National Casemix Office

NHS Digital

Grouper User Manual

HRG4+ 2021/22 National Costs Grouper

NC 21/22

Published February 2022

Information and technology
for better health and care

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Contents

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Grouper Installation and Uninstallation

This guide details the prerequisite system requirements for installing the Grouper and provides a step-by-step guide for installing and uninstalling the Grouper.

System Requirements

The Grouper has been developed on a platform that supports Window Server 2008 onwards.

Therefore, in order to install the Grouper or Prescribed Specialised Services Tool onto your computer, it must be running Operating System (OS) Windows 7/Windows Server 2008 R2 or a more recent Windows OS. The software can be run on Windows Vista, but this OS is considered unsupported as it is no longer covered under Microsoft extended support.

The minimum specification advised to run the software products based on the minimum recommended PC specification to run Windows 7 as specified by Microsoft are as follows:

- 1 gigahertz (GHz) or faster 32-bit (x86) or 64-bit (x64) processor
- 1 gigabyte (GB) RAM (32-bit) or 2 GB RAM (64-bit)
- A minimum install (excluding example files) requires 47Mb of free disk space
- Microsoft Windows .NET Framework version 4.5 or above

Previous OS are not supported, in line with the edict from the Cabinet Office.

Download and Install the Grouper

- Go to https://digital.nhs.uk/National-casemix-office/downloads-groupers-and-tools.
- Click on Costing Grouper.
- There may be more than one version available. Older versions can be found in the “Archived material” section.
- Click on the relevant Grouper.
- Click on the download link under the Summary text.
- Save the zip file to an appropriate location on your computer.
- Open the zip file and extract the installer.
- Double-click the installer file and follow the installation setup wizard. It is important to note that depending on your security settings, you may require elevated permissions or an administrator account to install this application. If this is the case, you will need to contact your IT department to secure the appropriate permissions.

Installation Setup Wizard

Double-click the installer file to open it. The Grouper setup wizard should automatically start. The first screen is shown below:

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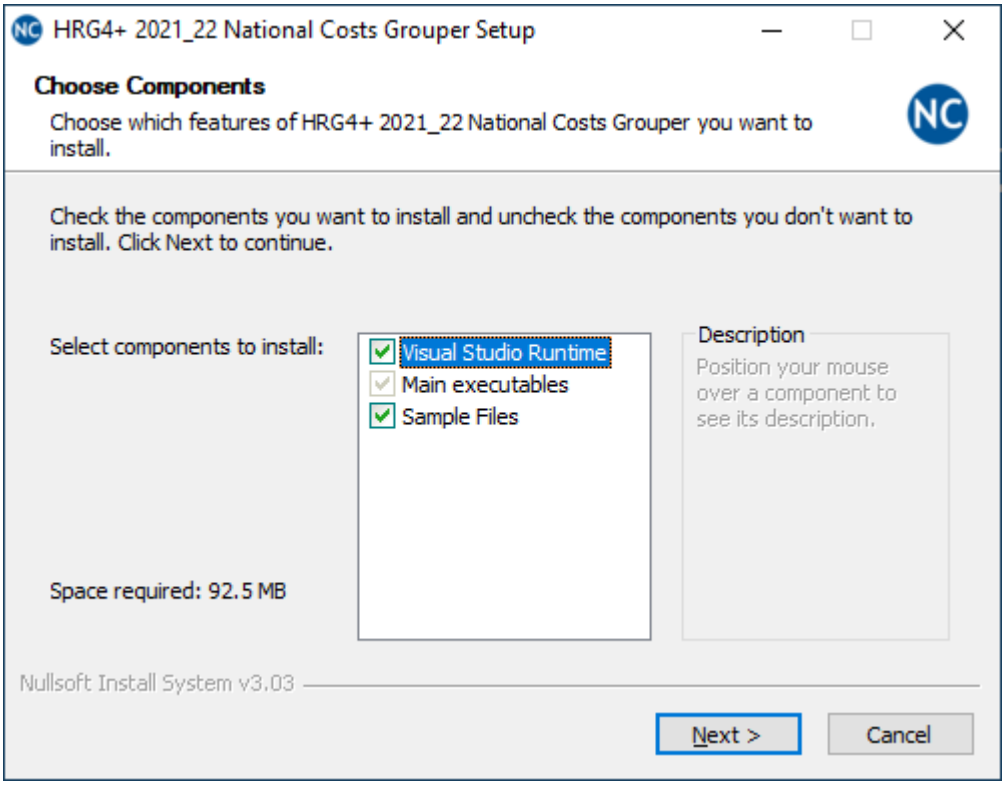

This screen allows the user to select the components to be installed. The **Main executables** component is selected for installation by default and cannot be unselected. The user can however choose whether to install a duplicate copy of the **Sample Files** as part of the installation process and/or whether to install the required copy of the Microsoft Visual C++ Redistributable package – **Visual Studio Runtime**.

The **Sample Files** include the Sample Data as published on the National Casemix Office website and the Default RDFs that are installed as part of the main executable. These files allow users to see the minimum required format of the data that is required to run the products.

The sample data is provided so users can easily test the product. They also provide a quick and easy way of testing the install – this is explained at the end of this section.

The sample files in the **Main executables** may not be easily edited from the default install location due to administrative permissions, which is why we also provide the sample data to download from the web.

The **Visual Studio Runtime** option installs the Microsoft C and C++ runtime libraries which are necessary for the application to operate. It is possible that your local computer may already have these libraries installed. To ensure the required versions are installed, the user now has the option to install these as part of the installation wrapper.

Once you have chosen the components to install, click **Next**.

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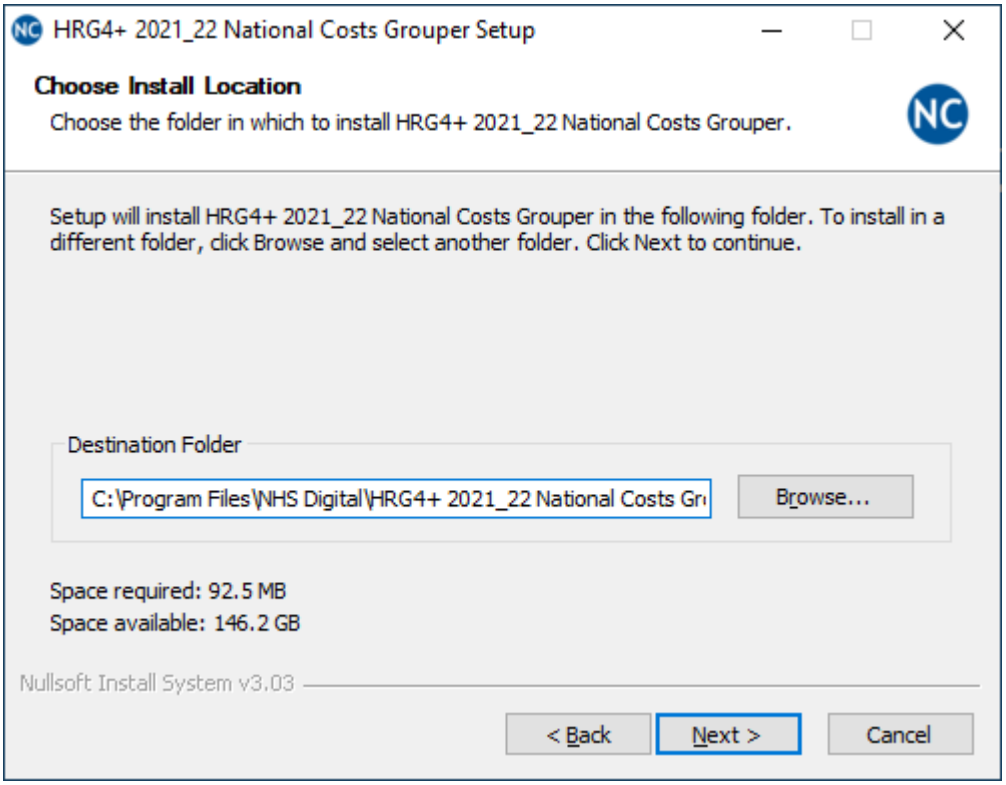

The next screen allows the user to choose where they would like to install the Grouper software. By default, the destination folder is installed to "**C:\Program Files\NHS Digital\ HRG4+ 2021_22 National Costs Grouper**".

It is strongly recommended that you use this as the destination folder for the Grouper software, unless there is a need to install to another location.

The reason for this is that should an update to the same product be made available or should a user wish to reinstall the same product, the updated version will overwrite the previous version, thus avoiding unnecessary disk space being lost and ensuring all relevant files are in a same location.

If, however, you do wish to install to another location, then use the browse function and select another folder location. It is strongly advised that the standard 21 Grouper application files, including 5 folders (3 folders if Sample Data and Default RDF folders are excluded), are extracted and maintained within a sub-directory.

As above, if you wish to reinstall the Grouper, all you need to do is select the same location and provided there have been no name changes to the default folder location (e.g. *HRG4+ 2021_22 National Costs Grouper*), the executable will simply overwrite the files as necessary.

When the appropriate destination folder is set, click **Next**.

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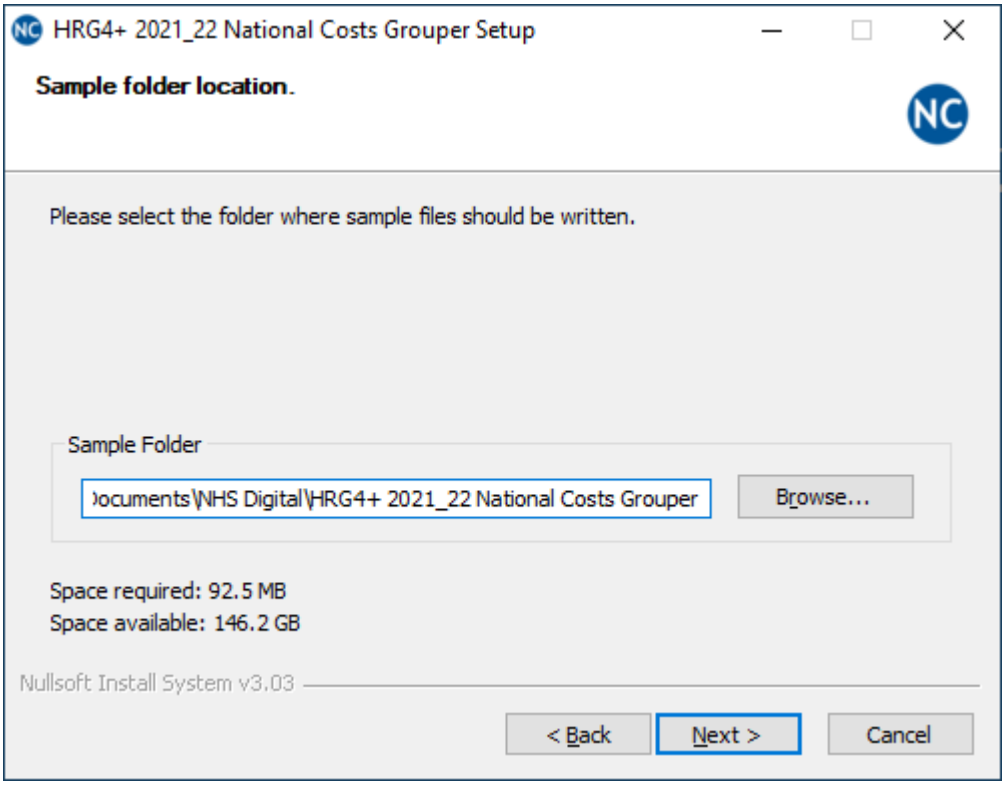

As stated above, users have the option (if selected) of installing a duplicate set of **Sample Files** as part of the installation process.

The default installation destination is set to a user's **Documents** folder. If you wish to install to another location, simply use the browse function and select another folder location.

If you did not select to install the **Sample Files** component on the first screen, this screen will not be shown as part of the installation process.

When the sample file folder is set, click **Next**.

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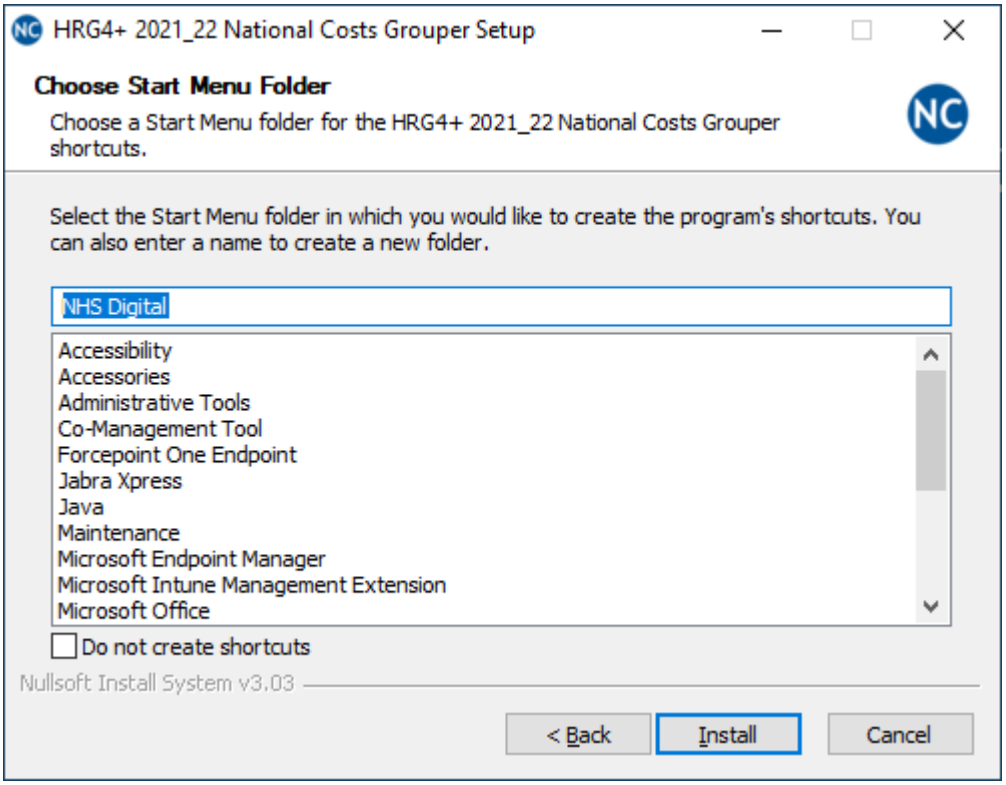

The next screen allows you to create a Grouper shortcut in the **Start Menu** folder. This defaults to a folder called *NHS Digital*, which is recommended, but a user can change the folder name if they wish, or depending on administrative rights, select an existing folder.

There is also an option not to create a shortcut by ticking the **Do not create shortcuts** tick box.

If at any point up to this stage you wish to alter any of the default or chosen file locations, you can use and navigate back through the process using the **<Back** button.

Once you have set a shortcut folder, click the **Install** button to complete the installation process.

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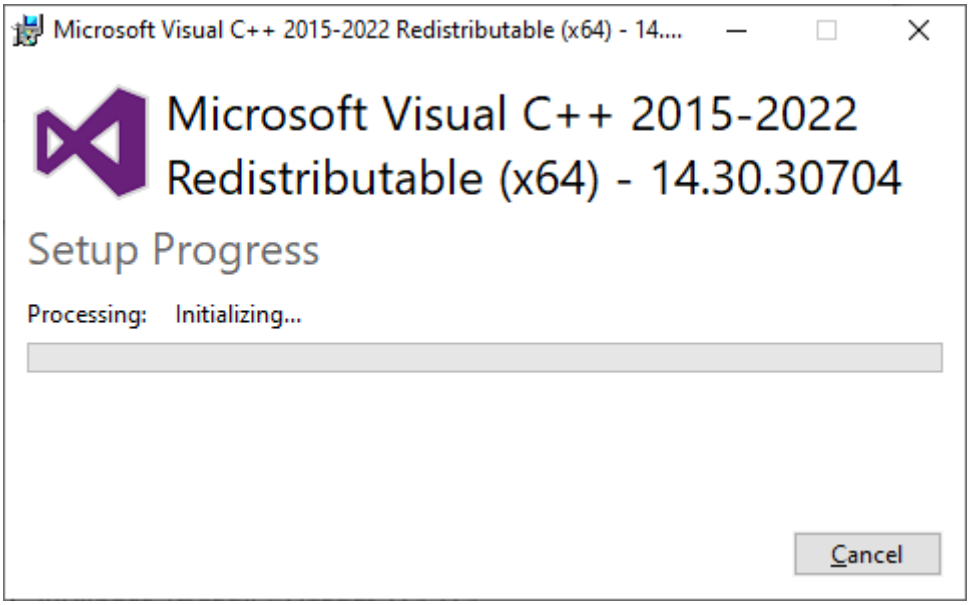
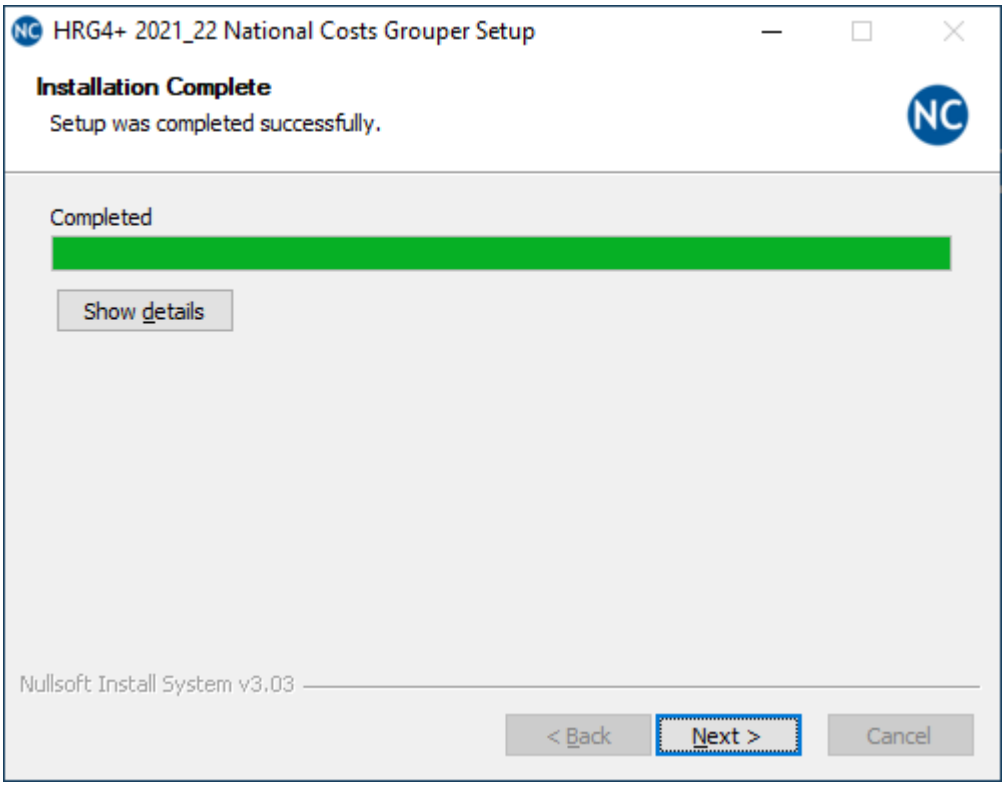


If you have chosen to install the component **Visual Studio Runtime**, then you will see this screen appear when the **Install** button has been selected. This checks whether your local computer has Microsoft Visual C++ Redistributable installed or not and if it has, whether it's the required version. If an appropriate version of Microsoft Visual C++ Redistributable package is already installed, no action will be taken, otherwise the necessary version will be installed.



The installation screen shows the progress of the installation. Once installation has completed click **Next**.

Users will then see the following screen, which confirms that the installation process is complete.

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This final screen allows you to finish the installation process and close the installation wizard by clicking **Finish** or to open the Grouper directly by ticking the **Start HRG4+ 2021_22 National Costs Grouper** tick box followed by **Finish**.

In the above example, this will open the **HRG4+ 2021_22 National Costs Grouper**, allowing you to immediately begin using the Grouper.

Alternatively (or after pressing finish), the product can be opened from the shortcut link in the start menu or by clicking on the **GUIShell** icon (which is the Grouper application) in the destination folder selected as part of the install.

A simple test to ensure the application is working as expected is to open the Grouper, select new Batch, load the sample APC RDF and then sample APC data, and press process. If grouping is successful, the Grouper will show 90% grouped and 10% ungrouped.

It is important to note that the sample data as provided will always result in this ratio of expected results. Each sample data file is product specific and is specifically designed to result in this 90/10 ratio when run using the specific Grouper for which it was created. If you do not obtain this result, but grouping has been successful, you may have altered the sample data in some way, or you may be using sample data designed to work with a different Grouper.

If running the sample data and it has not resulted in the expected 90/10 ratio, re-download a clean copy of the sample data and expected results for the Grouper you are using from the National Casemix Office (NCO) website. If this does not resolve your issue, please contact the NCO at enquiries@nhsdigital.nhs.uk, stating the relevant Grouper name in the subject title. We will be happy to walk you through the testing process.

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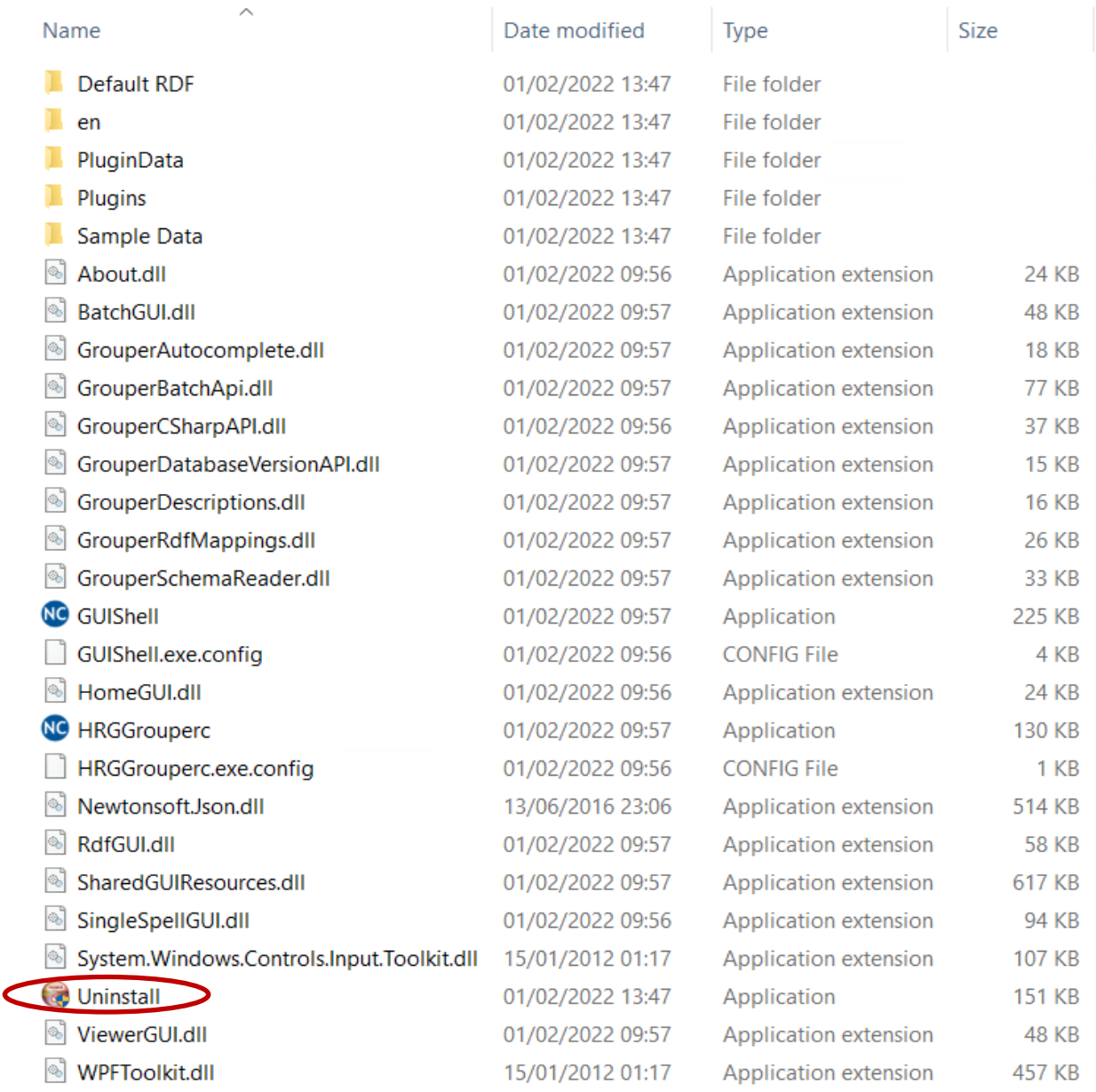
Uninstalling the Grouper

The Grouper installation pack comes with an uninstall executable, i.e. Uninstall.exe.



