Diagnosing cancer in an emergency: Patterns of emergency presentation of cancer in Ireland 2002-2015

Irish Cancer Society

National Cancer Registry Ireland

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Published by:

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This report should be cited as:

National Cancer Registry & Irish Cancer Society. 2018. *Diagnosing cancer in an emergency: Patterns of emergency presentation of cancer in Ireland 2002-2015.* Irish Cancer Society, Dublin and National Cancer Registry, Cork.

TABLE OF CONTENTS

FOREWORD BY THE IRISH CANCER SOCIETY

Every day, about sixty people in Ireland are diagnosed with an invasive cancer. Unfortunately, despite improvements in screening, diagnostic tools and rapid access pathways, over eight people per day are still diagnosed with cancer in an emergency situation.

By their very nature 'emergencies' are precipitated by acute episodes of pain or sudden changes in previously mild symptoms that are severe enough for alarm bells to start ringing for a patient, their families and in many cases, their GP. Couple the physical symptoms people face with the fear, uncertainty, helplessness, and even frustration at waiting in a crowded emergency department - all before even being triaged – and this can be an isolating experience. Being diagnosed with cancer in an emergency situation is nothing short of traumatic, and the battery of tests, consultations and difficult conversations that follow are emotionally and physically exhausting for any patient and their family.

Additionally, this report shows that five out of every seven diagnosed via emergency presentation will have an advanced cancer (Stage III or IV) which amounts to over six people per day. A cancer diagnosis at an advanced stage limits treatment options and, unfortunately, reduces the chance of a successful outcome for that treatment.

The National Cancer Strategy 2017-2026, published last year, contains a key target to reduce the proportion of cancers diagnosed in emergency departments (ED) by 50% over the course of the ten year Strategy, but quoted no baseline to measure this against.

To understand the scale of the problem, the Irish Cancer Society commissioned the National Cancer Registry of Ireland (NCRI) to analyse the proportion of cancers diagnosed via emergency presentation in Ireland.

The findings of this research show us that about 3,000 cases of cancer are diagnosed via emergency presentation every year. That's 14% of all invasive cancers diagnosed. Of those, 77% are advanced (Stage III or IV). These findings, while stark, set out some of the challenges faced if we are to reduce the numbers of cancer patients presenting for the first time in emergency departments right throughout the country.

What is perhaps most worrying, are the significant inequalities shown. Those from the poorest communities and those over 65 are far more likely to have their cancer diagnosed as an emergency, and therefore at a late stage.

These inequalities are unacceptable and must be systemically addressed.

While the reasons behind emergency diagnoses are multi-faceted and it is still not well understood how emergency presentations arise, issues such as a lack of access to GPs in deprived areas and long delays in accessing diagnostic tests, particularly for public patients, can only exacerbate the issue of emergency presentation.

Despite this, there are also a number of positives to take from the findings. In particular, we can see from the time trend analysis that the proportion of cancers being diagnosed as emergencies has reduced from 19-20% during 2002-2005 to 14% during 2009-2015. Much of this progress is likely due to the considerable reorganisation of cancer services undertaken over the last ten years, where cancer services were centralised, Rapid Access Clinics for diagnosis were developed, and referral guidelines and pathways for GPs were established.

This gives us hope that meaningful change can be made across the new ten-year Cancer Strategy to reach the target of a 50% reduction in emergency department (ED) cancer diagnoses. The Irish Cancer Society makes a number of recommendations in this report to achieve this goal, which have implications not only for the National Cancer Control Programme and Department of Health, but for broader system reform, which we hope the Department of Health, National Cancer Control Programme and the Sláintecare Office will seriously consider.

The Irish Cancer Society's vision is a future without cancer, and we want to make sure that no one is left behind. Everyone should have the same chances of an early diagnosis, in the right setting, and access to the best possible treatment giving them the best outcomes. An emergency cancer diagnosis deprives them of this opportunity.

Donal Buggy
Head of Services and Advocacy
Irish Cancer Society

FOREWORD BY THE NATIONAL CANCER REGISTRY

The National Cancer Registry is pleased to collaborate with the Irish Cancer Society in presenting the important findings in this report, highlighting a range of issues relating to Irish cancer patients presenting emergently. These issues include wide variation in the proportions of patients presenting emergently by cancer type, age, deprivation and stage.

Variation in emergency presentation rates by cancer type and stage are to some extent inevitable, given what we know about variation in aggressiveness or detectability of different cancers and stages. However, that is not to say that reductions in the proportions presenting emergently are not possible, and indeed substantial progress has already been seen a reduction between 2002 and 2009, although little change more recently.

The influence of deprivation and age on emergency presentations – with the oldest and poorest patients most likely to present emergently – are, sadly, all too consistent with what we already knew about inequalities by deprivation and age for a range of other cancer measures (incidence, treatment and survival). But targeting and tackling these inequalities would have the added benefit of contributing to overall reductions in the emergency presentation proportions.

The National Cancer Strategy 2017 – 2026 sets out a number of relevant initiatives, including:

- A Key Performance Indicator of a 50% relative reduction by 2026 (compared with 2013) in the percentage of cancers diagnosed in Emergency Department.
- The development of a rolling programme of targeted multimedia-based awareness campaigns, which will have a focus on at-risk populations.
- The development of referral criteria for patients with suspected cancer who fall outside of existing Rapid Access Clinics.
- The implementation of policies aimed at reducing cancer incidence, in particular, initiatives which will aim to reduce smoking, a key risk factor for cancer which is associated with higher incidence of cancer in deprived areas.
- The appointment of a National Clinical Lead for geriatric oncology, who will aim to reduce the proportion of geriatric patients diagnosed with cancer at a later stage and in emergency departments, and to improve the survival rates of members of this population who are diagnosed with cancer.

The National Cancer Registry's main role is to collate and present relevant data that will help with identification and implementation of policies to improve cancer outcomes in Ireland. As such, the Irish

Cancer Society, who commissioned this analysis, have, in this document, interpreted these data and set out a number of discussion and action points relating to our findings.

In line with the National Cancer Strategy, the National Cancer Registry will continue to present summary figures on emergency presentation in our annual report going forward, and will also investigate the possibility of further improving the reliability and completeness of these data.

Professor Kerri Clough-Gorr
Director
National Cancer Registry

1. SUMMARY

Emergency presentation of cancer in Ireland: 2002-2015

Background

Emergency presentation with cancer can result from lack of awareness of symptoms in patients and is generally associated with more advanced stage, limited treatment options and poorer survival outcomes. This report, commissioned by the Irish Cancer Society, assesses the proportion of cancers diagnosed in Ireland which first presented through emergency admissions, using data collected by the National Cancer Registry of Ireland (NCRI).

The main analysis relates to the diagnosis period 2010-2015, the most recent years for which reliable data were available. Within this period, variation in the proportion of cases presenting emergently is assessed in relation to:

- Cancer type (all cancers combined excluding non-melanoma skin cancer, and 24 specific cancer types)
- Deprivation (based on socioeconomic census data by area of patients' residence)
- Cancer stage at presentation
- Age at diagnosis
- Gender

In addition, trends in the proportions of patients presenting emergently are assessed over the period 2002-2015, i.e. the years for which NCRI data on mode of presentation was available.

The definition of "emergency" includes all cancers first diagnosed as part of an admission through a hospital emergency department, as well as any further cases described in hospital clinical notes as having been diagnosed during an emergency presentation. This information is collected by NCRI as part of its registration of cancer treatments (and other hospital consultations). The main analyses are based on emergency presentations as a proportion of all cases that presented either electively (on a planned basis) or as emergencies, i.e. excluding cases whose mode of presentation was unknown.

Main findings

Variation by cancer type (2010-2015)

- Overall during 2010-2015, 14% of cancer cases (excluding non-melanoma skin cancers) presented as emergencies at the time of diagnosis.
- Of the 24 individual cancer types examined, those with the highest proportions (>20%) of emergency presentation during 2010-2015 were pancreatic, brain / central nervous system and liver cancers (all 34%), leukaemia (27%), lung cancer (26%), ovarian (24%), colon (22%) and stomach cancers (21%).
- Cancers with the lowest proportions (<10%) of emergency presentation were: melanoma of skin (0.9%), and breast (1.5%), prostate (2.5%), thyroid (3.2%), uterine (4.4%), cervical (6.5%), oral / pharyngeal (6.8%) and laryngeal cancers (8.7%).
- Intermediate levels of emergency presentation were seen for multiple myeloma (19%), non-Hodgkin lymphoma (18%), oesophageal (16%), kidney (16%) and bladder cancers (13%), Hodgkin lymphoma (13%), testicular (10%) and rectal cancers (10%).
- After adjustment to allow a more appropriate comparison between two different healthcare systems, i.e. excluding the UK subset that present emergently to GPs, 16% of all invasive cancers presented emergently through hospitals in the UK (2006-2015). The UK figures included cases from an earlier period (2006-2009); this, or methodological differences, might account for the slightly higher proportion observed in the UK relative to Ireland.

Time trends (2002-2015)

- Over the period 2002-2015, the overall proportion of cancers presenting emergently fell from 20% to 14%, the biggest decline occurring between 2005 (19%) and 2009 (14%), with little change subsequently.
- Of 24 cancer types examined, 9 (colon, rectal, liver, pancreatic, breast, prostate, kidney, thyroid cancers and multiple myeloma) showed trends of significant decline in the proportion of cases presenting emergently over the whole period 2002-2015;
- 12 (oral/pharyngeal, oesophageal, stomach, laryngeal, cervical, uterine, testicular and bladder cancers, melanoma of skin, Hodgkin, non-Hodgkin lymphomas, and leukaemias) showed no significant trend during 2002-2015.
- 2 (lung and ovarian cancers) showed no significant recent trend (2012-2015 and 2009-2015, respectively), following earlier significant declines (2002-2012 and 2002-2009 respectively).
- Only cancers of the brain/central nervous system showed any significant recent increase in emergency presentations (2009-2015, following a significant decline during 2005-2009 respectively).

Variation by deprivation (2010-2015)

- For cancers presenting as emergencies, 30% were in patients from the most deprived population quintile, compared with only 23% for cancers presenting electively.
- Expressed in a different way, a much higher proportion of all cancer patients from the most deprived quintile presented as emergencies (18%), compared with patients from the least deprived quintile (11%). In other words cancer patients from the most deprived areas are *50% more likely* to be diagnosed via emergency presentation than those from the most affluent areas (adjusting for age).
- This pattern – i.e. a significantly higher likelihood of presenting as emergencies among patients from the most deprived areas – was also seen for 14 of the 24 individual cancer types examined (with a similar albeit non-significant patterns for most other cancers).

Variation by stage (2010-2014)

- For cancers as a whole, about 58% of known-stage cases were diagnosed at early stages (I or II), 42% at later stages (III or IV).
- However, for cancers presenting *emergently*, about 77% were diagnosed at later stages, compared with only 38% for cancers presenting *electively*.
- Expressed in a different way, a much higher proportion of late-stage (III/IV) cancers presented as emergencies (20%), compared with early-stage cancers (4.5%), excluding patients whose mode of presentation was unknown – equivalent to a statistically significant, *4-fold higher risk* of emergency presentation among late-stage cancers.
- This pattern, i.e. a significantly higher risk of presenting as emergencies among late-stage cancers was also seen for all 21 individual cancer types for which stage data were examined.
- Stage-related variation in emergency presentation risk was most marked for breast cancer (late-stage cases 14 times more likely to present emergently than early-stage cases, adjusted for age) and least marked for pancreatic cancer (late-stage cases 1.3 times more likely to present emergently).

Variation by age (2010-2015)

- For cancers as a whole, 56% of cases were diagnosed at ages 65 and over.
- For cancers presenting *emergently*, 71% were in patients aged 65+, compared with only 53% for cancers presenting *electively*.
- Expressed in a different way, cancer patients aged 65+ were *twice as likely* to present as emergencies (18%) as patients under 65 (9%).
- This pattern, i.e. a statistically significant higher likelihood of presenting as emergencies among older patients was also seen (to varying degrees) for all but 2 of the 24 individual cancer types examined.

- Age-related variation in emergency presentation likelihood was most marked for thyroid cancer (patients aged 65+ were 10 times more likely to present emergently than patients under 65) and least marked for multiple myeloma (no difference by age).
- Leukaemia was the only cancer group for which older patients were less likely to present emergently.

Variation by gender

- The proportion of all cancers presenting emergently was similar for males (13.9% excluding unknown presentations) and females (14.3%).
- For most cancers (and the all-cancer group), male/female differences in the proportion presenting emergently were not statistically significant after adjustment for age.
- Males with Hodgkin lymphoma, non-Hodgkin lymphoma and melanoma had a significantly higher age-adjusted risk of presenting emergently than female cases, whereas females with bladder, rectal, colon cancer, or leukaemia, had a significantly higher age-adjusted risk of presenting emergently than male cases. Otherwise male/female differences in the proportion presenting emergently were not statistically significant.

2. INTRODUCTION AND METHODOLOGY

Emergency presentation with cancer can result from lack of awareness of symptoms in patients and is generally associated with more advanced stage, limited treatment options and poorer survival outcomes. This report, commissioned by the Irish Cancer Society, assesses the proportion of cancers diagnosed in Ireland which first presented through emergency admissions, using data collected by the National Cancer Registry of Ireland (NCRI).

The number and proportion of cancer patients presenting emergently (i.e. first diagnosed as an emergency presentation) in a hospital was calculated using National Cancer Registry data for the period 2002-2015 inclusive. To this end, the sequential diagnosis/management/treatment schedule for each cancer case was abstracted within the date limits of 4 weeks before, to 1 year after the formal diagnosis date. The first record (*'1st presentation'*) within these date limits was categorised for each case by:

- Cancer type
- Presentation type (emergency/elective/unknown)
- Stage of disease
- Deprivation quintile of patient
- Age at diagnosis
- Sex of patient

The definition of "emergency" included all cancers first diagnosed during an admission through a hospital emergency department, as well as any further cases described in clinical notes as having been diagnosed emergently during (other) in-patient or out-patient hospital visits (but not including General Practitioner visits). At the level of the individual patient this approach might appear somewhat arbitrary, but at the population level it provides a useful way of looking at trends and ranking of different cancers for emergency presentation. As noted in the next section, future work may be able to look also at patients presenting emergently to GPs.

The analysis presented here expands the preliminary analyses presented in the 2017 annual report of NCRI [1] to include a wider range of cancer types; a longer run of diagnosis years (2002-2015 expanded from 2010-2014); and breakdown of statistics by patients' age and sex. However, the main focus is on the period 2010-2015 (or, in relation to cancer stage, 2010-2014).

The list of common invasive cancers selected is shown in Table 2.1, including a group for all invasive cancers combined (excl. non-melanoma skin [NMSC]).

Selected cases, cancers and analysis

Table 2.1
ICD10 codes and list of selected cancers (malignant neoplasms only)

C00-43 C45-96 all invasive cancers excluding NMSC[1]
C00-14 neoplasm of lip, oral cavity and pharynx (mouth and pharynx)
C15 neoplasm of oesophagus[1]
C16 neoplasm of stomach
C18 neoplasm of colon[1]
C19-20 rectum[1]
C22 neoplasm of liver and intrahepatic bile ducts
C25 neoplasm of pancreas[1]
C32 neoplasm of larynx
C33-34 neoplasm of lung and trachea[1]
C43 melanoma of skin[1]
C50 neoplasm of breast[1]
C53 neoplasm of cervix uteri[1]
C54 neoplasm of corpus uteri
C56 neoplasm of ovary[1]
C61 neoplasm of prostate
C62 neoplasm of testis
C64 neoplasm of kidney
C67 neoplasm of bladder
C70-72 malignant neoplasm of meninges, brain and spinal cord (brain & CNS)
C73 neoplasm of thyroid gland
C81 Hodgkin lymphoma[2]
C82-85 non-Hodgkin lymphoma[2]
C90 multiple myeloma
C91-95 leukaemia

[1]Preliminary figures previously reported [1]
[2]Preliminary figures previously reported for all lymphomas combined [1]

The NCRI began registration of cancer cases from 1994. Registration completeness has been estimated to be 98% within 5 years of diagnosis [2]. From 1994 to 2001, the 'presentation status' information was incompletely recorded or was not available. Analysis was thus confined to the diagnosis period 2002-2015 (14 years). Over this period, a small proportion of patients was diagnosed with more than one distinct primary cancer from one year to the next over the 14 year period. For the analysis in this report, all 'reportable' invasive cancers (i.e. cancers of sufficiently different site, morphology or both) [3] were counted for each patient. This applied both for the 'all invasive cancer' group (mainly with cancer at *another* body site), and for the individual types (with another *de-novo* cancer of a sufficiently different morphological type or subsite), excluding recurrences or progressions. This approach of considering some patients more than once, *i.e. 'case count vs. patient count'*, better reflects the scale of the burden of hospital presentation, and is consistent with how NCRI reports cancer incidence for wider purposes.

Presentation status was not known for 18.2% of cancer cases as a whole over the period 2002-2015, and this percentage varied between 14% and 20% annually. Both for time-trend analyses, and for assessment of variation of mode of presentation by cancer type, deprivation, stage or sex, analysis

focused mainly on cancers whose mode of presentation was known. Exclusion of cases with 'unknown' mode of presentation risks potential bias if the breakdown of 'known' cases is not truly representative of all cases. However, sensitivity analyses done for 2010-2013 cases using multiple imputation to predict presentation status among 'unknown' cases gave broadly similar estimates (generally within 1 percentage point of) the percentage among those whose mode of presentation was known [1].

Annual percentage changes (APC) for mode of presentation over time (2002-2015) were estimated with the Joinpoint regression program, based on proportion presenting electively and emergently, including and excluding unknown mode of presentation [4,5]. The default constraints specified with Joinpoint were that a maximum of two trend break points (indicating any significant changes in trend) were allowed over the 14 year period 2002-2015, and that all break points had to be at least four years (inclusive) from other break points or from either end of the 14-year range.

For each cancer type, the relative risk (RR) of presenting emergently (relative to elective) for stage III/IV (vs. stage I/II), most deprived (vs. least) populations, females (vs. males) and older (age 65+) patients (vs. <65) was estimated using Poisson regression with robust standard errors [6]. RR >1.0 or <1.0 indicated greater or lesser risk respectively; comparisons by stage, deprivation and sex were adjusted for age (5-year categories 0-4 to 85+).

Credits and acknowledgments

The analyses presented in this report were commissioned and funded by the Irish Cancer Society (ICS), who have provided the Foreword and Discussion/Actions sections.

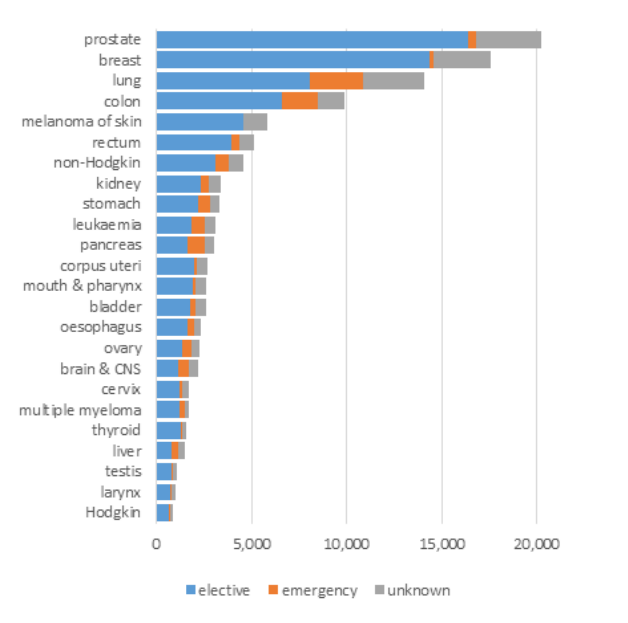
Data preparation, analyses and interpretive text were the responsibility of NCRI staff members Joe McDevitt and Paul M Walsh, with assistance for cancer stage data from Laura McGovern. Thanks are also due to other NCRI staff involved in collection of the underlying data used, and to NCRI staff and others who provided comments on earlier drafts or helped with proof-reading.

3. SUMMARY STATISTICS

Emergency presentation by cancer type during 2010-2015

Figure 3.1 Type of presentation, by cancer type (2010-2015)

Including 'unknown' presentation status

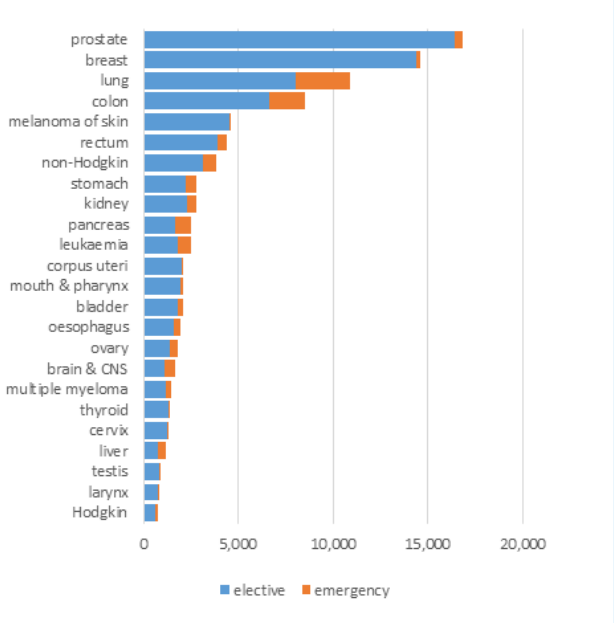


graph sorted in descending order

	cases	elective	emergency‡	unknown
pancreas	3,058	54.3%	28.5%↑	17.2%
liver	1,473	52.9%	27.1%↑	20.0%
brain & CNS	2,207	50.7%	26.1%↑	23.2%
leukaemia	3,083	59.8%	21.9%↑	18.3%
lung	14,090	57.2%	20.0%↑	22.8%
ovary	2,261	61.3%	19.2%↑	19.5%
colon	9,891	67.0%	18.9%↑	14.1%
stomach	3,348	66.5%	17.1%↑	16.4%
multiple myeloma	1,728	70.0%	16.7%↑	13.3%
non-Hodgkin	4,543	68.9%	15.5%↑	15.7%
oesophagus	2,332	70.2%	13.8%↑	16.0%
kidney	3,424	67.7%	13.3%↑	19.0%
all invasive*	**124,381**	**70.2%**	**11.5%**	**18.2%**
Hodgkin	855	75.6%	10.8%↓	13.7%
bladder	2,615	68.8%	10.0%↓	21.1%
testis	1,050	77.0%	9.0%↓	14.1%
rectum	5,103	77.2%	8.9%↓	13.9%
larynx	995	75.8%	7.2%↓	17.0%
mouth & pharynx	2,653	73.2%	5.3%↓	21.5%
cervix	1,728	72.2%	5.0%↓	22.7%
corpus uteri	2,656	76.1%	3.5%↓	20.4%
thyroid	1,579	83.4%	2.7%↓	13.9%
prostate	20,226	81.2%	2.1%↓	16.8%
breast	17,596	81.6%	1.3%↓	17.1%
melanoma	5,821	78.1%	0.7%↓	21.2%

* excluding NMSC
‡sorted in ascending order of % presenting emergently
↑↓ greater/ less than all invasive cancer figure

excluding 'unknown' presentation status



graph sorted in descending order

	cases	elective	emergency‡
pancreas	2,532	65.5%	34.5%↑
brain & CNS	1,695	66.1%	33.9%↑
liver	1,178	66.1%	33.9%↑
leukaemia	2,519	73.2%	26.8%↑
lung	10,879	74.1%	25.9%↑
ovary	1,820	76.2%	23.8%↑
colon	8,499	78.0%	22.0%↑
stomach	2,800	79.5%	20.5%↑
multiple myeloma	1,498	80.8%	19.2%↑
non-Hodgkin	3,831	81.6%	18.4%↑
oesophagus	1,958	83.6%	16.4%↑
kidney	2,772	83.6%	16.4%↑
all invasive*	**101,716**	**85.9%**	**14.1%**
bladder	2,062	87.3%	12.7%↓
Hodgkin	738	87.5%	12.5%↓
testis	902	89.6%	10.4%↓
rectum	4,392	89.7%	10.3%↓
larynx	826	91.3%	8.7%↓
mouth & pharynx	2,082	93.2%	6.8%↓
cervix	1,335	93.5%	6.5%↓
corpus uteri	2,114	95.6%	4.4%↓
thyroid	1,360	96.8%	3.2%↓
prostate	16,833	97.5%	2.5%↓
breast	14,589	98.5%	1.5%↓
melanoma	4,588	99.1%	0.9%↓

* excluding NMSC
‡sorted in ascending order of % presenting emergently
↑↓ greater/ less than all invasive cancer figure

- Overall during 2010-2015, 14% of cancer cases (excluding non-melanoma skin cancers) presented as emergencies at the time of diagnosis, excluding cases where the mode of presentation was unknown (Table 3.1).
- Of the 24 individual cancer types examined, those with the highest proportions (>20%) of emergency presentation during 2010-2015 were pancreatic, brain / central nervous system and liver cancers (all 34%), leukaemia (27%), lung cancer (26%), ovarian (24%), colon (22%) and stomach cancers (21%).
- Cancers with the lowest proportions (<10%) of emergency presentation were: melanoma of skin (0.9%), and breast (1.5%), prostate (2.5%), thyroid (3.2%), uterine (4.4%), cervical (6.5%), oral / pharyngeal (6.8%) and laryngeal cancers (8.7%).
- Intermediate levels of emergency presentation were seen for multiple myeloma (19%), non-Hodgkin lymphoma (18%), oesophageal (16%), kidney (16%) and bladder cancers (13%), Hodgkin lymphoma (13%), testicular (10%) and rectal cancers (10%).

Ireland/UK comparison of emergency presentation: sensitivity analysis

Table 3.1
Comparison between Ireland (2010-2015) and the UK (2006-2015) [7] for emergency presentation

	IRELAND (excluding GP)		UK (including GP)	UK breakdown of emergency presentation				UK (excluding GP)‡	
CANCER	emergency %	rank	emergency %	A&E %	GP %	in-patient %	out-patient %	emergency %	rank
pancreas	**34.5%**	1	46.8%	57.3%	31.1%	4.3%	7.3%	**32.3%**	1
meninges/brain/CNS~	**33.9%**	2	36.8%	51.8%	15.8%	3.8%	28.5%	**31.0%**	3
liver	**33.9%**	3	40.1%	62.5%	23.1%	3.4%	11.0%	**30.8%**	4
leukaemia†	**26.8%**	4	42.2%	54.8%	25.5%	3.9%	15.9%	**31.4%**	2
lung	**25.9%**	5	36.4%	67.1%	20.6%	3.8%	8.5%	**28.9%**	5
ovary	**23.8%**	6	28.7%	55.1%	28.9%	4.0%	12.0%	**20.4%**	8
colon #	**22.0%**	7	-	-	-	-	-	-	-
colorectal #	-	-	24.4%	63.5%	26.6%	3.7%	6.2%	**17.9%**	11
stomach	**20.5%**	8	32.0%	64.9%	24.9%	4.0%	6.1%	**24.0%**	7
multiple myeloma	**19.2%**	9	33.6%	57.9%	24.2%	4.2%	13.7%	**25.5%**	6
non-Hodgkin	**18.4%**	10	26.1%	56.8%	24.6%	4.4%	14.3%	**19.7%**	9
oesophagus	**16.4%**	11	20.6%	62.9%	26.4%	3.9%	6.8%	**15.2%**	12
kidney	**16.4%**	12	24.0%	62.5%	20.6%	3.9%	13.1%	**19.0%**	10
all invasive*	**14.1%**	-	**21.5%**	**61.8%**	**23.5%**	**4.0%**	**10.6%**	**16.5%**	-
bladder	**12.7%**	13	18.2%	64.0%	20.7%	4.1%	11.1%	**14.4%**	13
Hodgkin	**12.5%**	14	16.7%	53.3%	23.3%	4.7%	18.7%	**12.8%**	14
testis	**10.4%**	15	9.7%	48.8%	18.4%	6.8%	26.0%	**7.9%**	17
larynx	**8.7%**	16	10.4%	68.3%	11.5%	4.0%	16.2%	**9.2%**	15
mouth & pharynx	**6.8%**	17	8.1%	53.8%	11.6%	6.2%	28.3%	**7.1%**	18
cervix	**6.5%**	18	10.4%	63.7%	18.9%	3.9%	13.6%	**8.4%**	16
uterus	**4.4%**	19	8.0%	60.6%	17.5%	4.8%	17.1%	**6.6%**	20
thyroid	**3.2%**	20	6.5%	55.2%	13.6%	6.4%	24.8%	**5.6%**	21
prostate	**2.5%**	21	8.6%	62.3%	19.8%	4.3%	13.7%	**6.9%**	19
breast	**1.5%**	22	4.3%	66.3%	19.3%	4.2%	10.2%	**3.4%**	22
melanoma	**0.9%**	23	2.3%	57.1%	15.6%	5.2%	22.2%	**1.9%**	23

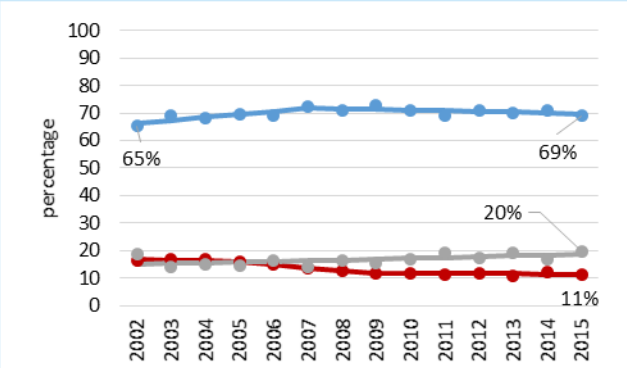
‡ For UK (excluding GP), the third column (UK [including GP] emergency %) was adjusted by factoring out GP emergency presentations to allow a more appropriate comparison with the data from Ireland;
† The UK presented separate figures for acute and chronic leukaemia; * excluding NMSC;
# The figures for the UK relate to all colorectal cancers (not just colon). In Ireland, rectal cancer had a lower rate of emergency presentation relative to colon (Fig. 3.1);
~ The UK data for brain & CNS cancers did not include cancer of the meninges.

