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Introduction

This is the supporting document for the publication on NHS maternity activity in England. This document contains further detail on Hospital Episode Statistics and the Maternity Services Data Set. It also gives further information relating to delivery and birth episodes and their booking appointments in 2017-18. A summary of data completeness and quality reports are included as well as what is included in this publication.

This publication describes NHS maternity activity in England in 2017-18. It looks only at booking appointments, deliveries and births. There are two data sources for this publication; Hospital Episode Statistics (HES) and the Maternity Services Data Set (MSDS).

This report does not examine statistics relating to outpatient appointments or attendances at A&E departments reported within HES which may be found in other publications. Data on other aspects of the maternity pathway from the MSDS is reported in a monthly publication series.

Hospital Episode Statistics (HES)

This comes from the HES data warehouse containing details of all admissions, outpatient appointments and accident and emergency (A&E) attendances at National Health Service (NHS) hospitals in England. It includes private patients treated in NHS hospitals, patients who were resident outside of England and care delivered by treatment centres (including those in the independent sector) funded by the NHS.

HES datasets are the data source for a wide range of healthcare analyses for the NHS, Government and many other organisations and individuals. HES is sourced from the Secondary Uses Service (SUS) database, which is collected from hospitals’ patient administration systems on a monthly basis at record level.

Records in the HES Admitted Patient Care (APC) database, which form the basis of this Hospital Maternity Activity publication, are called ‘hospital episodes’, and each hospital episode relates to a period of care for a patient under a single consultant within one hospital provider. A stay in hospital from admission to discharge is called a ‘spell’ and can be made up of one or more episodes of care. This publication releases some high level analyses of HES data relating to deliveries in NHS hospitals, and looks at specific types of hospital episodes called ‘finished delivery episodes’ and ‘finished birth episodes’.

For the 2017-18 financial year, HES collected over 20 million records detailing episodes of hospital inpatient activity at NHS hospitals in England or performed in the independent sector and commissioned by the English NHS. Of these 626,203 were delivery episodes, a decrease of 1.6 per cent from 2016-17.

Statistics published in this report using maternity data from HES are classified as Official Statistics reflecting its status as an established data source.

Each record in HES includes a wide range of information including details of the patient (age, gender, geographic details), when they were treated and what they were treated for.
Maternity Services Data Set (MSDS)

The MSDS is a patient-level data set that captures key information at each stage of the maternity service care pathway in NHS-funded maternity services, such as those maternity services provided by GP practices and hospitals. The data collected includes mother’s demographics, booking appointments, admissions and re-admissions, screening tests, labour and delivery along with baby’s demographics, diagnoses and screening tests. This information has been reported to NHS Digital on a monthly basis since April 2015.

The MSDS has been developed to help achieve better outcomes of care for mothers, babies and children. As a ‘secondary uses’ data set, it re-uses clinical and operational data for purposes other than direct patient care. It provides comparative, mother and child-centric data that will be used to improve clinical quality and reduce health inequalities.

For the 2017-18 financial year, MSDS recorded 486,866 deliveries. This figure is lower than the number of delivery episodes recorded in HES because as a new dataset, some maternity service providers submitted data to the MSDS for part of the financial year. The partial coverage of the MSDS both geographically and over time means that figures from the MSDS should not be interpreted as England level figures for 2017-18.

Statistics published in this report using maternity data from MSDS are classified as Experimental Statistics, these are new official statistics undergoing evaluation. They are published to involve users and stakeholders in their development and to build in quality at an early stage.

Further information on the MSDS is available at:

External Maternity Data Sources

The Office for National Statistics (ONS) also collects information on births and maternities (maternities are equivalent to deliveries in HES). Most of the information, for both live births and stillbirths, is supplied to registrars by one or both parents. It is legal requirement in England and Wales to register the identity of a new baby within 42 days of the birth.

As it is a legal requirement to register all births, the ONS is the official source of delivery and birth information and should be used in preference to HES and MSDS maternity data held by NHS Digital.

NHS Digital maternity data has the following advantages:

detailed information on the hospital care that a mother and baby received before, during and after the delivery, such as the method of delivery and the type of anaesthetic received;
clinical information about the mother and baby – diagnosis, investigation and treatment details;
the organisation where the baby was delivered.

Investigating links between previous medical or socio demographic factors of the mother at the beginning of the pregnancy to outcomes at the end of the pregnancy (MSDS).
New Additions to the Publication

PowerPoint Format

The joint summary report is now presented as a ‘PowerPoint’ style overview containing key graphs and charts, rather than a traditional report. The charts will draw on both data sources, using the most appropriate in each instance. They are accompanied detailed tables of data as with previous releases. The overall aim of this change is to improve the reporting of Official Statistics around maternity data, giving a clear and coherent picture of maternity activity.

The charts and visuals included in this report are listed in the Summary Report section immediately below.

Data Quality Review and Exploratory Analysis of Neonatal Critical Care Minimum Data Set (NCCMDS), Maternity Services Data Set (MSDS) & NHS Reference Cost Data

Published alongside the report this supplementary analysis has been produced by NHS Digital and contains Management Information produced using the NCCMDS and MSDS data collected by NHS Digital against activity published in NHS Reference Costs. This analysis seeks to assist users of the data in understanding the data quality of reported neonatal critical care data in both the NCCMDS and MSDS highlighting issues around coverage coherence and completeness of this data looking at the provider and all submitters geographies in order to assist how such data maybe used to support future user needs.

Timeliness

The previous publication for NHS Maternity Statistics 2016-17 was released on 9 November 2017. For 2017-18 this has been improved to be published on 25th October 2018.

