Child Health
27-30 Month Review Statistics
Technical Report
Scotland 2016/17

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An Official Statistics publication for Scotland
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Context
This technical report accompanies the Child Health 27-30 Month Review Statistics publication and provides background and supporting information on data quality and metadata.

Data can be viewed in an interactive data visualisation, which provides breakdowns by NHS Board, local authority, deprivation level, ethnicity, English as first language, bilingual status, Age at review and looked after child status (LAC).

High level breakdowns are also available in an excel workbook with several data tables and some charts. There are also open data tables accompanying this publication which provide greater accessibility and more flexible analysis by users. These can be found on the Open Data Platform.

Methods and Definitions
Data collection

The child health programme is offered to all children in Scotland. The programme includes screening for specific medical problems, provision of routine childhood immunisations, and a series of child health reviews. Health Visitors usually provide reviews for preschool children. The reviews involve assessment of children’s growth and development, and provision of advice and support for children and their families.

The delivery of the child health programme to pre-school aged children in Scotland is supported by the CHSP Pre-School system. The system facilitates the invitation of children for their child health reviews as they reach the appropriate age and also allows recording of information obtained and/or care given during the reviews.

These statistics are derived from data collected at the child health programme 27-30 month review.

At these reviews, the health professional records information on equality and diversity factors and on the child’s developmental progress.

These data are then recorded on the CHSP Pre-School system. ISD receive data extracts from the system for the purpose of producing and publishing statistics.

Development Assessment Analysis Methodology

The 27-30 month review records capture the outcome of developmental assessment for a set of domains. The health visitor can record for each domain whether there were no concerns, a concern that was newly suspected as a result of the assessment carried out during the 27-30 month review, a concern or disorder that was known prior to the review, or if the assessment was incomplete. The analysis looks at the responses for all domains individually as well as summary information for all domains combined and the presence of one (or more) concern. All percentages are based on the total number of reviews provided (not the number of reviews with meaningful assessment information recorded nor the population).
Developmental domain changes over time

When the 27-30 month review was introduced in April 2013 there were 9 domains being assessed. From April 2017 the number of domains has reduced to 8 with some domains being merged, and a new domain added (Problem Solving).

<table>
<thead>
<tr>
<th>Domains prior to April 2017</th>
<th>Domains from April 2017 onwards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social</td>
<td>Personal/Social</td>
</tr>
<tr>
<td>Emotional</td>
<td>Emotional/Behavioural</td>
</tr>
<tr>
<td>Behavioural</td>
<td></td>
</tr>
<tr>
<td>Attention</td>
<td></td>
</tr>
<tr>
<td>Speech, Language &amp; Communication</td>
<td>Speech, Language &amp; Communication</td>
</tr>
<tr>
<td>Fine Motor</td>
<td>Fine Motor</td>
</tr>
<tr>
<td>Gross Motor</td>
<td>Gross Motor</td>
</tr>
<tr>
<td>Vision</td>
<td>Vision</td>
</tr>
<tr>
<td>Hearing</td>
<td>Hearing</td>
</tr>
<tr>
<td>-</td>
<td>Problem Solving</td>
</tr>
</tbody>
</table>

For continuity, we mapped the old set to the new. Five of the original domains remain unchanged; Speech Language & Communication, Hearing, Vision, Fine Motor, Gross Motor.

The trio of Emotional, Behavioural and Attention have been mapped to the new domain Behavioural / Emotional; Social was mapped to the new domain of Personal / Social.

Some reviews would have been carried out using the old set of domains but the data entered onto ‘screens’ showing the new set. We have tried to mitigate this by allowing Problem Solving to be ‘blank’ for reviews prior to April 2017 even if the staff were forced to enter ‘blank’ on the system.