- Available Irish and UK figures on emergency presentation by cancer patients are not directly comparable, as the UK figures include data on patients who presented emergently via a General Practitioner (who may refer them to an elective but urgent hospital appointment). The latter aspect is not currently available routinely to the NCRI, thus figures on emergency presentation for Ireland and the UK presented here relate to *emergency presentation through hospitals only*.
- After adjustment to allow more appropriate comparison between two different healthcare systems, i.e. excluding UK patients who present urgently via GPs, 16.5% of all invasive cancers presented emergently in the UK [7] compared with 14.1% in Ireland. The UK figures included some cases from an earlier period (2006-2009); this, or methodological differences, might account for the slightly higher rate observed in the UK relative to Ireland.
- Otherwise, the percentages presenting as emergency through hospitals were broadly similar.
- Similarly, the ranking of cancers for emergency presentation were broadly similar; the top five and bottom five cancers were the same for Ireland and the UK.
- These comparisons provide reassurance that, at the very least, internal comparisons across cancer sites within Ireland, presented in this report, are valid.
- For future analyses, the potential for obtaining and using additional data related to GP presentations in Ireland will be investigated further by the NCRI.

4. TIME-TRENDS IN MODE OF PRESENTATION

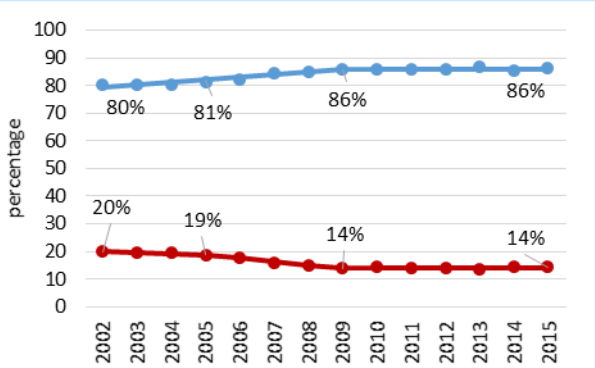
Figure 4.1
Trend in mode of presentation 2002-2015: all invasive cancer (excl. NMSC)

including unknown presenation status
●elective ●emergency ●unknown



	from	to	APC	95%CI	trend
elective	2002	2007	1.6	[0.2, 3.0]	↑
	2007	2015	-0.4	[-0.9, 0.2]	↔
emergency	2002	2005	-1.1	[-7.0, 5.1]	↔
	2005	2009	-7.8	[-13.6, -1.6]	↓
	2009	2015	-0.3	[-2.5, 1.9]	↔
unknown	2002	2015	1.7	[0.3, 3.1]	↑

excluding unknown presenation status
●elective ●emergency



	from	to	APC	95%CI	trend
elective	2002	2009	1.2	[0.9, 1.5]	↑
	2009	2015	0.0	[-0.3, 0.3]	↔
emergency	2002	2005	-2.2	[-6.5, 2.3]	↔
	2005	2009	-7.2	[-11.5, -2.6]	↓
	2009	2015	0.2	[-1.5, 1.8]	↔

APC = annual percentage change, with 95% CI = 95% confidence intervals
↓ significant decrease ↑ significant increase ↔ no significant change at the 95% level

- From 2005 to 2009 the incident proportion of invasive cancers presenting emergently decreased significantly from c.19% in 2005 to c.14% in 2009, with little change to 2015 (c.14%).
- This followed an earlier period of non-significant decline from 2002 (20%) to 2005; more recently (2009 to 2015) the trend has been stable.

Trends in mode of presentation for individual cancer sites are summarized in Table 4.1 (next page) and presented graphically in in Appendix I.

Table 4.1
Trend in mode of emergency presentation (as proportion of known modes of presentation): most recent stable trend

Cancer	from	to	APC	[95%CI]	trend
colon	2002	2015	-2.2	[-3.3, -1.1]	↓
rectum	2002	2015	-3.1	[-5.3, -0.8]	↓
liver	2002	2015	-2.4	[-4.3, -0.6]	↓
pancreas	2002	2015	-3.0	[-4.1, -2.0]	↓
breast	2002	2015	-6.4	[-9.0, -3.8]	↓
prostate	2002	2015	-10.6	[-11.9, -9.3]	↓
kidney	2002	2015	-4.2	[-5.8, -2.5]	↓
thyroid	2002	2015	-7.9	[-11.9, -3.8]	↓
multiple myeloma	2002	2015	-3.4	[-5.7, -1.0]	↓
meninges, brain and CNS	2009	2015	6.0	[0.8, 11.5]	↑
all invasive*	**2009**	**2015**	**0.2**	**[-1.5, 1.8]**	↔
mouth and pharynx	2002	2015	-2.7	[-5.3, 0.1]	↔
oesophagus	2002	2015	-1.9	[-4.2, 0.6]	↔
stomach	2002	2015	-1.9	[-4.2, 0.6]	↔
larynx	2002	2015	1.5	[-1.9, 5.0]	↔
lung	2012	2015	2.6	[-5.3, 11.2]	↔
melanoma	2002	2015	-5.6	[-12.9, 2.4]	↔
cervix	2002	2015	-0.4	[-4.9, 4.3]	↔
corpus uteri	2002	2015	-1.0	[-4.0, 2.0]	↔
ovary	2009	2015	3.0	[-3.3, 9.7]	↔
testis	2002	2015	3.2	[-1.6, 8.3]	↔
bladder	2002	2015	-0.1	[-2.5, 2.4]	↔
Hodgkin lymphoma	2002	2015	-2.3	[-5.3, 0.8]	↔
non-Hodgkin lymphoma	2002	2015	-0.2	[-2.1, 1.8]	↔
leukaemia	2002	2015	-0.5	[-1.9, 1.0]	↔

APC= annual percentage change, 95%CI = 95% confidence intervals,
↓ significant decrease ↑ significant increase ↔ no change at the 95% level
graphical trends are shown for each cancer type in Appendix I; * excluding NMSC

Of 24 cancer types examined:

- 9 (colon, rectal, liver, pancreatic, breast, prostate, kidney, thyroid cancers and multiple myeloma) showed trends of significant decline in the proportion of cases presenting emergently over the whole period 2002-2015;
- 12 (oral/pharyngeal, oesophageal, stomach, laryngeal, cervical, uterine, testicular and bladder cancers, melanoma of skin, Hodgkin and non-Hodgkin lymphomas, and leukaemias) showed no significant trend during 2002-2015;
- 2 (lung and ovarian cancers) showed no significant recent trend (2012-2015 and 2009-2015, respectively), following earlier significant declines (2002-2012 and 2002-2009 respectively).
- Only cancers of the brain/central nervous system showed any significant recent increase in emergency presentations (2009-2015, following a significant decline 2005-2009).

5. CANCER TYPE AND DEPRIVATION

Proportion presenting by area-based deprivation quintile

Cases were assigned where possible to electoral divisions, using address at diagnosis, to which quintiles of deprivation had been assigned using the Pobal 2011 deprivation index [8]. Quintiles (20% subdivisions of population at risk) were assigned to electoral divisions, ranked from least to most deprived, based on cumulative total populations by electoral divisions during the 2011 census.

Table 5.1
Deprivation distribution by cancer site (2010-2015)

	1 least	2	3	4	5 most	unspecified	Total
larynx	11.5%	14.1%	15.3%	21.8%	27.5%	9.8%	995
lung	13.9%	14.0%	15.6%	18.9%	27.4%	10.3%	14,090
cervix	13.9%	15.5%	15.2%	17.9%	26.3%	11.1%	1,728
stomach	14.0%	15.4%	16.9%	19.1%	25.1%	9.5%	3,348
liver	17.6%	14.4%	15.5%	16.3%	23.6%	12.6%	1,473
mouth & pharynx	15.9%	15.6%	15.7%	18.8%	23.5%	10.5%	2,653
bladder	16.2%	14.9%	15.6%	18.0%	23.5%	11.9%	2,615
oesophagus	15.9%	15.1%	17.4%	19.6%	23.1%	9.0%	2,332
pancreas	17.2%	14.6%	16.8%	18.8%	21.9%	10.7%	3,058
rectum	17.1%	15.7%	16.8%	18.6%	21.3%	10.6%	5,103
all invasive*	**16.7%**	**15.6%**	**16.5%**	**18.2%**	**21.1%**	**11.9%**	**124,381**
colon	17.2%	15.1%	16.6%	18.4%	21.0%	11.6%	9,891
kidney	15.4%	15.3%	18.0%	18.4%	20.8%	12.0%	3,424
corpus uteri	16.3%	16.9%	15.7%	18.0%	19.9%	13.2%	2,656
ovary	18.0%	15.3%	16.1%	19.1%	19.9%	11.6%	2,261
multiple myeloma	15.2%	15.6%	17.2%	19.2%	19.7%	13.1%	1,728
non-Hodgkin lymphoma	16.9%	16.1%	17.7%	17.4%	19.6%	12.3%	4,543
prostate	16.4%	16.1%	17.1%	18.5%	19.5%	12.4%	20,226
Hodgkin lymphoma	18.1%	16.4%	17.2%	16.3%	18.9%	13.1%	855
breast	18.8%	16.3%	16.0%	17.6%	18.4%	12.9%	17,596
thyroid	17.9%	18.0%	17.0%	16.8%	18.2%	12.0%	1,579
leukaemia	18.2%	15.1%	16.2%	15.9%	18.2%	16.4%	3,083
brain & CNS	17.9%	17.0%	16.6%	17.9%	18.2%	12.4%	2,207
testis	18.3%	17.1%	17.8%	18.3%	18.1%	10.4%	1,050
melanoma of skin	20.3%	18.4%	16.9%	15.9%	17.2%	11.3%	5,821

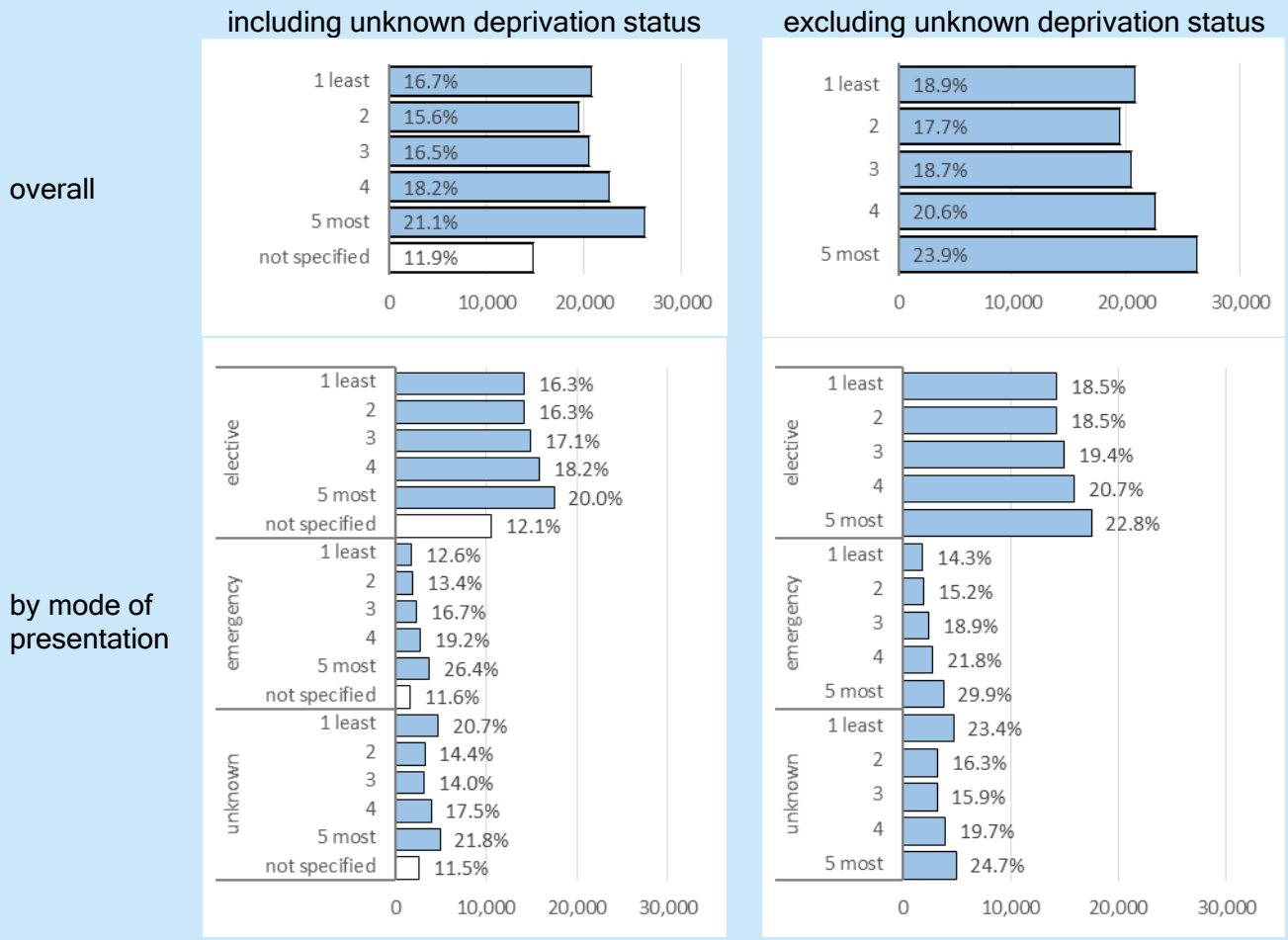
Sorted in ascending order on deprivation quintile 5 ('5 most')
↓/↑ greater/less than all invasive figure; * excluding NMSC

The distribution of all 2010-2015 cases by deprivation quintile is summarized in Table 5.1. In theory, if risk of cancer diagnosis was unaffected by deprivation, and the age/sex breakdown and population changes were similar in different EDs during 2010-2015, 20% of cancer cases would be expected to fall into each quintile. In practice, the incidence of many cancers shows strong associations with deprivation [9], thus a disproportionate number of such cases may occur in the most deprived quintile as seen for cervical and lung cancer (Table 5.1).

Percentages by quintile also deviate from 20% because some cancer cases, with poorer-quality address data, cannot be assigned to a specific deprivation quintile (11.9% of total cases during 2010-2015); and some ED's with older populations might be over-represented for cancers more common in older people.

Proportion presenting by deprivation quintile and mode of presentation

Figure 5.1
Proportional distribution of all invasive cancer (excluding NMSC) by deprivation quintile, overall and stratified by mode of presentation (2010-2015)



- 21.1% of all invasive cancer cases during 2010-2015 fell into the most deprived quintile (upper panels Fig. 5.1), equivalent to 23.9% of cases whose mode of presentation was known (i.e. if the unknown proportion, 11.9%, was excluded).
- For the subset presenting emergently, this proportion was higher (26.4%, or 29.9% if unknown presentations are excluded), compared with 20.0% (or 22.8% excluding unknown presentations) for cases presenting electively (lower panels Fig. 5.1).
- A similar pattern of over representation of patients from the most deprived quintile among those presenting emergently was seen for most individual cancer types examined.
- The findings are examined from a different perspective in the next subsection i.e. the proportion of patients in quintile 1 (least deprived) and 5 (most deprived) that presented as emergencies.

Proportion presenting emergently by deprivation quintile: least vs. most

Table 5.2
Proportion of cases presenting emergently, by deprivation quintile‡ (2010-2015)

		including 'unknown' presentation status				excluding unknown presentation status		
		1 least	5 most	all		1 least	5 most	all
all invasive*	elective	68.6%	66.7%	70.2%	elective	88.7%	82.2%	85.9%
	emergency	8.7%	14.5%	11.5%	emergency	11.3%	17.8%	14.1%
	unknown	22.6%	18.9%	18.2%	unknown	-	-	-

‡ not showing quintiles 2-4 and excluding cases who could not be assigned a deprivation quintile
*all invasive cancers excluding NMSC
see appendix III for figures for individual cancer types

- Overall, a higher proportion of all cancer patients from the most deprived quintile presented as emergencies (17.8%), compared with patients from the least deprived quintile (11.3%) – these figures (right-most panel of Table 5.2) exclude unknown presentations. This translates into a 50% increased risk of emergency presentation for patients resident in the most deprived areas (RR=1.54, Table 5.3).

Table 5.3
Proportion of cancer presenting emergently (2010-2015), by deprivation quintile (least vs. most)

Including 'unknown' presentation status			excluding 'unknown' presentation status						
	deprivation%			deprivation%		difference%		RISK†	
	least	most		least	most	absolute	relative‡	RR [95%CI]	p
thyroid	1.4	4.5	thyroid	1.7	5.4	3.7	215.0	2.25 [0.8, 6.6]	0.503
cervix	3.3	7.0	cervix	4.2	9.4	5.2	123.0	2.15 [1.0, 4.5]	0.243
prostate	1.4	2.8	prostate	1.7	3.5	1.7	99.0	1.82 [1.3, 2.5]	0.003
kidney	10.0	17.0	kidney	12.6	21.4	8.8	69.0	1.63 [1.2, 2.2]	0.006
ovary	14.7	24.9	ovary	18.2	30.5	12.3	67.0	1.63 [1.2, 2.1]	0.008
pancreas	21.3	36.9	pancreas	27.3	44.0	16.7	61.0	1.62 [1.4, 1.9]	<0.001
oesophagus	10.5	16.7	oesophagus	13.0	20.3	7.4	57.0	1.61 [1.1, 2.3]	0.045
mouth & pharynx	3.8	6.7	mouth & pharynx	5.2	8.5	3.3	63.0	1.57 [0.9, 2.8]	0.421
all invasive*	**8.7**	**14.5**	**all invasive***	**11.3**	**17.8**	**6.5**	**58.0**	**1.54 [1.5, 1.6]**	<0.001
bladder	7.8	11.6	bladder	10.4	15.1	4.7	46.0	1.50 [1.0, 2.2]	0.032
lung	14.5	22.2	lung	20.3	29.3	9.0	44.0	1.50 [1.3, 1.7]	<0.001
liver	20.8	32.8	liver	27.7	41.3	13.6	49.0	1.47 [1.1, 1.9]	0.031
stomach	14.0	21.0	stomach	17.3	24.7	7.4	43.0	1.44 [1.1, 1.9]	0.002
testis	7.8	11.6	testis	9.4	13.6	4.2	45.0	1.43 [0.8, 2.7]	0.673
colon	14.8	22.6	colon	18.6	26.3	7.7	42.0	1.42 [1.2, 1.6]	<0.001
breast	1.1	1.6	breast	1.3	2.0	0.7	52.0	1.36 [0.9, 2.1]	0.147
larynx	7.0	10.2	larynx	8.8	11.9	3.1	35.0	1.35 [0.6, 2.8]	0.142
rectum	7.8	11.3	rectum	9.5	12.9	3.4	36.0	1.35 [1.0, 1.8]	0.026
multiple myeloma	13.7	19.1	multiple myeloma	17.0	22.1	5.1	30.0	1.30 [0.9, 1.9]	0.483
brain & CNS	25.5	34.4	brain & CNS	34.1	44.2	10.1	30.0	1.29 [1.1, 1.6]	0.001
non-Hodgkin	13.8	18.4	non-Hodgkin	16.8	21.8	5.0	29.0	1.29 [1.0, 1.6]	0.034
leukaemia	22.5	24.1	leukaemia	29.5	28.5	-1.0	-3.0	1.07 [0.9, 1.3]	0.034
Hodgkin lymphoma	11.0	13.0	Hodgkin	13.6	15.4	1.8	14.0	1.06 [0.6, 1.9]	0.659
corpus uteri	2.8	2.6	corpus uteri	3.6	3.4	-0.2	-6.0	0.82 [0.4, 1.8]	0.736
melanoma of skin	0.8	0.7	melanoma of skin	1.1	0.9	-0.3	-22.0	0.75 [0.3, 2.0]	0.781

† age adjusted relative risk (RR), risk of presenting emergently (most deprived vs. least deprived), sorted on relative risk
‡ relative difference = (most/least-1) x100.
* excluding NMSC, both analyses excluded the c.12% of patients who were missing information on deprivation status

- A similar pattern of patients from the most deprived population quintile being more likely to present emergently was evident (to varying degrees) for all but 2 (melanoma and uterine) of the 24 individual cancer types examined, and was statistically significant for 14 of the cancer types (Table 5.3).
- For the majority of cancer types, patients from the most deprived population quintile were more likely to present emergently, both in *absolute* terms and in *relative* terms.
- For pancreatic, liver, ovarian, brain/CNS, lung, kidney, colon, stomach and oesophageal cancers (in declining order), *absolute differences* by deprivation were more marked than for cancers as a whole.
- For thyroid, cervical, prostate, kidney, ovarian, pancreatic, oesophageal cancers and mouth/pharynx and (in declining order), *risk differences* by deprivation were more marked than for all invasive cancers.

6. CANCER TYPE AND STAGE

TNM 5th-edition staging criteria were used for cases registered up to diagnosis year 2013 [10]; for 2014 onwards, TNM 7th-edition criteria were used [11]. Summary data are presented below for the period 2010-2014 (2015 stage data were less complete at time of compilation of this report). Because staging criteria differ for some individual cancer types between the 5th and 7th editions of TNM (see Table 6.2 footnote), stage breakdowns are presented separately below for 2014. Further details for individual cancer sites are given in Appendix II.

Proportion presenting by stage

Table 6.1
Stage distribution by cancer site (2010-2013) TNM5

	stage I	stage II	stage III	stage IV	unstaged	total
all invasive*	**19.2%**	**26.4%**	**15.9%**	**17.4%**	**21.0%**	**81,777**
mouth & pharynx	20.9%	9.8%	11.2%	44.6%	13.5%	1,689
oesophagus	6.6%	15.7%	18.9%	25.5%	33.2%	1,513
stomach	10.1%	8.6%	17.0%	37.5%	26.8%	2,176
colon	13.0%	28.1%	25.9%	22.1%	10.9%	6,463
rectum	16.4%	18.8%	35.1%	19.2%	10.6%	3,394
liver	6.4%	12.0%	14.5%	34.0%	33.0%	932
pancreas	7.0%	8.6%	10.4%	56.9%	17.0%	1,973
larynx	31.1%	15.8%	14.7%	24.3%	14.1%	672
lung	18.1%	7.4%	25.1%	36.9%	12.5%	9,276
melanoma of skin	57.0%	16.7%	16.2%	1.9%	8.1%	3,657
breast	32.7%	44.2%	12.2%	6.8%	4.0%	11,554
cervix	46.5%	12.9%	20.9%	12.1%	7.6%	1,215
corpus uteri	62.1%	5.9%	10.8%	6.7%	14.5%	1,706
ovary	17.2%	9.0%	30.5%	25.4%	18.0%	1,451
prostate	0.8%	68.0%	14.5%	8.9%	7.7%	13,659
testis	59.4%	27.2%	9.3%	0.0%	4.1%	688
kidney	45.6%	8.3%	17.3%	21.7%	7.1%	2,273
bladder	34.2%	20.9%	6.7%	14.6%	23.5%	1,709
brain & CNS	-	-	-	-	100.0%	1,449
thyroid	57.1%	21.6%	7.8%	8.8%	4.8%	1,039
Hodgkin lymphoma	14.9%	42.4%	19.8%	19.1%	3.9%	545
non-Hodgkin lymphoma	20.3%	16.2%	17.6%	30.8%	15.1%	3,005
multiple myeloma	-	-	-	-	100.0%	1,103
leukaemia	-	-	-	-	100.0%	2,062

'Stage 0' cases were pooled with 'stage I' for 'breast' and 'bladder' cancer; *excl. NMSC

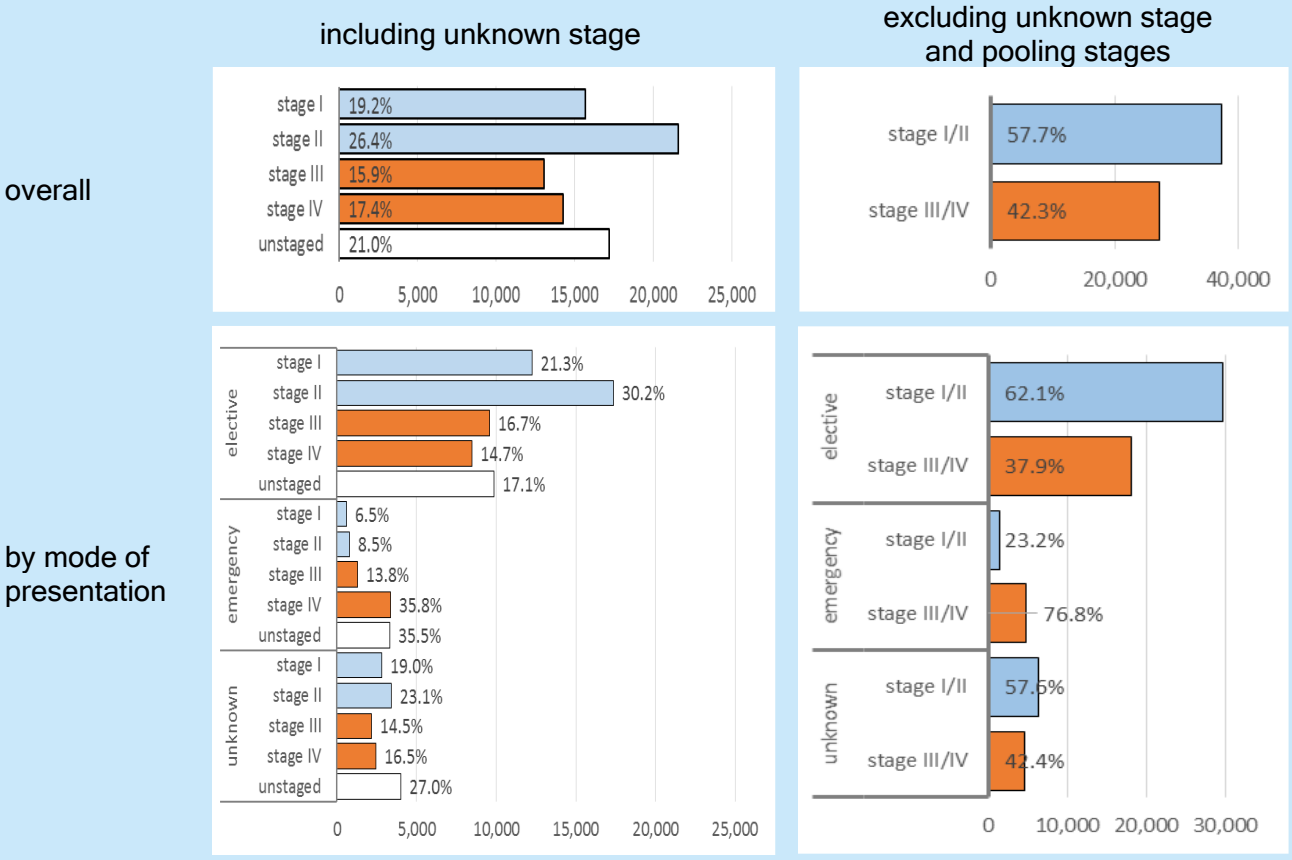
Table 6.2
Stage distribution by cancer site (2014) TNM7*

	stage I	stage II	stage III	stage IV	unstaged	total
colon [1]	14.2%	24.1%	27.8%	21.4%	12.5%	1,628
rectum [1]	16.0%	12.3%	38.7%	23.6%	9.4%	876
pancreas [2]	13.7%	20.9%	10.8%	43.4%	11.2%	555
lung [2]	16.8%	8.5%	23.2%	39.9%	11.7%	2,417
melanoma of skin [2]	61.0%	20.3%	8.5%	3.3%	7.0%	1,050
breast [2]	36.2%	41.7%	12.3%	6.3%	3.4%	2,929
cervix [1]	44.4%	16.4%	20.4%	12.4%	6.5%	275
corpus uteri [1]	61.5%	7.4%	9.8%	10.2%	11.0%	499
ovary [1]	25.9%	12.7%	30.9%	19.9%	10.6%	417
prostate [2]	34.0%	22.2%	14.3%	11.2%	18.3%	3,403
Hodgkin lymphoma [1]	14.9%	42.9%	22.4%	15.5%	4.3%	161
non-Hodgkin lymphoma [1]	23.0%	14.7%	17.5%	33.6%	11.1%	773

*TNM7 stage breakdown presented for selected cancers only, and not for 2015,
TNM7 stage-mapping is not yet finalised for other sites and stage data for 2015 are less complete.
1 For these cancers, staging criteria are equivalent between TNM 5th edition (2010-2013 cases) and TNM 7th edition (2014 cases).
2 For these cancers, staging criteria differ between TNM 5th edition (2010-2013 cases) and TNM 7th edition (2014 cases).

