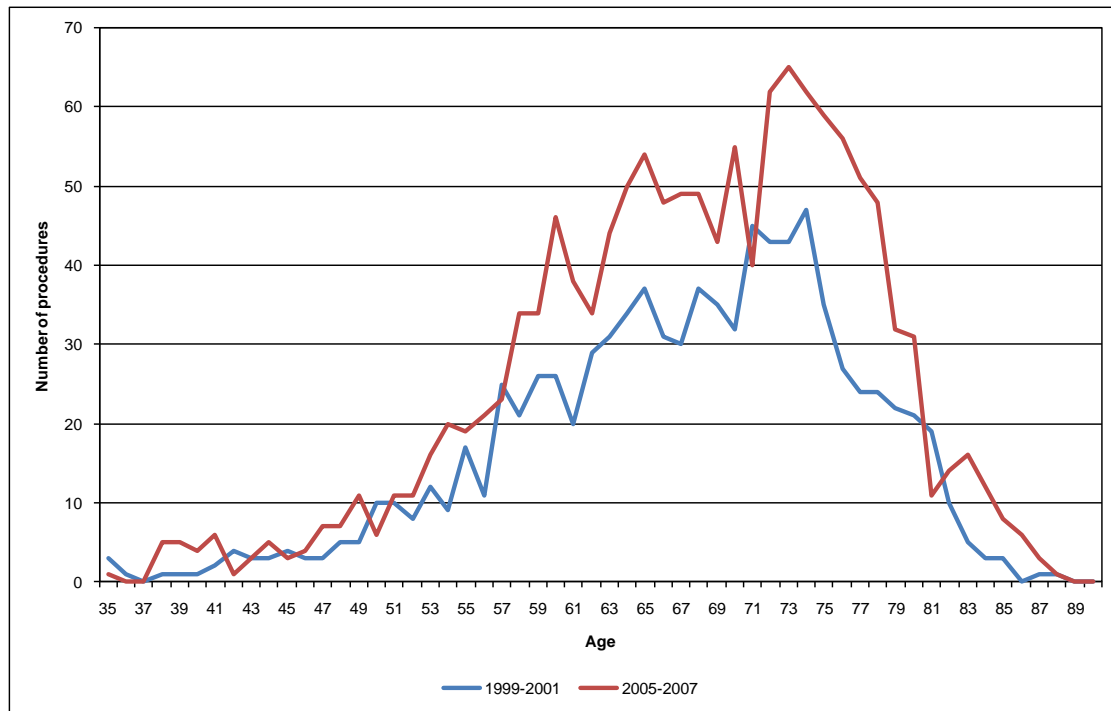
Muscle-invasive bladder cancer has been defined as stage T2, stage T3 and stage T4 cancers. The distribution of specific stage within this group changed when comparing diagnoses in 1999-2001 to diagnoses in 2005-2007 (Table 3). There was a statistically significant increase in T2 disease for both men and women ($p < 0.05$), and a statistically significant decrease in T3 disease for both men and women ($p < 0.05$). This stage shift may contribute to any differences observed.

Table 3: Stage distribution of patients treated with cystectomy for muscle-invasive bladder cancer.

TNM Stage	Treated in 1999-2001				Treated in 2005-2007			
	Male		Female		Male		Female	
T2	381	54%	126	48%	650	61%	213	59%
T3	236	34%	101	38%	254	24%	90	25%
T4	84	12%	38	14%	166	16%	60	17%