Information Included with this Publication

Summary Report

This is a separate Power Point document summarising maternity activity and performance of hospitals in England, during 2017-18 and as a comparison over time.

The Summary Report is a joint document between HES and MSDS providing a collective and coherent message between the two datasets. This enables a wider set of breakdowns and measures in the detailed reports.
Maternity Statistics Tables (HES)

This publication includes detailed tables at national level (HES Data):

- Time series
- Method of onset of labour
- Method of delivery
- Age of mother
- Deprivation
- Ethnicity
- Delivery complications
- Birth complications

Each of these tables is further broken down by additional dimensions such as gestation length, duration of hospital stay and birth status.

Provider Level Analysis (HES)

In addition to national aggregations of activity a provider-level analysis is supplied; this allows users to select hospital providers and compare activity with peer organisations, regions or the England total. One of the purposes of the provider-level analysis is to contribute to the improvement of both the quality and coverage of the data submitted to HES.

Provider Level Analysis (MSDS)

This provides information at provider level (where submitted) relating to:

- Body Mass Index at booking appointment
- Smoking status at booking appointment
- Baby’s Apgar score at 5 minutes after birth for term babies
- Baby’s first feed type
- Mother’s skin-to-skin contact within 1 hour of birth for term babies

Data Quality Comparison (HES and MSDS)

This provides information at provider level (where submitted) relating to:

- Number of deliveries recorded
- Gestation period in weeks at first antenatal assessment date
- Gestation length at delivery
- Method of onset of labour
- Method of delivery
Metadata

The table descriptions that accompany this publication are given in the documents entitled ‘NHS Maternity Activity, 2017-18 – HES Metadata’ and ‘NHS Maternity Activity, 2017-18 – MSDS Metadata’; this includes descriptions of the tables included in the report, as well as providing useful links to other relevant webpages and documents.

Further Information About NHS Maternity Data

Further information about HES

The NHS Digital website contains more background information about HES:
https://digital.nhs.uk/hes

The HES publications focus on headline information about hospital activity. Each annual publication includes a series of national tables and also provider-level breakdowns for some main areas.

All data items included in the published tables are explained in footnotes, and NHS Digital publishes data dictionaries for HES describing the format and possible values for all HES data items:
https://www.digital.nhs.uk/hes

This data is also readily accessible via an online interrogation service (for NHS users) or via our bespoke extract service:
https://www.digital.nhs.uk/dars

Further information about MSDS

The NHS Digital website contains more background information about HES and the MSDS:
http://digital.nhs.uk/hes

Alongside this publication a Statement of Administrative Sources is also published, as required by the Code of Practice for Official Statistics. More information on the background and purpose of the Statement of Administrative Sources can be found here:
Accessing NHS Maternity data

High level reporting of HES data is published on a monthly basis. For more detailed maternity specific information these data are also readily accessible via an online interrogation service (for NHS users) or via our bespoke extract service:

http://content.digital.nhs.uk/dars

MSDS data are published monthly at provider level and higher geographies. The data items included in the published tables are explained in a metadata document, and NHS Digital publish a technical output specification describing the format and possible values for all MSDS data items:


MSDS data relating to the booking appointment is available to access online through iViewPlus. This free to use system is regularly enhanced with further functionality and data and enables users to create interactive data visualisations and tables.

To use iViewPlus you need to register for a NHS Digital account at https://iviewplus.digital.nhs.uk/ and request access to the Maternity Booking Appointment Data Cube by emailing enquiries@nhsdigital.nhs.uk (please quote ‘Maternity iViewPlus Data Access’ in the subject line).

Other Maternity data

Statistics on Women's Smoking Status at Time of Delivery

NHS Digital produces a quarterly report on women’s smoking status at the time of delivery in England. The report for Quarter 1 2017-18 is available here:

http://digital.nhs.uk/catalogue/PUB30070

The National Maternity and Perinatal Audit

The National Maternity and Perinatal Audit (NMPA) is a large-scale audit of the NHS maternity services across England, Scotland and Wales. Published data from the NMPA can be accessed via their website: http://www.maternityaudit.org.uk/pages/home
Main findings

In 2017-18 there were 626,203 delivery episodes recorded within the HES maternity data set, a decrease of 1.6 per cent from 2016-17.

Table 1: Headline figures – Delivery Episodes from HES, 2017-18

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
<th>Per cent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total delivery episodes (including unknowns)</strong></td>
<td>626,203</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Method of onset (excluding unknowns)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spontaneous</td>
<td>280,186</td>
<td>52.2</td>
</tr>
<tr>
<td>Caesarean</td>
<td>86,671</td>
<td>16.2</td>
</tr>
<tr>
<td>Surgical induction</td>
<td>28,729</td>
<td>5.4</td>
</tr>
<tr>
<td>Medical induction</td>
<td>100,685</td>
<td>18.8</td>
</tr>
<tr>
<td>Combined induction</td>
<td>40,201</td>
<td>7.5</td>
</tr>
<tr>
<td><strong>Method of delivery (excluding unknowns)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spontaneous</td>
<td>350,184</td>
<td>58.8</td>
</tr>
<tr>
<td>Instrumental</td>
<td>76,350</td>
<td>12.8</td>
</tr>
<tr>
<td>Caesarean</td>
<td>168,946</td>
<td>28.4</td>
</tr>
<tr>
<td><strong>Age of mother (excluding unknowns)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14 and under</td>
<td>83</td>
<td>0.0</td>
</tr>
<tr>
<td>15-19</td>
<td>18,465</td>
<td>3.1</td>
</tr>
<tr>
<td>20-24</td>
<td>88,516</td>
<td>14.6</td>
</tr>
<tr>
<td>25-29</td>
<td>171,154</td>
<td>28.3</td>
</tr>
<tr>
<td>30-34</td>
<td>193,243</td>
<td>32.0</td>
</tr>
<tr>
<td>35-39</td>
<td>109,210</td>
<td>18.1</td>
</tr>
<tr>
<td>40-44</td>
<td>22,602</td>
<td>3.7</td>
</tr>
<tr>
<td>45-49</td>
<td>1,352</td>
<td>0.2</td>
</tr>
<tr>
<td>50 and over</td>
<td>108</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Source: HES

