



Public Health
England



Protecting and improving the nation's health

National Cancer Intelligence Network

Major resections by routes to diagnosis (2006 to 2010; England)

Produced in partnership with Cancer Research UK

About Public Health England

Public Health England exists to protect and improve the nation's health and wellbeing, and reduce health inequalities. It does this through world-class science, knowledge and intelligence, advocacy, partnerships and the delivery of specialist public health services. PHE is an operationally autonomous executive agency of the Department of Health.

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Foreword

This report presents analyses that update and enhance our understanding of the variation in major resection rates - the proportion of patients who have had surgery to remove a cancer between 2006 and 2010 - by route to diagnosis and by sex in England, for a wide range of cancers. It has been produced by the National Cancer Intelligence Network (NCIN) in partnership with Cancer Research UK (CRUK). It provides insights to guide attempts to improve access to optimal treatment for everyone affected by cancer, supporting the key goals of the two organisations (as well as NHS England). It also updates and expands on previous work published by NCIN.

We do not know the precise proportion of long term cancer survivors whose 'cure' can be said to be a result of surgery but experts believe that this proportion is over 50% (Price & Sikora, Treatment of Cancer, 2008). Better understanding of the patterns of surgical treatment in cancer is necessary in order to focus attempts to improve outcomes for cancer patients. Several noteworthy findings are illustrated by the comprehensive coverage of the 20 cancer sites in this report. As perhaps expected, the percentage of patients undergoing a major resection varies depending on their route to diagnosis (in other words, the way they presented to secondary care health services). Overall the proportion of patients presenting as an emergency who undergo surgery is around half that of those diagnosed via out-patient routes, either via an urgent referral for suspected cancer or a standard GP referral.

The analyses within this report enrich our understanding of the issues associated with access to potentially curative surgery and will hopefully inform efforts to improve referral practices and access to specialist care.

Cancer diagnosed at earlier stages generally has higher chances of effective treatment and long term survival. There are multiple and varied ways to address late diagnosis and reduce the number of patients being diagnosed via emergency routes unnecessarily, and the problem requires a 'whole system' response. These include increased public and primary care awareness of the signs of symptoms of cancer, quick and easy to access to diagnostic tests and results, rapid and consistent access to specialist care and shortened pathways to optimal treatment.

Had more recent hospital activity data linked to cancer registration data been available, this report would have been able to take into account stage at diagnosis, a significant factor in determining whether patients are suitable for surgery. The present analysis is based on data up to 2010. It is anticipated that updated data will be available in the near future and this will allow a more comprehensive analysis, including staging information.

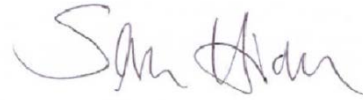
Future ability to link to radiotherapy and chemotherapy data will enable more detailed work on treatment patterns in subsequent reports.

We hope that this report will provide useful insight for both commissioners and health care providers to help inform and improve standards of care.



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Introduction

Cancer survival in the UK is lower than in many comparable countries (De Angelis & et al., 2014) (Walters & et al., 2013) (Maringe & et al., 2012) (Maringe & et al., 2013) (Walters & et al., 2013). This difference may be caused by a number of factors, which may include late diagnosis and lower levels of access to optimal treatment (Thomson & Foreman, 2009) (Richards, 2009).

Although surgery can be used in combination with radiotherapy and/or chemotherapy, experts believe that it is responsible for at least half of the cases where cancer is cured, making it the most effective form of treatment (Price & Sikora, Treatment of Cancer, 2008).

The NCIN's routes to diagnosis study (Elliss-Brookes & et al., 2012) has been instrumental in showing the proportion of patients that present through different routes. This new analysis combines these data with major resections, to investigate the surgical treatment of patients and examine the variation in this key cancer treatment depending on their route to diagnosis.

The report covers analyses of data for 20 different cancer sites and breaks the resections percentages down by routes to diagnosis and sex. It is split into two parts: an overview of the results across the 20 sites by route to diagnosis and then the detailed results by site, displaying the data for males and females separately.

In many places in this report, the term 'resection rates' is used as a shorthand, meaning the proportion or percentage of resections for a given site, route and sex combination.

Key messages

1. The proportions of patients undergoing surgical resection were lower following an emergency presentation route to diagnosis¹ in 19 out of the 20 cancer sites, when compared with two-week-waits (TWW). Only for larynx was this difference not statistically significant. This gap was most pronounced in lung, breast and liver cancers, where the proportion of resections for emergency presentations was a fifth to a quarter compared with those for TWWs. It was smallest for colorectal, bladder and pancreatic cancers.
2. Differences between resection rates following TWWs and other General Practitioner (GP) outpatient referrals, hereafter referred to as 'GP referrals', were significant in 15 of 20 sites. For ten of these 15 sites (two-thirds) resection rates were lower for GP referrals compared with TWWs; for the other five they were higher. Assuming a positive correlation between rates of surgery and survival, one-year relative survival estimates for GP referrals seemed to support these results, being also lower in seven of the ten sites with lower resection rates compared with TWWs (NCIN, 2013). Lung had higher resection rates for GP referrals, yet lower one-year relative survival.
3. Differences in resection rates following GP referral and 'other outpatient' routes were significant in 12 of the 20 sites, although GP referrals resections were only higher in one third of these (salivary glands, breast, uterus and prostate). Resections for 'inpatient elective' routes differed significantly from 'other outpatients' in six of the 20 sites but only substantially so for pancreas and lung ('inpatient' resection rates for these were around half those following 'other outpatient' routes). For pancreas, lung, kidney and bladder resections rates for GP referrals and 'inpatient elective' routes were both statistically significantly lower compared with 'other outpatient' routes.
4. Resections rates for cases with 'unknown' routes to diagnosis were mostly similar to those following emergency presentations: differences were non-significant in nine sites and close in three others, out of the 20 sites included in this report.

¹ The routes to diagnosis report (Elliss-Brookes, 2012) defined seven types of routes to diagnosis: screening, emergency presentation, GP referral, other outpatient, inpatient elective, unknown route.

Methods

Cases

National Cancer Data Repository (NCDR) data for England based on diagnosis period 2006 to 2010 were extracted for 20 cancer sites, grouped using codes from the International Classification of Diseases, 10th revision (ICD10) codes (WHO, 2010) . Data were further grouped by sex (males, females and persons) and routes to diagnosis.

The routes to diagnosis included in this report had been defined in the original studies (Elliss-Brookes & et al., 2012) (NCIN, 2013) as follows; see also the glossary for more detail.

1. *Screening* - detected via the breast, cervical or bowel screening programmes.
2. *Emergency presentation* - an emergency route via A&E, emergency GP referral, emergency transfer, emergency consultant outpatient referral, emergency admission or attendance (sometimes referred to as 'emergency/ies' here below).
3. *TWW (two-week waits)* - urgent GP referral with a suspicion of cancer, under which hospitals are required to see the patient within 14 days of referral.
4. *GP referral* - other GP routine and urgent referrals where the patient was not referred by the TWW referral route.
5. *Other outpatient* - an elective route starting with an outpatient appointment where no earlier referral could be found: either self-referral, consultant to consultant or other referral (these are sometimes referred to as 'outpatient/s' in this report).
6. *Inpatient elective* - an elective route where no earlier admission could be found prior to admission from a waiting list, booked or planned (occasionally called 'inpatient/s' in this report).
7. *Unknown* - NCDR records without matching activity in the datasets and within the time frame used by the routes to diagnosis study, or records with an unknown type of referral.

Sites exceeding 1,000 male or female cases over the five-year cohort were included. Previous national multi-site NCIN studies, such as the routes to diagnosis study referenced above, used a similar threshold to balance statistical robustness against the desire to cover as many cancers as possible.

A total of 971,329 cases were included. Table 1 breaks these down by site and by route to diagnosis, for persons.

Table 1: Cases included in the major resections by routes to diagnosis by cancer site, for persons; (2006 to 2010, England; see below for exclusions)

Cancer site	Screening	Emergency presentation	TWW	GP referral	Other outpatient	Inpatient elective	Unknown	Grand Total
Oropharynx	n/a	532	2,975	2,316	908	112	323	7,166
Oral cavity	n/a	668	3,276	2,801	3,192	133	430	10,500
Salivary glands	n/a	206	520	1,316	526	41	108	2,717
Hypopharynx	n/a	248	711	600	222	33	52	1,866
Larynx	n/a	938	2,967	3,555	995	126	266	8,847
Oesophagus	n/a	7,136	11,793	6,531	2,719	3,588	1,133	32,900
Stomach	n/a	10,015	7,163	6,575	2,742	2,914	1,025	30,434
Liver	n/a	7,387	1,350	3,479	2,258	393	541	15,408
Pancreas	n/a	16,456	4,160	6,856	3,680	1,153	1,383	33,688
Colorectal	7,537	39,197	42,170	39,293	13,749	7,625	5,714	155,285
Lung	n/a	62,572	39,533	35,019	17,130	3,113	4,589	161,956
Breast (malignant)	54,026	8,899	82,787	30,175	6,712	492	8,806	191,897
Vulva	n/a	341	1,597	1,909	574	65	191	4,677
Vagina	n/a	158	266	402	131	12	37	1,006
Cervix (malignant)	2,943	1,374	1,978	3,827	1,264	247	497	12,130
Uterus	n/a	2,636	12,656	11,775	2,837	481	1,334	31,719
Ovary	n/a	8,711	6,766	7,136	3,575	606	1,221	28,015
Prostate	n/a	15,346	47,037	69,127	18,949	4,717	8,273	163,449
Kidney and unspecified urinary organs	n/a	8,703	7,046	10,750	6,301	909	1,218	34,927
Bladder (malignant)	n/a	7,943	13,480	12,337	5,683	1,969	1,330	42,742
Grand Total	64,506	199,466	290,231	255,779	94,147	28,729	38,471	971,329

Exclusions

The project excluded 33,430 NCDR records (not shown in Table 1 above):

- only cases with a valid route to diagnosis from the original 2006 to 2010 study were retained for analysis: records that had not been assigned a route as a result of de-duplication on the 2006 to 2010 routes to diagnosis project², were excluded. In addition, male breast cancer cases with a route to diagnosis through the breast cancer screening programme were also excluded³
- cancer registrations based solely on the cause of death statement of the death certificate were also excluded from the overall sample: death certificate only (DCO) cases were, by definition, not diagnosed prior to death and would thus not have been considered for surgical treatment

² See the technical documentation of the 2006 to 2010 routes to diagnosis study [NCIN 2013].

³ The breast cancer screening programme covers women between the ages of 50 to 70 years.

- data for children aged 0 to 14 years were excluded from the analysis as the cancer types (morphology) for these sites can often differ markedly from adult cancers, and be subject to different and more complex treatments and pathways. Similar issues apply to some cancers in teenagers and young adults, however, given that there are probably more similarities with the adult patients than with children and that the small numbers of such patients would have very limited impact on the overall findings, we decided to include them in the analysis

Major resections

Major resection procedure codes were agreed with the NCIN Site-Specific Clinical Reference Groups (SSCRGs) for cancer sites for which surgical removal of the tumour is a viable form of potentially curative treatment. The procedures were defined using codes from the Office of Population Censuses and Surveys Classification of Surgical Operations and Procedures, 4th revision (OPCS4) (HSCIC). The OPCS4 procedure codes are included in the appendix.

Inpatient Hospital Episode Statistics (HES) data up to 2011 had previously been linked to cancer registrations on NCDR. To avoid missing out on resections due to date discrepancies between the date of surgery on HES and the date of cancer diagnosis on NCDR, any operations up to one month prior to diagnosis were included in the analysis. Breast⁴ and gynaecological⁵ cancer cases, whose pathway can include substantial pre-operative chemo- or radiotherapy, were followed up for 12 months after the date of diagnosis. All other cancer sites were followed up for six months after diagnosis. Consequently, breast and gynaecological cases from 2010 were followed up for procedures performed up to the end of December 2011, and all other cancer sites for ones performed up to the end of June 2011.

Using this linked dataset, a major resection for a given record on NCDR was considered to be the earliest operation having any of the agreed OPCS4 procedure codes in the HES data string, within the follow-up period detailed above. So if a patient underwent more than one operation for their cancer then the earliest one was accepted as the major resection.

⁴ Breast cancer included male and female cases.

⁵ Cancers of the vulva, vagina, cervix, uterus and ovary.

Percentage of resections and statistical tests

When investigating the differences in proportions of patients who underwent a resection between each of the routes to diagnosis, a Poisson generalized linear model (GLM) with a log link was applied. The results were calculated with a robust error variance.

Unless otherwise stated, the TWW route was used as the baseline to determine whether differences between its resection rate and those of the other routes were statistically significant. This forms the core of the results presented in this report. A further regression used the 'other outpatient' route as the baseline to test variations in resection rates between it and GP referral and 'inpatient elective' routes. The analysis was also repeated using emergency presentations as the baseline to compare its proportion of resections with the 'unknown' route.

These three regressions above (using TWWs, other outpatients and emergency presentations as the baseline) were first stratified solely by cancer site for persons, using the baseline to adjust the results of the other routes for age and, for the 14 non-sex-specific sites, sex. To obtain results for males and females separately they were subsequently stratified by site and sex, thus adjusting only for age.

A final GLM was applied for the non-sex-specific sites, stratifying the data by site and route, to determine whether variations by sex (males/females) played a statistically significant part in the proportion of resections for each site and route combination. This regression was also adjusted for age.

These adjustments allowed the resection rates of other routes to be compared with the baseline. Differences were said to be statistically significant for p -values of less than 0.05, based on a 95% confidence interval.

By multiplying the relative risk output of the regression and its confidence interval with the crude resection percentage of the baseline, adjusted resection proportions were obtained for the other routes.

Allowing for the exclusions above, the resulting adjusted percentage of resections represents the proportion of patients who underwent a resection for every 100 patients diagnosed with the relevant cancer.

Some of the results of the regressions above were compared to one-year relative survival estimates from the original routes to diagnosis study. These survival figures were taken from the 2006 to 2010 workbook 'a', available on the NCIN website [NCIN 2013].

Limitations

The results in this report should be interpreted with caution for the following reasons:

- the numerical values of percentages in this report give no indication as to the proportion of patients that *could or should have undergone* a major resection: a 'low' numerical percentage solely indicates that a given cancer was treated with 'major surgery' less often. Given the data available, these rates of surgery cannot be interpreted as implying inappropriate clinical treatment
- every attempt was made to ensure that the procedure codes included in the definition for 'major resections' were those which *can* be used for recording surgery performed with curative intent, however, the presence of these procedure codes in HES data does not definitively imply that said surgery was of curative intent. Certainly the resection rates should not be interpreted as the percentage of patients cured through surgery
- care should be taken when comparing the present data with previous major resection reports: the results are not directly comparable as the underlying populations were different (ie the denominators of the resection rates were not the same)
- we used ICD10 codes for the morphology of cancers in teenagers and young adults realising that a more appropriate coding system would be ICD-O, however, this coding is not at present generally available
- this report was based on 2006 to 2010 cancer registrations as these were the most recent linked HES data at the time. This meant that it was not possible to include cancer stage at diagnosis as a factor in the proportion of resections. Once more recent linked HES data become available, a more detailed and up-to-date analysis of surgical resections, including by stage, may be feasible

Summary results: resections by routes to diagnosis across cancer sites

These sections present the main findings across the 20 cancer sites for selected routes.

Results for emergency presentations, two-week-waits and GP referrals

Figure 1 gives an overview of the proportions of resections for the three main routes to diagnosis: emergency presentations, TWWs and GP referrals. The TWW route of each cancer site was used as the baseline to adjust the resection rates of the emergency presentation and GP referral routes for age and sex, and to test whether the difference between these two routes and TWWs was statistically significant.

The cancer sites along the x-axis of the graph have been listed in order of ICD10 codes, grouped by anatomical area: head and neck, upper gastrointestinal tract (GI), lower GI, respiratory organs, then breast, followed by sex-specific and, finally, urological organs.

Faded columns with dotted lines indicate that the resection rate for a given route was not statistically significantly different when compared with the TWWs percentage. The TWWs column was set as transparent when none of the other routes in the graph were significantly different (eg larynx in the first graph).

Figure 1: overview of resection proportions for emergency presentation, TWW and GP referral routes

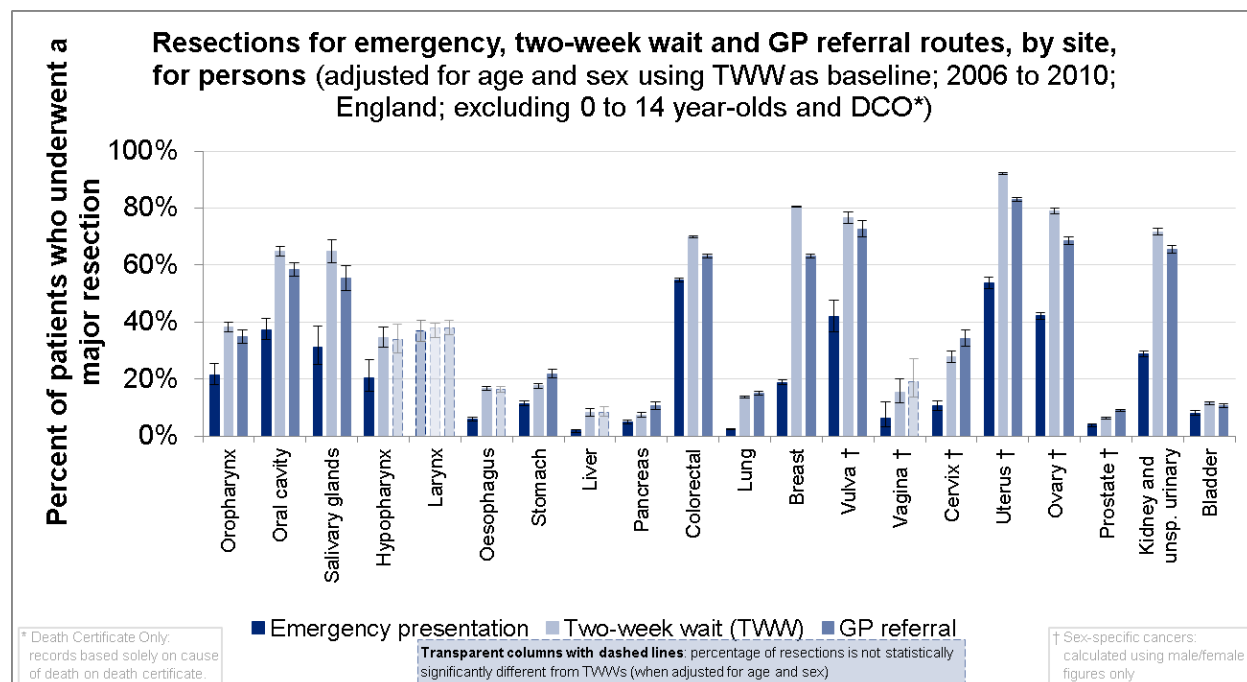
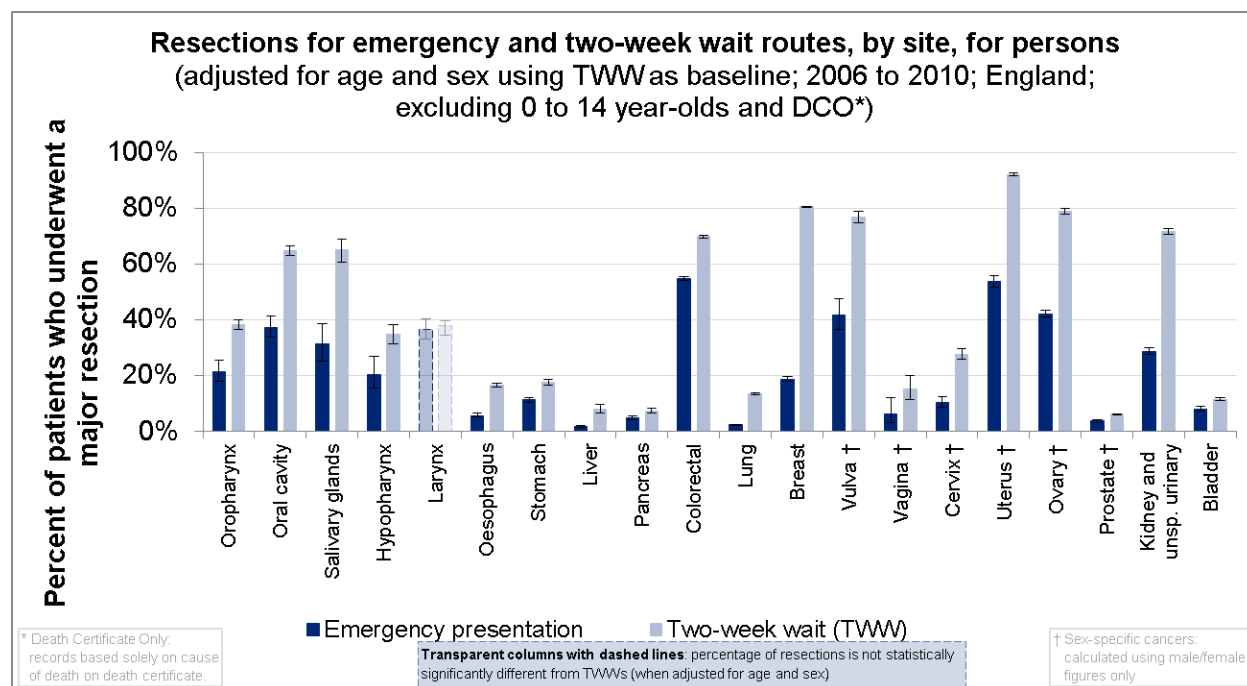


Figure 1a below focusses on the comparison of resection rates for emergency presentations and TWWs:

- in 19 out of the 20 sites, resections rates for emergency presentations were statistically significantly lower compared with TWWs. This difference was only non-significant for laryngeal cancer
- the absolute difference in the proportions of resections of these two routes was largest for breast, kidney (and unspecified urinary organs) and uterus, the gap ranging from 62 to 38 percentage points; in contrast it was smallest in prostate, pancreas and bladder, with a range of 2.5 to 3.5 percentage points
- in relative terms, ie what fraction of the TWW percentage did resection rates for emergency presentations represent, this was most pronounced in lung, breast and liver cancer, for which resections following emergency presentations ranged between less than a fifth to a quarter, of the TWW proportions. Conversely, this relative difference was smallest in colorectal, bladder and pancreatic cancer (emergency presentation rates at similar levels to TWWs)

Figure 1a: detailed comparison of emergency presentation and TWW resection percentages

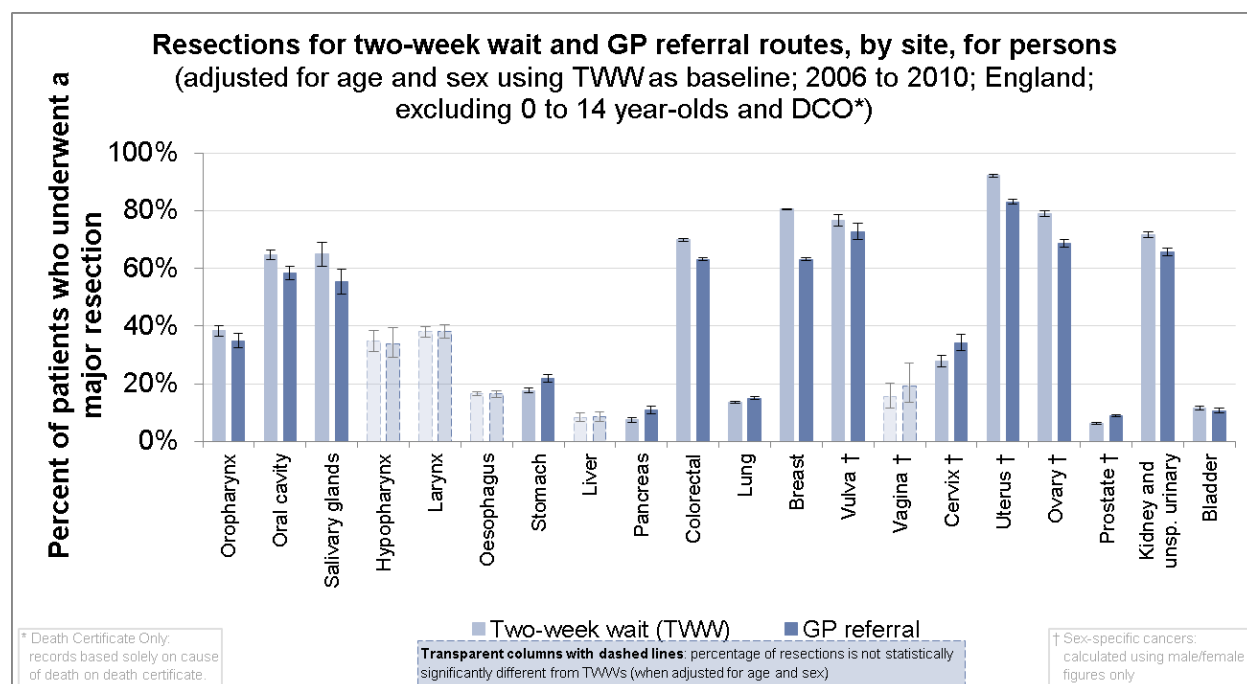


The results in Figure 1a are perhaps not surprising as for most cancers an emergency presentation could imply more advanced disease, compared with a cancer diagnosed through a TWW referral. It could be inferred that fewer patients with advanced disease would thus be treated with surgery, due to the spread of the tumour.

