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**Indicator Supporting Documentation**

**IAP00094 Patients with stroke admitted to an acute stroke unit within 4 hours of arrival to hospital**

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| IAP Code | IAP00091 |
| Title | People with stroke admitted to an acute stroke unit within 4 hours of arrival at hospital |
| Published by | Department of Health and Social Care |
| Reporting period | Annual |
| Geographical Coverage | England |
| Reporting level(s) | National |
| Based on data from | Royal College of Physicians’ Sentinel Stroke National Audit Programme (RCP SSNAP) |
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| Rating | Fit for use with caveats |
| Assurance date | 14/12/2015 |
| Review date | 14/12/2018 |
| Indicator set | CCG Outcomes Indicator Set (OIS) 3.5 |
| Brief Description | This indicator measures the percentage of people who have had a stroke who were admitted to an acute stroke unit within 4 hours of arrival to hospital. |
| Purpose | Patients who have had a stroke should be admitted directly to a specialist acute stroke unit. There is a clear link between getting patients to a stroke unit quickly and improved quality of care and improved outcomes for the patient.  This indicator is an important measure of the effectiveness of recognising the signs of a stroke, assessing the symptoms and getting the patient to a stroke unit as quickly as possible. Patients who have a stroke in hospital are included in the indicator to take into account the process of recognising a stroke has occurred and the systems in place for caring for the patient. |
| Definition | The percentage of people who have had a stroke admitted to an acute stroke unit within 4 hours of arrival at hospital.  The indicator is published annually in December for each Clinical Commissioning Group (CCG) in England. It was published for the first time in December 2014 (2013/14 data). |
| Data Source | RCP SSNAP |
| Numerator | Of the denominator, the number of patients whose first ward of admission is a stroke unit AND who are admitted to the stroke unit within 4 hours of arrival at hospital, except for those patients who were already in hospital at the time of new stroke occurrence, who are admitted to a stroke unit within 4 hours of onset of stroke symptoms. |
| Denominator | All patients admitted to hospital with a primary diagnosis of stroke, except for those whose first ward of admission was ITU, CCU or HDU.  (ITU = Intensive Treatment Unit, CCU = Critical Care Unit, HDU = High Dependency Unit) |
| Calculation | The percentage *p* is given by:  where:  *O* is the numerator and *n* is the denominator. |
| Interpretation Guidelines | A high percentage indicator value is desirable.  For a small percentage of patients, direct admission to a stroke unit is not appropriate. It differentiates between acceptable locations for admission, for example intensive care, and non-acceptable locations, for example generic admissions units.  This indicator should be considered alongside information from other indicators and alternative sources, such as Clinical Commissioning Groups Outcomes Indicator Set (CCG OIS) 3.9 (People who have had an acute stroke who spend 90% or more of their stay on a stroke unit) and the CCG level Sentinel Stroke National Audit Programme (SSNAP) stroke unit key indicators. When evaluated together, these will help to provide a comprehensive view of CCG outcomes and provide a more complete overview of the impact of the CCGs’ processes on outcomes. |
| Caveats | The patterns of providing care may vary between organisations in terms of hospital inpatient admission practices and policies.  There may be variation in the prevalence of stroke due to differing levels of deprivation, for other regional or demographic reasons or between patients of different ethnic heritages. |

# Application Form

Section 1 Introduction / Overview

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| **1.1 Title** |  |
| **1.2 Set or domain** | CCG Outcomes Indicator Set (OIS) 3.5 |
| **1.3 Topic area** | Cardiovascular |
| **1.4 Definition** | The percentage of people with stroke admitted to an acute stroke unit within 4 hours of arrival to hospital.  Technical description: Of all patients admitted to hospital with a primary diagnosis of stroke (except for those whose first ward of admission was ITU, CCU or HDU), the percentage whose first ward of admission is a stroke unit AND who arrive on the stroke unit within 4 hours of arrival at hospital (except for those patients who were already in hospital at the time of new stroke occurrence, who should instead be admitted to a stroke unit within 4 hours of onset of stroke symptoms).  (ITU = Intensive Treatment Unit, CCU = Critical Care Unit, HDU = High Dependency Unit)  Stroke is defined within this indicator as intracerebral haemorrhage (ICD-10 code: I61), cerebral infarction (I63) and stroke, not specified as haemorrhage or infarction (I64).  The indicator is published annually in December for each CCG in England. It was published for the first time in December 2014 (2013/14 data). |
| **1.5 Indicator owner & contact details** | Alison Roe, Senior Service Delivery Manager, HSCIC  [ccgois@hscic.gov.uk](mailto:ccgois@hscic.gov.uk) |
| **1.6 Publication status** | Currently in publication |