Proportion presenting by stage and mode of presentation

Figure 6.1
Proportional distribution of all invasive cancer (excluding NMSC) by TNM 5th Edition stage, overall and stratified by mode of presentation (2010-2013)



Note: stage data for all cancers combined are not comparable between sites, thus some differences by mode of presentation may reflect differences in cancer types involved

- For all invasive cancers (excl. NMSC) diagnosed during the period 2010-2013, most (46%) were diagnosed at early stage (I/II), 33% were late stage (III/IV) and 21% were unstaged (upper left panel of Figure 6.1).
- However, for the subset that presented *emergently* (lower panels, middle sections), diagnoses were predominantly late stage (50% III/IV, or 77% after excluding unknown stage), compared with a much lower percentage among those presenting *electively* (31% III/IV or 38% after excluding unknown stage).
- These findings are examined from a different perspective in the next subsection, presenting the proportion of patients at stage I/II or stage III/IV that presented emergently.

Proportion presenting by stage and mode of presentation: stage I/II vs. III/IV

Table 6.3
Proportion presenting emergently, by stage ‡ (2010-2013)

including 'unknown' presentation status					excluding unknown presentation status			
		stage I/II	stage III/IV	all		stage I/II	stage III/IV	all
all invasive*	elective	79.5%	66.2%	70.4%	elective	95.5%	79.6%	86.0%
	emergency	3.8%	17.0%	11.4%	emergency	4.5%	20.4%	14.0%
	unknown	16.8%	16.9%	18.2%	unknown	-	-	-

‡ excluding cases who could not be assigned stage
* excluding NMSC
see appendix IV for figures for individual cancer types

- Overall, a much higher proportion of late-stage (III/IV) cancers presented as emergencies (20.4%), compared with early-stage cancers (4.5%), excluding patients whose mode of presentation was unknown (Table 6.3)
- This difference was equivalent to a statistically significant, 4-fold higher risk (RR=4.12) of emergency presentation among late-stage cancers, adjusted for age (Table 6.4).

Table 6.4
Proportion of cancer presenting emergently (2010-2013), by stage (I/II vs. III/IV)

Including 'unknown' presentation status			excluding 'unknown' presentation status							
	stage %			stage%		difference%		AGE ADJUSTED RISK†		
	I/II	III/IV		I/II	III/IV	absolute	relative‡	RR	[95%CI]	p-value
breast	0.3	4.8	breast	0.4	5.8	5.5	1527	14.16	[9.2,21.9]	<0.001
larynx	1.3	14.5	larynx	1.4	18.1	16.7	1158	13.40	[4.9,36.7]	<0.001
melanoma of skin	0.1	1.5	melanoma of skin	0.1	1.9	1.7	1186	11.88	[2.7,52.7]	0.001
cervix	1.0	12.2	cervix	1.2	15.6	14.3	1162	10.40	[4.7,22.9]	<0.001
prostate	0.5	5.5	prostate	0.5	6.5	6.0	1108	9.33	[6.7,12.9]	<0.001
thyroid	1.0	12.2	thyroid	1.1	15.0	13.9	1254	5.07	[2.1,12.4]	<0.001
corpus uteri	1.6	7.0	corpus uteri	1.9	9.4	7.5	392	4.50	[2.4,8.4]	<0.001
mouth & pharynx	1.7	7.2	mouth & pharynx	2.1	9.1	7.0	338	4.48	[2.3,8.8]	<0.001
all invasive*	**3.8**	**17.0**	**all invasive***	**4.5**	**20.4**	**15.9**	**353**	**4.12**	**[3.9,4.4]**	<0.001
testis	5.9	15.6	testis	6.7	18.5	11.8	176	2.78	[1.5,5.3]	0.002
stomach	7.4	19.6	stomach	8.7	23.5	14.8	171	2.77	[1.9,4.0]	<0.001
oesophagus	5.9	15.6	oesophagus	6.8	18.0	11.2	163	2.63	[1.7,4.1]	<0.001
bladder	5.9	15.1	bladder	7.6	18.5	10.9	143	2.54	[1.8,3.6]	<0.001
Hodgkin lymphoma	6.4	17.0	Hodgkin lymphoma	7.3	19.1	11.8	162	2.50	[1.5,4.3]	0.001
lung	11.0	24.2	lung	14.1	29.8	15.7	112	2.20	[2.0,2.5]	<0.001
ovary	10.0	22.6	ovary	12.4	27.6	15.2	123	1.90	[1.4,2.6]	<0.001
rectum	6.0	10.2	rectum	7.1	11.7	4.7	66	1.75	[1.4,2.3]	<0.001
colon	13.4	22.2	colon	15.6	25.7	10.1	65	1.71	[1.5,1.9]	<0.001
kidney	9.3	15.2	kidney	11.2	19.0	7.9	70	1.60	[1.3,2.0]	<0.001
liver	19.2	29.2	liver	22.9	33.9	11.0	48	1.47	[1.1,2.0]	0.017
non-Hodgkin	12.8	18.4	non-Hodgkin	14.9	21.2	6.3	42	1.43	[1.2,1.7]	<0.001
pancreas	25.2	30.6	pancreas	29.3	36.6	7.3	25	1.29	[1.1,1.6]	0.011

† age adjusted relative risk (RR) of presenting emergently (stage III/IV vs. stage I/II, i.e. late stage vs. early stage), sorted on relative risk (RR)
‡ relative difference = (stage III/IV/stage I/II-1) x100.
* excluding NMSC, also excluding c.15% of cases who were missing information on stage

- This pattern, i.e. a significantly higher risk of presenting as emergencies among late-stage, was also seen for all 21 individual cancer types for which stage data were examined.

- Even though very few breast cancer patients presented emergently, stage-related variation in emergency presentation risk was most marked for breast cancer. Late-stage cases were 14 times (RR=14.16) or 1,300% more likely to present emergently than early-stage cases after adjusting for age (Table 6.4).
- Conversely, a high proportion of pancreatic cancer presented emergently (irrespective of stage) - the relative risk of late stage presentation was least marked for pancreatic cancer (late-stage cases were only 1.3 times or 29% more likely to present emergently).

7. CANCER TYPE AND AGE

Proportion presenting by age category

Table 7.1 Age distribution by cancer site (2010-2015)

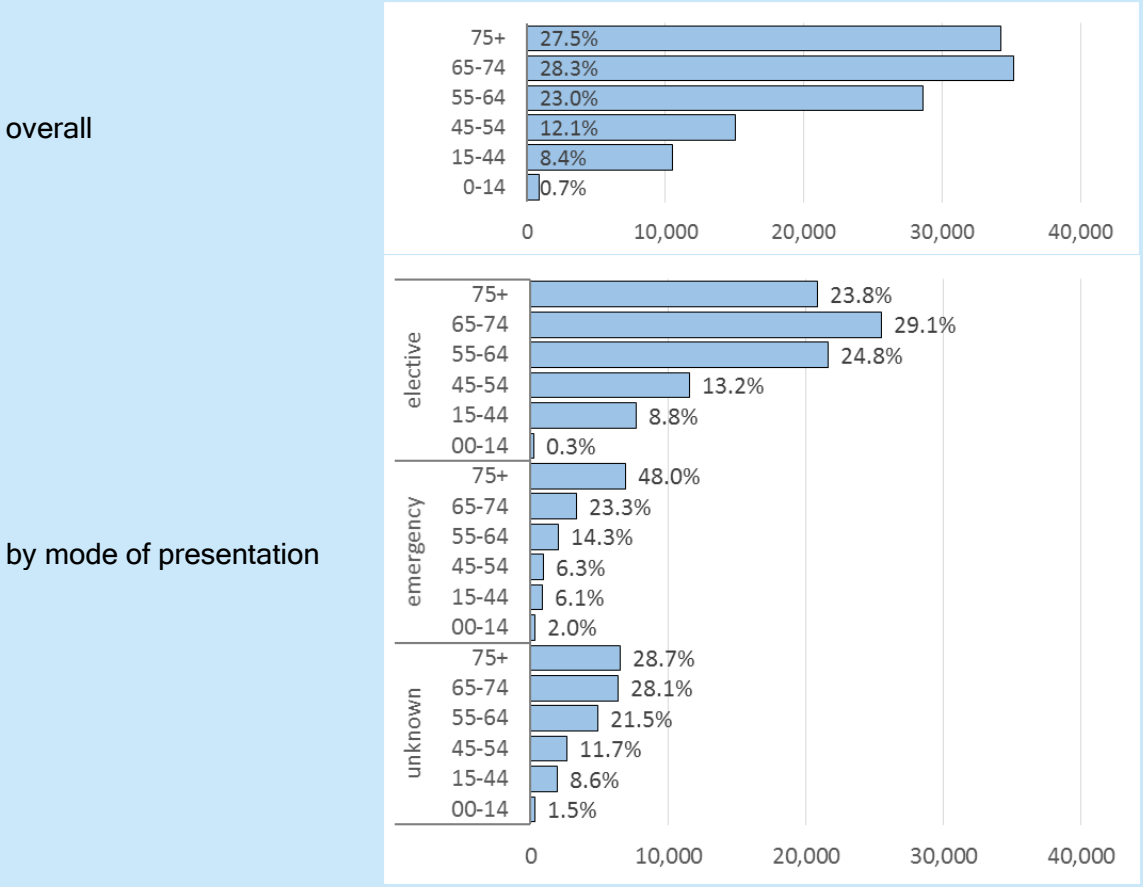
	0-14	15-44	45-54	55-64	65-74	75+	total
prostate	0.0%	0.5%	7.7%	32.3%	40.8%	18.7%	20,226
lung	0.0%	1.5%	6.6%	21.0%	34.5%	36.4%	14,090
oesophagus	0.0%	2.4%	8.4%	20.7%	31.5%	36.9%	2,332
rectum	0.0%	4.1%	11.1%	24.0%	31.5%	29.3%	5,103
pancreas	0.0%	2.4%	7.6%	18.3%	30.3%	41.3%	3,058
colon	0.3%	4.9%	7.5%	18.0%	29.7%	39.6%	9,891
liver	1.4%	4.6%	10.6%	19.8%	29.7%	33.9%	1,473
stomach	0.0%	4.1%	8.4%	18.1%	29.7%	39.7%	3,348
larynx	0.0%	3.8%	13.5%	31.9%	29.3%	21.5%	995
multiple myeloma	0.0%	3.2%	9.0%	21.2%	29.2%	37.3%	1,728
bladder	0.0%	1.9%	4.9%	16.6%	28.8%	47.7%	2,615
corpus uteri	0.0%	3.7%	14.5%	33.9%	28.5%	19.4%	2,656
all invasive*	**0.7%**	**8.4%**	**12.1%**	**23.0%**	**28.3%**	**27.5%**	**124,381**
non-Hodgkin lymphoma	0.9%	10.1%	12.6%	21.1%	27.7%	27.5%	4,543
kidney	1.7%	8.2%	14.3%	23.2%	27.6%	24.9%	3,424
mouth & pharynx	0.5%	7.5%	17.4%	31.4%	25.3%	17.9%	2,653
ovary	0.1%	8.6%	16.0%	24.6%	23.9%	26.8%	2,261
leukaemia	9.4%	10.0%	9.8%	17.2%	23.4%	30.3%	3,083
melanoma of skin	0.1%	19.4%	15.4%	18.4%	22.8%	24.0%	5,821
brain & CNS	6.9%	19.2%	12.6%	19.9%	22.3%	19.0%	2,207
breast	0.0%	13.1%	25.5%	26.2%	17.6%	17.6%	17,596
thyroid	0.4%	41.9%	18.6%	16.2%	14.2%	8.7%	1,579
Hodgkin lymphoma	4.1%	53.7%	12.5%	11.7%	11.0%	7.0%	855
cervix	0.1%	48.4%	20.5%	16.4%	8.0%	6.5%	1,728
testis	0.3%	81.2%	13.4%	3.2%	1.0%	0.9%	1,050

Sorted on descending order of proportion of cases occurring at ages 65-74 for each cancer
* excluding NMSC

- Prostate, lung, oesophageal, rectal, pancreatic and colon cancers tended to occur in older patients.
- Conversely, testicular and cervical cancers and Hodgkin lymphoma were more weighted towards younger patients.

Proportion presenting by age category and mode of presentation

Figure 7.1 Proportional distribution of all invasive cancer (excluding NMSC) by age, overall and stratified by mode of presentation (2010-2015)



- For cancers as a whole, 56% of cases were diagnosed at ages 65 and over.
- For cancers presenting emergently, 71% were in patients aged 65+, compared with only 53% for cancers presenting electively.
- Even more strikingly, 48% of cancers presenting emergently were among patients aged 75+, compared with only 24% for cancers presenting electively.
- The findings are examined from a different perspective in the next subsection; the proportion of patients at age <65 vs. 65+ that presented emergently.

Proportion of cancers presenting by age category: <65 vs. 65+ years

Table 7.2
Proportion of cases presenting emergently (2010-2015), by age (<65 / 65+)

including 'unknown' presentation status					excluding unknown presentation status			
		<65	65+	all		<65	65+	all
all invasive*	elective	74.7%	66.7%	70.2%	elective	90.9%	81.9%	85.9%
	emergency	7.5%	14.7%	11.5%	emergency	9.1%	18.1%	14.1%
	unknown	17.8%	18.5%	18.2%	unknown	-	-	-

* excluding NMSC
see appendix V for figures for individual cancer types

- For all invasive cancers combined, patients aged 65 years or over were more likely to present emergently (18%) than those under 65 (9%), excluding patients whose mode of presentation was unknown (Table 7.2).

Table 7.3
Proportion of cancer presenting emergently (2010-2015), by age (<65 vs. 65+)

Including 'unknown' presentation status			excluding 'unknown' presentation status						
	age%			age%		difference%	RISK†		
	<65	65+		<65	65+	absolute	relative‡	RR	[95%CI]	p
thyroid	0.9%	8.9%	thyroid	1.0	10.8	9.8	946	10.46	[5.3, 20.5]	<0.001
prostate	0.6%	3.1%	prostate	0.7	3.7	3.1	450	5.50	[4.1, 7.4]	<0.001
breast	0.6%	2.5%	breast	0.7	3.1	2.4	343	4.43	[3.3, 5.9]	<0.001
cervix	3.9%	11.6%	cervix	5.1	14.4	9.3	182	2.82	[1.9, 4.3]	<0.001
melanoma of skin	0.4%	1.0%	melanoma	0.5	1.3	0.7	134	2.34	[1.2, 4.5]	0.011
kidney	8.4%	17.7%	kidney	10.2	22.2	12.0	118	2.18	[1.8, 2.6]	<0.001
testis	8.8%	15.8%	testis	10.2	21.4	11.2	109	2.09	[0.8, 5.8]	0.157
ovary	12.4%	25.7%	ovary	15.6	31.5	15.9	101	2.01	[1.7, 2.4]	<0.001
all invasive*	**7.5%**	**14.7%**	**all invasive***	**9.1**	**18.1**	**9.0**	**98**	**1.98**	**[1.9, 2.1]**	**<0.001**
bladder	6.0%	11.2%	bladder	7.7	14.2	6.5	84	1.84	[1.3, 2.6]	<0.001
corpus uteri	2.5%	4.6%	corpus uteri	3.2	5.7	2.5	80	1.80	[1.2, 2.7]	0.005
oesophagus	9.4%	15.9%	oesophagus	11.0	19.0	8.0	72	1.72	[1.3, 2.2]	<0.001
Hodgkin	9.7%	15.6%	Hodgkin	11.1	18.9	7.8	70	1.70	[1.1, 2.6]	0.015
rectum	6.4%	10.5%	rectum	7.4	12.3	4.9	67	1.67	[1.4, 2.0]	<0.001
larynx	5.5%	8.9%	larynx	6.6	10.8	4.1	63	1.63	[1.0, 2.6]	0.037
stomach	12.4%	19.2%	stomach	14.6	23.1	8.4	58	1.58	[1.3, 1.9]	<0.001
brain & CNS	20.8%	33.4%	brain & CNS	27.5	42.8	15.4	56	1.56	[1.4, 1.8]	<0.001
pancreas	20.8%	31.6%	pancreas	25.4	38.0	12.6	49	1.49	[1.3, 1.7]	<0.001
liver	21.1%	30.5%	liver	26.5	38.1	11.6	44	1.44	[1.2, 1.7]	<0.001
lung	16.1%	21.6%	lung	20.8	27.9	7.2	35	1.35	[1.2, 1.5]	<0.001
non-Hodgkin	13.6%	17.0%	non-Hodgkin	16.0	20.2	4.2	26	1.26	[1.1, 1.4]	0.001
mouth & pharynx	5.0%	5.7%	mouth & pharynx	6.3	7.4	1.0	16	1.16	[0.8, 1.6]	0.365
colon	17.2%	19.7%	colon	19.8	23.0	3.2	16	1.16	[1.1, 1.3]	0.001
multiple myeloma	16.6%	16.7%	multiple myeloma	19.5	19.1	- 0.4	-2	0.98	[0.8, 1.2]	0.844
leukaemia	24.2%	19.8%	leukaemia	30.9	23.4	- 7.5	-24	0.76	[0.7, 0.9]	<0.001

† sorted on unadjusted relative risk (RR) of presenting emergently (65+ vs. <65)
‡ relative difference = (65+/<65-1) x100.
* excluding NMSC

- In terms of risk, cancer patients aged 65+ were twice as likely (RR=1.98) to present *emergently* as patients under 65, excluding patients whose mode of presentation was unknown (Table 7.3).

- This pattern – i.e. a statistically significant higher likelihood of presenting emergently among patients aged 65+ was also seen (to varying degrees) for all but 2 (multiple myeloma and leukaemia) of the 24 individual cancer types examined.
- Age-related variation in emergency presentation likelihood was most marked for thyroid cancer (patients aged 65+ were 10 times (RR=10.5) or 950% more likely to present emergently than patients under 65) and least marked for multiple myeloma (no difference by age).
- Even though very few of the common cancers (prostate, breast and melanoma) presented emergently, those that did present *emergently* were much more likely to be over 65 years (RR=5.5, RR=4.4 and RR=2.3 respectively).
- Leukaemia was the only cancer group for which older patients were significantly less likely to present as emergencies.

8. CANCER TYPE AND GENDER

Proportion of cancers presenting, by gender and mode of presentation

Table 8.1
Proportion presenting emergently, by gender (2010-2015)

including 'unknown' presentation status					excluding unknown presentation status			
		males	**females**	**all**		**males**	**females**	**all**
all invasive*	elective	70.6%	69.8%	70.2%	elective	86.1%	85.7%	85.9%
	emergency	11.4%	11.7%	11.5%	emergency	13.9%	14.3%	14.1%
	unknown	18.0%	18.5%	18.2%	unknown	-	-	-

* excluding NMSC; see appendix VI for figures for individual cancer types

- The proportion of all cancers presenting emergently was similar for males (13.9% excluding unknown presentations) and females (14.3%) during 2010-2015 (Table 8.1).
- For most cancers (and the *all invasive* cancer group), male/female differences in the proportion presenting emergently were not statistically significant after adjustment for age (Table 8.2).
- Males with Hodgkin/non-Hodgkin lymphoma and melanoma had a significantly higher age-adjusted risk of presenting emergently than female patients, whereas females with bladder, colon cancer and leukaemia, had a higher age-adjusted risk of presenting emergently (Table 8.2).

Table 8.2
Proportion of cancer presenting emergently (2010-2015), by gender

Including 'unknown' presentation status			excluding 'unknown' presentation status						
	gender%			**gender%**		**difference%**		**AGE ADJUSTED RISK†**		
	male	**female**		**male**	**female**	**absolute**	**relative‡**	**RR**	**[95%CI]**	**p**
thyroid	2.7	2.7	thyroid	3.3	3.1	-0.2	-6.0	1.29	[0.7,2.5]	0.46
bladder	8.9	12.7	bladder	11.3	16.0	4.7	41.0	1.29	[1.0,1.6]	0.03
larynx	7.0	8.6	larynx	8.4	10.4	2.0	24.0	1.27	[0.7,2.2]	0.394
rectum	8.1	10.5	rectum	9.4	12.2	2.8	30.0	1.16	[1.0,1.4]	0.099
leukaemia	19.8	24.9	leukaemia	24.0	30.9	6.9	29.0	1.13	[1.0,1.3]	0.049
brain & CNS	24.3	28.3	brain & CNS	31.9	36.4	4.5	14.0	1.11	[1.0,1.3]	0.116
colon	17.6	20.6	colon	20.3	24.2	3.9	19.0	1.09	[1.0,1.2]	0.04
liver	25.3	31.2	liver	32.1	37.8	5.7	18.0	1.08	[0.9,1.3]	0.354
all invasive*	**11.4**	**11.7**	**all invasive**	**13.9**	**14.3**	**0.4**	**3.0**	**1.00**	**[1.0,1.0]**	**0.762**
oesophagus	13.0	15.2	oesophagus	15.4	18.4	3.0	19.0	1.00	[0.8,1.2]	0.985
lung	20.0	19.9	lung	25.7	26.0	0.3	1.0	0.99	[0.9,1.1]	0.736
pancreas	27.2	30.1	pancreas	33.1	36.0	2.9	9.0	0.98	[0.9,1.1]	0.649
kidney	12.9	14.0	kidney	16.0	17.1	1.2	7.0	0.92	[0.8,1.1]	0.307
stomach	17.2	17.0	stomach	20.5	20.4	-0.1	0.0	0.88	[0.8,1.0]	0.099
mouth & pharynx	5.5	4.8	mouth & pharynx	7.0	6.2	-0.9	-12.0	0.85	[0.6,1.2]	0.383
multiple myeloma	17.6	15.3	multiple myeloma	20.2	17.8	-2.5	-12.0	0.85	[0.7,1.1]	0.15
non-Hodgkin	16.6	14.1	non-Hodgkin	19.7	16.7	-3.0	-15.0	0.84	[0.7,1.0]	0.013
breast	2.0	1.3	breast	2.7	1.5	-1.1	-43.0	0.82	[0.3,2.4]	0.718
Hodgkin	12.5	8.7	Hodgkin	14.5	10.0	-4.5	-31.0	0.61	[0.4,0.9]	0.018
melanoma of skin	0.9	0.5	melanoma of skin	1.2	0.6	-0.6	-48.0	0.52	[0.3,1.0]	0.051
corpus uteri		3.5	corpus uteri		4.4					
ovary		19.2	ovary		23.8					
cervix		5.0	cervix		6.5					
prostate	2.1		prostate	2.5						
testis	9.0		testis	10.4						

† Age adjusted relative risk (RR) of presenting emergently (F vs. M), sorted on relative risk (RR)
RR>1 females more likely to present emergently; RR<1 males more likely to present emergently *after adjusting for age*
‡ relative difference = (female/male-1) x100.
* excluding NMSC

9. DISCUSSION OF FINDINGS (IRISH CANCER SOCIETY)

Emergency presentation

It is still not well understood how emergency presentations of cancer arise or to what extent they are preventable.[1] Causes can be patient delay; a lack of awareness of signs and symptoms; GP failure to refer; sudden changes in symptoms; little or no consultation with GPs by patients[2]; delays in accessing diagnostics; and some cancers, such as pancreatic cancer, for example, tend to present late, and are not easily identifiable, or acute symptoms only appear at late stage.

In the UK, in 2007, the National Cancer Intelligence Network first analyzed the proportion of cancers diagnosed as emergency presentations, and reported a level of 23%[3]. Our starting position of 20% in 2002 falling to 14% by 2009 is quite positive, although that decline in emergency diagnosis has stalled, and evidently there is more to do to bring this down further.

A further cautionary note is that Irish figures quoted here are based on hospital emergency presentations only, whereas the full UK figures also include patients presenting in emergency situations to GPs. If emergency GP referrals are excluded from the UK figures about 16% of all invasive cancers in the UK (2006-2015) presented emergently through hospitals.

Ireland's National Cancer Strategy 2017-2026[4] contains a target to reduce the proportion of cancers diagnosed in the ED by 50%, over the course of the ten year Strategy. While the Strategy sets out a series of recommendations which are aimed at addressing delayed and emergency diagnosis, the interpretation and comprehensive implementation of these recommendations will be a key factor in making progress. Without concrete measures in place to reduce the proportion of emergency presentations, the target of 50% reduction in cancers diagnosed as an emergency by 2026 will not be realised.

The UK's recently published National Cancer Strategy Implementation Plan[5] contains a number of recommendations aimed at reducing emergency cancer diagnoses – better 'safety netting by GPs'; piloting of multidisciplinary rapid access diagnostic centres; piloting self-referral; direct access to diagnostics for GPs; a 'Significant Case Review Analysis' to be undertaken after every emergency diagnosis.

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[1] http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0135027
[2] http://bjgp.org/content/early/2017/04/24/bjgp17X690869
[3] http://www.ncin.org.uk/publications/data_briefings/routes_to_diagnosis
[4] http://health.gov.ie/wp-content/uploads/2017/07/National-Cancer-Strategy-2017-2026.pdf
[5] https://www.england.nhs.uk/wp-content/uploads/2016/05/cancer-strategy.pdf

Serious consideration needs to be given to the early implementation of the actions recommended in this report to ensure the challenges of emergency presentation of cancer are addressed over the course of the National Cancer Strategy 2017-2026.

Pathways to diagnosis

As the first port of call for many patients, primary care has a central role to play in early diagnosis. The detection of symptoms for cancer compared to other illnesses can be challenging for GPs.

Analysis from the UK's National Cancer Intelligence Network shows that in a third of emergency presentations the patient had presented at their GP prior to diagnosis[6]. On average patients attend their GP three times before a cancer diagnosis is made[7].

