

Routes to Diagnosis, a novel English methodology



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Nationally, what didn't we know?

- How people come to get diagnosed with cancer
- Whether late diagnosis arises where patients have not gone through the screening or suspected cancer route

Nationally, what did we want to know?

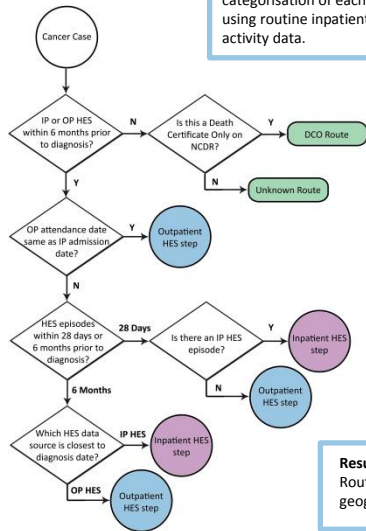
- Can we use routinely available datasets to define the route to diagnosis for patients diagnosed with cancer?
- If so, how do routes differ by cancer site, age, sex, ethnicity, deprivation or geography?
- Are there differences in survival for different routes?

Method: Routes to Diagnosis uses routinely collected data sources to work backwards through patient pathways to examine the sequence of events that led to a cancer diagnosis. The methodology identifies over 70 individual pathways and then categorises patients into one of eight broad Routes (see table to right).

1. Registration records for cancers newly diagnosed in 2006 to 2008 (ICD-10 C00-C97 excluding C44) for England residents were extracted from the National Cancer Data Repository.
2. Records were linked at patient level to national datasets for inpatient and outpatient activity, Cancer Waiting Times (CWT) monitoring and breast, cervical and bowel cancer screening.
3. Hospital Episode Statistics (HES) data were used to categorise the Route for each case individually, **the algorithm is described in the three flow diagrams below.**
4. Screening and CWT data were then examined with the Route potentially changing to either a Screening or Two Week Wait (urgent referral for suspected cancer) Route.

Route	Description
Screen Detected	Detected via the national breast, cervical or bowel screening programmes
Two Week Wait	Urgent GP referral with a suspicion of cancer
GP Referral	Routine and urgent GP referrals where the patient was not referred under the Two Week Wait referral route
Other Outpatient	An elective route starting with an outpatient appointment; either self-referral, consultant to consultant, other or unknown referral
Inpatient Elective	Where no earlier admission can be found prior to elective admission from a waiting list, booked or planned
Emergency Presentation	An emergency route via A&E, emergency GP referral, emergency transfer, emergency consultant outpatient referral, emergency admission or attendance
Death Certificate Only	No data available from Inpatient or Outpatient HES, CWT or screening and with a death certificate only diagnosis flagged by the cancer registry
Unknown	No data available from Inpatient or Outpatient HES, CWT or screening

Figure A



Figures A, B and C show the categorisation of each case into a Route using routine inpatient and outpatient activity data.

Figure B

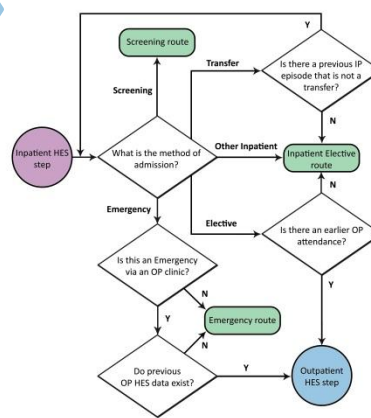
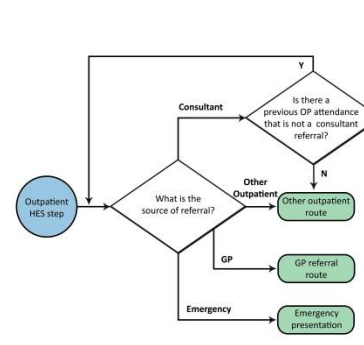


Figure C



Results: The percentage of patients diagnosed through each Route was broken down by cancer type, age, sex, deprivation, geography, ethnicity and year for 38 specific cancer types.

Relative survival estimates were calculated for 1, 3, 6, 9 and 12 month periods. Across all cancer types, one-year relative survival was significantly lower for Emergency Presentations.

Conclusions: The small selection of results presented show that linked cancer registration and administrative data can be used to robustly categorise the route to a cancer diagnosis for all patients.

The methodology outlined allows for automation of analysis and is robust, with results aligning to several other studies. It is also broadly transferable to other countries, allowing international comparisons.

However it is not without its limitations. A small level of impact from background admissions will be present as the algorithm assumes patient activity prior to diagnosis is associated with the diagnosis itself. The method cannot be used to identify presenting symptoms (of cancer or any other illness).

The full methodology published in the British Journal of Cancer*, an information supplement and an Excel workbook containing all available results are available from the NCIN website: www.ncin.org.uk

* Elliss-Brookes L, McPhail S, Ives A, Greenslade M, Shelton J, Hiom S, Richards M (2012) Routes to Diagnosis for cancer - Determining the patient journey using multiple routine datasets. BJC 107: 1220-1226

Percentage of diagnoses by route 2006-2008	Screen detected	Two Week Wait	GP referral	Other Outpatient	Inpatient Elective	Emergency Presentation	Death Certificate Only	Unknown	Number of cases
All cancers	5%	28%	21%	10%	6%	24%	1%	8%	739,667
Breast	28%	43%	11%	3%	1%	5%	0%	0%	110,173
Central Nervous System	1%	13%	11%	7%	62%	1%	6%	11,697	
Colorectal	2%	27%	20%	9%	26%	1%	6%	91,416	
Lung	24%	17%	10%	4%	39%	1%	5%	96,735	
Melanoma	41%	27%	7%	3%	0%	18%	26,660		
Ovary	23%	20%	12%	5%	32%	1%	7%	16,026	
Pancreas	11%	16%	9%	6%	50%	1%	6%	18,896	

Relative 12 month survival estimates by route and site, persons, 2006-2008	All routes	Screening	Two Week Wait	GP referral	Other outpatient	Inpatient Elective	Emergency presentation	Unknown	Number of cases
Breast	97%	100%	98%	96%	92%	91%	54%	95%	108,300
Central Nervous System	39%	47%	54%	62%	53%	30%	50%	11,353	
Colorectal	74%	82%	82%	80%	84%	50%	73%	89,484	
Lung	29%	40%	40%	44%	34%	12%	24%	92,522	
Melanoma	97%	99%	98%	94%	96%	62%	99%	26,587	
Ovary	70%	84%	81%	82%	81%	45%	68%	15,613	
Pancreas	17%	19%	26%	33%	29%	9%	16%	18,591	