Section 2 Rationale

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| **2.1 Purpose** | Patients who have had a stroke should be admitted directly to a specialist acute stroke unit. Getting patients to a stroke unit quickly is a strong indicator of eventual outcomes and is also closely linked to improved quality of care across other stroke care markers. The indicator is therefore an important measure of the effectiveness of recognition and assessment of the symptoms of stroke, and the process to transfer people to a stroke unit in a timely manner. Patients who have a stroke in hospital are included in the indicator to take into account the process of recognising the stroke has occurred and the systems in place for in-hospital pathways. |
| **2.2 Sponsor** | Richard Owen, Outcomes Strategy Lead, NHS Medical Directorate, NHS England. |
| **2.3 Endorsement** | The indicator was constructed following consultation with the following clinical and stroke data experts:   * Professor Anthony Rudd, Chair of the Intercollegiate Stroke Working Party, Associate Director for Stroke, Consultant Stroke Physician * James Campbell, Sentinel Stroke National Audit Programme (SSNAP) Intelligence Programme Manager, Royal College of Physicians (RCP) * Lizz Paley, Acting Stroke Programme Intelligence Manager – Data, RCP |
| **2.4 Evidence and Policy base**  Including related national incentives, critical business question, NICE quality standard and set or domain rationale, if appropriate | This indicator supports the NICE Quality Standard for stroke (QS2)¹ which covers care provided to adult stroke patients by healthcare staff during diagnosis and initial management, acute-phase care, rehabilitation and long-term management. It directly supports Quality Statement 3 within the standard, which states: ‘Patients with suspected stoke are admitted directly to a specialist acute stroke unit and assessed for thrombolysis, receiving it if clinically indicated’.  This indicator is aligned to the measure, Percentage of patients admitted to a stroke unit within 4 hours, included in the Department of Health’s Cardiovascular Disease Outcomes Strategy2.  Patients who receive organised stroke unit care are more likely to survive their stroke, return home and make a good recovery3. According to the Department of Health’s National Stroke Strategy, stroke unit care is the single biggest factor that can improve a person’s outcomes following a stroke. Successful stroke units are built around a stroke-skilled multidisciplinary team that is able to meet the needs of the individuals4.  Studies that have tested the effectiveness of stroke units have found that they help in reducing mortality. Stroke unit care as provided in routine clinical practice in England, Wales, and Northern Ireland reduces case fatality by ~25%, which is in line with the figures obtained from systematic analysis of stroke unit trial data5. In routine practice, stroke unit admission is associated with a greater likelihood of discharge home and with lower mortality up to 1 year6. Similar results have also been seen in a systematic review of observational studies of stroke unit implementation7, evidence that the benefit of stroke units translates across into trials more closely approximated with usual care. Studies also show that stroke units appear to reduce the risk of death following a stroke through the prevention and treatment of complications, in particular infections8.  This indicator is also supported by the RCP National Clinical Guideline for stroke which includes the following Quality Marker (QM9): ‘All stroke patients have prompt access to an acute stroke unit and spend the majority of their time at hospital in a stroke unit with high-quality stroke specialist care’9;10.  1.Quality Standard for Stroke (QS2), NICE, June 2010  [https://www.nice.org.uk/guidance/qs2/chapter/Introduction-and-overview](https://www.nice.org.uk/guidance/qs2/chapter/Introduction-and-overview 2)  [2](https://www.nice.org.uk/guidance/qs2/chapter/Introduction-and-overview 2). Cardiovascular Disease Outcomes Strategy, Department of Health, Mar 2013 <https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/214895/9387-2900853-CVD-Outcomes_web1.pdf>  3. Stroke Unit Trialists' Collaboration, Organised inpatient (stroke unit) care for stroke, 2007 <http://www.ncbi.nlm.nih.gov/pubmed/17943737>  4. National Stroke Strategy, Department of Health, Dec 2007 <http://clahrc-gm.nihr.ac.uk/cms/wp-content/uploads/DoH-National-Stroke-Strategy-2007.pdf>  5. National Sentinel Audit of Stroke, Stroke Unit Care and Outcome, Jan 2005 <http://stroke.ahajournals.org/content/36/1/103.full.pdf>  6. Journal of Neurology, Neurosurgery and Psychiatry, The impact of stroke unit care on outcome in a Scottish stroke population, taking into account case mix and selection bias, June 2014 <http://jnnp.bmj.com/content/early/2014/06/25/jnnp-2013-307478.full>  7. Seenan et al, Stroke units in their natural habitat: systematic review of observational studies, 2007 <http://www.ncbi.nlm.nih.gov/pubmed/17463308>  8. Govan et al, Does the Prevention of Complications Explain the Survival Benefit of Organized Inpatient (Stroke Unit) Care? 2007 <http://stroke.ahajournals.org/content/38/9/2536>  9. National Clinical Guideline for Stroke, Intercollegiate Stroke Working Party, RCP 4th ed. 2012 <http://www.rcplondon.ac.uk/sites/default/files/national-clinical-guidelines-for-stroke-fourth-edition.pdf>  10. Cardiovascular Disease Outcomes Strategy, Department of Health, March 2013 <https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/214895/9387-2900853-CVD-Outcomes_web1.pdf> |

