




Public Health
England

Protecting and improving the nation's health

Indicator Specification

Title: Proportion of cancer admissions diagnosed for the first time via emergency presentation

30th November 2015

Section 1. Introduction / Overview	
1.1. Title	[Proportion of cancer admissions diagnosed for the first time via emergency presentation]
1.2. Set or domain	[Cancer]
1.3. Topic area	[Cancer, Emergency Presentations]
1.4. Definition	<p>Cancer diagnosis can occur by many routes, for example through a screening programme, via a GP referral or through an emergency presentation. This indicator examines specifically the proportion of cancers diagnosed via this emergency route.</p> <p>The unit is expressed as a proportion (%) out of all cancer diagnoses to measure the fraction of diagnoses that are emergencies.</p> <p>The indicator covers all invasive malignancies (non-melanoma skin cancer excluded), all ages, for persons resident in England.</p> <p>Cancer is a major cause of death, accounting for around a quarter of deaths in England. More than 1 in 3 people will develop cancer at some point in their life.</p> <p>The Independent Cancer Taskforce has published <i>Achieving world-class cancer outcomes: a strategy for England 2015-2020</i>. This report sets out recommendations for a new cancer strategy for England and includes a specific call for the level of emergency presentations to be monitored at CCG level.</p> <p>Diagnosis via an emergency presentation is associated with substantially worse short-term survival outcomes. An indicator on the proportion of cancers diagnosed via an emergency presentation is therefore a useful proxy for assessing improvements in cancer survival rates.</p> <p>The indicator includes new first admissions for cancer via emergency presentation as a proportion of all new first admissions for cancer.</p> <p>This indicator is labelled as experimental statistics because of the use of a first inpatient admission for cancer as a proxy for the experience of all cancer patients.</p> <p>A full definition of the methodology is attached:</p> <div style="text-align: center;">  <p>Proxy for emergency presentations with ca</p> </div> <p>Note that the PCT geographic breakdown has been replaced by a CCG one.</p>
1.5. Indicator owner & contact details	<p>[Sean McPhail</p> <p>National Cancer Intelligence Network</p> <p>Public Health England</p>


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1.6. Publication status	[Currently in publication]
Section 2. Rationale	
2.1. Purpose	<p>The metric is designed to monitor the proportion of emergency presentations for cancer. Emergency presentations are a proxy for lower survival and routine monitoring of them can help efforts to improve early diagnosis.</p> <p>The indicator is currently published annually where possible. The Independent Cancer Taskforce report proposed better reporting of cancer outcomes, and the Secretary of State for Health requested the Department of Health develop a set of routine indicators for this purpose. The emergency presentation metric with greater publication frequency was one such metric selected for this.</p> <p>The metric can be used by NHS England, Public Health England and commissioning groups to monitor the trends in emergency presentations of cancer and target resources to reduce the proportion of patients diagnosed through this route. </p>
2.2. Sponsor	[Secretary of State for Health, Department of Health]
2.3. Endorsement	[Expert input from the National Cancer Intelligence Network and National Cancer Registration Service, Public Health England]
2.4. Evidence and Policy base	<p>The measure originates from the Routes to Diagnosis project, the rationale, justification and methodology for which is published here: http://www.nature.com/bjc/journal/v107/n8/pdf/bjc2012408a.pdf</p> <p>Including related national incentives, critical business question, NICE quality standard and set or domain rationale, if appropriate</p> <p>The proxy emergency presentation indicator was designed to make greater use of HES data to be more current than is possible with using the full Routes to Diagnosis methodology. The methodology document attached previously in section 1 contains a comparison between the proxy measure and the emergency presentation route from Routes to Diagnosis, establishing the accuracy of the measure.</p> <p>The measure sets out to help provide a proxy to measure early diagnosis, as emergency presentations have lower survival than other routes while routes associated with earlier diagnosis, such as through a GP referral or TWW, have higher survival than the emergency route.</p> <p>Policy around early diagnosis and the reduction of emergency presentations can be found below:</p> <p>Improving Outcomes - a Strategy for Cancer http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_123371</p>