Name	Date modified	Type	Size
Default RDF	01/02/2022 13:47	File folder	
en	01/02/2022 13:47	File folder	
PluginData	01/02/2022 13:47	File folder	
Plugins	01/02/2022 13:47	File folder	
Sample Data	01/02/2022 13:47	File folder	
About.dll	01/02/2022 09:56	Application extension	24 KB
BatchGUI.dll	01/02/2022 09:57	Application extension	48 KB
GrouperAutocomplete.dll	01/02/2022 09:57	Application extension	18 KB
GrouperBatchApi.dll	01/02/2022 09:57	Application extension	77 KB
GrouperCSharpAPI.dll	01/02/2022 09:56	Application extension	37 KB
GrouperDatabaseVersionAPI.dll	01/02/2022 09:57	Application extension	15 KB
GrouperDescriptions.dll	01/02/2022 09:57	Application extension	16 KB
GrouperRdfMappings.dll	01/02/2022 09:57	Application extension	26 KB
GrouperSchemaReader.dll	01/02/2022 09:57	Application extension	33 KB
GUIShell	01/02/2022 09:57	Application	225 KB
GUIShell.exe.config	01/02/2022 09:56	CONFIG File	4 KB
HomeGUI.dll	01/02/2022 09:56	Application extension	24 KB
HRGGrouperc	01/02/2022 09:57	Application	130 KB
HRGGrouperc.exe.config	01/02/2022 09:56	CONFIG File	1 KB
Newtonsoft.Json.dll	13/06/2016 23:06	Application extension	514 KB
RdfGUI.dll	01/02/2022 09:57	Application extension	58 KB
SharedGUIResources.dll	01/02/2022 09:57	Application extension	617 KB
SingleSpellGUI.dll	01/02/2022 09:56	Application extension	94 KB
System.Windows.Controls.Input.Toolkit.dll	15/01/2012 01:17	Application extension	107 KB
Uninstall	01/02/2022 13:47	Application	151 KB
ViewerGUI.dll	01/02/2022 09:57	Application extension	48 KB
WPFToolkit.dll	15/01/2012 01:17	Application extension	457 KB

There is no need to uninstall the product if you are re-installing a fresh copy. Provided the file names have not been altered and the same destination folder is selected, the executable will overwrite the previous installation.

New products will similarly install as separate folders and will not affect previous products based on a different design.

If, however, you do need to uninstall the product, the only consideration before activating the Uninstall.exe is to ensure that the above files are contained within a distinct separate folder.

This only matters to users who have used the functionality to create bespoke destination locations or who have altered the names of the destination folders/file names or added files to the program file folder after the installation. In this circumstance, the files listed above need to be contained in a separate sub-folder before activating the uninstaller.

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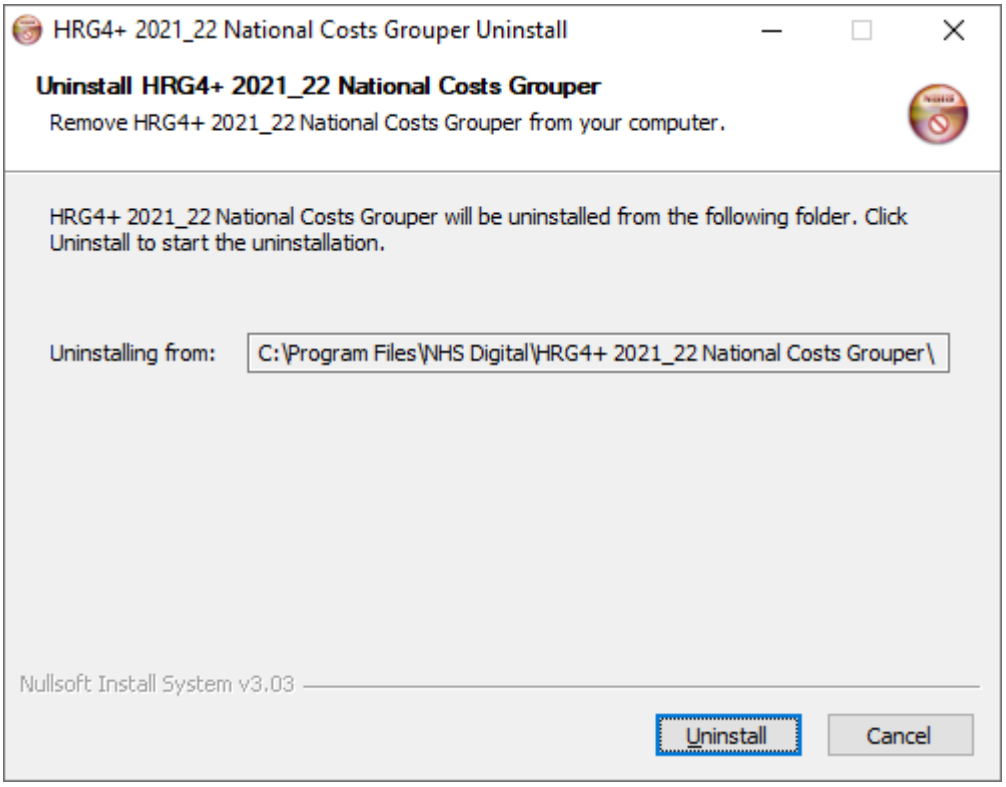
If you are ready to uninstall, simply double-click **Uninstall.exe**. This will bring up an uninstall dialogue box.



The uninstall screen confirms the folder and file path from which the software will be uninstalled.

Once you are happy that the folder and file path are correct, select **Uninstall**.

Whilst we strongly recommend that users use the default installation folder, we recognise that by giving users the flexibility to install the product as they wish, users may, in rare circumstances, wish to change the folder or file names, add files into the destination folders, or choose to not locate the Grouper files in a distinct sub-folder location. In these circumstances, where a user has deviated from the default, the uninstallation process will not execute correctly. This can be resolved by ensuring the installation files are named as given above and are stored in a separate sub-folder, as per the standard install.

Any files remaining after the uninstallation process is complete will not have been created as part of the standard install or will have been altered. These legacy files/folders can be moved or individually deleted as deemed appropriate by the user.

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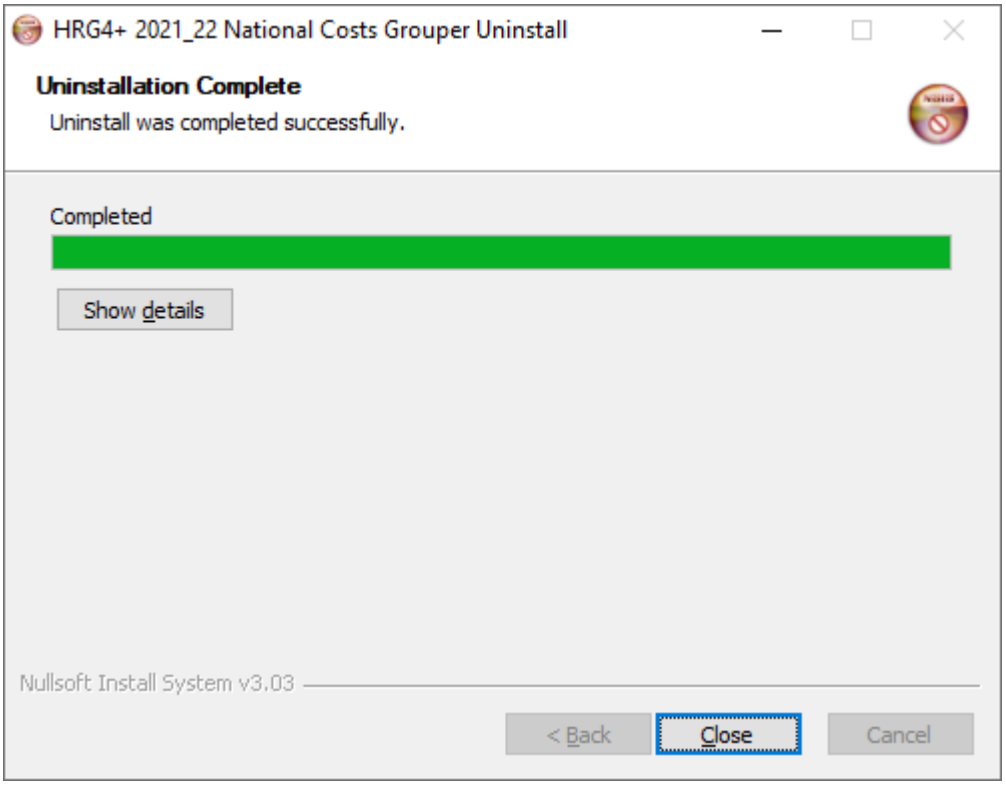
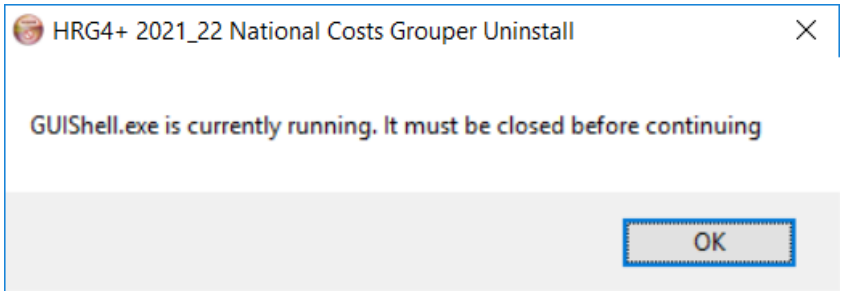


The uninstallation screen shows the progress of the uninstallation. Once this process has completed, click **Close**.

If any of the Grouper files are open during the uninstallation process, the uninstallation will be halted, and the following message will be displayed.



To continue the uninstallation process, close all open Grouper files and click **OK** to restart the uninstallation process.

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Grouper Functionality

This section will explain the different functionality available to users in the Grouper software. In order to help users understand how to use the functionality available, each section will use the default RDFs and sample data that are installed as part of the Grouper installation and the sample data and expected results available for download from the National Casemix Office website, i.e. the same site from which the Grouper was downloaded.

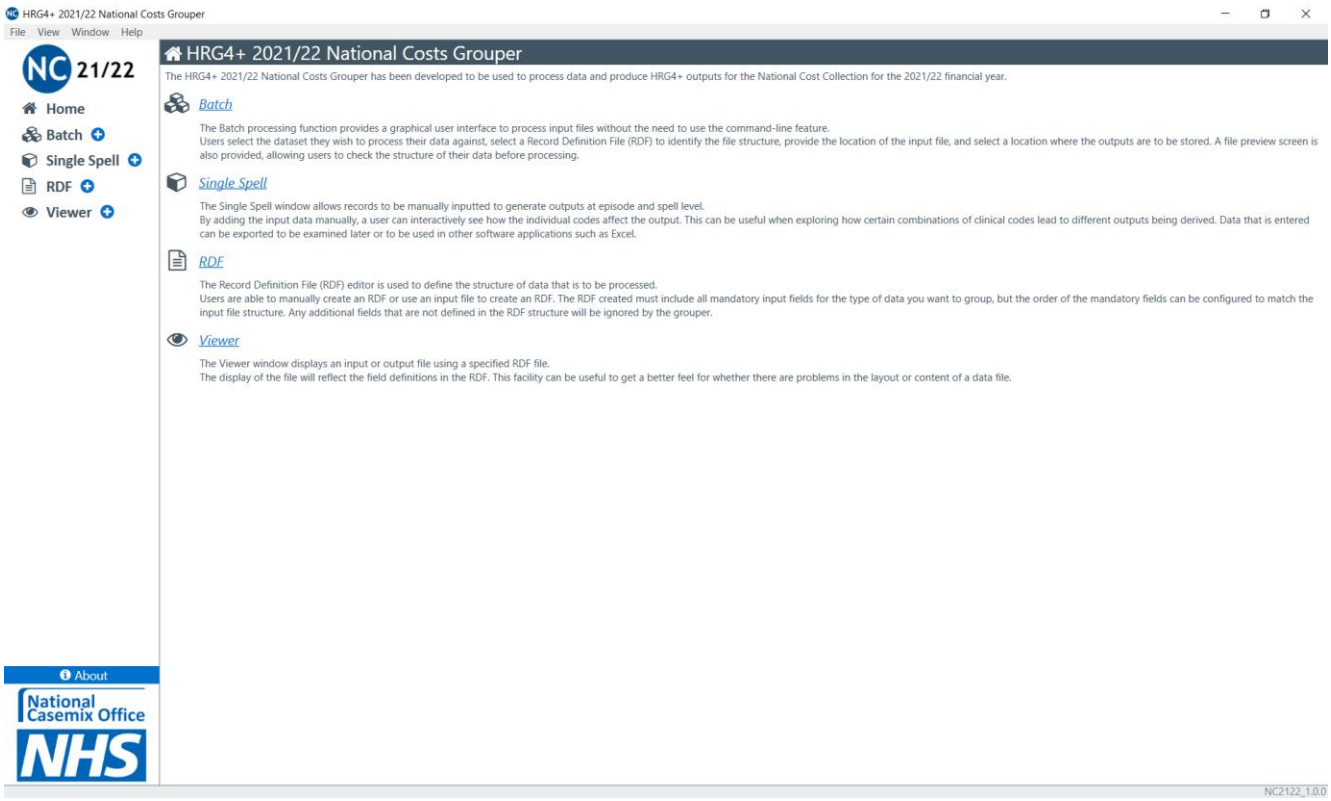
Batch Processing

Large amounts of data can be grouped via the Batch screen or command line. This section covers processing data via the Batch screen.

Before walking through how to use the Batch screen, ensure you have access to the sample data that is installed as part of the Grouper installation or downloaded from the National Casemix Office website.

If the sample data was not installed as part of the Grouper installation process, then download the “HRG4+ 202122 National Costs Grouper Test Data and Expected Results v.1.0” zip file from the same page as the Grouper and extract the contents of the zip file to a suitable location.

Open the Grouper application via the start menu or the GUIShell.exe within the installation folder.



Opening a Batch screen can be done in several ways:

- Select the ⊕ icon next to **Batch** on the navigation pane.
- Select the *Batch* title hyperlink or the icon on the main home screen.

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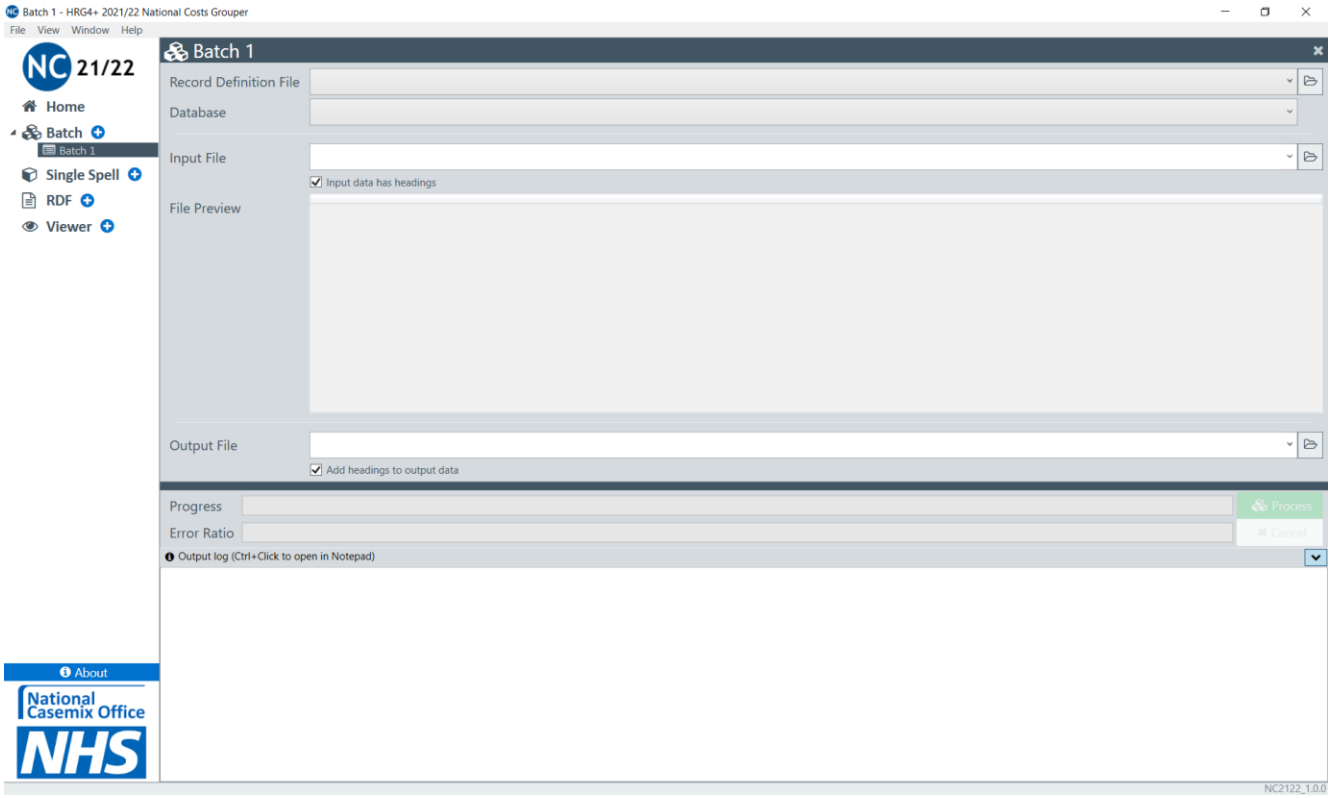
- Select **File** on the menu bar, then **New** and then **Batch**; or
- Use shortcut keys **Alt+B**.



In order to group data, a **Record Definition File (RDF)** must be selected. An RDF tells the Grouper the structure of the data you want to process, so input fields must match to the field position in the RDF. The Grouper comes with a set of sample RDFs; otherwise, there is an RDF Editor within the Grouper that allows users to create their own RDFs to match the structure of an input file.

To select an RDF, click the  icon to the right of the **Record Definition File** drop-down box. This will open the **Open Record Definition File** dialog box, allowing a user to search for the relevant RDF. The sample RDFs are located in the application's installation folder in a sub-folder called `Default RDF`.

Open the file `HRG4+_default_APC.rdf`. The sample RDF selected must match the database being used, e.g. if you are grouping APC data, the sample RDF specific to APC must be used.

Alternatively, an RDF can simply be dragged and dropped from a file explorer window straight into the **Record Definition File** drop-down box.

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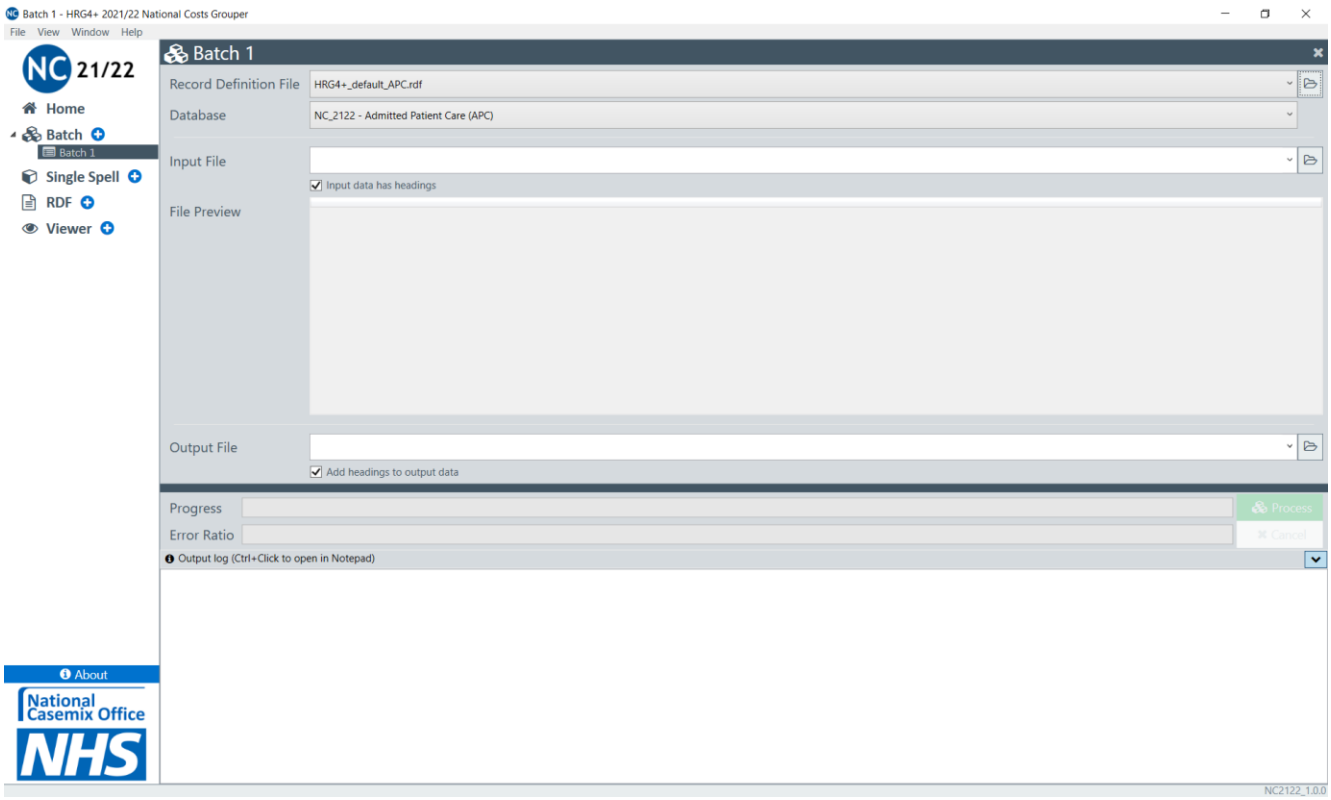

When an RDF is selected, the **Database** drop-down box will automatically populate with one of the seven databases used for grouping. The Grouper chooses the relevant database based on the fields defined in the RDF and processes the data with the correct algorithm.

The next step is to select an input file for grouping. To select an input file, click the  icon to the right of the **Input File** drop-down box. This will open the **Open Input File** dialog box, allowing a user to search for the relevant input file for grouping. The sample data files are located in the application's installation folder in a sub-folder called `Sample Data`.

Open the file `HRG4+ Admitted Patient Care Sample Test Data.csv`. If you are using a different database, the sample data file specific to that database must be used.

Alternatively, an input file can simply be dragged and dropped from a file explorer window straight into the **Input File** drop-down box.

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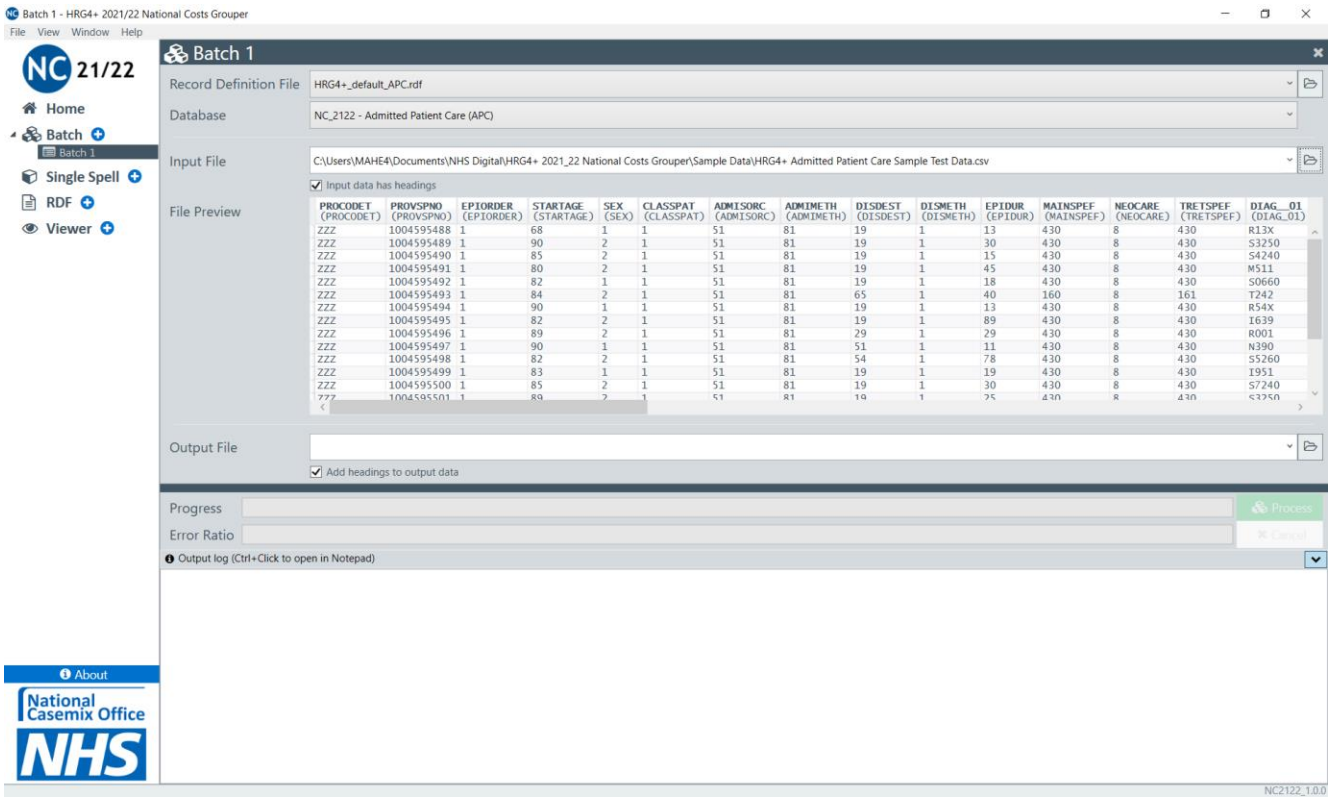

Ensure that the **Input data has headings** checkbox is checked. This tells the Grouper not to process the first line of the input file. If the first row of the input file does not contain headers, the checkbox should be unchecked.

The Batch screen contains a **File Preview** window that allows users to check their input file data against the RDF to see if there are any problems in the layout or content of the input file.

The next step is to select the file location to which the Grouper output files are to be written. To select an output file location, click the  icon to the right of the **Output File** drop-down box. This will open the **Save Output File** dialog box, allowing a user to navigate to the relevant location to which the Grouper output files should be written. Go to the folder containing the input file and type `output_apc_sample` (or anything similarly appropriate) in the **File name** box and click **Save**. The filename of the output file is displayed in the **Output File** drop-down box.