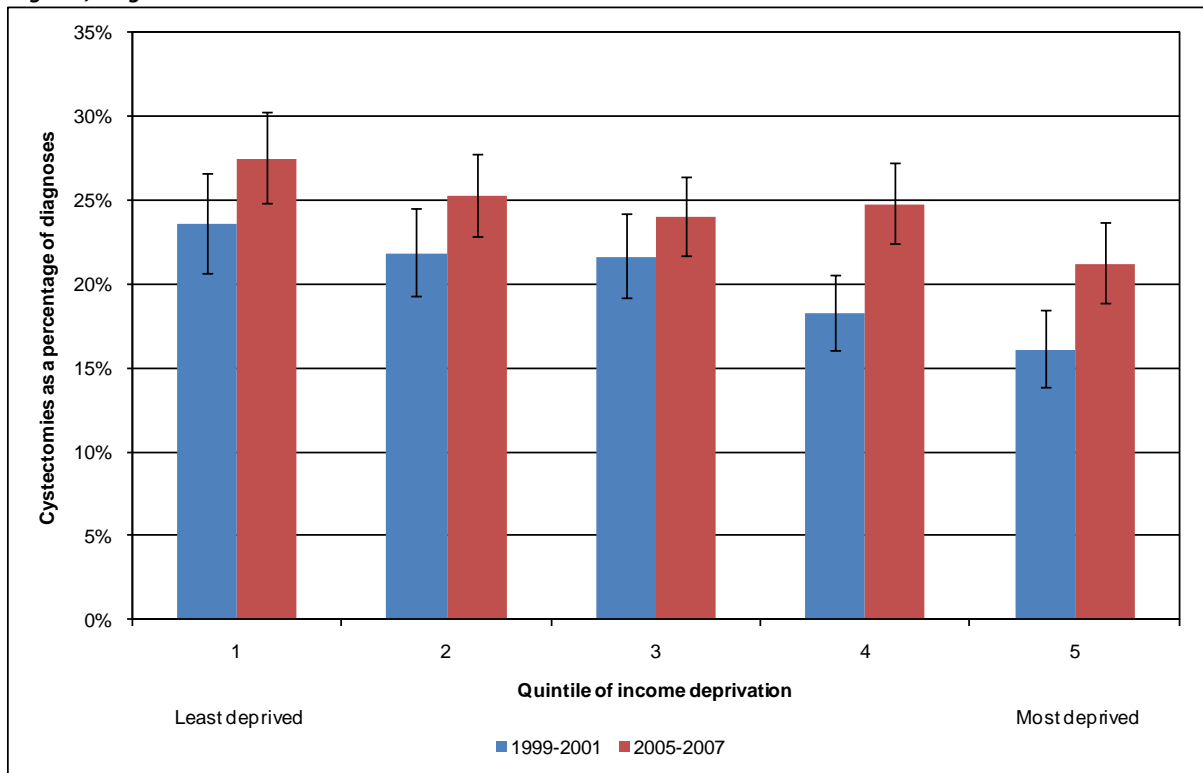
Source: United Kingdom Association of Cancer Registries; British Association of Urological Surgeons

Figure 5: Age at treatment for cystectomy, for muscle-invasive bladder cancer, in England, diagnosed 1999-2001 and 2005-2007.



Source: United Kingdom Association of Cancer Registries; Hospital Episode Statistics; British Association of Urological Surgeons

Figure 6: Cystectomies as a proportion of diagnoses by deprivation quintile, for muscle-invasive bladder cancer, in England, diagnosed 1999-2001 and 2005-2007.



Source: United Kingdom Association of Cancer Registries; Hospital Episode Statistics; Department of Communities and Local Government; British Association of Urological Surgeons

Relative survival for people with muscle-invasive bladder cancer diagnosed in 1999-2001 is shown in table 4, with survival for those diagnosed in 2005-2007 shown in table 5. Survival in the group of patients diagnosed in 2005-2007 is not significantly different from those diagnosed in 1999-2001, as can be seen in figure 7 from the overlap of confidence intervals. The precision of the calculated survival is reduced by the smaller numbers, as about half of cancers are not staged and so cannot be assessed for inclusion in the group.

Table 4: Relative survival for patients treated by cystectomy, for muscle-invasive bladder cancer, in England, diagnosed 1999-2001.

