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Introduction

The National Diabetes Inpatient Audit (NaDIA) is part of the National Diabetes Audit (NDA) programme and is commissioned by the Healthcare Quality Improvement Partnership (HQIP) as part of the National Clinical Audit Programme (NCA). The NDA is managed by NHS Digital in partnership with Diabetes UK and is supported by Public Health England (PHE).

The 2016 NaDIA report is the sixth annual snapshot audit of diabetes inpatient care in England and Wales. The audit is open to participation from hospitals with medical, surgical, gynaecology wards or intensive care units.

The audit sets out to measure the quality of diabetes care provided to people with diabetes while they are admitted to hospital, by answering the following questions:

- Did diabetes management minimise the risk of avoidable complications?
- Did harm result from the inpatient stay?
- Was patient experience of the inpatient stay favourable?

The report will be of interest to the public, especially to people with diabetes, to health planners and policy makers, as well as acute trusts, Clinical Commissioning Groups (CCGs), Local Health Boards (LHBs), Clinical Networks (CNs; formerly Strategic Clinical Networks or SCNs) and other providers and commissioners of specialist diabetes services.

The report presents findings from the 2016 audit – carried out on a day between 26 and 30 September 2016 – on patients admitted for at least 24 hours to specified types of inpatient ward. The audit collected data on characteristics of the hospital, patient clinical data and patient experience information using paper-based questionnaires.

Additional hospital episode outputs were acquired from the Hospital Episode Statistics (HES) database within NHS Digital, alongside data from the Patient Episode Database for Wales (PEDW).

Methodology

Overview

The National Diabetes Inpatient Audit 2016 was carried out by hospital teams in England and Wales on a nominated day between 26 and 30 September 2016. The audit collected data on characteristics of the hospital including staffing structures, patient clinical data and patient experience information, using paper-based questionnaires.

Each participating hospital identified all inpatients with diabetes and distributed questionnaires accordingly. Where the patient was able and willing a patient experience form was completed, as well as a bedside audit form which provided information on the patient’s medical treatment taken from their notes. The hospital team also completed a hospital characteristics questionnaire providing information on the hospital’s resources and staffing.
structure. Sample copies of the 2016 questionnaires can be found on the NHS Digital website:

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

A patient was included in the inpatient audit if they had been admitted to a bed for 24 hours or more. Patients on an Obstetric or Paediatric ward were excluded from this audit. Mental Health wards were also excluded due to the high prevalence of long stay patients. Other exclusions included:

- Patients who were hyperglycaemic but not yet formally diagnosed with diabetes
- Accident and Emergency
- Day case ward
- Day surgery unit patients
- Observation ward (if patients had been admitted for less than 24 hours)
- Surgical short stay unit (if patients had been admitted for less than 24 hours)
- Palliative care centres
- Community Hospitals.

Once all questionnaires were returned the data was collated and cleaned to produce the analysis for this report.

Where at least one type of questionnaire (either patient experience, bedside audit or hospital characteristics) was returned, the hospital has been counted in the overall participation rate. Hospital characteristics questionnaires were completed either at hospital level or at site level (i.e. where a number of hospitals were aggregated together); therefore, prevalence rates are based on the number of participating sites rather than individual hospitals.

Aggregated hospital episode outputs were acquired from the Hospital Episode Statistics (HES) database within NHS Digital, alongside data from the Patient Episode Database for Wales (PEDW). Where possible, comparisons have been made between inpatients with diabetes and all inpatients within English and Welsh hospitals. At the time of preparing this analysis, HES data for September 2016 was not available, so a comparison with HES data from September 2015 was made. PEDW data for September 2016 was available, so a 2016 comparison was possible. Supplementary Data containing the HES/PEDW comparisons and other NaDIA analysis not contained in the main report will be published after the main 8 March 2017 publication (date to be confirmed).

All percentages, charts and tables in this report relate to all inpatients in England and Wales, unless otherwise stated. Where the data for inpatients has been compared to hospital episode data that was collected separately for England (HES) and Wales (PEDW), the inpatient data has been analysed at country level to allow these comparisons to be made.

This differs from the 2011 and 2012 NaDIA annual reports that presented separate analysis for England and for Wales. The comparatives for 2011 and 2012 in this report will therefore differ from the figures published previously for those periods. Hospitals from Wales did not participate in the 2010 NaDIA.