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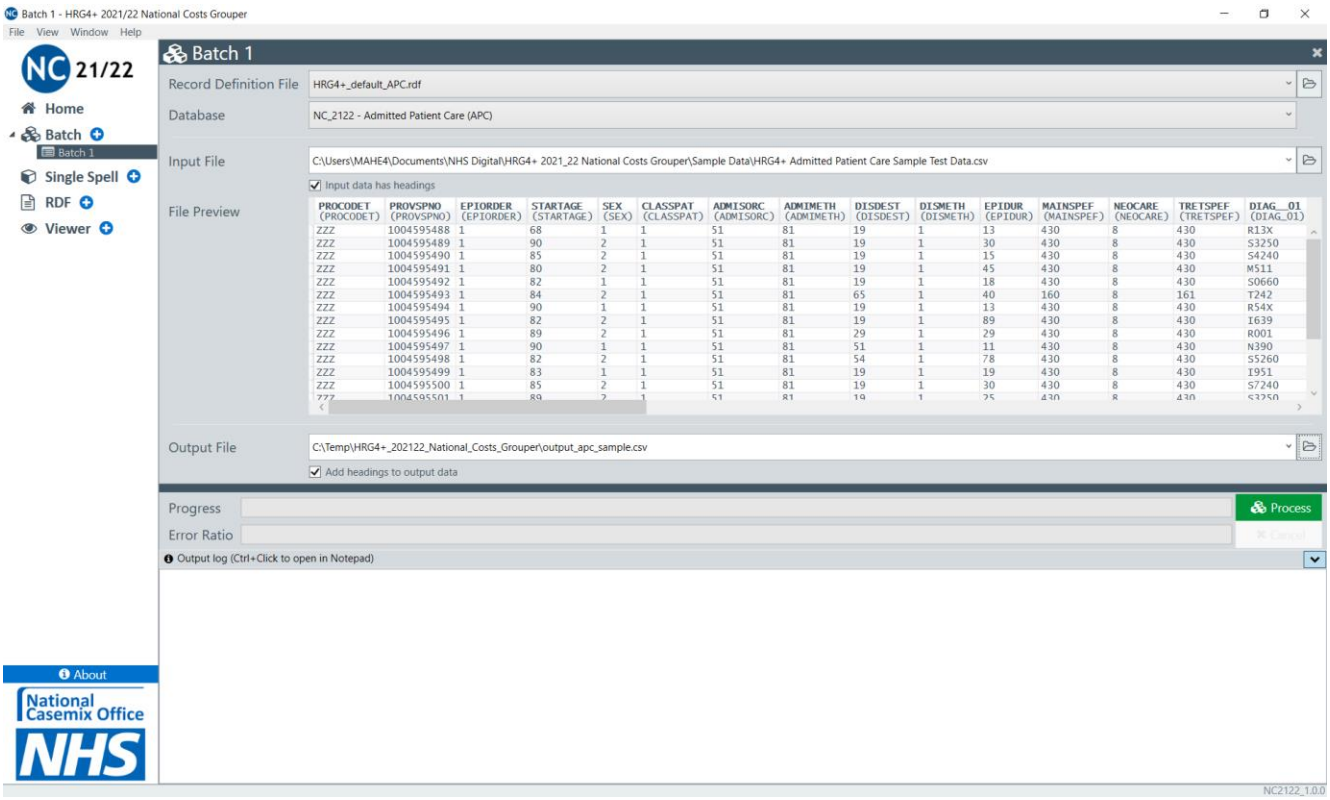
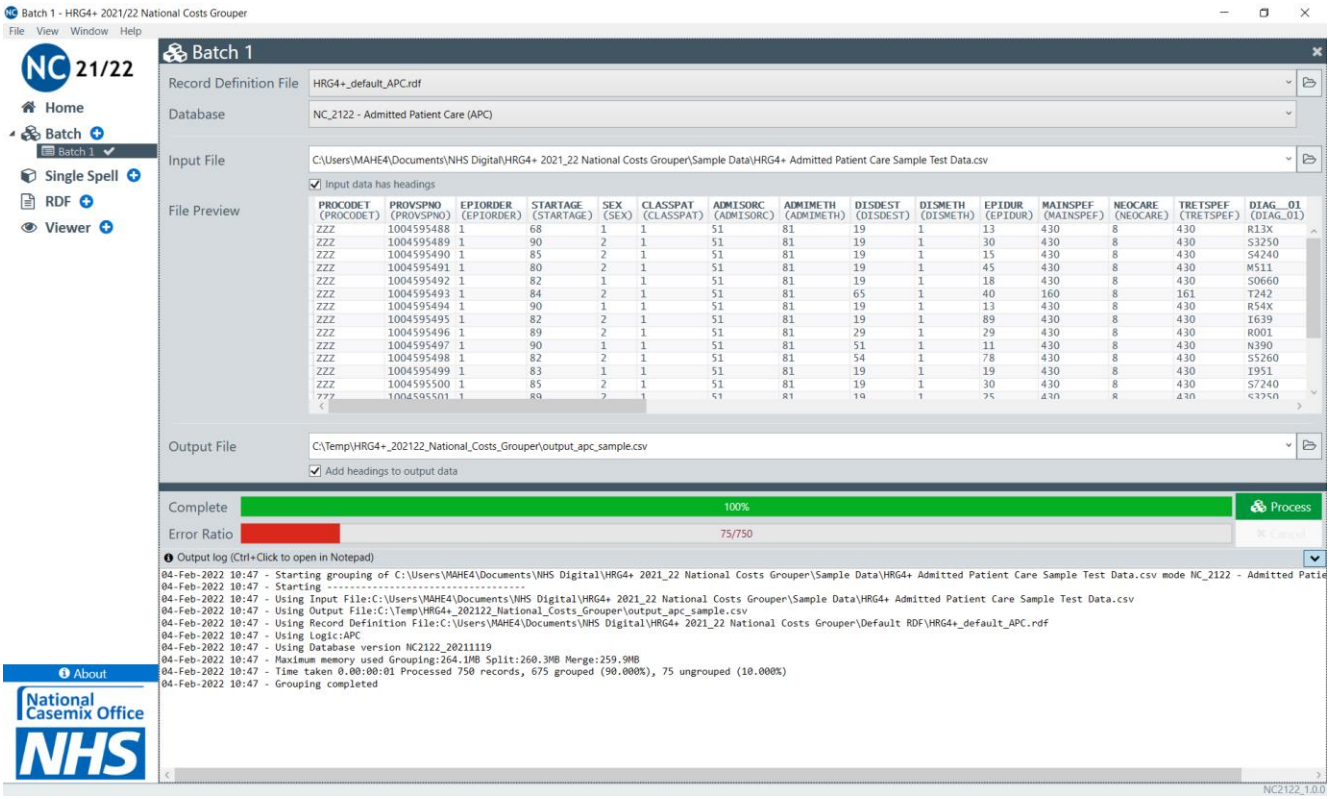


Ensure that the **Add headings to output data** box is checked. This adds column headings to the output files. A full list of output headings can be found in the **Output Files** section.

Once everything has been selected, the green **Process** button becomes active. To process the input file, click **Process**.



The **Complete** bar indicates how far the Grouper has progressed is in processing the file, and the **Error Ratio** bar indicates the number of errors detected in grouping the data. If a

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user wishes to abort the grouping process, the **Cancel** button can be used to stop processing.

When finished, the **Output log** display area shows information about the grouping session, including the number of records grouped. These details can also be found in the file `hrg.log`. To open the log file, select **Help** on the menu bar and then **View Log**.

To view the output files, open Windows Explorer and navigate to the location specified for the output file. Open the file `output_apc_sample_FCE.csv` in Microsoft Excel. The file is a copy of the input file with HRGs and other related columns appended.

Command Line Initiation

The alternative way to process large files is via command line. Command line refers to the character-based command shell user interface within Microsoft Windows, commonly known as the DOS Window. The Grouper can process a file using the command line with parameters shown below.

The parameters consist of a hyphen followed by a lower-case letter and, where applicable, a value (shown in italics). All parameters are mandatory except for the optional parameters shown enclosed in square brackets.

The command line takes the following form:

HRGGrouperc.exe -i *Input_File* -o *Output_File* -d *RDF_File* -l *Grouping_Logic* [-h] [-t] [-v] [-?] [> *Log_File*]

Command line parameters:

`-i` *`Input_File`*	The path and filename of the **i**nput file.
`-o` *`Output_File`*	The path and filename of the **o**utput file.
`-d` *`RDF_File`*	The path and filename of the record **d**efinition file.
`-l` *`Grouping_Logic`*	The grouping **l**ogic. The available values are APC, ACC, EM, NAC, PCC, NRD and NCC.
`-h`	Optional. Where present, indicates that the input file has a **h**eader row (field names). Omit this parameter where the first row in the file is a data row.
`-t`	Optional. Where present, stops generation of field names in the **t**op row of the output file. If this parameter is omitted, then each of the output files will contain a header row.
`-v`	Optional. Increases verbosity of the log output.
`-?`	Optional. Where present, directs the Grouper to list the available command line parameters. This parameter cannot be combined with other parameters.

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> Log_File	Optional. Where present, the Grouper redirects the log output to a specified file. If not used, the log output is written to the screen.

Where there are spaces in paths or filenames for parameter values, the parameter value must be enclosed within double-quote characters.

Running the Grouper

It is recommended that users invoke the command line Grouper from a script (also known as a batch file). For example, to group some APC data (with headings) in C:\Temp\data\apc.csv using a suitable Record Definition File (APC.rdf) in the same directory, then a suitable script is:

```
@echo off
cd /d "c:\Program Files\NHS Digital\HRG4+ 2021_22 National Costs Grouper"
HRGGrouperc.exe -i "c:\Temp\data\apc.csv" -o "c:\Temp\data\output.csv" -
d "c:\Temp\data\apc.rdf" -l APC -h > "c:\Temp\data\hrg.log"
if %ERRORLEVEL% neq 0 echo Error in command, please check hrg.log
pause
```

Alternatively, it is possible to run the Grouper from a working directory by invoking hrggrouperc.exe as a fully qualified path:

```
@echo off
cd /d "c:\Temp\data"
"c:\Program Files\NHS Digital\HRG4+ 2021_22 National Costs
Grouper\HRGGrouperc.exe" -i "apc.csv" -o "output.csv" -d "apc.rdf" -l APC
-h > "hrg.log"
if %ERRORLEVEL% neq 0 echo Error in command, please check hrg.log
pause
```

The penultimate statement of these scripts checks whether the Grouper run was successfully completed and prints a message if the run failed.

Single Spell Grouping

The Single Spell module is best used to help understand how outputs are derived for one particular spell or episode. By adding the input data manually, a user can see how the individual codes affect the output in real time. This can be useful when exploring how certain combinations of clinical codes lead to different HRGs being derived. It can also be useful to quickly find the descriptions of codes and ascertain which fields are mandatory (expressed in **bold** text).

Opening a Single Spell screen can be done in several ways:

- Select the icon next to **Single Spell** on the navigation pane;
- Select the *Single Spell* title hyperlink or the icon on the main home screen;
- Select **File** on the menu bar, then **New** and then **Single Spell**; or
- Use shortcut keys **Alt+S**.

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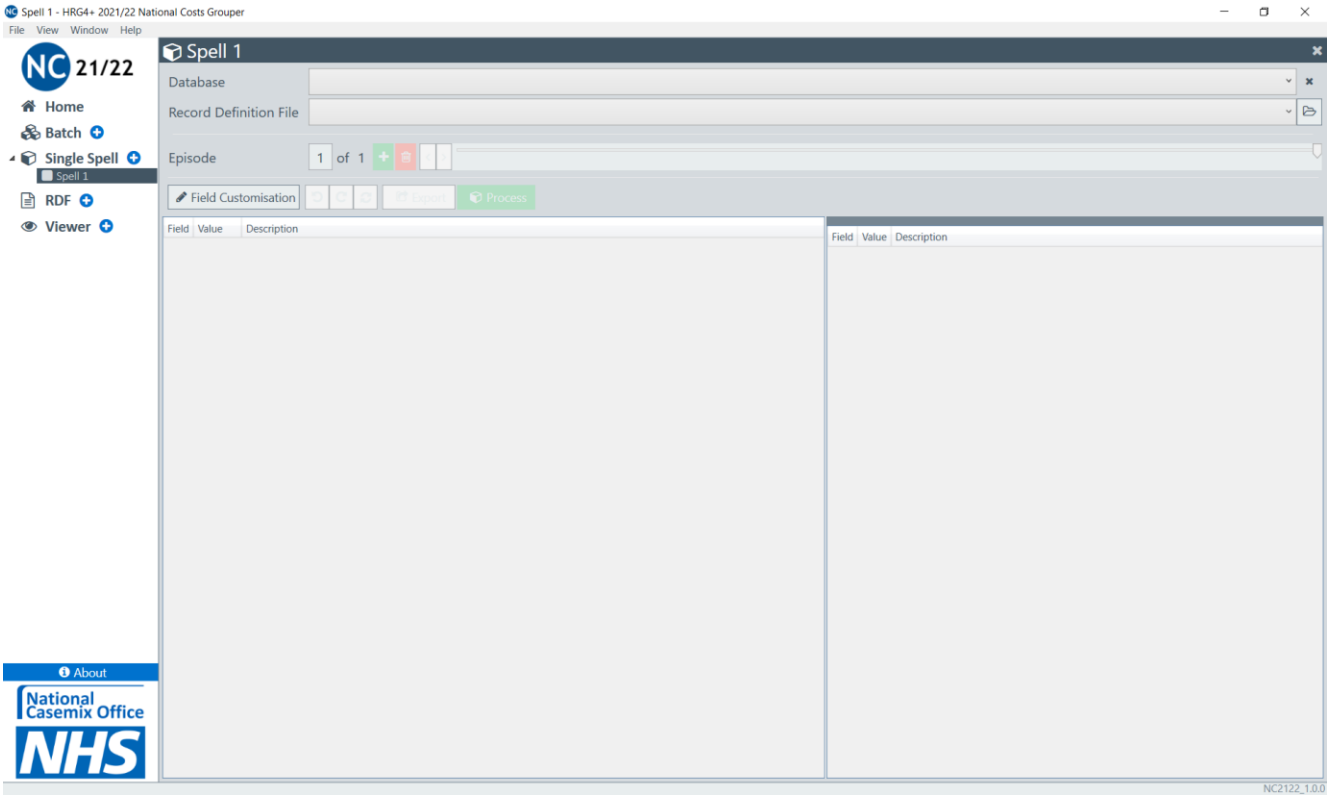

There are two ways to create a record in Single Spell. The first way to add a record is to select database from the **Database** drop-down list, which will automatically populate the screen with a set of default input fields to allow a user to group data. The second way is by selecting a Record Definition File (RDF) by either dragging an RDF directly into the **Record Definition File** box or by using the  icon to the right of the **Record Definition File** box. Selecting a **Record Definition File** will automatically choose the relevant **Database**.

Select **NC_2122 – Admitted Patient Care (APC)** from the **Database** drop-down list. The **Record Definition File** drop-down box will populate with a **<Default RDF>**, and based on the Default RDF, the Single Spell window will populate with a set of input fields.

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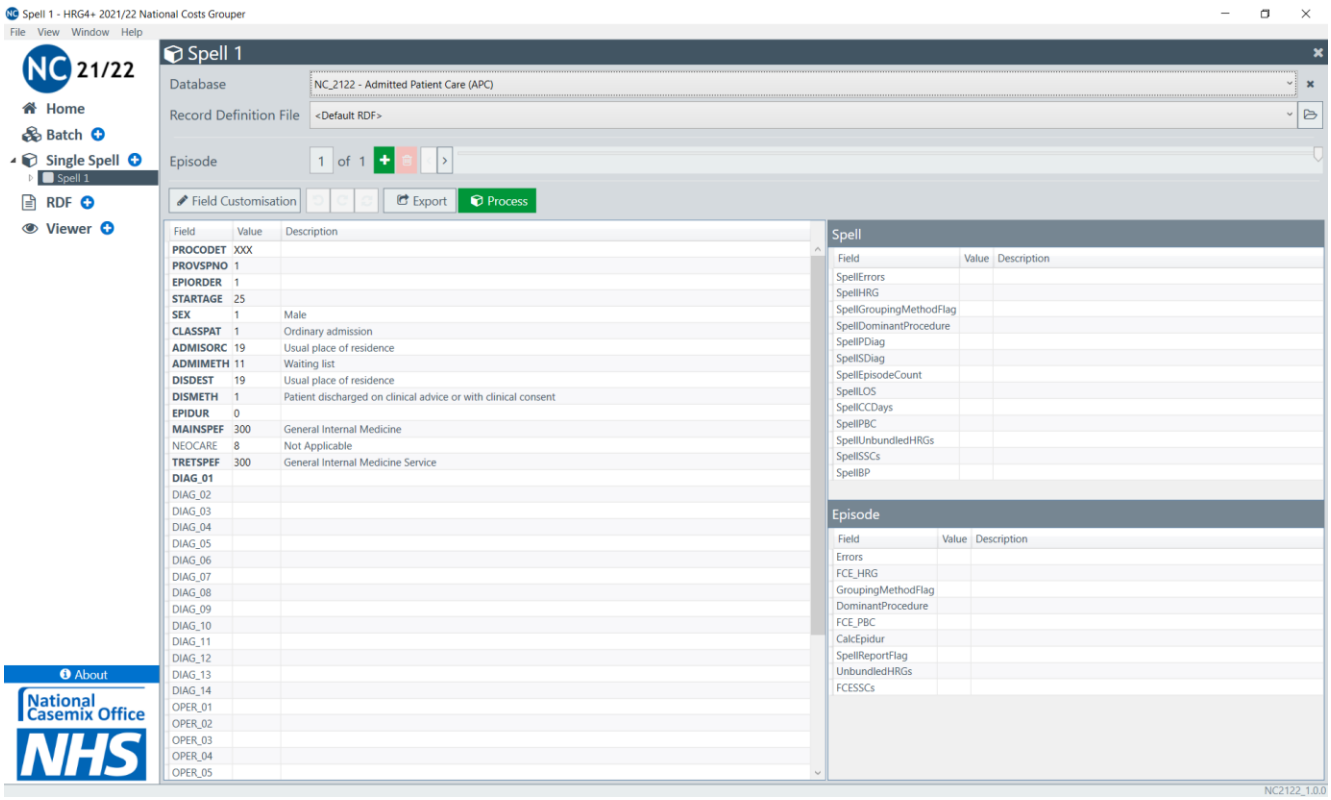
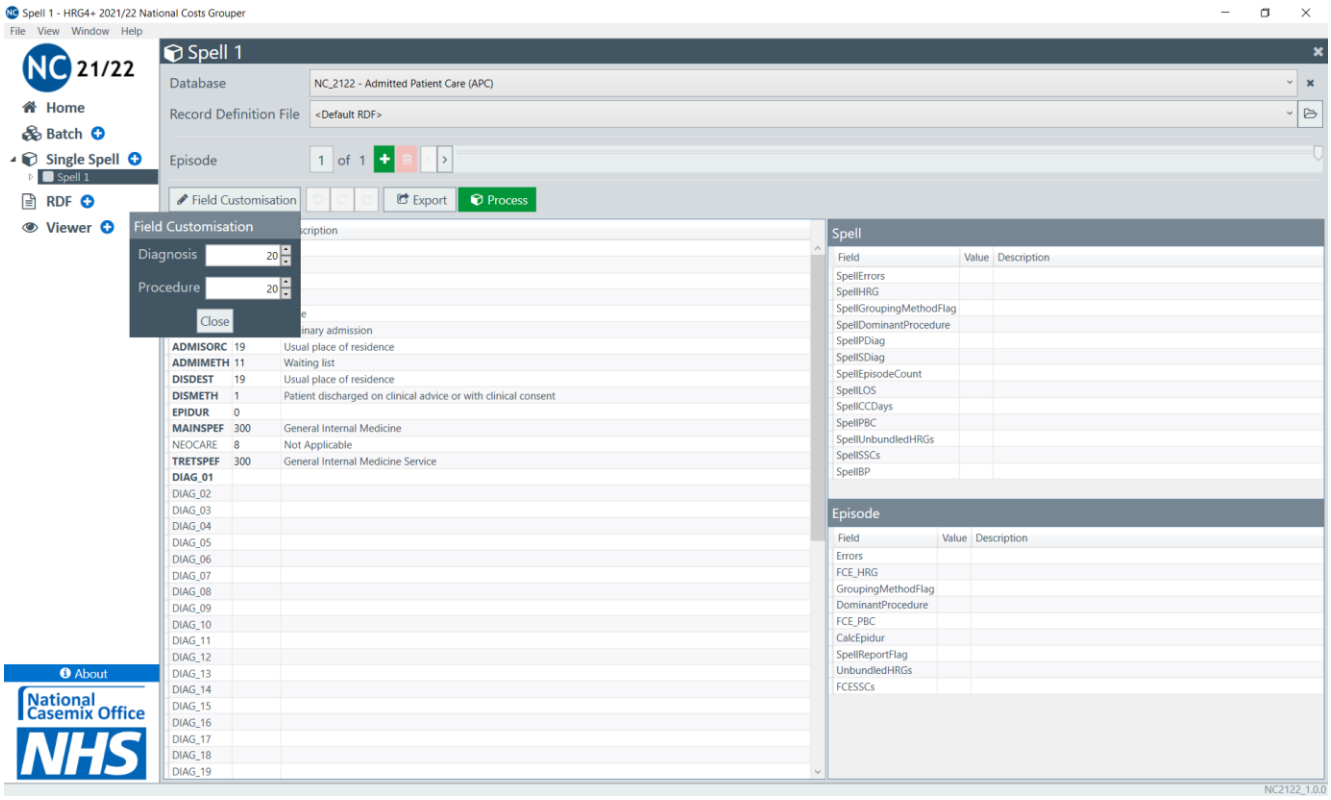


When using Single Spell, it may be appropriate to increase or decrease the number of variable fields for a database. The **Field Customisation** button allows users to easily increase certain fields without the need to create a bespoke Record Definition File.

Select the **Field Customisation** button and set the diagnosis and procedure fields to 20.



The input window should now display 20 diagnosis fields and 20 procedure fields.

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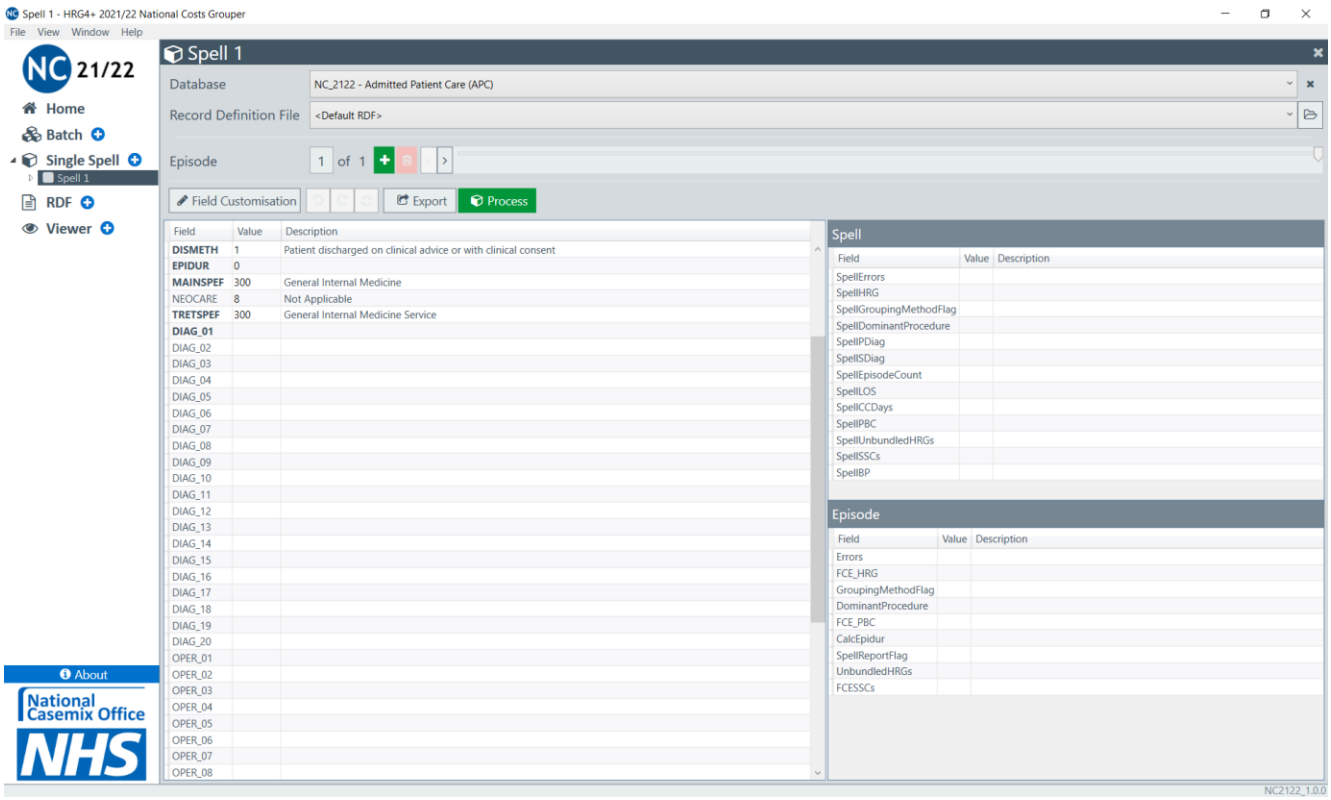

When a Database or Record Definition File is selected, certain fields in the input window are already populated with useful values to save some data input effort, but users can edit these values and populate other fields as appropriate.

Certain input fields contain an auto-complete function, meaning that when a user starts typing in the cell, a list of 10 relevant codes will be displayed along with their description. If a user continues to type in the input cell, the list of codes will narrow based on pattern matching.

For example:

In the **Diag_01** value cell, type “**N**”. You will see a list of 10 possible values appear, which a user can choose from.