Interval		Crude Survival	Relative Survival		
Start	End	Percentage	Percentage	LCI	UCI
0	1 month	96.6	96.9	95.5	97.9
1 month	2 months	93.5	94.1	92.3	95.4
2 months	3 months	90.2	90.9	88.8	92.6
3 months	4 months	87.9	88.7	86.4	90.6
4 months	5 months	84.2	85.2	82.7	87.4
5 months	6 months	81.6	82.7	80.1	85.1
6 months	7 months	78.3	79.6	76.8	82.1
7 months	8 months	76.3	77.8	74.9	80.4
8 months	9 months	74.7	76.3	73.3	79.0
9 months	10 months	72.3	74.1	71.1	76.9
10 months	11 months	70.0	71.9	68.8	74.8
11 months	1 year	69.0	71.0	67.8	73.9
1 year	1.5 years	59.3	62.1	58.7	65.3
1.5 years	2 years	53.4	56.6	53.2	59.9
2 years	2.5 years	48.6	52.3	48.8	55.6
2.5 years	3 years	46.1	50.1	46.6	53.5

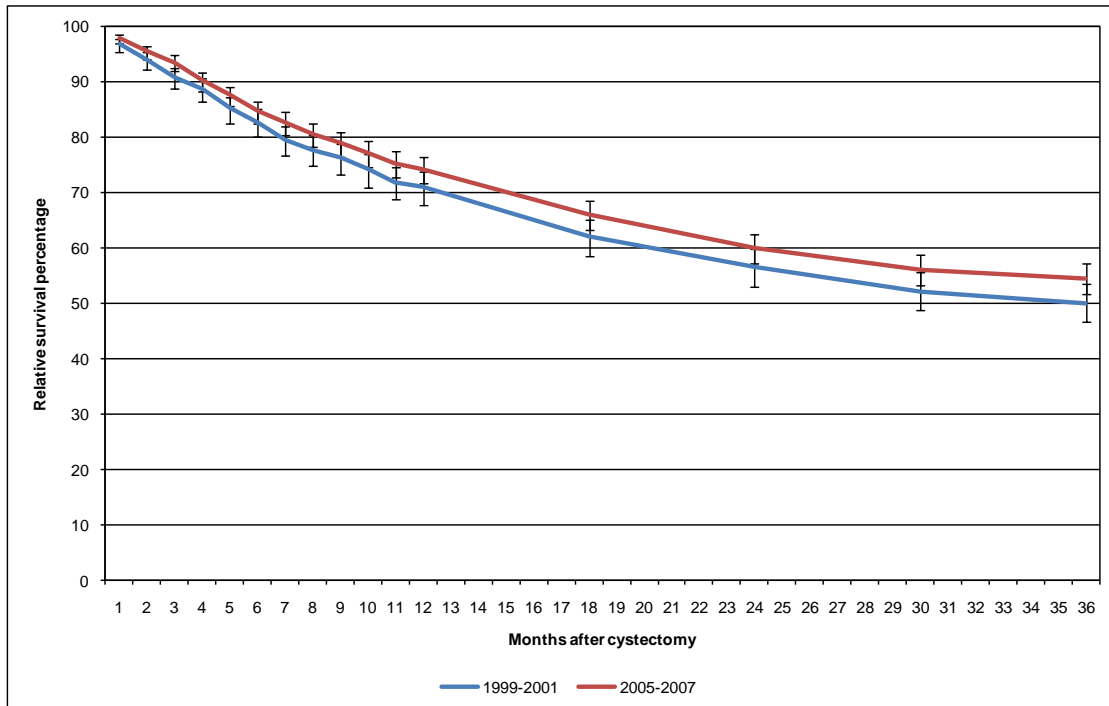
Source: United Kingdom Association of Cancer Registries; Hospital Episode Statistics; Department of Communities and Local Government

Table 5: Relative survival for patients treated by cystectomy, for muscle-invasive bladder cancer, in England, diagnosed 2005-2007.