As some children (approx. 15%) who were eligible for review in 2016/17 did not have their review until April 2017 or later, then these children were expected to have a value recorded for the Problem Solving domain. The transition to recording the new domains has taken some time to become established, and has not begun in some areas yet, and therefore the percentage of children with meaningful data against all domains is correspondingly lower for 2016/17 (80%) than it has been in earlier years (87-88%). We expect this will improve over time as Boards consistently use the ASQ-3 questionnaire and the new review forms which together support capturing and recording information on the problem solving domain.
Developmental Assessment Tools

The initial national guidance (http://www.scotland.gov.uk/Publications/2012/12/1478) on the content and delivery of 27-30 month reviews recommended that reviews should include ‘systematic consideration of all children’s development as part of ongoing surveillance’. The guidance described developmental surveillance as comprising the following steps:

- Asking parents/carers about any concerns they have regarding their child’s development
- Asking parents/carers about their child’s developmental abilities and attainment of relevant milestones
- Structured observation of the child within the context of the review to assess their developmental progress
- Then, if there are any uncertainties or concerns (from the parent/carer or health visitor) about the child’s development, using an appropriate developmental assessment questionnaire to obtain objective information on the child’s developmental status and to help inform decisions about further assessment and support needs.

The validated questionnaires that were recommended in the guidance as suitable for use in 27 month old children were:

- Ages and Stages Questionnaire 3 (ASQ 3 – all developmental domains)
- Schedule of Growing Skills II (SOGS II – all developmental domains)
- Strengths and Difficulties Questionnaire (SDQ – social/emotional domains)
- ASQ: Social and Emotional (ASQ:SE – social/emotional domains)
- Sure Start Language Measure (SSLM – speech and language domain)
- Modified Checklist for Autism in Toddlers (M-CHAT – autism risk)
- Eyberg Child Behaviour Inventory (Eyberg CBI – behavioural difficulties)

When 27-30 month reviews were implemented from April 2013, NHS Boards adopted different approaches to incorporating the use of the various recommended developmental assessment questionnaires within 27-30 month reviews. Some NHS Boards offered questionnaires to all children/parents invited for reviews rather than just administering them if/when a problem was suspected. NHS Boards also differed in the questionnaires they selected from the national list for use locally.

In November 2014, ISD produced a supplementary paper on ‘Use of developmental assessment questionnaires within 27-30 month child health reviews: insights from the first year of review delivery’ which provides more information on the different approaches to assessing development within 27-30 month reviews that different areas were taking and the impact this may have had on both data completeness and the number and type of concerns identified.

The national guidance changed in April 2017 to recommend that all boards offer parents bringing their child for a 27-30 month review the opportunity to complete an Ages and Stages Questionnaire 3 (ASQ-3). From this date onwards, the 27-30 month review forms were modified to allow recording of the ASQ scores for each developmental domain.
Table 1 shows the use of developmental assessment questionnaires within 27-30 month reviews in 2016/17, and highlights the variation between boards in the tools that they use.

### Table 1: Use of developmental assessment questionnaires\(^1\) within 27-30 month reviews, children turning 27 months during 2016/17

<table>
<thead>
<tr>
<th>NHS Board</th>
<th>Multi-domain questionnaire(^2)</th>
<th>Questionnaire focused on social/emotional domains(^3)</th>
<th>Questionnaire focused on speech and language domain(^4)</th>
<th>No of reviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ayrshire &amp; Arran</td>
<td>92%</td>
<td>92%</td>
<td>0%</td>
<td>3511</td>
</tr>
<tr>
<td>Borders</td>
<td>76%</td>
<td>1%</td>
<td>0%</td>
<td>1015</td>
</tr>
<tr>
<td>Dumfries &amp; Galloway</td>
<td>97%</td>
<td>0%</td>
<td>0%</td>
<td>1279</td>
</tr>
<tr>
<td>Fife</td>
<td>94%</td>
<td>93%</td>
<td>0%</td>
<td>3528</td>
</tr>
<tr>
<td>Forth Valley</td>
<td>71%</td>
<td>4%</td>
<td>0%</td>
<td>2935</td>
</tr>
<tr>
<td>Grampian</td>
<td>4%</td>
<td>0%</td>
<td>0%</td>
<td>5471</td>
</tr>
<tr>
<td>Greater Glasgow &amp; Clyde</td>
<td>0%</td>
<td>98%</td>
<td>98%</td>
<td>11459</td>
</tr>
<tr>
<td>Highland</td>
<td>12%</td>
<td>1%</td>
<td>4%</td>
<td>2764</td>
</tr>
<tr>
<td>Lanarkshire</td>
<td>75%</td>
<td>1%</td>
<td>0%</td>
<td>6821</td>
</tr>
<tr>
<td>Lothian</td>
<td>88%</td>
<td>83%</td>
<td>0%</td>
<td>8072</td>
</tr>
<tr>
<td>Orkney</td>
<td>85%</td>
<td>0%</td>
<td>0%</td>
<td>158</td>
</tr>
<tr>
<td>Shetland</td>
<td>71%</td>
<td>2%</td>
<td>0%</td>
<td>255</td>
</tr>
<tr>
<td>Tayside</td>
<td>95%</td>
<td>1%</td>
<td>0%</td>
<td>3823</td>
</tr>
<tr>
<td>Western Isles</td>
<td>2%</td>
<td>94%</td>
<td>94%</td>
<td>200</td>
</tr>
</tbody>
</table>