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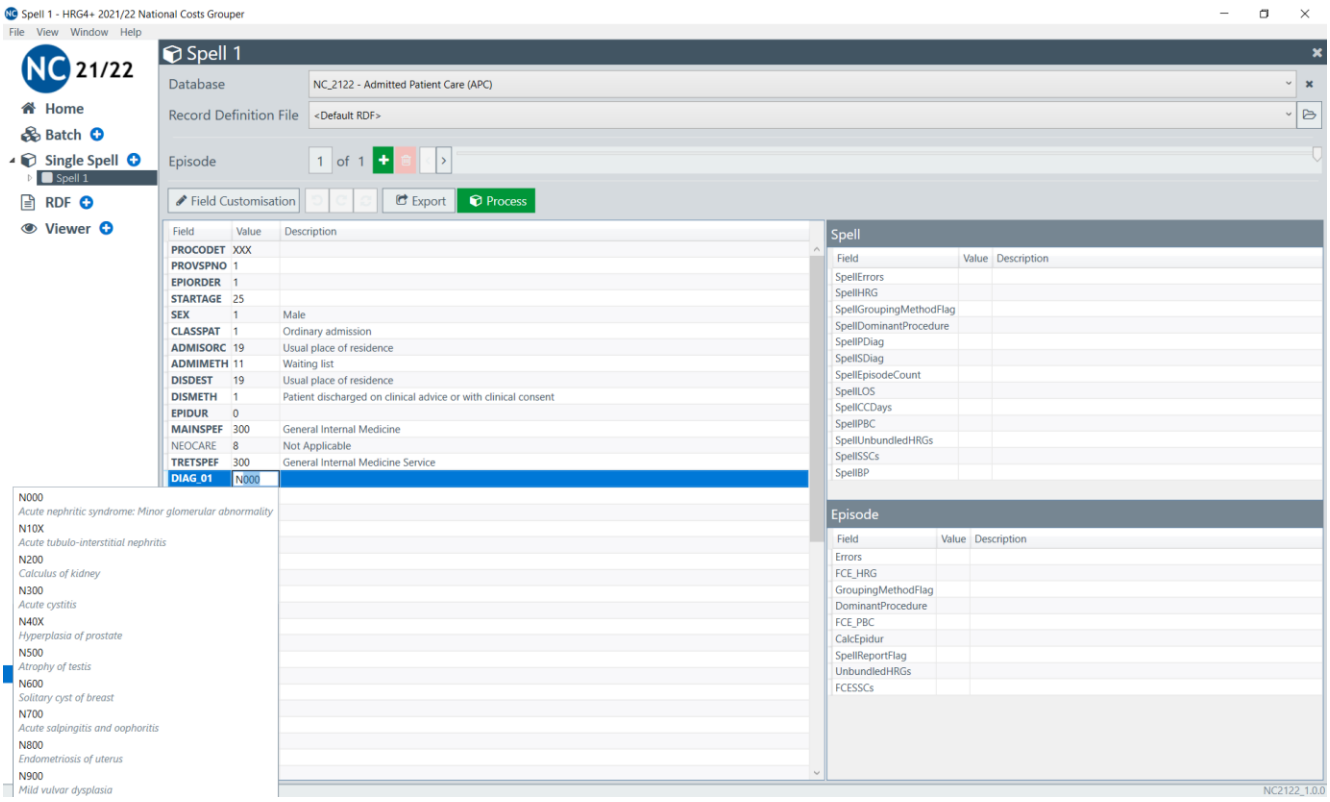
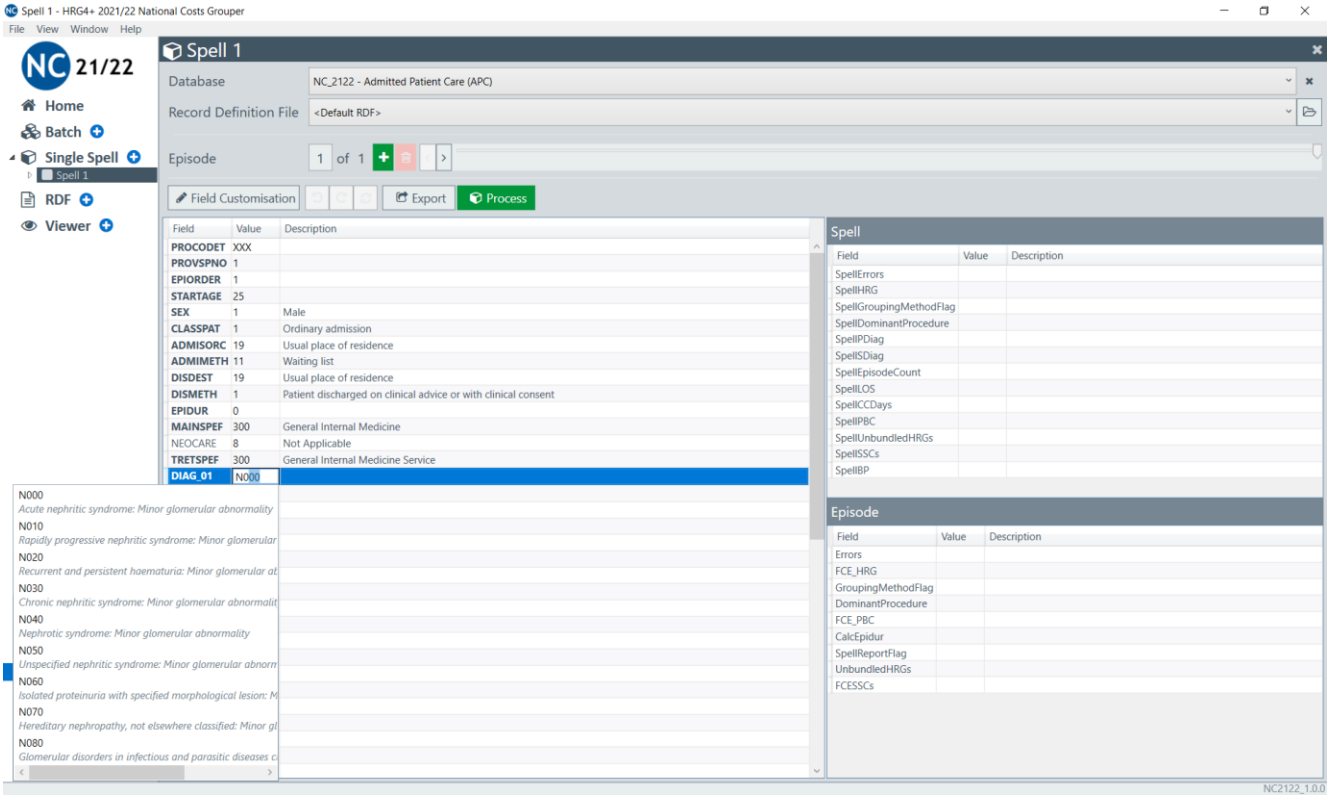


After “**N**”, type “**0**” and the list of 10 options will alter to possible values starting with “**N0**”.



Select value “**N000**” (Acute nephritic syndrome: Minor glomerular abnormality). Once selected, the input values will automatically process and produce outputs in the Spell and Episode windows.

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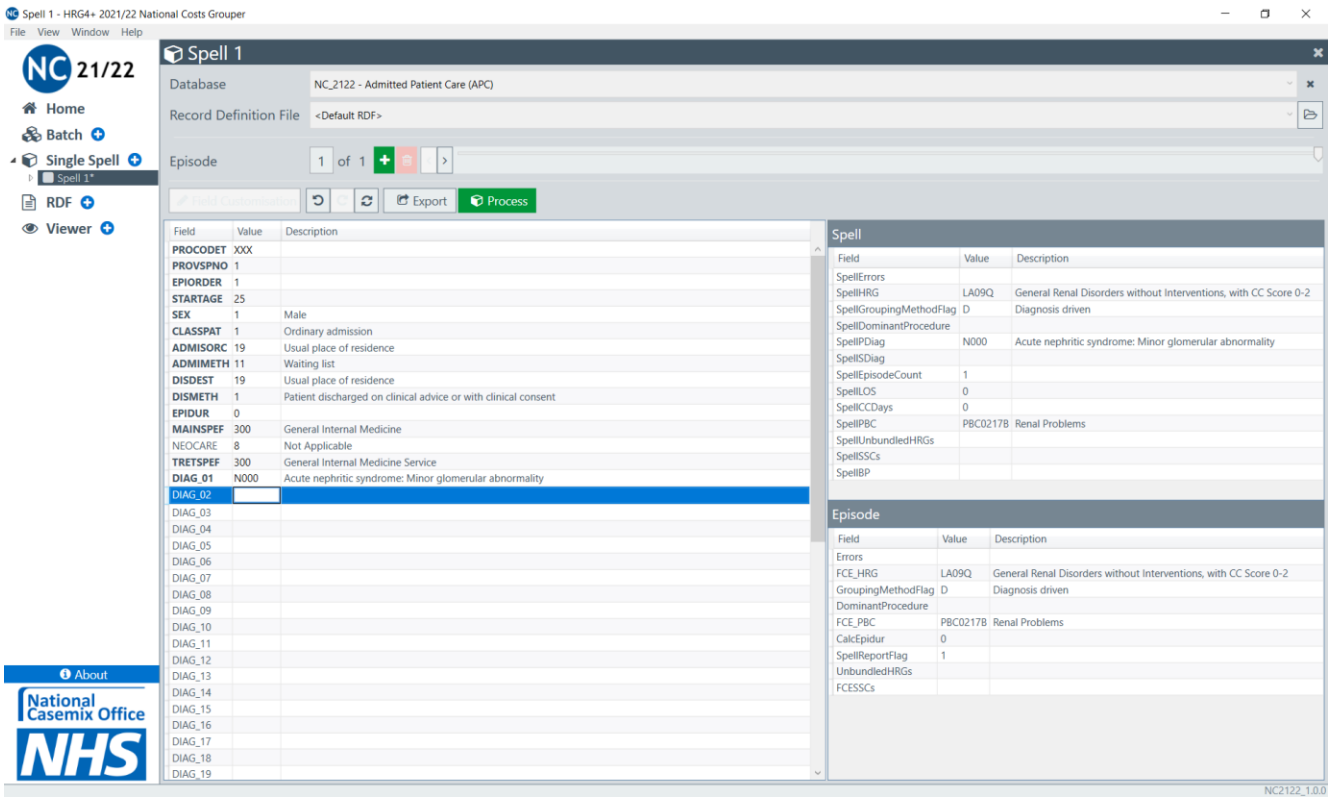
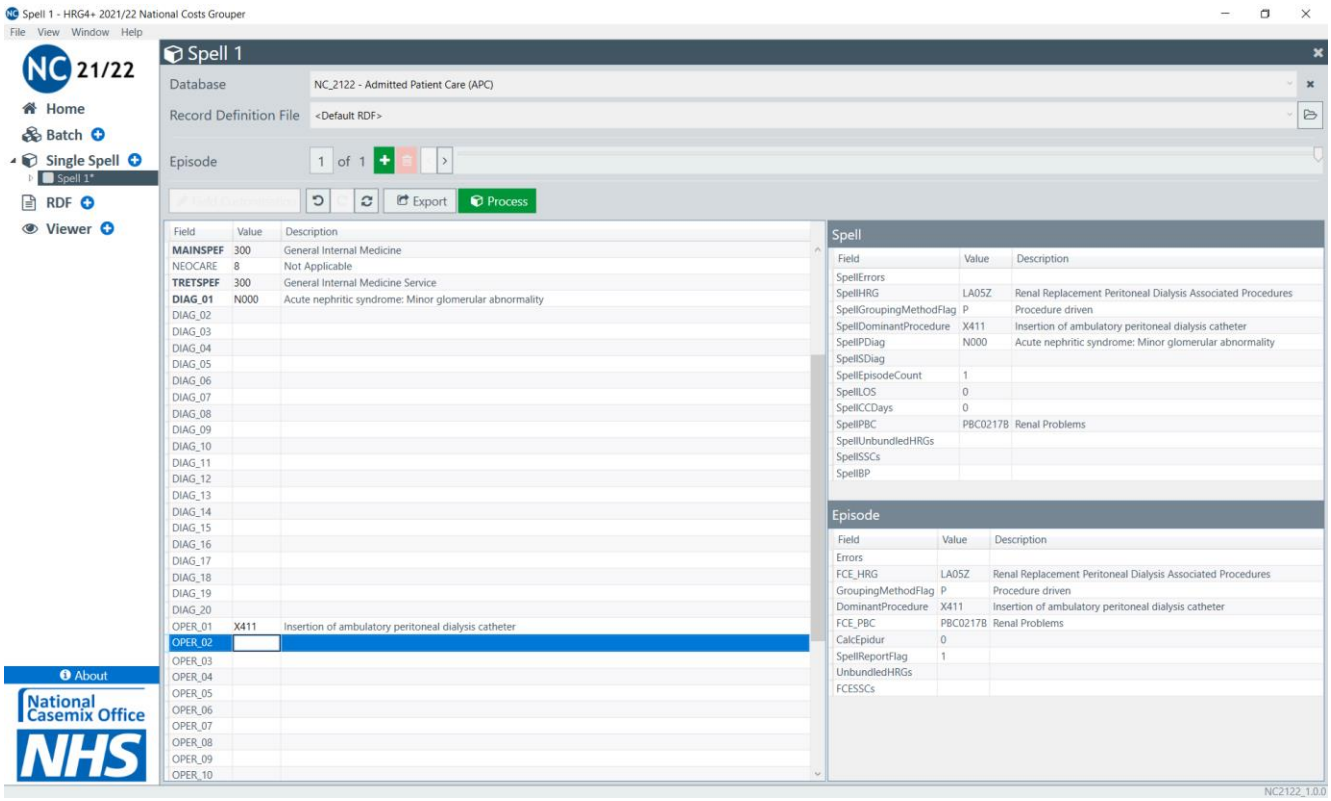


Now add code "**X411**" (Insertion of ambulatory peritoneal dialysis catheter) to the **OPER_01** value cell.



Once entered, the Spell and Episode outputs change from diagnosis-driven grouping to procedure-driven grouping, with the Episode and Spell HRGs changing.

In certain circumstances, a user may want to undo or redo an action performed in Single Spell. To undo a particular action, click the undo icon or use the shortcut keys **Ctrl+Z**. To

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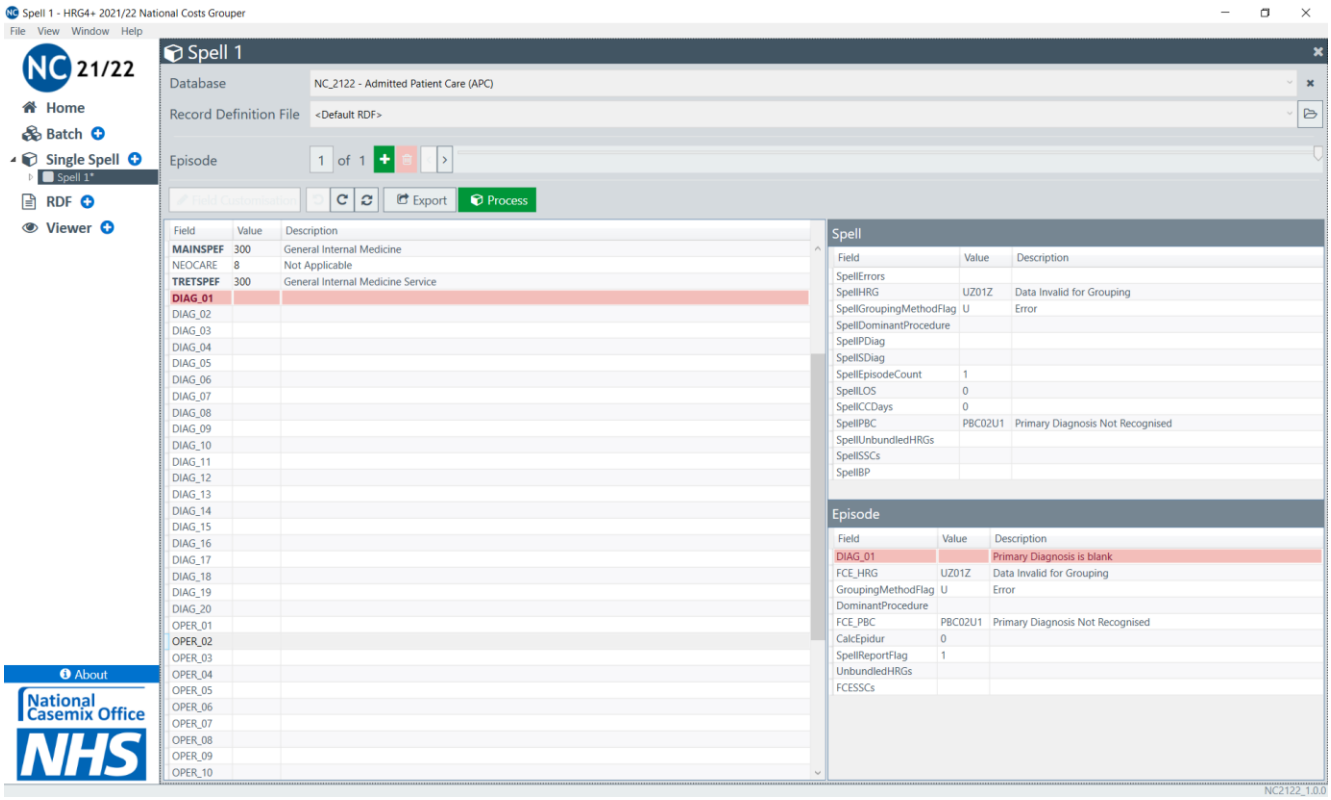
redo a previous action, click the redo icon or use the shortcut keys **Ctrl+Y**. The undo and redo buttons store up to a maximum of 5 changes. Where a user makes several changes to the input values in the Single Spell window and wants to return to the values when Single Spell was first opened, then selecting the Reset button will reset the Single Spell window back to its default values for a specific database.

Select the undo icon and the value "**X411**" is removed from the value field of OPER_01. Selecting the undo icon again will remove the value "**N000**" from DIAG_01, which causes the error message "Primary Diagnosis is blank" to be generated.



Select the redo icon and the value "**N000**" is re-populated in the value field of DIAG_01. Select the redo icon again and the value "**X411**" is re-populated in the value field of OPER_01.

For particular fields in Single Spell, there is "Drag and Drop" functionality, which allows users to drag a particular value from one field to another. The following fields contain the "Drag and Drop" facility:

APC – Diagnosis and Procedure fields

NAC – Procedure fields

EM – Investigation and Treatment fields

PCC – Critical Care Activity Code, Diagnosis and Procedure fields

NCC – Critical Care Activity Code fields

Enter the procedure code "**X428**" (Other specified placement of other apparatus for compensation for renal failure) into the OPER_02 value field and "**L725**" (Stimulated arteriography of pancreas) into the OPER_03 value field.

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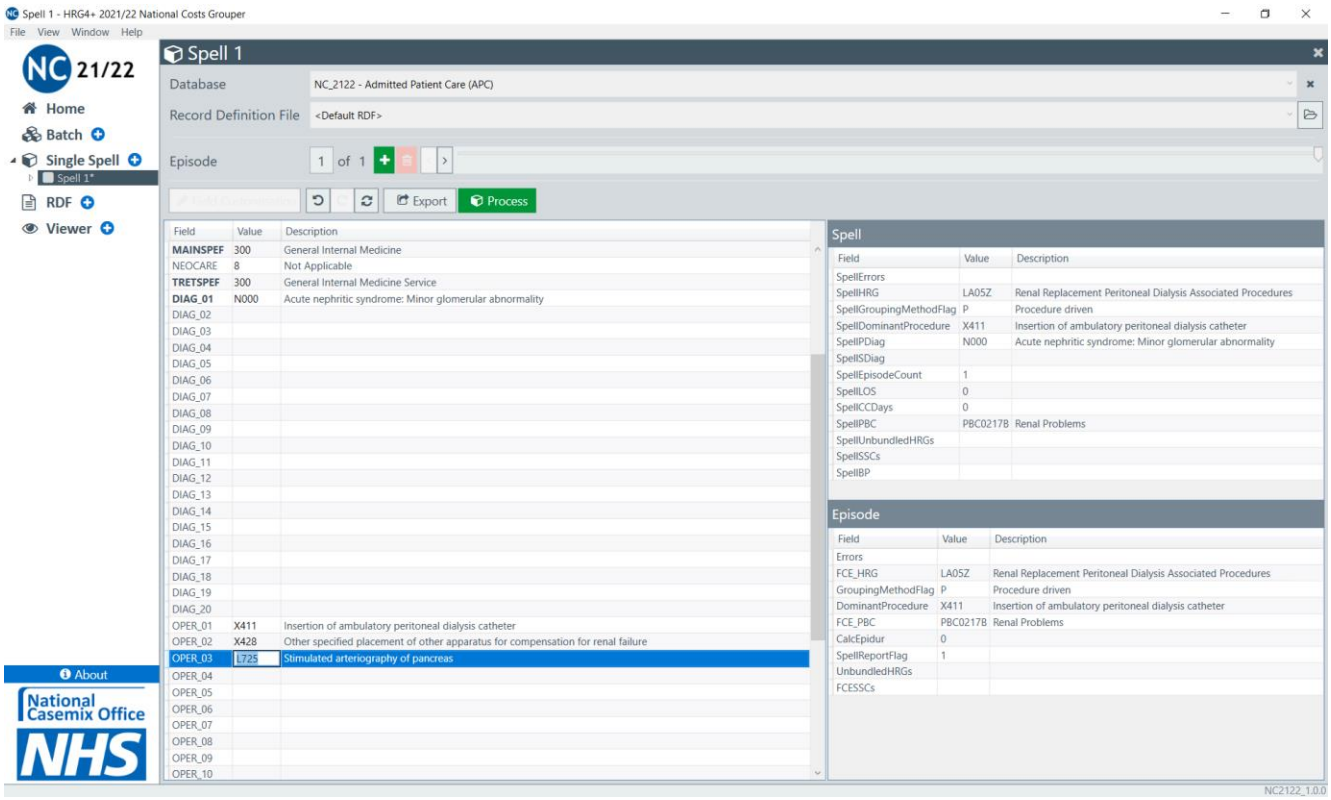
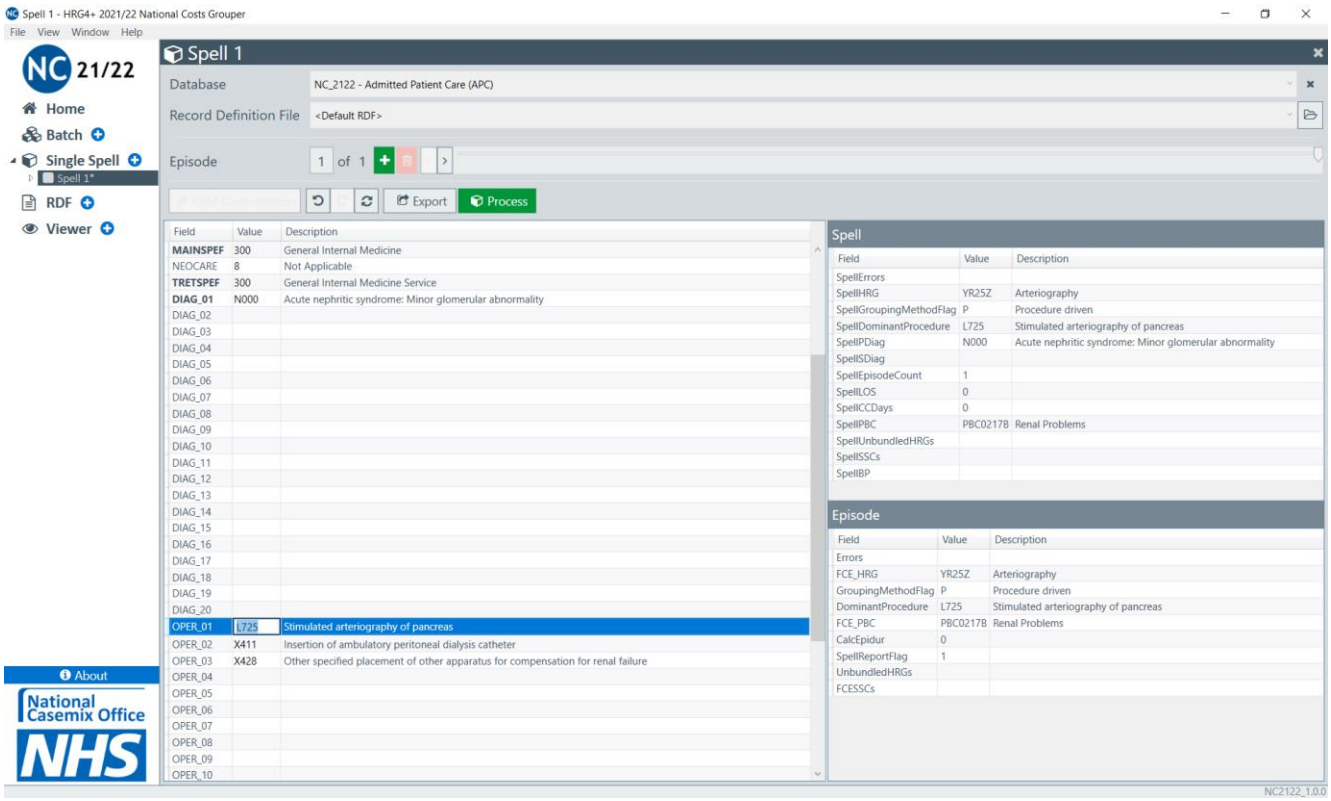
Click in the OPER_03 value field and highlight the value **L725**.



Using the cursor, select the actual value "**L725**" (highlighted blue) and drag it to the OPER_01 value field and drop it.



The OPER_01 value (**X411**) moves to OPER_02 and the OPER_02 value (**X428**) moves to the OPER_03.