Interval		Crude Survival	Relative Survival		
Start	End	Percentage	Percentage	LCI	UCI
0	1 month	97.6	97.9	96.9	98.5
1 month	2 months	95.0	95.5	94.2	96.5
2 months	3 months	92.9	93.6	92.1	94.8
3 months	4 months	89.3	90.2	88.5	91.7
4 months	5 months	86.6	87.6	85.7	89.3
5 months	6 months	83.6	84.7	82.7	86.6
6 months	7 months	81.3	82.6	80.4	84.6
7 months	8 months	79.2	80.6	78.4	82.7
8 months	9 months	77.3	78.9	76.6	81.0
9 months	10 months	75.4	77.1	74.8	79.3
10 months	11 months	73.5	75.2	72.8	77.5
11 months	1 year	72.3	74.2	71.8	76.5
1 year	1.5 years	63.4	66.0	63.3	68.5
1.5 years	2 years	56.9	60.0	57.2	62.6
2 years	2.5 years	52.7	56.2	53.4	58.9
2.5 years	3 years	50.5	54.6	51.7	57.4

Source: United Kingdom Association of Cancer Registries; Hospital Episode Statistics; Department of Communities and Local Government

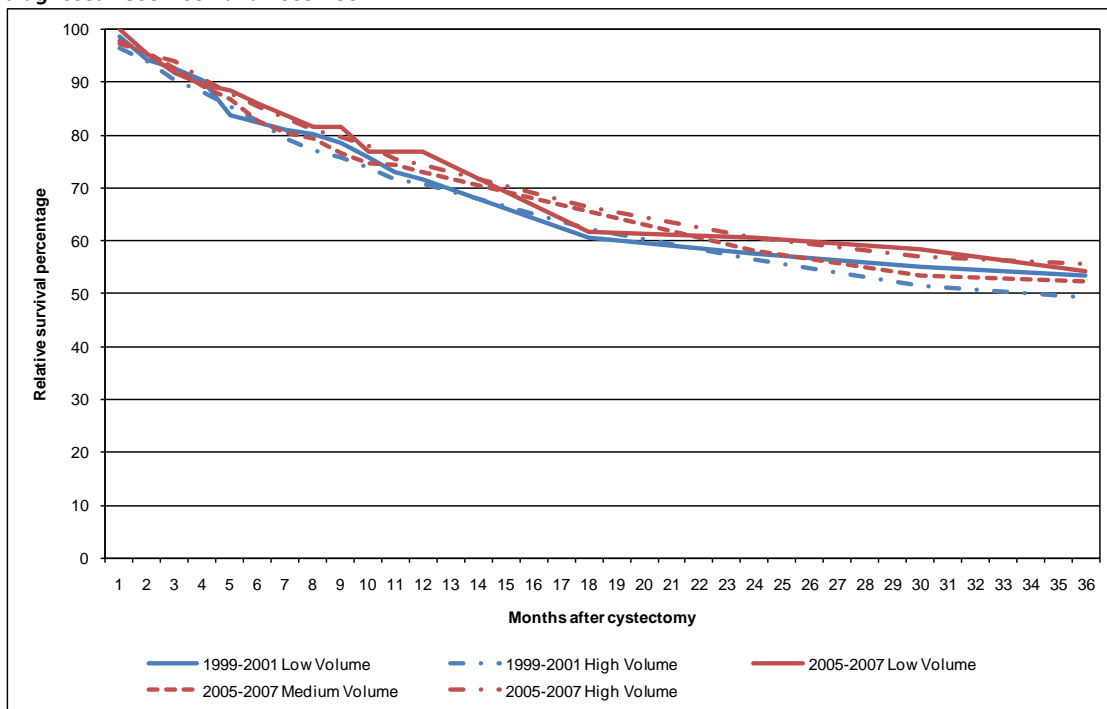
Figure 7: Relative survival for patients treated by cystectomy, for muscle-invasive bladder cancer, in England, diagnosed 1999-2001 and 2005-2007.



Source: United Kingdom Association of Cancer Registries; Hospital Episode Statistics; Department of Communities and Local Government; British Association of Urological Surgeons.