Figure 1b below shows the differences in resection rates following TWWs and GP referrals:

- these were significantly different in 15 of the 20 sites, as indicated by the pairs of bold columns. For hypopharynx, larynx, oesophagus, liver and vagina the proportions of resections were not statistically significantly different following a GP referral, when compared with the TWW route
- the gap between the proportions of resections for TWWs and GP referrals, both in absolute and in relative terms, is much narrower than in Figure 1a
- however, for two-thirds of the cancer sites with significant differences (so in 10 out of the 15) the percentage of resections following a GP referral is lower than that following a TWW route

Figure 1b: detailed comparison of TWW and GP referral resection percentages



This could be due to a number of factors, which in all probability vary from site to site.

It is possible that a non-TWW GP referral might be subject to greater delays. This might be due patients presenting with less specific symptoms and thus initial clinical investigations may not be as focussed on a cancer diagnosis in the first instance. Without the TWW priority, it is likely to take longer for a first appointment to be made. As a result, patients may have more advanced cancers at the point at which the diagnosis is made; these may therefore end up being less treatable by surgical means.

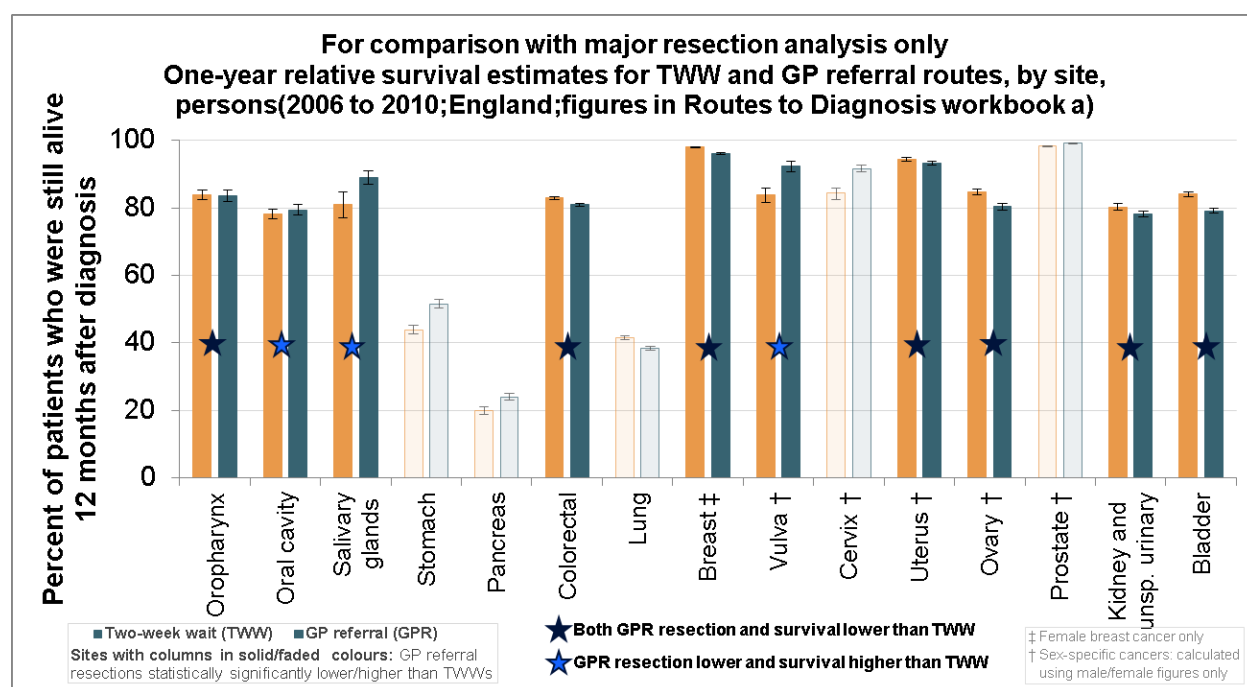
Conversely, for a few of the cancers sites above a diagnosis through a GP referral may imply less advanced stage cancer which might have been treated with less invasive procedures. The latter were not part of the 'major resections' data included in this report. To sense-check the results above, they were compared with one-year relative survival estimates for TWWs and GP referrals from the original 2006 to 2010 routes to diagnosis study [NCIN 2013]. In absence of cancer staging data, survival estimates could be a good indicator of stage at diagnosis: if both resection rates and survival were lower, this would imply more advanced cancer diagnosed via this route. **Note, however, that these survival estimates were not calculated as part of the major resections project and, as such, are not limited to the proportion of patients who underwent surgery.**

Nevertheless, assuming a positive correlation between rates of surgery and survival, one-year relative survival estimates for GP referrals seemed to support these major resection findings above.

Figure 2 below presents the survival figures. The graph only includes the 15 sites with statistically significant differences between TWWs and GP referrals resection rates. The 10 sites with *lower* proportions of resections following GP referrals are shown in solid blue and orange columns. Slightly paler/translucent colours indicate the five sites that had higher resections rates for GP referrals, compared with TWWs. Figure 2 below shows:

- for seven of the 10 sites with lower resection percentages, one-year relative survival for GP referrals was also lower compared with TWWs (although the difference seems minimal for oropharynx, as its confidence intervals overlapped)
- three of the 10 sites - oral cavity, salivary glands and vulva - had higher survival than TWWs
- lung cancer patients diagnosed following a GP referral had higher resection percentages yet lower one-year survival estimates, compared with TWWs

Figure 2: one-year relative survival estimates for TWW and GP referral routes



More research is clearly needed to investigate the detail of the reasons for these differences. This will be all the more meaningful once more recent routes to diagnosis data become available which will allow additional analyses by cancer stage.

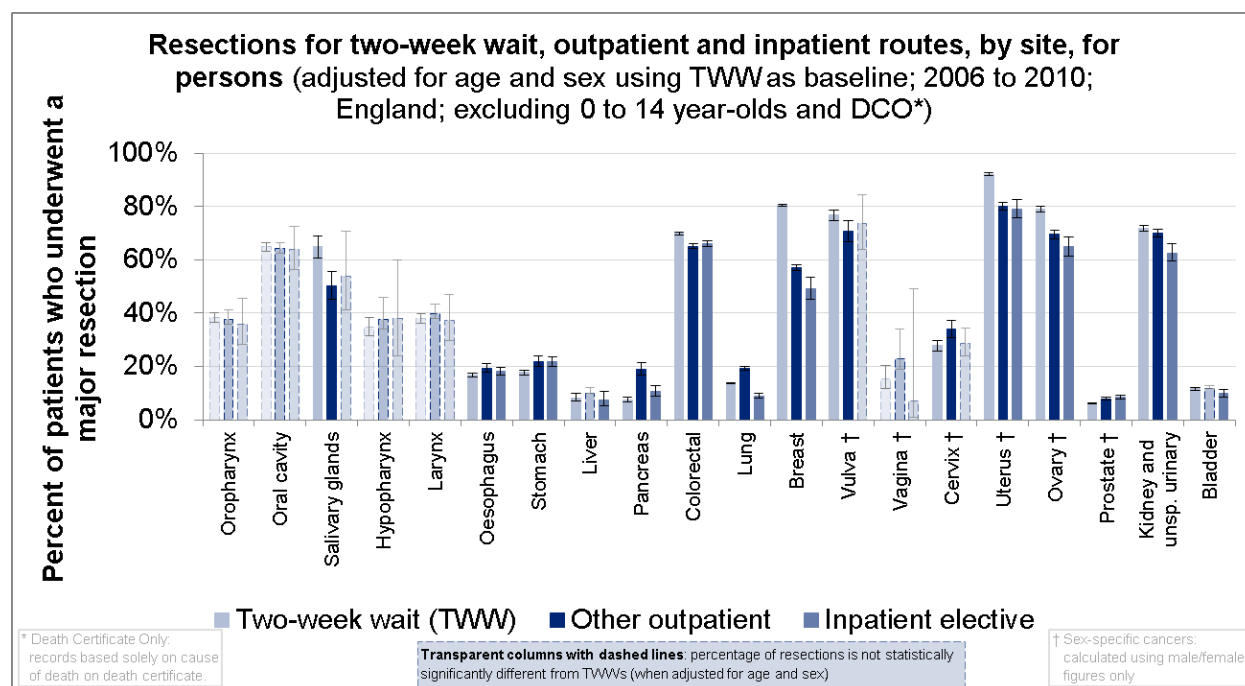
Results for two-week-waits, other outpatient and inpatient elective routes

Figure 3 illustrates the findings for 'other outpatient' and 'inpatient elective' routes (hereafter referred to as 'outpatient' and 'inpatient'). These should be treated with some caution as these routes can have considerably fewer cases compared with TWWs.

Compared to TWWs, resection percentages for outpatient and inpatient routes were not significantly different for head and neck sites: resections for salivary gland cancers with an outpatient route to diagnosis were the only significant result (they were lower).

In the other 15 sites, results for outpatient and inpatient routes were mostly statistically significant when compared with TWWs, except for vagina (neither significant), liver and bladder (outpatient non-significant), and vulva (inpatient non-significant). Most other sites had lower proportions of resections following outpatient or inpatient routes to diagnosis. For lung, resections for outpatient diagnoses were higher but those for inpatient diagnoses were lower. Note that for oesophagus, stomach, pancreas and prostate both outpatient and inpatient resections were higher than TWWs.

Figure 3: Resection proportions for TWW, outpatient and inpatient routes



Further results

In an attempt to provide a fuller picture for the less common routes, further analysis was performed to assess the differences in resections following GP referral, outpatient and

inpatient routes. For this the 'other outpatient' route was used as the baseline to provide results for both GP referrals and inpatients. Figure 3 below shows:

- proportions of resections following a GP referral were statistically significantly different in 12 of 20 sites; compared with outpatients they were higher in a third of those (4/12): salivary glands, breast, uterus and prostate
- differences in resections rates between outpatient and inpatient routes are not statistically significant in 14 of 20 sites. Of the six sites with significant differences, only lung and pancreas were substantial, with inpatient resection percentages around half those for outpatients
- in five of the 20 sites all three routes had statistically significantly different results: pancreas, lung, breast, kidney and bladder
- seven sites showed no significant difference between any of the three routes: oropharynx, hypopharynx, larynx, stomach, vulva, vagina and cervix

Table 2: significant differences for resections following GP referral and inpatient routes, compared with outpatients

Cancer site	GP referral resections rates, compared with outpatients	Inpatient resection rates, compared with outpatient
Oral cavity	Lower	NSS
Salivary glands	Higher	NSS
Oesophagus	Lower	NSS
Liver	Lower	NSS
Pancreas	Lower	Lower
Colorectal	Lower	NSS
Lung	Lower	Lower
Breast (malignant)	Higher	Lower
Uterus	Higher	NSS
Ovary	NSS	Lower
Prostate	Higher	NSS
Kidney and unspecified urinary organs	Lower	Lower
Bladder (malignant)	Lower	Lower
Grand Total	12	6

NSS: difference in resection rates was not statistically significant

Resection rates for patients with an 'unknown' route to diagnosis were generally lower than those for other routes; they ranged from 2% to 40%, with highest proportions for oral cavity and vulva. They most closely resembled those for emergency presentations (using the latter as the baseline, differences were non-significant in nine of the 20 sites).

However, given the low number of patients with an 'unknown' route to diagnosis, and the lack of pre-diagnostic data, these results ought to be interpreted with caution.

In-depth results: resections by cancer site, sex and routes to diagnosis

The site-specific pages begin with a summary of the findings for the cancer site. It describes:

- whether the resection rate for each route, by sex, was statistically significantly different from the TWW baseline
- what the modelled percentage difference was and whether it was significantly different between emergency presentations and GP referrals compared to TWWs
- whether the differences in sex of patients had a significant effect on the proportion of resection for each route for the non-sex-specific sites, ie whether the resection rates for males and females were significantly different
- whether the results for GP referral and 'inpatient elective' routes were significantly different from 'other outpatient' (using outpatients as the baseline)
- whether the results for 'unknown' routes differed significantly from emergency presentations (using the latter as the baseline)

Note that when describing the differences between resection percentages relative percentages were used rather than *absolute* percentage differences.

This is followed by the core data table of resections by route to diagnosis and sex. A graph showing proportions of resections by route to diagnosis and sex is also included. Both display adjusted resection percentages using the TWW route as the baseline.

Statistically significant results are shown in bold/solid coloured columns in the graph. Non-significant resection percentages are shown as faded columns with dotted lines.

A short summary of the methods, with the major resection procedures included in the analysis is given in the text beneath the graph.

Head and Neck

Oropharyngeal cancer (C01,C09-C10)

The results presented here show the percentage of oropharyngeal cancer patients who had a record of a major resection as part of their treatment. The percentages have been adjusted for age using the two-week-wait (TWW) route as the baseline.

Compared to TWW, the proportion of patients undergoing a resection was statistically significantly different for most routes, with the exception of outpatient and inpatient routes for both sexes and male GP referrals.

Resections following emergency presentations were 44% lower for males and 45% lower for females, compared to TWWs. Similarly, they were 14% lower for female GP referrals.

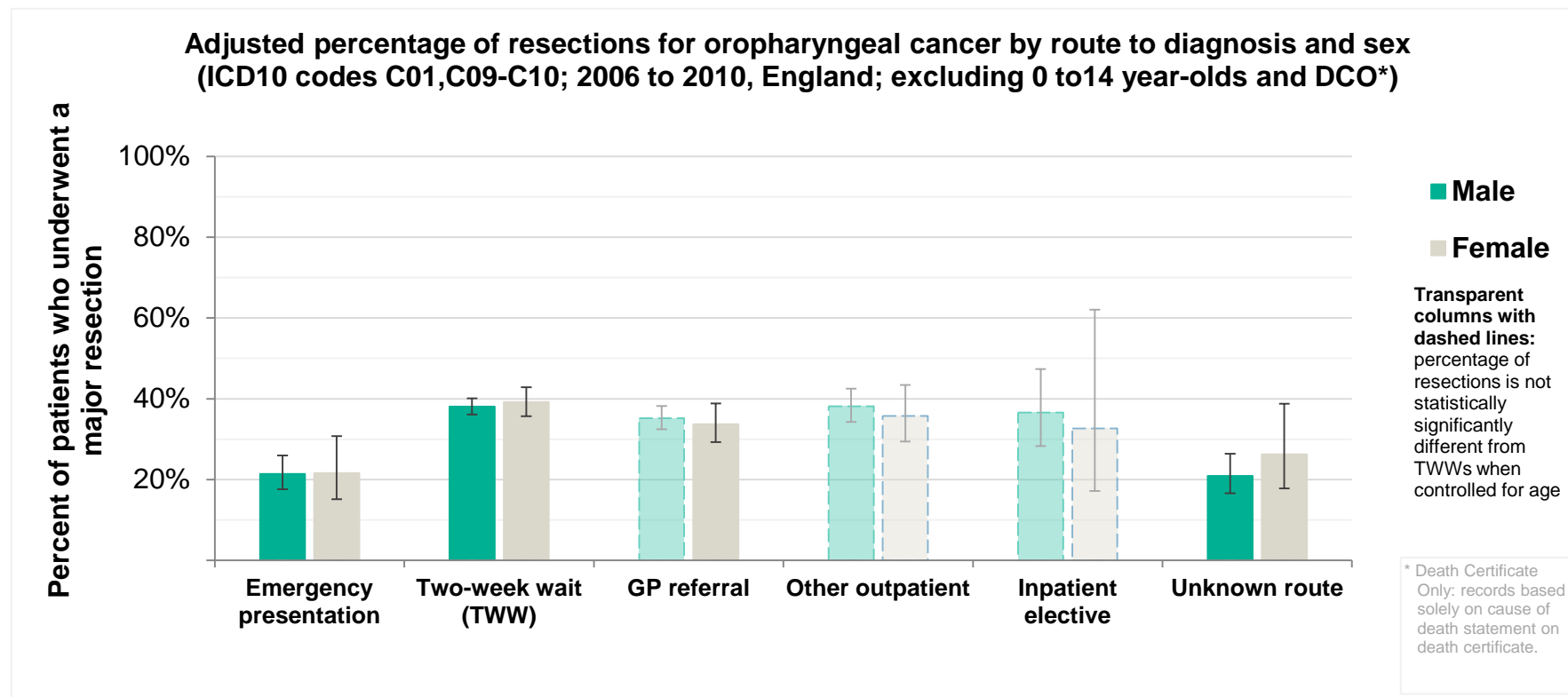
Further statistical tests indicated that the difference between male and female resection percentages was not statistically significant for any of the routes.

Analysis also showed that neither GP referral nor inpatient resections were significantly different from outpatients, for either sex. For males and females, resections following an 'unknown' route were not significantly different from emergency presentations.

Percentage of resections for oropharyngeal cancer by route to diagnosis and sex

(ICD10 codes C01,C09-C10; 2006 to 2010, England; excluding 0 to 14 year-olds and DCO*)

	Males				Females				Persons			
		Adjusted resection	95% confidence intervals			Adjusted resection	95% confidence intervals			Adjusted resection	95% confidence intervals	
Route	No.	%	lower	upper	No.	%	lower	upper	No.	%	lower	upper
Emergency presentation	407	21.4%	17.6%	26.0%	125	21.6%	15.1%	30.8%	532	21.5%	18.1%	25.5%
Two-week wait (TWW)	2,271	38.1%	36.1%	40.1%	704	39.2%	35.7%	42.9%	2,975	38.4%	36.6%	40.1%
GP referral	1,685	35.2%	32.4%	38.2%	631	33.7%	29.3%	38.9%	2,316	34.8%	32.4%	37.3%
Other outpatient	674	38.1%	34.2%	42.5%	234	35.8%	29.4%	43.4%	908	37.5%	34.1%	41.2%
Inpatient elective	93	36.6%	28.3%	47.3%	19	32.7%	17.2%	62.1%	112	35.9%	28.3%	45.6%
Unknown route	255	20.9%	16.6%	26.4%	68	26.3%	17.8%	38.8%	323	22.1%	18.1%	27.0%



Methods

The procedures for head and neck cancers were defined as a group and run against all relevant sites. Using OPCS4 codes, operations such as pharyngectomy were included as major resections. The full list is included in the appendix.

These results above show the variation in the percentage of major resection by sex and route to diagnosis. The two-week wait route was used as the baseline to test the statistical significance of differences between routes. Male and female percentages were adjusted for age-differences.

Caution should nevertheless be taken when interpreting these results due to limitations in using HES data. These results do not show the proportion of patients who are cured of their cancer through surgery, although it is believed that a majority of these operations will have been carried out with curative intent.

Oral cavity (C02-C04,C06)

The results presented here show the percentage of oral cavity cancer patients who had a record of a major resection as part of their treatment. The percentages have been adjusted for age using the two-week-wait (TWW) route as the baseline.

Compared to TWW, the proportion of patients undergoing a resection was statistically significantly different for most routes, with the exception of outpatient and inpatient routes for both sexes.

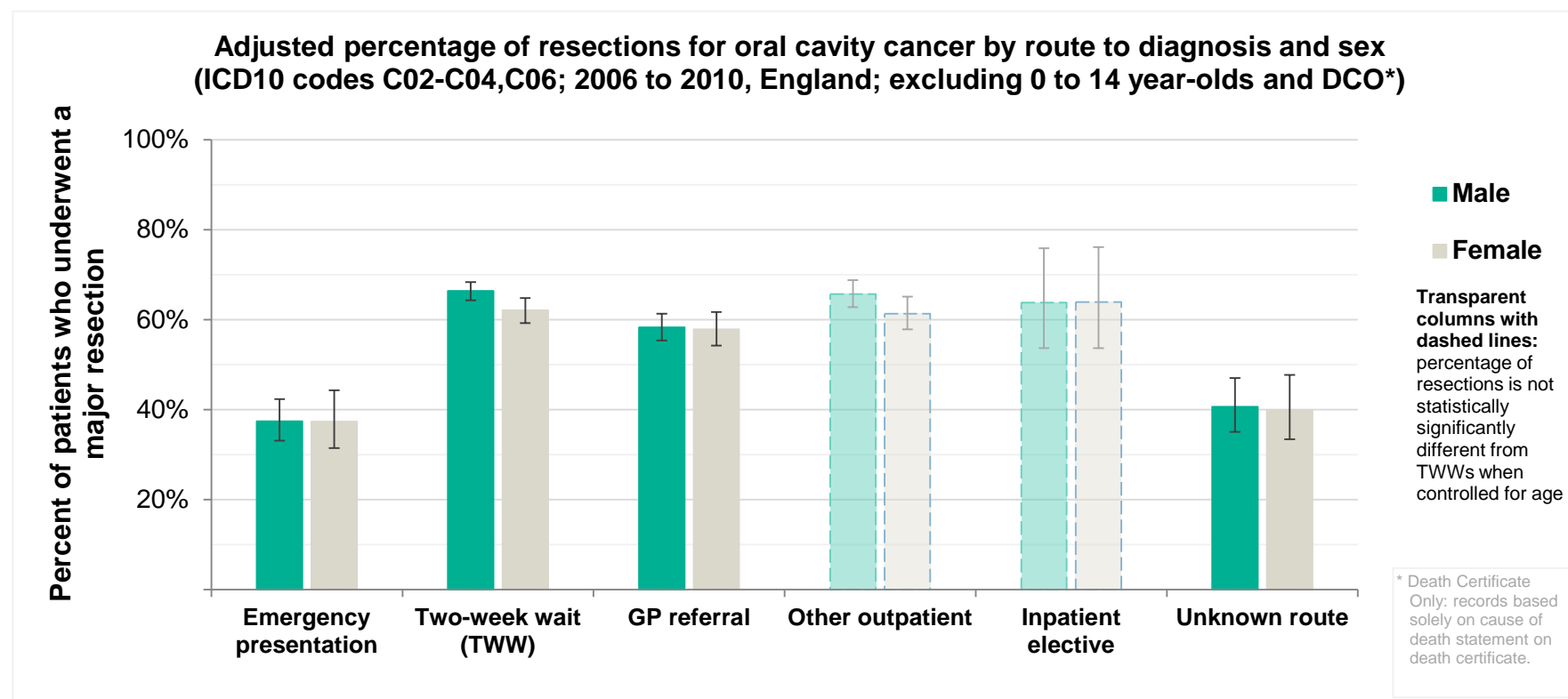
Resections following emergency presentations were 44% lower for males and 40% lower for females, compared to TWWs. Similarly, they were 12% lower for male and 7% lower for female GP referrals.