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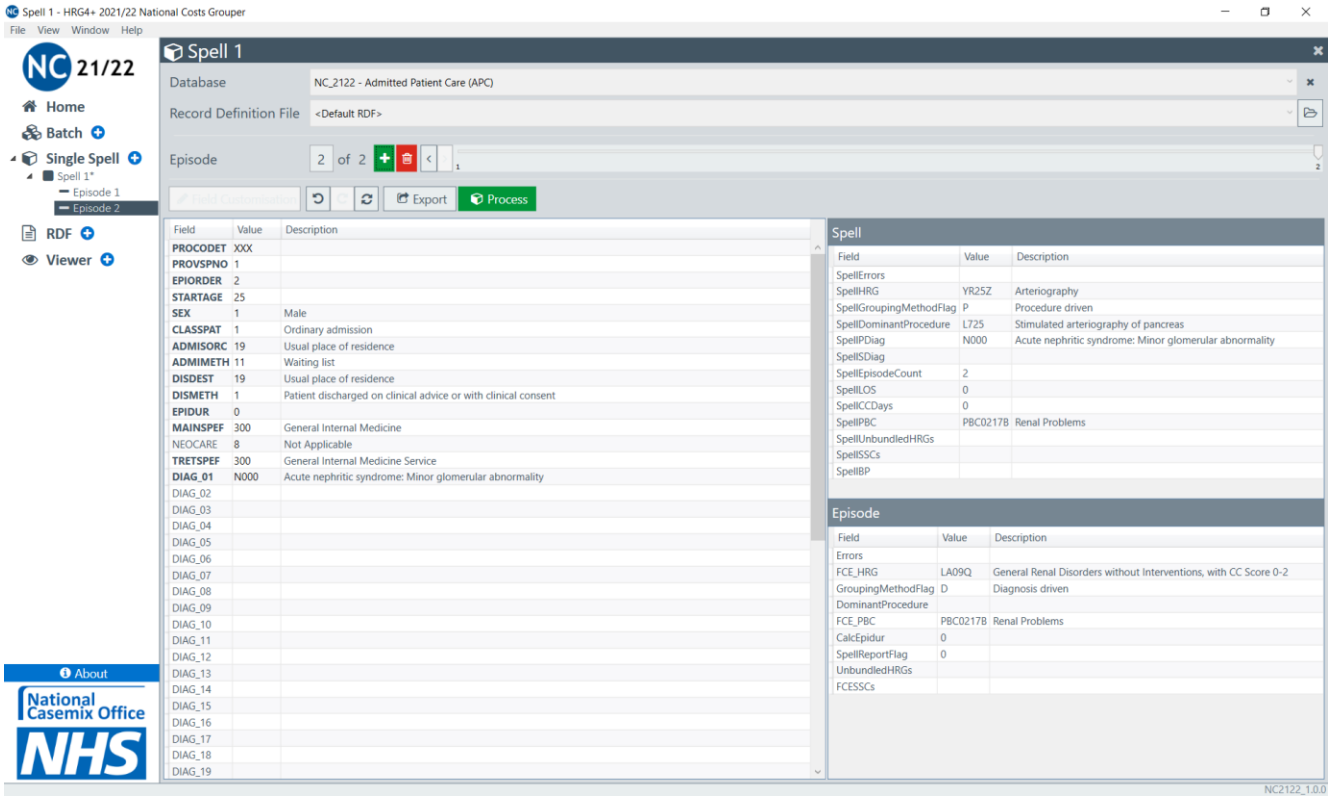
When values are moved, Single Spell automatically re-processes the data, so in this example **L725** (Stimulated arteriography of pancreas) becomes the dominant procedure code, resulting in the information in the Episode and Spell output windows changing. Previously, the Spell and Episode HRG was **LA05Z** (Renal Replacement Peritoneal Dialysis Associated Procedures), but this has now changed to **YR25Z** (Arteriography) as a result of the change in dominant procedure.

For some of the databases, such as Admitted Patient Care, it is possible to build up a spell consisting of multiple episodes. Additional episodes can be added by clicking the icon on the Single Spell window or by right-clicking on the particular Spell in the navigation pane and selecting **New Episode**. Databases that do not support additional episodes will have this functionality disabled.

Add a new episode to the current Spell by clicking the icon on the Single Spell window.

A new Episode window will open and certain information from the previous episode will be brought forward. This does not include non-primary diagnosis codes or procedure codes.



When the second episode is added, it automatically re-processes the input values again, and depending on the information in the episodes, the information in the Episode and Spell windows may change.

A user can navigate between different episodes within a Spell by either clicking on the **Episode** numbers in the navigation pane, entering a specific episode number in the **Episode Number box** or by using the **Slider bar**.

Single Spell allows information from other sources to be copied and pasted directly into the Single Spell window.

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The first way of copying information from an application such as Excel is to select a row of data from a file, along with header information, and paste it directly into the Single Spell window.

This is known as "**smart pasting**", and it uses the header information to identify which cells to paste the information into. This is a useful way of pasting information into Single Spell where the input fields in the Single Spell window are in a different order to the data being copied. The disadvantage to this method of copying and pasting is that the headers from where the data is being copied must be named exactly the same as the field names in the Single Spell window.

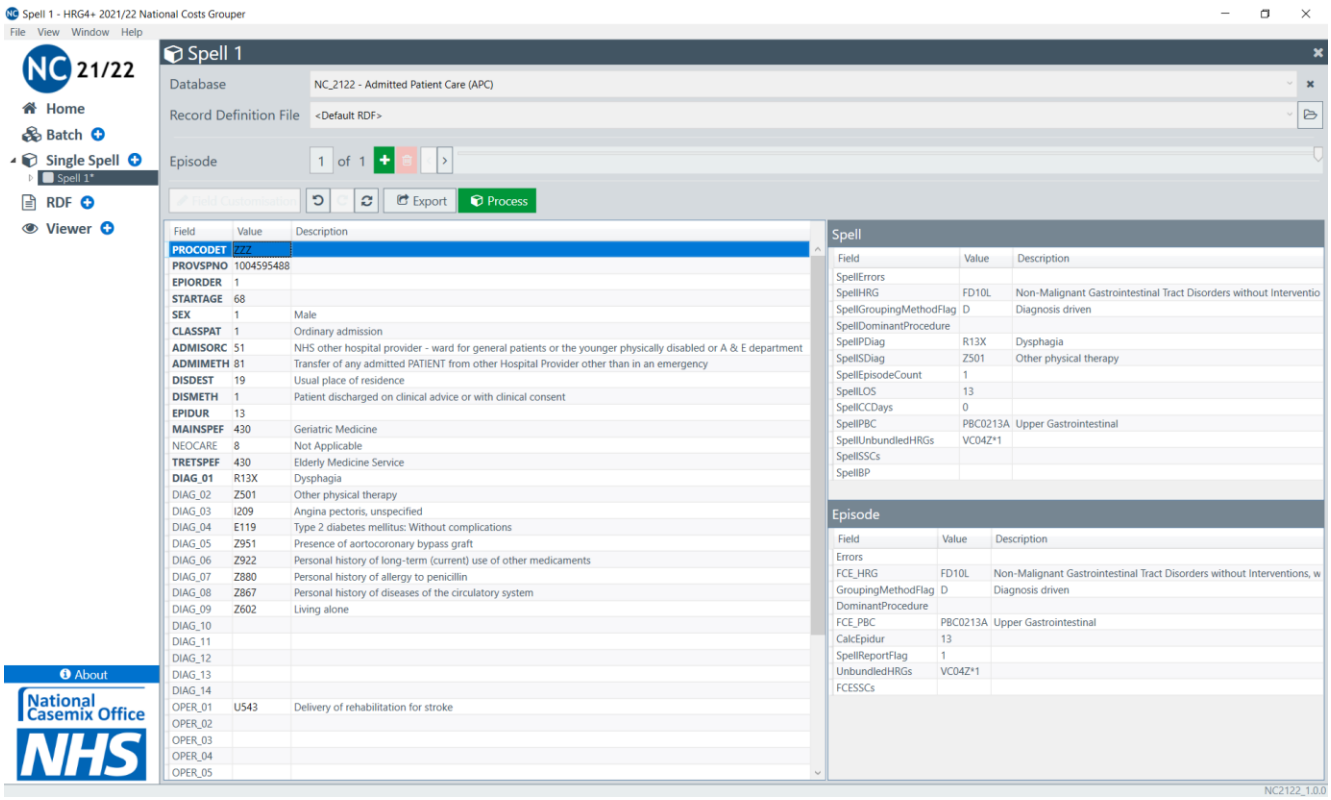
Open a new Single Spell window and select **NC_2122 – Admitted Patient Care (APC)** from the **Database** drop-down box.

Go to the HRG4+ Admitted Patient Care Sample Test Data.csv file and open it.

Select the header row and the first line of data and copy:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1	PROCODE	PROVSPNO	EPIORDER	STARTAGE	SEX	CLASSPAT	ADMISORC	ADMIMETH	DISDEST	DISMETH	EPIDUR	MAINSPEF	NEOCARE	TRETSPEF	DIAG_01	DIAG_02	DIAG_03	DIAG_04	DIAG_05
2	ZZZ	1004595488	1	68	1	1	51	81	19	1	13	430	8	430	R13X	Z501	I209	E119	Z951
3	ZZZ	1004595489	1	90	2	1	51	81	19	1	30	430	8	430	S3250	Z501	S700	M1999	M8199
4	ZZZ	1004595490	1	85	2	1	51	81	19	1	15	430	8	430	S4240	S799	Z501	I951	E871
5	ZZZ	1004595491	1	80	2	1	51	81	19	1	45	430	8	430	M511	G551	Z501	I10X	D759

Go back to the newly opened APC Single Spell window, click anywhere in the Single Spell input window, right-click and select Paste. Alternatively, using the shortcut keys **Ctrl + V** will paste the information into the Single Spell input window.



A user can copy a row of data or a particular column of codes from applications such as Excel and paste them straight into a Single Spell window. Single Spell will recognise a string of codes and paste them appropriately, transposing a row of codes automatically. This is the simplest way of pasting values into the Single Spell window, but it requires the user knowing

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the correct position to start pasting the copied values, otherwise errors are likely to be generated.

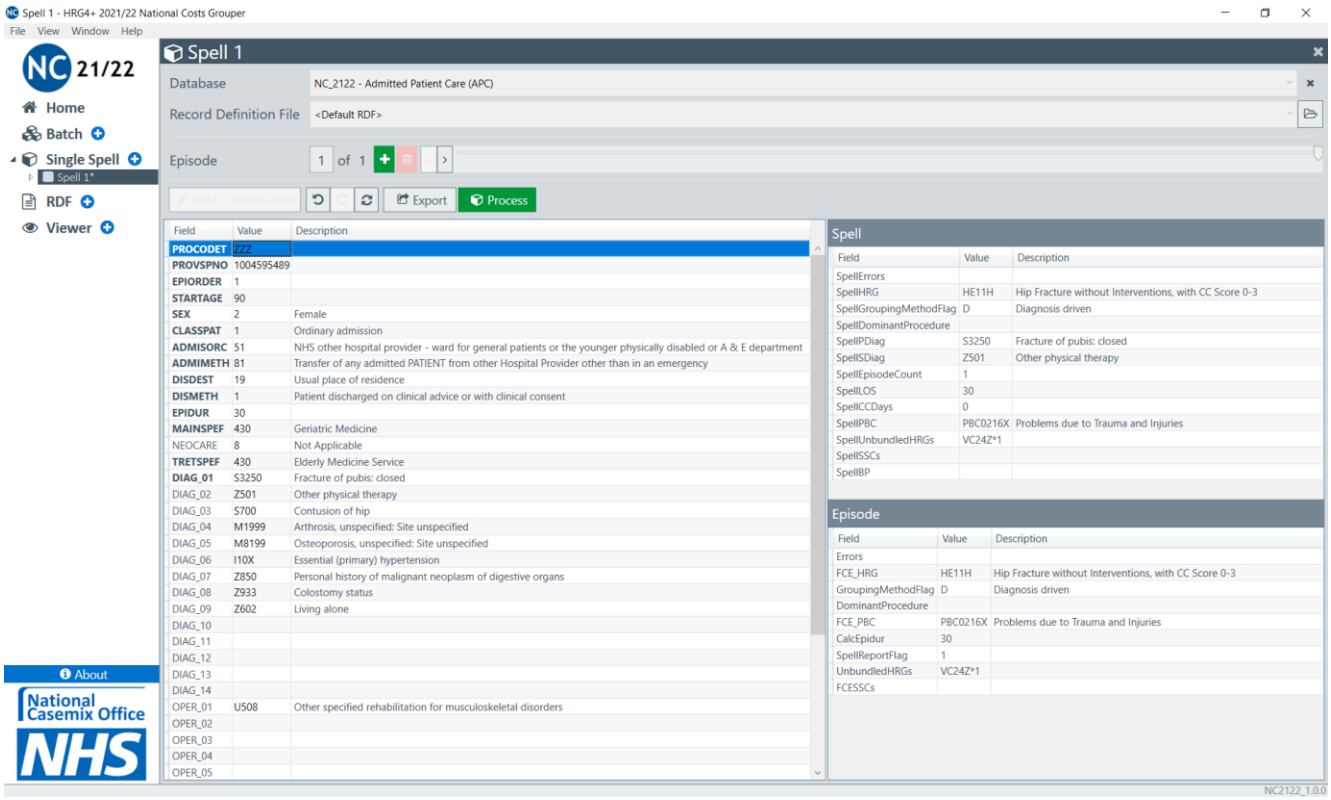
Open a new Single Spell window and select **NC_2122 – Admitted Patient Care (APC)** from the **Database** drop-down box.

Go to the HRG4+ Admitted Patient Care Sample Test Data.csv file and open it.

Select the second line of data and copy:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1	PROCODE	PROVSPNO	EPIORDER	STARTAGE	SEX	CLASSPAT	ADMISORC	ADMIMETH	DISDEST	DISMETH	EPIDUR	MAINSPEF	NEOCARE	TRETSPEF	DIAG_01	DIAG_02	DIAG_03	DIAG_04	DIAG_05
2	ZZZ	1004595488	1	68	1	1	51	81	19	1	13	430	8	430	R13X	Z501	I209	E119	Z951
3	ZZZ	1004595489	1	90	2	1	51	81	19	1	30	430	8	430	S3250	Z501	S700	M1999	M8199
4	ZZZ	1004595490	1	85	2	1	51	81	19	1	15	430	8	430	S4240	S799	Z501	I951	E871
5	ZZZ	1004595491	1	80	2	1	51	81	19	1	45	430	8	430	M511	G551	Z501	I10X	D759

Go back to the newly opened APC Single Spell window, right-click on the PROCODET field name and select Paste. Alternatively, using the shortcut keys **Ctrl + V** will paste the information into the Single Spell input window.



Single Spell also contains functions to allow users to copy or save information from Single Spell windows. This is useful if the information from single spell is needed for future use or is required for other purposes.

There are three different methods for copying information from Single Spell windows:

- **Copy** (Ctrl+C) – this will copy data in a transposed comma delimited format (CSV) for use in creating input files.
- **Copy Excel** (Ctrl+Shift+C) – this will copy data in a transposed tab delimited format (TSV) for use with Excel and other external editors; and
- **Copy with descriptions** (Ctrl+Alt+C) – this copies a Single Spell table in a tab delimited format (TSV), preserving the layout and descriptions for use in Excel and other editors.

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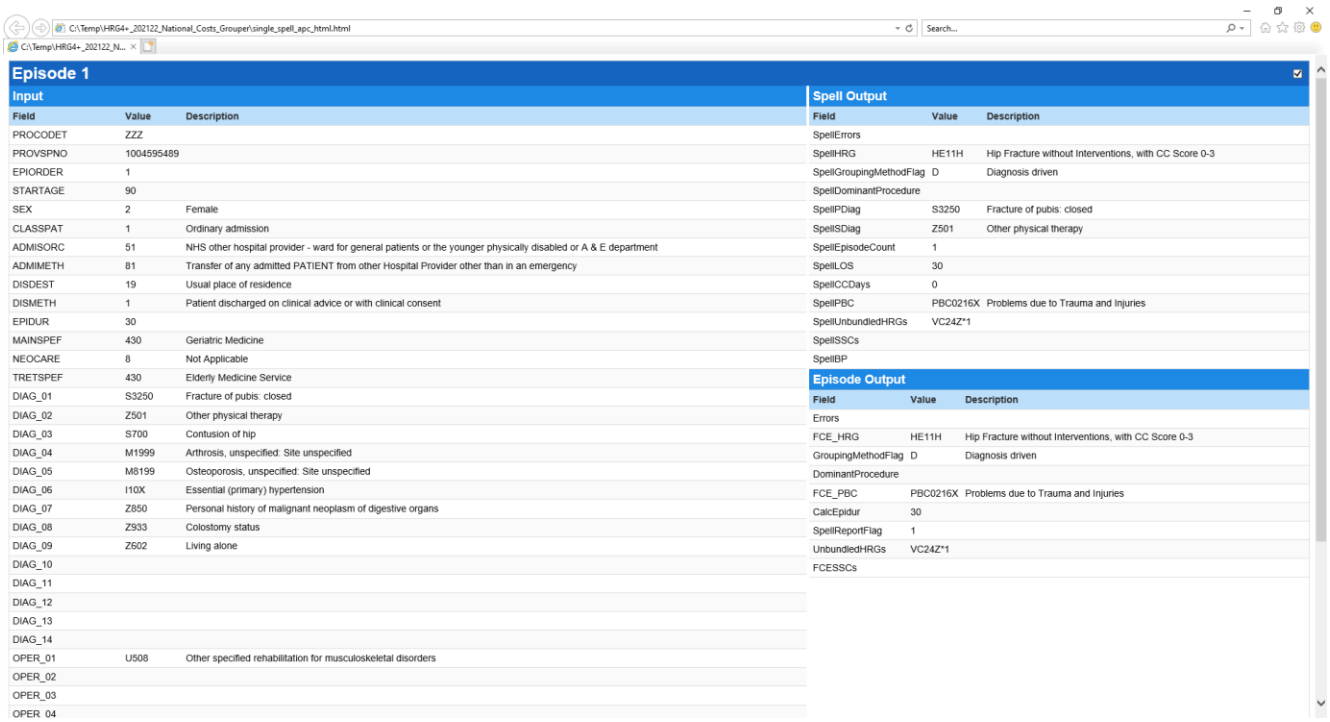
Single Spell also contains an **Export** button that allows information from the Single Spell window to be saved as a HTML or CSV file type. When saved as a HTML file type, the information is output in a similar layout to the Single Spell window, meaning the information can be printed in a structured format.

Following on from the previous copy and paste example, select the **Export** button on the Single Spell window. The **Save As** dialog box will appear, prompting the user to give the HTML file a name. Select an appropriate location and type `single_spell_apc_html` (or anything similarly appropriate) in the **File name** box and click **Save**. The HTML file will automatically open in your default web browser and display the information from the Single Spell window in a similar format.



Episode 1

Input

Field	Value	Description
PROCODET	ZZZ	
PROVSPNO	1004595489	
EPIORDER	1	
STARTAGE	90	
SEX	2	Female
CLASSPAT	1	Ordinary admission
ADMISORC	51	NHS other hospital provider - ward for general patients or the younger physically disabled or A & E department
ADMIMETH	81	Transfer of any admitted PATIENT from other Hospital Provider other than in an emergency
DISDEST	19	Usual place of residence
DISMETH	1	Patient discharged on clinical advice or with clinical consent
EPIDUR	30	
MAINSPEF	430	Geriatric Medicine
NEOCARE	8	Not Applicable
TRETSPEF	430	Elderly Medicine Service
DIAG_01	S3250	Fracture of pubis: closed
DIAG_02	Z501	Other physical therapy
DIAG_03	S700	Contusion of hip
DIAG_04	M1999	Arthrosis, unspecified: Site unspecified
DIAG_05	M8199	Osteoporosis, unspecified: Site unspecified
DIAG_06	I10X	Essential (primary) hypertension
DIAG_07	Z850	Personal history of malignant neoplasm of digestive organs
DIAG_08	Z933	Colostomy status
DIAG_09	Z602	Living alone
DIAG_10		
DIAG_11		
DIAG_12		
DIAG_13		
DIAG_14		
OPER_01	U508	Other specified rehabilitation for musculoskeletal disorders
OPER_02		
OPER_03		
OPER_04		

Spell Output

Field	Value	Description
SpellErrors		
SpellHRG	HE11H	Hip Fracture without Interventions, with CC Score 0-3
SpellGroupingMethodFlag	D	Diagnosis driven
SpellDominantProcedure		
SpellPDiag	S3250	Fracture of pubis: closed
SpellSDiag	Z501	Other physical therapy
SpellEpisodeCount	1	
SpellLOS	30	
SpellCCDays	0	
SpellPBC	PBC0216X	Problems due to Trauma and Injuries
SpellUnbundledHRGs	VC24Z*1	
SpellSSCs		
SpellBP		

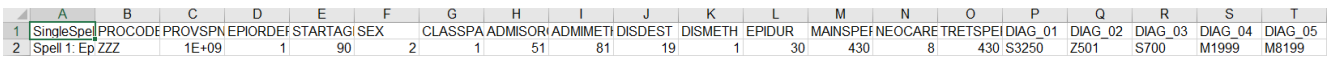
Episode Output

Field	Value	Description
Errors		
FCE_HRG	HE11H	Hip Fracture without Interventions, with CC Score 0-3
GroupingMethodFlag	D	Diagnosis driven
DominantProcedure		
FCE_PBC	PBC0216X	Problems due to Trauma and Injuries
CalcEpidur	30	
SpellReportFlag	1	
UnbundledHRGs	VC24Z*1	
FCESSCs		

Outputting information from Single Spell to an HTML file format also allows users to print the information when necessary. To print, right-click in the top blue bar named “**Episode 1**” and select **Print**.

In additional to saving information from Single Spell as an HTML file type, a user can use the **Export** button to save it as a CSV file type. When saved as a CSV file type, the information is transposed, along with headers, in a format needed for grouping purposes.

Using the same Single Spell window, select the **Export** button. The **Save As** dialog box will appear, prompting the user to give the CSV file a name. Change the **Save as type** to .csv (by default this is set to html). Select an appropriate location and type `single_spell_apc_csv` (or anything similarly appropriate) in the **File name** box and click **Save**. Navigate to the file location and open.



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
1	SingleSpel	PROCODE	PROVSPN	EPIORDER	STARTAGE	SEX	CLASSPA	ADMISORC	ADMIMETH	DISDEST	DISMETH	EPIDUR	MAINSPEF	NEOCARE	TRETSPEF	DIAG_01	DIAG_02	DIAG_03	DIAG_04	DIAG_05
2	Spell 1: Ep	ZZZ	1E+09	1	90	2	1	51	81	19	1	30	430	8	430	S3250	Z501	S700	M1999	M8199

The information is displayed in a format that can be used for grouping purposes.

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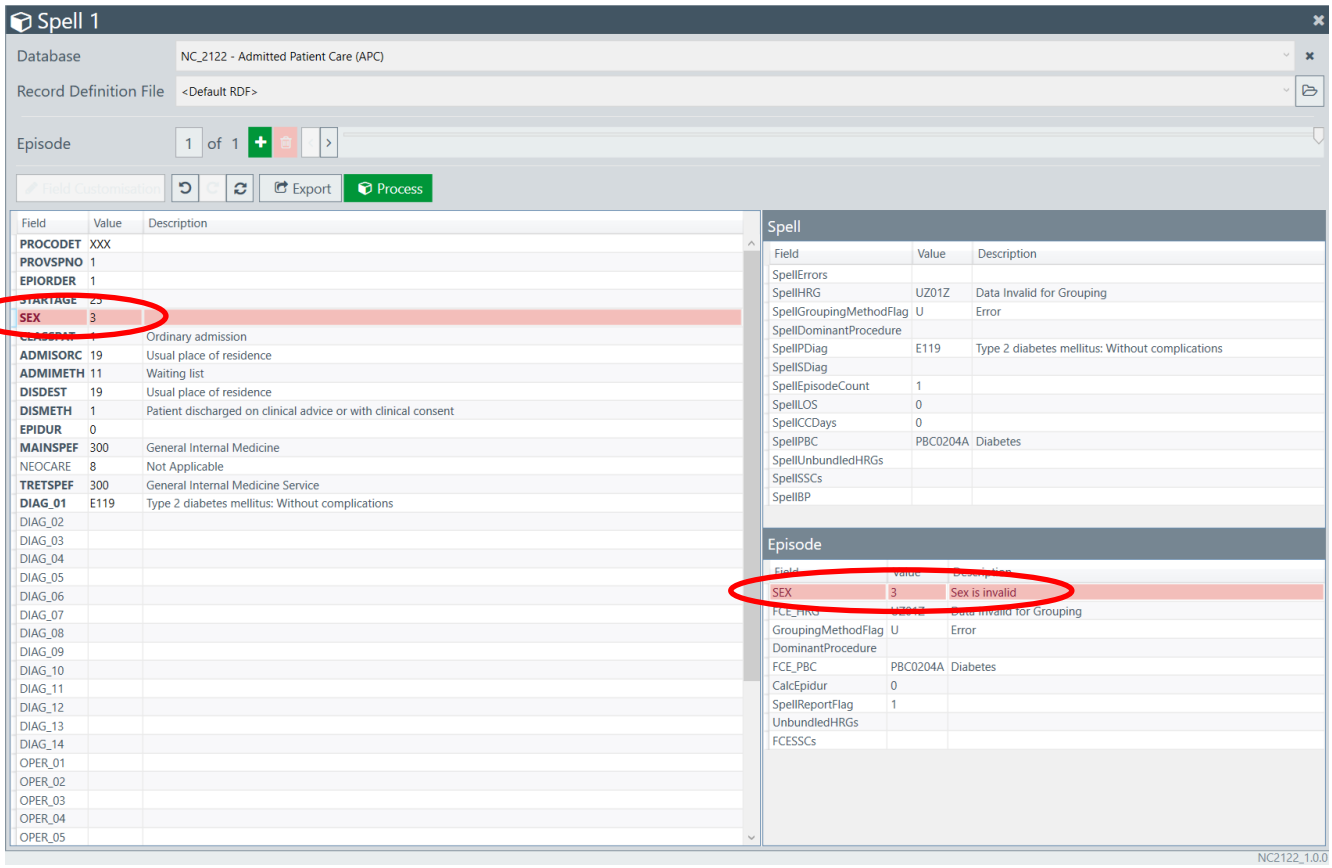
Episodes can be deleted by either using the icon or by right-clicking on an episode in the navigation pane and selecting **Delete Episode**. To close the entire Spell, right-click on the relevant Spell number in the navigation pane and select **Close**.

Delete Episode 2 from Spell 1 by clicking the icon on the Single Spell window.

Any errors are highlighted in red in both the Input and Output sections.