Section 3 Data

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| **3.1 Data source** | RCP SSNAP  The SSNAP is guided by the Intercollegiate Stroke Working Party (ICSWP) and delivered by the Stroke Programme within the Clinical Effectiveness and Evaluation Unit in the RCP. It is centrally funded by the Healthcare Quality Improvement Partnership (HQIP) on behalf of NHS England as part of the National Clinical Audit and Patient Outcomes Programme (NCAPOP).  <http://www.rcplondon.ac.uk/projects/sentinel-stroke-national-audit-programme> |
| **3.2 Justification of source and others considered** | The SSNAP is the single source of data on stroke services, processes of care and outcomes. It provides the data for other statutory reporting mechanisms in England, including the NICE Quality Standard and the five other CCG OIS stroke measures; it is also due to be used for the NHS Outcomes Framework. SSNAP metrics are aligned with those in the Cardiovascular Disease Outcomes Strategy.  Hospital Episode Statistics (HES) was considered as a data source for this indicator; however it does not contain the necessary detail required for this indicator to measure stroke unit admission. |
| **3.3 Data availability** | CCG OIS indicators are published annually. SSNAP data for the full financial year is available to produce the indicator approximately 8 months after the financial year end; therefore the indicator is published each year in December.  CCG OIS indicators are official statistics and the publication date is pre-announced. There is no gap between the planned and actual publication date.  The RCP make this indicator, along with a number of others, accessible to the public via RCP reporting, including an Easy Access Version aimed at stroke survivors and carers. It is available via Excel spreadsheets and other formats including graphical representation. |
| **3.4 Data quality** | The indicator is published in the context of case ascertainment between SSNAP and HES. This is the percentage of patients with primary ICD-10 codes I61, I63 and I64 in HES who are included in SSNAP for the same time period.  The SSNAP is a mandatory collection and overall case ascertainment increased from 72% in Quarter 1 to 95% in Quarter 4, 2013/14 (Quarter 2: 83%, Quarter 3: 90%). It has further improved to 97% by Quarter 4, 2014/15. Case ascertainment is reported alongside the indicator for all CCGs in the published CCG OIS data files. Only five CCGs (2.4%) had their percentages suppressed in the published 2013/14 data due to less than 50% case ascertainment with HES.  Patient records are only included in audit analyses if they include the minimum requirements of completion of mandatory fields. The minimum includes all of the fields required to calculate this indicator. Case ascertainment is reported publicly at hospital level and therefore there is a strong incentive for hospitals to ensure they have submitted all of their patients to the audit and completed the mandatory fields. The data is received via a secure web tool which has strong built-in validation meaning that data used in the calculation of this indicator is fully complete.  Patients are mapped to a CCG using patient postcode. National level figures are published including patients that could not be mapped to a CCG and therefore the total of the individual CCGs does not match the national level figure. Over 99% of patients are matched to a CCG across each of the CCG OIS stroke indicators. |
| **3.5 Quality assurance** | As SSNAP data is subject to strong built-in validation via the secure web tool, it means that it is not possible for providers to enter illogical timings; however, this is double checked during analysis and therefore the accuracy of the indicator is very high. No assumptions are made regarding the arrival and discharge times, apart from when a patient died in hospital.  When submitting SSNAP data, security and confidentiality are maintained through the use of passwords and a person specific registration process. A dedicated helpdesk is in place to answer queries from SSNAP participants, helping to ensure questions are interpreted consistently (which informs updates to FAQs and data set help notes). Users can register for their team on the SSNAP web tool and input data for their team. Once records are complete and correct they can be ‘locked’ at different levels. Records can be ‘locked’ to 72 hours once this information is completed, they can then be locked to discharge once this is applicable. Locking confirms that all data have been clinically signed off and are ready for central analysis. The ‘Lead clinical contact’ role is responsible for ensuring that the overall system of data collection and entry onto the web tool is accurate, robust and functioning. The SSNAP encourage the lead to routinely check data. Only complete and locked to 72 hours records go into data analysis for the 72 hour section and complete and locked to discharge records go into data analysis for the post-72h section.  Eligibility criteria are applied to determine which records can be included in the audit. The criteria are: ICD-10 codes I61, I63, I64, but hospitals have means of checking for eligible patients other than their coding system and participants are encouraged to enter cases prospectively meaning the stroke team have more control over selecting records to be included and can also refer to their stroke register, should they have one. |
| **3.6 Quality improvement plan**  If appropriate | N/A |
| **3.7 Data linkage** | None. |
| **3.8 Quality of data linkage** | N/A |
| **3.9 Data fields** | The data fields supplied by the RCP are as follows:  1. Number of records in SSNAP attributed to this CCG according to patient postcode  2. Estimated expected number of patients (from HES)  3. Case ascertainment band  4. Numerator  5. Denominator  6. Percentage of applicable patients who go direct to a stroke unit within 4 hours |
| **3.10 Data filters** | SSNAP-derived records meeting all of the following requirements are valid for the denominator in this indicator:   * Audit Question 1.14 – ‘Which was the first ward the patient was admitted to?’ is not equal to ‘ITU/CCU/HDU’   SSNAP-derived records meeting all of the following requirements are valid for the numerator in this indicator:   * Audit Question 1.14 – ‘Which was the first ward the patient was admitted to?’ is equal to ‘Stroke Unit’ * Audit Question 1.15 – ‘Date/time patient first arrived on stroke unit’ is within 4 hours of Audit Question 1.13 – Date/time patient arrived at first hospital   If Audit Question 1.10 (Was the patient already an inpatient at the time of stroke?) is equal to ‘Yes’ then;   * Audit Question 1.15 – ‘Date/time patient first arrived on stroke unit’ is within 4 hours of Audit Question 1.11 – Date/time of onset/awareness of symptoms * Audit Question 1.11.1 – ‘The date given is: Precise/Best estimate/Not known’ is equal to ‘Precise’ or ‘Best estimate’ * Audit Question 1.11.2 – The time given is: Precise/Best estimate/Not known is equal to ‘Precise’ or ‘Best estimate’ |
| **3.11 Justifications of inclusions and exclusions**  and how these adhere to standard definitions | Audit Question 1.14 is not equal to ‘ITU/CCU/HDU’ – Excludes patients who have been admitted to ITU (Intensive Treatment Unit), CCU (Critical Care Unit) or HDU (High Dependency Unit). Some patients’ condition is sufficiently serious that the most appropriate place to meet their needs is ITU, CCU or HDU. The reason for the audit having these exclusions is to prevent any perverse incentives to have all patients on a stroke unit even if they are better off being treated elsewhere.  Audit Question 1.14 is equal to ‘Stroke Unit’ - Identifies only patients who have been admitted to a stroke unit.  Audit Question 1.15 is within 4 hours of Audit Question 1.13 – Identifies only patients who have arrived in hospital and moved to a stroke unit within 4 hours.  Audit Question 1.15 is within 4 hours of Audit Question 1.11 – Identifies patients who had a stroke when in hospital and were moved to a stroke unit within 4 hours. There is evidence that patients who have a stroke in hospital are sometimes treated less quickly because it is not recognised or systems are not set up well for in-hospital pathways. The audit has always defined the timelines in this way and it is recognised as helpful by the steering group and hospital clinicians.  Audit Question 1.11.1 is equal to ‘Precise’ or ‘Best estimate’ – Identifies patients whose date of onset/awareness of symptoms is reliable.  Audit Question 1.11.2 is equal to ‘Precise’ or ‘Best estimate’ – Identifies patients whose time of onset/awareness of symptoms is reliable.  The SSNAP uses the following ICD-10 diagnosis codes to identify stroke patients:   * I61 - Intracerebral haemorrhage * I63 - Cerebral infarction * I64 - Stroke, not specified as haemorrhage or infarction   The coding advice from the Clinical Classifications Service also includes I60 (Subarachnoid haemorrhage) and I62 (Other nontraumatic intracranial haemorrhage), however this advice would not be endorsed by the RCP as subarachnoid haemorrhage and other non-traumatic intracranial haemorrhage have a different care pathway and outcome.  Subarachnoid haemorrhages and other non-traumatic intracranial haemorrhages are routinely and nearly always managed entirely outside of the stroke unit by neurosurgeons or by interventional neuroradiologists, which is what is recommended in national guidelines for these cases. The indicators need to reflect the care given on appropriate clinical pathways, not arbitrary groupings. |
| **3.12 Data processing** | The calculated CCG level indicator is provided by the RCP and includes the percentage, numerator, denominator and contextual information. It is provided with any necessary data suppression.  A 95% confidence interval is calculated by Clinical Indicators for each CCG prior to publication. |