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	<p>Achieving world-class cancer outcomes: a strategy for England 2015-2020</p> <p>(http://www.cancerresearchuk.org/sites/default/files/achieving_world-class_cancer_outcomes_-_a_strategy_for_england_2015-2020.pdf)</p>
<h3>Section 3. Data</h3>	
<p>3.1. Data source</p>	<p>National Cancer Registry Cancer Analysis System and the PHE Admitted Patient Care HES database. HES data are shared by the HSCIC under the memorandum of understanding between PHE and HSCIC.</p> <p>Only finalised registrations are used to exclude prior registered cases. All HES records with a diagnostic cancer code are included in the initial database, but are excluded where a prior HES or registration record of a similar cancer type can be identified.</p>
<p>3.2. Justification of source and others considered</p>	<p>There are no alternative national data sources. National HES data are collected exclusively by the HSCIC and cancer registration data is collected exclusively by the National Cancer Registration Service. Alternative data sources would require duplication of methodology and resources.</p>
<p>3.3. Data availability</p>	<p>Cancer data are available from the Cancer Analysis System and are updated every month, approximately 9 months in arrears for finalised registrations.</p> <p>HES data is available from within PHE, shared by the HSCIC under the memorandum of understanding between PHE and HSCIC. The data is approximately 1 year behind “realtime” (to be confirmed).</p> <p>Data are accessible by analytical staff with the National Cancer Intelligence Network and National Cancer Registration Service Analytical and data management teams.</p> <p>Cancer registration is collected under Section 60 of the Health and Social Care Act 2001 and Section 251 of the NHS Act 2006. Cancer registration data has been collected in England for many years and will continue to be in the longer term.</p> <p>The indicator will include the most recent year (4 most recent quarters), and updates quarterly</p>
<p>3.4. Data quality</p>	<p>Data quality can be assessed by comparison to the emergency route data produced by Routes to Diagnosis. The validity of this work is established in a paper found here: http://www.nature.com/bjc/journal/v107/n8/pdf/bjc2012408a.pdf. The proportion of cancers not assigned a Route has fallen over time, at 3% for 2013.</p> <p>Of the 28 sites for which results have been produced here and within Routes to Diagnosis, 13 sites had less than 3 percentage points difference between the results, and 24 sites had less than 5 percentage points differences between the sites.</p> <p>Trends over time are preserved between the two datasets – falls in</p>

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	Emergency presentations in Routes are mirrored by a fall in the proxy data.
3.5. Quality assurance	<p>Data are checked at each stage of processing.</p> <p>The initial code to link and extract data has been established and tested, with any changes quality assured by an analyst familiar with the coding system.</p> <p>The output of the algorithm is checked for completeness by assessing missing fields and comparing numbers both to previous publications of the data and where possible to the Routes to Diagnosis data where it is available.</p> <p>The output is checked for incorrect values in each field, and the calculations used to produce the proportions is checked and recreated by another member of the NCIN analytical team.</p>
3.6. Quality improvement plan If appropriate	The proxy methodology here is used due to the time required to produce and quality assure cancer registration data to ensure its accuracy. As this process speeds up and registration data become more timely it may be possible to switch to using the published Routes to Diagnosis methodology, should other data sources such as HES data, become concurrently available.
3.7. Data linkage	<p>Information on the data linkage can be found here:</p> <p></p> <p>Proxy for emergency presentations with ca</p> <p>Linkage occurs between HES data and historic cancer registration data. Note that the PCT geographic breakdown has been replaced by a CCG one.</p>
3.8. Quality of data linkage	<p>All new HES tumours are assigned the status of emergency or non-emergency.</p> <p>Data quality issues exist due to lack of cancer registration data, although the differences produced by this are minimal as noted earlier. This will vary by cancer site.</p>
3.9. Data fields	Date of diagnosis and cancer type of diagnosis within the cancer registration data. Admission method and primary diagnosis code within the HES data. NHS number and date of birth to link the two.
3.10 Data filters	ICD10 C00-C97 excluding C44 for both HES data and cancer registration data.
3.11 Justifications of inclusions and exclusions and how these	ICD group selection follows long established reporting practice by national and international cancer registries for “all cancers”.