1 Multiple questionnaires can be used at each review, and some boards use other questionnaires that are not included here

2 Questionnaires include ASQ3 & SOGSII

3 Questionnaires include SDQ & ASQ:SE

4 SSLM Questionnaire
Coverage Methodology

In order to calculate the coverage of the review, all children eligible for a 27-30 month review were linked to their specific 27-30 month review record. Eligible children are defined as children who turned 27 months old during the analysis period (for example, 1 April 2016 to 31 March 2017) and who were registered to receive the child health programme on the Scottish Immunisation & Recall System (SIRS), which supports the administration of childhood immunisations in Scotland. Each of the eligible children is linked to their specific 27-30 month review record, provided it took place before they turned three years or age and regardless of whether their review happened in the same time period. For example, a child eligible for review in financial year 1 April 2016 to 31 March 2017 might not receive their review until well beyond March 2017.

This approach which we have called ‘Achieved Coverage’ means there is an inevitable delay before coverage can be calculated. It is necessary to wait until, as far as reasonably possible, all eligible children have received their reviews and these have been recorded on the child health surveillance programme pre-school system. It was felt that this analysis is feasible if data sourcing continues until November of the relevant year. It is likely that the number of reviews provided after November 2017 would be very small, as even the youngest eligible children would have been 34 months old, and hence should have already received their review, by that time. As the 2018 publication was slightly delayed, data sourcing continued until February 2018, but there were very few extract records received between November 2017 and February 2018.
Definitions

**Number of children eligible for review (denominator):** total number of children turning 27 months during the year 2016/17 who were registered for child health surveillance on the Scottish Immunisation & Recall System (SIRS) in May 2017.

**Number of reviews recorded on child health surveillance programme pre-school (CHSP-PS) system (numerator):** Number of children eligible for a review in financial year 2016/17 who had a review recorded on the child health system at the time of the data extract, provided the review took place when the child was aged 24-35 months inclusive. Children reviewed who subsequently moved out of Scotland will be excluded. Similarly children reviewed by one board who moved to another by the time of the SIRS cohort snapshot are counted as though reviewed by the new board.

**Percentage Coverage of eligible children reviewed is calculated as:**

\[
\text{Percentage Coverage} = \left( \frac{\text{Number of reviews recorded on CHSP-PS}}{\text{Number of children eligible for review}} \right) \times 100
\]

**Meaningful developmental assessment outcome data (N, C, P) across all domains:** the number of children reviewed who had meaningful assessment data recorded for all development domains. Meaningful data is defined as N=No Concerns, C=Concern newly suspected, or P=Concern/Disorder previously identified.

It is important to note that prior to April 2017 there were 9 developmental domains, and from April 2017 onwards there are eight developmental domains. See Developmental domain changes over time for further information.