Further statistical tests indicated that the difference between male and female resection percentages was statistically significant for emergency presentations and GP referrals only.

Analysis also showed that resections following male GP referrals were significantly lower compared to outpatients; there was no difference for female GP referrals and inpatient routes for both sexes. For males and females, resections following an 'unknown' route were not significantly different from emergency presentations.

Percentage of resections for oral cavity cancer by route to diagnosis and sex
(ICD10 codes C01,C09-C10; 2006 to 2010, England; excluding 0 to 14 year-olds and DCO*)

Route	Males				Females				Persons			
	No.	Adjusted resection %	95% confidence intervals		No.	Adjusted resection %	95% confidence intervals		No.	Adjusted resection %	95% confidence intervals	
			lower	upper			lower	upper			lower	upper
Emergency presentation	439	37.4%	33.1%	42.4%	229	37.4%	31.5%	44.3%	668	37.4%	33.9%	41.4%
Two-week wait (TWW)	2,097	66.4%	64.3%	68.4%	1,179	62.1%	59.3%	64.8%	3,276	64.8%	63.2%	66.5%
GP referral	1,619	58.3%	55.4%	61.3%	1,182	57.9%	54.3%	61.7%	2,801	58.3%	56.0%	60.7%
Other outpatient	1,741	65.7%	62.8%	68.8%	1,451	61.4%	57.8%	65.1%	3,192	64.1%	61.8%	66.5%
Inpatient elective	70	63.8%	53.7%	75.9%	63	63.9%	53.7%	76.1%	133	63.9%	56.5%	72.3%
Unknown route	258	40.6%	35.1%	47.1%	172	40.0%	33.4%	47.8%	430	40.5%	36.2%	45.4%



Methods

The procedures for head and neck cancers were defined as a group and run against all relevant sites. Using OPCS4 codes, operations such as glossectomy, excision of mandible and reconstruction of mouth were included as major resections. The full list is included in the appendix.

These results above show the variation in the percentage of major resection by sex and route to diagnosis. The two-week wait route was used as the baseline to test the statistical significance of differences between routes. Male and female percentages were adjusted for age-differences.

Caution should nevertheless be taken when interpreting these results due to limitations in using HES data. These results do not show the proportion of patients who are cured of their cancer through surgery, although it is believed that a majority of these operations will have been carried out with curative intent.

Salivary glands (C07-C08)

The results presented here show the percentage of salivary glands cancer patients who had a record of a major resection as part of their treatment. The percentages have been adjusted for age using the two-week-wait (TWW) route as the baseline.

Compared to TWW, the proportion of patients undergoing a resection was statistically significantly different for most routes, with the exception of inpatient routes for both sexes.

Resections following emergency presentations were 47% lower for males and 58% lower for females, compared to TWWs. Similarly, they were 13% lower for male and 17% lower for female GP referrals.

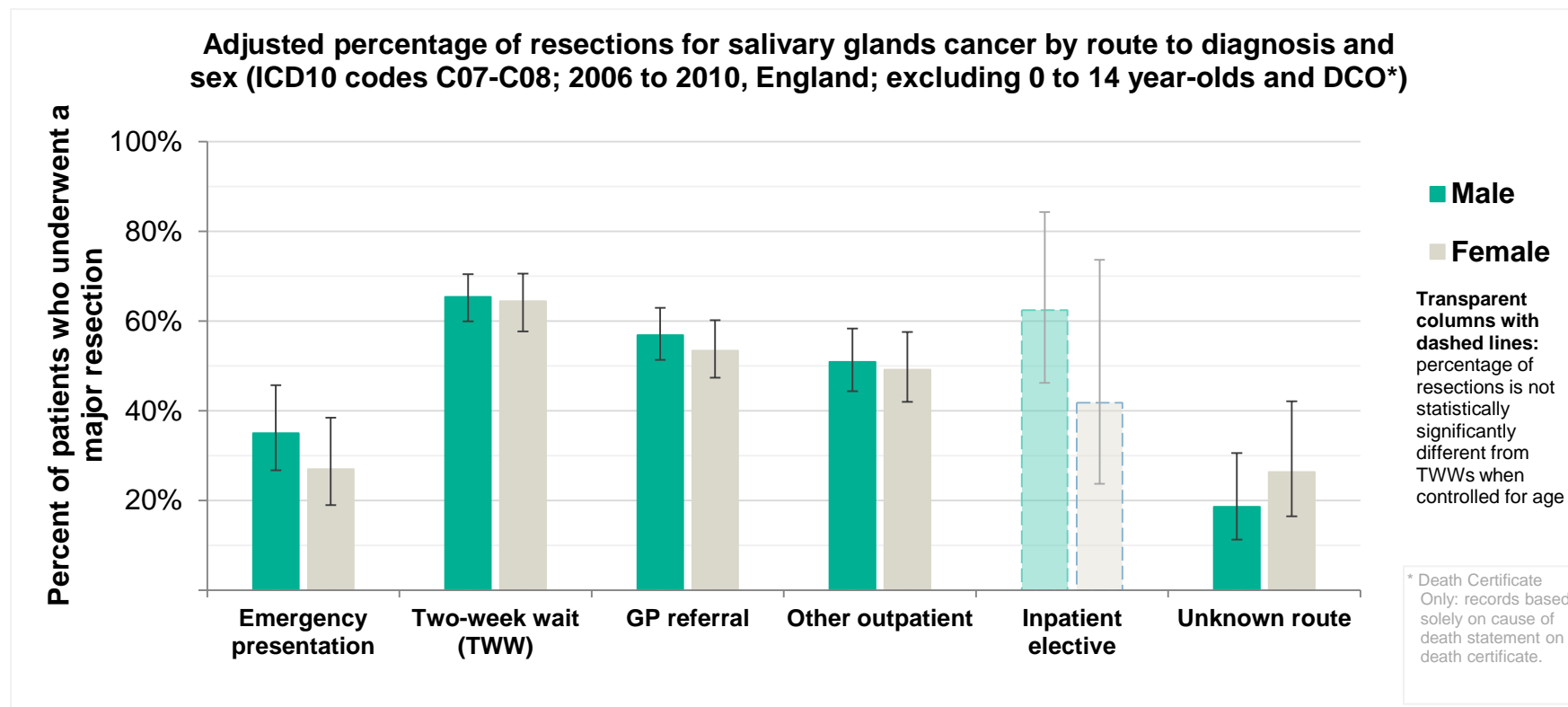
Further statistical tests indicated that the difference between male and female resection percentages was not statistically significant for any of the routes.

Analysis also showed that neither GP referral nor inpatient resections were significantly different from outpatients, for either sex. For males, resections following an 'unknown' route were significantly lower compared to emergency presentations; there was no significant difference for females.

Percentage of resections for salivary glands cancer by route to diagnosis and sex

(ICD10 codes C01,C09-C10; 2006 to 2010, England; excluding 0 to 14 year-olds and DCO*)

Route	Males				Females				Persons			
	No.	Adjusted resection %	95% confidence intervals		No.	Adjusted resection %	95% confidence intervals		No.	Adjusted resection %	95% confidence intervals	
			lower	upper			lower	upper			lower	upper
Emergency presentation	111	35.0%	26.7%	45.7%	95	27.0%	19.0%	38.4%	206	31.3%	25.2%	38.8%
Two-week wait (TWW)	312	65.4%	59.9%	70.4%	208	64.4%	57.7%	70.6%	520	65.0%	60.8%	69.0%
GP referral	696	56.9%	51.4%	62.9%	620	53.4%	47.4%	60.2%	1,316	55.3%	51.2%	59.8%
Other outpatient	286	50.9%	44.4%	58.4%	240	49.1%	42.0%	57.5%	526	50.1%	45.2%	55.6%
Inpatient elective	25	62.4%	46.2%	84.3%	16	41.8%	23.7%	73.7%	41	53.9%	41.0%	70.8%
Unknown route	67	18.6%	11.3%	30.5%	41	26.3%	16.5%	42.1%	108	21.5%	15.2%	30.4%



Methods

The procedures for head and neck cancers were defined as a group and run against all relevant sites. Using OPCS4 codes, operations such as excision of parotid gland were included as major resections. The full list is included in the appendix.

These results above show the variation in the percentage of major resection by sex and route to diagnosis. The two-week wait route was used as the baseline to test the statistical significance of differences between routes. Male and female percentages were adjusted for age-differences.

Caution should nevertheless be taken when interpreting these results due to limitations in using HES data. These results do not show the proportion of patients who are cured of their cancer through surgery, although it is believed that a majority of these operations will have been carried out with curative intent.

Hypopharynx (C12-C13)

The results presented here show the percentage of hypopharyngeal cancer patients who had a record of a major resection as part of their treatment. The percentages have been adjusted for age using the two-week-wait (TWW) route as the baseline.

Compared to TWW, the proportion of patients undergoing a resection was not statistically significantly different for most routes, with the exception of male emergency presentations and female inpatient routes which were significant.

Resections following emergency presentations were 41% lower for males, compared to TWWs.

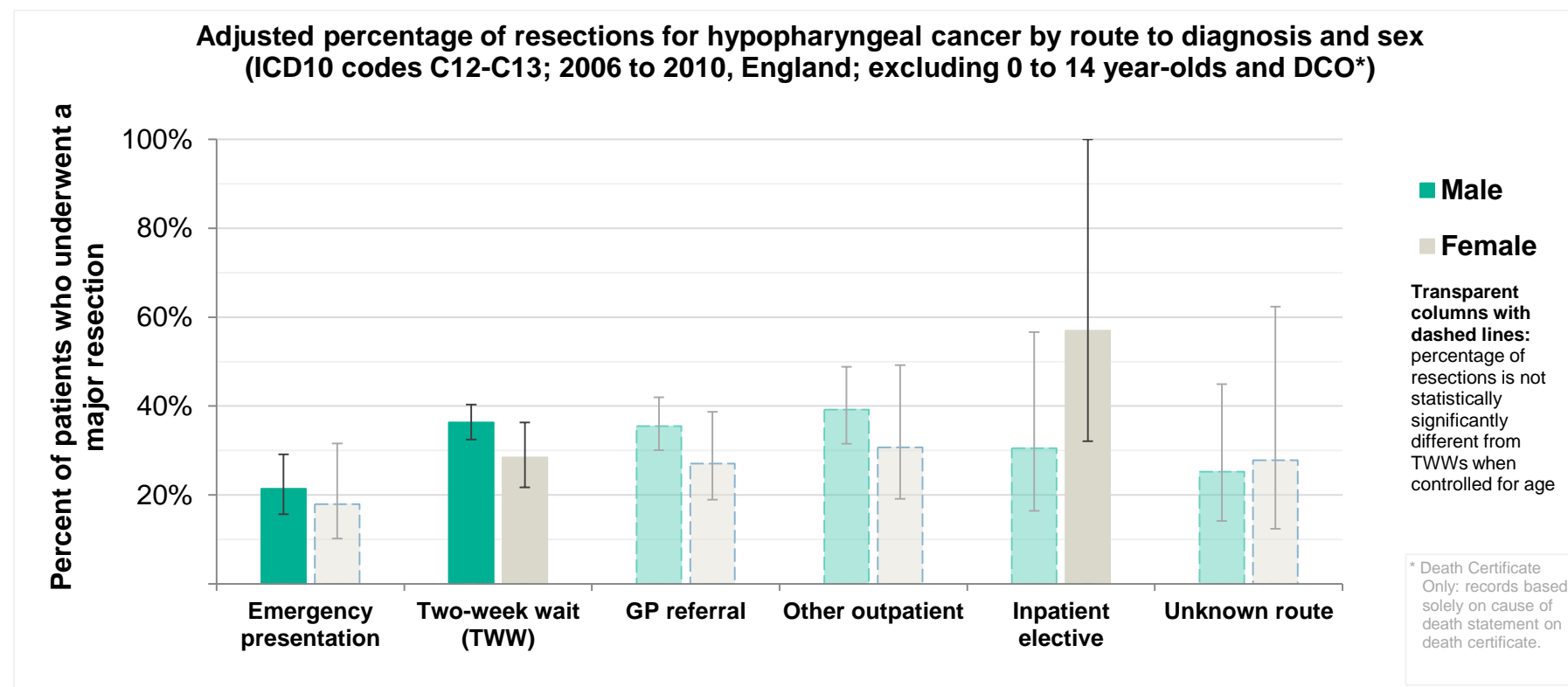
Further statistical tests indicated that the difference between male and female resection percentages was statistically significant for inpatient routes only.

Analysis also showed that neither GP referral nor inpatient resections were significantly different from outpatients, for either sex. For males and females, resections following an 'unknown' route were not significantly different from emergency presentations.

Percentage of resections for hypopharyngeal cancer by route to diagnosis and sex

(ICD10 codes C01,C09-C10; 2006 to 2010, England; excluding 0 to 14 year-olds and DCO*)

Route	Males				Females				Persons			
	No.	Adjusted resection %	95% confidence intervals		No.	Adjusted resection %	95% confidence intervals		No.	Adjusted resection %	95% confidence intervals	
			lower	upper			lower	upper			lower	upper
Emergency presentation	167	21.4%	15.7%	29.1%	81	17.9%	10.2%	31.6%	248	20.5%	15.6%	26.9%
Two-week wait (TWW)	567	36.3%	32.5%	40.4%	144	28.5%	21.7%	36.3%	711	34.7%	31.3%	38.3%
GP referral	442	35.5%	30.1%	42.0%	158	27.1%	18.9%	38.7%	600	33.8%	29.0%	39.3%
Other outpatient	167	39.2%	31.5%	48.9%	55	30.7%	19.2%	49.2%	222	37.6%	30.8%	45.9%
Inpatient elective	23	30.5%	16.4%	56.7%	10	57.0%	32.1%	100.0%	33	38.0%	24.1%	59.8%
Unknown route	36	25.2%	14.2%	44.9%	16	27.8%	12.4%	62.4%	52	26.3%	16.4%	42.3%



Methods

The procedures for head and neck cancers were defined as a group and run against all relevant sites. Using OPCS4 codes, operations such as pharyngectomy, laryngectomy and partial oesophagectomy were included as major resections. The full list is included in the appendix.

These results above show the variation in the percentage of major resection by sex and route to diagnosis. The two-week wait route was used as the baseline to test the statistical significance of differences between routes. Male and female percentages were adjusted for age-differences.

Caution should nevertheless be taken when interpreting these results due to limitations in using HES data. These results do not show the proportion of patients who are cured of their cancer through surgery, although it is believed that a majority of these operations will have been carried out with curative intent.

Larynx (C32)

The results presented here show the percentage of laryngeal cancer patients who had a record of a major resection as part of their treatment. The percentages have been adjusted for age using the two-week-wait (TWW) route as the baseline.

Compared to TWW, the proportion of patients undergoing a resection was not statistically significantly different for most routes, with the exception of 'unknown' routes for both sexes and female emergency presentations, which were significant.

Resections following emergency presentations were 24% lower for females, compared to TWWs.

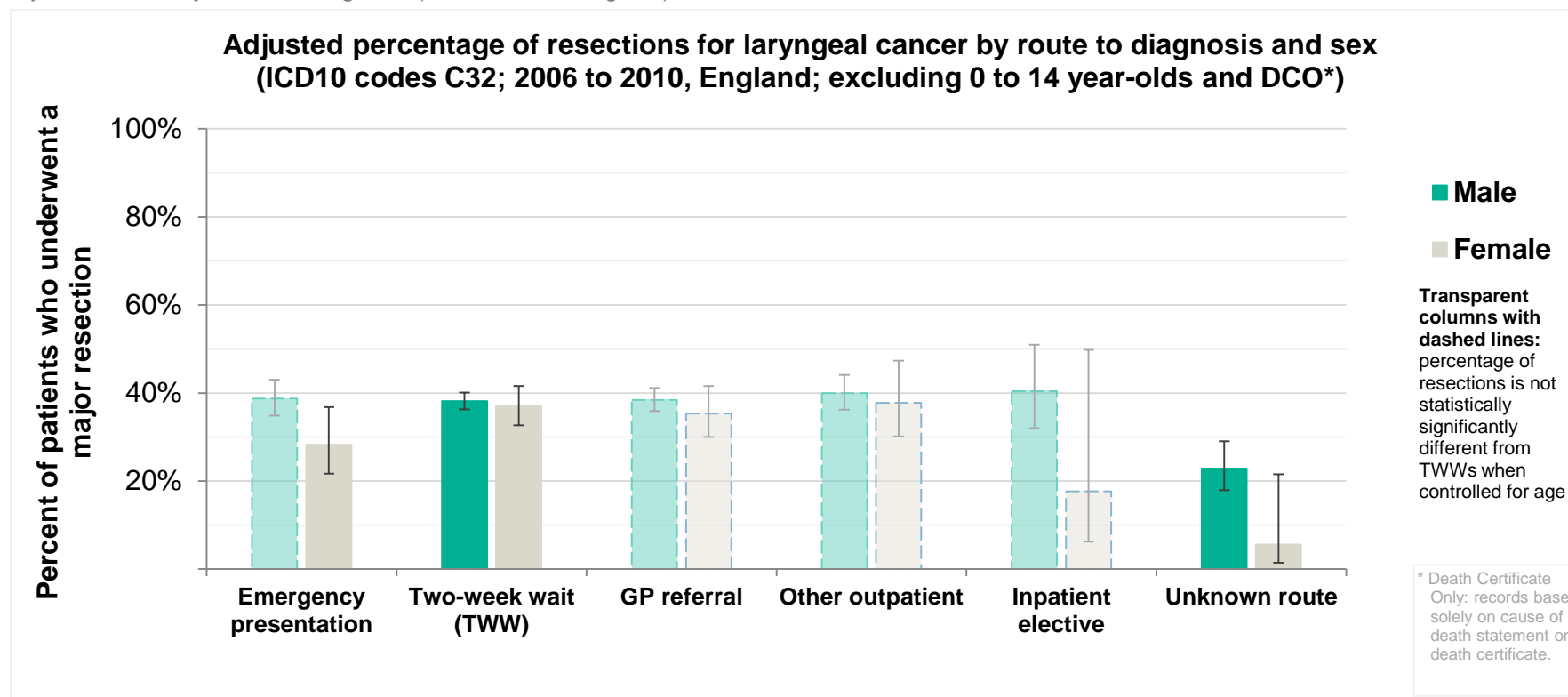
Further statistical tests indicated that the difference between male and female resection percentages was statistically significant for emergency presentations and 'unknown' routes only.

Analysis also showed that neither GP referral nor inpatient resections were significantly different from outpatients, for either sex. For males and females, resections following an 'unknown' route were significantly lower compared to emergency presentations.

Percentage of resections for laryngeal cancer by route to diagnosis and sex

(ICD10 codes C01,C09-C10; 2006 to 2010, England; excluding 0 to 14 year-olds and DCO*)

Route	Males				Females				Persons			
	No.	Adjusted resection %	95% confidence intervals		No.	Adjusted resection %	95% confidence intervals		No.	Adjusted resection %	95% confidence intervals	
			lower	upper			lower	upper			lower	upper
Emergency presentation	739	38.7%	34.9%	43.0%	199	28.3%	21.7%	36.8%	938	36.8%	33.3%	40.6%
Two-week wait (TWW)	2,521	38.2%	36.3%	40.1%	446	37.0%	32.6%	41.6%	2,967	38.0%	36.3%	39.7%
GP referral	2,938	38.4%	35.9%	41.1%	617	35.3%	30.0%	41.6%	3,555	38.0%	35.7%	40.5%
Other outpatient	817	40.0%	36.3%	44.1%	178	37.8%	30.1%	47.3%	995	39.7%	36.3%	43.4%
Inpatient elective	108	40.4%	32.0%	51.0%	18	17.6%	6.3%	49.8%	126	37.2%	29.6%	46.8%
Unknown route	230	22.8%	17.9%	29.1%	36	5.6%	1.5%	21.6%	266	20.5%	16.1%	26.0%



Methods

The procedures for head and neck cancers were defined as a group and run against all relevant sites. Using OPCS4 codes, operations such as full and partial laryngectomy, laryngofissure and chordectomy, and tracheo-oesophageal puncture with insertion of speech prosthesis were included. The full list is included in the appendix.

These results above show the variation in the percentage of major resection by sex and route to diagnosis. The two-week wait route was used as the baseline to test the statistical significance of differences between routes. Male and female percentages were adjusted for age-differences.

Caution should nevertheless be taken when interpreting these results due to limitations in using HES data. These results do not show the proportion of patients who are cured of their cancer through surgery, although it is believed that a majority of these operations will have been carried out with curative intent.

Upper GI

Oesophagus (C15)

The results presented here show the percentage of oesophageal cancer patients who had a record of a major resection as part of their treatment. The percentages have been adjusted for age using the two-week-wait (TWW) route as the baseline.

Compared to TWW, the proportion of patients undergoing a resection was statistically significantly different for most routes, with the exception of GP referrals for both sexes and female outpatient, inpatient and 'unknown' routes.

Resections following emergency presentations were 62% lower for males and 74% lower for females, compared to TWWs.

