METHODOLOGY TO CREATE PROVIDER AND CIP SPELLS FROM HES APC DATA
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Introduction

Episodes and Spells

An episode is a single period of care under one consultant. The treatment of Patient A in hospital by Consultant A for a broken leg is an example of an episode.

In general, a patient's entire stay in hospital is a spell. A spell can contain one episode, as with Patient A in the example above, or several episodes. For example, if Patient A, while still in hospital, was diagnosed and treated for diabetes by Consultant B, there would be two episodes (one for the broken leg and Consultant A, and one for diabetes and Consultant B). If the patient is transferred to another hospital, dies or is discharged, the episode and the spell end. The vast majority of spells however, contain only one episode.

The association between spells and episodes is illustrated in Figure 2 (below); the box that surrounds episode/episodes is a spell. In the example, 10 episodes make up the five spells. Spell B is a single episode spell, while spells A, D and E contain two episodes each. Spell C contains three episodes.

Figure 2: Illustration of spells, episodes, admissions, discharges and in-year data.
Types of Spells

There are two types of spells - Provider and Continuous In-Patient (CIP). The main differences between the two are outlined below.

Provider spell

A Provider spell (sometimes called the hospital provider spell) is the time that a patient stays in one hospital. The patient will be using a bed that is managed by one health care provider and may be treated by one or more consultants, therefore a provider spell can contain one or more episodes. The provider spell starts when a decision has been made to admit the patient, and a consultant has taken responsibility for their care. The spell ends when the patient is transferred to another hospital, dies or is discharged.

When a patient is transferred from one hospital provider to another, they are discharged from the first and admitted to the second. This shift in responsibility commands the commencement of a new provider spell following the transfer. It is important to note however, that if a patient is moved between hospitals or sites within the same hospital provider, the provider spell continues.

Continuous Inpatient (CIP) spell

A continuous inpatient (CIP) spell is a continuous period of care within the NHS, regardless of any transfers which may take place. It can therefore be made up of one or more provider spells. A CIP spell starts when a decision has been made to admit the patient, and a consultant has taken responsibility for their care. The spell ends when the patient dies or is discharged from hospital.

There is a hierarchical structure to spells and episodes. One CIP spell contains one or more Provider spells. One Provider spells contains one or more episodes. Most of the time, each CIP spell has only one Provider spell and one episode. This can be seen in Figure 3.

Figure 3: Demonstration of how CIP Spells, Provider Spells and Episodes relate to each other.
Methodology for linking HES APC (Admitted Patient Care) Episodes to create Provider and CIP Spells

This section describes the methodology for creating Provider and CIP spells from HES APC Episodes data.

Source data
HES APC annual refresh and provisional monthly data are used to spell episodes over historic and current years.

Reference data
- Provider mapping file: This file is a lookup for provider codes that have changed as a result of trust mergers or demergers. Using this data all activity can be mapped to the current organisation and reported against the most recent trust code.
- HESID mapping file: This file is a lookup for HESIDs that have changed over time. Using this data all activity can be mapped to the current HESID for the patient.

Criteria for selecting episodes
This is the criteria used for selecting episodes from the HES APC dataset for creating spells.

- Finished episodes: epistat = 3
- Provider code: Episodes with non-blank provider code (procodet)
- Admission date: between 01/Jan/1930 and HES data period end date

Provider mapping
Provider codes beginning with R are truncated to 3 characters. Provider codes that have changed are mapped to the new codes using the Provider mapping reference data file and the mapped codes are stored under the field name Procodet_mapped.

HESID mapping
HESIDs that have changed over time are mapped to the new HESIDs using latest version of the HESID mapping file. The mapped HESID is stored in the field HESID_mapped.

Creating Provider Spells from Episodes

Episodes that have the same HESID_mapped, Admidate, Procodet_mapped and Provspno are considered to be in the same provider spell. Regular attender episodes (classpat = ‘3’ and ‘4’) are considered as separate units of care that should not be linked to other episodes and therefore are excluded from the episode ordering criteria shown below – they form single episode provider spells.

Ordering episodes within a provider spell
Episodes within a provider spell are sorted using the following criteria

1. Epistart
2. Epiorder
3. Epiend
4. Epkey

The order of episodes within the spell is indicated by a derived field called P_Spell_Epiorder. In most cases this field should match the provider submitter episode order (Epiorder) but in a small number of cases data quality issues have caused this to be different.
First episode in provider spell
The episode with P_Spell_EpiOrder = 1 is the first episode in the provider spell. These episodes are also flagged using the derived field P_Spell_First_Episode = ‘Y’.

Last episode in provider spell
These episodes are flagged using the derived field P_Spell_Last_Episode = ‘Y’. This flag is applied only on ‘closed spells’ (i.e. spells with an episode containing a valid discharge date) on the episode with the highest P_Spell_EpiOrder.