Open a new Single Spell window and select **NC_2122 – Admitted Patient Care (APC)** from the **Database** drop-down box.

Change the field value of **SEX** to **3**.



A value of 3 in the field SEX is invalid. The input field is highlighted red and an error message is output in the Episode output window which is also highlighted red.

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Record Definition File (RDF)

The RDF tells the Grouper the structure of the data you want it to process. The field content of the RDF must include all mandatory input fields for the type of data you want to group. Although these fields are mandatory, the user defines their order. The user may include additional fields, but these will be ignored by the Grouper.

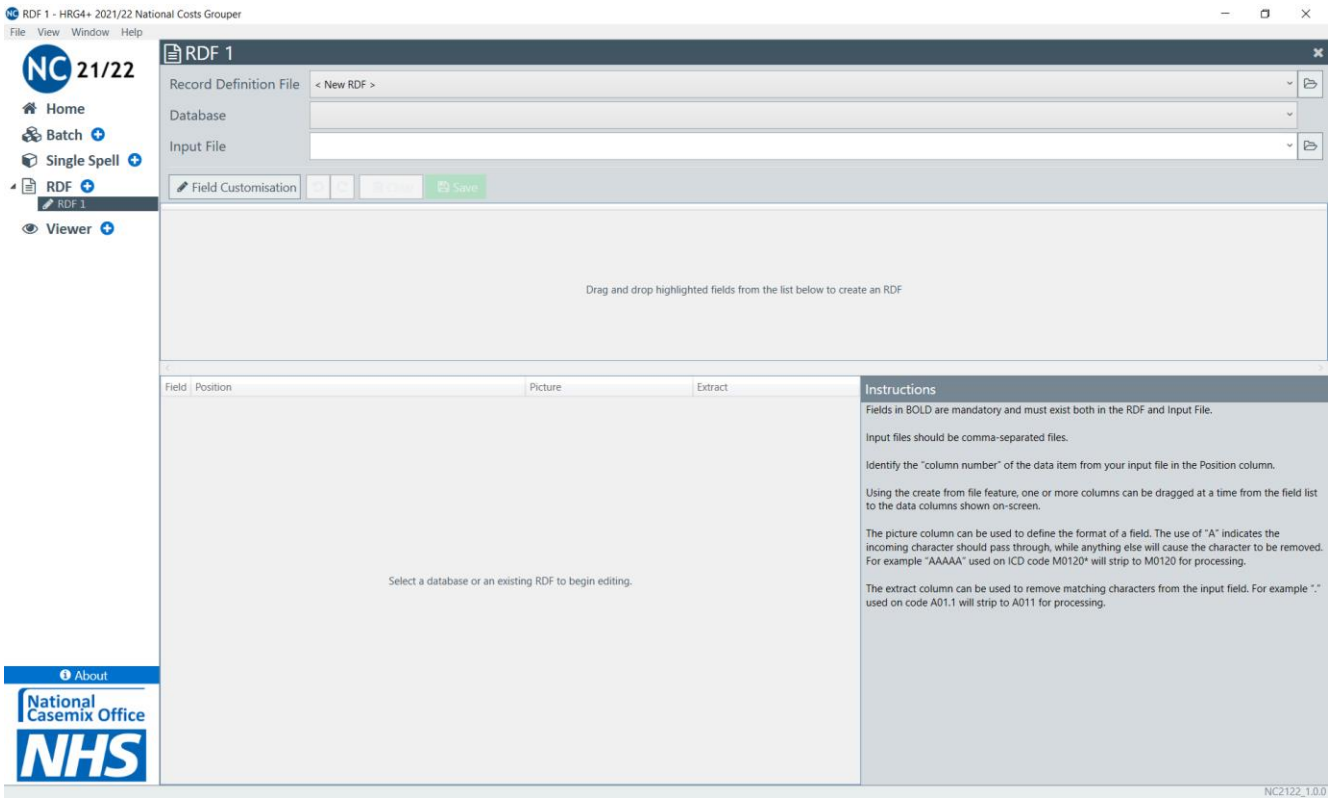
The product comes with a set of standard RDFs that hold all the mandatory fields required to be able to group data. You can adapt your data to match the standard RDFs or create an RDF manually.

To create or modify an RDF, the Grouper has an interactive RDF module.

The RDF module allows a user to create an RDF from scratch or to modify an existing RDF. This section explains the different ways a user can create or modify an existing RDF.

The RDF screen can be opened in several ways:

- Select the ⊕ icon next to RDF on the navigation pane.
- Select the *RDF* title hyperlink or the 🗎 icon on the main home screen.
- Select **File** on the menu bar, then **New** and then **RDF**; or
- Use shortcut keys **Alt+R**.



A user can create an RDF manually in two ways. The first way is to create an RDF using an input file, and the second way is to create an RDF using a specific database from the **Database** drop-down box.

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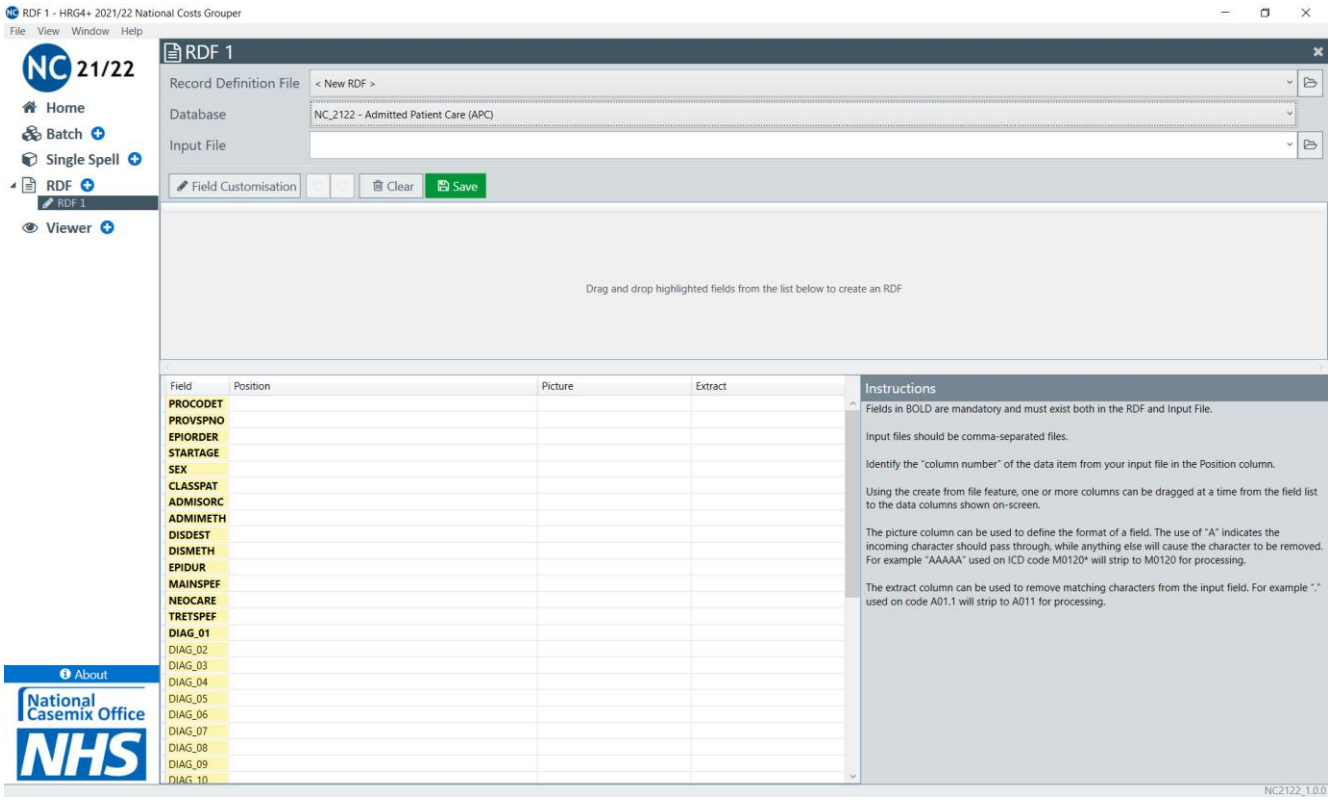
Create a New RDF – Create from Input File

When the RDF screen is opened, the **Record Definition File** box is automatically set to **< New RDF >**.

The **Input** window, which contains the columns headers **Field**, **Position**, **Picture** and **Extract**, prompts the user to "*Select a database or an existing RDF to begin editing*". As we are creating an RDF from an input file in this section, select **NC_2122 – Admitted Patient Care (APC)** from the **Database** drop-down list. If you are using a different database, the sample data file specific to that database must be used.



When the database is selected, the **Input** window auto-populates with a list of field names, which are highlighted yellow. All field names in bold are mandatory and must be assigned a position when creating an RDF.

The next step is to select an input file to use as a guide for creating an RDF. To select an input file, click the icon to the right of the **Input File** drop-down box. This will open the **Open Input File** dialog box, allowing a user to search for the relevant input file (which should be format *.csv). The sample data are located in the application's installation folder in a sub-folder called `Sample Data`.

Open the file `HRG4+ Admitted Patient Care Sample Test Data.csv`. If you are using a different database, the sample data file specific to that database must be used.

Alternatively, an input file can simply be dragged and dropped from a file explorer window straight into the **Input File** drop-down box.

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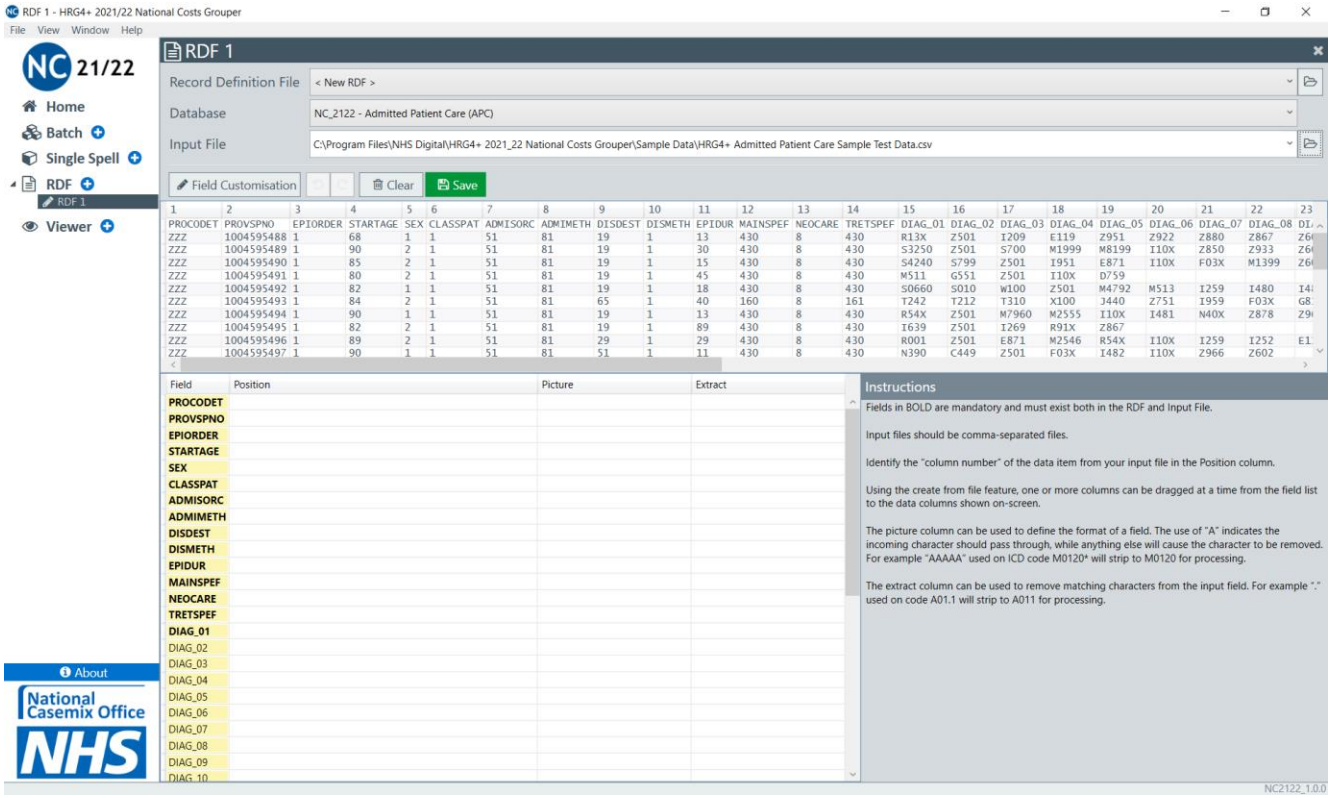

The first 30 rows of the selected input file are displayed in the **Drag and Drop** window. Each field displayed in the **Drag and Drop** window is assigned a position, e.g.1, 2, 3.

Depending on the database chosen, the number of repeating occurrences of certain fields can be increased or decreased using the **Field Customisation** button. For example, if the input file contains 20 diagnosis codes, the number of diagnosis fields can be increased from the default value of 14 to 20 using the toggle buttons.

In addition to the **Field Customisation** button, a user can insert and delete non-mandatory fields. Extra fields can be added to the RDF using the blank row at the bottom of the **Input** window or by highlighting a field row, right-clicking and selecting **Insert Row** (Ctrl+I). To delete a non-mandatory field, select the field row to be deleted and either select the **Delete** key or right-click and select **Remove Row** (Ctrl+Delete). The field will be removed from the field list. Mandatory fields cannot be deleted from an RDF.

To create an RDF, select each of the field names highlighted in yellow and drag it to the appropriate column in the **Drag and Drop** window, i.e. PROCODET to column number 1, PROVSPNO to column 2, etc.

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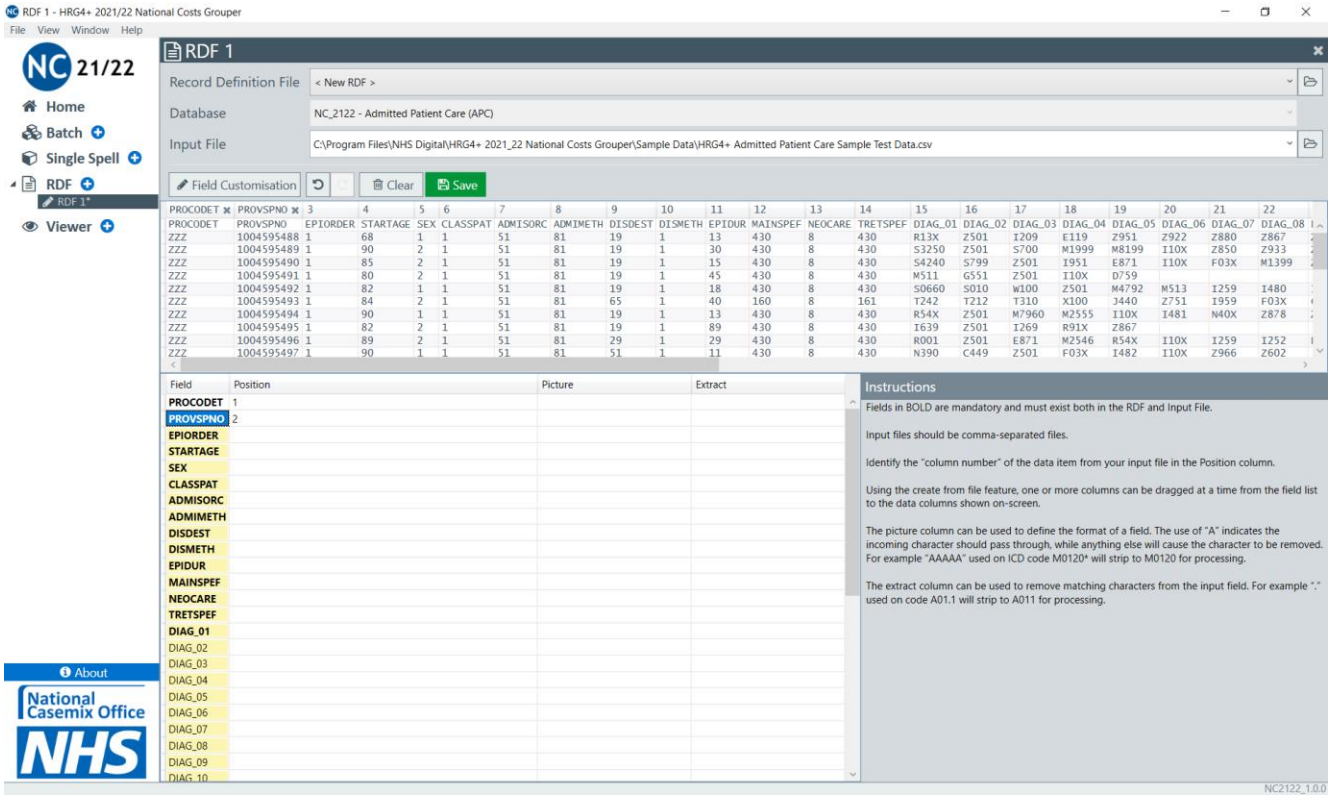

Once a field is dragged into the **Drag and Drop** window, the **Position** column in the **Input** window will be populated with the relevant field position number. Alternatively, a user can type the field number directly into the **Position** column.

Multiple fields can be selected by clicking with the mouse while holding down the SHIFT and/or CTRL keys. The selected fields can then be dragged to the **Drag and Drop** window.

If a field is erroneously assigned, it can be removed in a variety of ways. Fields are unassigned by clicking the "**x**" next to the field name in the drag and drop window; by right-clicking on the field name and selecting **Unassign**; or by selecting the field position from the **Position** column and pressing the **Delete** key. The field will then be removed from the file preview window. If you wish to clear all the field positions allocated, select the **Clear** button to reset all the field positions.

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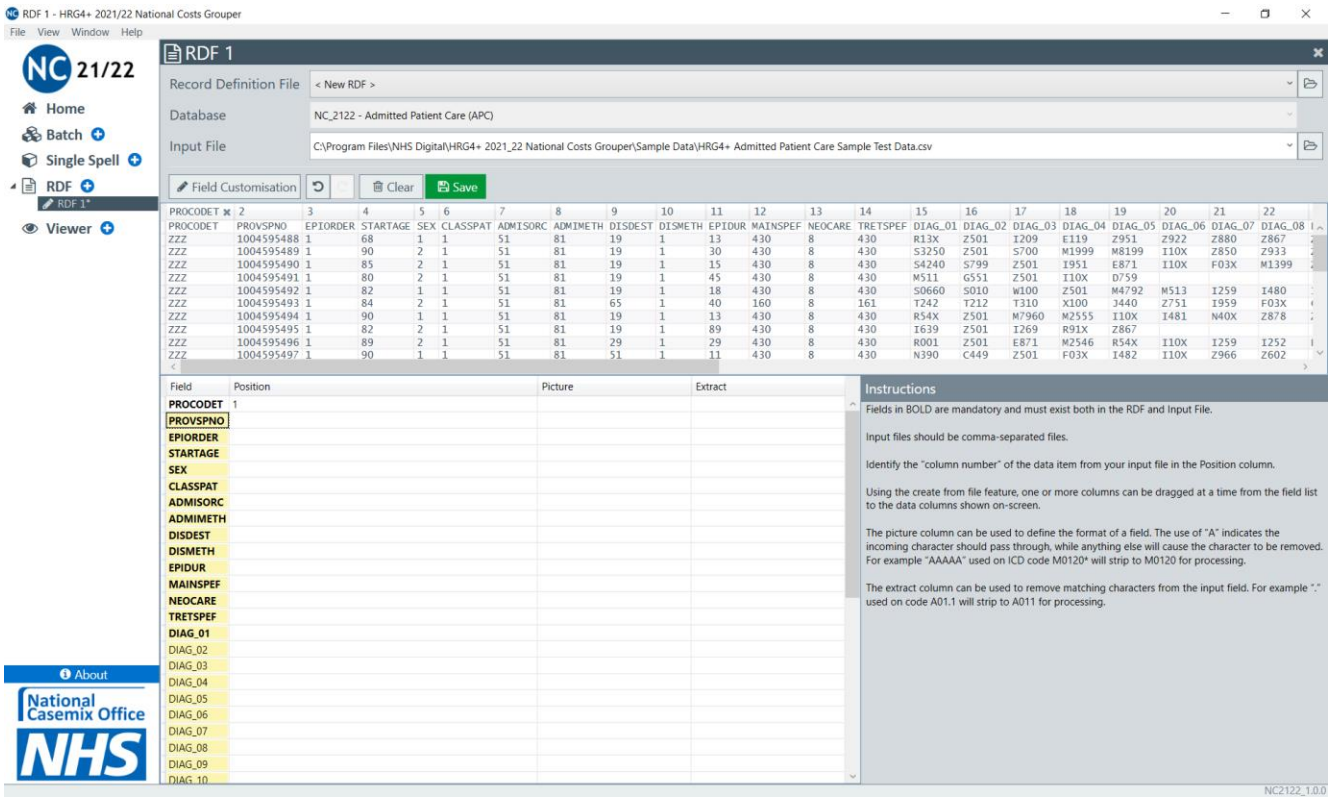

In certain circumstances, actions performed on the RDF Editor screen may need to be undone or redone. The **Undo** and **Redo** buttons store up to a maximum of 5 changes. Alternatively, the shortcut combination keys of **Ctrl+Z** (Undo) and **Ctrl+Y** (Redo) can be used.

When all highlighted fields have been assigned, the RDF can be saved by selecting the **Save** button. The **Save As** dialog box will appear, prompting the user to give the RDF file a name. Select an appropriate location and type `rdf_apc` (or anything similarly appropriate) in the **File name** box and click **Save**.

Create a New RDF – Create from Database

An RDF can be created manually by using a specific database from the **Database** drop-down box. This method is reliant on the user knowing the structure of the data without the need to use it as a guide in the **Drag and Drop** window.

The create an RDF using this method, first open a new RDF window.

When the RDF screen is opened, the **Record Definition File** box is automatically set to **< New RDF >**.

Select **NC_2122 – Admitted Patient Care (APC)** from the **Database** drop-down list.

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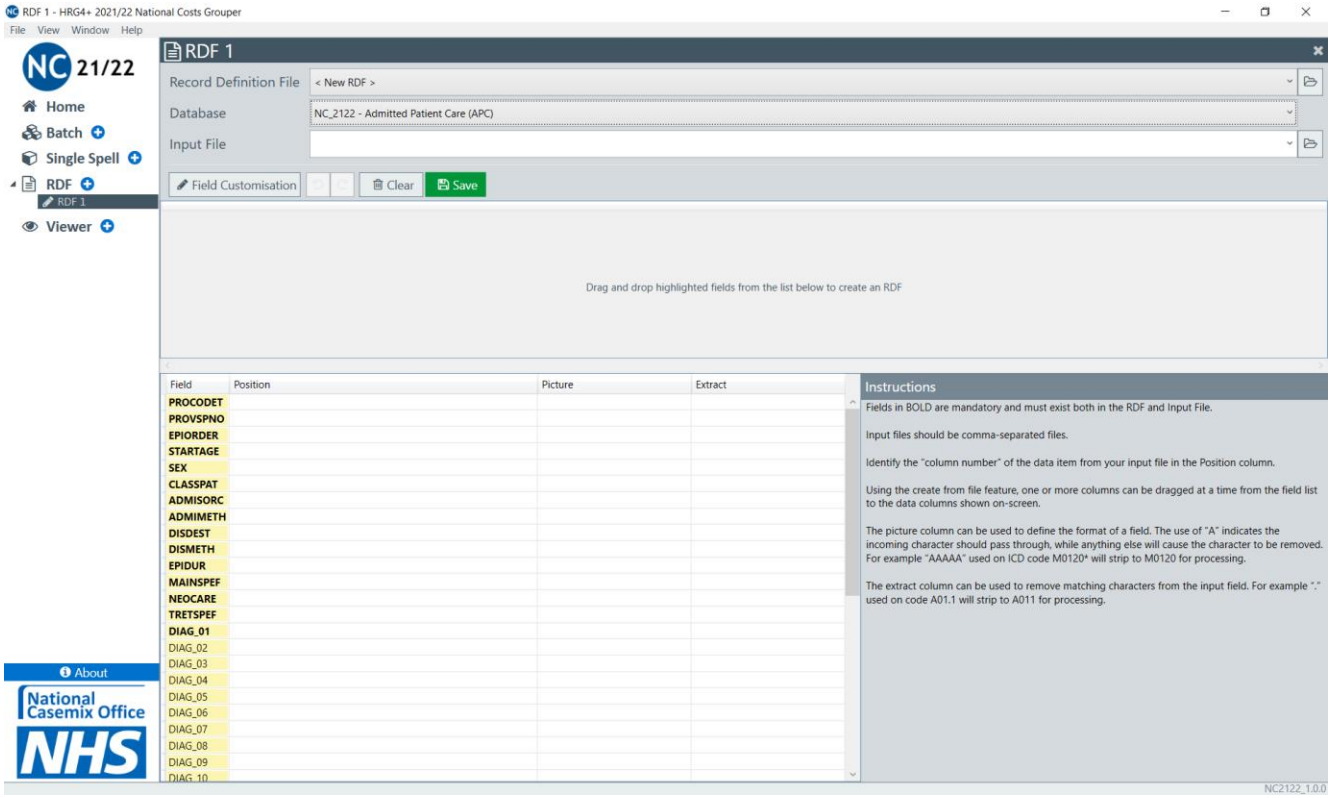

The **Input** window auto-populates with a list of field names, which are highlighted yellow. All field names in bold are mandatory and must be assigned a position when creating an RDF. As no input file is used in this method of creating an RDF, the **Drag and Drop** window remains blank.

Depending on the database chosen, the number of repeating occurrences of certain fields can be increased or decreased using the **Field Customisation** button. For example, if the input file contains 20 diagnosis codes, the number of diagnosis fields can be increased from the default value of 14 to 20 using the toggle buttons.

Select the **Field Customisation** button and set the diagnosis and procedure fields to 20.