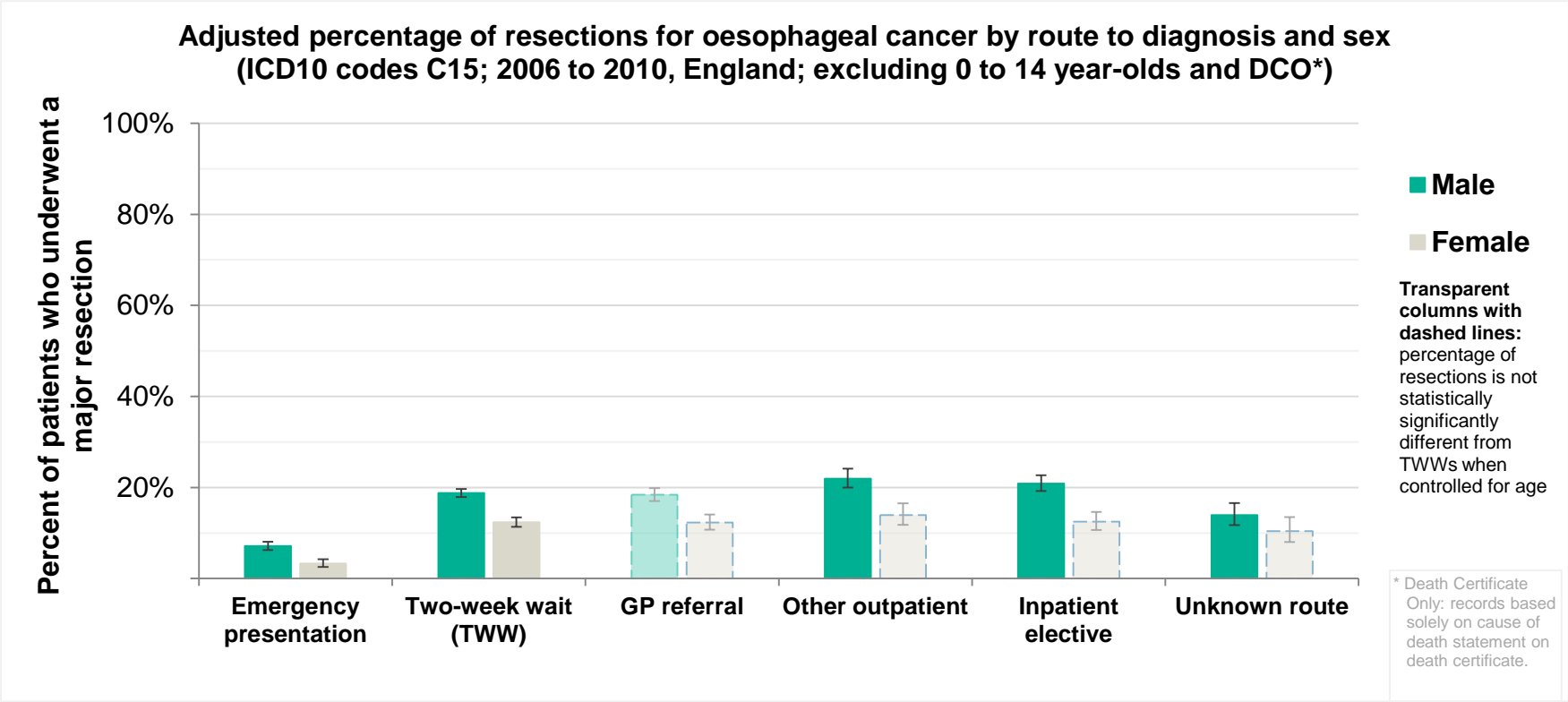
Further statistical tests indicated that the difference between male and female resection percentages was statistically significant for most routes, except outpatient and 'unknown' routes.

Analysis also showed that resections following male GP referrals were significantly lower compared to outpatients; there was no difference for female GP referrals and inpatient routes for both sexes. For males and females, resections following an 'unknown' route were significantly higher compared to emergency presentations.

Percentage of resections for oesophageal cancer by route to diagnosis and sex

(ICD10 codes C01,C09-C10; 2006 to 2010, England; excluding 0 to 14 year-olds and DCO*)

Route	Males				Females				Persons			
	No.	Adjusted resection %	95% confidence intervals		No.	Adjusted resection %	95% confidence intervals		No.	Adjusted resection %	95% confidence intervals	
			lower	upper			lower	upper			lower	upper
Emergency presentation	4,419	7.1%	6.3%	8.1%	2,717	3.3%	2.5%	4.2%	7,136	5.8%	5.2%	6.5%
Two-week wait (TWW)	7,920	18.8%	17.9%	19.6%	3,873	12.4%	11.4%	13.4%	11,793	16.7%	16.0%	17.3%
GP referral	4,351	18.4%	17.0%	19.8%	2,180	12.3%	10.8%	14.0%	6,531	16.4%	15.4%	17.5%
Other outpatient	1,878	22.0%	20.0%	24.1%	841	13.9%	11.8%	16.5%	2,719	19.4%	17.9%	21.1%
Inpatient elective	2,492	20.9%	19.2%	22.7%	1,096	12.5%	10.7%	14.6%	3,588	18.1%	16.8%	19.5%
Unknown route	737	14.0%	11.8%	16.6%	396	10.4%	8.0%	13.5%	1,133	12.9%	11.2%	14.8%



Methods

Using OPCS4 codes, operations that have been defined as major resections include oesophagectomy, and partial excisions of the oesophagus. The full list of procedure codes for oesophageal cancer is included in the appendix.

These results above show the variation in the percentage of major resection by sex and route to diagnosis. The two-week wait route was used as the baseline to test the statistical significance of differences between routes. Male and female percentages were adjusted for age-differences.

Caution should nevertheless be taken when interpreting these results due to limitations in using HES data. These results do not show the proportion of patients who are cured of their cancer through surgery, although it is believed that a majority of these operations will have been carried out with curative intent.

Stomach (C16)

The results presented here show the percentage of stomach cancer patients who had a record of a major resection as part of their treatment. The percentages have been adjusted for age using the two-week-wait (TWW) route as the baseline.

Compared to TWW, the proportion of patients undergoing a resection was statistically significantly different for most routes, with the exception of female outpatient and inpatient routes.

Resections following emergency presentations were 31% lower for males and 44% lower for females, compared to TWWs. Similarly, they were 28% higher for male and 13% higher for female GP referrals.

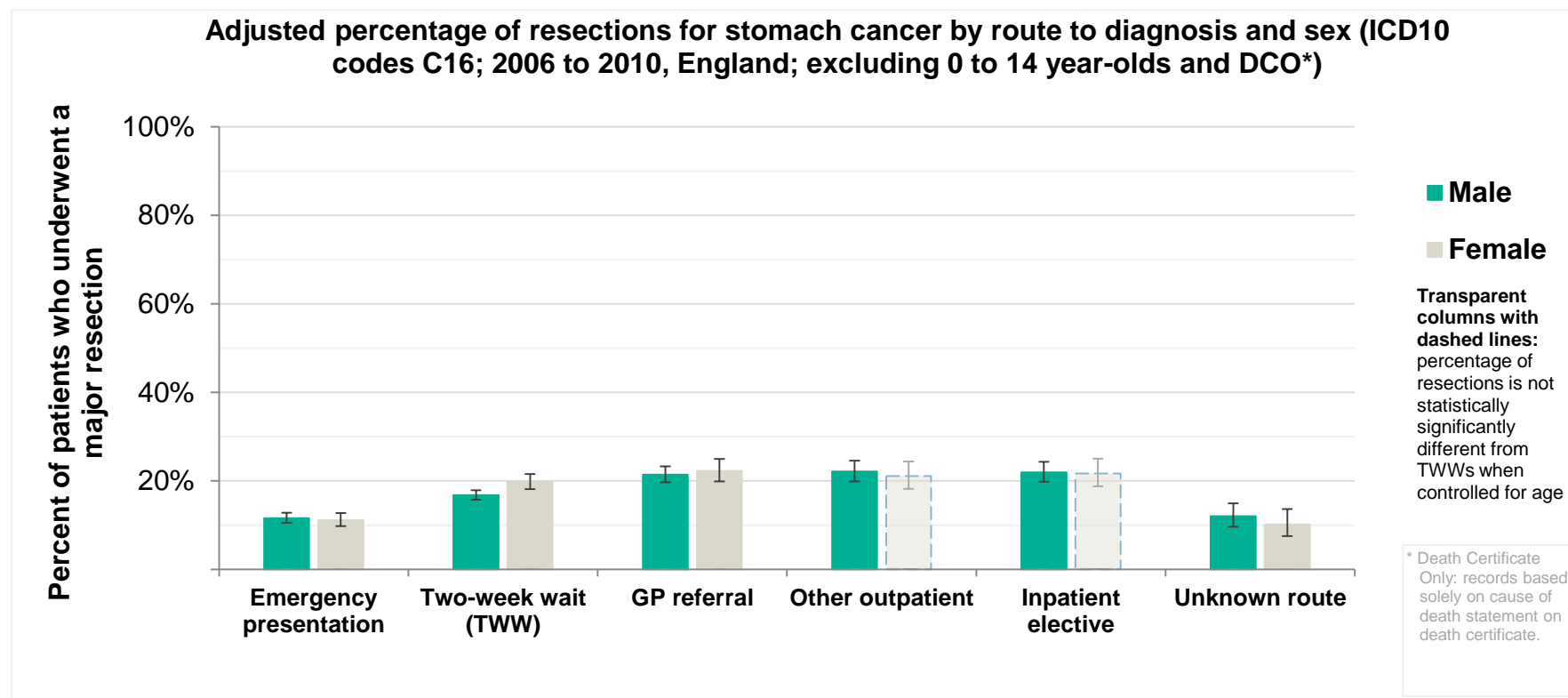
Further statistical tests indicated that the difference between male and female resection percentages was statistically significant for TWWs and GP referrals only.

Analysis also showed that neither GP referral nor inpatient resections were significantly different from outpatients, for either sex. For males and females, resections following an 'unknown' route were not significantly different from emergency presentations.

Percentage of resections for stomach cancer by route to diagnosis and sex

(ICD10 codes C01,C09-C10; 2006 to 2010, England; excluding 0 to 14 year-olds and DCO*)

Route	Males				Females				Persons			
	No.	Adjusted resection %	95% confidence intervals		No.	Adjusted resection %	95% confidence intervals		No.	Adjusted resection %	95% confidence intervals	
			lower	upper			lower	upper			lower	upper
Emergency presentation	6,028	11.6%	10.5%	12.8%	3,987	11.2%	9.8%	12.7%	10,015	11.4%	10.5%	12.3%
Two-week wait (TWW)	5,062	16.8%	15.8%	17.9%	2,101	19.8%	18.2%	21.6%	7,163	17.7%	16.8%	18.6%
GP referral	4,244	21.4%	19.7%	23.3%	2,331	22.3%	19.9%	25.0%	6,575	21.8%	20.4%	23.4%
Other outpatient	1,767	22.1%	19.9%	24.6%	975	21.1%	18.2%	24.4%	2,742	21.8%	20.0%	23.8%
Inpatient elective	2,004	22.0%	19.8%	24.3%	910	21.7%	18.8%	25.1%	2,914	21.8%	20.1%	23.7%
Unknown route	625	12.0%	9.7%	14.9%	400	10.2%	7.6%	13.7%	1,025	11.2%	9.4%	13.3%



Methods

Using OPCS4 codes, operations that have been defined as major resections include total excision of stomach and partial excision of the stomach. The full list of procedure codes for stomach cancer is included in the appendix.

These results above show the variation in the percentage of major resection by sex and route to diagnosis. The two-week wait route was used as the baseline to test the statistical significance of differences between routes. Male and female percentages were adjusted for age-differences.

Caution should nevertheless be taken when interpreting these results due to limitations in using HES data. These results do not show the proportion of patients who are cured of their cancer through surgery, although it is believed that a majority of these operations will have been carried out with curative intent.

Liver (C22)

The results presented here show the percentage of liver cancer patients who had a record of a major resection as part of their treatment. The percentages have been adjusted for age using the two-week-wait (TWW) route as the baseline.

Compared to TWW, the proportion of patients undergoing a resection was statistically significantly different for most routes, with the exception of GP referrals and inpatient routes for both sexes and female outpatient routes.

Resections following emergency presentations were 77% lower for males and 78% lower for females, compared to TWWs.

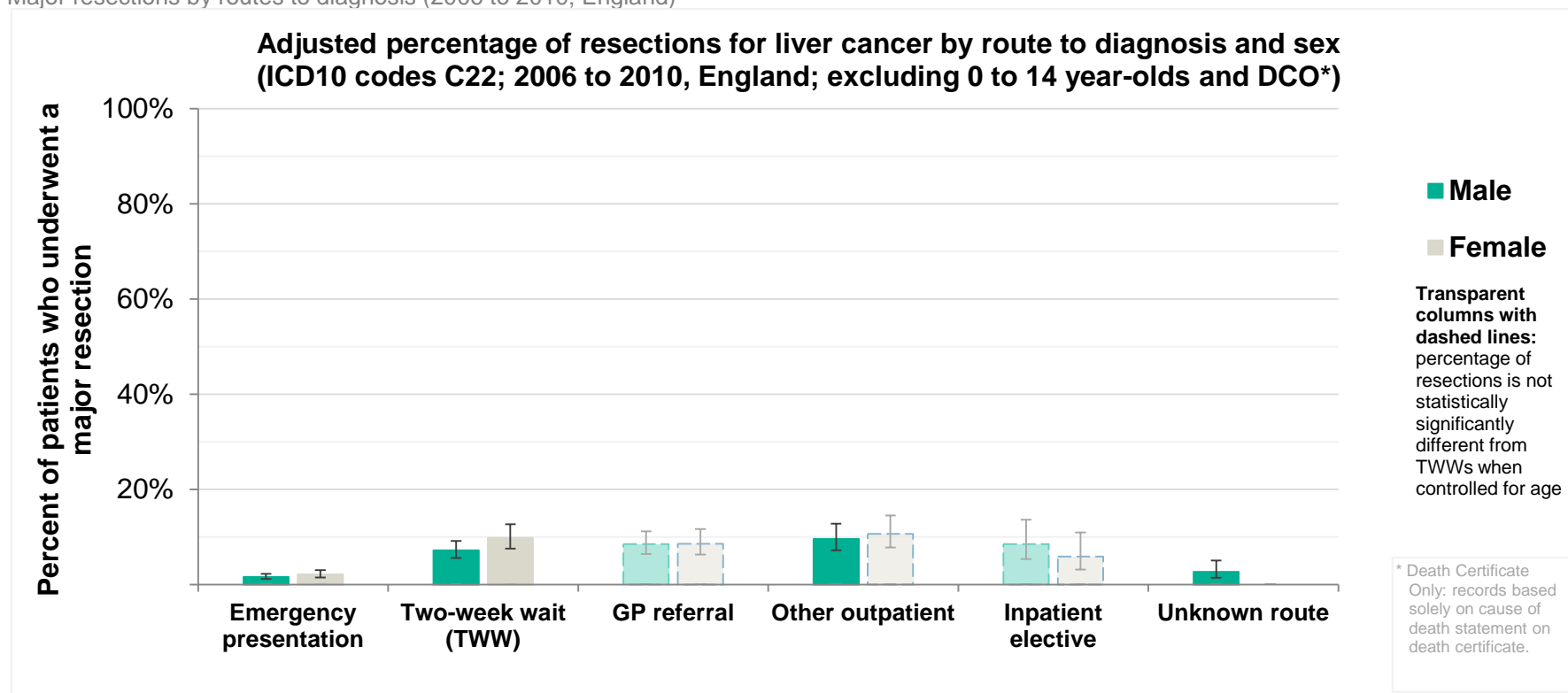
Further statistical tests indicated that the difference between male and female resection percentages was statistically significant for emergency presentations, outpatient and 'unknown' routes.

Analysis also showed that neither GP referral nor inpatient resections were significantly different from outpatients, for either sex. For females, resections following an 'unknown' route were significantly lower compared to emergency presentations; there was no significant difference for males.

Percentage of resections for liver cancer by route to diagnosis and sex

(ICD10 codes C01,C09-C10; 2006 to 2010, England; excluding 0 to 14 year-olds and DCO*)

Route	Males				Females				Persons			
	No.	Adjusted resection %	95% confidence intervals		No.	Adjusted resection %	95% confidence intervals		No.	Adjusted resection %	95% confidence intervals	
			lower	upper			lower	upper			lower	upper
Emergency presentation	4,431	1.6%	1.2%	2.3%	2,956	2.1%	1.5%	3.1%	7,387	1.8%	1.4%	2.3%
Two-week wait (TWW)	821	7.2%	5.6%	9.2%	529	9.8%	7.6%	12.7%	1,350	8.2%	6.9%	9.8%
GP referral	2,292	8.5%	6.4%	11.2%	1,187	8.6%	6.3%	11.7%	3,479	8.5%	6.9%	10.4%
Other outpatient	1,531	9.6%	7.2%	12.8%	727	10.7%	7.8%	14.5%	2,258	9.9%	8.0%	12.2%
Inpatient elective	232	8.5%	5.3%	13.6%	161	5.9%	3.2%	11.0%	393	7.3%	5.1%	10.6%
Unknown route	358	2.7%	1.4%	5.1%	183	0.0%	0.0%	0.0%	541	1.8%	1.0%	3.3%



Methods

Using OPCS4 codes, operations that have been defined as major resections are those classified under partial excisions of the liver. The full list of procedure codes used for liver cancer is included in the appendix.

These results above show the variation in the percentage of major resection by sex and route to diagnosis. The two-week wait route was used as the baseline to test the statistical significance of differences between routes. Male and female percentages were adjusted for age-differences.

Caution should nevertheless be taken when interpreting these results due to limitations in using HES data. These results do not show the proportion of patients who are cured of their cancer through surgery, although it is believed that a majority of these operations will have been carried out with curative intent.

Pancreas (C25)

The results presented here show the percentage of pancreatic cancer patients who had a record of a major resection as part of their treatment. The percentages have been adjusted for age using the two-week-wait (TWW) route as the baseline.

Compared to TWW, the proportion of patients undergoing a resection was statistically significantly different for all routes.

Resections following emergency presentations were 36% lower for males and 31% lower for females, compared to TWWs. Similarly, they were 26% higher for male and 64% higher for female GP referrals.

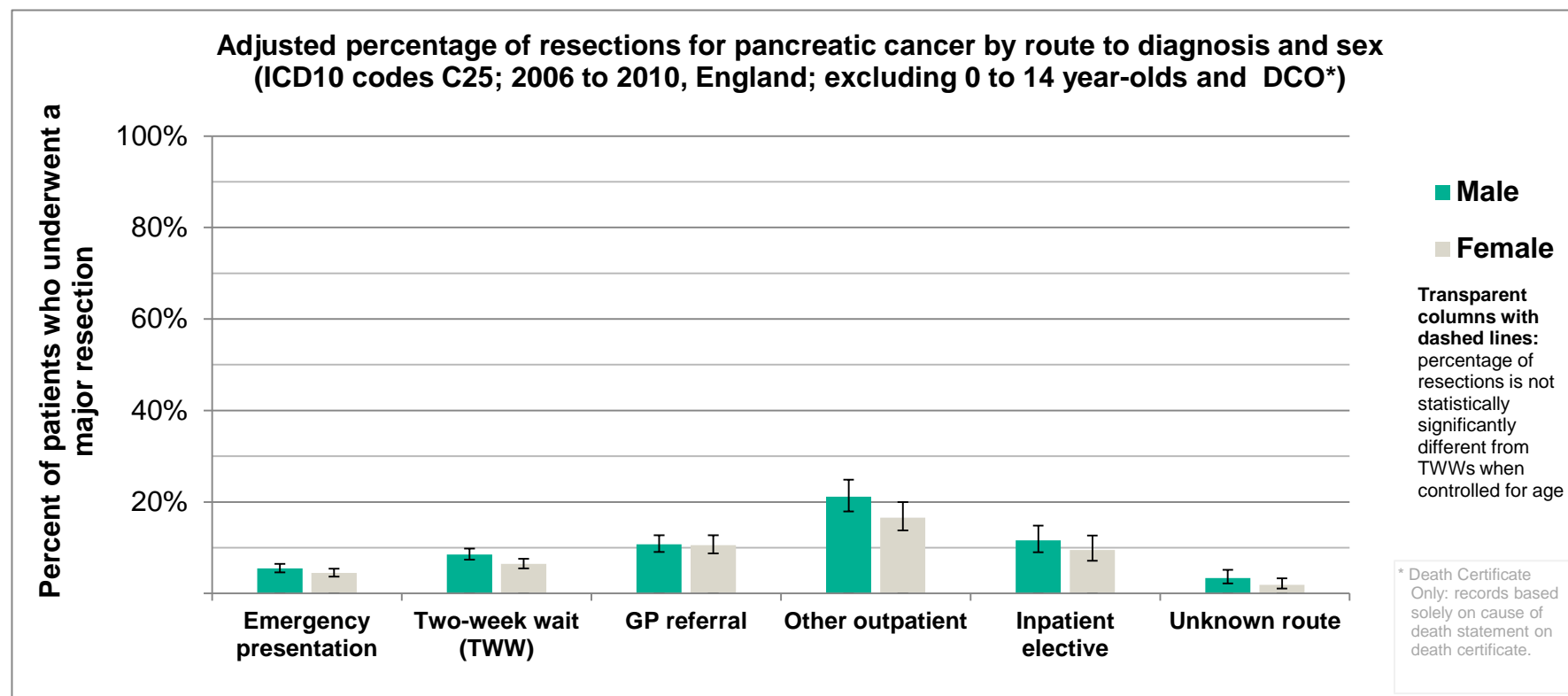
Further statistical tests indicated that the difference between male and female resection percentages was statistically significant for GP referrals only.

Analysis also showed that resections following GP referrals and inpatients were significantly lower compared to outpatients, for both sexes. For males and females, resections following an 'unknown' route were significantly lower compared to emergency presentations.

Percentage of resections for pancreatic cancer by route to diagnosis and sex

(ICD10 codes C01,C09-C10; 2006 to 2010, England; excluding 0 to 14 year-olds and DCO*)

Route	Males				Females				Persons			
	No.	Adjusted resection %	95% confidence intervals		No.	Adjusted resection %	95% confidence intervals		No.	Adjusted resection %	95% confidence intervals	
			lower	upper			lower	upper			lower	upper
Emergency presentation	7,802	5.5%	4.6%	6.5%	8,654	4.5%	3.7%	5.4%	16,456	4.9%	4.3%	5.6%
Two-week wait (TWW)	2,067	8.5%	7.4%	9.8%	2,093	6.5%	5.5%	7.6%	4,160	7.5%	6.7%	8.3%
GP referral	3,469	10.8%	9.1%	12.7%	3,387	10.5%	8.8%	12.7%	6,856	10.8%	9.5%	12.2%
Other outpatient	1,914	21.1%	18.0%	24.9%	1,766	16.6%	13.8%	20.0%	3,680	19.0%	16.8%	21.4%
Inpatient elective	587	11.6%	9.0%	14.9%	566	9.5%	7.2%	12.6%	1,153	10.5%	8.7%	12.7%
Unknown route	647	3.4%	2.2%	5.2%	736	1.9%	1.1%	3.3%	1,383	2.6%	1.8%	3.6%



Methods

Using OPCS4 codes, operations that have been defined as major resections include total excision of the pancreas, excision of head of pancreas and partial excision of the pancreas. The full list of procedure codes for pancreatic cancer is included in the appendix.

These results above show the variation in the percentage of major resection by sex and route to diagnosis. The two-week wait route was used as the baseline to test the statistical significance of differences between routes. Male and female percentages were adjusted for age-differences.

Caution should nevertheless be taken when interpreting these results due to limitations in using HES data. These results do not show the proportion of patients who are cured of their cancer through surgery, although it is believed that a majority of these operations will have been carried out with curative intent.

Lower GI

Colorectal (C18-C20)

The results presented here show the percentage of colorectal cancer patients who had a record of a major resection as part of their treatment. The percentages have been adjusted for age using the two-week-wait (TWW) route as the baseline.

Compared to TWW, the proportion of patients undergoing a resection was statistically significantly different for most routes, with the exception of female screening.

Resections following emergency presentations were 20% lower for males and 23% lower for females, compared to TWWs. Similarly, they were 9% lower for male and 10% lower for female GP referrals.