Volume analysis was undertaken for patients diagnosed in 1999-2001 by splitting into two groups, as there was no reasonable arrangement for three groups. Groups were determined for the best compromise between evenly sized groups, and the range and number of procedures. Patients were divided by centres performing up to five procedures (74 centres, 110 procedures), and centres performing six procedures or more (66 centres, 779 procedures). Patients diagnosed in 2005-2007 were grouped into three by centres performing up to five procedures (34 centres, 82 procedures), centres performing six to 15 procedures (38 centres, 371 procedures) and centres performing 16 procedures or more (31 centres, 976 procedures). It can be seen in Figure 8 that there is no dependence of relative survival on centre volume or time period evident.

Figure 8: Relative survival for patients treated by cystectomy, for muscle-invasive bladder cancer, by centre volume, diagnosed 1999-2001 and 2005-2007.



Source: United Kingdom Association of Cancer Registries; Hospital Episode Statistics; Department of Communities and Local Government; British Association of Urological Surgeons.

Stage-Specific survival

Stage of disease is not available for all patients, due to incomplete or incorrect details at registration. The percentage of missing stage has decreased in recent years, with increased completeness for almost all stages. Stage T2 appears to have experienced the biggest increase (Table 6), however when the difference in missing stage is taken into account the only group to have shown a statistically significant change is men with stage T3 disease, where the proportion of staged cases in this category has decreased.

Table 6: Stage distribution of patients treated with cystectomy for any bladder cancer.

TNM Stage	Diagnosed in 1999-2001				Diagnosed in 2005-2007			
	Male		Female		Male		Female	
Oa	26	1%	7	1%	54	2%	18	2%
Ois	12	0%	0	0%	19	1%	4	0%
T1	228	9%	56	7%	464	15%	81	8%
T2	380	15%	125	16%	650	21%	213	22%
T3	232	9%	101	13%	253	8%	90	9%
T4	83	3%	38	5%	165	5%	58	6%
BLANK	1,551	62%	435	57%	1,500	48%	491	51%

Source: United Kingdom Association of Cancer Registries, British Association of Urological Surgeons

Relative survival has been analysed for stages T1,T2,T3 and T4. Numbers in stage 0 were too low for robust analysis. Survival percentages are summarised in Table 7 for diagnoses in 1999-2001 and in Table 8 for diagnoses in 2005-2007. The confidence intervals on the survival curve for each stage were larger than for the overall survival analysis, as the cohorts analysed were smaller. Therefore it cannot be said that there is any statistically significant difference between stage-specific survival in 2005-2007 and 1999-2001.

There are differences in the groupings of stage survival curves for diagnoses in 2005-2007, compared to 1999-2001. In the 1999-2001 group survival for T1 and T2 tumours is not significantly different, but from about 9 months onwards the survival for T1/T2 is higher than T3/T4. Survival for T3 and T4 tumours is only statistically significantly different at three years post-surgery, when it is higher in T3 (45%) compared to stage T4 (25%) (Figure 9).

For those persons diagnosed in 2005-2007 survival for T1 tumours is higher than for T2 tumours, from 18 months post-surgery. Survival from T2 and T3 tumours is different from 6 to 18 months after surgery, but is then similar. In 2005-07 the relative survival for T3 tumours is higher than for T4 tumours from 3 months post-surgery onwards (Figures 10).

Although survival for each stage does not differ with any statistical significance, the similarity of the T3 survival curve with T2 in patients diagnosed in 2005-2007, as opposed to its similarity to the T4 survival curve in 1999-2001 diagnoses, suggests the pattern of survival by stage is changing. T4 tumours, which invade the abdominal or pelvic wall, or have lymph node involvement, or have metastatic sites, are clearly separated from earlier stage tumours.

Table 7: Relative survival for patients treated by cystectomy for bladder cancer, by stage at diagnosis, in England, diagnosed 1999-2001.