In 2017-18, 486,866 deliveries were recorded within the MSDS by 132 maternity service providers. The number of deliveries is lower than recorded in HES because:

- Only 88 of the 132 providers that submitted delivery episode data to the MSDS did so for each of the 12 months of 2017-18.

Table 2: Headline figures – Deliveries and babies from the MSDS, 2017-18

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total deliveries</td>
<td>486,866</td>
</tr>
<tr>
<td>Total babies</td>
<td>494,512</td>
</tr>
</tbody>
</table>

Source: MSDS
Booking appointments (MSDS)

Figures on smoking status shown relate to the time of the booking appointment which based on NICE recommendations should ideally take place before 10 weeks gestation age in the pregnancy. This is different to information reported within the Smoking at Time of Delivery (SATOD) data collection which is the official source of data for the proportion of women smoking at the time of delivery. This information is captured around 6 months after the time of the smoking status at booking appointment. Data published from SATOD is used within the Public Health Outcomes Framework and CCG Outcome Indicator Set and is used to monitor a number of existing national targets. Published SATOD data can be accessed via the following link:


Analysis and Commentary

Percentages included in this publication, unless otherwise stated, are based on total ‘knowns’, e.g. the percentage of caesareans is based on all deliveries with a known method of delivery, excluding those with an unknown method of delivery. Where there is a high percentage of ‘unknowns’ for a given clinical practice or outcome (these are identifiable in all tables), the reported figures for ‘knowns’ should be treated with caution. Given the fluctuation in the number of ‘unknowns’ over time, it should be noted that all reported changes may be the result of changes/improvements in recording practice rather than changes in clinical practice or clinical outcomes.

For information on fields referred to below refer to the HES data dictionary and MSDS Technical Output Specification:

http://content.digital.nhs.uk/hesdatadictionary

## Appendix 1: Glossary of Terms

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A&amp;E</td>
<td>Accident and Emergency</td>
</tr>
<tr>
<td>ACC</td>
<td>Adult Critical Care</td>
</tr>
<tr>
<td>APC</td>
<td>Admitted Patient Care</td>
</tr>
<tr>
<td>AR</td>
<td>Annual Refresh</td>
</tr>
<tr>
<td>AT</td>
<td>Area Team</td>
</tr>
<tr>
<td>BMI</td>
<td>Body Mass Index</td>
</tr>
<tr>
<td>CCG</td>
<td>Clinical Commissioning Group</td>
</tr>
<tr>
<td>CDS</td>
<td>Commissioning Data Set</td>
</tr>
<tr>
<td>DH</td>
<td>Department of Health</td>
</tr>
<tr>
<td>ECDS</td>
<td>Emergency Care Data Set</td>
</tr>
<tr>
<td>FAE</td>
<td>Finished Admission Episode</td>
</tr>
<tr>
<td>FCE</td>
<td>Finished Consultant Episode</td>
</tr>
<tr>
<td>HCHS</td>
<td>NHS Hospital &amp; Community Health Service</td>
</tr>
<tr>
<td>HES</td>
<td>Hospital Episode Statistics</td>
</tr>
<tr>
<td>ICD-10</td>
<td>International Classification of Diseases and Related Health Problems version10</td>
</tr>
<tr>
<td>MSDS</td>
<td>Maternity Services Data Set</td>
</tr>
<tr>
<td>NHS</td>
<td>National Health Service</td>
</tr>
<tr>
<td>ODS</td>
<td>Organisation Data Service</td>
</tr>
<tr>
<td>OECD</td>
<td>Organisation for Economic Co-operation and Development</td>
</tr>
<tr>
<td>ONS</td>
<td>Office for National Statistics</td>
</tr>
<tr>
<td>OP</td>
<td>Outpatient</td>
</tr>
<tr>
<td>OPCS 4.7</td>
<td>Office for Population, Censuses and Surveys</td>
</tr>
<tr>
<td>PAS</td>
<td>Patient Administration Systems</td>
</tr>
<tr>
<td>PbR</td>
<td>Payment by Results</td>
</tr>
<tr>
<td>SUS</td>
<td>Secondary Uses Service</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organisation</td>
</tr>
</tbody>
</table>
Appendix 2: Hospital Episode Statistics Data Quality Statement

Introduction

HES data includes patient level data on hospital admissions, outpatient appointments and A&E attendances for all NHS trusts in England. It covers acute hospitals, mental health trusts and other providers of hospital care. HES includes information about private patients treated in NHS hospitals, patients who were resident outside England and care delivered by treatment centres (including those in the independent sector) funded by the NHS.

Healthcare providers collect administrative and clinical information locally to support the care of the patient. This data is submitted to the SUS to enable hospitals to be paid for the care they deliver. HES is created from SUS to enable further secondary use of this data.

HES is the data source for a wide range of healthcare analysis used by a variety of people including the NHS, government, regulators, academic researchers, the media and members of the public.