It is still unclear what role avoidable diagnostic delay plays in emergency diagnosis, but it is clear that there is scope to reduce avoidable diagnostic delays through raising awareness of symptoms amongst clinicians in both primary and emergency care services, and among the public, given that some patients may have no contact with the health system prior to presentation[8].

There are lessons to be taken from UK research into the patient pathway to an emergency presentation. In the UK, a nested study was carried out surveying 27 patients who had their cancer diagnosed as an emergency, as part of the National Patient Experience Survey. This study found that most participants needed multiple visits, sometimes to several healthcare providers, before visiting an emergency department (ED), and before a cancer diagnosis was made. A minority had a rapid, straightforward pathway. A significant number experienced symptoms on the NICE qualifying list, yet were missed for referral[9].

Other qualitative studies of cancer patients in the UK provide further insight. Patients may defer seeking care when they have intermittent symptoms or are unaware of the implications of specific symptoms. This could lead to emergency presentations if patients only seek help when symptoms are at crisis point[10]. However, another study suggested that patients did not ignore escalating symptoms and repeatedly sought healthcare, in contrast to perceptions that patients may ignore symptoms[11].

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[6]http://www.ncin.org.uk/publications/data_briefings/routes_to_diagnosis_exploring_emergency_presentatins
[7] https://www.nature.com/articles/6605399
[8] http://bjgp.org/content/early/2017/04/24/bjgp17X690869
[9] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4529308/pdf/pone.0135027.pdf
[10]https://www.ncbi.nlm.nih.gov/pubmed/23047590
https://www.nature.com/articles/bjc2013105.pdf?origin=ppub
https://www.ncbi.nlm.nih.gov/pubmed/24549161
https://www.ncbi.nlm.nih.gov/pubmed/16139657
[11] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4529308/pdf/pone.0135027.pdf

The National Cancer Strategy contains a recommendation to conduct a Cancer Patient Experience Survey. This offers a unique opportunity to undertake research into the causes of emergency presentation in Ireland, and investigate improvements that can be made.

Like cancer, emergency presentation is complex. The international literature highlights there is no clear understanding of what causes an emergency diagnosis. The findings and implications of this report need to be assessed for some time, and a better understanding of the causes of emergency presentations developed.

We need to acknowledge, also, that there will always be some cancer cases diagnosed by emergency presentation, given the vague nature and late onset of some cancer symptoms. We need to ensure these patients achieve the best outcomes possible by implementing a clear, defined, rapid access pathway to treatment (see *Action points*).

Late-stage diagnosis

The findings of this report show a strong link between emergency presentation and a late-stage cancer diagnosis. In 77% or 3 in 4 of the emergency diagnoses the cancer was already at Stage III or IV.

We know that an early cancer diagnosis saves lives; and a late diagnosis reduces your treatment options and limits your chances of survival (see Table 9.1 below). The National Cancer Strategy recognises that stage at diagnosis is probably the most important determinant of survival and contains a number a targets to achieve earlier diagnosis (see Action points).

Table 9.1.
Survival at one and five years for cancers diagnosed 2008-2012, by stage at diagnosis [12]

	survival at 1 year		survival at 5 years	
CANCER	stage I	stage IV	stage I	stage IV
colorectal	98%	49%	95%	10%
lung	71%	16%	40%	3%
breast	99%	48%	94%	19%
prostate	99%	78%	93%	36%
pancreatic	37%	14%	17%	4%
ovarian	95%	51%	83%	15%

While the link between stage of diagnosis and cancer survival is complex, it is clear that treatment at an early stage offers the greatest potential for improved 5-year survival. From evidence in the UK we know that emergency presentations have poorer one-year relative survival[13].

[12] https://health.gov.ie/wp-content/uploads/2017/07/National-Cancer-Strategy-2017-2026.pdf
[13]http://www.ncin.org.uk/publications/data_briefings/routes_to_diagnosis_exploring_emergency_presentations

While cancer survival rates in Ireland are higher than they have ever been, in some cancers like pancreas and lung, survival rates are low. Earlier detection of cancer and effective treatments are key to improving survival rates and reducing cancer deaths in Ireland.

The National Cancer Strategy contains a target to increase the proportion of colorectal, breast, and lung cancers diagnosed at stage I and II by the end of the Strategy. We expect efforts to improve uptake rates of existing screening programmes for breast and bowel cancers, particularly in areas of deprivation, will support the achievement of this target, but would like to see the specific action points set out in this report actioned as part of the interpretation and implementation of the National Cancer Strategy 2017-2026.

The toll of an emergency cancer diagnosis on a patient is huge, but the cost to the health service is significant as well. A Cancer Research UK report shows the treatment of later stage colorectal, ovary and lung cancers was more than twice the cost of treatment of stage I and II disease[14].

Health Inequalities: Deprivation & Age

We know there is a Cancer Gap in Ireland: you are more likely to get, and twice as likely to die from cancer if you come from the poorest communities[15]. Cancer incidence is higher in the most deprived 20% of the population, by approximately 10% for males and 4% for females, having adjusted for age[16].

We know that cervical, lung and stomach cancers show strong patterns of increasing incidence with increasing deprivation, with rates 120%, 60% and 40% higher, respectively, in the most deprived populations compared to the most affluent 20% of the population[17].

This report again highlights the cancer gap and shows a clear deprivation gradient for emergency presentations. The analysis shows that patients are 50% more likely to present as an emergency if they come from the most deprived areas than if they come from the most affluent areas.

Additionally, the findings display an inequality linked to age as well; cancer patients are twice as likely to present as an emergency if they are 65 or over. For cancers presenting as emergencies 71% were in patients over 65, compared with only 52% in cancers presenting electively. This highlights the particular challenges we face in effectively communicating signs and symptoms to our older population.

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[14] http://www.cancerresearchuk.org/sites/default/files/saving_lives_averting_costs.pdf
[15] Combat Poverty (2008) 'Tackling Health Inequalities: An All Island Approach to Social Determinants'
[16] http://health.gov.ie/wp-content/uploads/2017/07/National-Cancer-Strategy-2017-2026.pdf
[17] IBID

Meanwhile, this can present further problems along the patient journey, given we know that older patients are often under-treated or offered more limited treatment options[18] [19]. With cancer cases projected to almost double by 2040, largely due to our ageing population, it is crucial these inequalities are addressed.

The National Cancer Strategy recognises the need to address both age and deprivation related inequalities and sets targets to:

- Reduce inequalities in age-related cancer incidence for all cancers (ex. NMSC)
- Reduce inequalities in cancer survival between the most and least deprived groups to no greater than 3% for all cancers combined (ex. NMSC), colorectal, lung and breast.

Actions to support these targets are set out in *Action Points*, and it is imperative that any measures adopted are targeted to the relevant population groups.

Access to Diagnostics

We know that rapid access to diagnostics for a suspected cancer can assist in the earlier detection of cancer, and ultimately save lives. NICE, in the UK, has estimated that 5,000 lives could be saved every year if cancers were diagnosed sooner[20].

Appropriate access can positively impact on earlier stage diagnosis and is likely to benefit patient outcomes, improve survival rates and improve quality of life[21] [22].

An Irish Cancer Society commissioned report from 2016 'Access to Diagnostics Used to Detect Cancer'[23] highlighted that there were long delays for GPs accessing diagnostic tests for a suspected cancer; a lack of access to direct diagnostic tests; lack of community diagnostics; and a lack of access to rapid investigative tests for suspected cancer.

Often, because of these problems, GPs are forced to send a patient directly to ED to access urgent diagnostic tests. A NCCP study found that over four-fifths of GPs sent patients to ED to bypass

[18] https://www.ncri.ie/research/projects/treat-treatment-receipt-elderly-women-diagnosed-cancer
[19] https://www.macmillan.org.uk/documents/getinvolved/campaigns/ageoldexcuse/ageoldexcusereport-macmillancancersupport.pdf
[20] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4540374/
[21] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4385982/
[22] https://www.ncbi.nlm.nih.gov/pubmed/24314615
[23] https://www.cancer.ie/sites/default/files/content-attachments/icgp_irish_cancer_society_report_-_access_to_diagnostics_to_detect_cancer.pdf

difficulties in accessing services[24]. The Irish Cancer Society/ICGP[25] report showed that just 51% of GPs had direct access to diagnostic tests for 'urgent' referrals. GPs reported that in some cases they had extremely limited access to fast-track diagnostic tests for symptoms of pancreatic, neurological, head and neck and haematological cancers[26]. In our survey, GPs listed "guaranteed direct access to diagnostic tests for cancer" and "establishment of rapid access clinics for all suspected cancers" as the top two factors which would most assist them in the early detection of cancer [27].

[24] https://www.icgp.ie/go/library/catalogue/item/FF3B481A-F603-C920-82011F16FC87DAE5
[25] https://www.cancer.ie/sites/default/files/content-attachments/icgp_irish_cancer_society_report_-_access_to_diagnostics_to_detect_cancer.pdf
[26] IBID
[27]https://www.cancer.ie/sites/default/files/content-attachments/icgp_irish_cancer_society_report_-_access_to_diagnostics_to_detect_cancer.pdf

10. ACTION POINTS (IRISH CANCER SOCIETY)

The actions below set out how, in the Irish Cancer Society's view, the recommendations within the National Cancer Strategy 2017-2026 can be comprehensively interpreted and implemented to address emergency presentation. They are drawn from evidence and best practice from Ireland and elsewhere and are aligned to the ambitions set out in Sláintecare.

As the implementation of the Strategy progresses the Society believe the Department of Health and the NCCP, ICGP and others should give consideration to integrating within any action plans the points below in order to address emergency diagnosis.

Progress in relation to emergency diagnosis of cancer should be central to Annual Reports on the implementation of the Strategy.

General

- Development of rapid access pathway for patients diagnosed as an emergency, allowing quick access to treatment.
- To investigate the possibility of a Significant Event Analysis being conducted for patients diagnosed with cancer following an emergency admission.
- Investigate the opportunity to survey patients experiencing an emergency cancer diagnosis via the Cancer Patient Experience Survey.
    - The NCRI continue to monitor cancer emergency presentations on an ongoing basis in their Annual Reports, examine the feasibility of extending this to include all 'emergency' referrals from GPs, and on a regional basis.
- Ensure the NCCP and HSE develop referral criteria for patients outside of Rapid Access Clinics by year end.

    The National Cancer Strategy contains a target for the "NCCP, working with other Directorates in the HSE, will develop criteria by end-2018 for the referral of patients with suspected cancer, who fall outside of existing Rapid Access Clinics, for diagnostic tests."

Improved access to diagnostics

- Direct access to diagnostics for GPs at secondary care level

    The National Cancer Strategy commits to "enhancing the care pathways between primary and secondary care for specific cancers"; and will "set out criteria for referral to diagnostics and incorporate the requirements for additional Rapid Access Clinics."

- Development of community diagnostic schemes.

    The UK National Cancer Strategy Implementation Plan[28] has recommended the piloting of multi-disciplinary rapid access diagnostic centres, which would act as a one stop shop for diagnosis, and

[28] https://www.england.nhs.uk/wp-content/uploads/2016/05/cancer-strategy.pdf

assist in earlier diagnosis for people with vague or uncertain symptoms. A patient would have access to a multi-disciplinary clinical team and may get results on the same day.

Sláintecare[29] recommends the "significant expansion of diagnostic services outside of hospitals to enable timely access for GPs to diagnostic tests. Primary care centres should be the hub of community diagnostic services so that all patients can access diagnostics in these centres."

- Reducing public waiting times for investigative diagnostic tests

  According to the Irish Cancer Society's 'Access to Diagnostics' report, patients could be waiting on average 80 days for an abdominal ultrasound; 47 days for a CT brain scan; 126 days for a brain MRI; and approximately 60 days for an endoscopy[30].

  GPs also reported unacceptable delays in accessing tests for gynaecological, neurological, urological (excluding prostate) and head and neck cancers.

  Sláintecare[31] contains a target that no patient should wait more than 10 days for a diagnostic test.

  Development of referral guidelines for GPs needing to access rapid specialist testing at secondary care for suspected cancer

  The National Cancer Strategy has committed to developing criteria for the referral of patients with suspected cancer, who fall outside of the existing Rapid Access Clinics for diagnostic tests by end of 2018, and the NCCP will ensure GPs have agreed timelines to access these tests.

Cancer awareness campaigns

- Development of national public awareness campaigns aimed at informing the public of key signs and symptoms of cancer.

  The National Cancer Strategy 2017-2026 contains a recommendation to "develop a rolling programme of targeted multimedia based public awareness campaigns… with particular focus on at-risk populations."

- The NCCP, and other stakeholders, should work in partnership with the ICGP to develop educational programmes for GPs on cancer signs and symptoms

  A GP might only see, on average, 7 cancer cases a year[32], and while we acknowledge they are already highly skilled in this area, further engagement on rarer cancers and cancers that are more difficult to diagnose will assist in earlier diagnosis.

Primary care

- The NCCP, and other stakeholders, should work in partnership with the ICGP to develop guidance for GPs on how best to communicate with patients on monitoring symptoms and re-attending for consultation.

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[29] https://www.oireachtas.ie/parliament/media/committees/futureofhealthcare/Oireachtas-Committee-on-the-Future-of-Healthcare-Slaintecare-Report-300517.pdf
[30] https://www.cancer.ie/sites/default/files/content-attachments/icgp_irish_cancer_society_report_-_access_to_diagnostics_to_detect_cancer.pdf
[31] https://www.oireachtas.ie/parliament/media/committees/futureofhealthcare/Oireachtas-Committee-on-the-Future-of-Healthcare-Slaintecare-Report-300517.pdf
[32] https://www.cancer.ie/sites/default/files/content-attachments/icgp_irish_cancer_society_report_-_access_to_diagnostics_to_detect_cancer.pdf

A study in the UK showed that patients reported that GPs may give some advice about further help-seeking, but will not offer enough information on how to monitor symptoms or a threshold for re-consultation. The often led patients to not return to GPs[33].

For example, GPs could make the patient a follow up appointment with the advice to cancel if their symptoms improve – in contrast to merely advising to return if they worsen.

- The NCCP, and other stakeholders, should work in partnership with the ICGP to investigate the establishment of 'safety-netting' by GPs[34].

  Although there is currently a dearth of peer-reviewed evidence to support 'safety-netting', the practice is seen as an essential component of primary care consultation and as such is recommended as part of the NICE guidelines for suspected cancer referral, and the 2015 cancer strategy for England.

- Free primary care for all

  A 2016 report, commissioned by the Irish Cancer Society showed that patients who had no medical card were more likely to delay visiting their GP[35].

- Ensure an adequate number of GPs to population ratio and target health care resources into areas with the most health needs.

  We know that in certain areas, there is a lack of GPs, which could hinder patients' ability to access primary care. On average in Ireland there is one GP per 1,600 population, however in North Dublin this falls to one GP in 2,500[36]. Additionally, some of these areas have the greatest health needs.

[33] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4529308/pdf/pone.0135027.pdf
[34] Safety netting is a diagnostic strategy or consultation technique to help manage diagnostic uncertainty. It helps ensure patients undergoing investigations for, or presenting with symptoms which could indicate serious disease, are followed up in a timely and appropriate manner. The process is broken into three questions 1. If I'm right what do I expect to happen? 2. How will I know if I'm wrong? 3. What would I do then?
[35] https://www.cancer.ie/sites/default/files/content-attachments/icgp_irish_cancer_society_report_-_access_to_diagnostics_to_detect_cancer.pdf
[36] http://www.lenus.ie/hse/bitstream/10147/617214/1/Irish_General_Practice_-_Working_with_Deprivation.pdf

REFERENCES

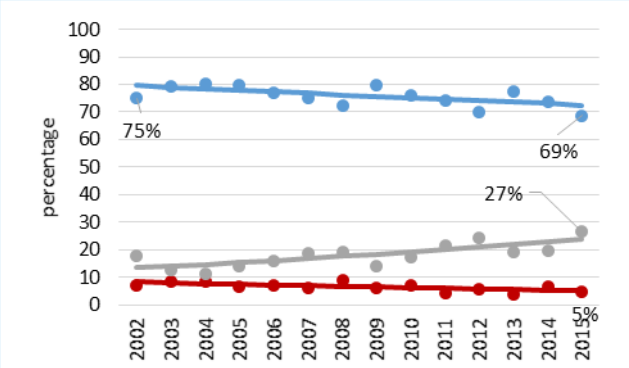
[1] Cancer in Ireland 1994-2015 with estimates for 2015-2017: Annual report of the National Cancer Registry. NCRI, Cork, Ireland; 2017.
[2] O'Brien K, Comber H, Sharp L. Completeness of case ascertainment at the Irish National Cancer Registry. Ir J Med Sci 2013. doi:10.1007/s11845-013-0993-z.
[3] Fritz AG. International classification of diseases for oncology: ICD-O. Geneva: World Health Organization; 2000.
[4] Kim HJ, Fay MP, Feuer EJ, Midthune DN. Permutation tests for joinpoint regression with applications to cancer rates. Stat Med 2000;19:335-51.
[5] SEER. Joinpoint Regression Program - Surveillance Research Program http://surveillance.cancer.gov/joinpoint/ (accessed November 19, 2013).
[6] Zou G. A Modified Poisson Regression Approach to Prospective Studies with Binary Data. Am J Epidemiol 2004;159:702-6. doi:10.1093/aje/kwh090.
[7] Routes to diagnosis n.d. http://www.ncin.org.uk/publications/routes_to_diagnosis (accessed March 9, 2018).
[8] Pobal Haase Deprivation Index 03.doc - PobalHaaseDeprivationIndex03.pdf http://maps.pobal.ie/Documents/PobalHaaseDeprivationIndex03.pdf (accessed May 26, 2016).
[9] Walsh PM, McDevitt J, Deady S, O'Brien K, Comber H. Cancer inequalities in Ireland by deprivation, urban/rural status and age: a report by the National Cancer Registry. National Cancer Registry, Cork, Ireland. 2016.
[10] Sobin LH, Fleming ID. TNM classification of malignant tumors, fifth edition (1997). Cancer 1997;80:1803-4. doi:10.1002/(SICI)1097-0142(19971101)80:9<1803:AID-CNCR16>3.0.CO;2-9.
[11] Sobin LH, Gospodarwicz MK, Wittekind Ch. TNM classification of malignant tumours. 7th. Edition. UICC, Wiley-Blackwell; 2010.

APPENDIX I: TIME TRENDS: MODE OF PRESENTATION

Appendix I. Figure 1. Trend in mode of presentation 2002-2015: lip, mouth and pharynx

including unknown presenation status

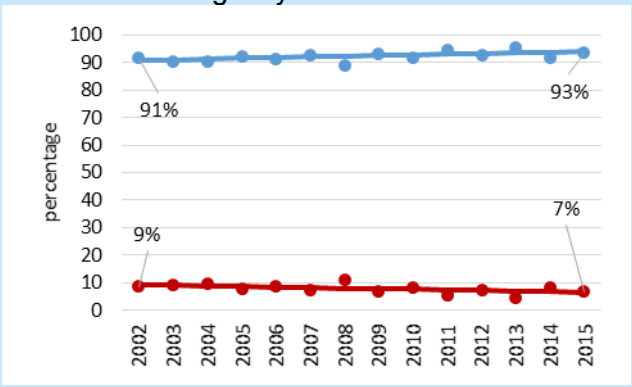
●elective ●emergency ●unknown



	from	to	APC	95%CI	trend
elective	2002	2015	-0.7	[-1.3, -0.1]	↓
emergency	2002	2015	-3.6	[-6.3, -0.9]	↓
unknown	2002	2015	4.5	[2.1, 7.0]	↑

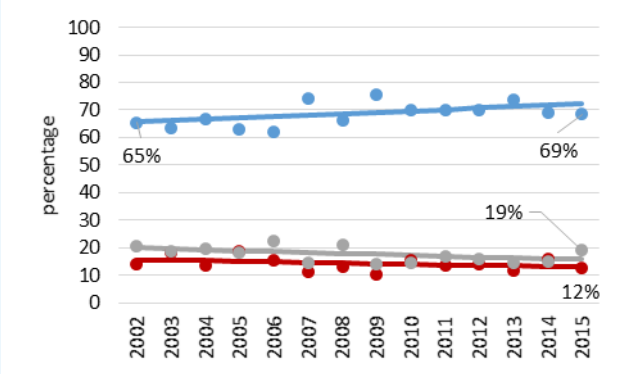
excluding unknown presenation status

●elective ●emergency

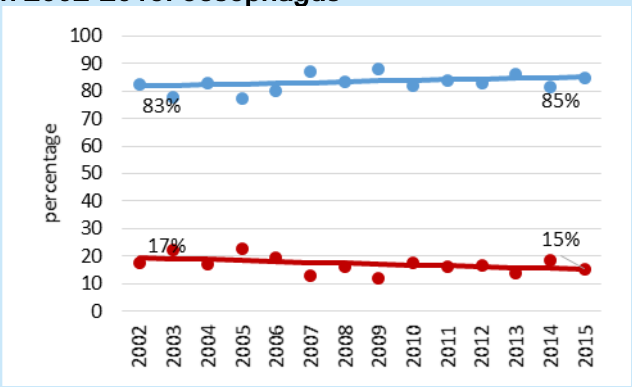


	from	to	APC	95%CI	trend
elective	2002	2015	0.3	[0.0, 0.5]	↑
emergency	2002	2015	-2.7	[-5.3, 0.1]	↔

Appendix I. Figure 2. Trend in mode of presentation 2002-2015: oesophagus

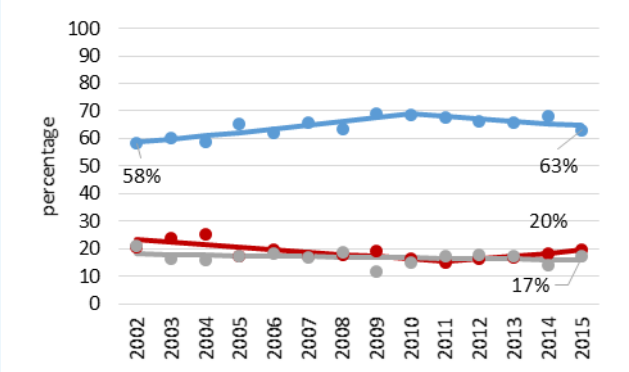


	from	to	APC	95%CI	trend
elective	2002	2015	0.7	[-0.2, 1.6]	↔
emergency	2002	2015	-1.4	[-3.7, 0.9]	↔
unknown	2002	2015	-1.8	[-3.8, 0.2]	↔

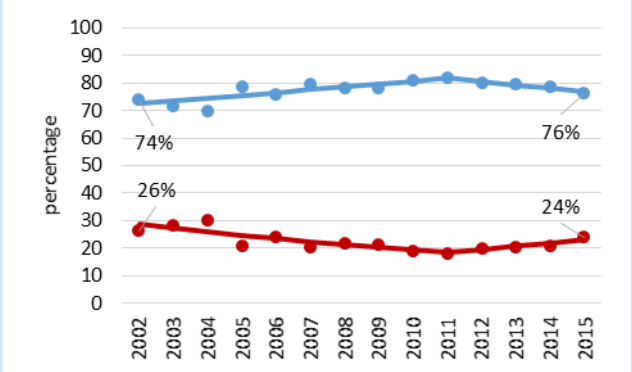


	from	to	APC	95%CI	trend
elective	2002	2015	0.3	[-0.2, 0.8]	↔
emergency	2002	2015	-1.9	[-4.2, 0.6]	↔

Appendix I. Figure 3. Trend in mode of presentation 2002-2015: stomach

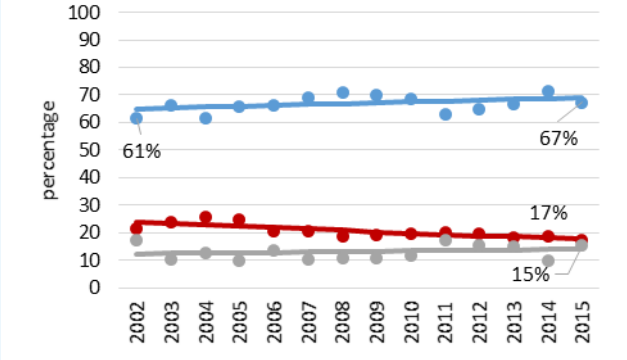


	from	to	APC	95%CI	trend
elective	2002	2010	2.0	[0.9, 3.2]	↑
	2010	2015	-1.2	[-3.3, 0.8]	↔
emergency	2002	2011	-4.5	[-7.3, -1.5]	↓
	2011	2015	5.7	[-4.8, 17.3]	↔
unknown	2002	2015	-1.0	[-2.8, 0.8]	↔

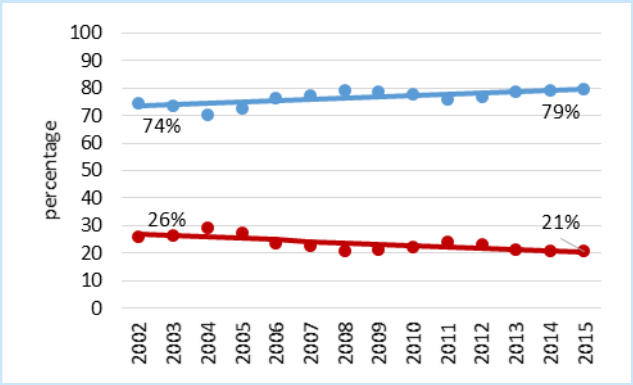


	from	to	APC	95%CI	trend
elective	2002	2011	1.4	[0.5, 2.2]	↑
	2011	2015	-1.6	[-4.0, 0.9]	↔
emergency	2002	2011	-4.8	[-7.3, -2.3]	↓
	2011	2015	5.9	[-3.2, 15.9]	↔

Appendix I. Figure 4. Trend in mode of presentation 2002-2015: colon

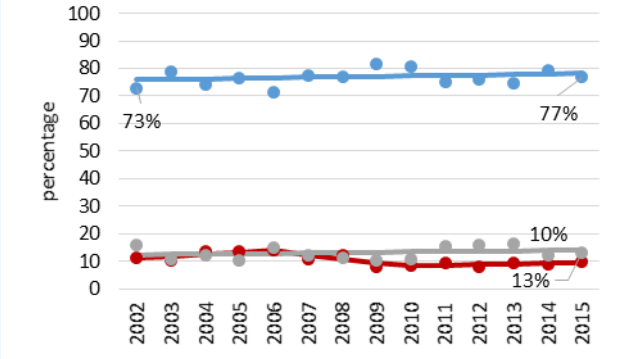


	from	to	APC	95%CI	trend
elective	2002	2015	0.5	[-0.2, 1.1]	↔
emergency	2002	2015	-2.3	[-3.4, -1.3]	↓
unknown	2002	2015	1.0	[-2.0, 4.1]	↔

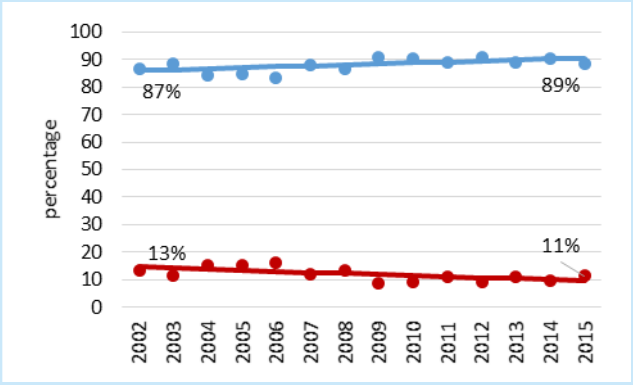


	from	to	APC	95%CI	trend
elective	2002	2015	0.6	[0.3, 1.0]	↑
emergency	2002	2015	-2.2	[-3.3, -1.1]	↓