**Number without a concern but with some domains missing/incomplete:** the number of children reviewed who did not have C or P recorded for any domain, but some of the domains were either missing or incomplete.
Accuracy and reliability

This is an established data collection which covers a large proportion of the target population typically between 87 and 90% of each cohort.

Within individual reviews in the past, about 87-88% had complete information on all domains. This dropped to around 80% for the 2016/17 cohort which had generally fewer completed domains largely due to the introduction of the problem solving domain for records input from 1\textsuperscript{st} April 2017 onwards, as discussed above.

Source for images

The toddler image was sourced from \url{The Noun Project} and the designer was Bianca Teixeira.
## Glossary

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHSP Pre-School</td>
<td>Child Health System Programme Pre-School</td>
</tr>
<tr>
<td>ISD</td>
<td>Information Services Division</td>
</tr>
<tr>
<td>SIMD</td>
<td>The Scottish indicator of multiple deprivation. Deprivation is reported via the use of Scottish Index of Multiple Deprivation. See Appendix A1 for more information.</td>
</tr>
<tr>
<td>SIRS</td>
<td>Scottish Immunisation &amp; Recall System. SIRS covers the entire child population in Scotland up to six years of age. The data are recorded on SIRS for the primary purpose of facilitating the invitation of children for immunisation. SIRS began in the 1970s and has been used by all NHS boards since 2002.</td>
</tr>
<tr>
<td>SLC</td>
<td>Speech Language and Communication</td>
</tr>
<tr>
<td>LAC</td>
<td>Looked After Children. Children who are looked after by a local authority. Looked after children may remain in their family home under compulsory supervision by social work services or be living with friends or family (kinship care), with a foster family, or in other residential care settings</td>
</tr>
</tbody>
</table>
Appendices

Appendix 1 – Background information

Data Completeness

The target population this publication aims to cover is all children in each cohort. i.e. the data are not based on a sample.

There are two aspects to data completeness:

Coverage - the percentage of children who have a review within the age limits (24-35 months inclusive). This is shown in detail in the workbooks.

The percentages of reviews where the information in every domain is complete – i.e. one of the three valid options is entered: no concerns, concern newly identified or concern previously known.

Coverage has increased slightly each year since the review started in 2013/14 from 87% to 89%.

The percentage with every domain complete was steady at around 87% but has dropped to 80% in the latest year. The introduction of a new domain, problem solving, in which implementation in has been poorly completed is largely responsible for this.

Revisions history

In the annual publication released in December 2015, a new method, based on taking a snapshot / cohort from SIRS, was implemented to improve the accuracy of coverage. The previous method underestimated the coverage of the first year in particular by about 10 percentage points and especially Boards who reviewed children a little older, e.g. Greater Glasgow and Clyde. The method made it theoretically possible to have coverage above 100% in subsequent years.

Further information can be found in Appendix A1 of the 2015 publication.

Scottish Index of Multiple Deprivation (SIMD)

Deprivation for individuals is estimated from aggregate data derived from the census and other routine sources. These are used to estimate the deprivation of individuals in small geographical areas. The Scottish Index of Multiple Deprivation has seven domains (income, employment, education, housing, health, crime, and geographical access), which have been combined into an overall index to pick out area concentrations of multiple deprivation. The SIMD postcode mappings do not attempt to identify individuals who are deprived.

Further information about SIMD can be found at:

http://www.isdscotland.org/Products-and-Services/GPD-Support//Deprivation/SIMD

A more detailed explanation about the application of SIMD, its advantages and disadvantages is available at:

ISD analyses use population-weighted deprivation categories (e.g. quintiles or deciles. It is important not to mix these data with unweighted deprivation categories used by the Scottish Government (SG) and National Records of Scotland (NRS). The reason for this can be found here.