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adhere to standard definitions	
3.12 Data processing	Data are extracted as numerator and denominator fields, with no additional calculations performed.
Section 4. Construction	
4.1. Numerator	<p>Number of first inpatient admissions having a diagnostic code indicating a presentation of cancer which has an emergency method of admission. Note that persons with a prior registration or prior admission of cancer of a similar type are removed from the numerator.</p> <p>Data are drawn from the Hospital Episode Statistics Admitted Patient Care data linked to cancer registration data. </p>
4.2. Denominator	<p>Number of first inpatient admissions having a diagnostic code indicating a presentation of cancer Note that persons with a prior registration or prior admission of cancer of a similar type are removed from the denominator.</p> <p>Data are drawn from the Hospital Episode Statistics Admitted Patient Care data linked to cancer registration data. </p>
4.3. Computation	<p>Crude percentage: the number of first inpatient admissions, having a cancer diagnostic code indicating a presentation with an emergency method of admission, <i>divided by</i>, the number of first of inpatient admissions, having a cancer diagnostic code, <i>multiplied by 100</i>.</p> <p>Note that records which can be matched to historic cancer registration (thereby probably indicating a recurrence of the original primary cancer) are excluded – only first admissions are included in either the numerator or the denominator.</p> <p>The result is displayed as a proportion to zero decimal places, rounded up.</p> <p>The units used are %.</p> <p>All ages are included.</p> <p>All sexes are included (Persons).</p> <p>Data are provided at CCG level. </p>
4.4. Risk adjustment or standardisation on type and methodology	<p>None</p> <p><i>Variables and methodology: N/A</i></p> <p> </p>
4.5. Justification of risk adjustment type and variables or why risk adjustment is	<p>Risk adjustments are not used as falls or rises in emergency presentations have been shown to correlate with higher or lower survival for all sexes, age groups and deprivation quintiles.</p> <p>The effect of other variables is document in the full Routes to Diagnosis study and associated publications. </p>

not used	
<p>4.6. Confidence interval / control limit use and methodology</p>	<p>Confidence Intervals</p> <p><i>Methodology:</i></p> <p>Wilson Score method</p> <p>A confidence interval is a range of values that is used to quantify the imprecision in the estimate of a particular indicator. Specifically it quantifies the imprecision that results from random variation in the measurement of the indicator. A wider confidence interval shows that the indicator value presented is likely to be a less precise estimate of the true underlying value.</p> <p>The Wilson Score method¹ gives very accurate approximate confidence intervals for proportions and odds based on the assumption of a Binomial distribution. It can be used with any data values, even when the denominator is very small and, unlike some methods, it does not fail to give an interval when the numerator count, and therefore the proportion, is zero. The Wilson Score method is the preferred method for calculating confidence intervals for proportions and odds, but it can also be used for rates, as long as the event rate is low (relatively rare events within the population) as the Binomial distribution is a very good approximation to the Poisson distribution when the event rate is low. The method is described in detail in APHO Technical Briefing 3: Commonly used public health statistics and their confidence intervals.²</p> <p>The confidence level will be 95%.</p> <p>¹ Wilson EB. Probable inference, the law of succession, and statistical inference. <i>J Am Stat Assoc</i>1927;22:209-12. ² Eayres D. <i>Technical Briefing 3: Commonly used public health statistics and their confidence intervals</i>. York: APHO; 2008. Available at http://www.apho.org.uk/resource/item.aspx?RID=48457]</p>
<p>4.7. Justification of confidence intervals / control limits used</p>	<p>[These are the validated and standard confidence intervals used for health data and data of this type.]</p>

Section 5. Presentation and Interpretation

<p>Presentation</p>	
<p>5.1. Presentation of indicator</p>	<p>[The indicator will initially be presented in an MS Excel workbook, with figures presented as proportions and an accompanying line graph to show variation over time.</p> <p>This will be hosted on the NCIN website (www.ncin.org.uk) and will be accessible to anyone who can access the website.</p> <p>A large proportion of the intended audience will have access to both the website and the software to utilise an MS Excel workbook, and this</p>