Appendix I. Figure 5. Trend in mode of presentation 2002-2015: rectum

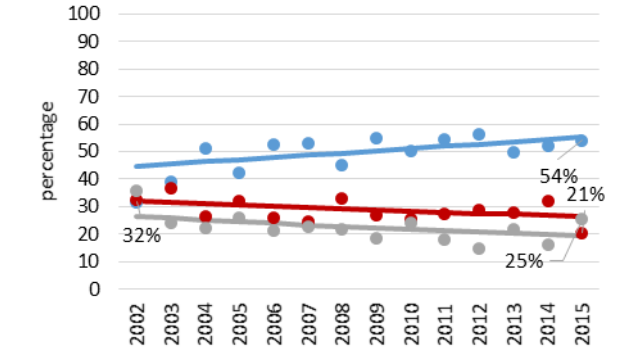


	from	to	APC	95%CI	trend
elective	2002	2015	0.2	[-0.3, 0.8]	↔
emergency	2002	2006	5.8	[-7.0, 20.3]	↔
	2006	2010	-12.4	[-30.1, 9.7]	↔
	2010	2015	3.0	[-6.6, 13.6]	↔
unknown	2002	2015	1.0	[-1.5, 3.6]	↔

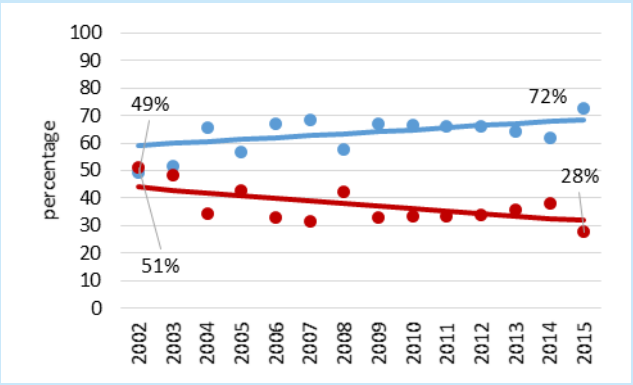


	from	to	APC	95%CI	trend
elective	2002	2015	0.4	[0.1, 0.7]	↑
emergency	2002	2015	-3.1	[-5.3, -0.8]	↓

Appendix I. Figure 6. Trend in mode of presentation 2002-2015: liver

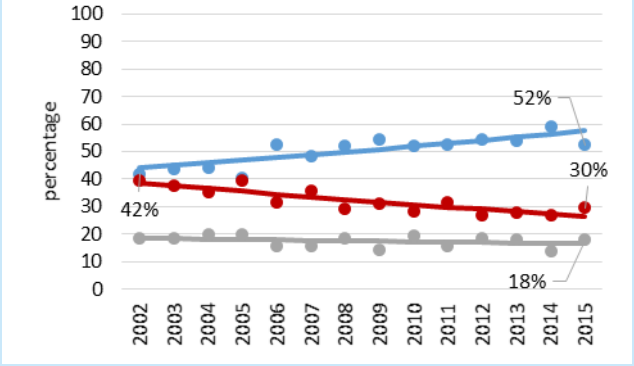


	from	to	APC	95%CI	trend
elective	2002	2015	1.6	[0.1, 3.1]	↑
emergency	2002	2015	-1.4	[-3.4, 0.6]	↔
unknown	2002	2015	-2.4	[-5.1, 0.3]	↔

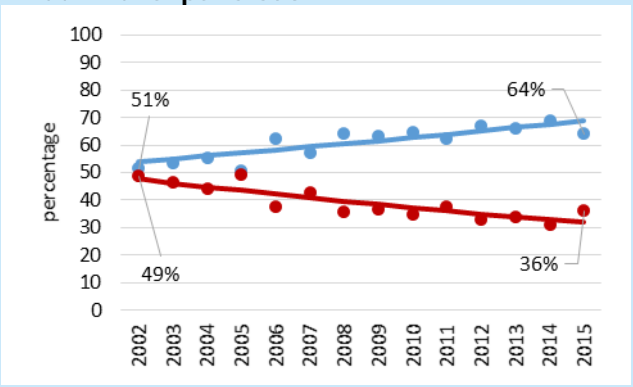


	from	to	APC	95%CI	trend
elective	2002	2015	1.1	[-0.1, 2.3]	↔
emergency	2002	2015	-2.4	[-4.3, -0.6]	↓

Appendix I. Figure 7. Trend in mode of presentation 2002-2015: pancreas

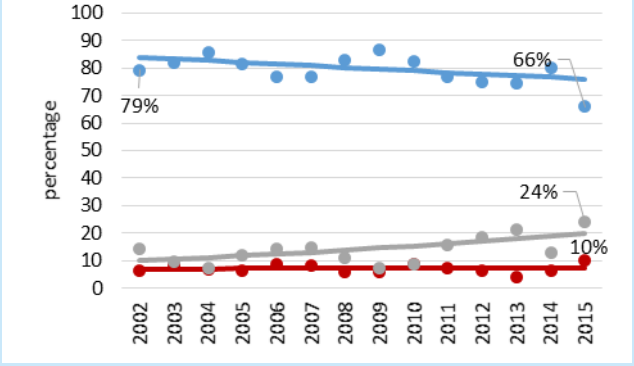


	from	to	APC	95%CI	trend
elective	2002	2015	2.1	[1.1, 3.0]	↑
emergency	2002	2015	-2.8	[-3.8, -1.8]	↓
unknown	2002	2015	-0.9	[-2.5, 0.8]	↔

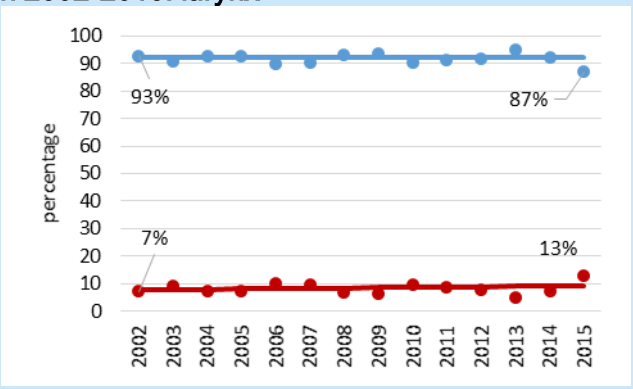


	from	to	APC	95%CI	trend
elective	2002	2015	1.9	[1.1, 2.7]	↑
emergency	2002	2015	-3.0	[-4.1, -2.0]	↓

Appendix I. Figure 8. Trend in mode of presentation 2002-2015: larynx

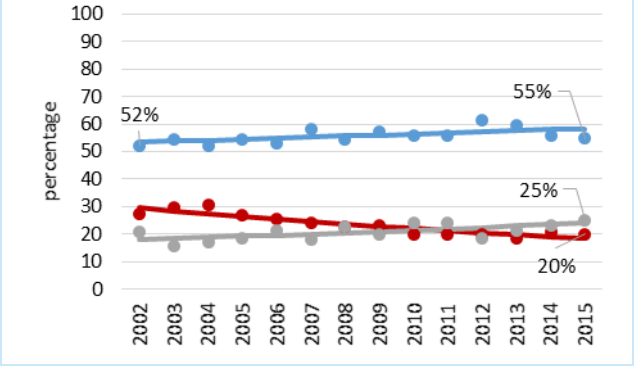


	from	to	APC	95%CI	trend
elective	2002	2015	-0.8	[-1.6, 0.1]	↔
emergency	2002	2015	0.6	[-2.6, 3.9]	↔
unknown	2002	2015	5.3	[1.3, 9.5]	↑

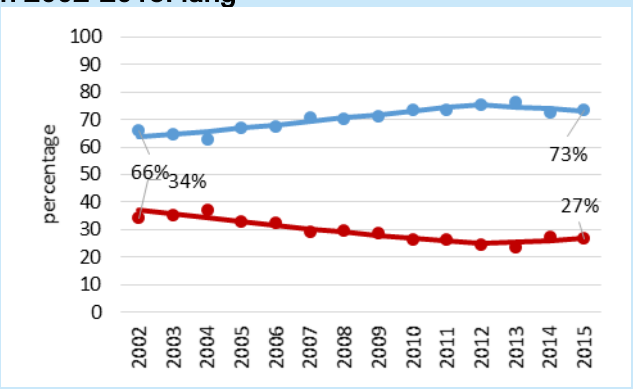


	from	to	APC	95%CI	trend
elective	2002	2015	0	[-0.3, 0.3]	↔
emergency	2002	2015	1.5	[-1.9, 5.0]	↔

Appendix I. Figure 9. Trend in mode of presentation 2002-2015: lung

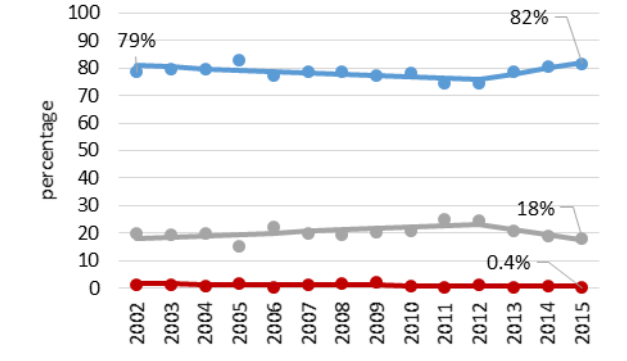


	from	to	APC	95%CI	trend
elective	2002	2015	0.7	[0.1, 1.3]	↑
emergency	2002	2015	-3.5	[-4.5, -2.6]	↓
unknown	2002	2015	2.2	[0.6, 3.9]	↑

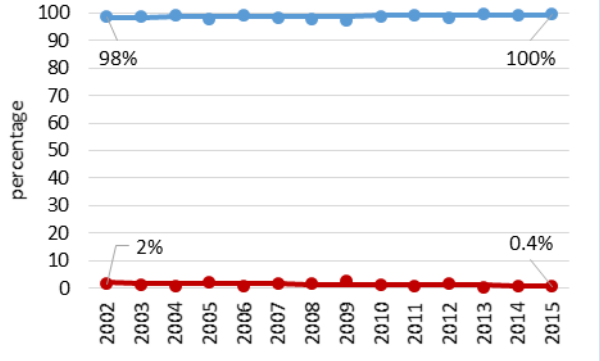


	from	to	APC	95%CI	trend
elective	2002	2012	1.7	[1.2, 2.3]	↑
elective	2012	2015	-1.1	[-3.6, 1.5]	↔
emergency	2002	2012	-3.9	[-5.0, -2.8]	↓
	2012	2015	2.6	[-5.3, 11.2]	↔

Appendix I. Figure 10. Trend in mode of presentation 2002-2015: melanoma of skin

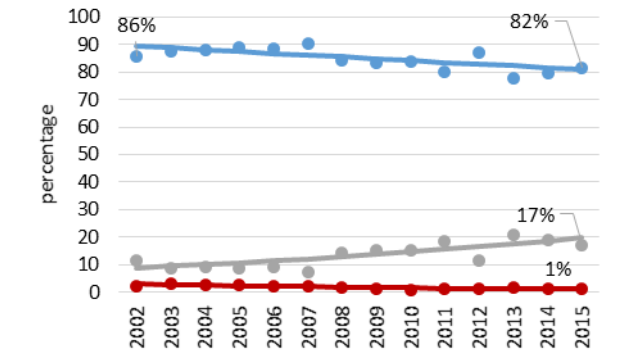


	from	to	APC	95%CI	trend
elective	2002	2012	-0.6	[-1.2, -0.1]	↓
	2012	2015	2.6	[-0.2, 5.6]	↔
emergency	2002	2015	-5.9	[-13.2, 2.0]	↔
unknown	2002	2012	2.5	[0.0, 5.1]	↑
	2012	2015	-9.0	[-20.4, 4.1]	↔

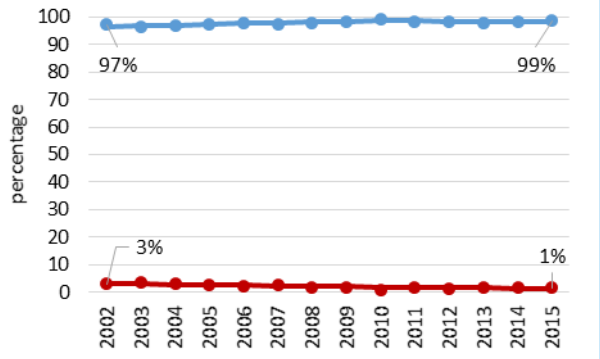


	from	to	APC	95%CI	trend
elective	2002	2015	0.1	[0.0, 0.2]	↑
emergency	2002	2015	-5.6	[-12.9, 2.4]	↔

Appendix I. Figure 11. Trend in mode of presentation 2002-2015: breast

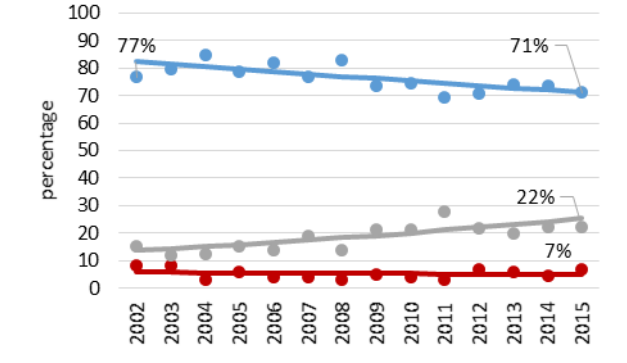


	from	to	APC	95%CI	trend
elective	2002	2015	-0.8	[-1.3, -0.3]	↓
emergency	2002	2015	-7.3	[-9.9, -4.7]	↓
unknown	2002	2015	6.3	[3.1, 9.6]	↑

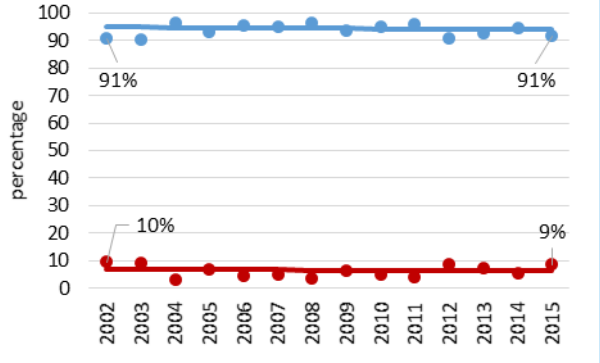


	from	to	APC	95%CI	trend
elective	2002	2010	0.3	[0.2, 0.4]	↑
elective	2010	2015	-0.1	[-0.2, 0.1]	↔
emergency	2002	2015	-6.4	[-9.0, -3.8]	↓

Appendix I. Figure 12. Trend in mode of presentation 2002-2015: cervix

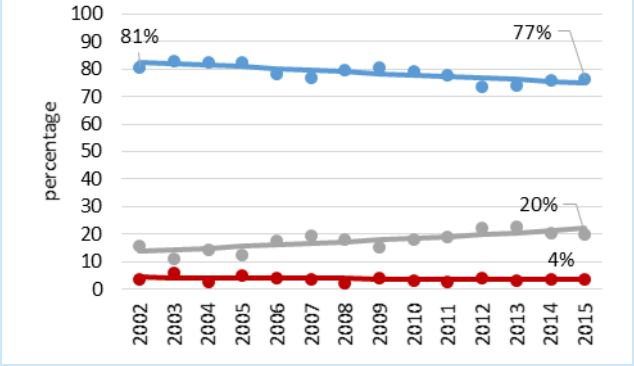


	from	to	APC	95%CI	trend
elective	2002	2015	-1.1	[-1.8, -0.4]	↓
emergency	2002	2015	-1.4	[-5.9, 3.4]	↔
unknown	2002	2015	4.8	[2.0, 7.7]	↑

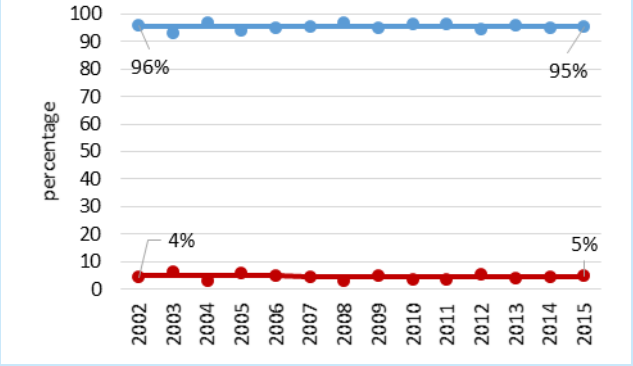


	from	to	APC	95%CI	trend
elective	2002	2015	-0.1	[-0.4, 0.3]	↔
emergency	2002	2015	-0.4	[-4.9, 4.3]	↔

Appendix I. Figure 13. Trend in mode of presentation 2002-2015: corpus uteri

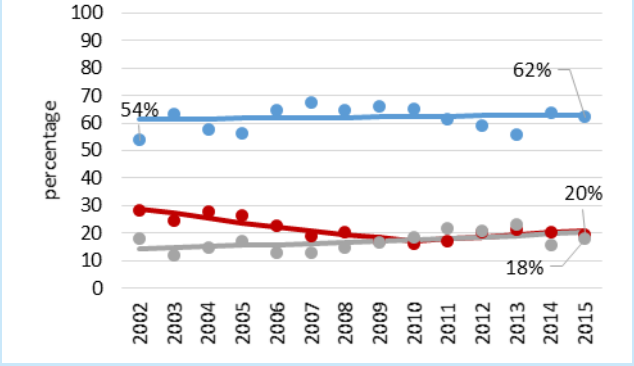


	from	to	APC	95%CI	trend
elective	2002	2015	-0.7	[-1.1, -0.4]	↓
emergency	2002	2015	-1.8	[-4.9, 1.3]	↔
unknown	2002	2015	3.5	[1.7, 5.4]	↑

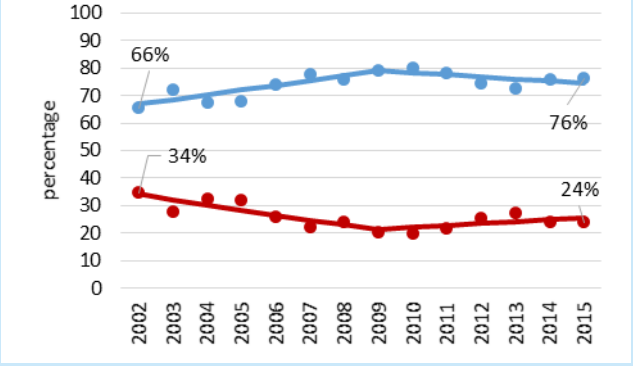


	from	to	APC	95%CI	trend
elective	2002	2015	0.0	[-0.2, 0.2]	↔
emergency	2002	2015	-1.0	[-4.0, 2.0]	↔

Appendix I. Figure 14. Trend in mode of presentation 2002-2015: ovary

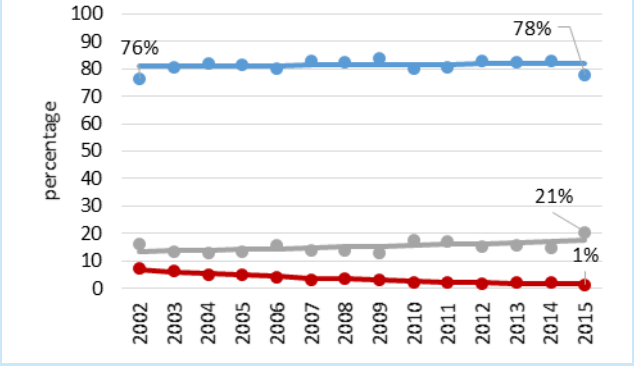


	from	to	APC	95%CI	trend
elective	2002	2015	0.2	[-0.8, 1.2]	↔
emergency	2002	2010	-6.3	[-9.0, -3.4]	↓
	2010	2015	4.1	[-2.5, 11.0]	↔
unknown	2002	2015	2.7	[0.2, 5.2]	↑

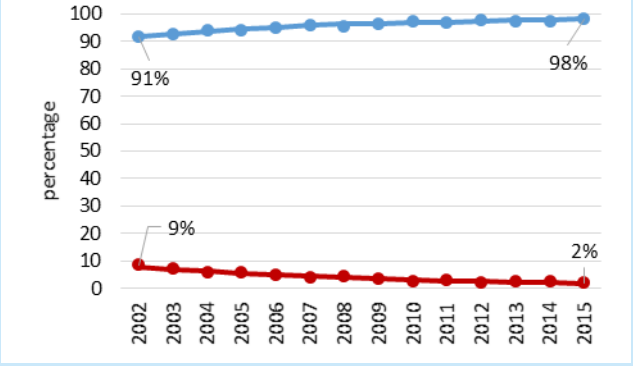


	from	to	APC	95%CI	trend
elective	2002	2009	2.5	[0.8, 4.2]	↑
elective	2009	2015	-1.0	[-2.8, 0.7]	↔
emergency	2002	2009	-6.5	[-10.5, -2.2]	↓
	2009	2015	3.0	[-3.3, 9.7]	↔

Appendix I. Figure 15. Trend in mode of presentation 2002-2015: prostate

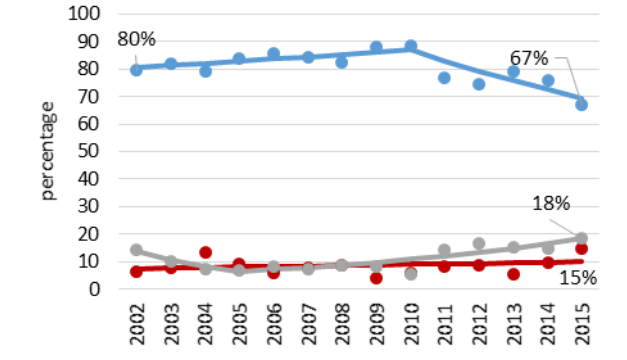


	from	to	APC	95%CI	trend
elective	2002	2015	0.1	[-0.3, 0.5]	↔
emergency	2002	2015	-10.8	[-12.2, -9.5]	↓
unknown	2002	2015	2	[0.2, 3.9]	↑

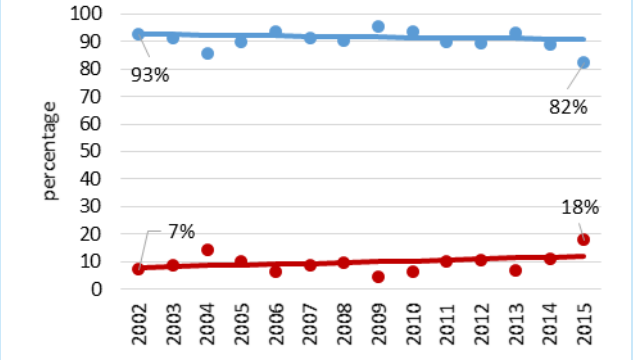


	from	to	APC	95%CI	trend
elective	2002	2007	0.9	[0.4, 1.4]	↑
elective	2007	2015	0.3	[0.1, 0.4]	↑
emergency	2002	2015	-10.6	[-11.9, -9.3]	↓

Appendix I. Figure 16. Trend in mode of presentation 2002-2015: testis

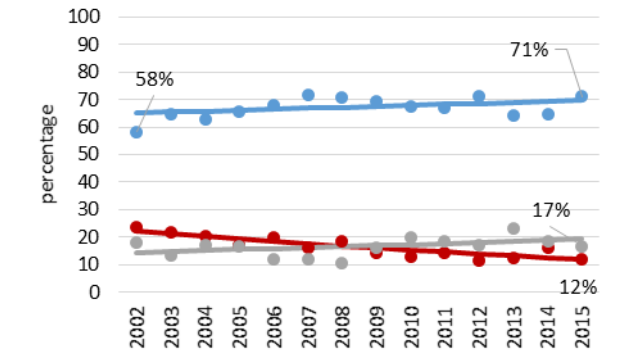


	from	to	APC	95%CI	trend
elective	2002	2010	1.0	[-0.2, 2.1]	↔
	2010	2015	-4.4	[-7.2, -1.6]	↓
emergency	2002	2015	2.3	[-2.3, 7.1]	↔
unknown	2002	2005	-22.3	[-49.3, 18.9]	↔
	2005	2015	11.2	[5.5, 17.1]	↑

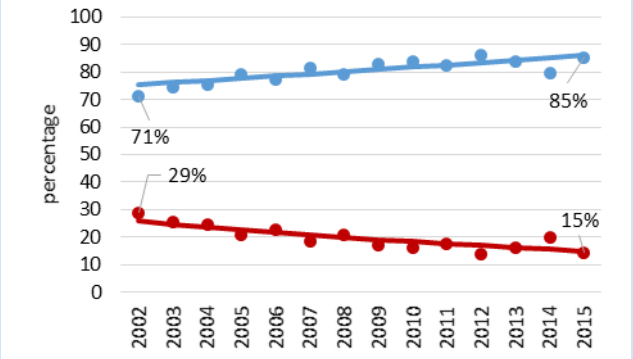


	from	to	APC	95%CI	trend
elective	2002	2015	-0.2	[-0.7, 0.4]	↔
emergency	2002	2015	3.2	[-1.6, 8.3]	↔

Appendix I. Figure 17. Trend in mode of presentation 2002-2015: kidney

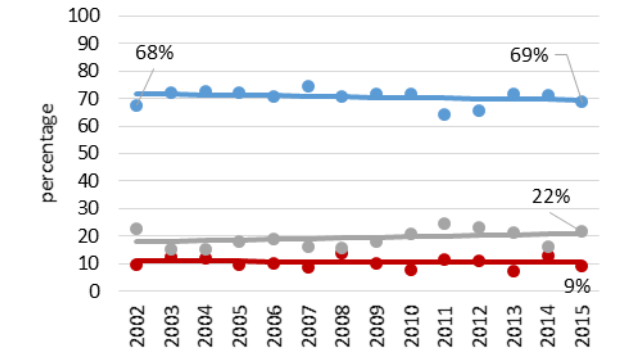


	from	to	APC	95%CI	trend
elective	2002	2015	0.5	[-0.3, 1.3]	↔
emergency	2002	2015	-4.6	[-6.2, -2.8]	↓
unknown	2002	2015	2.3	[-0.5, 5.1]	↔

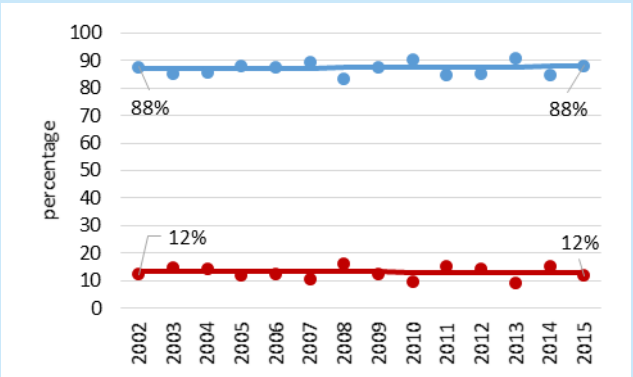


	from	to	APC	95%CI	trend
elective	2002	2015	1.0	[0.5, 1.5]	↑
emergency	2002	2015	-4.2	[-5.8, -2.5]	↓

Appendix I. Figure 18. Trend in mode of presentation 2002-2015: bladder

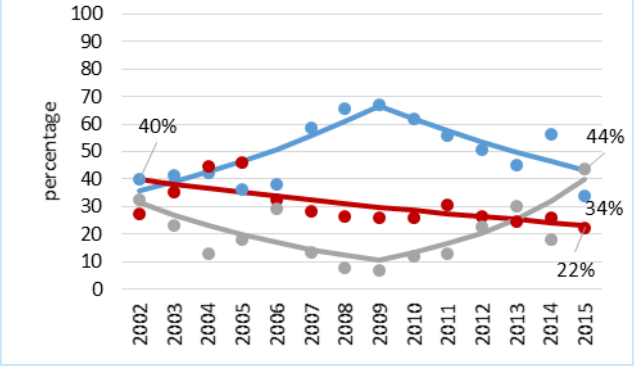


	from	to	APC	95%CI	trend
elective	2002	2015	-0.3	[-0.8, 0.3]	↔
emergency	2002	2015	-0.4	[-3.1, 2.3]	↔
unknown	2002	2015	1.3	[-1.1, 3.6]	↔