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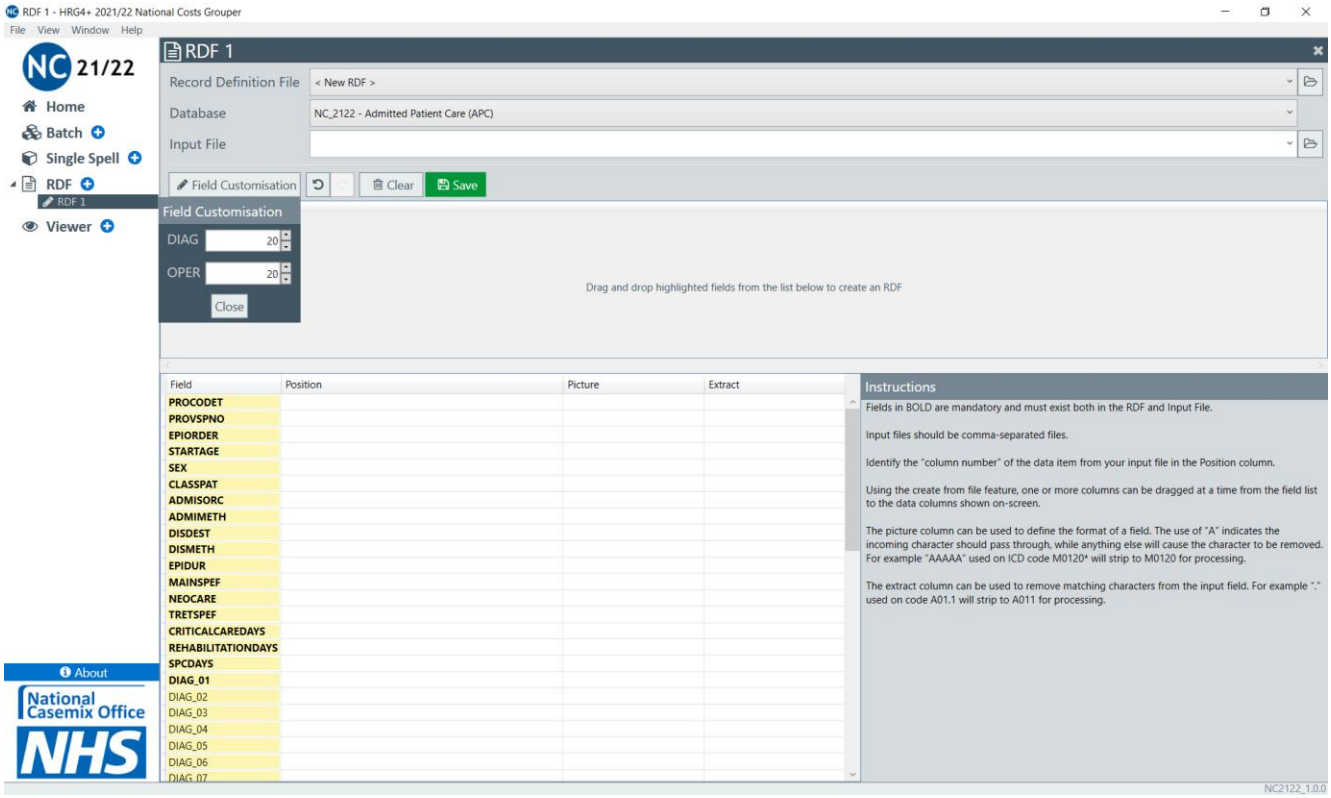

When altering the number of variable fields for a particular database, the field ordering changes, so in the above example, diagnosis and procedure fields move to the bottom of the field list.

To create the RDF, type the field numbers directly into the **Position** column in the **Input** window to specify the order of the input file that will be processed.

If a field is erroneously assigned, it can be removed in a variety of ways. Fields are unassigned by clicking the "**x**" next to the field name in the **Drag and Drop** window; by right-clicking on the field name and selecting **Unassign**; or by selecting the field position from the **Position** column and pressing the **Delete** key. The field will then be removed from the file preview window. If you wish to clear all the field positions allocated, select the **Clear** button to reset all the field positions.

In certain circumstances, actions performed on the RDF Editor screen may need to be undone or redone. The **Undo** and **Redo** buttons store up to a maximum of 5 changes. Alternatively, the shortcut combination keys of **Ctrl+Z** (Undo) and **Ctrl+Y** (Redo) can be used.

When all highlighted fields have been assigned, the RDF can be saved by selecting the **Save** button. The **Save As** dialog box will appear, prompting the user to give the RDF file a name. Select an appropriate location and type `rdf_apc` (or anything similarly appropriate) in the **File name** box and click **Save**.

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Edit an Existing RDF

In addition to manually creating an RDF, a user can edit an existing RDF.

First open a new RDF window.

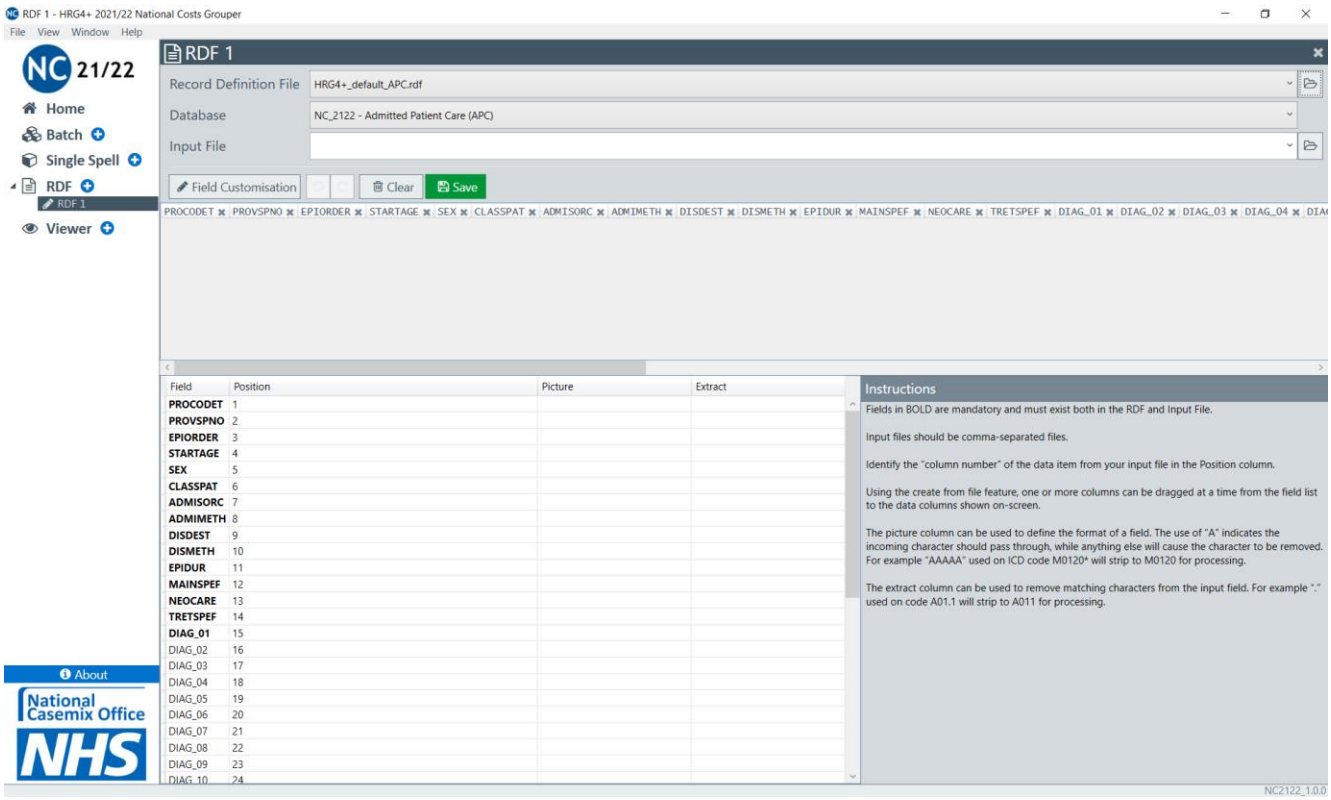
When the RDF screen is opened, the **Record Definition File** box is automatically set to **< New RDF >**. To select an existing RDF to edit, click the icon to the right of the **Record Definition File** drop-down box. This will open the **Open RDF File** dialog box, allowing a user to search for the relevant RDF to edit (which should be format *.RDF). The sample RDFs are located in the application's installation folder in a sub-folder called `Default RDF`.

Open the file `HRG4+_default_APC.rdf`. If you are using a different database, the sample RDF specific to that database must be used.

Alternatively, simply drag and drop the relevant **RDF** into the **Record Definition File** drop-down box.

The **Database** drop-down box will automatically populate with the relevant database depending on the mandatory fields contained in the selected RDF.

Once the RDF is selected, the **Drag and Drop** window will display all the fields stated in the RDF and the **Input** window will display the RDF field names and their assigned position numbers.



Depending on the data type, the number of repeating occurrences of certain fields can be increased or decreased using the **Field Customisation** button. For example, if the input file contains 20 diagnosis codes, the number of diagnosis fields can be increased from the default value of 14 to 20 using the toggle buttons.

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In addition to the **Field Customisation** button, a user can insert and delete non-mandatory fields. Extra fields can be added to the RDF using the blank row at the bottom of the **Input** window or by highlighting a field row, right-clicking and selecting **Insert Row** (Ctrl+I). To delete a non-mandatory field, select the field row to be deleted and either select the **Delete** key or right-click and select **Remove Row** (Ctrl+Delete). The field will be removed from the field list. Mandatory fields cannot be deleted from an RDF.

If a field is erroneously assigned, it can be removed in a variety of ways. Fields are unassigned by clicking the "**x**" next to the field name in the drag and drop window; by right-clicking on the field name and selecting **Unassign**; or by selecting the field position from the **Position** column and pressing the **Delete** key. The field will then be removed from the file preview window. If you wish to clear all the field positions allocated, select the **Clear** button to reset all the field positions.

In certain circumstances, actions performed on the RDF Editor screen may need to be undone or redone. The **Undo** and **Redo** buttons store up to a maximum of 5 changes. Alternatively, the shortcut combination keys of **Ctrl+Z** (Undo) and **Ctrl+Y** (Redo) can be used.

When all the highlighted fields have been assigned, the RDF can be saved by selecting the **Save** button. The **Save As** dialog box will appear, prompting the user to give the RDF file a name. Select an appropriate location and type `rdf_apc` (or anything similarly appropriate) in the **File name** box and click **Save**.

RDF Input Window

The RDF **Input** window contains the following four columns:

Name	Description
Field	The field name. Mandatory fields (in bold) cannot be modified.
Position	The field column number in the input file.
Picture	Specifies whether specific character positions in the field are used or ignored during processing. It must be specified as a string of "A" and "." where "A" means keep the character in that position and "." means ignore the character in that position. For example: "AAA.A" means ignore the 4th character and process characters in positions 1,2,3 and 5 as if it is a 4-character code, so that W58.1 gets processed as W581. Note that it is no longer necessary to use Picture to remove full stops from procedure and diagnosis codes because these now get removed automatically.
Extract	Allows you to specify that specific characters (in any position) in the field are ignored during processing. For example, "." (without quote marks) will remove all full stops from the field.

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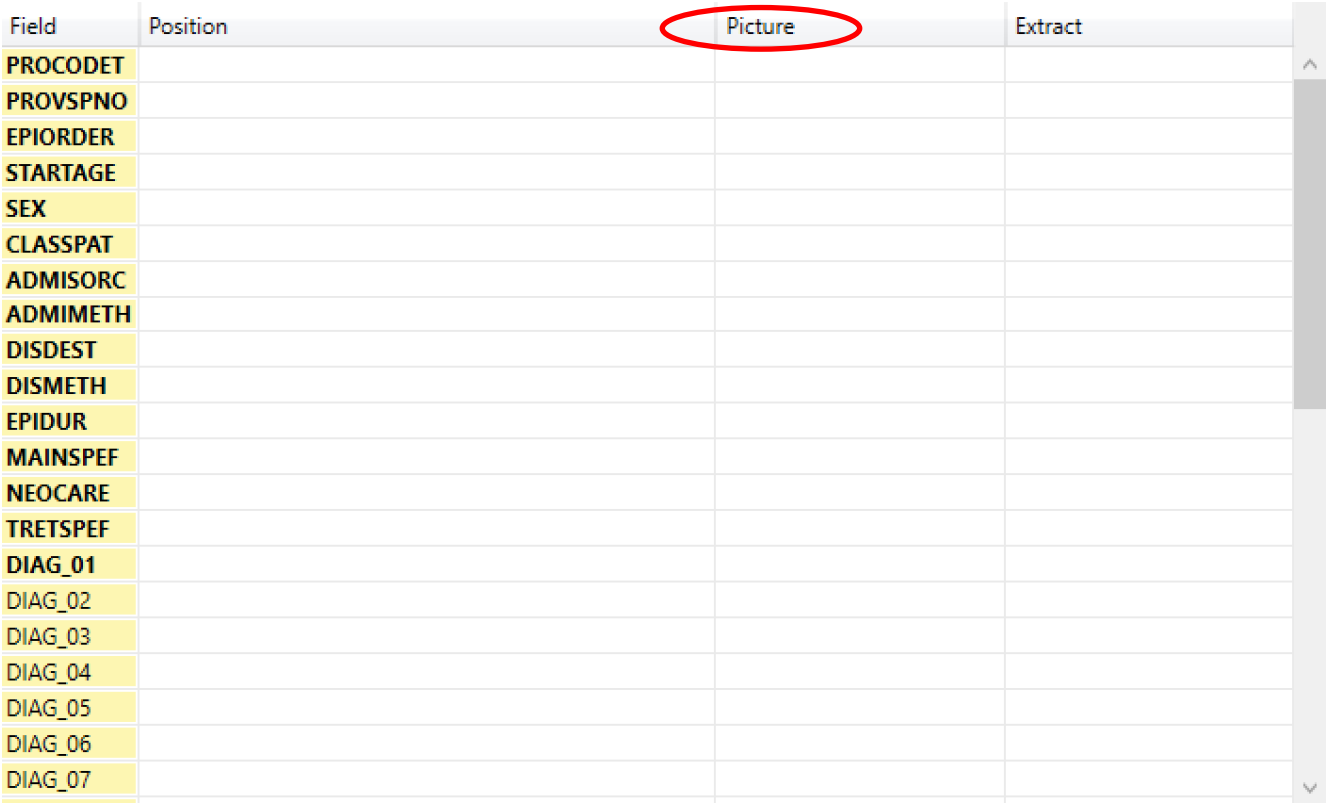
Picture

Picture is a feature within the RDF that can be used to specify the inclusion or exclusion of specific character positions from input fields. It allows the user to provide filtering instructions for each field by describing a character template. During processing, the application will apply this template to the field by selectively ignoring characters in specific positions within a field.

An “A” character indicates a character position to be included in grouping and a full stop indicates a character position to be ignored in grouping. This “picture” is then imposed on the field before grouping, meaning that the modified version of the field contents is processed by the Grouper.



Field	Position	Picture	Extract
PROCODET			
PROVSPNO			
EPIORDER			
STARTAGE			
SEX			
CLASSPAT			
ADMISORC			
ADMIMETH			
DISDEST			
DISMETH			
EPIDUR			
MAINSPEF			
NEOCARE			
TRETSPEF			
DIAG_01			
DIAG_02			
DIAG_03			
DIAG_04			
DIAG_05			
DIAG_06			
DIAG_07			

To use Picture, enter a character template in the **Picture** column of the Record Definition File using the RDF module.

- Characters should not be separated by spaces.
- Quotation marks should not be used.
- Picture can be used with alpha and numeric fields.
- Where the number of characters in the field exceeds the number of characters specified in Picture, the application will implement the Picture on the left-most portion of the field. For this reason, care should be taken when using Picture with variable length fields as this may lead to unpredictable results.
- Picture is applied prior to data validation.
- Picture applies to file processing only; it does not affect single spell grouping.

Example 1 AAA.AA Characters 1, 2, 3, 5 and 6 are used. Character 4 is ignored.

Example 2 .A.AAA Characters 2, 4, 5 and 6 are used. Characters 1 and 3 are ignored.

Example 3 .A. Character 2 is used. Characters 1 and 3 are ignored.

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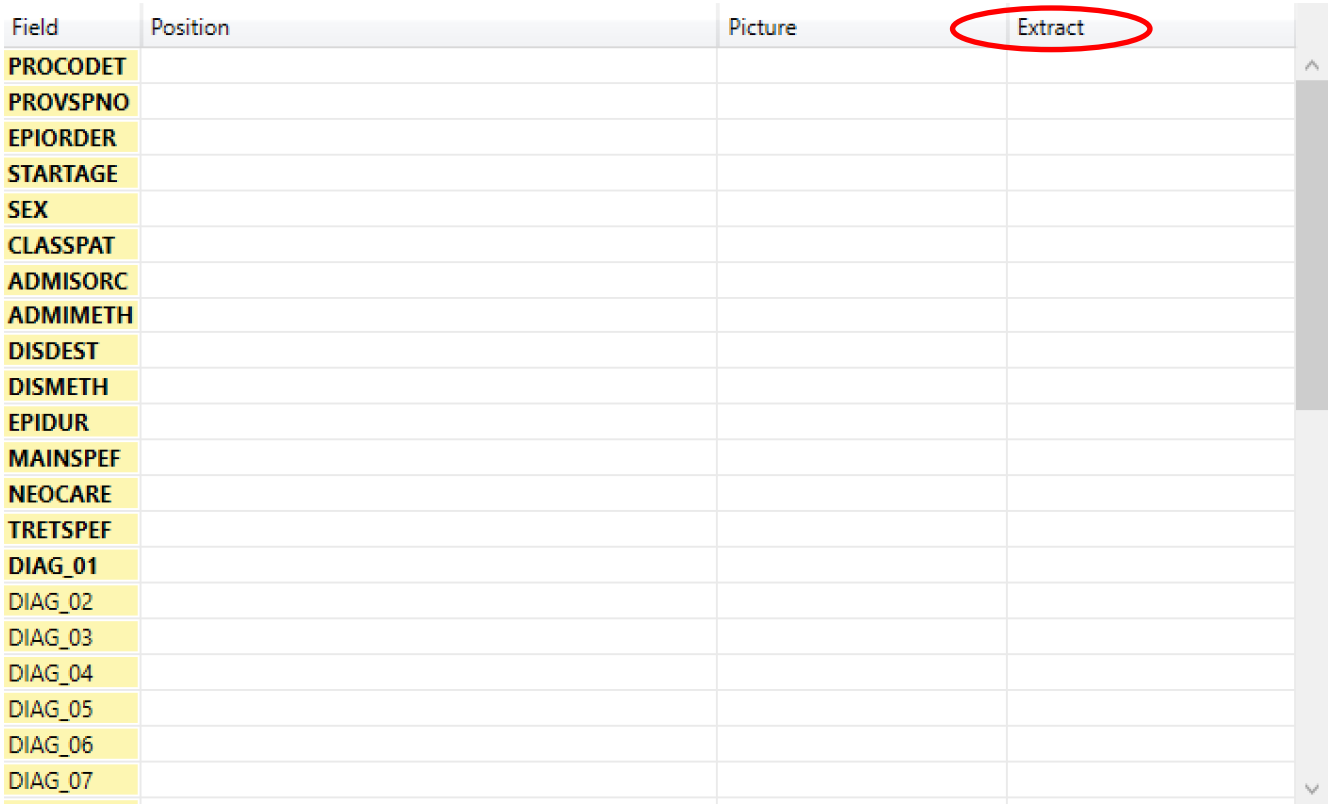
Example 4 AA Characters 1 and 2 are used (Note that full stops are not required if consecutive characters from the beginning of the field are the only characters required).

Extract

Extract is a feature of the RDF that can be used to make the Grouper ignore specific characters in input fields, irrespective of character position.

Entering one or more characters in the **Extract** column of the RDF using the RDF module will instruct the Grouper that any occurrence of any of these characters in that field should be ignored in grouping. (Note: Commas cannot be excluded because the input data files are comma-separated.)



Field	Position	Picture	Extract
PROCODET			
PROVSPNO			
EPIORDER			
STARTAGE			
SEX			
CLASSPAT			
ADMISORC			
ADMIMETH			
DISDEST			
DISMETH			
EPIDUR			
MAINSPEF			
NEOCARE			
TRETSPEF			
DIAG_01			
DIAG_02			
DIAG_03			
DIAG_04			
DIAG_05			
DIAG_06			
DIAG_07			

The application does not consider a series of characters as a string of characters to be ignored as a single entity. Each character entered is ignored wherever it appears in the input field.

- The characters specified will be ignored wherever they appear in the input data field.
- There is no relation between the position of a character in the extract field and the input field.
- All occurrences of the characters are affected.
- Extract is applied prior to data validation.
- Extract applies to file processing only; it does not affect single spell grouping.

Extract Field Examples

The examples below are shown in quotation marks (“) to help identify the examples. Quotation marks should not be entered when using the Extract function (unless a user wishes to ignore quotation marks).

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Example 1

Entering an Extract character of “.” informs the application that all occurrences of a decimal place or full stop should be ignored when processing that field. This is a convenient way to remove decimal points from a field in the input file. An input field containing the character string “abc…d” will be interpreted by the application as “abcd”.

Example 2

Entering the characters “+$” in this field informs the application that any occurrences of both the “+” character and the “$” character are to be ignored by the application when processing that field. An input field containing the character string “46+$$++” will be interpreted by the application as “46”.

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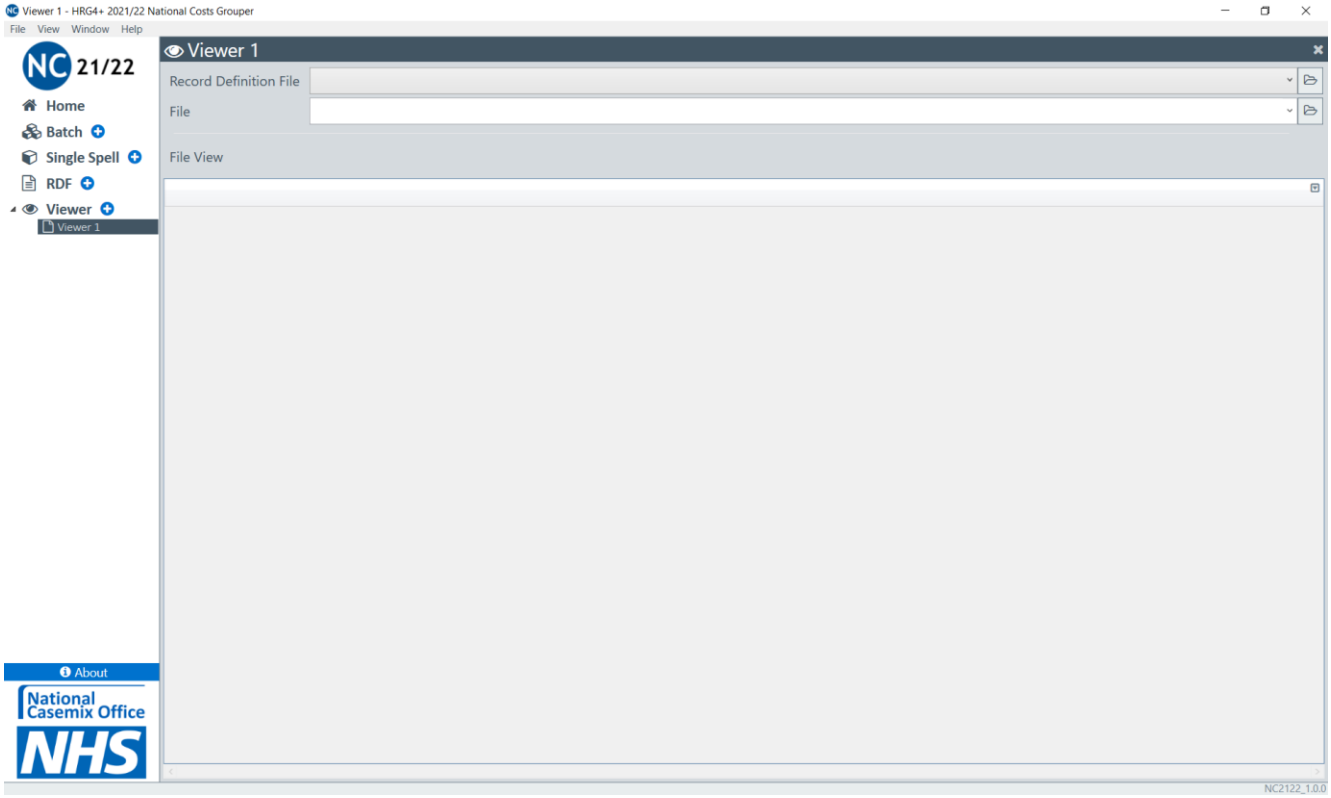
Viewer

The Grouper provides a file viewer that can be used to view input or output files. The Viewer allows users to filter on columns and select data that are then opened in Single Spell.

Selecting a **Record Definition File** and a **File** will display the file data organised into the columns specified in the RDF and can be used as an aid to see if there are problems in the layout or content of a data file.

Opening a Viewer screen can be done in several ways:

- Select the ⊕ icon next to **Viewer** on the navigation pane;
- Select the *Viewer* title hyperlink or the 👁 icon on the main home screen;
- Select **File** on the menu bar, then **New** and then **Viewer**; or
- Use shortcut keys **Alt+V**.



To view a file, you can either drag a file directly into the **File** drop-down box or use the 🗁 icon to navigate to the appropriate file to be viewed.

It is advised that a user selects an appropriate RDF as some functionality within the Viewer requires the use of the fields defined in the RDF. To select an RDF, you can either drag a file directly into the **Record Definition File** drop-down box or use the 🗁 icon to navigate to the appropriate RDF.

To select the **Record Definition File**, navigate to the Default RDF folder installed with the Grouper and select the file `HRG4+_default_APC.rdf` or alternatively drag and drop the file `HRG4+_default_APC.rdf` directly into the **Record Definition File** drop-down box.