Section 4 Construction

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| **4.1 Numerator** | Of the denominator, the number of patients whose first ward of admission is a stroke unit AND who are admitted to the stroke unit within 4 hours of arrival at hospital, except for those patients who were already in hospital at the time of new stroke occurrence, who are admitted to a stroke unit within 4 hours of onset of stroke symptoms. |
| **4.2 Denominator** | All patients admitted to hospital with a primary diagnosis of stroke, except for those whose first ward of admission was ITU, CCU or HDU.  (ITU = Intensive Treatment Unit, CCU = Critical Care Unit, HDU = High Dependency Unit) |
| **4.3 Computation** | The percentage *p* is given by:  where:  *O* is the numerator and *n* is the denominator. |
| **4.4 Risk adjustment or standardisation type and methodology** | The indicator is not standardised or risk adjusted. |
| **4.5 Justification of risk adjustment type and variables**  or why risk adjustment is not used | All people who have had a stroke (excluding those admitted to ITU, CCU or HDU) should be admitted to a stroke unit within 4 hours of arrival to hospital/onset of symptoms, regardless of age, sex etc. |
| **4.6 Confidence interval / control limit use and methodology** | Confidence Intervals  Confidence intervals are calculated using the Wilson Score method, as specified in “Commonly used public health statistics and their confidence intervals” (Public Health England (PHE), March 2008 <http://www.apho.org.uk/resource/view.aspx?RID=48617>).  The formulae for the 100(1 – α)% confidence interval limits for the proportion p are:  where:  *O* is the observed number of individuals in the sample/population having the specified characteristic (i.e., the numerator);  *n* is the total number of individuals in the sample/population (i.e., the denominator);  *q* = (1 – *p*) is the proportion without the specified characteristic;  *z* is the 100(1 – *α*/2)th percentile value from the Standard Normal distribution. For example for a 95% confidence interval, *α* = 0.05, and *z* = 1.96 (i.e. the 97.5th percentile value from the Standard Normal distribution). |
| **4.7 Justification of confidence intervals / control limits used** | The preferred PHE confidence interval method for proportions is the Wilson Score method9 which has been evaluated and recommended by Newcombe and Altman10;11. It can be used with any data values and, unlike some methods, it does not fail to give an interval when the numerator count, and therefore the proportion, is zero12.  9. Wilson EB. Probable inference, the law of succession, and statistical inference. J Am Stat Assoc 1927.  10. Newcombe RG. Two-sided confidence intervals for the single proportion: comparison of seven methods. Stat Med 1998.  11. Newcombe RG, Altman DG. Proportions and their differences. In Altman DG et al. (eds). Statistics with confidence (2nd edn). London: BMJ Books; 2000.  12. Agresti A, Coull BA. Approximate is better than ‘exact’ for interval estimation of binomial proportions. Am Stat 1998 |

Section 5 Presentation and Interpretation

Presentation

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| **5.1 Presentation of indicator** | The indicator is presented on the HSCIC Indicator Portal in a consistent format to other CCG OIS indicators. It is accompanied by indicator specification and quality statement documents, which provide details of indicator construction, data quality, statistical methods and interpretation considerations [http://indicators.ic.nhs.uk/webview](http://indicators.ic.nhs.uk/webview/index.jsp?v=2&submode=ddi&study=http%3A%2F%2F172.16.9.26%3A80%2Fobj%2FfStudy%2FP01851&mode=documentation&top=yes)  The data is presented with a detailed header including information on the statistic presented, the reporting period, level of coverage, publication date, data source, and any further notes to be aware of. The customer is also able to make use of drop-down filtering. (see table below) |

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| **Column name** | **Output** |
| Reporting period | Financial year |
| Breakdown | England, CCG |
| Level | CCG Code |
| Level description | CCG Name |
| Percentage | The indicator percentage calculation |
| CI lower | Lower 95% confidence interval |
| CI upper | Upper 95% confidence interval |
| Denominator | All patients admitted to hospital with a primary diagnosis of stroke, except for those who first ward of admission was ITU, CCU or HDU. |
| Numerator | The number of acute stroke patients who arrive on the stroke unit within 4 hours of arrival at hospital. |
| Number of records in SSNAP (care delivered within the first 72hrs) | The number of cases in SSNAP for the ‘care delivered within the first 72hrs’ cohort of stroke patients |
| Estimated expected number of patients (from HES) | The number of cases in HES |
| Case ascertainment band | Case ascertainment between SSNAP and HES |

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| **5.2 Contextual information provided alongside indicator**  with justification | Alongside the numerator, denominator and percentage, the number of records in SSNAP (care delivered within first 72hrs) is provided for each CCG as contextual information.  The indicator is published in the context of case ascertainment between SSNAP and HES. The ‘Estimated expected number of patients from HES’ figure is the number of patients who have been coded as a primary diagnosis of stroke during their admission in a year’s worth of HES, split by the patient’s CCG recorded in the HES record. Case ascertainment is reported alongside the indicator for all CCGs to highlight audit coverage against HES. MRG requested this further analysis in the original assurance process.  Case ascertainment is reported within the context of the ‘care delivered within the first 72hrs’ cohort of stroke patients for this indicator. The ‘Case ascertainment band’ column in the published output uses the following bandings:   * 90%+ * 80-89% * 70-79% * 50-69% * Less than 50%   The indicator is not reported for any CCGs with lower than 50% case ascertainment or for those with fewer than 20 patients. |
| **5.3 Calculation and data source of contextual information** | The contextual information is sourced from the SSNAP and provided by the RCP. |
| **5.4 Use of bandings, benchmarks or targets**  with justification | NHS England state in their summary of the CCG OIS that ‘The Indicator Set does not in itself set thresholds or levels of ambition for CCGs, it is intended as a tool for CCGs to drive local improvement and set priorities.’ <http://www.england.nhs.uk/resources/resources-for-ccgs/ccg-out-tool/ccg-ois/>  A high percentage of patients with stroke admitted to an acute stroke unit within 4 hours of arrival to hospital is desirable. When presenting the data, the RCP use the following bandings which are accepted by the clinical teams that submit SSNAP data as aspirational markers of performance: below 55.0%, 55.0-59.9%, 60.0-74.9%, 75.0–89.9%, 90.0% or higher.  The bandings were used in the map published for this indicator in the December 2014 CCG OIS publication commentary document:  Map showing banding for indicator achieved in England |
| **5.5 Banding, benchmark or target methodology**  if appropriate | The bandings used by the RCP are accepted by the clinical teams that submit SSNAP data as aspirational markers of performance. |