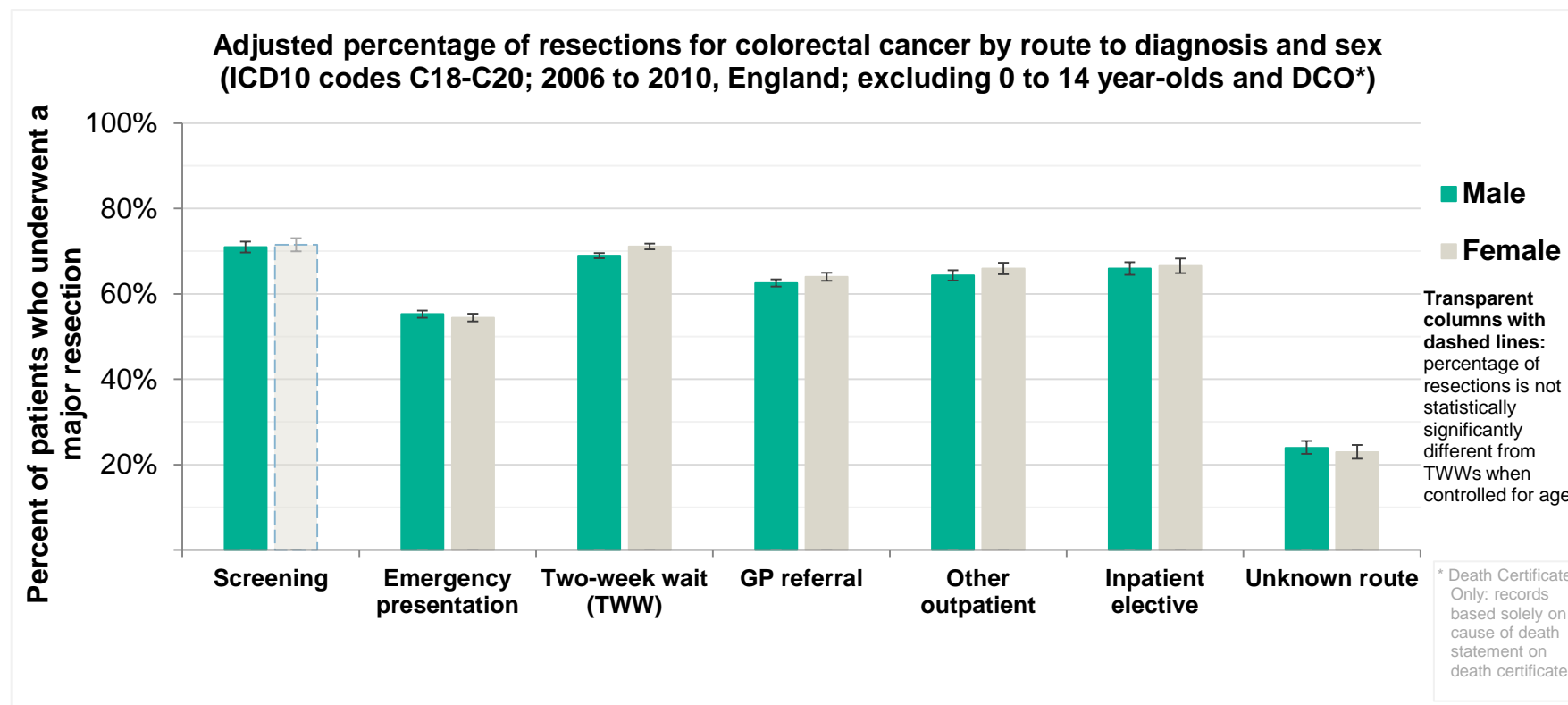
Further statistical tests indicated that the difference between male and female resection percentages was statistically significant for all routes, except emergency presentations, inpatient and 'unknown' routes.

Analysis also showed that resections following GP referrals were significantly lower compared to outpatients, for both sexes; there was no difference for inpatient routes for either sexes. For males and females, resections following an 'unknown' route were significantly lower compared to emergency presentations.

Percentage of resections for colorectal cancer by route to diagnosis and sex

(ICD10 codes C01,C09-C10; 2006 to 2010, England; excluding 0 to 14 year-olds and DCO*)

Route	Males				Females				Persons			
	No.	Adjusted resection %	95% confidence intervals		No.	Adjusted resection %	95% confidence intervals		No.	Adjusted resection %	95% confidence intervals	
			lower	upper			lower	upper			lower	upper
Screening	5,081	71.0%	69.7%	72.2%	2,456	71.5%	69.9%	73.1%	7,537	71.0%	70.0%	72.0%
Emergency presentation	19,526	55.3%	54.4%	56.1%	19,671	54.4%	53.6%	55.3%	39,197	54.7%	54.1%	55.4%
Two-week wait (TWW)	24,283	69.0%	68.4%	69.5%	17,887	71.1%	70.4%	71.7%	42,170	69.9%	69.4%	70.3%
GP referral	21,726	62.5%	61.7%	63.4%	17,567	64.0%	63.1%	64.9%	39,293	63.2%	62.6%	63.8%
Other outpatient	7,671	64.3%	63.1%	65.5%	6,078	65.9%	64.6%	67.3%	13,749	65.1%	64.2%	66.0%
Inpatient elective	4,431	65.9%	64.4%	67.4%	3,194	66.5%	64.9%	68.3%	7,625	66.2%	65.1%	67.3%
Unknown route	3,059	24.0%	22.5%	25.5%	2,655	22.9%	21.4%	24.6%	5,714	23.4%	22.4%	24.6%



Methods

Using OPCS4 codes, operations such as hemicolectomy, total colectomy and total excision of colon were included as major resections. The full list of procedure codes for colorectal cancer is included in the appendix.

These results above show the variation in the percentage of major resection by sex and route to diagnosis. The two-week wait route was used as the baseline to test the statistical significance of differences between routes. Male and female percentages were controlled for age-differences.

Caution should nevertheless be taken when interpreting these results due to limitations in using HES data. These results do not show the proportion of patients who are cured of their cancer through surgery, although it is believed that a majority of these operations will have been carried out with curative intent.

Respiratory

Lung (C33-C34)

The results presented here show the percentage of lung cancer patients who had a record of a major resection as part of their treatment. The percentages have been adjusted for age using the two-week-wait (TWW) route as the baseline.

Compared to TWW, the proportion of patients undergoing a resection was statistically significantly different for all routes.

Resections following emergency presentations were 81% lower for males and 83% lower for females, compared to TWWs. Similarly, they were 8% higher for male and 11% higher for female GP referrals.

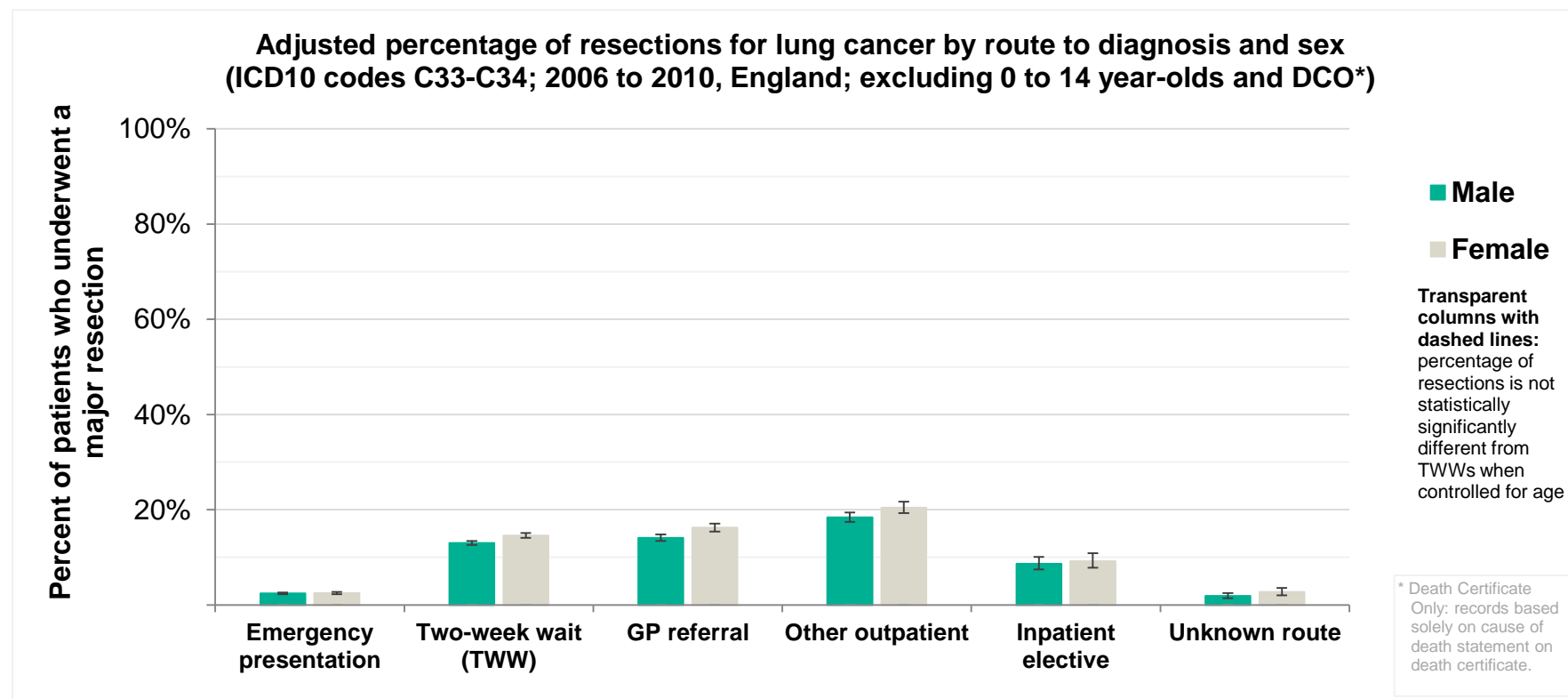
Further statistical tests indicated that the difference between male and female resection percentages was statistically significant for TWWs, GP referrals and outpatient routes.

Analysis also showed that resections following GP referrals and inpatients were significantly lower compared to outpatients, for both sexes. For males and females, resections following an 'unknown' route were not significantly different from emergency presentations.

Percentage of resections for lung cancer by route to diagnosis and sex

(ICD10 codes C01,C09-C10; 2006 to 2010, England; excluding 0 to 14 year-olds and DCO*)

Route	Males				Females				Persons			
	No.	Adjusted resection %	95% confidence intervals		No.	Adjusted resection %	95% confidence intervals		No.	Adjusted resection %	95% confidence intervals	
			lower	upper			lower	upper			lower	upper
Emergency presentation	34,585	2.4%	2.3%	2.6%	27,987	2.5%	2.3%	2.7%	62,572	2.5%	2.3%	2.6%
Two-week wait (TWW)	22,519	13.0%	12.6%	13.4%	17,014	14.6%	14.1%	15.1%	39,533	13.7%	13.4%	14.0%
GP referral	20,033	14.1%	13.4%	14.8%	14,986	16.2%	15.4%	17.1%	35,019	15.0%	14.5%	15.6%
Other outpatient	9,771	18.4%	17.4%	19.4%	7,359	20.4%	19.3%	21.7%	17,130	19.3%	18.5%	20.1%
Inpatient elective	1,767	8.7%	7.5%	10.1%	1,346	9.2%	7.8%	10.8%	3,113	8.9%	7.9%	9.9%
Unknown route	2,543	1.9%	1.4%	2.5%	2,046	2.7%	2.0%	3.6%	4,589	2.2%	1.8%	2.7%



Methods

Using OPCS-4 codes, operations including pneumonectomy, bilobectomy and lobectomy as well as excisions of the trachea were included as major resections. The full list of procedure codes for lung cancer is included in the appendix.

These results above show the variation in the percentage of major resection by sex and route to diagnosis. The two-week wait route was used as the baseline to test the statistical significance of differences between routes. Male and female percentages were adjusted for age-differences.

Caution should nevertheless be taken when interpreting these results due to limitations in using HES data. These results do not show the proportion of patients who are cured of their cancer through surgery, although it is believed that a majority of these operations will have been carried out with curative intent.

Breast

Breast (C50)

The results presented here show the percentage of breast cancer patients who had a record of a major resection as part of their treatment. They have been adjusted for age using the two-week-wait (TWW) route as the baseline.

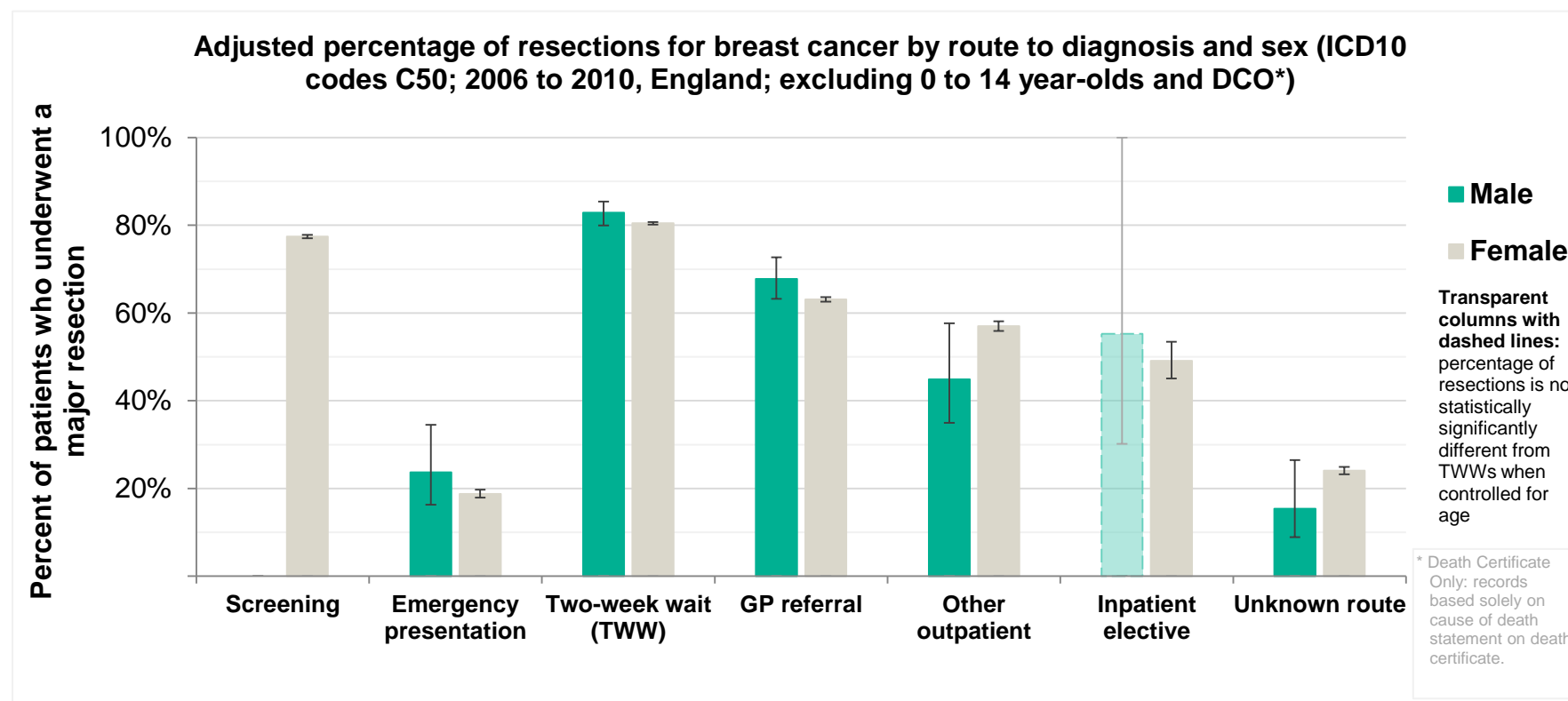
Compared to TWW, the proportion of patients undergoing a resection was statistically significantly different for most routes, with the exception of male inpatient routes.

Resections following emergency presentations were 71% lower for males and 77% lower for females, compared to TWWs. Similarly, they were 18% lower for male and 22% lower for female GP referrals.

Further statistical tests indicated that the difference between male and female resection percentages was statistically significant for TWWs and GP referrals.

Analysis also showed that resections following GP referrals were significantly higher for both sexes and following female inpatient routes significantly lower, compared to outpatients; there was no difference for male inpatients. For females, resections following an 'unknown' route were significantly higher compared to emergency presentations; there was no significant difference for males.

Percentage of resections for breast cancer by route to diagnosis and sex (ICD10 codes C01,C09-C10; 2006 to 2010, England; excluding 0 to 14 year-olds and DCO*)												
Route	Males				Females				Persons			
	No.	Adjusted resection %	95% confidence intervals		No.	Adjusted resection %	95% confidence intervals		No.	Adjusted resection %	95% confidence intervals	
			lower	upper			lower	upper			lower	upper
Screening	-	-	-	-	54,026	77.4%	77.1%	77.8%	54,026	77.4%	77.1%	77.8%
Emergency presentation	95	23.7%	16.3%	34.5%	8,804	18.8%	17.9%	19.7%	8,899	18.8%	18.0%	19.8%
Two-week wait (TWW)	723	82.8%	79.9%	85.4%	82,064	80.5%	80.2%	80.7%	82,787	80.5%	80.2%	80.7%
GP referral	423	67.8%	63.2%	72.7%	29,752	63.1%	62.6%	63.6%	30,175	63.2%	62.6%	63.7%
Other outpatient	75	44.9%	35.0%	57.7%	6,637	57.0%	55.9%	58.1%	6,712	56.9%	55.8%	58.0%
Inpatient elective	9	55.3%	30.2%	100.0%	483	49.1%	45.1%	53.4%	492	49.2%	45.2%	53.5%
Unknown route	67	15.4%	8.9%	26.5%	8,739	24.0%	23.2%	24.9%	8,806	24.0%	23.2%	24.8%



Methods

Using OPCS4 codes, operations that have been defined as major resections include total excision of breast, partial excision and excision of breast, or breast duct, lesions. The full list of procedure codes for breast cancer is included in the appendix.

These results above show the variation in the percentage of major resection by sex and route to diagnosis. The two-week wait route was used as the baseline to test the statistical significance of differences between routes. Male and female percentages were controlled for age-differences.

Caution should nevertheless be taken when interpreting these results due to limitations in using HES data. These results do not show the proportion of patients who are cured of their cancer through surgery, although it is believed that a majority of these operations will have been carried out with curative intent.

Female reproductive organs

Vulva (C51)

The results presented here show the percentage of vulval cancer patients who had a record of a major resection as part of their treatment. The percentages have been adjusted for age using the two-week-wait (TWW) route as the baseline.

Compared to TWW, the proportion of patients undergoing a resection was statistically significantly different for most routes, with the exception of inpatient routes.

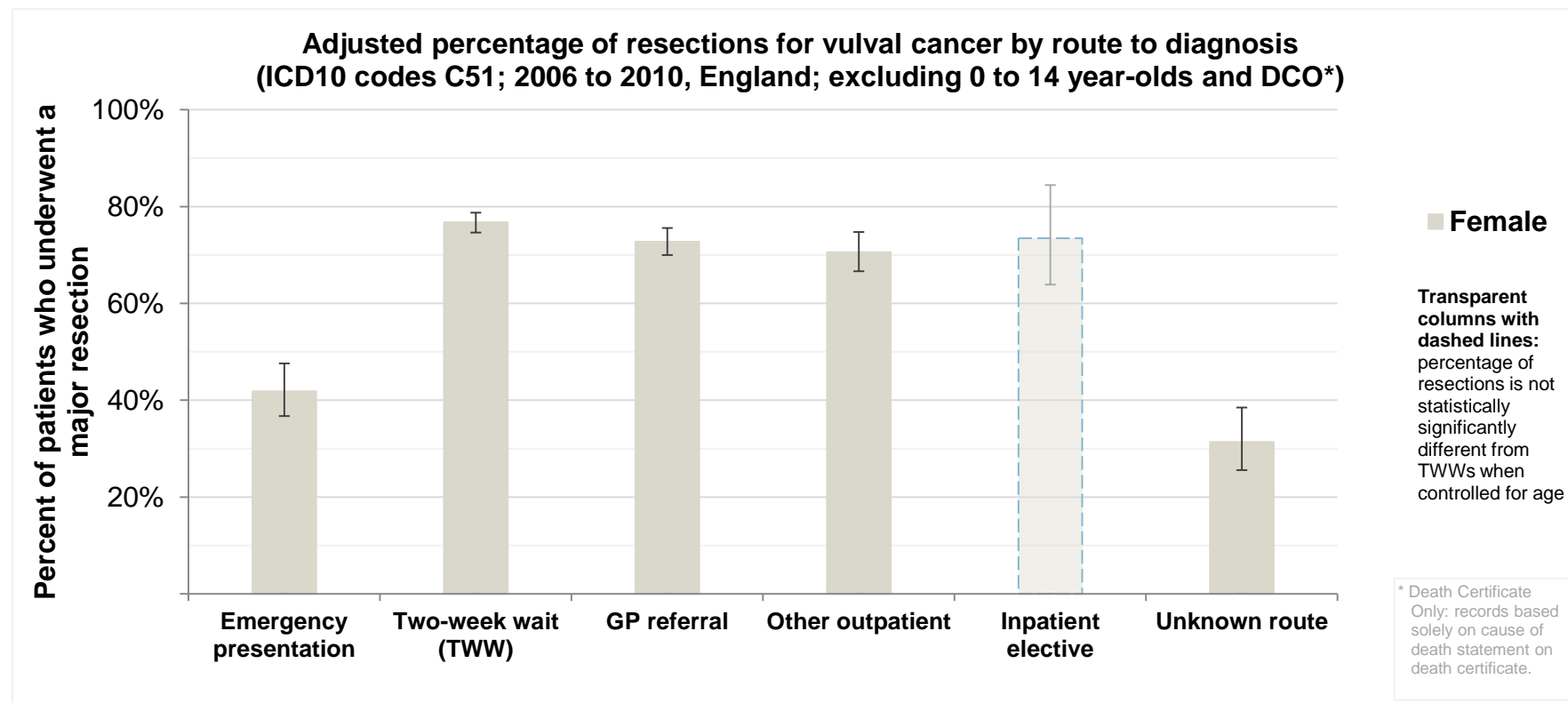
Resections following emergency presentations were 46% lower compared to TWWs. Similarly, they were 5% lower for GP referrals.

Analysis also showed that neither GP referral nor inpatient resections were significantly different from outpatients. Resections following an 'unknown' route were significantly lower compared to emergency presentations.

Percentage of resections for vulval cancer by route to diagnosis

(ICD10 codes C01,C09-C10; 2006 to 2010, England; excluding 0 to 14 year-olds and DCO*)

Route	Males				Females				Persons			
	No.	Adjusted resection %	95% confidence intervals		No.	Adjusted resection %	95% confidence intervals		No.	Adjusted resection %	95% confidence intervals	
			lower	upper			lower	upper			lower	upper
Emergency presentation	-	-	-	-	341	41.8%	36.8%	47.6%	-	-	-	-
Two-week wait (TWW)	-	-	-	-	1,597	76.8%	74.6%	78.8%	-	-	-	-
GP referral	-	-	-	-	1,909	72.7%	70.0%	75.6%	-	-	-	-
Other outpatient	-	-	-	-	574	70.6%	66.7%	74.8%	-	-	-	-
Inpatient elective	-	-	-	-	65	73.4%	63.9%	84.5%	-	-	-	-
Unknown route	-	-	-	-	191	31.4%	25.6%	38.5%	-	-	-	-



Methods

Using OPCS4 codes, operations such as excision of vulva, excision of lesion of Bartholin gland and clitoridectomy were included as major resections. The full list of procedure codes for vulval cancer is included in the appendix.

These results above show the variation in the percentage of major resection by route to diagnosis. The two-week wait route was used as the baseline to test the statistical significance of differences between routes. Percentages were adjusted for age-differences.

Caution should nevertheless be taken when interpreting these results due to limitations in using HES data. These results do not show the proportion of patients who are cured of their cancer through surgery, although it is believed that a majority of these operations will have been carried out with curative intent.

Vagina (C52)

The results presented here show the percentage of vaginal cancer patients who had a record of a major resection as part of their treatment. The percentages have been adjusted for age using the two-week-wait (TWW) route as the baseline.

Compared to TWW, the proportion of patients undergoing a resection was not statistically significantly different for any route, with the exception of emergency presentations.