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	publication format lines up with many previous outputs.
5.2. Contextual information provided alongside indicator with justification	The output will include a sheet with a brief description of the indicator and a summary of the methodology along with an outline of the cancer sites included and time periods covered. This will also include further contact details for more information and a link to other relevant resources.
5.3. Calculation and data source of contextual information	The information has accompanied previous publications of this indicator, and will be updated to reflect the new time periods included.
5.4. Use of bandings, benchmarks or targets with justification	No targets or bandings are used. The average for England will be included as a benchmark. Other publications suggest a fall in emergency presentations helps improve cancer survival, but this may be in combination with many other factors such as improvements in surgical techniques and stage shifts. A reduction in the proportion of emergency presentations is regarded as a goal to contribute to earlier diagnosis initiatives.
5.5. Banding, benchmark or target methodology if appropriate	N/A
Interpretation	
5.6. Interpretation guidelines	This indicator is a proxy measure for the proportion of tumours diagnosed following an initial emergency presentation into secondary care. It can be used to track rises or falls in the proportion of cancers that present as an emergency and those which do not. While the measure itself may correlate with improved survival where emergency presentations fall, this is not necessarily a direct cause and many other factors will be involved.
5.7. Limitations and potential bias	The denominator is all tumours identified from Inpatient HES and therefore does not include all diagnosed tumours registered by the National Cancer Registration Service. As a result, the results presented here may differ from publicly available results such as Routes to Diagnosis. Previously diagnosed cancers not captured in the cancer register, for example those diagnosed overseas, would not be included and subsequent treatment would appear here as a first presentation. However due to the

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	<p>completeness of the cancer registration data this effect is believed to be small.</p> <p>The indicator is not adjusted for case-mix. In particular CCGs with an older population can be expected to see a larger number of Emergency Presentations. CCGs with a larger number of lung cancers (due to smoking prevalence) or smaller number of breast cancers (due to broader socio-economic factors) can be expected to see a larger proportion of emergency presentations.</p> <p>Smaller numbers at CCG level may result in large variability in the confidence intervals. </p>
5.8. Improvement actions	<p>Reducing emergency presentations is a large undertaking that feeds in to much work and policy around earlier diagnosis.</p> <p>Work around awareness for the public, GPs and improvements in referral pathways are all some of the areas targeted to improve earlier diagnosis and may help reduce emergency presentations. For more information please see: http://www.cancerresearchuk.org/health-professional/early-diagnosis-activities/national-awareness-and-early-diagnosis-initiative-naedi </p>
5.9. Evidence of variability	<p>Variation is visible in this indicator. Data are published here: https://www.cancertoolkit.co.uk/ , with an NHS.net account login required for access. </p>

Section 6. Risks

6.1. Similar existing indicators	<p>The full Routes to Diagnosis study contains information on the proportion of emergency presentations. This work is dependent upon many data sources and resources. The proxy indicator here requires fewer data sets that contain more recent data and can be updated more frequently with fewer resources. To be able to monitor emergency presentations the data need to be current, and this is the main strength of this indicator over the full methodology. </p>
6.2. Coherence and comparability	<p>As noted in the methodology, the proxy indicator is not completely consistent with the Routes to diagnosis methodology. However, as noted, the variation is limited. </p>
6.3. Undesired behaviours and/or gaming	<p>The indicator is reliant upon recording systems for admission methods being accurate and unaltered. </p>
6.4. Approach to indicator review	<p>The indicator is reviewed in line with updated to the full Routes to Diagnosis study to match up with cancer site groupings and any major methodological changes.</p> <p>An email address is provided on outputs for feedback which is incorporated by the project group where appropriate. </p>

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6.5. Disclosure control	Indicator values based on numerator counts less than 5 are not suppressed, in accordance with HSCIC anonymisation standard which classifies indicators based on a population of over 1,000 persons as anonymous. All CCG populations greatly exceed this population.
6.6. Copyright	Public Health England Hospital Episode Statistics are used with the permission of the Health and Social Care Information Centre The data may be reused referencing Public Health England