Provider spell level fields
The following fields are derived from the first and discharge episodes of the provider spell and are available on all episodes in the provider spell which in turn is used for creating CIP spells.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>P_Spell_Admidate</td>
<td>Admission date for the provider spell</td>
</tr>
<tr>
<td>P_Spell_Adminmeth</td>
<td>Admission method for the provider spell</td>
</tr>
<tr>
<td>P_Spell_Admisorc</td>
<td>Admission source for the provider spell</td>
</tr>
<tr>
<td>P_Spell_Disdate</td>
<td>Discharge date for the provider spell</td>
</tr>
<tr>
<td>P_Spell_Dismeth</td>
<td>Discharge method for the provider spell</td>
</tr>
<tr>
<td>P_Spell_Disdest</td>
<td>Discharge destination for the provider spell</td>
</tr>
</tbody>
</table>

Open provider spells
Open provider spells do not have a discharge date (P_Spell_Disdate) or a last episode flag (P_Spell_Last_Episode = ‘Y’).

Creating CIP spells from provider spells
The Provider spells dataset is ordered based on the following criteria

1. HESID_mapped
2. P_Spell_Admidate
3. P_Spell_Disdate
4. Transfer (refer to Annex 2)

Regular attender episodes (classpat = ‘3’ and ‘4’) are considered as separate units of care that should not be linked to other episodes or spells – they form single episode-single provider CIP spells.

Two provider spells are joined if:

- they belong to the same patient (same HESID_Mapped)
  - AND
- the difference between the discharge date of the first provider spell (P_Spell_Disdate) and the admission date of the next provider spell (P_Spell_Admidate) is between 0 and 2 days inclusive
  - AND
- one of the following criteria is met indicating that a transfer has taken place
  - disdest (P_Spell_Disdest) of first provider spell indicates a hospital transfer (49, 50, 51, 52, 53, 84)
  - OR
  - admisorc (P_Spell_Admisorc) of next provider spell indicates a hospital transfer (49, 50, 51, 52, 53, 87)
  - OR

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- admimeth (P_Spell_Admimeth) of next provider spell indicates a hospital transfer (2B, 81)

AND

- **EXCLUDE** the combination where discharge destination of the first spell is 19 AND admission source of the next spell is 51 AND admission method of the next spell is 21

**Provider Spell Order**
The provider spells within the CIP spell are given a sequence number (CIP_P_Spell_Order) based on the criteria for ordering provider spells for creating CIP spells (see above).

**First episode in CIP spell**
First episodes are flagged in the episodes table using the derived field CIP_Spell_First_Episode = ‘Y’. The provider spell with CIP_P_Spell_Order = 1 is considered to be the first provider spell in the CIP spell. The first episode in this provider spell is already flagged in the episodes table using the derived field P_Spell_First_Episode = ‘Y’. This episode is flagged as the first episode in the CIP spell.

**Last episode in CIP spell**
Last episodes are flagged in the episodes table using the derived field CIP_Spell_Last_Episode = ‘Y’. The provider spell with the highest CIP_P_Spell_Order is considered to be the last provider spell in the CIP spell. If this provider spell is a closed spell i.e. if it has a non-blank discharge date (P_Spell_Disdate), then last episode in this provider spell indicated by the derived field P_Spell_Last_Episode = ‘Y’ in the episodes table is considered to be the last episode in the CIP spell.

**CIP spell level fields**
The following fields are derived from the first and discharge episodes of the CIP spell and are available on all episodes in the CIP spell.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIP_Spell_Admidate</td>
<td>Admission date for the CIP spell</td>
</tr>
<tr>
<td>CIP_Spell_Admimeth</td>
<td>Admission method for the CIP spell</td>
</tr>
<tr>
<td>CIP_Spell_Admsorc</td>
<td>Admission source for the CIP spell</td>
</tr>
<tr>
<td>CIP_Spell_Disdate</td>
<td>Discharge date for the CIP spell</td>
</tr>
<tr>
<td>CIP_Spell_Dismeth</td>
<td>Discharge method for the CIP spell</td>
</tr>
<tr>
<td>CIP_Spell_Disdest</td>
<td>Discharge destination for the CIP spell</td>
</tr>
</tbody>
</table>

**Open CIP spells**
Open CIP spells do not have a discharge date (CIP_Spell_Disdate) or a last episode flag (CIP_Spell_Last_Episode = ‘Y’).
### Annex 1 – SPELLS dataset