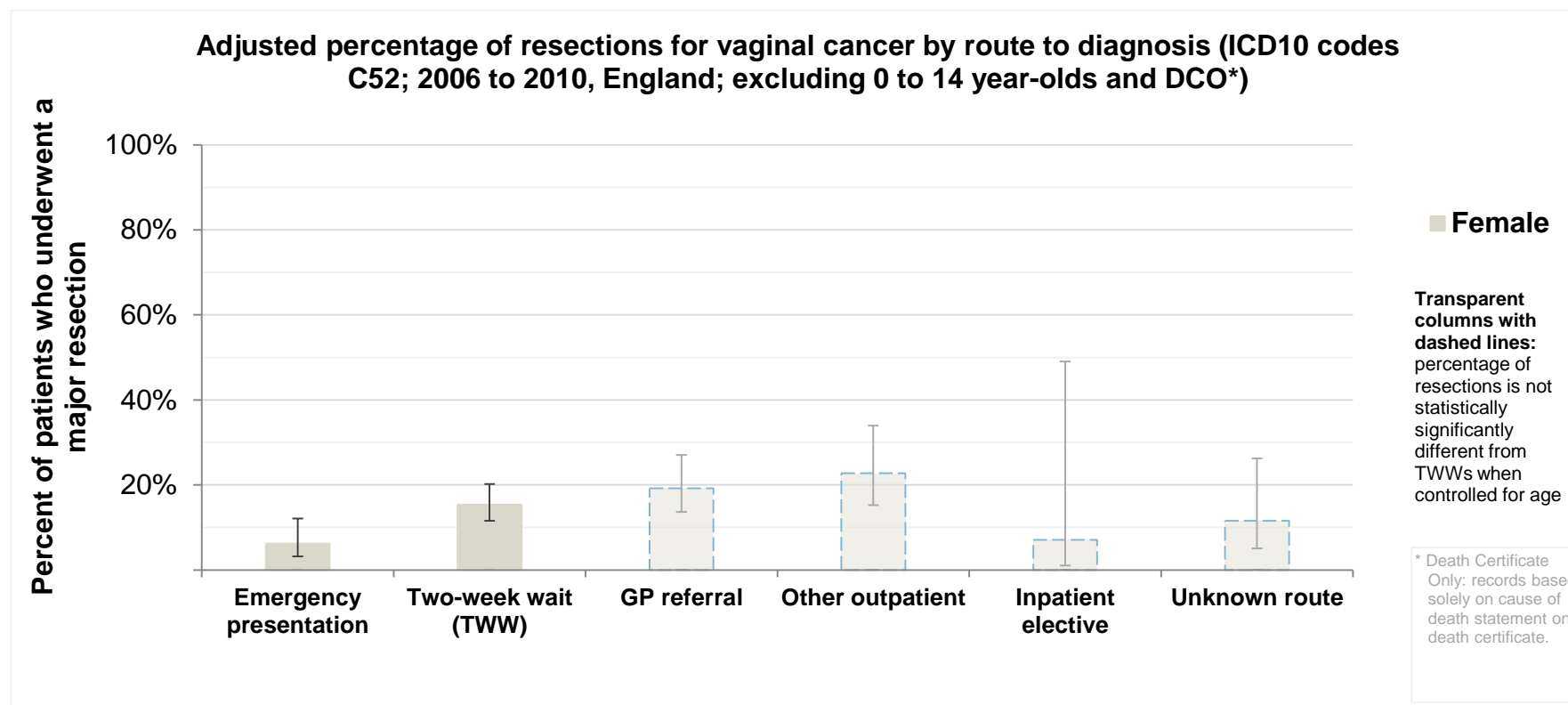
Resections following emergency presentations were 60% lower compared to TWWs.

Analysis also showed that neither GP referral nor inpatient resections were significantly different from outpatients. Resections following an 'unknown' route were not significantly different from emergency presentations.

Percentage of resections for vaginal cancer by route to diagnosis

(ICD10 codes C01,C09-C10; 2006 to 2010, England; excluding 0 to 14 year-olds and DCO*)

Route	Males				Females				Persons			
	No.	Adjusted resection %	95% confidence intervals		No.	Adjusted resection %	95% confidence intervals		No.	Adjusted resection %	95% confidence intervals	
			lower	upper			lower	upper			lower	upper
Emergency presentation	-	-	-	-	158	6.2%	3.2%	12.1%	-	-	-	-
Two-week wait (TWW)	-	-	-	-	266	15.4%	11.6%	20.2%	-	-	-	-
GP referral	-	-	-	-	402	19.2%	13.7%	27.1%	-	-	-	-
Other outpatient	-	-	-	-	131	22.8%	15.3%	34.0%	-	-	-	-
Inpatient elective	-	-	-	-	12	7.1%	1.0%	49.1%	-	-	-	-
Unknown route	-	-	-	-	37	11.5%	5.1%	26.2%	-	-	-	-



Methods

Using OPCS4 codes, operations such as full and partial colpectomy and abdominal hysterocolpectomy were included as major resections. The full list of procedure codes for vaginal cancer is included in the appendix.

These results above show the variation in the percentage of major resection by route to diagnosis. The two-week wait route was used as the baseline to test the statistical significance of differences between routes. Percentages were adjusted for age-differences.

Caution should nevertheless be taken when interpreting these results due to limitations in using HES data. These results do not show the proportion of patients who are cured of their cancer through surgery, although it is believed that a majority of these operations will have been carried out with curative intent.

Cervix (C53)

The results presented here show the percentage of cervical cancer patients who had a record of a major resection as part of their treatment. The percentages have been adjusted for age using the two-week-wait (TWW) route as the baseline.

Compared to TWW, the proportion of patients undergoing a resection was statistically significantly different for most routes, with the exception of inpatient routes.

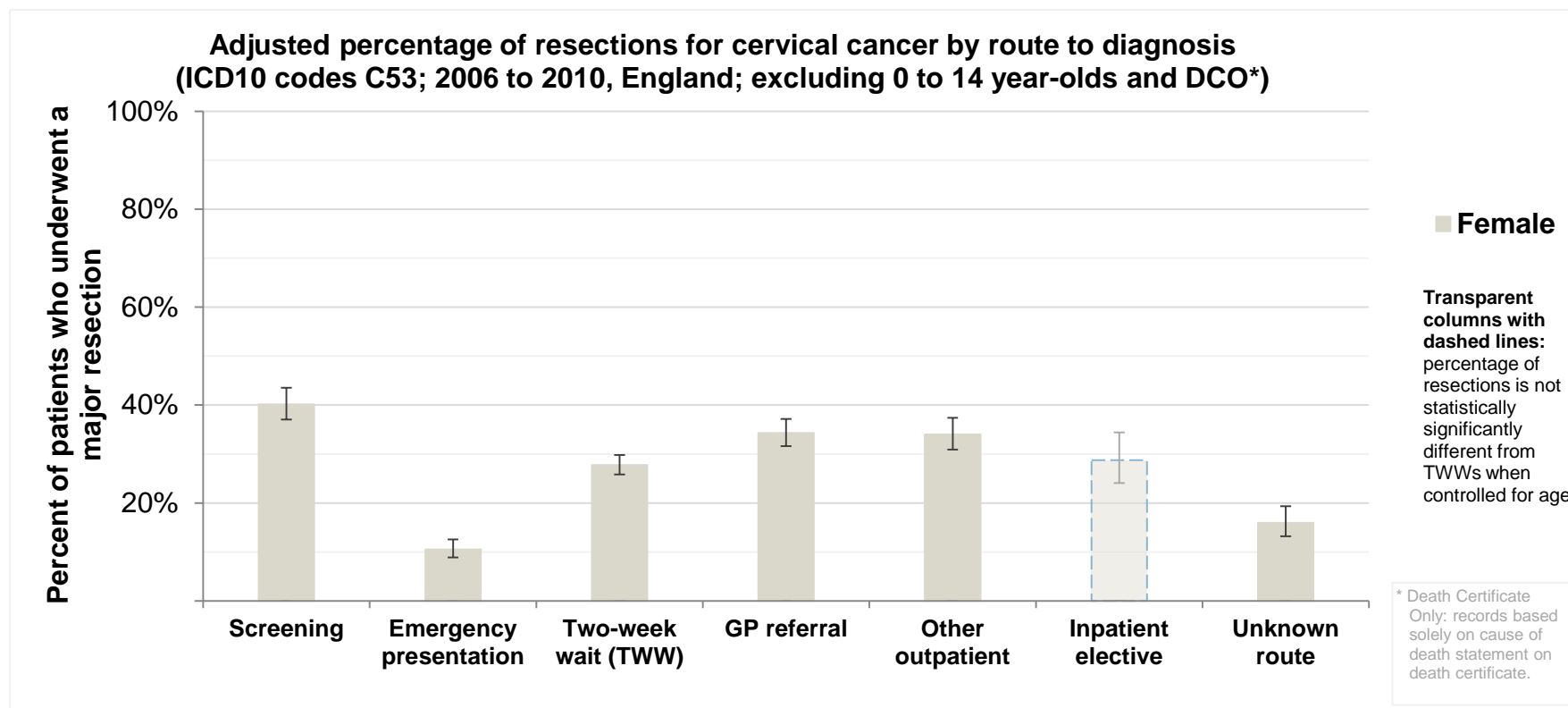
Resections following emergency presentations were 62% lower compared to TWWs. Similarly, they were 24% higher for GP referrals.

Analysis also showed that neither GP referral nor inpatient resections were significantly different from outpatients. Resections following an 'unknown' route were significantly higher compared to emergency presentations.

Percentage of resections for cervical cancer by route to diagnosis

(ICD10 codes C01,C09-C10; 2006 to 2010, England; excluding 0 to 14 year-olds and DCO*)

Route	Males				Females				Persons			
	No.	Adjusted resection %	95% confidence intervals		No.	Adjusted resection %	95% confidence intervals		No.	Adjusted resection %	95% confidence intervals	
			lower	upper			lower	upper			lower	upper
Screening	-	-	-	-	2,943	40.2%	37.0%	43.6%	-	-	-	-
Emergency presentation	-	-	-	-	1,374	10.5%	8.8%	12.5%	-	-	-	-
Two-week wait (TWW)	-	-	-	-	1,978	27.8%	25.8%	29.8%	-	-	-	-
GP referral	-	-	-	-	3,827	34.3%	31.6%	37.2%	-	-	-	-
Other outpatient	-	-	-	-	1,264	34.0%	30.9%	37.4%	-	-	-	-
Inpatient elective	-	-	-	-	247	28.8%	24.0%	34.4%	-	-	-	-
Unknown route	-	-	-	-	497	16.0%	13.2%	19.3%	-	-	-	-



Methods

Using OPCS4 codes, operations such as excision of cervix uteri, hysterocolpectomy and clearance of pelvis were included as major resections. The full list of procedure codes for cervical cancer is included in the appendix.

These results above show the variation in the percentage of major resection by route to diagnosis. The two-week wait route was used as the baseline to test the statistical significance of differences between routes. Percentages were controlled for age-differences.

Caution should nevertheless be taken when interpreting these results due to limitations in using HES data. These results do not show the proportion of patients who are cured of their cancer through surgery, although it is believed that a majority of these operations will have been carried out with curative intent.

Uterus (C54-C55)

The results presented here show the percentage of uterine cancer patients who had a record of a major resection as part of their treatment. The percentages have been adjusted for age using the two-week-wait (TWW) route as the baseline.

Compared to TWW, the proportion of patients undergoing a resection was statistically significantly different for all routes.

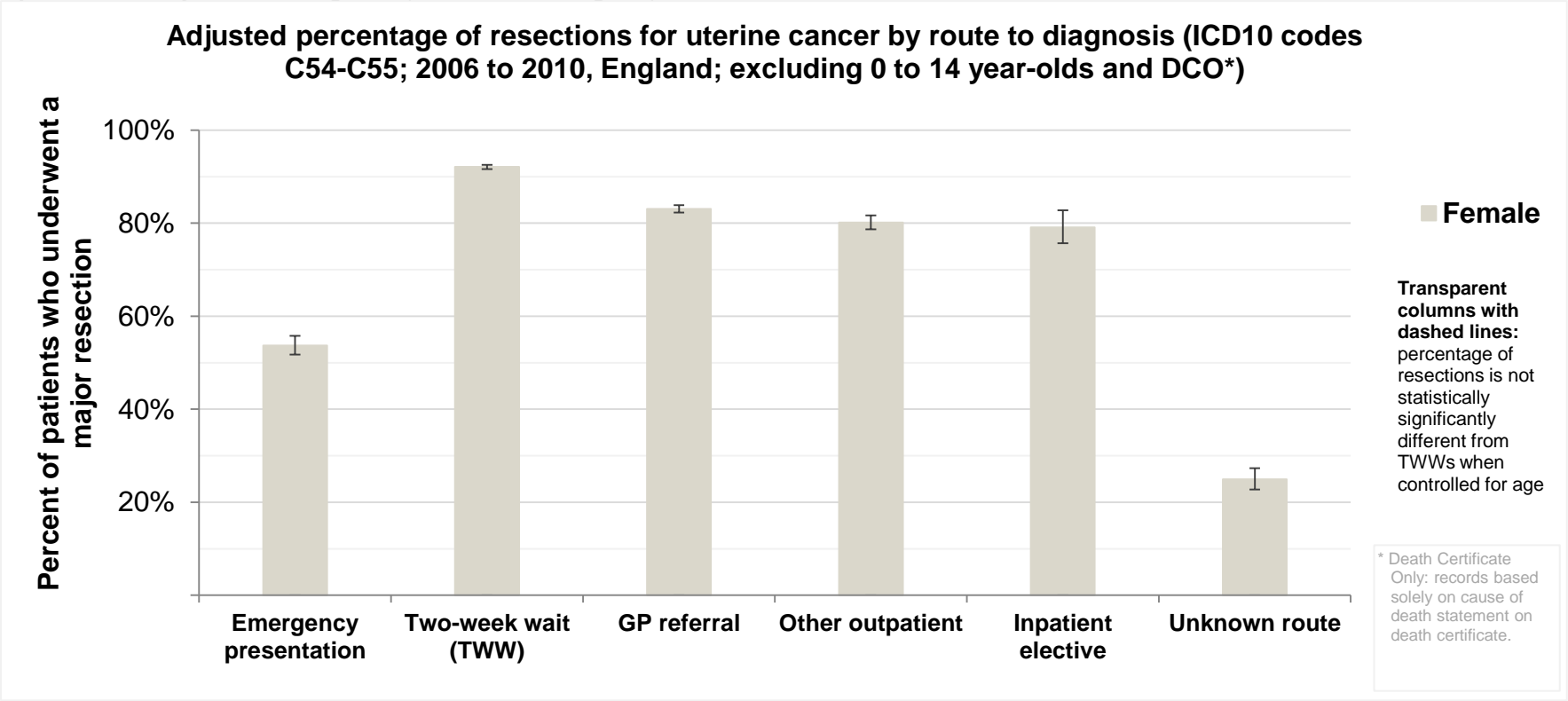
Resections following emergency presentations were 42% lower compared to TWWs. Similarly, they were 10% lower for GP referrals.

Analysis also showed that resections following GP referrals were significantly higher compared to outpatients; there was no difference for inpatient routes. Resections following an 'unknown' route were significantly lower compared to emergency presentations.

Percentage of resections for uterine cancer by route to diagnosis

(ICD10 codes C01,C09-C10; 2006 to 2010, England; excluding 0 to 14 year-olds and DCO*)

Route	Males				Females				Persons			
	No.	Adjusted resection %	95% confidence intervals		No.	Adjusted resection %	95% confidence intervals		No.	Adjusted resection %	95% confidence intervals	
			lower	upper			lower	upper			lower	upper
Emergency presentation	-	-	-	-	2,636	53.7%	51.7%	55.8%	-	-	-	-
Two-week wait (TWW)	-	-	-	-	12,656	92.1%	91.6%	92.6%	-	-	-	-
GP referral	-	-	-	-	11,775	83.1%	82.3%	83.9%	-	-	-	-
Other outpatient	-	-	-	-	2,837	80.2%	78.7%	81.7%	-	-	-	-
Inpatient elective	-	-	-	-	481	79.1%	75.7%	82.7%	-	-	-	-
Unknown route	-	-	-	-	1,334	24.9%	22.7%	27.3%	-	-	-	-



Methods

Using OPCS4 codes, operations such as hysterectomy, hysterocolpectomy, salpingoophorectomy and clearance of pelvis were included as major resections. The full list of procedure codes for uterine cancer is included in the appendix.

These results above show the variation in the percentage of major resection by route to diagnosis. The two-week wait route was used as the baseline to test the statistical significance of differences between routes. Percentages were adjusted for age-differences.

Caution should nevertheless be taken when interpreting these results due to limitations in using HES data. These results do not show the proportion of patients who are cured of their cancer through surgery, although it is believed that a majority of these operations will have been carried out with curative intent.

Ovary (C56-C57)

The results presented here show the percentage of ovarian cancer patients who had a record of a major resection as part of their treatment. The percentages have been adjusted for age using the two-week-wait (TWW) route as the baseline.

Compared to TWW, the proportion of patients undergoing a resection was statistically significantly different for all routes.

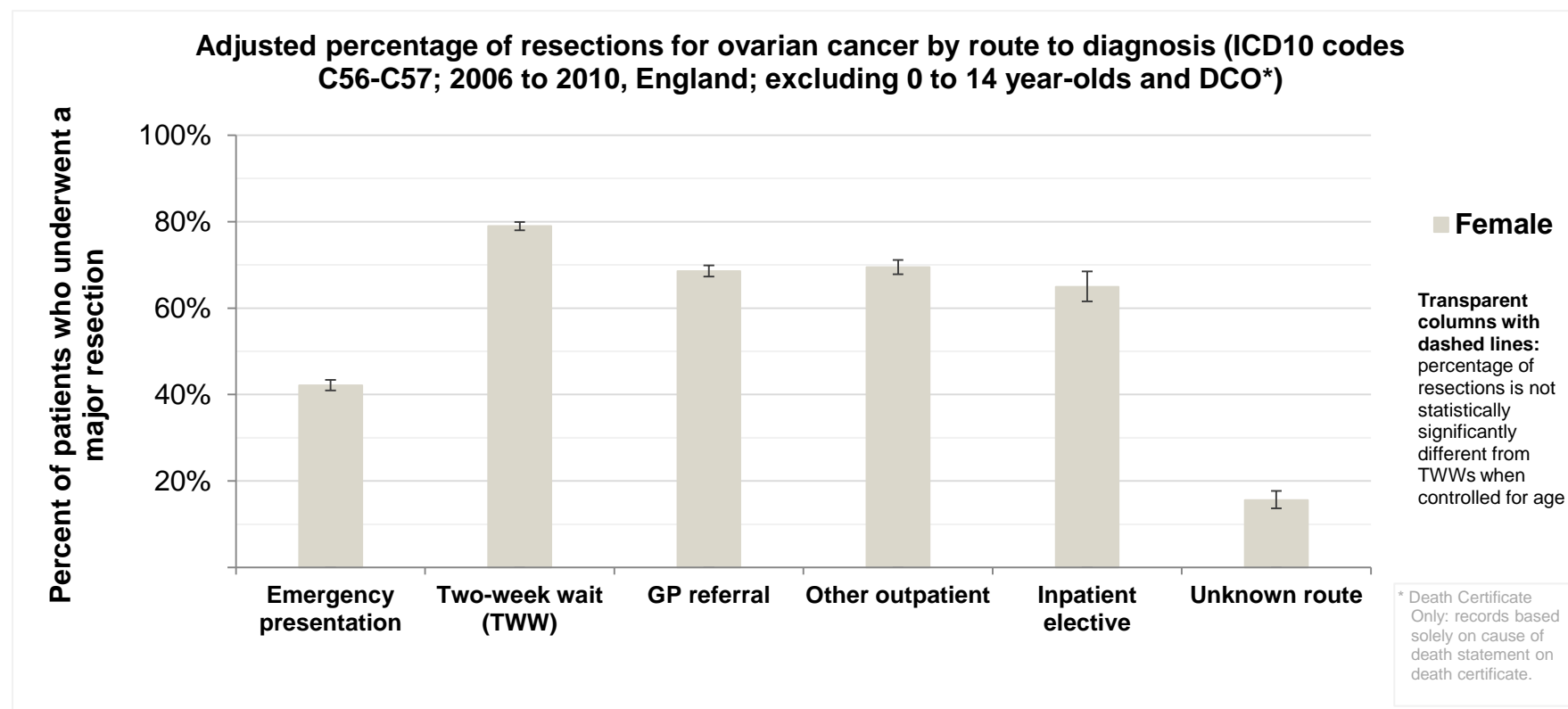
Resections following emergency presentations were 47% lower compared to TWWs. Similarly, they were 13% lower for GP referrals.

Analysis also showed that resections following inpatient routes were significantly lower compared to outpatients; there was no difference for GP referrals. Resections following an 'unknown' route were significantly lower compared to emergency presentations.

Percentage of resections for ovarian cancer by route to diagnosis

(ICD10 codes C01,C09-C10; 2006 to 2010, England; excluding 0 to 14 year-olds and DCO*)

Route	Males				Females				Persons			
	No.	Adjusted resection %	95% confidence intervals		No.	Adjusted resection %	95% confidence intervals		No.	Adjusted resection %	95% confidence intervals	
			lower	upper			lower	upper			lower	upper
Emergency presentation	-	-	-	-	8,711	42.1%	41.0%	43.4%	-	-	-	-
Two-week wait (TWW)	-	-	-	-	6,766	79.0%	78.0%	79.9%	-	-	-	-
GP referral	-	-	-	-	7,136	68.6%	67.3%	69.9%	-	-	-	-
Other outpatient	-	-	-	-	3,575	69.5%	67.9%	71.1%	-	-	-	-
Inpatient elective	-	-	-	-	606	64.9%	61.5%	68.5%	-	-	-	-
Unknown route	-	-	-	-	1,221	15.6%	13.7%	17.7%	-	-	-	-



Methods

Using OPCS4 codes, operations such as salpingoophorectomy, hysterocolpectomy, bowel resections and clearance of pelvis were included as major resections. The full list of procedure codes for ovarian cancer is included in the appendix.

These results above show the variation in the percentage of major resection by route to diagnosis. The two-week wait route was used as the baseline to test the statistical significance of differences between routes. Percentages were adjusted for age-differences.

Caution should nevertheless be taken when interpreting these results due to limitations in using HES data. These results do not show the proportion of patients who are cured of their cancer through surgery, although it is believed that a majority of these operations will have been carried out with curative intent.

Male reproductive organs

Prostate (C61)

The results presented here show the percentage of prostate cancer patients who had a record of a major resection as part of their treatment. The percentages have been adjusted for age using the two-week-wait (TWW) route as the baseline.

Compared to TWW, the proportion of patients undergoing a resection was statistically significantly different for all routes.