**Looked After Children**

The number of children receiving a 27-30 month review who are recorded as being looked after by their local authority at the time of their review has been reducing each year since the 27-30 month review began. However, there has been a more substantial reduction in 2016/17. This is predominantly due to a reduction in the number of children recorded as being ‘looked after at home’. Some of this reduction is likely to be genuine as the number of looked after children, particularly of children looked after at home, has reduced over recent years (see the Scottish Government website) however the majority of the fall seen in 2016/17 is likely to reflect improved recording of children’s looked after status on 27-30 month review records in 2016/17. Prior to 2016/17, numbers of children recorded as being looked after at their 27-30 month review were higher than would have been expected based on comparison to official children’s social work statistics. In addition, anecdotal evidence has suggested that prior to 2016/17 some non-looked after children were erroneously recorded as being looked after, in particular looked after at home, on their 27-30 month review record.

**Geographical information**

NHS Board figures are based on NHS Board of residence based on the child’s home postcode in the May, immediately following the financial year in which the children turned 27 months, as recorded on CHSP Pre-School (SIRS) snapshot. A small percentage of SIRS records could not be mapped due to missing postcode information in which case the postcode at review was used as a proxy for most but not all of these. After this, a few records still didn’t have a valid postcode; therefore the sum of the NHS Board areas does not equal the total for Scotland. Similarly for Local Authority and deprivation areas.

**Changes from previous publications**

Significant changes have been made between the November 2016 and February 2018 publications.

From 1st April 2017, the original set of 9 domains was replaced by a set of 8; see developmental domain changes over time for further information.

The content and format of the Full Report, Summary and data tables have changed – generally to simplify. This publication includes an interactive data visualisation, which allows users to select various breakdowns of data. The supporting Excel tables for this publication are not as extensive as in previous years, because so much of the data is available in the interactive data visualisation or in the NHS open data portal at:

https://www.opendata.nhs.scot/theme/isd
Some new indicators have been added. We now count the number of reviews without a concern but some domains incomplete – of the eight domains, seven could have ‘no concerns’ and one could be ‘incomplete’. This, when added to those with any concern and those with no concerns in any domain accounts for all the reviews.

An issue was identified with the source data coming from boards which resulted in the loss of some data items for children who move between NHS Board areas. An adjustment was made by ISD to resolve this by retaining the first record ever submitted for all 27-30 month reviews. On account of adjustments to try to repair the missing data, a small percentage of other records may have become slightly less accurate, as they lose the benefit of subsequent corrections made after the ISD quarterly extract.

**Data quality checks by ISD**

Data are compared to figures for previous years and to expected trends.
## Appendix 2 – Publication Metadata

<table>
<thead>
<tr>
<th>Metadata Indicator</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Publication title</td>
<td>Child Health 27-30 Month Review Statistics Scotland</td>
</tr>
<tr>
<td></td>
<td>Financial year 2016/17</td>
</tr>
<tr>
<td>Description</td>
<td>Release of statistics from the 27-30 month review. Figures are presented for 2013/14-2016/17. Information is provided on the coverage of the review and the outcome of developmental assessments. Figures are presented by Health Board, Local Authority, Deprivation, Gender, Ethnicity, Looked After Status (LAC), and Language.</td>
</tr>
<tr>
<td>Theme</td>
<td>Health and Social Care</td>
</tr>
<tr>
<td>Topic</td>
<td>Child Health</td>
</tr>
<tr>
<td>Format</td>
<td>PDF documents, Excel workbooks, Open Data &amp; Tableau Visualisation</td>
</tr>
<tr>
<td>Data source(s)</td>
<td>Child Health Systems Programme Pre-School (CHSP Pre-School)</td>
</tr>
<tr>
<td></td>
<td>Scottish Immunisation and Recall System (SIRS)</td>
</tr>
<tr>
<td>Date that data are acquired</td>
<td>9 February 2018</td>
</tr>
<tr>
<td>Release date</td>
<td>24 April 2018</td>
</tr>
<tr>
<td>Frequency</td>
<td>Annual</td>
</tr>
<tr>
<td>Timeframe of data and timeliness</td>
<td>Data recorded on CHSP pre-school on 27-30 months reviews up to the data extract on 9 February 2018. Children eligible for the 27-30 month review in financial years 2013/14-2016/17. No delays between receipt and processing of data for publication.</td>
</tr>
<tr>
<td>Continuity of data</td>
<td>The set of ‘domains’ changed for reviews from 1 April 2017 which meant a ‘best-fit' mapping of some of the original set to match the new. See Developmental domain changes over time for further information.</td>
</tr>
<tr>
<td>Revisions statement</td>
<td>The publication is produced from a dataset containing the first 27-30 month review record received for each child, so any subsequent updates will not be taken into account. This is different from in previous years when the latest data extract would always have been used. See Appendix 1 for more information on why this method had to be adopted.</td>
</tr>
<tr>
<td>Information Services Division</td>
<td></td>
</tr>
</tbody>
</table>