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>HESID_mapped</td>
<td>Unique ID for a patient in HES – mapped to the latest value if changed</td>
</tr>
<tr>
<td>Procodet_mapped</td>
<td>Provider code – mapped to the latest org code if changed</td>
</tr>
<tr>
<td>FYear</td>
<td>Indicates the financial year when the episode ended</td>
</tr>
<tr>
<td>Epikey</td>
<td>Unique identifier for an episode within a FYear of APC data</td>
</tr>
<tr>
<td>P_Spell_Number</td>
<td>Provider spell number - unique identifier for a provider spell</td>
</tr>
<tr>
<td>P_Spell_Epiorder</td>
<td>Order of the episode within the provider spell</td>
</tr>
<tr>
<td>P_Spell_First_Episode</td>
<td>= ‘Y’ on the first episode of the provider spell</td>
</tr>
<tr>
<td>P_Spell_Last_Episode</td>
<td>= ‘Y’ on the last episode of the provider spell</td>
</tr>
<tr>
<td>P_Spell_Admidate</td>
<td>Admission date for the provider spell</td>
</tr>
<tr>
<td>P_Spell_Admimeth</td>
<td>Admission method for the provider spell</td>
</tr>
<tr>
<td>P_Spell_Admisorc</td>
<td>Admission source for the provider spell</td>
</tr>
<tr>
<td>P_Spell_Disdate</td>
<td>Discharge date for the provider spell</td>
</tr>
<tr>
<td>P_Spell_Dismeth</td>
<td>Discharge method for the provider spell</td>
</tr>
<tr>
<td>P_Spell_Disdest</td>
<td>Discharge destination for the provider spell</td>
</tr>
<tr>
<td>P_Spell_LOS</td>
<td>Provider spell length of stay (P_Spell_Disdate – P_Spell_Admidate)</td>
</tr>
<tr>
<td>CIP_Spell_Number</td>
<td>CIP spell number - unique identifier for a CIP spell</td>
</tr>
<tr>
<td>CIP_P_Spell_Order</td>
<td>Order of the provider spell in the CIP spell</td>
</tr>
<tr>
<td>CIP_Spell_First_Episode</td>
<td>= ‘Y’ on the first episode of the CIP spell</td>
</tr>
<tr>
<td>CIP_Spell_Last_Episode</td>
<td>= ‘Y’ on the last episode of the CIP spell</td>
</tr>
<tr>
<td>CIP_Spell_Admidate</td>
<td>Admission date for the CIP spell</td>
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<td>Discharge destination for the CIP spell</td>
</tr>
<tr>
<td>CIP_Spell_LOS</td>
<td>CIP spell length of stay (CIP_Spell_Disdate – CIP_Spell_Admidate)</td>
</tr>
</tbody>
</table>
Annex 2 – Hospital transfers

To order same day admissions i.e. provider spells for a patient having the same admission and discharge date a Transfer field has been introduced. This field indicates if

- Provider spells which did not begin as a transfer but ended in a hospital transfer = 1
- Provider spells which began as well as ended in a hospital transfer = 2
- Provider spells which began as a hospital transfer but did not end a transfer = 3

A combination of 3 fields is used to identify hospital transfers – discharge destination (disdest), admission source (admisorc) and admission method (admimeth).

Transfer = 1 for provider spells where
[ disdest IN (49, 50, 51, 52, 53, 84) AND { admisorc NOT IN (49, 50, 51, 52, 53, 87) OR admimeth NOT IN (2B, 81) } ]

Transfer = 2 for provider spells where
[ disdest IN (49, 50, 51, 52, 53, 84) AND { admisorc IN (49, 50, 51, 52, 53, 87) OR admimeth IN (2B, 81) } ]

Transfer = 3 for provider spells where
[ disdest NOT IN (49, 50, 51, 52, 53, 84) AND { admisorc IN (49, 50, 51, 52, 53, 87) OR admimeth IN (2B, 81) } ]

Transfer field is NULL in all other cases.

Annex 3 – HES transfer codes

Disdest

- 19 = The usual place of residence, including no fixed abode
- 48 = High security psychiatric hospital, Scotland (from 1999-2000)
- 49 = NHS other hospital provider - high security psychiatric accommodation
- 50 = NHS other hospital provider - medium secure unit (from 1999-2000)
- 51 = NHS other hospital provider - ward for general patients or the younger physically disabled
- 52 = NHS other hospital provider - ward for maternity patients or neonates
- 53 = NHS other hospital provider - ward for patients who are mentally ill or have learning disabilities
- 84 = Non-NHS run hospital - medium secure unit (from 2003-04)

Admisorc

- 19 = The usual place of residence, including no fixed abode
- 49 = NHS other hospital provider: high security psychiatric accommodation in an NHS hospital provider (NHS trust)
- 50 = NHS other hospital provider: medium secure unit (1999-00 to 2006-07)
- 51 = NHS other hospital provider: ward for general patients or the younger physically disabled or A&E department
- 52 = NHS other hospital provider: ward for maternity patients or neonates
- 53 = NHS other hospital provider: ward for patients who are mentally ill or have learning disabilities
- 87 = Non-NHS run hospital

Admimeth

- 21 = Emergency: via Accident and Emergency (A&E) services, including the casualty department of the provider
- 2B = Transfer of an admitted patient from another hospital provider in an emergency
- 81 = Transfer of any admitted patient from another hospital provider other than in an emergency; this does not include admissions to high security psychiatric hospitals (HSPH)