HES is a unique data source, whose strength lies in the richness of detail at patient level going back to 1989 for Admitted Patient Care (APC) episodes, 2003 for outpatient appointments and 2007 for A&E attendances. HES data includes:

- specific information about the patient, such as age, gender and ethnicity
- clinical information about diagnoses, operations and consultant specialties
- administrative information, such as time waited, and dates and methods of admission and discharge
- geographical information such as where the patient was treated and the area in which they live

The principal benefits of HES are in its use to:

- monitor trends and patterns in NHS hospital activity
- assess effective delivery of care and provide the basis for national indicators of clinical quality
- support NHS and parliamentary accountability
- inform patient choice
- provide information on hospital care within the NHS for the media
- determine fair access to health care
- develop, monitor and evaluate government policy
- reveal health trends over time
- support local service planning
Relevance

The HES publications focus on headline information about hospital activity. Each annual publication includes a series of national tables and also provider-level breakdowns for some main areas.

Most data included in the published tables are aggregate counts of hospital activity. Where averages are published, e.g. average length of stay for inpatients or caesarean rates for maternity statistics, this data is clearly labelled stating how the data has been calculated.

Accuracy and Reliability

The accuracy of HES data is the responsibility of the NHS providers who submit the data to the Secondary Uses Service (SUS). This data is required to be accurate to enable providers to be correctly paid for the activity they undertake.

SUS is the single, comprehensive repository for healthcare data in England which enables a range of reporting and analyses to support the NHS in the delivery of healthcare services.

When a patient or service user is treated or cared for, information is collected which supports their treatment. This information is also useful to commissioners and providers of NHS-funded care for ‘secondary’ purposes - purposes other than direct or ‘primary’ clinical care - such as:

- healthcare planning
- commissioning of services
- national tariff reimbursement
- development of national policy

SUS is a secure data warehouse that stores this patient-level information in line with national standards and applies complex derivations which support national tariff policy and secondary analysis.

A list of mandatory and optional fields for submission in in the Commissioning Data Set (CDS) is provided within the NHS Model and Data Dictionary:

CDS V6-2 Type 120 – Finished Birth Episode CDS
CDS V6-2 Type 140 – Finished Delivery Episode CDS
CDS V6-2 Type 150 – Other Birth Event CDS
CDS V6-2 Type 160 – Other Delivery Event CDS

NHS Digital has a well-developed data quality assurance process for the SUS and HES data. It uses an xml schema to ensure some standardisation of the data received. The use of the schema means that the data set has to meet certain validation rules before it can be submitted to SUS. NHS Digital leads on the schema changes and consults the data suppliers about proposed changes.

Each month NHS Digital create data quality dashboards available to NHS providers to show the completeness and validity of their data submissions to SUS. This helps to highlight any issues present in the provisional data allowing time for corrections to be made before the annual data is submitted.
An external auditor, acting on behalf of the Department of Health (DH), audits the data submitted to SUS to ensure NHS providers are being correctly paid by Payment by Results (PbR) for the care they provide.

NHS Digital validates and cleans the HES extract and derives new items. The team discusses data quality issues with the information leads in hospital trusts who are responsible for submitting data. The roles and responsibilities within NHS Digital are clear for the purposes of data quality assurance, to assess the quality of data received against published standards and report the results.

Data quality information for each year to date HES dataset is published alongside the provisional year to date HES data, and also alongside annual publications. These specify known data quality issues each year and where a trust has a known shortfall of secondary diagnoses. The statisticians can only check the validity and format of the data and not whether they are accurate, as accuracy checking requires a level of audit capacity and capability which NHS Digital does not currently possess.


NHS Digital also publishes an annual report The Quality of Nationally Submitted Health and Social Care Data, which highlights issues around the recording of the underlying data that is used for HES, as well as examples of good and poor practice, and a regular Data Quality Maturity Index for providers across several datasets including HES: https://content.digital.nhs.uk/dq

The UK Statistics Authority conducted case studies of quality assurance and audit arrangements of administrative data sources. HES was used as a case study and further information can be found in the published report (Annex C, case study 3), available at: https://www.statisticsauthority.gov.uk/osr/systemic-reviews/administrative-data-and-official-statistics/quality-assurance-and-audit-arrangements-for-administrative-data/

**Data completeness**

As noted above there are data quality issues on the rising number of unknowns for several of the breakdowns.

The impact of this deteriorating data quality can skew any potential trends highlighted in the data which may not exist if the missing entries were recorded by hospitals.

Table 3 provides a count and percentage of records that have valid data in specific key fields.
Table 3: Number of valid records in HES by maternity key fields, 2016-17 and 2017-18

<table>
<thead>
<tr>
<th>HES maternity key fields</th>
<th>2016-17</th>
<th>2017-18</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of valid/known deliveries/records</td>
<td>Percentage of valid/known deliveries/records</td>
</tr>
<tr>
<td>Place of delivery</td>
<td>529,308</td>
<td>83</td>
</tr>
<tr>
<td>Person conducting delivery</td>
<td>509,953</td>
<td>80</td>
</tr>
<tr>
<td>Anaesthetics used before or during delivery</td>
<td>507,067</td>
<td>80</td>
</tr>
<tr>
<td>Method of onset of labour</td>
<td>540,918</td>
<td>85</td>
</tr>
<tr>
<td>Method of delivery</td>
<td>627,398</td>
<td>99</td>
</tr>
<tr>
<td>Duration of antenatal stay</td>
<td>546,417</td>
<td>86</td>
</tr>
<tr>
<td>Duration of postnatal stay</td>
<td>545,639</td>
<td>86</td>
</tr>
<tr>
<td>Gestation length</td>
<td>518,281</td>
<td>81</td>
</tr>
<tr>
<td>Gestation period in weeks at first antenatal assessment date</td>
<td>429,064</td>
<td>67</td>
</tr>
<tr>
<td>Birth status</td>
<td>569,765</td>
<td>90</td>
</tr>
<tr>
<td>Birth weight</td>
<td>568,670</td>
<td>89</td>
</tr>
<tr>
<td>Total deliveries</td>
<td>636,401</td>
<td>n/a</td>
</tr>
</tbody>
</table>

Source: HES

Final and Provisional Data Comparison

Collection of HES data is carried out on a monthly basis throughout the financial year, with a final annual refresh (AR) once the year end has passed. Each monthly collection refreshes data back to the start of the financial year.