Interval		Stage T1	Stage T2	Stage T3	Stage T4
Start	End	Relative Survival Percentage	Relative Survival Percentage	Relative Survival Percentage	Relative Survival Percentage
0	1 month	95.2	96.9	96.7	97.6
1 month	2 months	93.7	94.3	93.5	94.5
2 months	3 months	92.1	91.4	90.3	90.5
3 months	4 months	90.8	89.3	89.0	85.4
4 months	5 months	89.9	87.6	83.7	79.0
5 months	6 months	89.4	86.6	79.6	75.6
6 months	7 months	88.2	83.6	77.1	70.5
7 months	8 months	86.6	82.8	74.6	66.3
8 months	9 months	83.8	82.0	72.2	64.7
9 months	10 months	83.7	80.4	70.2	59.7
10 months	11 months	82.8	78.3	67.5	58.0
11 months	1 year	82.3	77.1	66.8	58.0
1 year	1.5 years	76.5	70.4	55.5	46.4
1.5 years	2 years	72.3	65.7	50.1	38.2
2 years	2.5 years	68.8	61.5	46.3	31.5
2.5 years	3 years	65.6	59.7	45.0	25.4

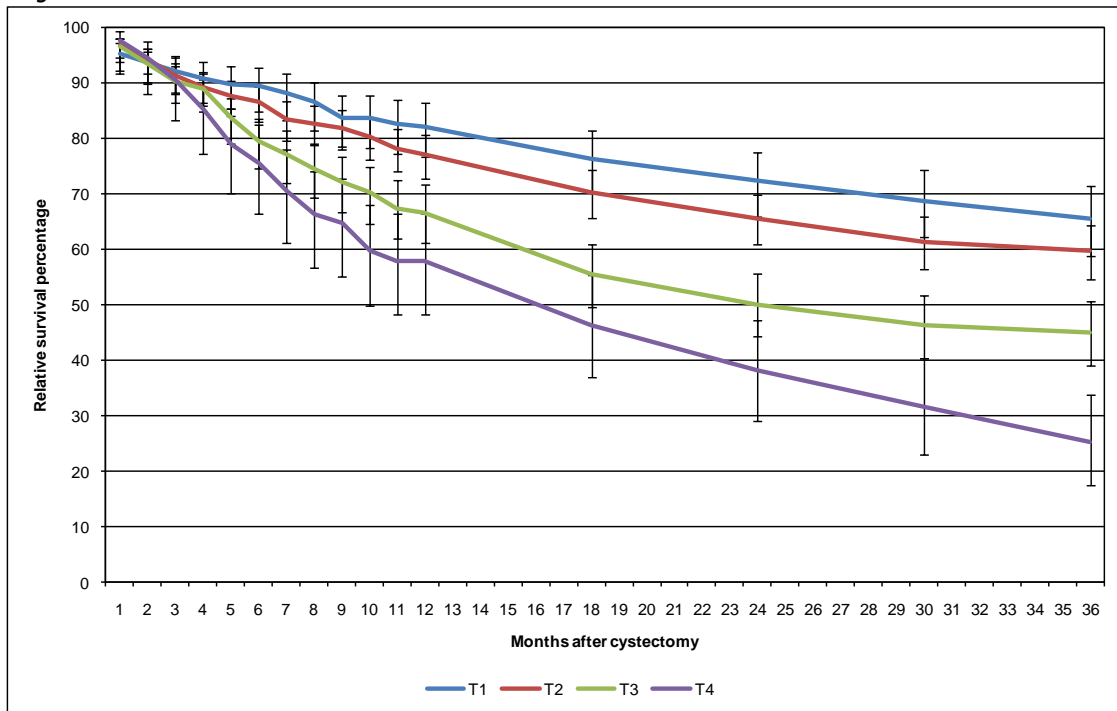
Source: United Kingdom Association of Cancer Registries; Hospital Episode Statistics; Department of Communities and Local Government

Table 8: Relative survival for patients treated by cystectomy for bladder cancer, by stage at diagnosis, in England, diagnosed 2005-2007.