**Revisions relevant to this publication**
The domains for 2013/14-2016/17 have been remapped to show the new set of developmental domains for continuity.

**Concepts and definitions**
See [Definitions section](#).

**Relevance and key uses of the statistics**
Monitoring the delivery of the 27-30 month review and making information publicly available for planning, provision of services and providing comparative information.

**Accuracy**
Programmes were checked and data was compared with the figures for the previous year.

**Completeness**
See [Coverage methodology](#). Concerns over data completeness are followed up with individual boards.

**Comparability**
N/A

**Accessibility**
It is the policy of ISD Scotland to make its web sites and products accessible according to [published guidelines](#).

**Coherence and clarity**
Tables and charts are accessible via the [ISD website](#). Information is presented by NHS Board and LA.

**Value type and unit of measurement**
Numbers and percentages

**Disclosure**
The [ISD protocol on Statistical Disclosure Protocol](#) is followed.

**Official Statistics designation**
Official Statistics

**UK Statistics Authority Assessment**
These statistics have not been submitted for assessment by the UK statistics Authority.

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16 December 2014

**Help email**
[NSS.isdchildhealth@nhs.net](mailto:NSS.isdchildhealth@nhs.net)

**Date form completed**
12 April 2018
Appendix 3 – Early access details

Pre-Release Access

Under terms of the "Pre-Release Access to Official Statistics (Scotland) Order 2008", ISD is obliged to publish information on those receiving Pre-Release Access ("Pre-Release Access" refers to statistics in their final form prior to publication). The standard maximum Pre-Release Access is five working days. Shown below are details of those receiving standard Pre-Release Access.

**Standard Pre-Release Access:**

- Scottish Government Health Department
- NHS Board Chief Executives
- NHS Board Communication leads
Appendix 4 – ISD and Official Statistics

About ISD

Scotland has some of the best health service data in the world combining high quality, consistency, national coverage and the ability to link data to allow patient based analysis and follow up.

Information Services Division (ISD) is a business operating unit of NHS National Services Scotland and has been in existence for over 40 years. We are an essential support service to NHSScotland and the Scottish Government and others, responsive to the needs of NHSScotland as the delivery of health and social care evolves.

Purpose: To deliver effective national and specialist intelligence services to improve the health and wellbeing of people in Scotland.

Mission: Better Information, Better Decisions, Better Health

Vision: To be a valued partner in improving health and wellbeing in Scotland by providing a world class intelligence service.

Official Statistics

Information Services Division (ISD) is the principal and authoritative source of statistics on health and care services in Scotland. ISD is designated by legislation as a producer of ‘Official Statistics’. Our official statistics publications are produced to a high professional standard and comply with the Code of Practice for Official Statistics. The Code of Practice is produced and monitored by the UK Statistics Authority which is independent of Government. Under the Code of Practice, the format, content and timing of statistics publications are the responsibility of professional staff working within ISD.

ISD’s statistical publications are currently classified as one of the following:

- National Statistics (i.e. assessed by the UK Statistics Authority as complying with the Code of Practice)
- National Statistics (i.e. legacy, still to be assessed by the UK Statistics Authority)
- Official Statistics (i.e. still to be assessed by the UK Statistics Authority)
- other (not Official Statistics)

Further information on ISD’s statistics, including compliance with the Code of Practice for Official Statistics, and on the UK Statistics Authority, is available on the ISD website.