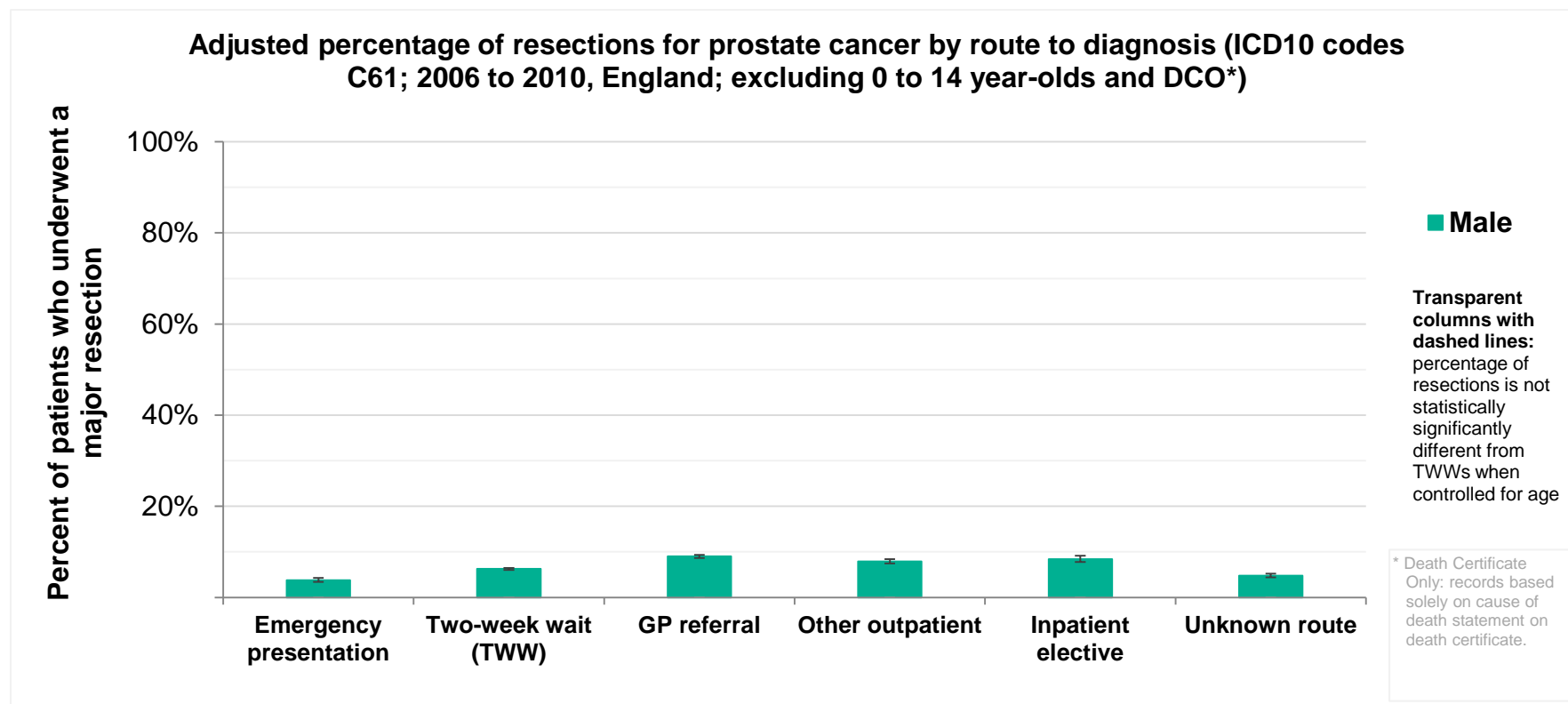
Resections following emergency presentations were 39% lower compared to TWWs. Similarly, they were 44% higher for GP referrals.

Analysis also showed that resections following GP referrals were significantly higher compared to outpatients; there was no difference for inpatient routes. Resections following an 'unknown' route were significantly higher compared to emergency presentations.

Percentage of resections for prostate cancer by route to diagnosis

(ICD10 codes C01,C09-C10; 2006 to 2010, England; excluding 0 to 14 year-olds and DCO*)

Route	Males				Females				Persons			
	No.	Adjusted resection %	95% confidence intervals		No.	Adjusted resection %	95% confidence intervals		No.	Adjusted resection %	95% confidence intervals	
			lower	upper			lower	upper			lower	upper
Emergency presentation	15,346	3.8%	3.4%	4.3%	-	-	-	-	-	-	-	-
Two-week wait (TWW)	47,037	6.3%	6.1%	6.5%	-	-	-	-	-	-	-	-
GP referral	69,127	9.0%	8.7%	9.4%	-	-	-	-	-	-	-	-
Other outpatient	18,949	7.9%	7.5%	8.4%	-	-	-	-	-	-	-	-
Inpatient elective	4,717	8.4%	7.8%	9.2%	-	-	-	-	-	-	-	-
Unknown route	8,273	4.8%	4.4%	5.2%	-	-	-	-	-	-	-	-



Methods

Using OPCS4 codes, operations involving the total/open excision of the prostate were included as major resections. The full list of procedure codes for prostate cancer is included in the appendix.

These results above show the variation in the percentage of major resection by route to diagnosis. The two-week wait route was used as the baseline to test the statistical significance of differences between routes. Percentages were adjusted for age-differences.

Caution should nevertheless be taken when interpreting these results due to limitations in using HES data. These results do not show the proportion of patients who are cured of their cancer through surgery, although it is believed that a majority of these operations will have been carried out with curative intent.

Urological

Kidney and unspecified urinary organs (C64-C66,C68)

The results presented here show the percentage of kidney cancer patients who had a record of a major resection as part of their treatment. The percentages have been adjusted for age using the two-week-wait (TWW) route as the baseline.

Compared to TWW, the proportion of patients undergoing a resection was statistically significantly different for most routes, with the exception of outpatient routes for both sexes.

Resections following emergency presentations were 57% lower for males and 64% lower for females, compared to TWWs. Similarly, they were 8% lower for male and 10% lower for female GP referrals.

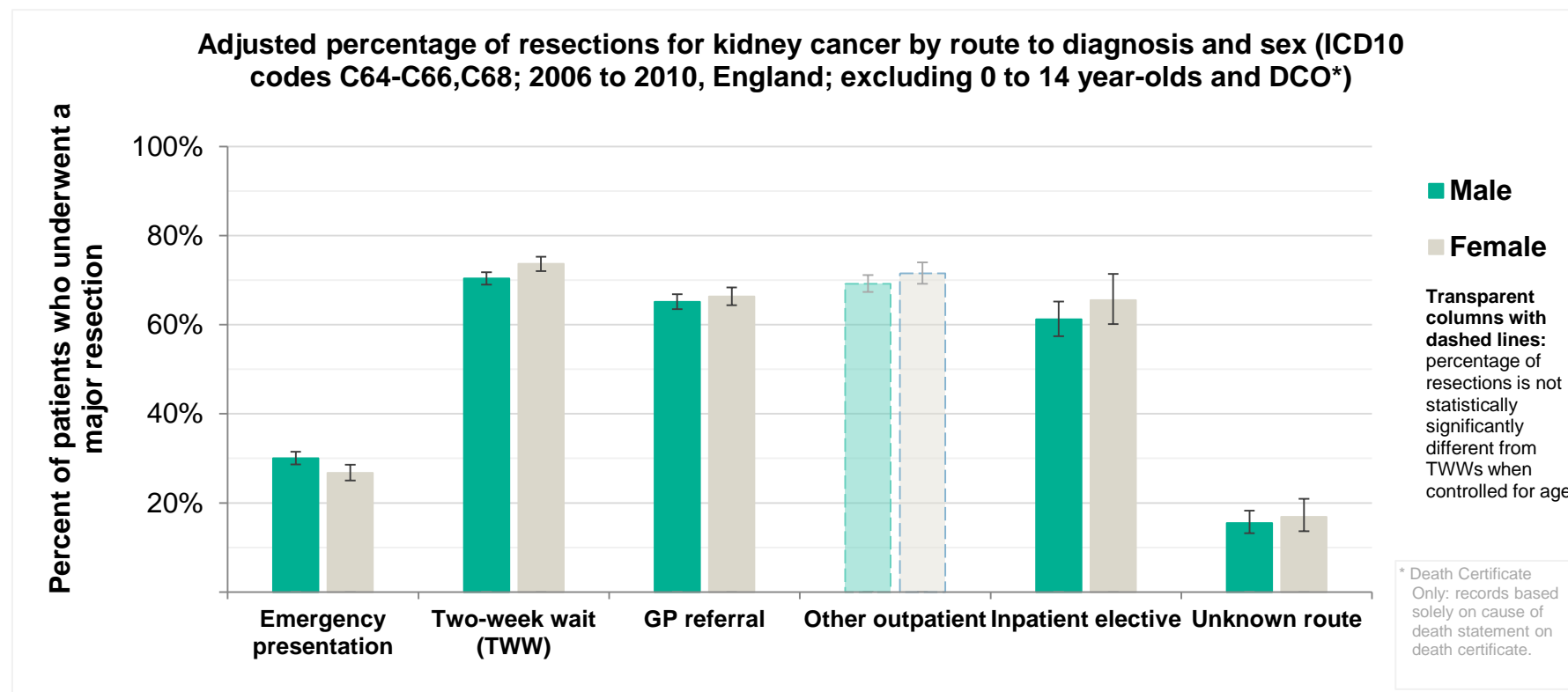
Further statistical tests indicated that the difference between male and female resection percentages was statistically significant for TWWs, GP referrals and outpatient routes.

Analysis also showed that resections following GP referrals for both sexes and male inpatients routes were significantly lower compared to outpatients; there was no difference for female inpatients. For males and females, resections following an 'unknown' route were significantly lower compared to emergency presentations.

Percentage of resections for kidney and unspecified urinary cancer by route to diagnosis and sex

(ICD10 codes C01,C09-C10; 2006 to 2010, England; excluding 0 to 14 year-olds and DCO*)

Route	Males				Females				Persons			
	No.	Adjusted resection %	95% confidence intervals		No.	Adjusted resection %	95% confidence intervals		No.	Adjusted resection %	95% confidence intervals	
			lower	upper			lower	upper			lower	upper
Emergency presentation	5,231	30.0%	28.6%	31.5%	3,472	26.7%	25.0%	28.6%	8,703	28.8%	27.7%	29.9%
Two-week wait (TWW)	4,231	70.4%	69.0%	71.8%	2,815	73.7%	72.1%	75.3%	7,046	71.7%	70.7%	72.8%
GP referral	6,680	65.1%	63.5%	66.8%	4,070	66.3%	64.4%	68.4%	10,750	65.6%	64.4%	66.9%
Other outpatient	4,134	69.2%	67.3%	71.2%	2,167	71.5%	69.2%	74.0%	6,301	70.1%	68.6%	71.6%
Inpatient elective	605	61.2%	57.4%	65.2%	304	65.5%	60.1%	71.4%	909	62.6%	59.5%	65.9%
Unknown route	782	15.5%	13.2%	18.2%	436	16.9%	13.7%	20.9%	1,218	16.0%	14.0%	18.2%



Methods

Using OPCS4 codes, operations such as nephroureterectomy, total and partial excision of kidney and excision of ureter were included as major resections. The full list of procedure codes for renal cancer is included in the appendix.

These results above show the variation in the percentage of major resection by sex and route to diagnosis. The two-week wait route was used as the baseline to test the statistical significance of differences between routes. Male and female percentages were adjusted for age-differences.

Caution should nevertheless be taken when interpreting these results due to limitations in using HES data. These results do not show the proportion of patients who are cured of their cancer through surgery, although it is believed that a majority of these operations will have been carried out with curative intent.

Bladder (C67)

The results presented here show the percentage of bladder cancer patients who had a record of a major resection as part of their treatment. The percentages have been adjusted for age using the two-week-wait (TWW) route as the baseline.

Compared to TWW, the proportion of patients undergoing a resection was statistically significantly different for most routes, with the exception of GP referral for both sexes, male outpatient and female inpatient and 'unknown' routes.

Resections following emergency presentations were 29% lower for males and 33% lower for females, compared to TWWs.

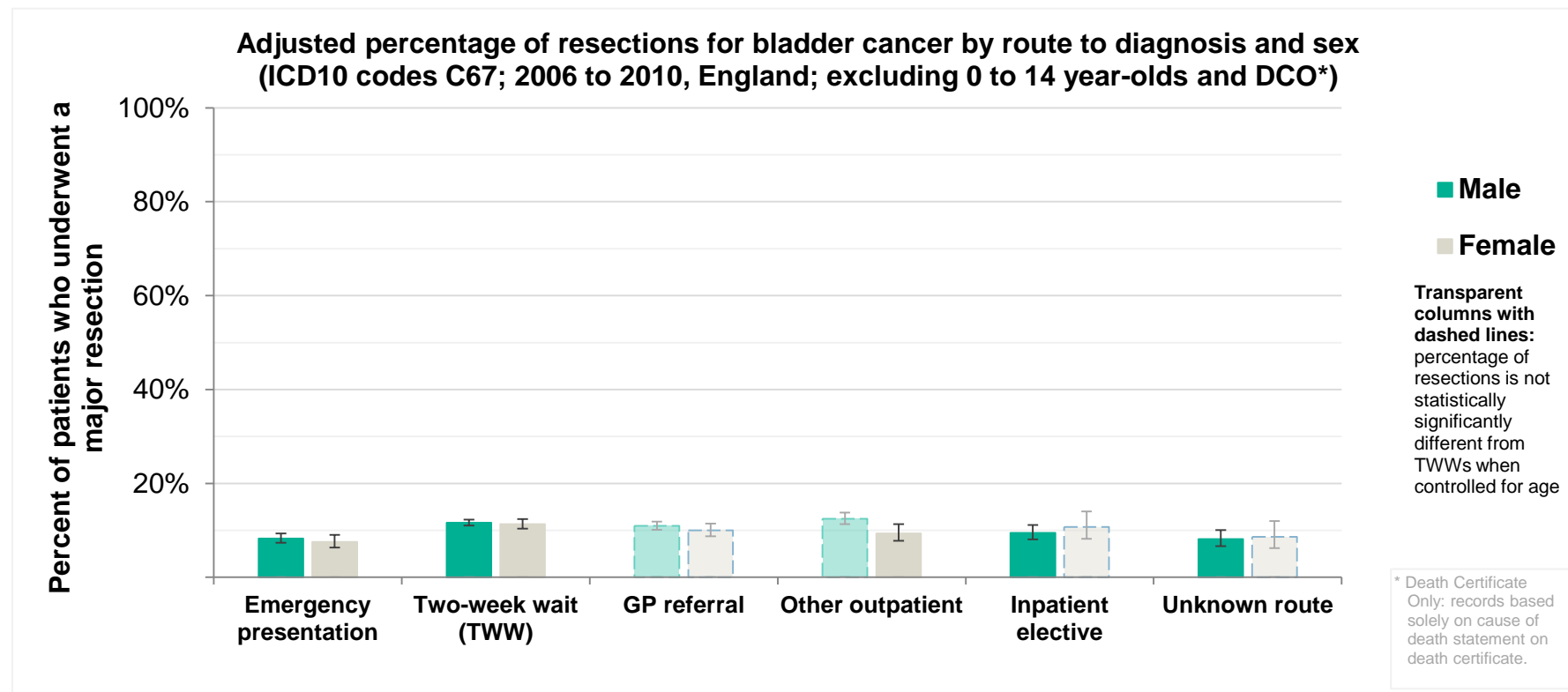
Further statistical tests indicated that the difference between male and female resection percentages was not statistically significant for any of the routes.

Analysis also showed that resections following male GP referrals and inpatient routes were significantly lower compared to outpatients; there was no difference for female GP referrals or inpatient routes. For males and females, resections following an 'unknown' route were not significantly different from emergency presentations.

Percentage of resections for bladder cancer by route to diagnosis and sex

(ICD10 codes C01,C09-C10; 2006 to 2010, England; excluding 0 to 14 year-olds and DCO*)

Route	Males				Females				Persons			
	No.	Adjusted resection %	95% confidence intervals		No.	Adjusted resection %	95% confidence intervals		No.	Adjusted resection %	95% confidence intervals	
			lower	upper			lower	upper			lower	upper
Emergency presentation	5,007	8.3%	7.4%	9.3%	2,936	7.6%	6.3%	9.0%	7,943	8.1%	7.3%	9.0%
Two-week wait (TWW)	9,972	11.6%	11.0%	12.3%	3,508	11.3%	10.3%	12.4%	13,480	11.6%	11.0%	12.1%
GP referral	9,063	10.9%	10.1%	11.8%	3,274	10.0%	8.7%	11.4%	12,337	10.7%	10.0%	11.5%
Other outpatient	4,321	12.5%	11.3%	13.8%	1,362	9.4%	7.8%	11.3%	5,683	11.8%	10.8%	12.8%
Inpatient elective	1,498	9.5%	8.1%	11.1%	471	10.7%	8.2%	14.0%	1,969	9.8%	8.5%	11.2%
Unknown route	972	8.2%	6.6%	10.1%	358	8.6%	6.2%	12.0%	1,330	8.3%	7.0%	9.9%



Methods

Using OPCS4 codes, operations such as total excision of bladder, cystourethrectomy and cystoprostatectomy (males only) were included as major resections. The full list of procedure codes for bladder cancer is included in the appendix.

These results above show the variation in the percentage of major resection by sex and route to diagnosis. The two-week wait route was used as the baseline to test the statistical significance of differences between routes. Male and female percentages were adjusted for age-differences.

Caution should nevertheless be taken when interpreting these results due to limitations in using HES data. These results do not show the proportion of patients who are cured of their cancer through surgery, although it is believed that a majority of these operations will have been carried out with curative intent.

Appendix

Glossary

Cases

Cases included were those diagnosed during the years 2006 to 2010 with a cancer of the 20 sites listed, and allowing for the exclusions below. A total of 971,336 records were included. These were the denominator of the resection percentage.

Exclusions

A total of 33,430 cases were excluded from the analysis.

Most of these cases had not been assigned a route to diagnosis as a result of the de-duplication algorithm used in the 2006 to 2010 routes to diagnosis study.⁶ Please see the technical documentation of the 2006 to 2010 routes to diagnosis study [NCIN 2013].

Male breast cancer cases with a route to diagnosis through the breast cancer screening programme, as well as registrations based solely on DCOs and patients aged 0 to 14 were also excluded.

Table 3: Breakdown of excluded cases

Exclusion due to:	Males	Females	Persons
1. No route assigned	12,175	16,163	28,338
2. Male breast screening	7	-	7
3. Death certificate only	1,966	2,469	4,435
4. 0 to 14 year-olds	287	363	650
Total	14,435	18,995	33,430

Note that the figures for 'no route assigned' and 'death certificate only' contain an additional nine cases of '0 to 14 year-olds'.

Confidence intervals

These are a measure of variability in the calculated percentages. The upper and lower limits of the confidence interval show how big a contribution chance may have made to

⁶ This does not mean that these cases would have been assigned an 'unknown' route had they been included in the routes to diagnosis study.

a particular statistic. The 95% confidence intervals quoted give the range in which the rate in question would fall 19 times out of 20, were it possible to repeat the analyses.

The generalized linear model regression outputs 95% confidence intervals. (See resection percentage and regression below.)

For the crude resection percentages, 95% confidence intervals are calculated using the Wilson score method. These have only been included in the Excel data workbook.

Death certificate only (DCO)

These are cancer registrations based solely on a death certificate on which cancer is indicated as a cause of death. No other information relating to the cancer diagnosis could be found at the time of registration.

HES and HSCIC

Hospital episode statistics (HES) data for inpatient and day-care admissions, containing procedures and diagnoses coded by NHS trusts in England, are held at the Health and Social Care Information Centre (HSCIC). The HES extract used in the major resections analysis consisted of inpatient and day case episodes for the cancer patients registered on the NCDR.

ICD10

The International Statistical Classification of Diseases and Related Health Problems 10th Revision, managed by the World Health Organization (2010 edition).

LCI and UCI

These are the acronyms for lower confidence interval and upper confidence interval. See 'confidence intervals' above.

Major resection

A major surgical resection was defined with Site Specific Clinical Reference Group lead clinicians as an operation which would be carried out on a cancer patient to attempt to remove the entire tumour. The resection procedures were defined using OPCS4 codes, as agreed with SSCRG clinicians. The OPCS4 procedure codes are included below.

For the data presented in this report, a major resection for a given record on NCDR was considered to be the earliest operation having any of the agreed OPCS4 procedure codes in the HES data string, within the follow-up period detailed above. So if a patient underwent more than one operation for their cancer then the earliest one was accepted as the major resection.

NCDR

The National Cancer Data Repository contains details of all patients registered with cancer in England. The details of cancer patients diagnosed between 2006 and 2010 were extracted from this dataset and used in this study.

OPCS4

The Office of Population Censuses and Surveys Classification of Surgical Operations and Procedures (4th revision) is a coding system, managed by the Clinical Classifications Service at the HSCIC. It is used by Trusts across England to record procedures which patients underwent at the hospital.

Resection percentage and statistical tests

Resection percentages shown in this report have been adjusted for age and, where necessary, sex by running a Poisson generalised linear model regression with a log link in STATA®. Unless otherwise stated above, the resulting resection percentages were adjusted using the two-week-wait route as a baseline.

As well as controlling for age (and if relevant sex), the regression tests the statistical significance of differences between the proportions of resections for each route compared with the baseline and outputs *p*-values at a 95% confidence interval. This means that resection percentages were statistically significantly different compared with the baseline when *p*-value was less than 0.05.

Crude resection percentages were calculated by dividing the cases with a matched resection in HES data (the numerator), by the number of cases for a given diagnosis, sex and age combination (the denominator). This represents the number of patients who underwent a resection for every 100 patients diagnosed with the respective cancer. Crude percentages have only been included in the Excel data workbook. Owing to age and sex-differences between the routes these should be used with caution.

Route to diagnosis

The routes to diagnosis study defines a methodology by which the route the patient follows to the point of diagnosis can be categorised, in order to examine demographic, organisational, service and personal reasons for delayed diagnosis.

It combines cancer registration data from the NCDR with administrative HES, cancer waiting times (CWT) and cancer screening programmes data to categorise every case of cancer registered in England, diagnosed in 2006 to 2010, into one of eight 'routes to diagnosis'.

The NCDR dataset used in the routes to diagnosis 2006 to 2010 study was de-duplicated using European Network of Cancer Registries (ENCR) criteria, resulting in a number of 'duplicate' cancer diagnosis records not being assigned a route [NCIN 2013]. These cases have thus also been excluded from the present report (see 'Exclusions' above).

More information on routes to diagnosis, including a full technical document detailing the methodology, is available on the NCIN website, here:

www.ncin.org.uk/publications/routes_to_diagnosis

Sex

The coefficients for sex in the regression stratified by site and route showed the amount of variation in resection rates due to sex alone. In other words, it shows how much variation would occur from moving from one sex to the other. If the p-value was less than 0.05 (with a 95% confidence interval) then the impact of the sex of the patients was significant on the proportion of resections for a given site and route. This implies that the difference in the proportion of resections between male and female patients was significant. This regression also adjusted for age to make sure that the age effect is not confounding the sex effect.

Site Specific Clinical Reference Groups (SSCRG)

The SSCRG bring together clinical specialists, staff from the cancer registration service, patient and charity representatives in order to advise, support and shape the work of the NCIN. More information can be found on the NCIN website, notably here:

www.ncin.org.uk/cancer_type_and_topic_specific_work/cancer_type_specific_work/sscrs

Cancer site ICD10 groups

The cancer groups included in this report are as follows, grouped by ICD10 codes here listed. The corresponding procedure codes are listed in the chapter following this list, with the sites in the same order as here shown.

• Head and neck	Oropharynx	C01,C09-C10
	Oral cavity	C02-C04,C06
	Salivary glands	C07-C08
	Hypopharynx	C12-C13
	Larynx	C32
• Upper GI	Oesophagus	C15
	Stomach	C16
	Liver	C22
	Pancreas	C25
• Lower GI	Colorectal	C18-C20
• Respiratory	Lung	C33-C34
• Breast	Breast (malignant)	C50
• Female reproductive organs	Vulva	C51
	Vagina	C52
	Cervix (malignant)	C53
	Uterus	C54-C55
	Ovary	C56-C57
• Male reproductive organs	Prostate	C61
• Urological	Kidney and unspecified urinary organs	C64-C66,C68
	Bladder (malignant)	C67

Major resection OPCS4 procedure codes

The following OPCS4 procedure codes had been agreed as 'major resections' for the sites indicated. Sites are listed in order of ICD10 code groups, as listed here above.