Interval		Stage T1	Stage T2	Stage T3	Stage T4
Start	End	Relative Survival Percentage	Relative Survival Percentage	Relative Survival Percentage	Relative Survival Percentage
0	1 month	97.1	97.9	98.2	97.4
1 month	2 months	96.4	95.8	96.0	93.5
2 months	3 months	95.6	94.8	94.4	87.9
3 months	4 months	93.6	92.4	90.2	81.7
4 months	5 months	92.6	90.2	87.4	77.7
5 months	6 months	91.3	88.0	84.4	72.9
6 months	7 months	90.0	87.0	79.8	70.3
7 months	8 months	89.1	85.2	78.4	66.4
8 months	9 months	88.1	84.2	76.2	62.5
9 months	10 months	86.9	82.6	75.0	59.4
10 months	11 months	85.2	81.4	73.3	54.4
11 months	1 year	84.6	80.3	73.1	52.6
1 year	1.5 years	80.8	72.8	64.7	41.8
1.5 years	2 years	77.0	67.6	59.4	31.6
2 years	2.5 years	74.9	64.2	55.5	26.7
2.5 years	3 years	72.7	62.4	54.4	24.9

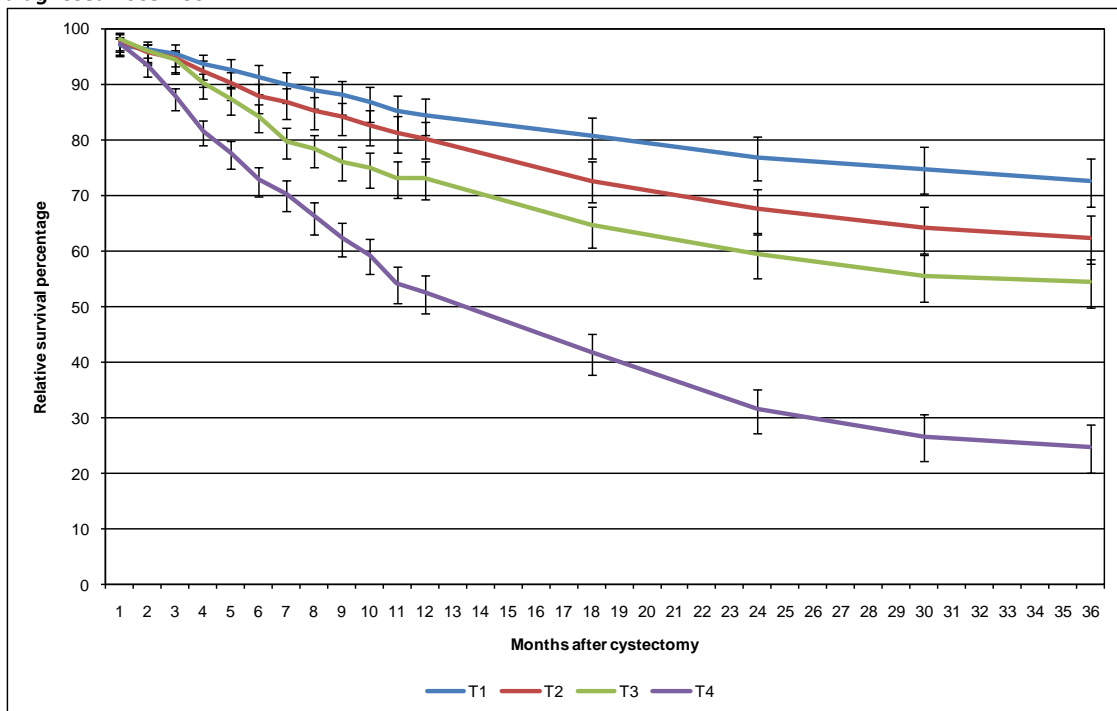
Source: United Kingdom Association of Cancer Registries; Hospital Episode Statistics; Department of Communities and Local Government

Figure 9: Relative survival for patients treated by cystectomy for bladder cancer, by stage at diagnosis, in England, diagnosed 1999-2001.