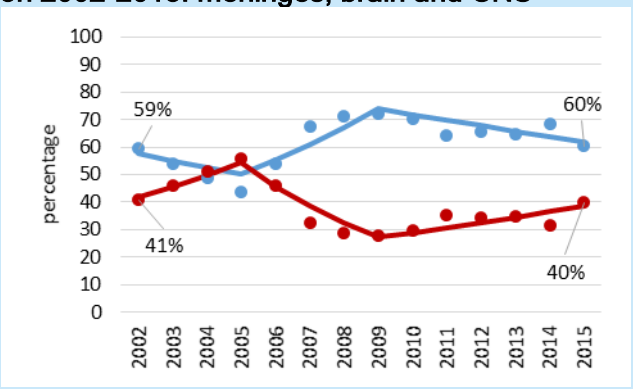


	from	to	APC	95%CI	trend
elective	2002	2015	0.1	[-0.3, 0.5]	↔
emergency	2002	2015	-0.1	[-2.5, 2.4]	↔

Appendix I. Figure 19. Trend in mode of presentation 2002-2015: meninges, brain and CNS

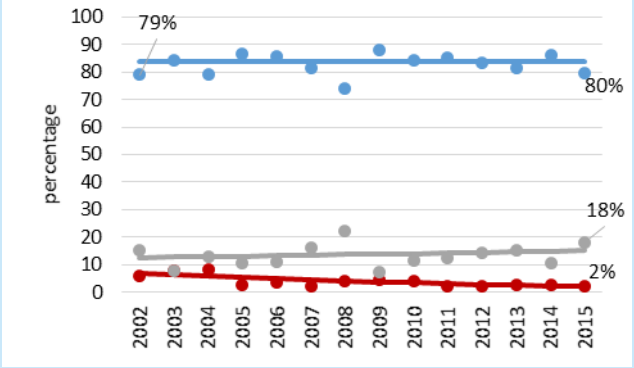


	from	to	APC	95%CI	trend
elective	2002	2009	9.3	[2.5, 16.6]	↑
	2009	2015	-6.9	[-13.8, 0.5]	↔
emergency	2002	2015	-4.1	[-6.6, -1.5]	↓
unknown	2002	2009	-14.4	[-27.3, 0.8]	↔
	2009	2015	24.7	[4.4, 48.9]	↑

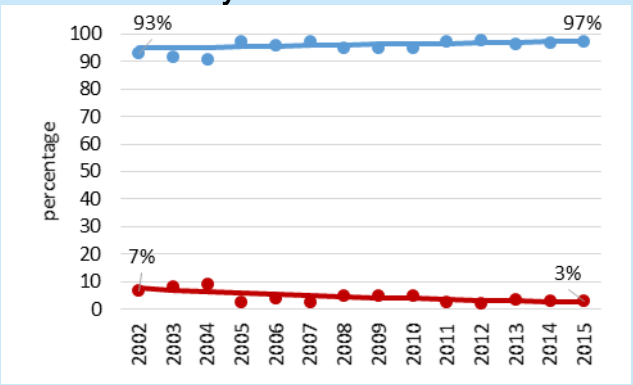


	from	to	APC	95%CI	trend
elective	2002	2005	-4.5	[-14.9, 7.2]	↔
	2005	2009	10.2	[0.6, 20.8]	↑
	2009	2015	-2.9	[-5.6, -0.1]	↓
emergency	2002	2005	9.1	[-3.6, 23.5]	↔
	2005	2009	-15.9	[-26.8, -3.3]	↓
	2009	2015	6.0	[0.8, 11.5]	↑

Appendix I. Figure 20. Trend in mode of presentation 2002-2015: thyroid

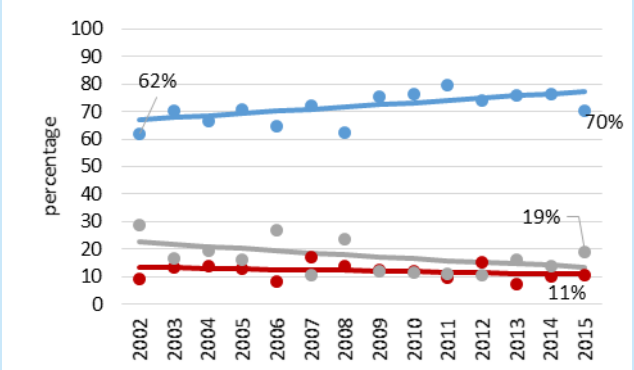


	from	to	APC	95%CI	trend
elective	2002	2015	0.0	[-0.7, 0.7]	↔
emergency	2002	2015	-8.2	[-12.2, -4.0]	↓
unknown	2002	2015	1.4	[-3.0, 5.9]	↔

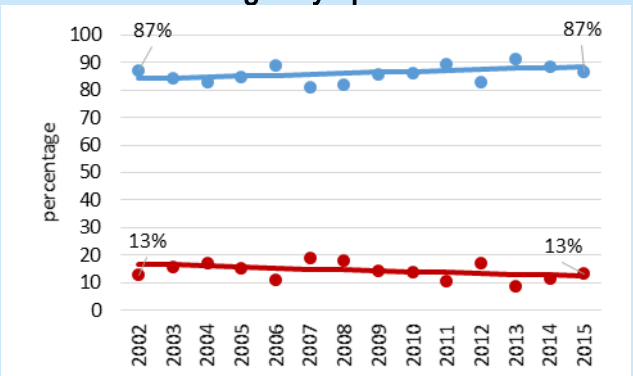


	from	to	APC	95%CI	trend
elective	2002	2015	0.2	[-0.0, 0.4]	↔
emergency	2002	2015	-7.9	[-11.9, -3.8]	↓

Appendix I. Figure 21. Trend in mode of presentation 2002-2015: Hodgkin lymphoma

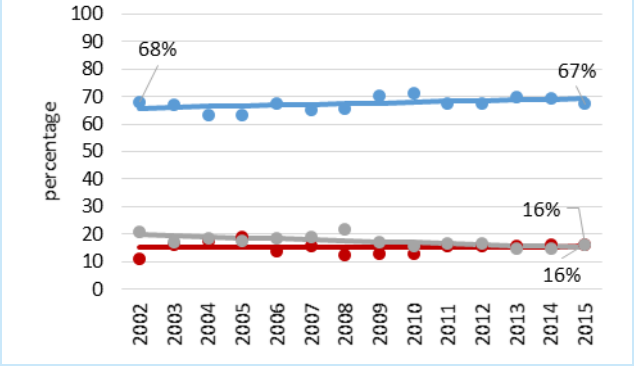


	from	to	APC	95%CI	trend
elective	2002	2015	1.1	[0.2, 2.0]	↑
emergency	2002	2015	-1.6	[-5.0, 2.0]	↔
unknown	2002	2015	-3.9	[-8.0, 0.4]	↔

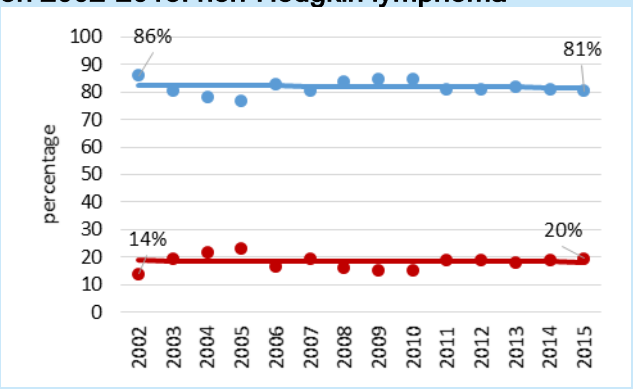


	from	to	APC	95%CI	trend
elective	2002	2015	0.4	[-0.1, 0.9]	↔
emergency	2002	2015	-2.3	[-5.3, 0.8]	↔

Appendix I. Figure 22. Trend in mode of presentation 2002-2015: non-Hodgkin lymphoma

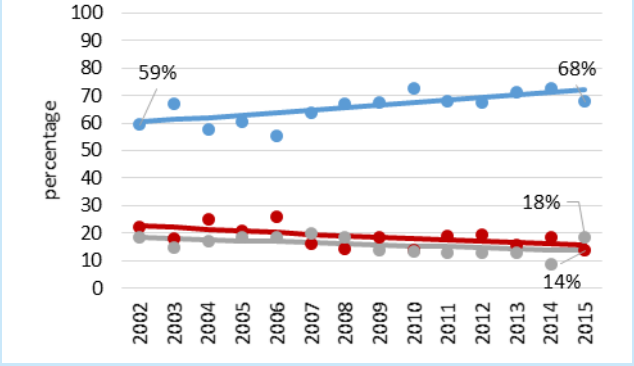


	from	to	APC	95%CI	trend
elective	2002	2015	0.4	[-0.1, 0.9]	↔
emergency	2002	2015	0.2	[-1.8, 2.3]	↔
unknown	2002	2015	-2	[-3.3, -0.7]	↓

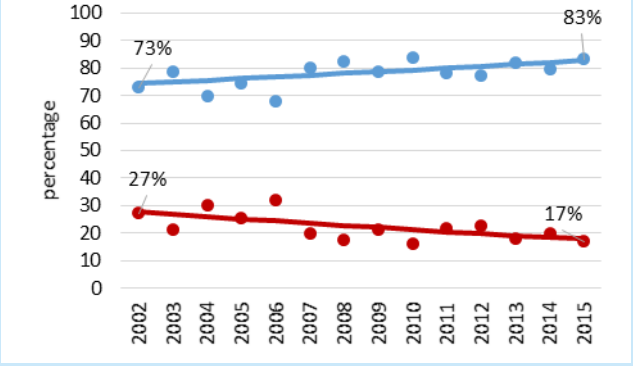


	from	to	APC	95%CI	trend
elective	2002	2015	-0.1	[-0.5, 0.4]	↔
emergency	2002	2015	-0.2	[-2.1, 1.8]	↔

Appendix I. Figure 23. Trend in mode of presentation 2002-2015: multiple myeloma

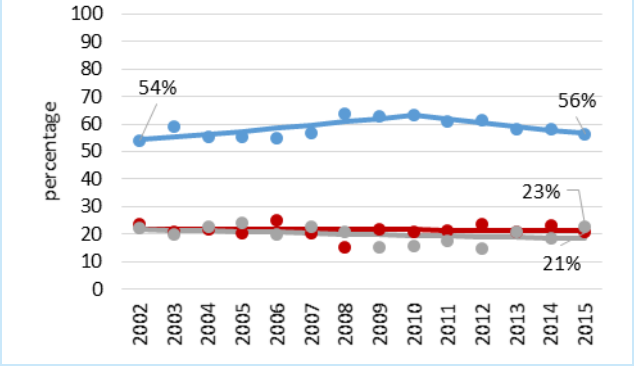


	from	to	APC	95%CI	trend
elective	2002	2015	1.4	[0.5, 2.2]	↑
emergency	2002	2015	-2.8	[-5.2, -0.3]	↓
unknown	2002	2015	-2.3	[-5.0, 0.5]	↔

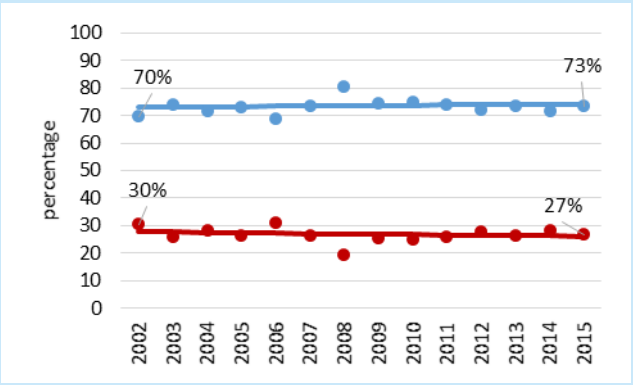


	from	to	APC	95%CI	trend
elective	2002	2015	0.8	[0.1, 1.5]	↑
emergency	2002	2015	-3.4	[-5.7, -1.0]	↓

Appendix I. Figure 24. Trend in mode of presentation 2002-2015: leukaemia



	from	to	APC	95%CI	trend
elective	2002	2010	1.9	[0.5, 3.3]	↑
	2010	2015	-2.2	[-4.8, 0.6]	↔
emergency	2002	2015	-0.1	[-1.6, 1.5]	↔
unknown	2002	2015	-1.3	[-3.3, 0.8]	↔

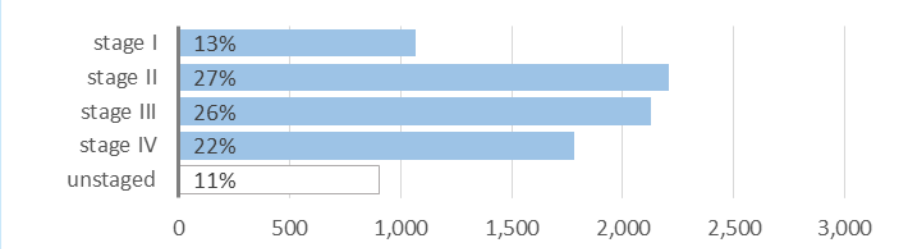


	from	to	APC	95%CI	trend
elective	2002	2015	0.1	[-0.5, 0.8]	↔
emergency	2002	2015	-0.5	[-1.9, 1.0]	↔

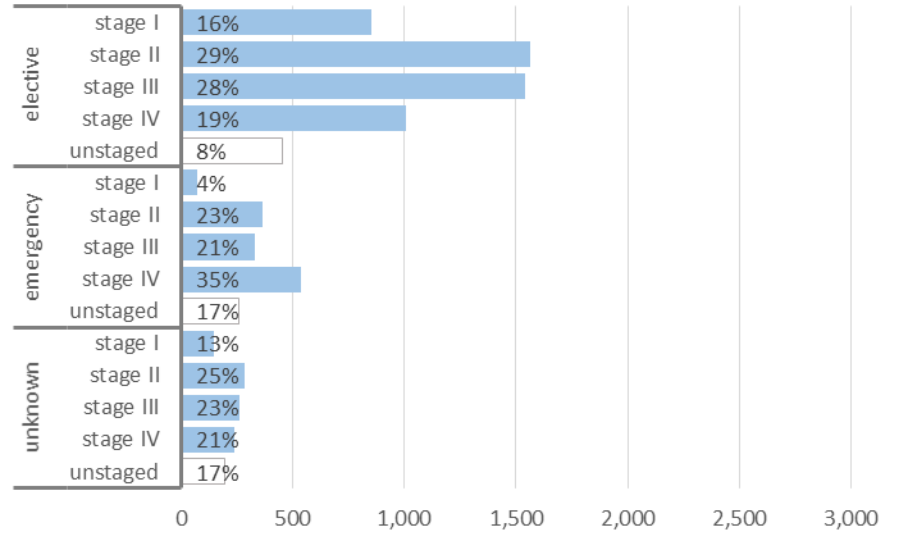
APPENDIX II: MODE OF PRESENTATION BY STAGE

Appendix II. Figure 1.
Proportional distribution of stage at presentation: colon cancer (2010-2014)

overall
2010-2014 (TNM 5 &7)



by mode of presentation
2010-2014 (TNM 5 &7)

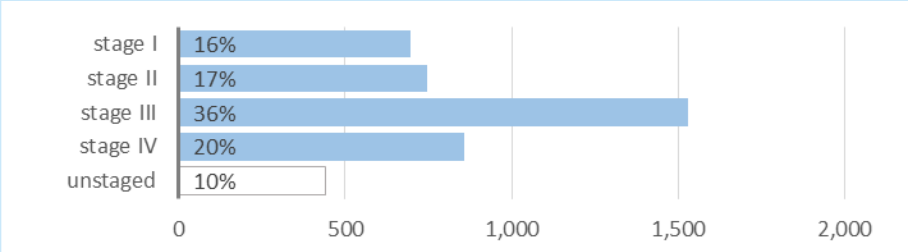


Note: staging criteria for these cancers were equivalent for 2010-2013 and 2014 cases thus data are combined.

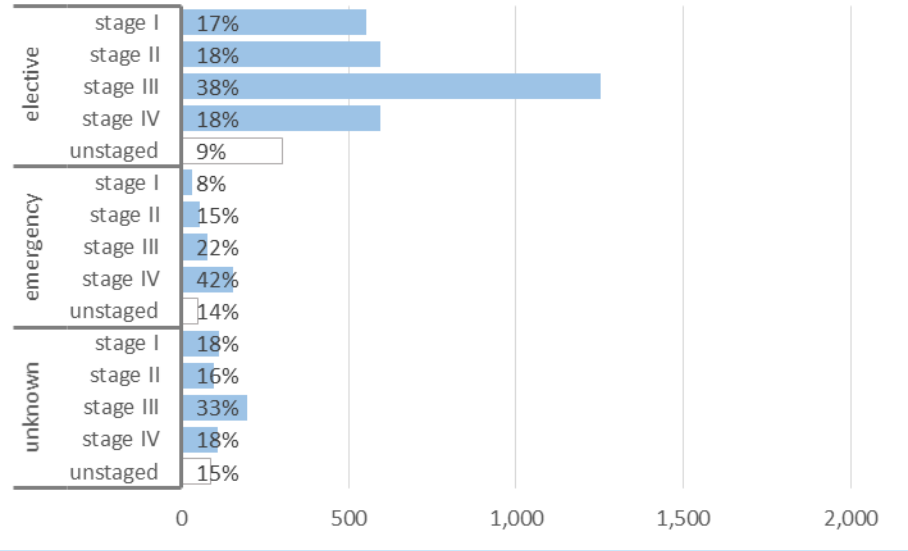
- For colon cancers diagnosed during 2010-2014, most (48%) were diagnosed at late stages (III/IV), with 40% at earlier stages (I/II) and 11% unstaged (upper panel).
- For cases that presented emergently (lower middle panel), the diagnosis was more markedly late stage (56% III/IV or 67% of cases with known mode of presentation) compared with those presenting electively (47% III/IV or 51% of cases with known mode of presentation).
- Stage III/IV patients were 71% more likely to present emergently as stage I/II patients (age-adjusted relative risk (RR) 1.71, 95% confidence interval [CI] 1.5-1.7, P<0.001) (Table 6.4 in main body of report).

Appendix II. Figure 2.
Proportional distribution of stage at presentation: rectum (2010-2014)

overall
2010-2014 (TNM 5 &7)



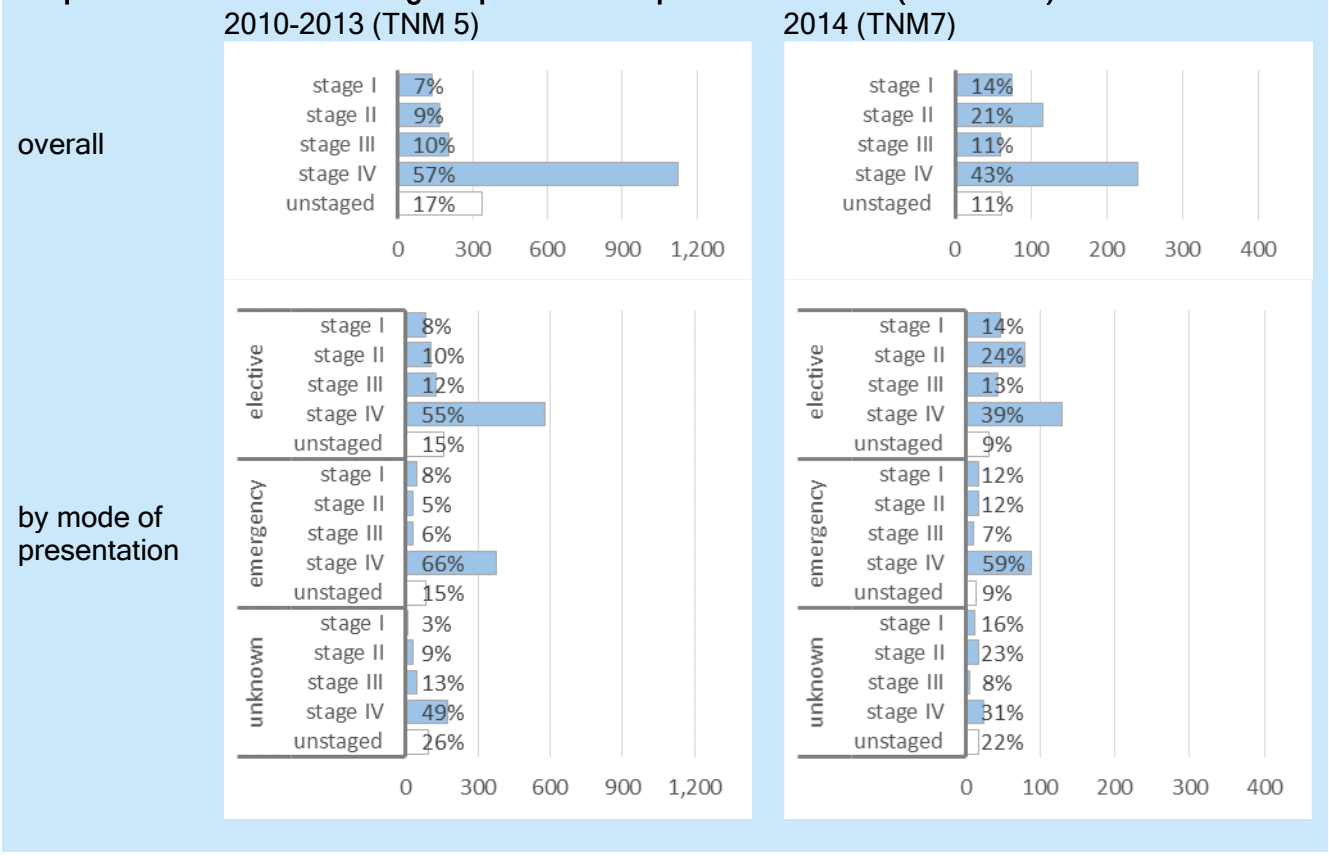
by mode of presentation
2010-2014 (TNM 5 &7)



Note: staging criteria for these cancers were equivalent for 2010-2013 and 2014 cases thus data are combined.

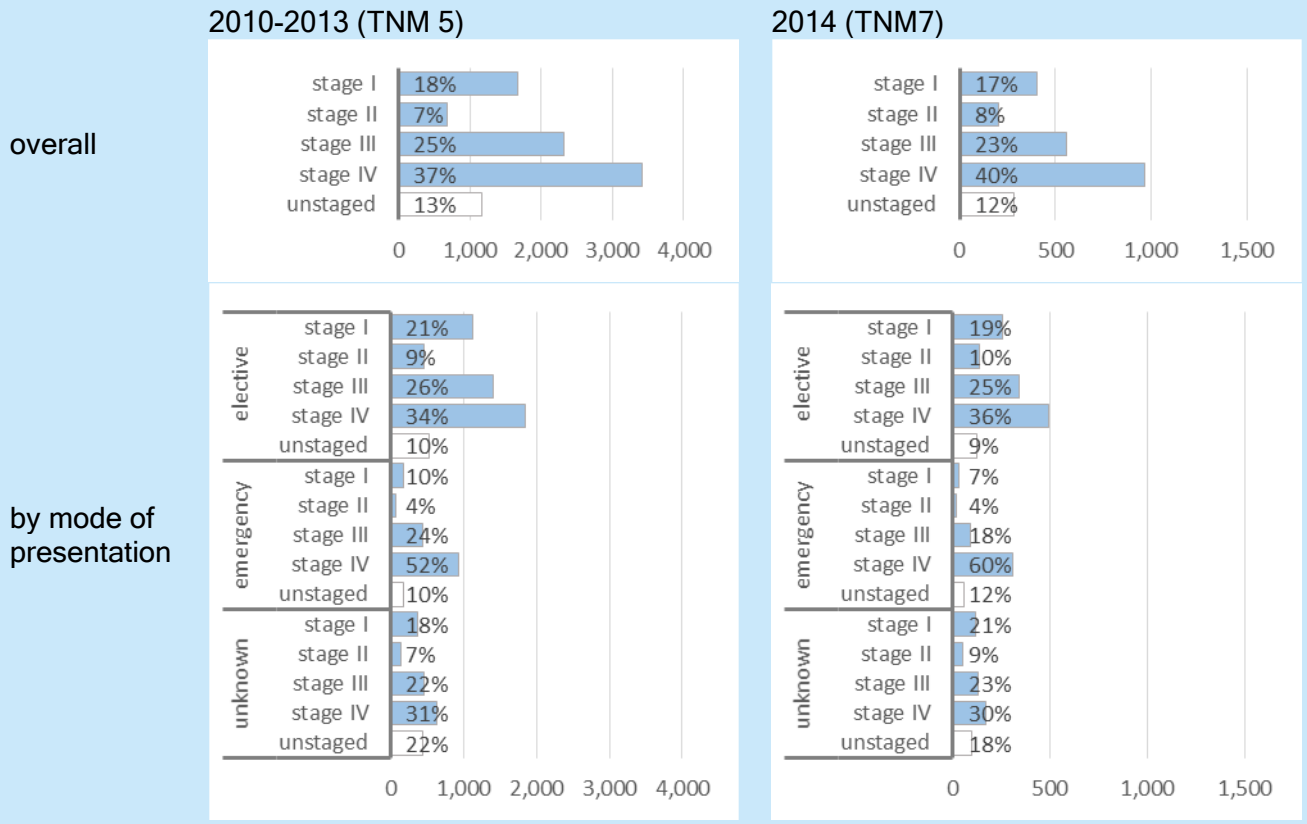
- For rectal cancers diagnosed during 2010-2014 most (56%) were diagnosed at late stages (III/IV), with 33% at earlier stages (I/II) and 10% unstaged (upper panel).
- For patients that presented emergently (lower middle panel), the diagnosis was more markedly late stage (64% III/IV or 74% of cases with known mode of presentation), compared with those presenting electively (56% III/IV or 62% of cases with known mode of presentation).
- Stage III/IV patients were 75% more likely to present emergently than stage I/II patients (age-adjusted relative risk 1.75, 95% CI 1.4-2.3, P<0.001) (Table 6.4 in main body of report).

Appendix II. Figure 3.
Proportional distribution of stage at presentation: pancreatic cancer (2010-2014)



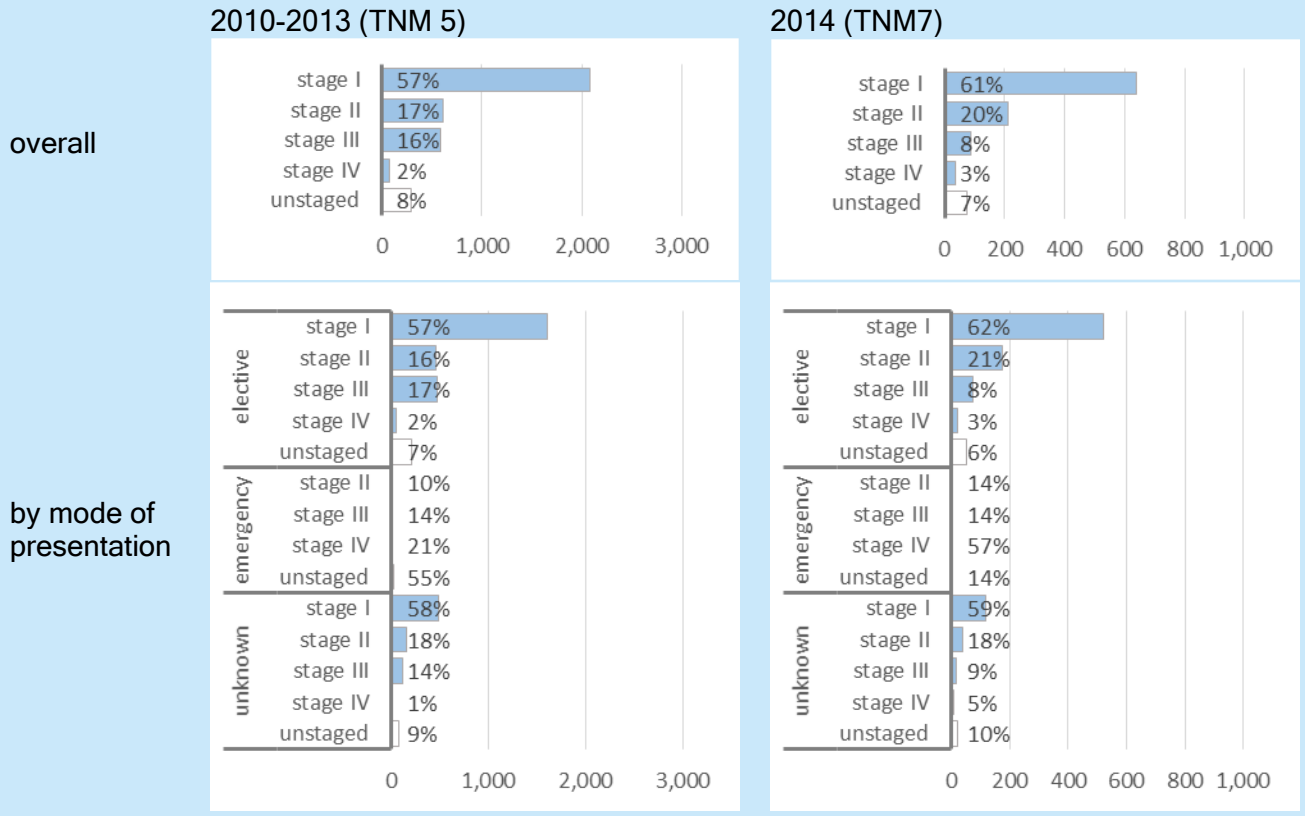
- For pancreatic cancers diagnosed during 2010-2013 (TNM 5th-edition stage data), most (67%) were diagnosed at late stage (III/IV), with only 16% at earlier stages (I/II) and 17% unstaged (upper left panel).
- For patients that presented emergently (lower left middle panel), the diagnosis was more slightly late stage (72% III/IV or 85% of cases with known mode of presentation), compared with those presenting electively (67% III/IV or 79% of cases with known mode of presentation).
- For cases diagnosed in 2014 (TNM 7th-edition stage data), a similar pattern was seen: 54% of all cases presented at stages III/IV (or 67% of known presentations) (upper right panel)
- For cases diagnosed in 2014 (TNM 7th-edition stage data), 66% of emergency cases were stage III/IV (or 81% of known presentations) compared with 52% of elective cases (or 57% of known presentations) (lower right panel).
- Stage III/IV patients were 29% more likely to present emergently than stage I/II patients (age-adjusted relative risk 1.29, 95% CI 1.1-1.6, P=0.011) (Table 6.4 in main body of report).