Interpretation

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| **5.6 Interpretation guidelines** | A high percentage of patients with stroke admitted to an acute stroke unit within 4 hours of arrival to hospital is desirable.  This indicator acknowledges that for a small percentage of patients direct admission to a stroke unit is not appropriate. It differentiates between those who go to an acceptable other location (i.e. people transferred to intensive care are excluded from the indicator) compared to a ‘non acceptable’ location (e.g. generic admissions unit).  This indicator requires careful interpretation and should not be viewed in isolation, but instead be considered alongside information from other indicators and alternative sources, such as CCG OIS 3.9 (People who have had an acute stroke who spend 90% or more of their stay on a stroke unit) and the CCG level SSNAP stroke unit key indicators. When evaluated together, these will help to provide a holistic view of CCG outcomes and provide a more complete overview of the impact of the CCGs’ processes on outcomes. |
| **5.7 Limitations and potential bias** | The patterns of providing care may vary between organisations in terms of hospital inpatient admission practices and policies.  There may be variation in the prevalence of stroke due to differing levels of deprivation, for other geo-demographic reasons or between patients of different ethnic heritages. |
| **5.8 Improvement actions** | It is expected that CCGs will use this indicator to identify improvements in care and how they can be delivered.  Improvements could be made by enhancing aspects of the services CCGs commission for patients. This could come in the form of better recognition and assessment of the symptoms of stroke, particularly for those already in hospital, and an established process to transfer those people to a stroke unit in a timely manner. |
| **5.9 Evidence of variability** | The data within this section is taken from the December 2014 CCG OIS publication.  During the financial year 2013/14 there were 68,820 patients admitted to hospital with a primary diagnosis of stroke (excluding those whose first ward of admission was ITU, CCU or HDU). Of these, 41,223 were transferred to a stroke unit within 4 hours of arrival at hospital. |

The data below shows the ten CCGs with the lowest and the ten CCGs with the highest percentages in 2013/14. Five CCGs have been suppressed due to insufficient case ascertainment between SSNAP and HES and are not included within the data below.

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| **CCG** | **%** | **LCI** | **UCI** | **Den** | **Num** | **Records in SSNAP** | **Records in HES** | **Case ascertainment** |
| **CCG1** | 21.7 | 15.7 | 29.3 | 138 | 30 | 138 | 190 | 70-79% |
| **CCG2** | 24.6 | 20.7 | 28.9 | 423 | 104 | 425 | 536 | 70-79% |
| **CCG3** | 30.3 | 25.7 | 35.4 | 340 | 103 | 352 | 308 | 90%+ |
| **CCG4** | 31.6 | 28.0 | 35.5 | 594 | 188 | 608 | 594 | 90%+ |
| **CCG5** | 33.7 | 29.7 | 38.0 | 507 | 171 | 531 | 540 | 90%+ |
| **CCG6** | 34.2 | 29.6 | 39.1 | 386 | 132 | 392 | 368 | 90%+ |
| **CCG7** | 34.3 | 28.6 | 40.6 | 236 | 81 | 244 | 269 | 90%+ |
| **CCG8** | 35.1 | 30.2 | 40.4 | 336 | 118 | 347 | 390 | 80-89% |
| **CCG9** | 35.7 | 28.9 | 43.1 | 171 | 61 | 173 | 205 | 80-89% |
| **CCG10** | 36.7 | 32.2 | 41.5 | 414 | 152 | 416 | 371 | 90%+ |
|  |  |  |  |  |  |  |  |  |
| **CCG** | **%** | **LCI** | **UCI** | **Den** | **Num** | **Records in SSNAP** | **Records in HES** | **Case ascertainment** |
| **CCG197** | 79.3 | 73.8 | 84.0 | 242 | 192 | 245 | 347 | 70-79% |
| **CCG198** | 79.3 | 74.9 | 83.1 | 367 | 291 | 373 | 389 | 90%+ |
| **CCG199** | 80.0 | 76.2 | 83.3 | 485 | 388 | 489 | 556 | 80-89% |
| **CCG200** | 80.2 | 75.5 | 84.1 | 328 | 263 | 330 | 295 | 90%+ |
| **CCG201** | 82.1 | 79.3 | 84.5 | 847 | 695 | 853 | 872 | 90%+ |
| **CCG202** | 82.2 | 77.3 | 86.2 | 286 | 235 | 288 | 300 | 90%+ |
| **CCG203** | 82.5 | 78.5 | 85.9 | 406 | 335 | 409 | 470 | 80-89% |
| **CCG204** | 83.7 | 79.4 | 87.2 | 343 | 287 | 347 | 431 | 80-89% |
| **CCG205** | 83.8 | 80.6 | 86.5 | 586 | 491 | 591 | 692 | 80-89% |
| **CCG206** | 84.5 | 80.1 | 88.1 | 317 | 268 | 324 | 470 | 50-69% |