Source: United Kingdom Association of Cancer Registries; Hospital Episode Statistics; Department of Communities and Local Government; British Association of Urological Surgeons

Figure 10: Relative survival for patients treated by cystectomy for bladder cancer, by stage at diagnosis, in England, diagnosed 2005-2007.



Source: United Kingdom Association of Cancer Registries; Hospital Episode Statistics; Department of Communities and Local Government; British Association of Urological Surgeons

Conclusions

The number of cystectomies has increased by about 23% between 1999-2001 and 2005-2007, during which time the number of bladder tumours has increased by 3%. The publication of Improving Outcomes Guidance was intended to improve patient care, with some specific recommendations. Uptake of cystectomy is dependent on several factors, including disease characteristics, patient choice and co-morbidities. There is some indication that less deprived populations have a greater number of cystectomies, as a proportion of diagnoses. This is also evident when looking specifically at more advanced muscle-invasive disease.

Comparing the survival of patients treated by cystectomy for bladder cancer before and after the IOG implementation there has been an increase in relative survival at all periods of follow-up, up to three years after surgery. There is a specific recommendation in IOG that 30-day mortality should be 3.5% or less, which has been achieved for both crude and relative survival.

Analysis of survival for more advanced, muscle-invasive, disease shows that relative survival has not changed in the periods before and after IOG implementation. Although numbers are small, this could suggest that the increased numbers of cystectomies are mostly being performed for less invasive tumours. There has been a shift towards lower stage for muscle-invasive disease. Further analysis of survival by specific tumour stage suggests a change on the pattern of stage recorded, with the relative survival curve for stage T3 tumours becoming aligned with the survival curves for stage T1 and T2 tumours in the post-IOG period. The survival curve for stage T4 tumours, the most advanced type, is distinctly separate from survival for other stages of tumour.

The volume of cystectomy procedures undertaken by each centre has increased, on average, in the period post-IOG. However, there is still a wide range of procedures performed per centre, for patients diagnosed in 2005-2007. The specific recommendation of IOG was that centres should undertake at least 50 cystectomies and/or prostatectomies each year. The analysis presented here does not look at prostatectomies, nor at procedures undertaken for reasons other than cancer, so further analysis would be required to determine if centres are reaching the recommended levels of activity.

The NCIN is a UK-wide initiative, working to drive improvements in standards of cancer care and clinical outcomes by improving and using the information collected about cancer patients for analysis, publication and research.

Sitting within the National Cancer Research Institute (NCRI), the NCIN works closely with cancer services in England, Scotland, Wales and Northern Ireland. In England, the NCIN is part of the National Cancer Programme.

Our aims and objectives cover five core areas to improve the quality and availability of cancer data from its collection to use:

- Promoting efficient and effective data collection throughout the cancer journey
- Providing a common national repository for cancer datasets
- Producing expert analyses, to monitor patterns of cancer care
- Exploiting information to drive improvements in cancer care and clinical outcomes
- Enabling use of cancer information to support audit and research programmes

Further information

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About the South West Public Health Observatory

The South West Public Health Observatory (SWPHO) is part of a network of regional public health observatories in the UK (funded by the Department of Health) and Ireland. These were established in 2000 as outlined in the Government White Paper *Saving lives: our healthier nation*. Key tasks include: monitoring health and disease trends; identifying gaps in health information; advising on methods for health and health impact assessment; drawing together information from different sources; and carrying out projects on particular health issues.

The SWPHO incorporates the National Drug Treatment Monitoring System South West (NDTMS-SW), and in April 2005 merged with the South West Cancer Intelligence Service (SWCIS). The SWPHO works in partnership with a wide range of agencies, networks and organisations regionally and nationally to provide 'a seamless public health intelligence service' for the South West.

For more information about the SWPHO and its partner organisations, please visit www.swpho.nhs.uk