Appendix II. Figure 4.
Proportional distribution of stage at presentation: lung cancer (2010-2014)



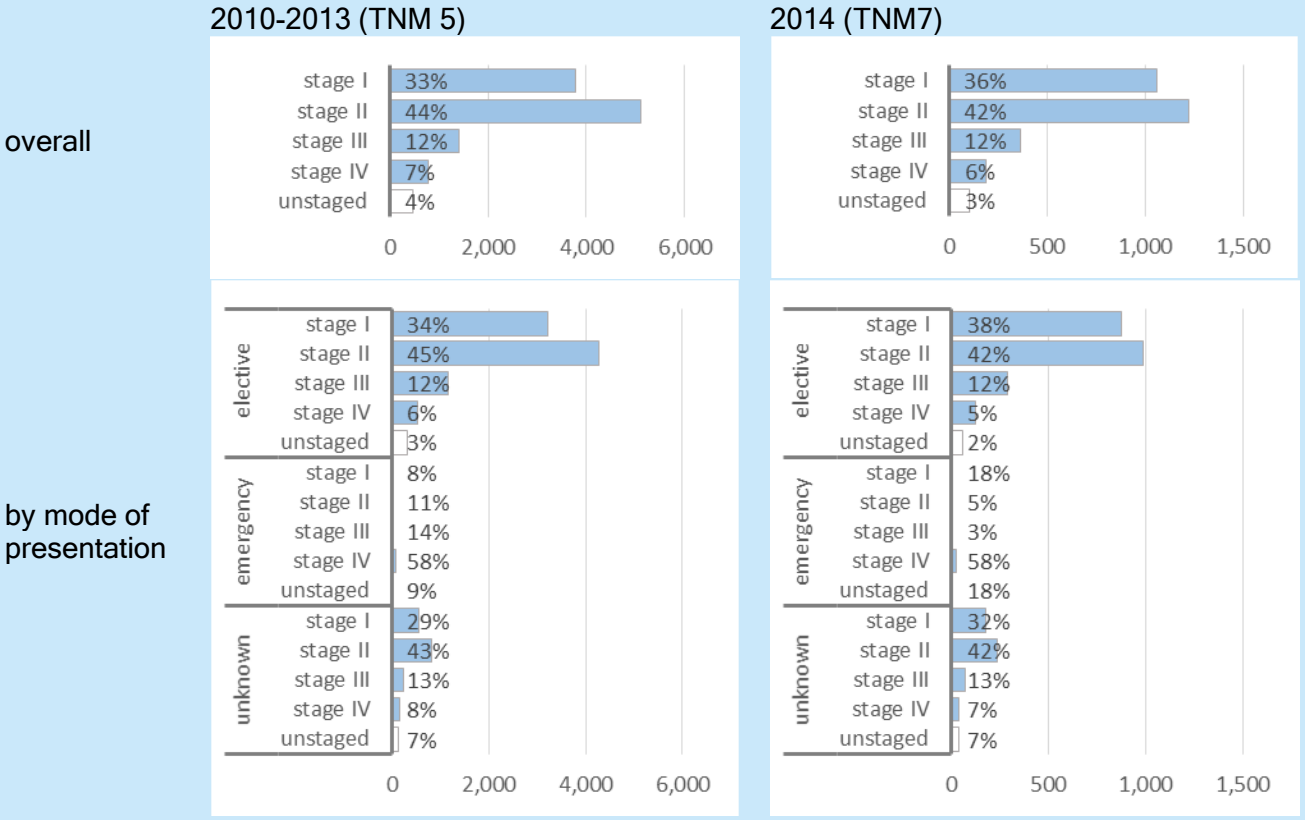
- For lung cancers diagnosed during 2010-2013 (TNM 5th-edition stage data), most (62%) were diagnosed at late stages (III/IV), with only 25% at earlier stages (I/II) and 13% unstaged (upper left panel).
- For patients that presented emergently, the diagnosis was more markedly late stage (76% III/IV or 84% of cases with known mode of presentation), compared with those presenting electively (60% III/IV or 67% of cases with known mode of presentation) (lower left panel).
- For cases diagnosed in 2014 (TNM 7th-edition stage data), a similar pattern was seen: 63% of all cases presented at stages III/IV (or 67% of known presentations), (upper right panel).
- For cases diagnosed in 2014 (TNM 7th-edition stage data), 78% of emergency cases were stage III/IV (or 89% of known presentations) compared with 61% of elective cases (or 69% of known presentations) (lower right panel).
- Stage III/IV patients were 120% more likely to present emergently than stage I/II patients (age-adjusted relative risk 2.20, 95% CI 2.0-2.5, P<0.001) (Table 6.4 in main body of report).

Appendix II. Figure 5.
Proportional distribution of stage at presentation: melanoma of the skin (2010-2014)



- For melanomas of skin diagnosed during 2010-2013 (TNM 5th-edition stage data), most (74%) were diagnosed at early stages (I/II), with only 18% at later stages (III/IV) and 8% unstaged (upper left panel).
- For patients that presented emergently, the diagnosis was more markedly late stage (35% III/IV or 64% of cases with known mode of presentation), compared with those presenting electively (19% III/IV or 20% of cases with known mode of presentation) (lower left panel).
- For cases diagnosed in 2014 (TNM 7th-edition stage data), a similar pattern was seen: 11% of all cases presented at stages III/IV (or 12% of known presentations), (upper right panel).
- For cases diagnosed in 2014 (TNM 7th-edition stage data), 71% of emergency cases were stage III/IV (or 82% of known presentations) compared with only 11% of elective cases (or 12% of known presentations), (lower right panel).
- Stage III/IV patients were 12 times more likely to present emergently than stage I/II patients (age-adjusted relative risk 11.9, 95% CI 2.7-52.7, P=0.001) (Table 6.4 in main body of report).

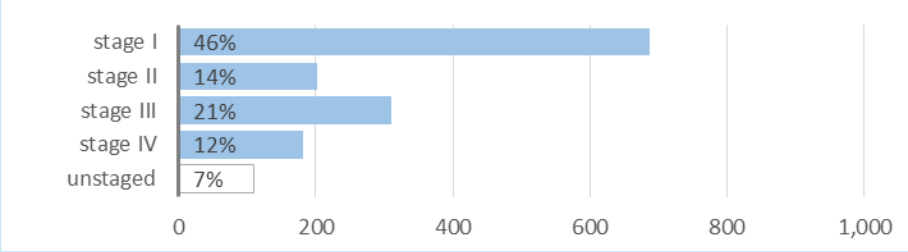
Appendix II. Figure 6.
Proportional distribution of stage at presentation: breast cancer (2010-2014)



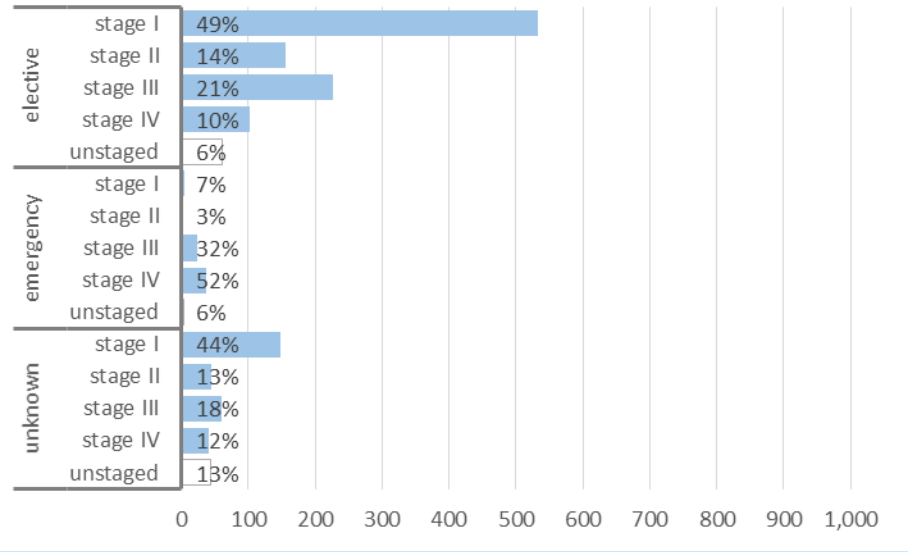
- For breast cancers diagnosed during 2010-2013 (TNM 5th-edition stage data), most (77%) were diagnosed at early stages (I/II), with 19% at later stages (III/IV) and 4% unstaged (upper left panel).
- For the small subset of breast cancer patients that presented emergently (lower left middle panel), the diagnosis was predominantly later stage (72% III/IV or 79% of cases with known mode of presentation), compared with those presenting electively (only 18% III/IV or 19% of cases with known mode of presentation).
- For cases diagnosed in 2014 (TNM 7th-edition stage data), a similar pattern was seen: 18% of all cases presented at stages III/IV (or 19% of known presentations), (upper right panel).
- For cases diagnosed in 2014 (TNM 7th-edition stage data), 61% of emergency cases were stage III/IV (or 74% of known presentations) compared with only 17% of elective cases (also 17% of known presentations) (lower right panel).
- Stage III/IV patients were 14 times more likely to present emergently than stage I/II patients (age-adjusted relative risk 14.2, 95% CI 9.2-21.9, P<0.001) (Table 6.4 in main body of report).

Appendix II. Figure 7.
Proportional distribution of stage at presentation: cervical cancer (2010-2014)

overall
2010-2014 (TNM 5 &7)



by mode of presentation
2010-2014 (TNM 5 &7)

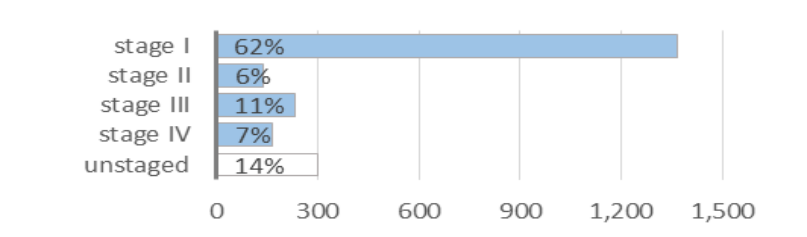


Note: staging criteria for these cancers were equivalent for 2010-2013 and 2014 cases thus data are combined.

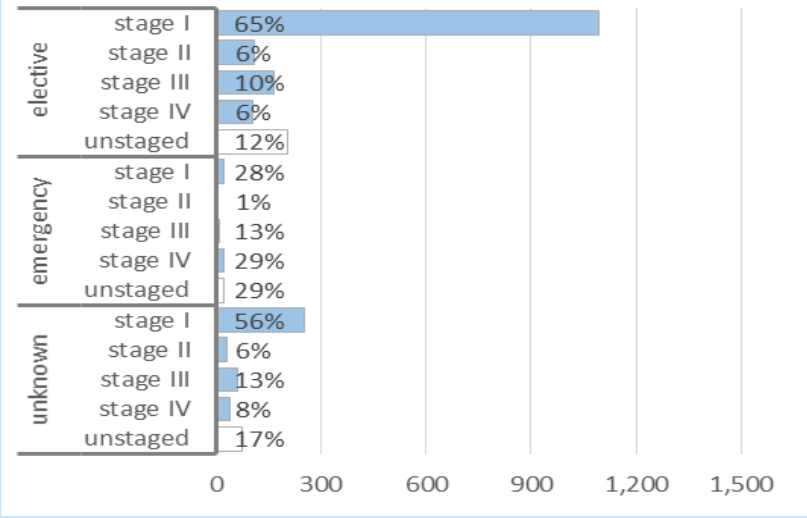
- For cervical cancers diagnosed during 2010-2014, most (60%) were diagnosed at early stages (I/II), with 33% at later stages (III/IV) and 7% unstaged (upper panel).
- In contrast, for patients that presented emergently (lower panel), the diagnosis was predominantly late stage (84% III/IV or 89% of cases with known mode of presentation), compared with those presenting electively (only 31% III/IV or 35% of cases with known mode of presentation).
- Stage III/IV patients were 10 times more likely to present emergently than stage I/II patients (age-adjusted relative risk 10.4, 95% CI 4.7-22.9, P<0.001) (Table 6.4 in main body of report).

Appendix II. Figure 8.
Proportional distribution of stage at presentation: uterine cancer (corpus uteri) (2010-2014)

overall
2010-2014 (TNM 5 &7)



by mode of presentation
2010-2014 (TNM 5 &7)

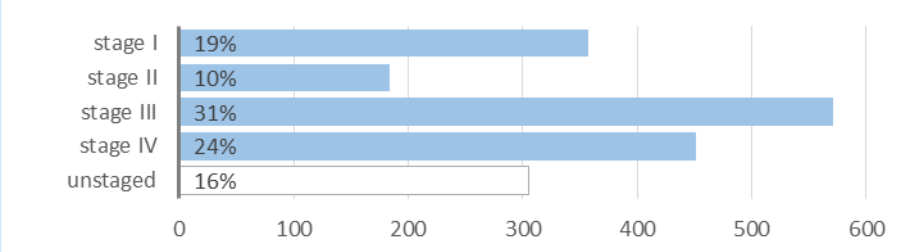


Note: staging criteria for these cancers were essentially equivalent for 2010-2013 and 2014 cases thus data are combined.

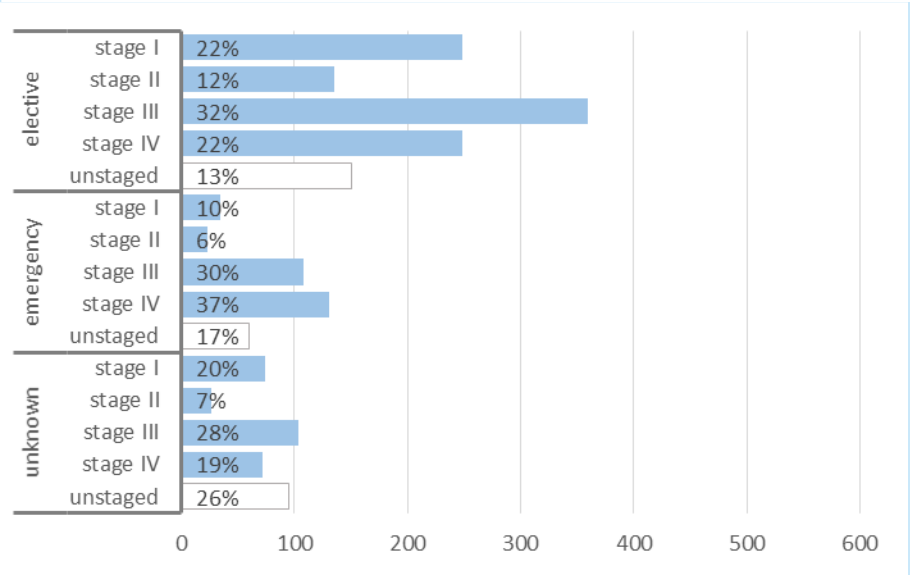
- For uterine cancers diagnosed during 2010-2014 (equivalent stage data), most (68%) were diagnosed at early stages (I/II), with only 17% at later stages (III/IV) and 14% unstaged (upper panel).
- In contrast, for the small number of patients that presented emergently (lower panel), the diagnosis was predominantly late stage (42% III/IV or 59% of cases with known mode of presentation), compared with those presenting electively (only 16% III/IV or 20% of cases with known mode of presentation).
- Stage III/IV patients were 4.5 times more likely to present emergently than stage I/II patients (age-adjusted relative risk 4.5, 95% CI 2.4-8.4, P<0.001) (Table 6.4 in main body of report).

Appendix II. Figure 9.
Proportional distribution of stage at presentation: ovarian cancer (2010-2014)

overall
2010-2014 (TNM 5 &7)



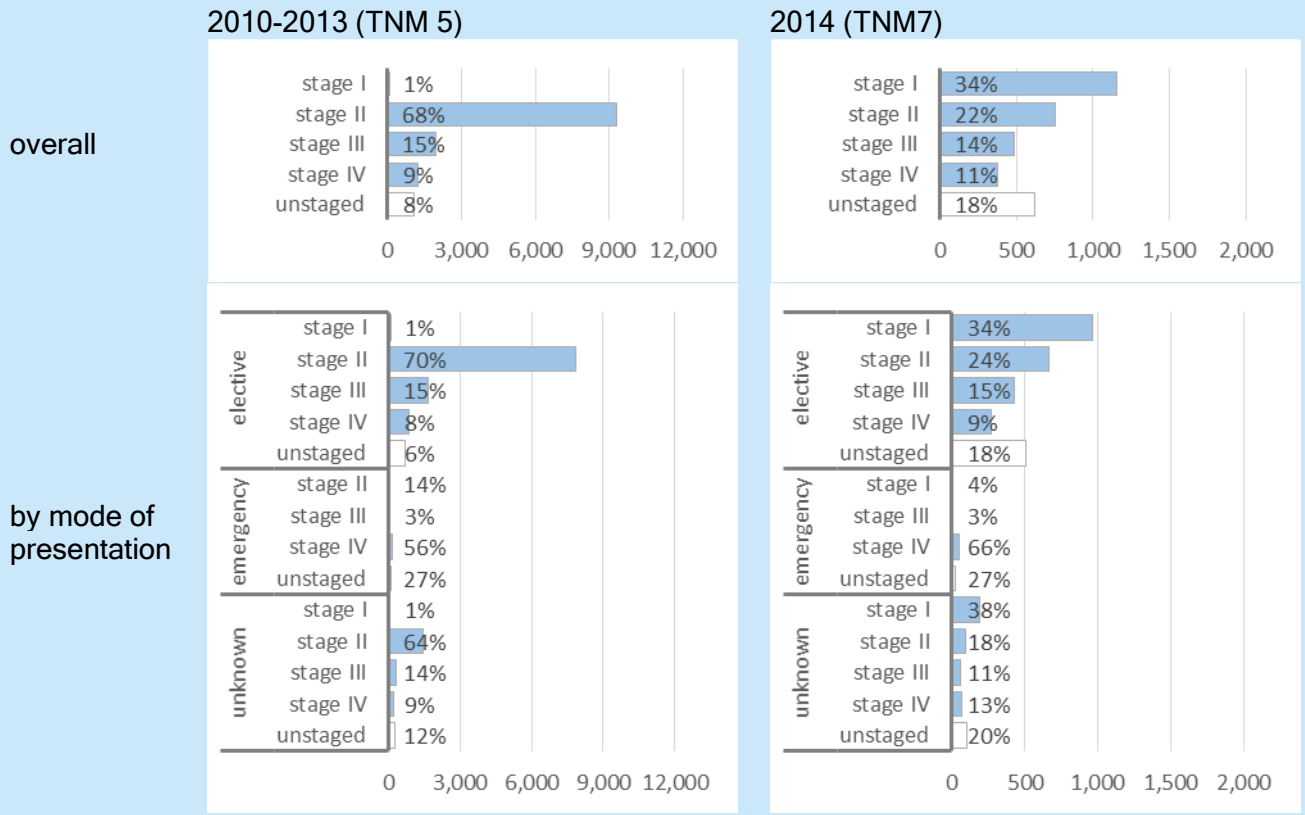
by mode of presentation
2010-2014 (TNM 5 &7)



Note: staging criteria for these cancers were equivalent for 2010-2013 and 2014 cases thus data are combined.

- For ovarian cancers diagnosed during 2010-2014, most (55%) were diagnosed at late stages (III/IV), with only 29% at earlier stages (I/II) and 16% unstaged (upper panel).
- For patients that presented emergently (lower panel), the diagnosis was even more markedly late stage (67% III/IV or 81% of cases with known mode of presentation), compared with those presenting electively (54% III/IV or 62% of cases with known mode of presentation).
- Stage III/IV patients were 90% more likely to present emergently than stage I/II patients (age-adjusted relative risk 1.90, 95% CI 1.4-2.6, P<0.001) (Table 6.4 in main body of report).

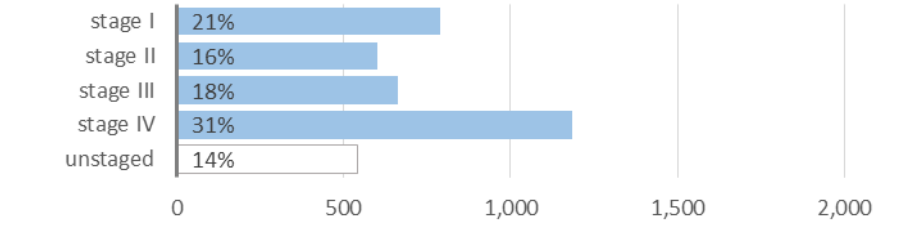
Appendix II. Figure 10.
Proportional distribution of stage at presentation: prostate cancer (2010-2014)



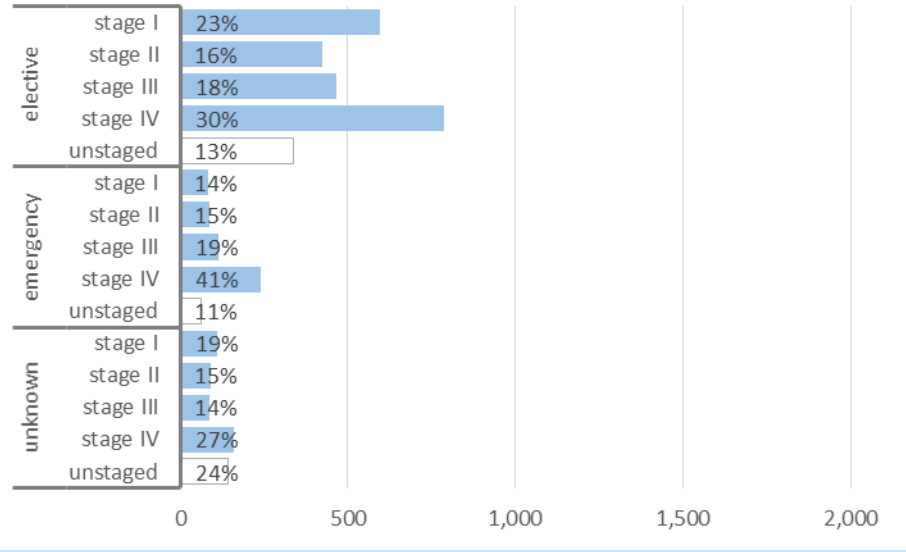
- For prostate cancers diagnosed during 2010-2013 (TNM 5th-edition stage data), most (69%) were diagnosed at early stages (I/II), with 24% at later stages (III/IV) and 8% unstaged (upper left panel).
- For the small subset of prostate cancer cases that presented emergently (lower left panel), the diagnosis was predominantly later stage (59% III/IV or 77% of cases with known mode of presentation), compared with those presenting electively (23% III/IV or 24% of cases with known mode of presentation) (lower left panel).
- For cases diagnosed in 2014 (TNM 7th-edition stage data), a similar pattern was seen: 25% of all cases presented at stages III/IV (or 33% of known presentations) (upper right panel)
- For cases diagnosed in 2014 (TNM 7th-edition stage data), 69% of emergency cases were stage III/IV (or 94% of known presentations) compared with only 24% of elective cases (or 30% of known presentations) (lower right panel).
- Stage III/IV patients were 9 times more likely to present emergently than stage I/II patients (age-adjusted relative risk 9.3, 95% CI 6.7-12.9, P<0.001) (Table 6.4 in main body of report).

Appendix II. Figure 11.
Proportional distribution of stage at presentation: non-Hodgkin lymphoma (2010-2014)

overall
2010-2014 (TNM 5 &7)
(Ann Arbor staging)



by mode of presentation
2010-2014

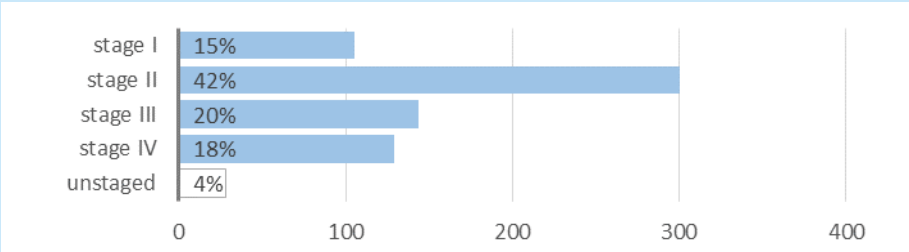


Note: staging criteria for these cancers were equivalent for 2010-2013 and 2014 cases thus data are combined.

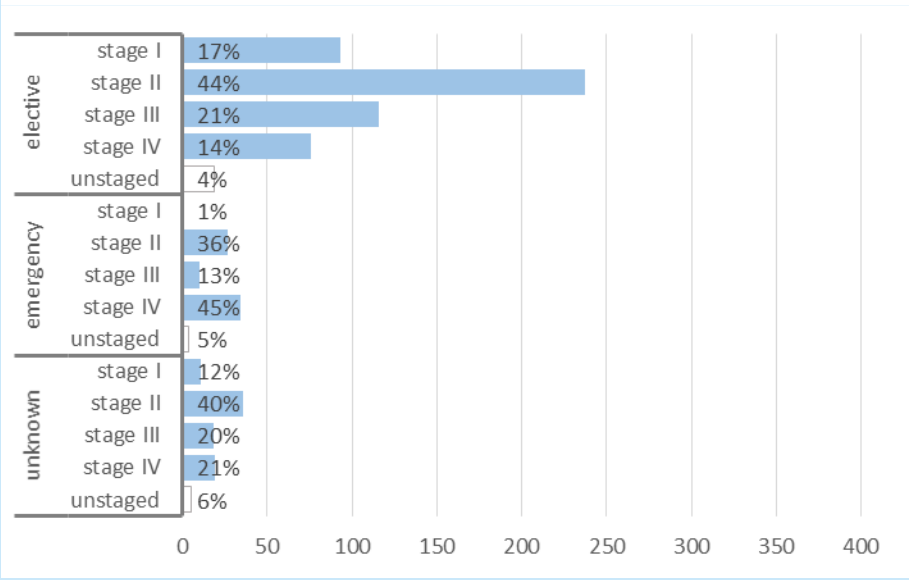
- For non-Hodgkin lymphomas diagnosed during 2010-2014, most (49%) were diagnosed at late stages (III/IV), with 37% at earlier stages (I/II) and 14% unstaged (upper panel).
- For patients that presented emergently (lower panel), the diagnosis was more markedly late stage (60% III/IV or 67% of cases with known mode of presentation), compared with those presenting electively (48% III/IV or 55% of cases with known mode of presentation).
- Stage III/IV patients were 40% more likely to present emergently than stage I/II patients (age-adjusted relative risk 1.40, 95% CI 1.2-1.7, P<0.001) (Table 6.4 in main body of report).