Section 6 Risks

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| **6.1 Similar existing indicators** | This indicator, along with a number of other measures relating to stroke, is published in different formats at CCG, trust and stroke team level on the SSNAP results portal <http://www.strokeaudit.org/results/Clinical-audit/National-Results.aspx>  The Accelerating Stroke Improvement (ASI) National Plan was a national initiative designed to ensure that maximum implementation of the Quality Markers in the National Stroke Strategy were achieved before the end of the 2010/11 financial year. One of the measures (measure 3) looked at the proportion of patients admitted directly to an acute stroke unit within 4 hours of hospital arrival, with the aim of 90% by April 2011. This indicator is no longer produced. <http://www.stroke-in-stoke.info/otherfiles/Accelerating%20Stroke%20Improvement%20National%20Plan.pdf> |
| **6.2 Coherence and comparability** | The methodology and results for this indicator are consistent with the same indicator published on the SSNAP results portal. |
| **6.3 Undesired behaviours and/or gaming** | Gaming would involve managing patient transfer in order to increase the number of patients transferred within 4 hours at the expense of those who have already breached the timescale. The RCP have no evidence to suggest that this is happening. |
| **6.4 Approach to indicator review** | The Indicator Governance Board (IGB) set a review period of one year when the indicator was originally assured, due to the relative immaturity of the SSNAP data set at that time. The time period for the next review will again be set by IGB.  User feedback and comments on this indicator are welcomed via HSCIC Enquires [enquiries@hscic.gov.uk](mailto:enquiries@hscic.gov.uk) or the CCG OIS mailbox [ccgois@hscic.gov.uk](mailto:ccgois@hscic.gov.uk) |
| **6.5 Disclosure control** | Case ascertainment used is the proportion of patients per CCG with primary ICD-10 codes I61, I63 and I64 in HES data who are included in SSNAP for the same time period.  Case ascertainment is reported alongside the indicator for all CCGs. The indicator is not reported for any CCGs with lower than 50% case ascertainment or for those with fewer than 20 patients, instead replacing the percentage with ‘\*’.  Percentages are rounded to one decimal place before publication. |
| **6.6 Copyright** | There are no restrictions on the use of these data. Any subsequent use or publishing of these data should reference the RCP SSNAP. |

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| Logo of Indicator Governance Board |
| Indicator Assurance Report |
| **Patients with stroke admitted to an acute stroke unit within 4 hours of arrival to hospital** |
| **IAP00094** |

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**Final Assurance Rating from the Indicator Governance Board**

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| --- | --- |
| **Clarity** | **Fit for use** |
| **Rationale** | **Fit for use with caveats** |
| **Data** | **Fit for use with caveats** |
| **Construction** | **Fit for use** |
| **Presentation and Interpretation** | **Fit for use with caveats** |
| **Risks and Usefulness** | **Fit for use with caveats** |
| **Overall rating** | Fit for use with caveats |

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| **This indicator has been approved for inclusion in the National Library of Quality Assured Indicators** |

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| **Key findings from Assurance** |
| * IGB members consider the indicator as suitable for inclusion in the Library, pending the sign off by the Chair of the action to clarify how the start time is recorded. A review date of 3 years has been set. |

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| **Approval date** | 14/12/2015 |
| **Review date** | 14/12/2018 |

**Review - MRG Assessment Summary - 10/09/2015**

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| **Methodology appraisal body** | HSCIC's Indicator & Methodology Assurance Service |
| **Reason for assessment** | Scheduled review (review date reached) |
| **Iteration** | 1st MRG meeting |

**Suggested Assurance Rating by Methodology Appraisal Body**

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| --- | --- |
| **Clarity** | **Fit for use** |
| **Rationale** | **Fit for use with caveats** |
| **Data** | **Fit for use with caveats** |
| **Construction** | **Fit for use** |
| **Presentation and Interpretation** | **Fit for use with caveats** |
| **Risks and Usefulness** | **Fit for use with caveats** |
| **Overall rating** | Fit for use with caveats |

**Summary Recommendation to Applicant:**

MRG noted that the indicator has been previously assured as suitable for inclusion in the Library of Quality Assured Indicators, however this was under an earlier iteration of the assurance process. Members thanked the applicant for the “uplift” in documentation which has allowed the indicator to be assessed against the standard criteria assessment and “levels of assurance”.   
  
Upon review the indicator has been given an overall rating of “Fit for use with caveats”, as MRG were generally content with the information provided in the application form. Therefore they are endorsing the indicator for inclusion in the Library. However, there are improvements which could be made, which can be found in the appraisal log (below).

**Summary Recommendation to IGB:**

MRG endorse the indicator for inclusion in the Library, however there are small improvements which could be made to the metadata, specifically around the justification of the data source, how and why HES is used to measure case ascertainment, and the interpretation guidelines. In addition, there is currently no named sponsor for the indicator.

**Please find a detailed description of recommendations and actions in the appraisal log at the end of the document.**

**What do the Assurance Ratings mean?**

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| **Rating** | **Description** |
| **Fit for use** | This indicator can be used with confidence that it is constructed in a sound manner that is fit for purpose. |
| **Fit for use with caveats** | The indicator is fit for use, however users should be aware of caveats and/or recommendations for improvement that have been identified during the assurance process. |
| **Use with caution** | The indicator is based on a sound methodology for which the assurance process endorse the use, however issues have been identified with the national data source which have implications for its use as an indicator. |
| **Not fit for use** | Issues have been identified with the indicator which have resulted in the assurance process currently not endorsing its use as a quality indicator. |
| **Not enough information provided** | There has not been enough information supplied to the assurance process to be able to accurately give the indicator a level of assurance. |

**Appraisal Log**

**Clarity**

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| ***Rec. no*** | ***Issue or recommendation*** | ***Raised by / Date*** | ***Response or Action taken by applicant*** | ***Response date*** | ***Resolved*** | ***Sign off by / Date*** |
| 1a |  |  |  |  |  |  |