‘Month 13’ represents the provisional full year data and was published in June 2017. Hospital providers and NHS Digital HES Data Quality team work to improve the quality and completeness of the data in order to produce the final annual refresh data used in this report, as described in ‘Accuracy and Reliability’. There are no differences between Month 13 and AR maternity data in this report.

Data Quality Notes

Information about completeness of key data items relevant to this report for each data set is included in the data completeness section of this report.

Detailed information about data quality of HES data items, and completeness of provider data submissions can be accessed via the following link:


Detailed information about data quality of MSDS data items, and completeness of provider data submissions can be found in the Excel data quality files published alongside this report.
A joint data quality statement reporting against the European Statistical System (ESS) quality dimensions and principles is published with this report.

**Timeliness and Punctuality**

HES data is published as early as possible. The production of the underlying annual HES data sets takes several months after the reference period. The final submission deadline for NHS providers to send annual data to SUS is normally at the end of May, almost two months after that year has finished. It then takes approximately two months to produce the HES data set and a further month to complete publication production and data investigation.

In addition to annual data NHS Digital also publishes provisional monthly HES data approximately two months after the reference period.

The final annual data includes some additional data cleaning and more up-to-date reference data used with the derivations, compared to Month 13 data.

**Coherence and Comparability**

Users can misinterpret HES data as relating to numbers of patients but care should be taken as the standard unit of HES data relates to hospital activity, not individuals.

In the case of A&E data, this is presented as attendances, which may include people attending more than once in the reporting period.

**Other Comparable Data**

**UK Comparisons**

Separate collections of hospital statistics are undertaken by Northern Ireland, Scotland and Wales. There are a number of important differences between the countries in the way that data measures are collected and classified, and in the organisation of health and social services. For these reasons, any comparisons made between HES and other UK data should be treated with caution.

ONS used to produce UK Health Statistics which contained key figures about the use of health and social services, including hospital admitted patient activity and waiting times across the UK. The last version of this discontinued series can be found at: https://www.ons.gov.uk/ons/rel/ukhs/united-kingdom-health-statistics/2010/edition-4--2010.pdf

**Other UK Data**

Hospital data for the other administrations can be found at:

- Northern Ireland – Hospital Statistics
- Scotland – Hospital Care
- Wales – Health and social care statistics
as mentioned in the Data Comparability section above. NHS England also publish other hospital activity data: [https://www.england.nhs.uk/statistics/statistical-work-areas](https://www.england.nhs.uk/statistics/statistical-work-areas)

**Wider International Comparisons**

HES and similar statistics from the devolved administrations are used to contribute to World Health Organisation (WHO), Organisation for Economic Co-operation and Development (OECD) and Eurostat compendiums on health statistics.

**Improvements Over Time**

HES data is available from 1989-90 onwards whilst outpatient HES data is available from 2003-04 onwards, and A&E data is available from 2007-08. Changes to the figures over time need to be interpreted in the context of improvements in data quality and coverage (particularly in earlier years), improvements in coverage of independent sector activity (particularly from 2006-07) and changes in NHS practice.

Payment by Results (PbR) is a system whereby hospitals are paid for the number of patient treatments, known as activity, they perform and the complexity of these treatments. It was introduced in a phased way from 2003-04 onwards. In order to be paid correctly, care providers need to record the activity they perform and the clinical codes that outline the patients’ conditions and treatment.

The introduction of PbR increased private sector involvement in the delivery of secondary care and brought about some changes in clinical practice (including some procedures occurring as outpatient appointments instead of hospital admissions). It is likely that these changes will have affected trends.

This has provided a major financial incentive for care providers to ensure all of the activity they perform and the clinical coding is fully recorded. This improved recording of information captured by HES could be one of the factors leading to the reported activity increases.

In order to manage patients’ waiting times there has been the need for additional elective operations to be performed as well as a requirement for more capacity in NHS funded care to perform this activity. In the middle of the last decade, additional capacity was brought in from the private sector via treatment centres, with the NHS funding some patients to be treated there for routine operations.

Improvements in technology and the need to increase efficiency to allow more patients to be treated have led to a reduction in the length of time patients need to stay in hospital for certain planned operations. In particular, many operations that would have involved an overnight stay at the start of the period are now routinely performed as day cases. In addition, many operations where a patient would have been admitted to hospital at the start of the period are now routinely performed in outpatients. This has led to increases in day case rates and outpatient attendances over the period.

The recent period has also seen a rise in the number of emergency admissions. One factor contributing to this is likely to be the increased demand on health services from an ageing population. Alongside this there has been the introduction of observation or medical assessment units at many hospitals to which patients arriving in A&E departments are admitted, often for around a day, to enable observation and tests to be performed on them.
Comparisons of Annual HES Data

Care should be taken when comparing annual HES data over time, as improvements in coverage in HES will contribute alongside growth from increased activity through the years.