Appendix II. Figure 12.
Proportional distribution of stage at presentation: Hodgkin lymphoma (2010-2014)

overall
2010-2014 (TNM 5 &7)



by mode of presentation
2010-2014 (TNM 5 &7)



Note: staging criteria for these cancers were equivalent for 2010-2013 and 2014 cases thus data are combined.

- For Hodgkin lymphomas diagnosed during 2010-2014, most (57%) were diagnosed at early stages (I/II), with 38% at later stages (III/IV) and 4% unstaged (upper panel).
- In contrast, for cases that presented emergently, the diagnosis was predominantly late stage (58% III/IV or 61% of cases with known mode of presentation), compared with those presenting electively (only 35% III/IV or 36% of cases with known mode of presentation (lower panel).
- Stage III/IV patients were 2.5 times more likely to present emergently than stage I/II patients (age-adjusted relative risk 2.50, 95% CI 1.5-4.3, P=0.001) (Table 6.4 in main body of report).

APPENDIX III: DEPRIVATION, STAGE, AGE & GENDER

Appendix III. Table 1. Proportion of cases presenting emergently, by deprivation quintile‡ and cancer type (2010-2015)

including 'unknown' presentation status					excluding unknown presentation status				
	presentation	**1 least**	**5 most**	**all**		**presentation**	**1 least**	**5 most**	**all**
all invasive*	**elective**	**68.6%**	**66.7%**	**70.2%**	**all invasive***	**elective**	**88.7%**	**82.2%**	**85.9%**
	emergency	**8.7%**	**14.5%**	**11.5%**		**emergency**	**11.3%**	**17.8%**	**14.1%**
	unknown	**22.6%**	**18.9%**	**18.2%**					
mouth & pharynx	elective	69.0%	72.8%	73.2%	mouth & pharynx	elective	94.8%	91.5%	93.2%
	emergency	3.8%	6.7%	5.3%		emergency	5.2%	8.5%	6.8%
	unknown	27.2%	20.5%	21.5%					
oesophagus	elective	70.6%	65.6%	70.2%	oesophagus	elective	87.0%	79.7%	83.6%
	emergency	10.5%	16.7%	13.8%		emergency	13.0%	20.3%	16.4%
	unknown	18.9%	17.7%	16.0%					
stomach	elective	67.2%	63.9%	66.5%	stomach	elective	82.7%	75.3%	79.5%
	emergency	14.0%	21.0%	17.1%		emergency	17.3%	24.7%	20.5%
	unknown	18.7%	15.1%	16.4%					
colon	elective	64.8%	63.4%	67.0%	colon	elective	81.4%	73.7%	78.0%
	emergency	14.8%	22.6%	18.9%		emergency	18.6%	26.3%	22.0%
	unknown	20.5%	14.0%	14.1%					
rectum	elective	74.6%	76.6%	77.2%	rectum	elective	90.5%	87.1%	89.7%
	emergency	7.8%	11.3%	8.9%		emergency	9.5%	12.9%	10.3%
	unknown	17.6%	12.1%	13.9%					
liver	elective	54.4%	46.6%	52.9%	liver	elective	72.3%	58.7%	66.1%
	emergency	20.8%	32.8%	27.1%		emergency	27.7%	41.3%	33.9%
	unknown	24.7%	20.7%	20.0%					
pancreas	elective	57.0%	47.0%	54.3%	pancreas	elective	72.7%	56.0%	65.5%
	emergency	21.3%	36.9%	28.5%		emergency	27.3%	44.0%	34.5%
	unknown	21.7%	16.1%	17.2%					
larynx	elective	72.8%	75.9%	75.8%	larynx	elective	91.2%	88.1%	91.3%
	emergency	7.0%	10.2%	7.2%		emergency	8.8%	11.9%	8.7%
	unknown	20.2%	13.9%	17.0%					
lung	elective	56.8%	53.7%	57.2%	lung	elective	79.7%	70.7%	74.1%
	emergency	14.5%	22.2%	20.0%		emergency	20.3%	29.3%	25.9%
	unknown	28.7%	24.1%	22.8%					
melanoma of skin	elective	73.5%	78.6%	78.1%	melanoma of skin	elective	98.9%	99.1%	99.1%
	emergency	0.8%	0.7%	0.7%		emergency	1.1%	0.9%	0.9%
	unknown	25.6%	20.7%	21.2%					
breast	elective	78.9%	80.1%	81.6%	breast	elective	98.7%	98.0%	98.5%
	emergency	1.1%	1.6%	1.3%		emergency	1.3%	2.0%	1.5%
	unknown	20.1%	18.3%	17.1%					
cervix	elective	75.9%	68.1%	72.2%	cervix	elective	95.8%	90.6%	93.5%
	emergency	3.3%	7.0%	5.0%		emergency	4.2%	9.4%	6.5%
	unknown	20.7%	24.8%	22.7%					
corpus uteri	elective	73.2%	74.3%	76.1%	corpus uteri	elective	96.4%	96.6%	95.6%
	emergency	2.8%	2.6%	3.5%		emergency	3.6%	3.4%	4.4%
	unknown	24.0%	23.1%	20.4%					
ovary	elective	66.1%	56.7%	61.3%	ovary	elective	81.8%	69.5%	76.2%
	emergency	14.7%	24.9%	19.2%		emergency	18.2%	30.5%	23.8%
	unknown	19.2%	18.4%	19.5%					
prostate	elective	77.9%	78.6%	81.2%	prostate	elective	98.3%	96.5%	97.5%
	emergency	1.4%	2.8%	2.1%		emergency	1.7%	3.5%	2.5%
	unknown	20.8%	18.5%	16.8%					
testis	elective	75.5%	73.7%	77.0%	testis	elective	90.6%	86.4%	89.6%
	emergency	7.8%	11.6%	9.0%		emergency	9.4%	13.6%	10.4%
	unknown	16.7%	14.7%	14.1%					
kidney	elective	69.3%	62.4%	67.7%	kidney	elective	87.4%	78.6%	83.6%
	emergency	10.0%	17.0%	13.3%		emergency	12.6%	21.4%	16.4%
	unknown	20.6%	20.6%	19.0%					
bladder	elective	67.2%	65.0%	68.8%	bladder	elective	89.6%	84.9%	87.3%
	emergency	7.8%	11.6%	10.0%		emergency	10.4%	15.1%	12.7%
	unknown	25.0%	23.5%	21.1%					
brain & CNS	elective	49.2%	43.4%	50.7%	brain & CNS	elective	65.9%	55.8%	66.1%
	emergency	25.5%	34.4%	26.1%		emergency	34.1%	44.2%	33.9%
	unknown	25.3%	22.2%	23.2%					
thyroid	elective	80.6%	78.5%	83.4%	thyroid	elective	98.3%	94.6%	96.8%
	emergency	1.4%	4.5%	2.7%		emergency	1.7%	5.4%	3.2%
	unknown	18.0%	17.0%	13.9%					
Hodgkin lymphoma	elective	69.7%	71.0%	75.6%	Hodgkin lymphoma	elective	86.4%	84.6%	87.5%
	emergency	11.0%	13.0%	10.8%		emergency	13.6%	15.4%	12.5%
	unknown	19.4%	16.0%	13.7%					
non-Hodgkin lymphoma	elective	68.2%	66.2%	68.9%	non-Hodgkin lymphoma	elective	83.2%	78.2%	81.6%
	emergency	13.8%	18.4%	15.5%		emergency	16.8%	21.8%	18.4%
	unknown	18.1%	15.4%	15.7%					
multiple myeloma	elective	66.9%	67.4%	70.0%	multiple myeloma	elective	83.0%	77.9%	80.8%
	emergency	13.7%	19.1%	16.7%		emergency	17.0%	22.1%	19.2%
	unknown	19.4%	13.5%	13.3%					
leukaemia	elective	53.8%	60.4%	59.8%	leukaemia	elective	70.5%	71.5%	73.2%
	emergency	22.5%	24.1%	21.9%		emergency	29.5%	28.5%	26.8%
	unknown	23.8%	15.5%	18.3%					

‡ not showing quintiles 2-4 inclusive and excluding cases who could not be assigned a deprivation quintile, * excluding NMSC

Appendix III. Table 2. Proportion presenting, by stage ‡ and cancer type (2010-2013)

including 'unknown' presentation status					excluding unknown presentation status				
	presentation	stage I/II	stage III/IV	all		presentation	stage I/II	stage III/IV	all
all invasive*	**elective**	**79.5%**	**66.2%**	**70.4%**	**all invasive***	**elective**	**95.5%**	**79.6%**	**86.0%**
	emergency	**3.8%**	**17.0%**	**11.4%**		**emergency**	**4.5%**	**20.4%**	**14.0%**
	unknown	**16.8%**	**16.9%**	**18.2%**					
mouth & pharynx	elective	81.7%	72.1%	74.4%	mouth & pharynx	elective	97.9%	90.9%	93.6%
	emergency	1.7%	7.2%	5.1%		emergency	2.1%	9.1%	6.4%
	unknown	16.6%	20.7%	20.5%					
oesophagus	elective	80.8%	71.3%	70.9%	oesophagus	elective	93.2%	82.0%	83.8%
	emergency	5.9%	15.6%	13.7%		emergency	6.8%	18.0%	16.2%
	unknown	13.3%	13.1%	15.5%					
stomach	elective	77.8%	64.1%	67.0%	stomach	elective	91.3%	76.5%	80.6%
	emergency	7.4%	19.6%	16.1%		emergency	8.7%	23.5%	19.4%
	unknown	14.8%	16.3%	16.8%					
colon	elective	72.6%	64.1%	65.9%	colon	elective	84.4%	74.3%	77.3%
	emergency	13.4%	22.2%	19.4%		emergency	15.6%	25.7%	22.7%
	unknown	14.0%	13.6%	14.8%					
rectum	elective	79.4%	76.4%	76.7%	rectum	elective	92.9%	88.3%	89.8%
	emergency	6.0%	10.2%	8.7%		emergency	7.1%	11.7%	10.2%
	unknown	14.6%	13.5%	14.6%					
liver	elective	64.5%	56.9%	52.8%	liver	elective	77.1%	66.1%	65.7%
	emergency	19.2%	29.2%	27.6%		emergency	22.9%	33.9%	34.3%
	unknown	16.3%	13.9%	19.6%					
pancreas	elective	60.8%	53.0%	53.3%	pancreas	elective	70.7%	63.4%	65.0%
	emergency	25.2%	30.6%	28.7%		emergency	29.3%	36.6%	35.0%
	unknown	13.9%	16.4%	17.9%					
larynx	elective	87.0%	65.6%	77.2%	larynx	elective	98.6%	81.9%	92.0%
	emergency	1.3%	14.5%	6.7%		emergency	1.4%	18.1%	8.0%
	unknown	11.7%	19.8%	16.1%					
lung	elective	67.4%	56.9%	58.2%	lung	elective	85.9%	70.2%	74.7%
	emergency	11.0%	24.2%	19.7%		emergency	14.1%	29.8%	25.3%
	unknown	21.6%	19.0%	22.1%					
melanoma of skin	elective	76.6%	79.5%	76.4%	melanoma of skin	elective	99.9%	98.1%	99.0%
	emergency	0.1%	1.5%	0.8%		emergency	0.1%	1.9%	1.0%
	unknown	23.3%	19.0%	22.8%					
breast	elective	84.3%	77.0%	82.2%	breast	elective	99.6%	94.2%	98.5%
	emergency	0.3%	4.8%	1.3%		emergency	0.4%	5.8%	1.5%
	unknown	15.4%	18.2%	16.5%					
cervix	elective	77.7%	66.3%	72.2%	cervix	elective	98.8%	84.4%	93.7%
	emergency	1.0%	12.2%	4.9%		emergency	1.2%	15.6%	6.3%
	unknown	21.3%	21.4%	23.0%					
corpus uteri	elective	79.8%	68.1%	76.1%	corpus uteri	elective	98.1%	90.6%	95.8%
	emergency	1.6%	7.0%	3.3%		emergency	1.9%	9.4%	4.2%
	unknown	18.6%	24.8%	20.6%					
ovary	elective	70.8%	59.3%	60.4%	ovary	elective	87.6%	72.4%	76.4%
	emergency	10.0%	22.6%	18.7%		emergency	12.4%	27.6%	23.6%
	unknown	19.2%	18.1%	21.0%					
prostate	elective	84.1%	78.6%	81.4%	prostate	elective	99.5%	93.5%	97.4%
	emergency	0.5%	5.5%	2.2%		emergency	0.5%	6.5%	2.6%
	unknown	15.5%	15.9%	16.4%					
testis	elective	81.7%	68.8%	79.9%	testis	elective	93.3%	81.5%	91.7%
	emergency	5.9%	15.6%	7.3%		emergency	6.7%	18.5%	8.3%
	unknown	12.4%	15.6%	12.8%					
kidney	elective	73.9%	64.8%	67.5%	kidney	elective	88.8%	81.0%	84.1%
	emergency	9.3%	15.2%	12.8%		emergency	11.2%	19.0%	15.9%
	unknown	16.8%	20.0%	19.7%					
bladder	elective	72.0%	66.3%	68.2%	bladder	elective	92.4%	81.5%	87.9%
	emergency	5.9%	15.1%	9.4%		emergency	7.6%	18.5%	12.1%
	unknown	22.1%	18.6%	22.4%					
brain & CNS	elective			53.4%	brain & CNS	elective			66.4%
	emergency			27.0%		emergency			33.6%
	unknown			19.6%					
thyroid	elective	87.4%	69.2%	83.5%	thyroid	elective	98.9%	85.0%	96.8%
	emergency	1.0%	12.2%	2.8%		emergency	1.1%	15.0%	3.2%
	unknown	11.6%	18.6%	13.7%					
Hodgkin	elective	81.4%	71.7%	76.7%	Hodgkin	elective	92.7%	80.9%	87.4%
	emergency	6.4%	17.0%	11.0%		emergency	7.3%	19.1%	12.6%
	unknown	12.2%	11.3%	12.3%					
non-Hodgkin	elective	72.7%	68.2%	69.1%	non-Hodgkin	elective	85.1%	78.8%	82.1%
	emergency	12.8%	18.4%	15.1%		emergency	14.9%	21.2%	17.9%
	unknown	14.5%	13.4%	15.8%					
multiple myeloma	elective			69.9%	multiple myeloma	elective			80.4%
	emergency			17.0%		emergency			19.6%
	unknown			13.1%					
leukaemia	elective			61.1%	leukaemia	elective			73.7%
	emergency			21.8%		emergency			26.3%
	unknown			17.1%					

‡ excluding cases who could not be assigned stage, * excluding NMSC

Appendix III. Table 3. Proportion of cases presenting emergently (2010-2015), by age and cancer type

including 'unknown' presentation status					excluding unknown presentation status				
	presentation	<65	65+	all		presentation	<65	65+	all
all invasive*	**elective**	**74.7%**	**66.7%**	**70.2%**	**all invasive***	**elective**	**90.9%**	**81.9%**	**85.9%**
	emergency	**7.5%**	**14.7%**	**11.5%**		**emergency**	**9.1%**	**18.1%**	**14.1%**
	unknown	**17.8%**	**18.5%**	**18.2%**					
mouth & pharynx	elective	74.4%	71.5%	73.2%	mouth & pharynx	elective	93.7%	92.6%	93.2%
	emergency	5.0%	5.7%	5.3%		emergency	6.3%	7.4%	6.8%
	unknown	20.6%	22.8%	21.5%					
oesophagus	elective	75.6%	67.6%	70.2%	oesophagus	elective	89.0%	81.0%	83.6%
	emergency	9.4%	15.9%	13.8%		emergency	11.0%	19.0%	16.4%
	unknown	15.1%	16.5%	16.0%					
stomach	elective	72.2%	64.0%	66.5%	stomach	elective	85.4%	76.9%	79.5%
	emergency	12.4%	19.2%	17.1%		emergency	14.6%	23.1%	20.5%
	unknown	15.4%	16.8%	16.4%					
colon	elective	69.7%	65.8%	67.0%	colon	elective	80.2%	77.0%	78.0%
	emergency	17.2%	19.7%	18.9%		emergency	19.8%	23.0%	22.0%
	unknown	13.1%	14.5%	14.1%					
rectum	elective	80.6%	75.0%	77.2%	rectum	elective	92.6%	87.7%	89.7%
	emergency	6.4%	10.5%	8.9%		emergency	7.4%	12.3%	10.3%
	unknown	13.0%	14.5%	13.9%					
liver	elective	58.7%	49.6%	52.9%	liver	elective	73.5%	61.9%	66.1%
	emergency	21.1%	30.5%	27.1%		emergency	26.5%	38.1%	33.9%
	unknown	20.2%	19.9%	20.0%					
pancreas	elective	61.0%	51.6%	54.3%	pancreas	elective	74.6%	62.0%	65.5%
	emergency	20.8%	31.6%	28.5%		emergency	25.4%	38.0%	34.5%
	unknown	18.2%	16.8%	17.2%					
larynx	elective	77.9%	73.7%	75.8%	larynx	elective	93.4%	89.2%	91.3%
	emergency	5.5%	8.9%	7.2%		emergency	6.6%	10.8%	8.7%
	unknown	16.6%	17.4%	17.0%					
lung	elective	61.2%	55.6%	57.2%	lung	elective	79.2%	72.1%	74.1%
	emergency	16.1%	21.6%	20.0%		emergency	20.8%	27.9%	25.9%
	unknown	22.7%	22.8%	22.8%					
melanoma of skin	elective	78.0%	78.3%	78.1%	melanoma of skin	elective	99.5%	98.7%	99.1%
	emergency	0.4%	1.0%	0.7%		emergency	0.5%	1.3%	0.9%
	unknown	21.6%	20.8%	21.2%					
breast	elective	83.5%	78.3%	81.6%	breast	elective	99.3%	96.9%	98.5%
	emergency	0.6%	2.5%	1.3%		emergency	0.7%	3.1%	1.5%
	unknown	16.0%	19.2%	17.1%					
cervix	elective	72.9%	68.5%	72.2%	cervix	elective	94.9%	85.6%	93.5%
	emergency	3.9%	11.6%	5.0%		emergency	5.1%	14.4%	6.5%
	unknown	23.2%	19.9%	22.7%					
corpus uteri	elective	77.1%	75.0%	76.1%	corpus uteri	elective	96.8%	94.3%	95.6%
	emergency	2.5%	4.6%	3.5%		emergency	3.2%	5.7%	4.4%
	unknown	20.4%	20.4%	20.4%					
ovary	elective	66.9%	56.0%	61.3%	ovary	elective	84.4%	68.5%	76.2%
	emergency	12.4%	25.7%	19.2%		emergency	15.6%	31.5%	23.8%
	unknown	20.7%	18.3%	19.5%					
prostate	elective	83.9%	79.3%	81.2%	prostate	elective	99.3%	96.3%	97.5%
	emergency	0.6%	3.1%	2.1%		emergency	0.7%	3.7%	2.5%
	unknown	15.5%	17.6%	16.8%					
testis	elective	77.3%	57.9%	77.0%	testis	elective	89.8%	78.6%	89.6%
	emergency	8.8%	15.8%	9.0%		emergency	10.2%	21.4%	10.4%
	unknown	13.9%	26.3%	14.1%					
kidney	elective	73.9%	62.0%	67.7%	kidney	elective	89.8%	77.8%	83.6%
	emergency	8.4%	17.7%	13.3%		emergency	10.2%	22.2%	16.4%
	unknown	17.7%	20.3%	19.0%					
bladder	elective	72.1%	67.8%	68.8%	bladder	elective	92.3%	85.8%	87.3%
	emergency	6.0%	11.2%	10.0%		emergency	7.7%	14.2%	12.7%
	unknown	21.9%	20.9%	21.1%					
brain & CNS	elective	55.1%	44.6%	50.7%	brain & CNS	elective	72.5%	57.2%	66.1%
	emergency	20.8%	33.4%	26.1%		emergency	27.5%	42.8%	33.9%
	unknown	24.1%	21.9%	23.2%					
thyroid	elective	86.5%	73.1%	83.4%	thyroid	elective	99.0%	89.2%	96.8%
	emergency	0.9%	8.9%	2.7%		emergency	1.0%	10.8%	3.2%
	unknown	12.6%	18.0%	13.9%					
Hodgkin	elective	77.5%	66.9%	75.6%	Hodgkin	elective	88.9%	81.1%	87.5%
	emergency	9.7%	15.6%	10.8%		emergency	11.1%	18.9%	12.5%
	unknown	12.8%	17.5%	13.7%					
non-Hodgkin	elective	71.1%	67.0%	68.9%	non-Hodgkin	elective	84.0%	79.8%	81.6%
	emergency	13.6%	17.0%	15.5%		emergency	16.0%	20.2%	18.4%
	unknown	15.3%	16.0%	15.7%					
multiple myeloma	elective	68.5%	70.8%	70.0%	multiple myeloma	elective	80.5%	80.9%	80.8%
	emergency	16.6%	16.7%	16.7%		emergency	19.5%	19.1%	19.2%
	unknown	14.9%	12.5%	13.3%					
leukaemia	elective	54.0%	64.9%	59.8%	leukaemia	elective	69.1%	76.6%	73.2%
	emergency	24.2%	19.8%	21.9%		emergency	30.9%	23.4%	26.8%
	unknown	21.8%	15.3%	18.3%					

* excluding NMSC

Appendix III. Table 4. Proportion presenting emergently, by gender (2010-2015)

including 'unknown' presentation status					excluding unknown presentation status				
	presentation	males	females	all		presentation	males	females	all
all invasive*	**elective**	**70.6%**	**69.8%**	**70.2%**	**all invasive***	**elective**	**86.1%**	**85.7%**	**85.9%**
	emergency	**11.4%**	**11.7%**	**11.5%**		**emergency**	**13.9%**	**14.3%**	**14.1%**
	unknown	**18.0%**	**18.5%**	**18.2%**					
mouth & pharynx	elective	73.3%	72.7%	73.2%	mouth & pharynx	elective	93.0%	93.8%	93.2%
	emergency	5.5%	4.8%	5.3%		emergency	7.0%	6.2%	6.8%
	unknown	21.1%	22.5%	21.5%					
oesophagus	elective	71.6%	67.5%	70.2%	oesophagus	elective	84.6%	81.6%	83.6%
	emergency	13.0%	15.2%	13.8%		emergency	15.4%	18.4%	16.4%
	unknown	15.4%	17.3%	16.0%					
stomach	elective	66.7%	66.2%	66.5%	stomach	elective	79.5%	79.6%	79.5%
	emergency	17.2%	17.0%	17.1%		emergency	20.5%	20.4%	20.5%
	unknown	16.1%	16.8%	16.4%					
colon	elective	69.0%	64.5%	67.0%	colon	elective	79.7%	75.8%	78.0%
	emergency	17.6%	20.6%	18.9%		emergency	20.3%	24.2%	22.0%
	unknown	13.4%	15.0%	14.1%					
rectum	elective	78.0%	75.5%	77.2%	rectum	elective	90.6%	87.8%	89.7%
	emergency	8.1%	10.5%	8.9%		emergency	9.4%	12.2%	10.3%
	unknown	13.9%	14.0%	13.9%					
liver	elective	53.5%	51.4%	52.9%	liver	elective	67.9%	62.2%	66.1%
	emergency	25.3%	31.2%	27.1%		emergency	32.1%	37.8%	33.9%
	unknown	21.1%	17.4%	20.0%					
pancreas	elective	55.0%	53.4%	54.3%	pancreas	elective	66.9%	64.0%	65.5%
	emergency	27.2%	30.1%	28.5%		emergency	33.1%	36.0%	34.5%
	unknown	17.8%	16.5%	17.2%					
larynx	elective	76.2%	73.7%	75.8%	larynx	elective	91.6%	89.6%	91.3%
	emergency	7.0%	8.6%	7.2%		emergency	8.4%	10.4%	8.7%
	unknown	16.8%	17.8%	17.0%					
lung	elective	57.9%	56.4%	57.2%	lung	elective	74.3%	74.0%	74.1%
	emergency	20.0%	19.9%	20.0%		emergency	25.7%	26.0%	25.9%
	unknown	22.0%	23.7%	22.8%					
melanoma of skin	elective	77.2%	78.9%	78.1%	melanoma of skin	elective	98.8%	99.4%	99.1%
	emergency	0.9%	0.5%	0.7%		emergency	1.2%	0.6%	0.9%
	unknown	21.9%	20.6%	21.2%					
breast	elective	74.8%	81.7%	81.6%	breast	elective	97.3%	98.5%	98.5%
	emergency	2.0%	1.3%	1.3%		emergency	2.7%	1.5%	1.5%
	unknown	23.1%	17.0%	17.1%					
cervix	elective		72.2%	72.2%	cervix	elective		93.5%	93.5%
	emergency		5.0%	5.0%		emergency		6.5%	6.5%
	unknown		22.7%	22.7%					
corpus uteri	elective		76.1%	76.1%	corpus uteri	elective		95.6%	95.6%
	emergency		3.5%	3.5%		emergency		4.4%	4.4%
	unknown		20.4%	20.4%					
ovary	elective		61.3%	61.3%	ovary	elective		76.2%	76.2%
	emergency		19.2%	19.2%		emergency		23.8%	23.8%
	unknown		19.5%	19.5%					
prostate	elective	81.2%		81.2%	prostate	elective	97.5%		97.5%
	emergency	2.1%		2.1%		emergency	2.5%		2.5%
	unknown	16.8%		16.8%					
testis	elective	77.0%		77.0%	testis	elective	89.6%		89.6%
	emergency	9.0%		9.0%		emergency	10.4%		10.4%
	unknown	14.1%		14.1%					
kidney	elective	67.8%	67.5%	67.7%	kidney	elective	84.0%	82.9%	83.6%
	emergency	12.9%	14.0%	13.3%		emergency	16.0%	17.1%	16.4%
	unknown	19.3%	18.5%	19.0%					
bladder	elective	69.8%	66.4%	68.8%	bladder	elective	88.7%	84.0%	87.3%
	emergency	8.9%	12.7%	10.0%		emergency	11.3%	16.0%	12.7%
	unknown	21.3%	20.9%	21.1%					
brain & CNS	elective	51.8%	49.4%	50.7%	brain & CNS	elective	68.1%	63.6%	66.1%
	emergency	24.3%	28.3%	26.1%		emergency	31.9%	36.4%	33.9%
	unknown	23.9%	22.3%	23.2%					
thyroid	elective	79.6%	84.7%	83.4%	thyroid	elective	96.7%	96.9%	96.8%
	emergency	2.7%	2.7%	2.7%		emergency	3.3%	3.1%	3.2%
	unknown	17.7%	12.6%	13.9%					
Hodgkin	elective	73.3%	78.2%	75.6%	Hodgkin	elective	85.5%	90.0%	87.5%
	emergency	12.5%	8.7%	10.8%		emergency	14.5%	10.0%	12.5%
	unknown	14.2%	13.1%	13.7%					
non-Hodgkin	elective	67.7%	70.2%	68.9%	non-Hodgkin	elective	80.3%	83.3%	81.6%
	emergency	16.6%	14.1%	15.5%		emergency	19.7%	16.7%	18.4%
	unknown	15.7%	15.7%	15.7%					
multiple myeloma	elective	69.5%	70.8%	70.0%	multiple myeloma	elective	79.8%	82.2%	80.8%
	emergency	17.6%	15.3%	16.7%		emergency	20.2%	17.8%	19.2%
	unknown	12.9%	13.9%	13.3%					
leukaemia	elective	62.6%	55.7%	59.8%	leukaemia	elective	76.0%	69.1%	73.2%
	emergency	19.8%	24.9%	21.9%		emergency	24.0%	30.9%	26.8%
	unknown	17.6%	19.3%	18.3%					

* excluding NMSC