**Rationale**

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| ***Rec. no*** | ***Issue or recommendation*** | ***Raised by / Date*** | ***Response or Action taken by applicant*** | ***Response date*** | ***Resolved*** | ***Sign off by / Date*** |
| 2a | Clarification is sought from RCP around the reasoning for the inclusion of inpatients and how this impacts the indicator. | MRG  27/3/12 | There is evidence that patients who have a stroke in hospital are sometimes treated less quickly because it is not recognised or systems are not set up well for in-hospital pathways. The audit has always defined the timelines in this way and it is recognised as helpful by the steering group and hospital clinicians. | 13/08/15 |  | MRG  10/09/15 |
| 2b | A sponsor for the indicator needs to be identified. | MRG  10/09/15 | The sponsor of the CCG OIS is Richard Owen, Outcomes Strategy Lead, NHS Medical Directorate, NHS England. |  |  |  |
| 2c | The definition should be clear as to the types of stroke included in the indicator. | MRG  10/09/15 | A sentence is included in the definition section of the IAS application form and Indicator Quality Statement, stating: Stroke is defined within this indicator as intracerebral haemorrhage (ICD-10 code: I61), cerebral infarction (I63) and stroke, not specified as haemorrhage or infarction (I64). |  |  |  |

**Data**

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| ***Rec. no*** | ***Issue or recommendation*** | ***Raised by / Date*** | ***Response or Action taken by applicant*** | ***Response date*** | ***Resolved*** | ***Sign off by / Date*** |
| 3a | Concern was raised around the completeness of the data. As such if these indicators were to be progressed there would need to be a statement of the completeness of the data to provide context to the results. To provide confidence in recording levels there would need to be analysis of the completeness at hospital level, and also at CCG level.  MRG suggested that RCP could be asked to look at a high level cross validation with HES to compare the broad participation numbers by trust. | MRG  27/3/12 | The indicator is published in the context of case ascertainment between SSNAP and HES. This is the percentage of patients with primary ICD-10 codes I61, I63 and I64 in HES who are included in SSNAP for the same time period.  The SSNAP is a mandatory collection and overall case ascertainment increased from 72% in Quarter 1 to 95% in Quarter 4, 2013/14 (Quarter 2: 83%, Quarter 3: 90%). It has further improved to 97% by Quarter 4, 2014/15. Case ascertainment is reported alongside the indicator for all CCGs in the published CCG OIS data files. Only five CCGs (2.4%) had their percentages suppressed in the published 2013/14 data due to less than 50% case ascertainment with HES.  Patient records are only included in audit analyses if they include the minimum requirements of completion of mandatory fields. The minimum includes all of the fields required to calculate this indicator. Case ascertainment is reported publicly at hospital level and therefore there is a strong incentive for hospitals to ensure they have submitted all of their patients to the audit and completed the mandatory fields. The data is received via a secure web tool which has strong built-in validation meaning that data is fully complete. | 13/08/15 |  | MRG  10/09/15 |
| 3b | Further clarification is sought on how representative the audit data is at CCG level. | MRG  27/3/12 | Only five CCGs were suppressed in the 2013/14 data, due to having insufficient case ascertainment between SSNAP and HES. The audit data is considered to be sufficiently representative to be used at CCG level given the levels of case ascertainment and the suppression rules in place. | 13/08/15 |  | MRG  10/09/15 |
| 3c | Further clarification is sought on the time periods defined in the indicators, including frequency, collection periods, reporting periods etc. | MRG  27/3/12 | CCG OIS indicator data are reported annually. SSNAP data for the full financial year is available approximately eight months after the financial year end; therefore the indicator is published each year in December. The indicator was published for the first time in December 2014, using 2013/14 for each CCG in England. 2014/15 data is due to be published in December 2015.  CCG OIS indicators are official statistics and the December 2014 publication date was pre-announced. There was no gap between the planned and actual publication date. | 13/08/15 |  | MRG  10/09/15 |
| 3d | RCP to be asked to clarify and list exclusions in the indicators. | MRG  27/3/12 | The indicator has the following denominator:  *All patients admitted to hospital with a primary diagnosis of stroke, except for those whose first ward of admission was ITU, CCU or HDU.*  *(ITU = Intensive Treatment Unit, CCU = Critical Care Unit, HDU = High Dependency Unit)*  The RCP have confirmed that the reason for these exclusions is that some patients’ condition is sufficiently serious that the most appropriate place to meet their needs is ITU, CCU or HDU. These exclusions prevent any perverse incentives to have all patients on a stroke unit even if they are better off being treated elsewhere. | 13/08/15 |  | MRG  10/09/15 |
| 3e | MRG recommended that investigations into whether case ascertainment is the same for different age and sex breakdowns as selection bias could affect the calculation of the indicators. | MRG  6/9/12 | The age and sex breakdowns were investigated by the RCP in 2012 and found to be comparable with published literature and therefore not felt to represent a selection bias.  The SSNAP annual report provides some overall demographic details of patients included in the SSNAP <https://www.strokeaudit.org/Documents/Newspress/SSNAP-Annual-Report-(April-2013-March-2014).pdf>  Along with a host of other detailed audit information, the quarterly SSNAP public report provides specific details on the casemix breakdowns, including patient numbers, gender, age, co-morbidities, stroke type, Modified Rankin Scales scores, NIHSS and the onset of symptoms (Section 2: Casemix, p48) <https://www.strokeaudit.org/Documents/Results/National/OctDec2014/OctDec2014-PublicReport.aspx> | 13/08/15 |  | MRG  10/09/15 |
| 3f | The rationale for selecting the ICD-10 codes used to identify stroke patients should be clearly stated in the documentation for each indicator.  Update:  There is a discrepancy between what SSNAP and the clinical classifications service consider a stroke, therefore further justification for the codes used is required and the definition should be updated (as stated in recommendation 2c). | MRG  6/9/12  MRG  10/09/15 | The SSNAP uses the following ICD-10 diagnosis codes to identify stroke patients:   * I61 - Intracerebral haemorrhage * I63 - Cerebral infarction * I64 - Stroke, not specified as haemorrhage or infarction   The coding advice from the Clinical Classifications Service also includes I60 (Subarachnoid haemorrhage) and I62 (Other nontraumatic intracranial haemorrhage), however this advice would not be endorsed by the RCP as subarachnoid haemorrhage and other non-traumatic intracranial haemorrhage have a different care pathway and outcome.  Update:  Subarachnoid haemorrhages and other non-traumatic intracranial haemorrhages are routinely and nearly always managed entirely outside of the stroke unit by neurosurgeons or by interventional neuroradiologists, which is what is recommended in national guidelines for these cases. The indicators need to reflect the care given on appropriate clinical pathways, not arbitrary groupings. | During initial assurance |  |  |
| 3g | MRG recommended that clarity over the timescales involved was required. | MRG  6/9/12 | See section 3c. | 13/08/15 |  | MRG  10/09/15 |
| 3h | The narrative around why SSNAP is being used as opposed to HES should be strengthened. The application states that over-coding occurs in HES, however the results in section 5.9 show that case “ascertainment” against HES is over 100%. | MRG  10/09/15 | The application for this indicator did not state that over-coding occurs in HES. The application stated that HES does not contain the necessary detail required to measure this indicator. |  |  |  |
| 3i | The applicant should consider how useful it is to provide case ascertainment against HES data, since it is recognised that over-coding occurs in HES, making the figure hard to interpret. If the figure is to be presented, MRG recommend changing the name from “case ascertainment” to “case comparison” and to present bands above 90+%. | MRG  10/09/15 | This contextual case ascertainment information aligns to the information and bandings presented in the RCP SSNAP publication. The RCP view is that it is not case comparison as it is not comparing the same year’s HES with SSNAP. Since the purpose of including case ascertainment is to highlight CCGs with low case ascertainment indicating that hospitals within the CCG have not been entering in all their patients onto SSNAP (and the results may therefore not reflect the care that all the CCGs patients received), having bands above 100% would not be useful. HES is not the ‘gold standard’, but it is a useful indication of case selection.  The HES case ascertainment figure (‘Estimated expected number of patients from HES’) is the number of patients who have been coded as a primary diagnosis of stroke during their admission in a year’s worth of HES, split by the patient’s CCG recorded in the HES record. The indicator is not reported for CCGs with less than 50% case ascertainment. |  |  |  |
| 3j | The first paragraph in section 3.11 regarding justifications of inclusions/exclusions contains an error in the justification for excluding ITU/CCU/HDU. | MRG  10/09/15 | The justification for inclusion of the Audit Question 1.14 filter has been amended to:  Audit Question 1.14 is not equal to ‘ITU/CCU/HDU’ – Excludes patients who have been admitted to ITU (Intensive Treatment Unit), CCU (Critical Care Unit) or HDU (High Dependency Unit). Some patients’ condition is sufficiently serious that the most appropriate place to meet their needs is ITU, CCU or HDU. The reason for the audit having these exclusions is to prevent any perverse incentives to have all patients on a stroke unit even if they are better off being treated elsewhere. |  |  |  |