Head and neck (for oropharynx, oral cavity, salivary glands, hypopharynx and larynx)

E19.1	Total pharyngectomy
E19.2	Partial pharyngectomy
E21.4	Plastic repair of pharynx NEC
E23.1	Open excision of lesion of pharynx
E29.1	Total laryngectomy
E29.2	Partial horizontal laryngectomy
E29.3	Partial vertical laryngectomy
E29.5	Laryngofissure and chordectomy of vocal chord

Head and neck (for oropharynx, oral cavity, salivary glands, hypopharynx and larynx)

E30.1	Excision of lesion of larynx using thyrotomy as approach
E34.1	Microtherapeutic endoscopic extirpation of lesion of larynx using laser
E34.2	Microtherapeutic endoscopic resection of lesion of larynx NEC
E41.4	Tracheo-oesophageal puncture with insertion of speech prosthesis
F01.1	Excision of vermilion border of lip and advancement of mucosa of lip
F01.8	Other specified partial excision of lip
F04.2	Reconstruction of lip using skin flap
F20.2	Excision of lesion of gingiva
F22.1	Total glossectomy
F22.2	Partial glossectomy
F30.1	Plastic repair of palate using flap of palate
F30.3	Plastic repair of palate using flap of tongue
F30.4	Plastic repair of palate using graft of skin
F30.5	Plastic repair of palate using flap of mucosa
F32.4	Operations on uvula NEC
F32.8	Other specified other operations on palate
F34.9	Unspecified excision of tonsil
F38.1	Excision of lesion of floor of mouth
F38.2	Excision of lesion of mouth NEC
F39.1	Reconstruction of mouth using flap NEC
F39.2	Reconstruction of mouth using graft NEC
F44.1	Total excision of parotid gland
F44.2	Partial excision of parotid gland
G02.1	Total oesophagectomy and anastomosis of pharynx to stomach
G03.2	Partial oesophagectomy and interposition of microvascularly attached jejunum
S17.1	Distant myocutaneous subcutaneous pedicle flap to head or neck
S20.8	Other specified other distant flap of skin
S24.8	Other specified local flap of skin and muscle
S28.8	Other specified flap of mucosa
S35.3	Split autograft of skin to head or neck NEC
T85.1	Block dissection of cervical lymph nodes
V14.1	Hemimandibulectomy
V14.2	Extensive excision of mandible NEC
V14.3	Partial excision of mandible NEC
V14.4	Excision of lesion of mandible
V16.8	Other specified division of mandible
V19.1	Reconstruction of mandible
Y05.1	Total excision of organ NOC
Y59.2	Harvest of radial artery flap of skin and fascia
Y59.8	Other specified harvest of flap of skin and fascia
Y61.2	Harvest of flap of skin and pectoralis major muscle
Y63.1	Harvest of flap of latissimus dorsi muscle NEC

Head and neck (for oropharynx, oral cavity, salivary glands, hypopharynx and larynx)

Y63.8 Other specified harvest of flap of muscle of trunk

Y66.2 Harvest of bone from rib

Oesophagus

G01.1 Oesophagogastrectomy and anastomosis of oesophagus to stomach

G01.8 Other specified excision of oesophagus and stomach

G01.9 Unspecified excision of oesophagus and stomach

G02.1 Total oesophagectomy and anastomosis of pharynx to stomach

G02.2 Total oesophagectomy and interposition of microvascularly attached jejunum

G02.3 Total oesophagectomy and interposition of jejunum NEC

G02.4 Total oesophagectomy and interposition of microvascularly attached colon

G02.5 Total oesophagectomy and interposition of colon NEC

G02.8 Other specified total excision of oesophagus

G02.9 Unspecified total excision of oesophagus

G03.1 Partial oesophagectomy and end to end anastomosis of oesophagus

G03.2 Partial oesophagectomy and interposition of microvascularly attached jejunum

G03.5 Partial oesophagectomy and interposition of microvascularly attached colon

G03.6 Partial oesophagectomy and interposition of colon NEC

G03.8 Other specified partial excision of oesophagus

G03.9 Unspecified partial excision of oesophagus

Stomach

G01.2 Oesophagogastrectomy and anastomosis of oesophagus to transposed jejunum

G01.3 Oesophagogastrectomy and anastomosis of oesophagus to jejunum NEC

G27.1 Total gastrectomy and excision of surrounding tissue

G27.2 Total gastrectomy and anastomosis of oesophagus to duodenum

G27.3 Total gastrectomy and interposition of jejunum

G27.4 Total gastrectomy and anastomosis of oesophagus to transposed jejunum

G27.5 Total gastrectomy and anastomosis of oesophagus to jejunum NEC

G27.8 Other specified total excision of stomach

G27.9 Unspecified total excision of stomach

G28.1 Partial gastrectomy and anastomosis of stomach to duodenum

G28.2 Partial gastrectomy and anastomosis of stomach to transposed jejunum

G28.3 Partial gastrectomy and anastomosis of stomach to jejunum NEC

G28.8 Other specified partial excision of stomach

G28.9 Unspecified partial excision of stomach

Liver

J02.1 Right hemihepatectomy NEC

Liver

J02.2	Left hemihepatectomy NEC
J02.3	Resection of segment of liver
J02.4	Wedge excision of liver
J02.6	Extended right hemihepatectomy
J02.7	Extended left hemihepatectomy
J02.8	Other specified partial excision of liver
J02.9	Unspecified partial excision of liver

Pancreas

J55.1	Total pancreatectomy and excision of surrounding tissue
J55.2	Total pancreatectomy NEC
J55.8	Other specified total excision of pancreas
J55.9	Unspecified total excision of pancreas
J56.1	Pancreaticoduodenectomy and excision of surrounding tissue
J56.2	Pancreaticoduodenectomy and resection of antrum of stomach
J56.3	Pancreaticoduodenectomy NEC
J56.4	Subtotal excision of head of pancreas with preservation of duodenum and drainage HFQ
J56.8	Other specified excision of head of pancreas
J56.9	Unspecified excision of head of pancreas
J57.1	Subtotal pancreatectomy
J57.2	Left pancreatectomy and drainage of pancreatic duct
J57.3	Left pancreatectomy NEC
J57.4	Excision of tail of pancreas and drainage of pancreatic duct
J57.5	Excision of tail of pancreas NEC
J57.8	Other specified other partial excision of pancreas
J57.9	Unspecified other partial excision of pancreas

Colorectal

X14.1	Total exenteration of pelvis
X14.2	Anterior exenteration of pelvis
X14.3	Posterior exenteration of pelvis
H04.1	Panproctocolectomy and ileostomy
H04.2	Panproctocolectomy and anastomosis of ileum to anus and creation of pouch HFQ
H04.3	Panproctocolectomy and anastomosis of ileum to anus NEC
H04.8	Other specified total excision of colon and rectum
H04.9	Unspecified total excision of colon and rectum
H05.1	Total colectomy and anastomosis of ileum to rectum
H05.2	Total colectomy and ileostomy and creation of rectal fistula HFQ
H05.3	Total colectomy and ileostomy NEC

Colorectal

H05.8	Other specified total excision of colon
H05.9	Unspecified total excision of colon
H06.1	Extended right hemicolectomy and end to end anastomosis
H06.2	Extended right hemicolectomy and anastomosis of ileum to colon
H06.3	Extended right hemicolectomy and anastomosis NEC
H06.4	Extended right hemicolectomy and ileostomy HFQ
H06.8	Other specified extended excision of right hemicolon
H06.9	Unspecified extended excision of right hemicolon
H07.1	Right hemicolectomy and end to end anastomosis of ileum to colon
H07.2	Right hemicolectomy and side to side anastomosis of ileum to transverse colon
H07.3	Right hemicolectomy and anastomosis NEC
H07.4	Right hemicolectomy and ileostomy HFQ
H07.8	Other specified other excision of right hemicolon
H07.9	Unspecified other excision of right hemicolon
H08.1	Transverse colectomy and end to end anastomosis
H08.2	Transverse colectomy and anastomosis of ileum to colon
H08.3	Transverse colectomy and anastomosis NEC
H08.4	Transverse colectomy and ileostomy HFQ
H08.5	Transverse colectomy and exteriorisation of bowel NEC
H08.8	Other specified excision of transverse colon
H08.9	Unspecified excision of transverse colon
H09.1	Left hemicolectomy and end to end anastomosis of colon to rectum
H09.2	Left hemicolectomy and end to end anastomosis of colon to colon
H09.3	Left hemicolectomy and anastomosis NEC
H09.4	Left hemicolectomy and ileostomy HFQ
H09.5	Left hemicolectomy and exteriorisation of bowel NEC
H09.8	Other specified excision of left hemicolon
H09.9	Unspecified excision of left hemicolon
H10.1	Sigmoid colectomy and end to end anastomosis of ileum to rectum
H10.2	Sigmoid colectomy and anastomosis of colon to rectum
H10.3	Sigmoid colectomy and anastomosis NEC
H10.4	Sigmoid colectomy and ileostomy HFQ
H10.5	Sigmoid colectomy and exteriorisation of bowel NEC
H10.8	Other specified excision of sigmoid colon
H10.9	Unspecified excision of sigmoid colon
H11.1	Colectomy and end to end anastomosis of colon to colon NEC
H11.2	Colectomy and side to side anastomosis of ileum to colon NEC
H11.3	Colectomy and anastomosis NEC
H11.4	Colectomy and ileostomy NEC
H11.5	Colectomy and exteriorisation of bowel NEC
H11.8	Other specified other excision of colon
H11.9	Unspecified other excision of colon

Colorectal

H29.1	Subtotal excision of colon and rectum and creation of colonic pouch and anastomosis of colon to anus
H29.2	Subtotal excision of colon and rectum and creation of colonic pouch NEC
H29.3	Subtotal excision of colon and creation of colonic pouch and anastomosis of colon to rectum
H29.4	Subtotal excision of colon and creation of colonic pouch NEC
H29.8	Other specified subtotal excision of colon
H29.9	Unspecified subtotal excision of colon
H33.1	Abdominoperineal excision of rectum and end colostomy
H33.2	Proctectomy and anastomosis of colon to anus
H33.3	Anterior resection of rectum and anastomosis of colon to rectum using staples
H33.4	Anterior resection of rectum and anastomosis NEC
H33.5	Rectosigmoidectomy and closure of rectal stump and exteriorisation of bowel
H33.6	Anterior resection of rectum and exteriorisation of bowel
H33.7	Perineal resection of rectum HFQ
H33.8	Other specified excision of rectum
H33.9	Unspecified excision of rectum
H40.4	Trans-sphincteric anastomosis of colon to anus
H40.8	Other specified operations on rectum through anal sphincter
H40.9	Unspecified operations on rectum through anal sphincter
X14.8	Other specified clearance of pelvis
X14.9	Unspecified clearance of pelvis

Lung

E39.1	Open excision of lesion of trachea
E39.8	Other specified partial excision of trachea
E39.9	Unspecified partial excision of trachea
E44.1	Excision of carina
E46.1	Sleeve resection of bronchus and anastomosis HFQ
E54.1	Total pneumonectomy
E54.2	Bilobectomy of lung
E54.3	Lobectomy of lung
E54.4	Excision of segment of lung
E54.5	Partial lobectomy of lung NEC
E54.8	Other specified excision of lung
E54.9	Unspecified excision of lung
E55.2	Open excision of lesion of lung
E55.9	Unspecified open extirpation of lesion of lung
T01.3	Excision of lesion of chest wall
T02.3	Insertion of prosthesis into chest wall NEC

Breast

B27.1	Total mastectomy and excision of both pectoral muscles and part of chest wall
B27.2	Total mastectomy and excision of both pectoral muscles NEC
B27.3	Total mastectomy and excision of pectoralis minor muscle
B27.4	Total mastectomy NEC
B27.5	Subcutaneous mastectomy
B27.6	Skin sparing mastectomy
B27.8	Other specified total excision of breast
B27.9	Unspecified total excision of breast
B28.1	Quadrantectomy of breast
B28.2	Partial excision of breast NEC
B28.3	Excision of lesion of breast NEC
B28.4	Re-excision of breast margins
B28.5	Wire guided partial excision of breast
B28.6	Excision of accessory breast tissue
B28.8	Other specified other excision of breast
B28.9	Unspecified other excision of breast
B34.1	Subareolar excision of mammary duct
B34.2	Excision of mammary duct NEC
B34.3	Excision of lesion of mammary duct
B35.2	Excision of nipple
B35.3	Extirpation of lesion of nipple
B37.4	Capsulectomy of breast
B40.1	Interstitial laser destruction of lesion of breast
B40.8	Other specified destruction of lesion of breast
B40.9	Unspecified destruction of lesion of breast

Vulva

P01.1	Clitoridectomy
P03.3	Excision of lesion of Bartholin gland
P05.1	Total excision of vulva
P05.2	Partial excision of vulva
P05.4	Excision of lesion of vulva NEC
P05.8	Other specified excision of vulva
P06.4	Implantation of radioactive substance into vulva

Vagina

P17.1	Total colpectomy
P17.2	Partial colpectomy
P17.8	Other specified excision of vagina
P17.9	Unspecified excision of vagina

Vagina

- P20.1 Excision of lesion of vagina
- Q07.1 Abdominal hysterocolpectomy and excision of periuterine tissue

Cervix

- P17.2 Partial colpectomy
- Q01.1 Amputation of cervix uteri
- Q01.3 Excision of lesion of cervix uteri
- Q01.8 Other specified excision of cervix uteri
- Q07.1 Abdominal hysterocolpectomy and excision of periuterine tissue
- Q07.2 Abdominal hysterectomy and excision of periuterine tissue NEC
- Q07.3 Abdominal hysterocolpectomy NEC
- Q07.4 Total abdominal hysterectomy NEC
- Q07.8 Other specified abdominal excision of uterus
- Q07.9 Unspecified abdominal excision of uterus
- Q08.1 Vaginal hysterocolpectomy and excision of periuterine tissue
- Q08.2 Vaginal hysterectomy and excision of periuterine tissue NEC
- Q08.3 Vaginal hysterocolpectomy NEC
- Q08.8 Other specified vaginal excision of uterus
- Q08.9 Unspecified vaginal excision of uterus
- T85.4 Block dissection of para-aortic lymph nodes
- T85.5 Block dissection of inguinal lymph nodes
- T85.6 Block dissection of pelvic lymph nodes
- X14.1 Total exenteration of pelvis
- X14.2 Anterior exenteration of pelvis
- X14.3 Posterior exenteration of pelvis
- X14.8 Other specified clearance of pelvis
- X14.9 Unspecified clearance of pelvis

Uterus

- Q07.1 Abdominal hysterocolpectomy and excision of periuterine tissue
- Q07.2 Abdominal hysterectomy and excision of periuterine tissue NEC
- Q07.3 Abdominal hysterocolpectomy NEC
- Q07.4 Total abdominal hysterectomy NEC
- Q07.8 Other specified abdominal excision of uterus
- Q07.9 Unspecified abdominal excision of uterus
- Q08.1 Vaginal hysterocolpectomy and excision of periuterine tissue
- Q08.2 Vaginal hysterectomy and excision of periuterine tissue NEC
- Q08.3 Vaginal hysterocolpectomy NEC
- Q08.8 Other specified vaginal excision of uterus
- Q08.9 Unspecified vaginal excision of uterus

Uterus

T85.4	Block dissection of para-aortic lymph nodes
T85.5	Block dissection of inguinal lymph nodes
T85.6	Block dissection of pelvic lymph nodes
X14.1	Total exenteration of pelvis
X14.2	Anterior exenteration of pelvis
X14.3	Posterior exenteration of pelvis
X14.8	Other specified clearance of pelvis
X14.9	Unspecified clearance of pelvis
Q07.5	Subtotal abdominal hysterectomy
Q09.3	Open excision of lesion of uterus NEC
Q16.1	Vaginal excision of lesion of uterus
Q22.1	Bilateral salpingoophorectomy
Q22.2	Bilateral salpingectomy NEC
Q22.3	Bilateral oophorectomy NEC
Q22.8	Other specified bilateral excision of adnexa of uterus
Q22.9	Unspecified bilateral excision of adnexa of uterus
Q23.1	Unilateral salpingoophorectomy NEC
Q23.2	Salpingoophorectomy of remaining solitary fallopian tube and ovary
Q23.5	Unilateral oophorectomy NEC
Q23.6	Oophorectomy of remaining solitary ovary NEC
Q23.8	Other specified unilateral excision of adnexa of uterus
Q23.9	Unspecified unilateral excision of adnexa of uterus
Q52.1	Excision of lesion of broad ligament of uterus

Ovary

Q07.1	Abdominal hysterocolpectomy and excision of periuterine tissue
Q07.2	Abdominal hysterectomy and excision of periuterine tissue NEC
Q07.3	Abdominal hysterocolpectomy NEC
Q07.4	Total abdominal hysterectomy NEC
Q07.8	Other specified abdominal excision of uterus
Q07.9	Unspecified abdominal excision of uterus
Q08.1	Vaginal hysterocolpectomy and excision of periuterine tissue
Q08.2	Vaginal hysterectomy and excision of periuterine tissue NEC
Q08.3	Vaginal hysterocolpectomy NEC
Q08.8	Other specified vaginal excision of uterus
Q08.9	Unspecified vaginal excision of uterus
T85.4	Block dissection of para-aortic lymph nodes
T85.5	Block dissection of inguinal lymph nodes
T85.6	Block dissection of pelvic lymph nodes
X14.1	Total exenteration of pelvis
X14.2	Anterior exenteration of pelvis

Ovary

X14.3	Posterior exenteration of pelvis
X14.8	Other specified clearance of pelvis
X14.9	Unspecified clearance of pelvis
H33.1	Abdominoperineal excision of rectum and end colostomy
H33.2	Proctectomy and anastomosis of colon to anus
H33.3	Anterior resection of rectum and anastomosis of colon to rectum using staples
H33.4	Anterior resection of rectum and anastomosis NEC
H33.5	Rectosigmoidectomy and closure of rectal stump and exteriorisation of bowel
H33.6	Anterior resection of rectum and exteriorisation of bowel
H33.7	Perineal resection of rectum HFQ
H33.8	Other specified excision of rectum
H33.9	Unspecified excision of rectum
Q07.5	Subtotal abdominal hysterectomy
Q22.1	Bilateral salpingoophorectomy
Q22.3	Bilateral oophorectomy NEC
Q23.1	Unilateral salpingoophorectomy NEC
Q23.2	Salpingoophorectomy of remaining solitary fallopian tube and ovary
Q23.5	Unilateral oophorectomy NEC
Q23.6	Oophorectomy of remaining solitary ovary NEC
Q24.1	Salpingoophorectomy NEC
Q24.3	Oophorectomy NEC
Q43.8	Other specified partial excision of ovary
Q43.9	Unspecified partial excision of ovary
Q47.3	Open biopsy of lesion of ovary
Q47.8	Other specified other open operations on ovary
Q49.1	Endoscopic extirpation of lesion of ovary NEC
T33.1	Open excision of lesion of peritoneum
T33.2	Open destruction of lesion of peritoneum
T33.8	Other specified open extirpation of lesion of peritoneum
T33.9	Unspecified open extirpation of lesion of peritoneum
T36.1	Omentectomy
T36.2	Excision of lesion of omentum

Prostate

M61.1	Total excision of prostate and capsule of prostate
M61.4	Perineal prostatectomy
M61.8	Other specified open excision of prostate
M61.9	Unspecified open excision of prostate

Kidney and unspecified urinary organs

M02.1	Nephrectomy and excision of perirenal tissue
M02.2	Nephroureterectomy NEC
M02.3	Bilateral nephrectomy
M02.4	Excision of half of horseshoe kidney
M02.5	Nephrectomy NEC
M02.8	Other specified total excision of kidney
M02.9	Unspecified total excision of kidney
M03.8	Other specified partial excision of kidney
M03.9	Unspecified partial excision of kidney
M04.2	Open excision of lesion of kidney NEC
M10.4	Endoscopic cryoablation of lesion of kidney
M18.1	Total ureterectomy
M18.2	Excision of segment of ureter
M18.3	Secondary ureterectomy
M25.2	Open excision of lesion of ureter NEC

Bladder

M34.1	Cystoprostatectomy
M34.2	Cystourethrectomy
M34.3	Cystectomy NEC
M34.4	Simple cystectomy
M34.8	Other specified total excision of bladder
M34.9	Unspecified total excision of bladder

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The intelligence networks

Public Health England operates a number of intelligence networks, which work with partners to develop world-class population health intelligence to help improve local, national and international public health systems.

National Cancer Intelligence Network

The National Cancer Intelligence Network (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.

National Cardiovascular Intelligence Network

The National Cardiovascular Intelligence Network (NCVIN) analyses information and data and turns it into meaningful timely health intelligence for commissioners, policy makers, clinicians and health professionals to improve services and outcomes.

National Child and Maternal Health Intelligence Network

The National Child and Maternal Health Intelligence Network provides information and intelligence to improve decision-making for high-quality, cost-effective services. Its work supports policy makers, commissioners, managers, regulators, and other health stakeholders working on children's, young people's and maternal health.

National Mental Health, Dementia and Neurology Intelligence Network

The National Mental Health Intelligence Networks (NMHDNIN) brings together the distinct National Mental Health Intelligence Network, the Dementia Intelligence Network and the Neurology Intelligence Network under a single programme. The Networks work in partnership with key stakeholder organisations. The Networks seeks to put information and intelligence into the hands of decision makers to improve mental health and wellbeing, support the reduction of risk and improve the lives of people living with dementia and improve neurology services.

National End of Life Care Intelligence Network

The National End of Life Care Intelligence Network (NEoLCIN) aims to improve the collection and analysis of information related to the quality, volume and costs of care provided by the NHS, social services and the third sector to adults approaching the end of life. This intelligence will help drive improvements in the quality and productivity of services.

This is a CRUK-NCIN Partnership report.

In 2013 Cancer Research UK (CRUK) and the National Cancer Intelligence Network (NCIN) established a partnership to conduct analyses seen as priorities by both organisations to provide intelligence to support improved patient outcomes.

Recent developments in the extent and linkage of cancer data have provided CRUK and NCIN with the opportunity to enhance understanding of the patient pathway and, as a result, to support improvements in cancer service delivery and outcomes for patients. This partnership brings together the strengths of both organisations and is one small step towards saving 5,000+ lives a year.

For more information, including other publications, see the partnership page here: www.ncin.org.uk/about_ncin/the_cruk_ncin_partnership_improving_outcomes_through_cancer_intelligence

About Cancer Research UK:

- Cancer Research UK is the world's leading cancer charity dedicated to saving lives through research
- the charity's pioneering work into the prevention, diagnosis and treatment of cancer has helped save millions of lives
- Cancer Research UK receives no government funding for its life-saving research - every step it makes towards beating cancer relies on every pound donated
- Cancer Research UK has been at the heart of the progress that has already seen survival rates in the UK double in the last forty years
- Cancer Research UK supports research into all aspects of cancer through the work of over 4,000 scientists, doctors and nurses
- together with its partners and supporters, Cancer Research UK's vision is to bring forward the day when all cancers are cured

For further information on Cancer Research UK visit the CRUK website, www.cruk.org/cancerstats