Summary data by country for England and Wales is included in the 2016 Hospital Level Analysis available from: http://content.digital.nhs.uk/pubs/nadia2016

The section below explains the ‘all recorded data’ method used within this report. The statistical glossary at the end of the document explains the testing mechanism used within this report.
How did we calculate the values in the audit?

The ‘all recorded data’ method

The information in the National Diabetes Inpatient Audit is collected by medical and audit professionals across England and Wales using three questionnaires. We appreciate all their hard work.

The audit forms are divided into sections. When we receive audit forms most are filled in completely but some have gaps. Some sections will have an answer in some boxes but other boxes will be blank.

When we analyse the data we have to make a decision. Do we only include results for patients where every box in a section has been completed (i.e. only include complete records)? Or do we include results from all boxes that have been completed, even if there is missing information elsewhere in that section (i.e. use all the recorded data)? Both methods of analysis are valid (see the examples below).

It has been decided that the audit should be using as much of the data as possible (all recorded data). The audit report was prepared using the ‘all recorded data’ method for the first time in 2012.

For more detail or any questions please contact NaDIA@nhs.net.

Example - Insulin prescription errors:

<table>
<thead>
<tr>
<th>Insulin</th>
<th>Form 1</th>
<th>Form 2</th>
<th>Form 3</th>
<th>Form 4</th>
<th>Form 5</th>
<th>Form 6</th>
<th>Form 7</th>
<th>Form 8</th>
<th>Form 9</th>
<th>Form 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulin not written up</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>Name of insulin incorrect (e.g. Humalog)</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>Number (dose) unclear</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>Unit abbreviated to ‘u’ or written unclearly</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>Insulin or prescription chart not signed by prescriber</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>Insulin not signed as given</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>Insulin given/prescribed at wrong time</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td></td>
</tr>
</tbody>
</table>

Y = did occur, N = did not occur

‘Completed records method’ using only forms in which every box was completed (grey columns): 2 Y in 8 forms = 25% had a prescription error.

‘All recorded data method’ using all completed boxes: 4 Y in 10 forms = 40% had a prescription error.
Statistical glossary

Confidence intervals

Surveys produce statistics that are estimates of the true figure for the whole population, which would only be known if the entire population was surveyed. Therefore, estimates from sample surveys are always surrounded by a confidence interval which assesses the level of uncertainty caused by only surveying a sample of service users. If 100 samples were selected, and a 95 per cent confidence interval calculated for each one, then you would expect the true value of the population to be found within 95 of those ranges.

Calculating confidence intervals

\[
P_{\text{lower}} = \frac{(2O + z^2 - z\sqrt{z^2 + 4Oq})}{2(n + z^2)}
\]

\[
P_{\text{upper}} = \frac{(2O + z^2 + z\sqrt{z^2 + 4Oq})}{2(n + z^2)}
\]

We have used the following calculation of a 95 per cent confidence interval (CI) for the estimate of a proportion \(p\) from a sample survey:

Where:

- \(O\) is the observed number of individuals in the sample having the specified characteristic
- \(n\) is the sample size achieved (number of useable responses);
- \(q = (1-p)\) is the proportion without the specified characteristic;
- \(z\) is the 100(1-\(\alpha/2\))\(th\) percentile value from the Standard Normal distribution. For example for a 95% confidence interval; \(\alpha = 0.05\) and \(z = 1.96\).

Significance testing

Most significance testing of differences over time in this report compares 2016 NaDIA values with those from the previous NaDIA collection (2015) and/or the first collection covering both England and Wales (2011). Some significance testing is done on NaDIA values from the 2010 and 2012 audits, though it should be noted that Wales did not submit data for the 2010 collection.
**Response rates**

A patient is classed as a respondent if they responded to one or more question, allowing them to express their views on areas they feel strongly about without having to complete the entire questionnaire.

8,579 inpatients responded to the Patient Experience element of the audit out of the total responses to the audit (15,774 patients), a response rate of 54.4 per cent.

**Weighting**

When conducting sample surveys it is important to consider weighting the data to allow for any survey design effects as well as potential bias caused by non-response.

The patient experience survey results have been weighted to reflect the differing response rates by age, ethnic group, type of admission, type and duration of diabetes, ward speciality and length of hospital stay at the time of the audit. The weights are calculated using the relative proportions of the eligible population, the Bedside Audit respondents.