**Construction**

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| ***Rec. no*** | ***Issue or recommendation*** | ***Raised by / Date*** | ***Response or Action taken by applicant*** | ***Response date*** | ***Resolved*** | ***Sign off by / Date*** |
| 4a | IGB sought further clarification as to how arrival time was being recorded in regards to the numerator, and at what point the clock starts for the 4 hours measurement. IGB were interested in whether there is the potential for organisations to record the information differently which in turn could skew the interpretation of the indicator. | IGB – 14/12/2015 | The RCP SSNAP team have confirmed that the arrival at hospital time is recorded by the clinical team who treat the stroke patient, along with all other audit questions in SSNAP and any other national audit. It would be recorded on the patient’s medical notes as part of the A&E record or the Electronic Patient Record, and is a mandatory field in the audit.  As Developers we would also suggest that the time of arrival to hospital is a concept which is well understood by staff within trusts and that it is in their interests to complete it accurately.  Like any measure it could in theory be gamed but that could be true for all indicators.  The audit currently reports performance at 60% for this indicator nationally, when over 90% would be expected; this suggests that the data is not being gamed. |  |  | 26/06/2017 (Retrospective sign-off due to delayed communications) |

**Presentation and Interpretation**

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| ***Rec. no*** | ***Issue or recommendation*** | ***Raised by / Date*** | ***Response or Action taken by applicant*** | ***Response date*** | ***Resolved*** | ***Sign off by / Date*** |
| 5a | The metadata needs to be clear regarding what the target value for the indicator is, and generally around how the indicator should be interpreted. | MRG  10/09/15 | NHS England state in their summary of the CCG OIS that ‘The Indicator Set does not in itself set thresholds or levels of ambition for CCGs, it is intended as a tool for CCGs to drive local improvement and set priorities.’ <http://www.england.nhs.uk/resources/resources-for-ccgs/ccg-out-tool/ccg-ois/>  A high percentage of patients with stroke admitted to an acute stroke unit within 4 hours of arrival to hospital is desirable. When presenting the data, the RCP use the following bandings which are accepted by the clinical teams that submit SSNAP data as aspirational markers of performance: below 55.0%, 55.0-59.9%, 60.0-74.9%, 75.0–89.9%, 90.0% or higher. |  |  |  |

**Risks and Usefulness**

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| ***Rec. no*** | ***Issue or recommendation*** | ***Raised by / Date*** | ***Response or Action taken by applicant*** | ***Response date*** | ***Resolved*** | ***Sign off by / Date*** |
| 6a | MRG recommended that work on cross-validating the audit data set with HES data should continue, as the credibility of the indicators could be impacted by conflicting sources. MRG recommended including a contextual indicator on the relationship between the audit and HES data as this would also encourage improvements in data quality. | MRG  6/9/12 | See section 3a. |  |  | MRG  10/09/15 |
| 6b | Section 6.1 contains information about regarding the target for this indicator by April 2011. MRG queried whether there was any more up-to-date information available. | MRG  10/09/15 | The Accelerating Stroke Improvement (ASI) indicator was only included within the ‘Similar existing indicators’ section of the application form to show where this indicator originated from. The ASI indicator is no longer produced. |  |  |  |

**Any complaints or appeals against the decisions made during the assurance process should be made to the Indicator & Methodology Assurance Service (IMAS) Team at HSCIC. Likewise, if you are unclear regarding any of the recommendations in this report, or have any queries about the assurance process in general, please contact the IMAS team.**

**Indicator and Methodology Assurance Service**

**Health and Social Care Information Centre**

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