Extra care should be taken when looking at clinical data, as changes in NHS practices (such as the introduction of new procedures and interventions) can have an effect on changes through time.

Changes to Organisation Codes and Geographical Boundaries

The Organisation Data Service (ODS) is responsible for the publication of all organisation and practitioner codes and national policy and standards with regard to the majority of organisation codes.

For more information about the ODS and changes to organisation codes and geographical boundaries visit: https://systems.digital.nhs.uk/data/ods

Accessibility and Clarity

As HES is such a rich source of data it is not possible to publish aggregate tables covering all permutations of possible analysis. Underlying HES data is also made available to facilitate further analysis that is of direct relevance to users. There are no restrictions to accessing the published data.

Trade-offs between Quality Components

As discussed in the Accuracy and Reliability section, providers have the opportunity to submit data each month, which is centrally assessed for data quality and issues is reported back to providers in order to give an opportunity to address any issues found. The dataset is then finalised for the full financial year, and issues remaining after that point are published on NHS Digital’s website, but no attempt is made to amend the data.

Assessment of User Needs and Perceptions

Users of the data and this publication are encouraged to report and feedback their views and suggestions. We have a dedicated e-mail address for users to e-mail their queries or concerns and if anything is identified as being unclear, we address that as soon as we possibly can.

We consult users when proposing significant changes to the content of or methodologies used in the publications. NHS Digital conducted a wider consultation exercise on all its publications and services, including HES, and the outcome is available to all. https://content.digital.nhs.uk/article/7041/Consultation-on-changes-to-HSCIC-Statistics-201617---201819-Now-Closed
Cost, Performance and Respondent Burden

The production of HES data is a secondary use of data collected during the care of patients in the NHS and submitted for NHS Providers to be paid for the care they deliver. Therefore HES does not incur additional costs or burden on the providers of the data.

Confidentiality, Transparency and Security

Although certain information is considered especially sensitive, all information about someone’s health and the care they are given must be treated confidentially and in accordance with legislation and NHS Digital protocols at all times.

There are a limited number of people authorised to have access to the record level data, all of whom must adhere to the written protocol issued by NHS Digital on the dissemination of HES data. For example, guidance is given on handling the very small numbers that sometimes occur in tables to reduce the risk that local knowledge could enable the identification of either a patient or clinician.

HES is a record level data warehouse and it contains information that could (if it was made freely available) potentially identify patients or the consultant teams treating them. In some cases, record level data may be provided for medical / health care research purposes. For example, data is likely to be required by the Care Quality Commission and other such bodies. The information may be given following a stringent application procedure, where the project can justify the need and where aggregated data will not suffice. Any request involving sensitive information, or where there may be potential for identification of an individual, is referred to the appropriate governance committee. NHS Digital publishes a quarterly register of data releases, which includes releases of HES data.

HES data is stored to strict standards: a system level security protocol is in place. This details the security standards that are in place to ensure data is secure and only accessed by authorised users.
Appendix 3: Maternity Services Data Set Data Quality Statement

Introduction

The Maternity Services Data Set (MSDS) is a patient-level data set that captures key information at each stage of the maternity service care pathway in NHS-funded maternity services, such as those maternity services provided by GP practices and hospitals. The MSDS does not cover non-NHS funded maternity services provided by independent organisations (e.g. private clinics).

The MSDS has been developed to help achieve better outcomes of care for mothers, babies and children. As a 'secondary uses' data set, it re-uses clinical and operational data for purposes other than direct patient care.

Providers of NHS-funded maternity services in England have been required to make monthly MSDS submissions since April 2015.

There are currently 42 tables in the MSDS that each contain information relating to a specific event or type of information in the maternity pathway. However, only 3 of these tables must be completed in each submission. They cover the woman's details, GP registration information and booking appointment details. Other information relating to a specific event or activity in the pathway should be submitted when those events or activities occur.

MSDS data includes:

- mother’s demographics
- booking appointments
- admissions and re-admissions
- screening tests
- labour and delivery
- baby’s demographics, diagnoses and screening tests.

It is intended that information from the data set will be made widely available to commissioners, providers, clinicians, service users, and the public to inform choice through monthly and annual statistical publications.

Relevance

The MSDS analyses in this publication focus on headline information about births recorded in the MSDS, data on babies’ health and care soon after birth, and information on maternal characteristics earlier in pregnancy.

To help users understand the coverage of MSDS data as a new data set compared with HES as a more established data source, the publication also includes a comparison of data common to both datasets.
As the national collection of the MSDS becomes established and more maternity service providers can submit more of the MSDS tables and data items, the MSDS analysis in the annual publication will be expanded to report on other pregnancy and birth events.

**Accuracy and Reliability**

**Accuracy**

MSDS data submitted by providers each month is validated at the point of submission. Providers receive immediate record-level reports of any submission errors from the data submission portal and can amend and re-submit data as many times as they wish prior to the submission deadline to improve data quality.

Following the submission deadline, NHS Digital run data quality checks as part of the validation and load process. The methodology for these data quality checks is regularly refined and additional data quality checks are added.

Providers receive a monthly data quality notice shortly after the submission deadline, summarising the quality of their final submission for that reporting period.

Where specific issues are identified, the NHS Digital team contact providers directly to highlight these.

Following the monthly submission deadline, there is no mechanism for providers to resubmit data, but providers are encouraged to address issues in future monthly submissions.

Data quality information at provider level is published alongside each monthly MSDS report, and alongside the annual analysis. Certain data from the MSDS is included in the NHS Digital Data Quality Maturity Index, which reports across data sets.

Where records are identified from the data quality checks as having possible data quality issues, these are not ignored in the calculated outputs unless specifically stated in the published data quality information.

Users of the data must make their own assessment of the quality of the data for a particular purpose, drawing on these resources.

In addition, local knowledge, or other comparative data sources, may be required to assess the extent to which the reported analysis is affected by local data quality issues.

**Reliability**

**Coverage – providers submitting data**

All providers of NHS-funded maternity services should submit MSDS data. However, as a new data set, there are non-response issues and not all providers make submissions every month. The ‘Dataset coverage by provider worksheet’ in the MSDS DQ tables spreadsheet provides a full list of the providers that submitted for each monthly reporting period during 2017-18.

It is not expected that each organisation reporting to the MSDS should also be submitting data to HES (for example, the organisation may only provide antenatal care). However, it is expected that all organisations reporting to HES should be reporting to the MSDS.
The Hospital Episode Statistics (HES) provider level analysis for 2017-18 shows 132 providers that submitted 10 or more delivery episodes to HES. All of these providers have submitted some delivery episode data to the MSDS during 17-18 and these delivery data have been used in this report.

The number of providers submitting valid data for each data table and data item varies widely. It is also possible that providers have not sent records for all the activity that occurred. The accompanying data quality report provides coverage information for each data table and quality information for each data item in many of the tables.

Totals in MSDS analysis are therefore presented as ‘All Submitters’ values rather than England figures, and users of the data should consider the coverage for the relevant analysis when interpreting the data.

**Coverage – inclusion of eligible activity**

Local knowledge may be required to assess the completeness of a submission, based on information about local caseload. Providers and commissioners are encouraged to review the published data to ensure that submissions accurately reflect the local situation. Providers should also use all the aggregate record counts produced at the point of submission as part of the Data Summary Reports to check coverage in key areas.

Where an organisation submitted delivery data to the MSDS for 2017-18, the number of deliveries submitted can be compared to the number of deliveries reported in HES for the same period (noting that the MSDS is not limited to births in hospital).

At the ‘All Submitters’ level, the number of deliveries recorded in the MSDS for 2017-18 is 78 per cent of the number of deliveries recorded in HES. The MSDS has seen a big increase in coverage compared to last year, when the equivalent figure was only 56 per cent.

**Coverage - timeliness of local recording**

Whilst local systems may be continuously updated, the MSDS submission process provides a time-limited opportunity for data relevant to each month to be submitted. The submission requirements for MSDS are that all appropriate activity (e.g. booking appointment, dating scans) be included in the submission for each month in which they occur.

The submission window opens one month following the end of the reporting month and remains open for two months. This means that the timeliness of recording all relevant activity on local systems has an impact on the completeness of the MSDS submission. For example, a birth in June 2017, but not entered onto the local system until the beginning of October 2017 will not be included in the final June 2017 submission (deadline end of September 2017).

**Duplication**

It is possible for the same delivery to be submitted to the MSDS by more than one provider, although this would not be expected to happen as providers should be reporting their own activity only. Investigation has shown that less than 0.1 per cent of deliveries included in the 2017-18 annual analysis were submitted by more than one provider.
If a delivery is reported by two separate providers within the same NHS England Region then provided the same information is submitted by each provider, the delivery would be counted once at each provider, and would be counted only once at NHS England Region level.

However, if the delivery were submitted by two separate providers from two different NHS England Regions, then the delivery would be counted once for each NHS England Region.

Similarly, if the delivery was submitted by two separate providers within the same NHS England Region with different data values submitted by each provider, then this delivery may be counted twice at NHS England Region level. For example, a baby reported with an Apgar score at 5 minutes of 6 recorded by one provider and 8 by another provider would be counted in the NHS England Region total twice, once in the '0 to 6' group and once in the '7 to 10' group.

**Quality of Experimental Analysis**

It should be noted that statistics from the MSDS are presently experimental in nature and are likely to be subject to further refinement; reference should be made to all accompanying footnotes and commentary when using these statistics.

**Data completeness**

As the number of deliveries recorded in the MSDS is only 78 per cent of the number of deliveries recorded in HES, the partial coverage of the MSDS both geographically and over time means that figures from the MSDS should not be interpreted as England level figures for 2017-18.

The proportion of missing or invalid values varies between data items. As percentages in this report exclude missing or invalid values from the denominator, they should be interpreted with caution.

There are provider-specific data quality issues relating to gestation length at birth, BMI and Apgar score at 5 minutes after birth. These are described in more detail on the face of the accompanying Excel data quality report.

The MSDS team are working with providers to increase the submission rate of relevant data items and expect the number of deliveries for which the onset of labour cannot be derived to decrease in future.

Comparisons at provider level are published in an Excel file alongside this report.
Table 4: Number of valid records in MSDS for fields used in this report, 2017-18

<table>
<thead>
<tr>
<th>MSDS fields used in this report</th>
<th>Number of valid deliveries/records</th>
<th>Percentage of valid deliveries/Records</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total term babies</td>
<td>431,452</td>
<td>n/a</td>
</tr>
<tr>
<td>Apgar score</td>
<td>405,969</td>
<td>94</td>
</tr>
<tr>
<td>Total babies</td>
<td>494,512</td>
<td>n/a</td>
</tr>
<tr>
<td>Baby first feed status</td>
<td>389,250</td>
<td>79</td>
</tr>
<tr>
<td>Total term deliveries</td>
<td>428,574</td>
<td>n/a</td>
</tr>
<tr>
<td>Skin to skin contact within 1 hour</td>
<td>385,327</td>
<td>90</td>
</tr>
<tr>
<td>Total deliveries</td>
<td>486,866</td>
<td>n/a</td>
</tr>
<tr>
<td>Gestation at booking (derived)</td>
<td>486,789</td>
<td>&gt;99</td>
</tr>
<tr>
<td>Smoking status at booking</td>
<td>446,271</td>
<td>92</td>
</tr>
<tr>
<td>BMI at booking (derived)</td>
<td>398,029</td>
<td>82</td>
</tr>
<tr>
<td>Onset of labour (derived)</td>
<td>236,491</td>
<td>49</td>
</tr>
<tr>
<td>Gestation at delivery</td>
<td>461,860</td>
<td>95</td>
</tr>
<tr>
<td>Method of delivery</td>
<td>476,298</td>
<td>98</td>
</tr>
</tbody>
</table>

Source: MSDS

Timeliness and Punctuality

Annual analysis from the MSDS is published alongside annual HES data, which are published as early as possible after the annual HES submission deadline. This report will be published on the pre-announced publication date.

Coherence and Comparability

Coherence

Information submitted to the MSDS is used to create the Maternity Booking Appointment Data Cube available on iViewPlus. As the booking appointment data in iViewPlus is not linked to birth data, querying iViewPlus for the booking appointment details reported in the annual analysis (smoking status and BMI) will produce different results to those published in this report.

NHS Digital also publishes maternity data from HES as part of this release. As the number of deliveries recorded in the MSDS for 2017-18 is 78 per cent of the number of deliveries recorded in HES, some differences are likely to be found when comparing analysis common to both sources.

A comparison of HES and MSDS data for certain data common to both data sets is shown in the ‘HES and MSDS comparison’ spreadsheet published as part of this release.

The Office for National Statistics also publishes annual data on live births and stillbirths in England and Wales. These data are collated from local registrar records and are the most complete data source available. The latest publication for these data can be found here.
NHS England published quarterly data on mothers initiating breastfeeding by NHS Trust and by CCG up to March 2017. The MSDS now reports monthly on the baby's first feed status but this differs slightly from the definition of breastfeeding initiation in the NHS England collection, so data is not exactly comparable between the two sources.

**Comparability**

This publication is the second in the series. HES data from this publication is comparable with the previous publication. However for MSDS, the number of providers submitting data for each publication differs, therefore it is not advisable to compare MSDS figures from this publication with the previous publication.

**Accessibility and Clarity**

Monthly and annual publications of MSDS data include a report, an interactive Excel provider level analysis, detailed data quality information spreadsheets and data in machine-readable format.

A detailed metadata document explaining the construction of all published measures forms part of each publication, and supporting information is included throughout the publication files to help interpret the data.

Monthly data files are also made available on the data.gov website at https://data.gov.uk/dataset/maternity-services-monthly-statistics-england

Use and re-use of the published data under the Open Government Licence is encouraged, subject to the conditions outlined at https://digital.nhs.uk/article/235/Terms-and-conditions

Maternity service providers can obtain a record level data extract for their patients from the data submission system.

Data Services for Commissioners Regional Offices (DSCROs) can obtain a record level extract of data relevant to the Clinical Commissioning Groups (CCGs) that they support; and can share data with these CCGs subject to the relevant data sharing agreements being in place. Information about DSCROs is available from http://content.digital.nhs.uk/dataservicesforcommissioners

**Trade-offs between Output Quality Components**

To meet user needs for prompt and detailed information on maternity services, data from the MSDS is published as final on a monthly basis. This means that where providers are notified of data quality issues following review of their monthly submission, they can only address these for future monthly submissions and cannot amend and resubmit data for previous reporting periods.

There is also no opportunity for late submissions should a provider miss the submission deadline for the relevant reporting period.

Please note that this differs from Hospital Episode Statistics, where data can be resubmitted throughout the year until a final annual deadline.
Assessment of User Needs and Perceptions

We welcome feedback on any data releases from the MSDS, which can be sent to us via enquiries@nhsdigital.nhs.uk.

NHS Digital has held regular workshops with maternity service providers, system suppliers, and analysts to provide information updates and obtain feedback on the development of the data set and statistical outputs from the MSDS.

Cost, Performance and Respondent Burden

The MSDS is a ‘secondary uses’ data set i.e. it re-uses existing clinical and operational data for purposes other than direct patient care. It does not require the collection of new data items by maternity providers.

Providers are not required to submit data held only on paper records as no provision has been made for any cost of transcribing these records into electronic format.

Only three of the data tables are required in every MSDS submission (MAT001, MAT003 and MAT101). Submission of the remaining tables is only necessary when activity has occurred that is captured within these tables.

Confidentiality, Transparency and Security

MSDS data are stored by NHS Digital and accessed in accordance with strict standards.

Relevant NHS Digital policies include:
Statistical Governance Policy
Click here

A Guide to Confidentiality in Health and Social Care
Click here

Privacy and Data Protection
Click here

Freedom of Information Process
Click here

A limited number of people within NHS Digital have access to the record level data. Providers can download their processed data extracts through a secure system, and access for DSCROs (Data Services for Commissioners Regional Offices) to data for the CCGs that they support is similarly controlled.

Access to record level data for medical/health care research purposes would require application through a stringent process where the need for record level rather than aggregate data would need to be justified. NHS Digital publishes a quarterly register of data releases that includes applications that have successfully completed this process.

To minimise the risk of identifying an individual from small numbers in any table from the MSDS, all counts between zero and four below ‘All Submitters’ level are replaced with an asterisk (*) and all counts of five or more below ‘All Submitters’ level are rounded to the nearest five.