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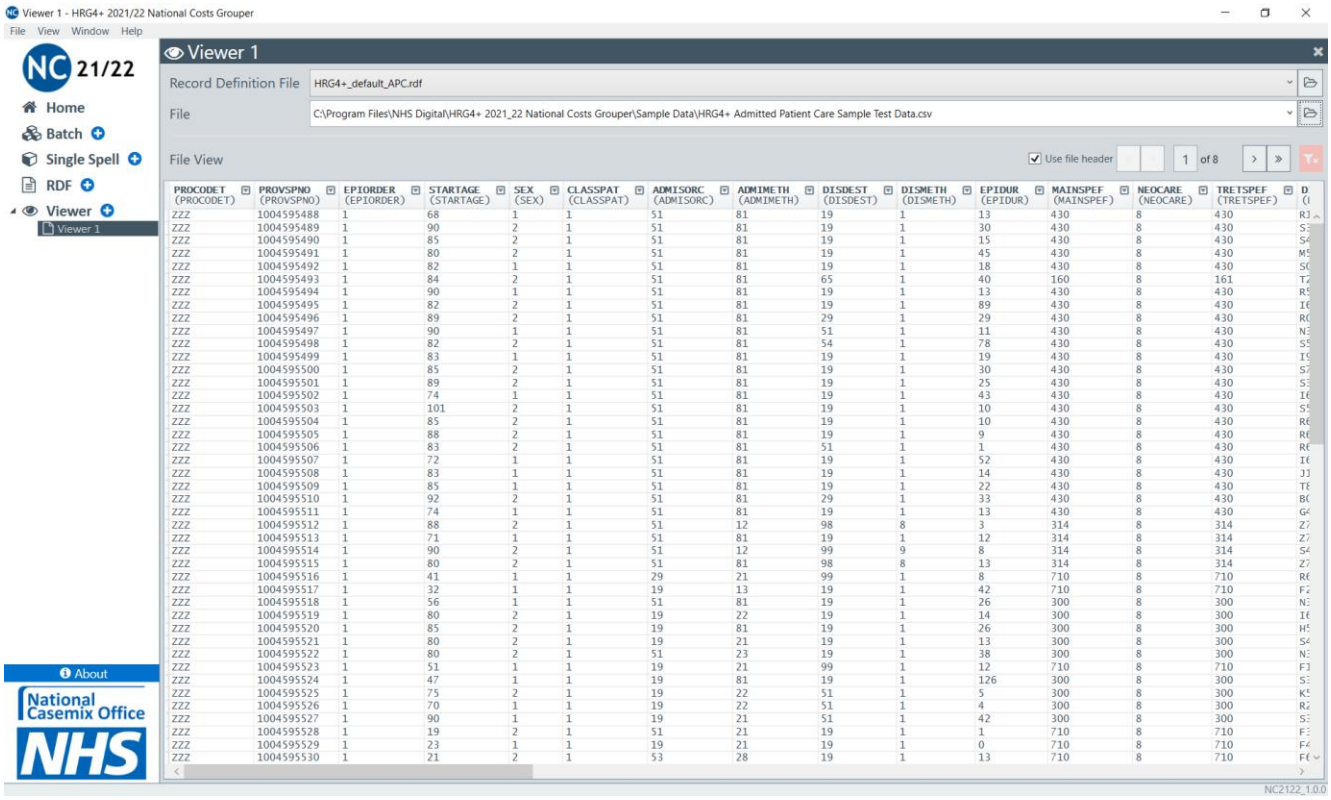
For the **File**, navigate to the Sample Data folder installed with the Grouper and select the file `HRG4+ Admitted Patient Care Sample Test Data.csv` or alternatively drag and drop the file `HRG4+ Admitted Patient Care Sample Test Data.csv` directly into the **File** drop-down box.



When a file is selected, the data will be displayed in the **File View** window. Depending on the number of rows of data in your file, the Viewer will display the data over a number of pages.

The **Use file header** checkbox allows a user to specify whether the first row in the file being viewed is a header row. When this is ticked, the file headers (surrounded by rounded brackets) underneath the Record Definition File headers in bold remain visible when navigating between the different pages.

Users can use the navigation buttons to move between pages in the Viewer window.

› Moves the user to the next page of the file

» Moves the user to the last page of the file

‹ Moves the user to the previous page of the file

« Moves the user to the first page of the file

A user can also use the page number box to manually enter a specific page number to view.

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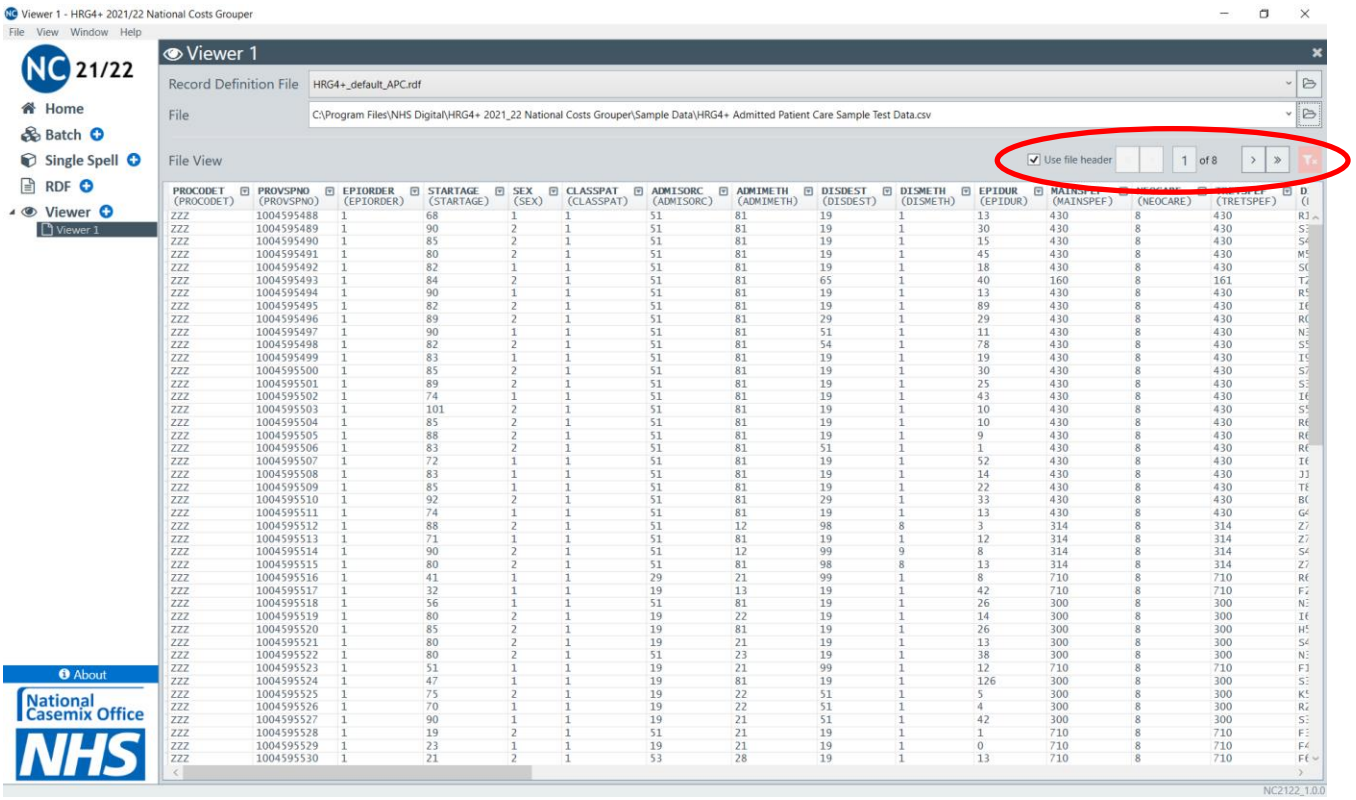
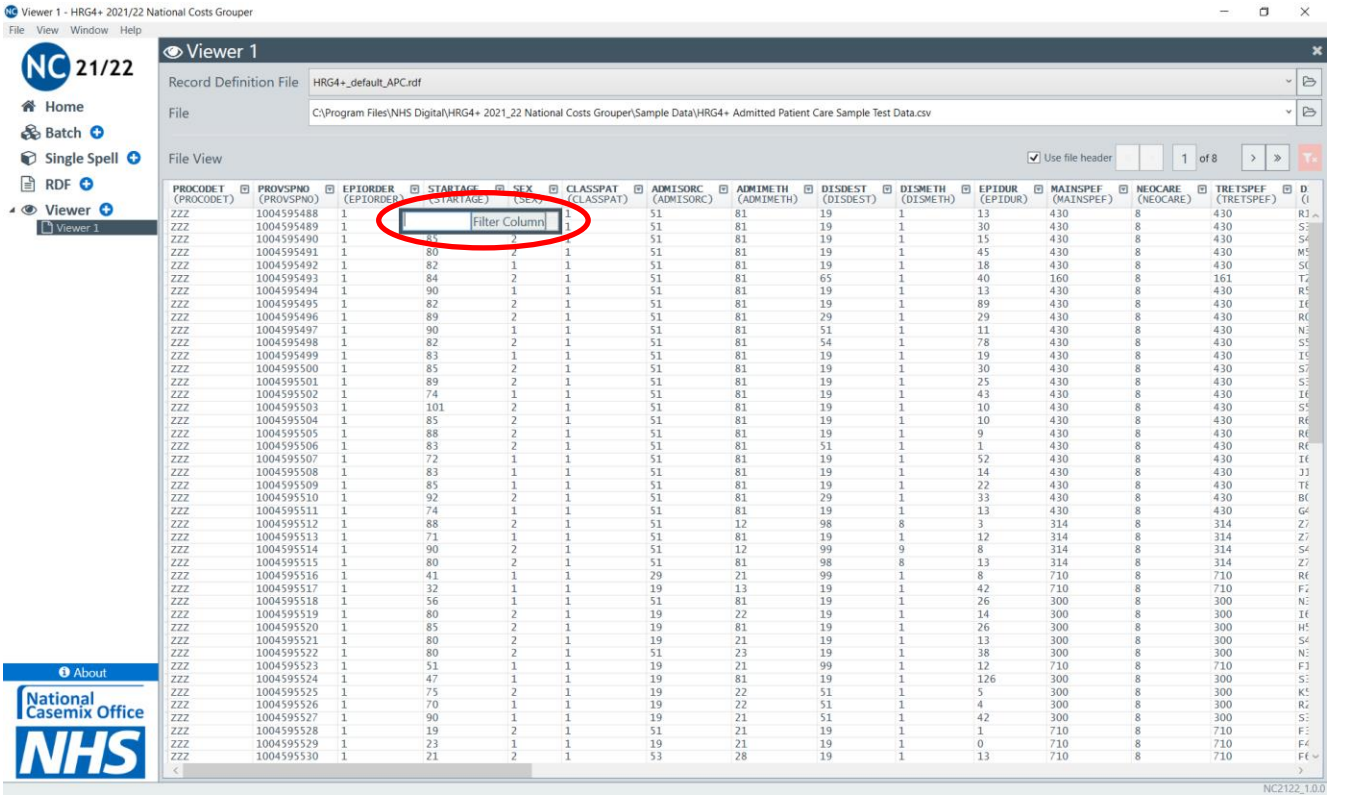


Filters have been introduced into the Viewer that allow users to filter on specific columns in the **File View** window. In the top row of the **File View** window, each column contains a small drop-down arrow that when clicked opens a pop-up box that allows users to filter on a particular value.



Users can filter on a particular value or use the wildcard characters * and ?

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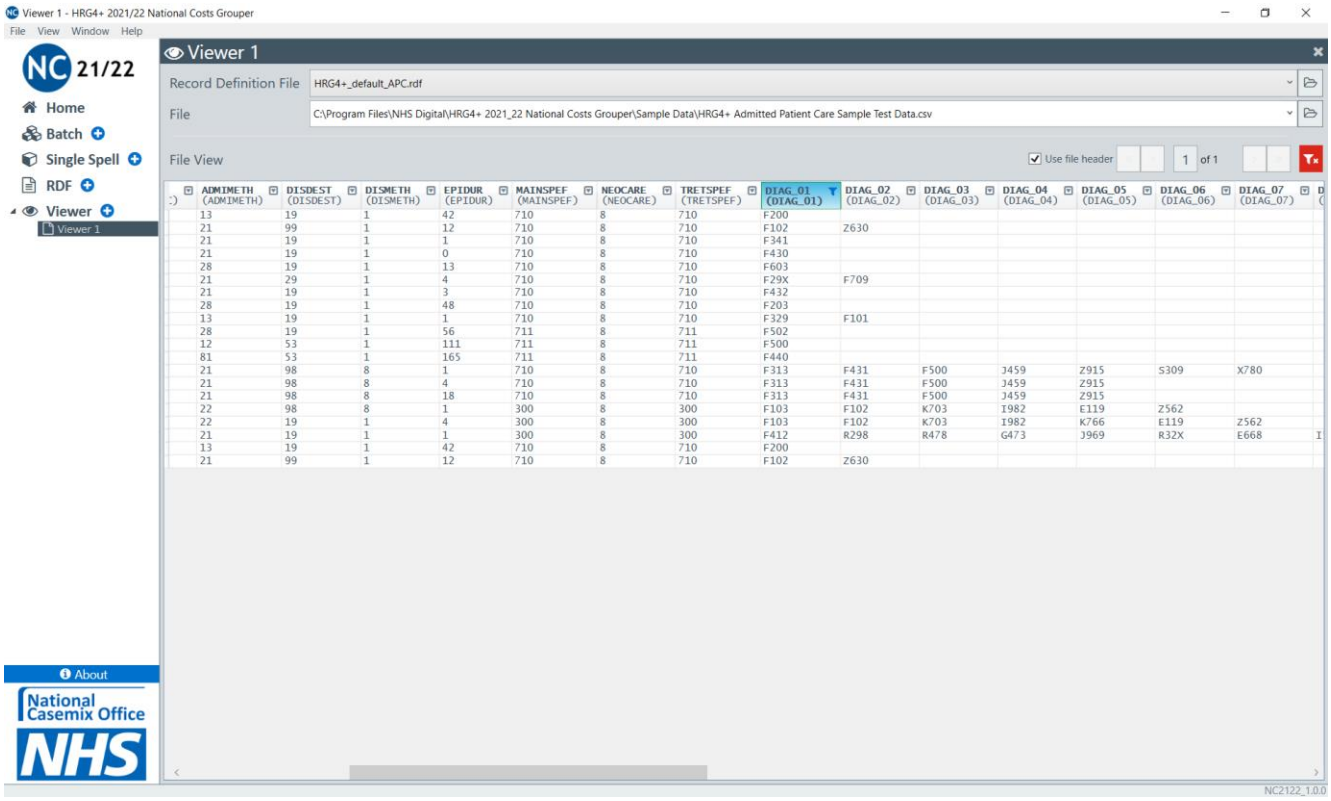
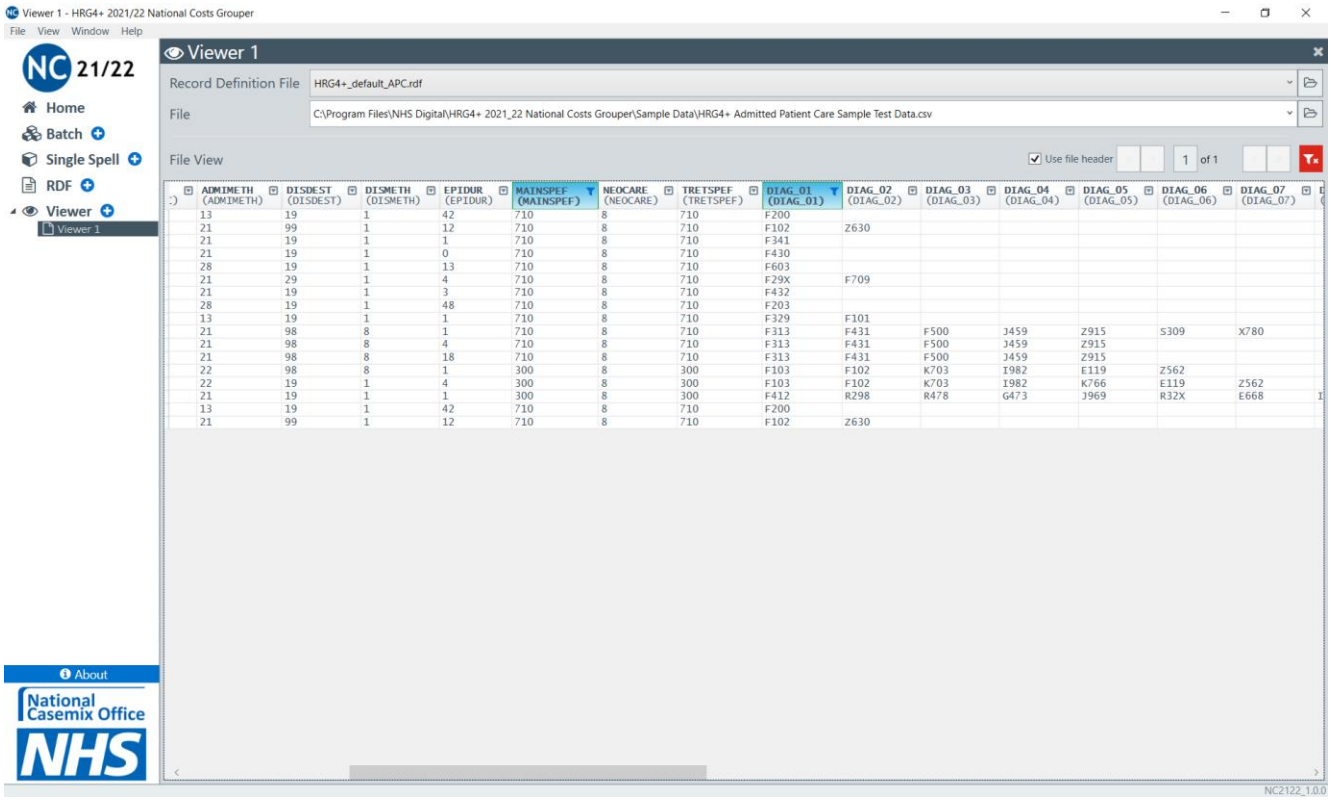
The asterisk (*) in a wildcard matches any character zero or more times. For example, click the ▽ button in the DIAG_01 column and enter F*. This will return all diagnosis codes that start with F.



The question mark (?) in a wildcard matches a single character once. The question mark can also be used more than once. For example, click the ▽ button in the MAINSPEF column and enter ??0. This will return all main specialty codes where the code is three characters, and the last character is a 0.



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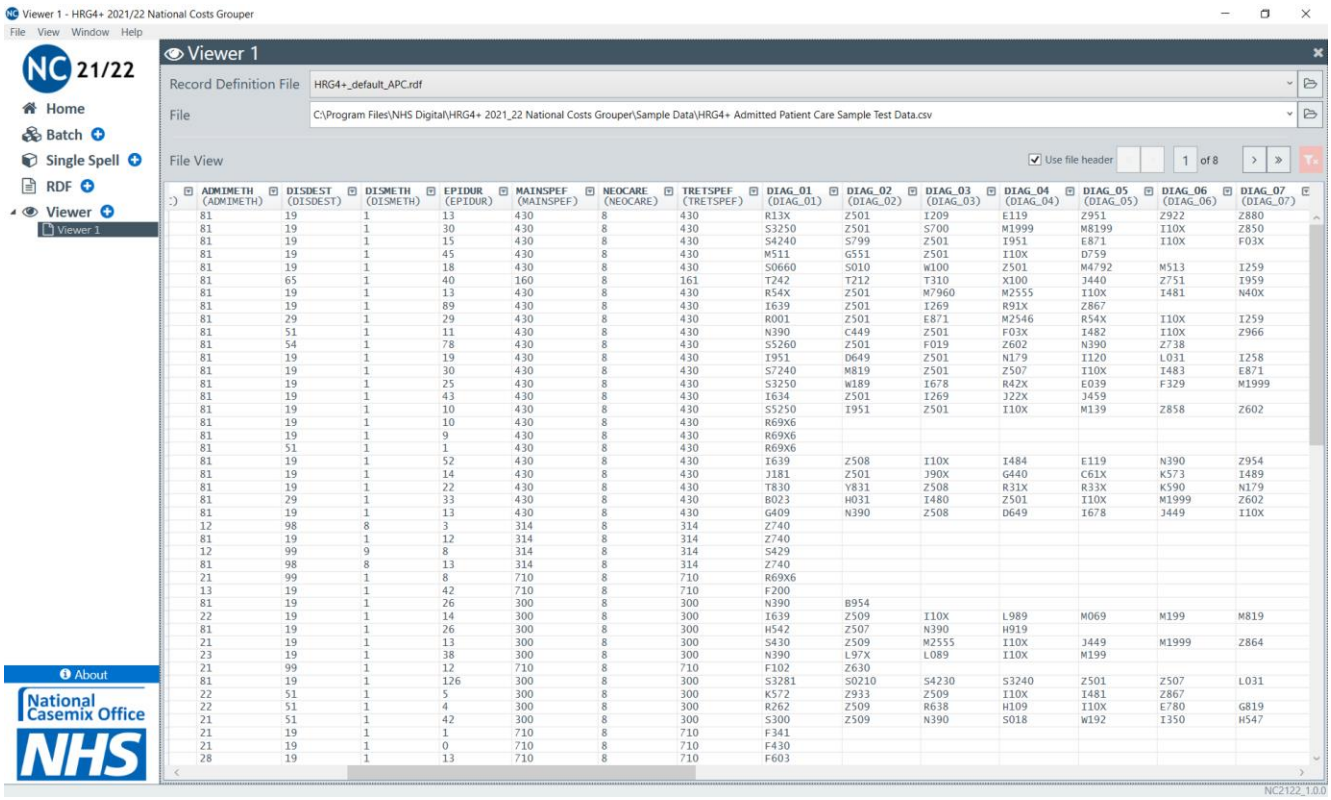
A user can filter on blanks by leaving the “Filter Column” blank.

Individual filters can be cleared by clicking on the small drop-down arrow on columns where filters are applied and clicking on the bin icon, or where multiple filters have been applied, all filters can be cleared by clicking on the (Clear All Filter) icon.

Click the clear all filter icon to reset the viewing window to its original state.



While the use of the Viewer has limited value for manipulating large files (due to the display limitations), one specific area of development has been to introduce cross-functionality whereby a user can now double-click on a row of data in the **File View** window to open a new Single Spell window with the information already populated in the relevant fields.

Double-click the first line of data of the `HRG4+ Admitted Patient Care Sample Test Data.csv` in the **File View** window or right-click on the row of data and select “Open in single spell”.

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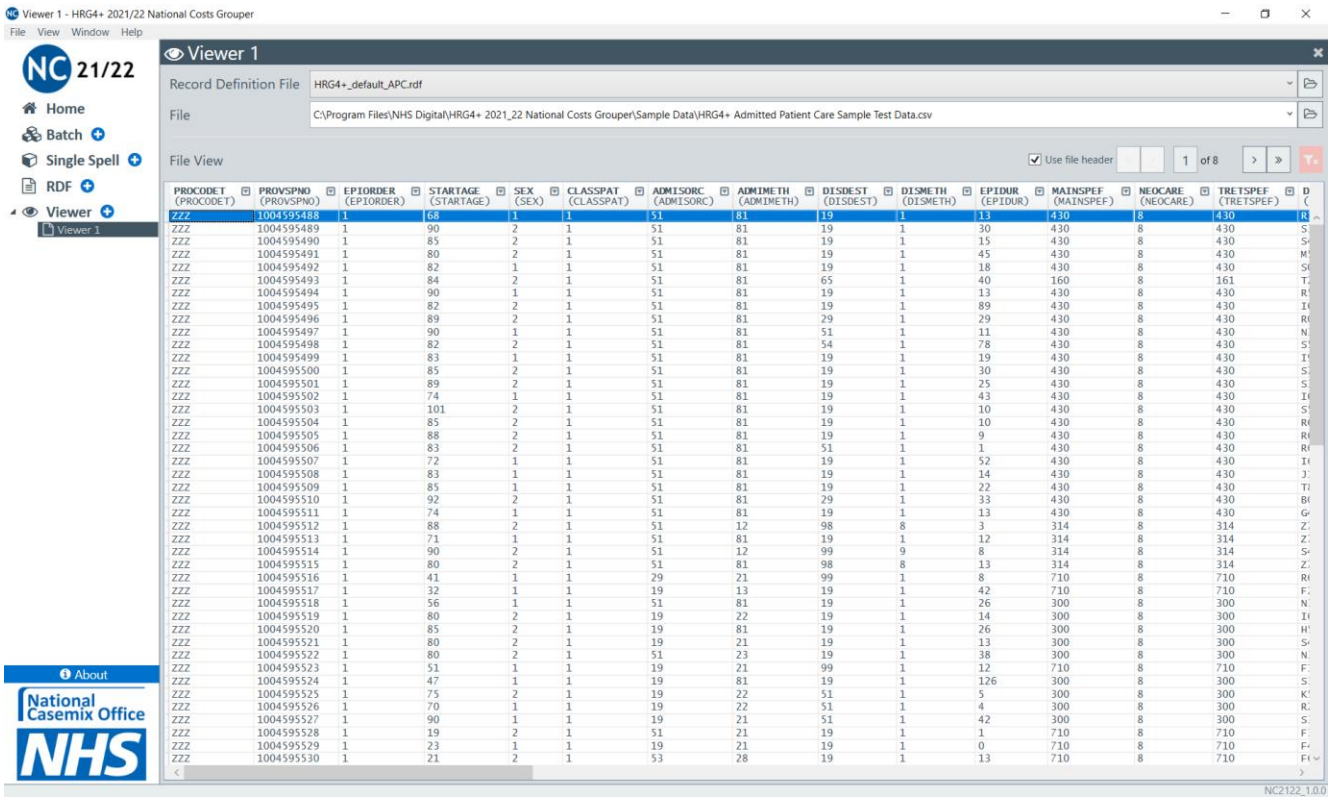
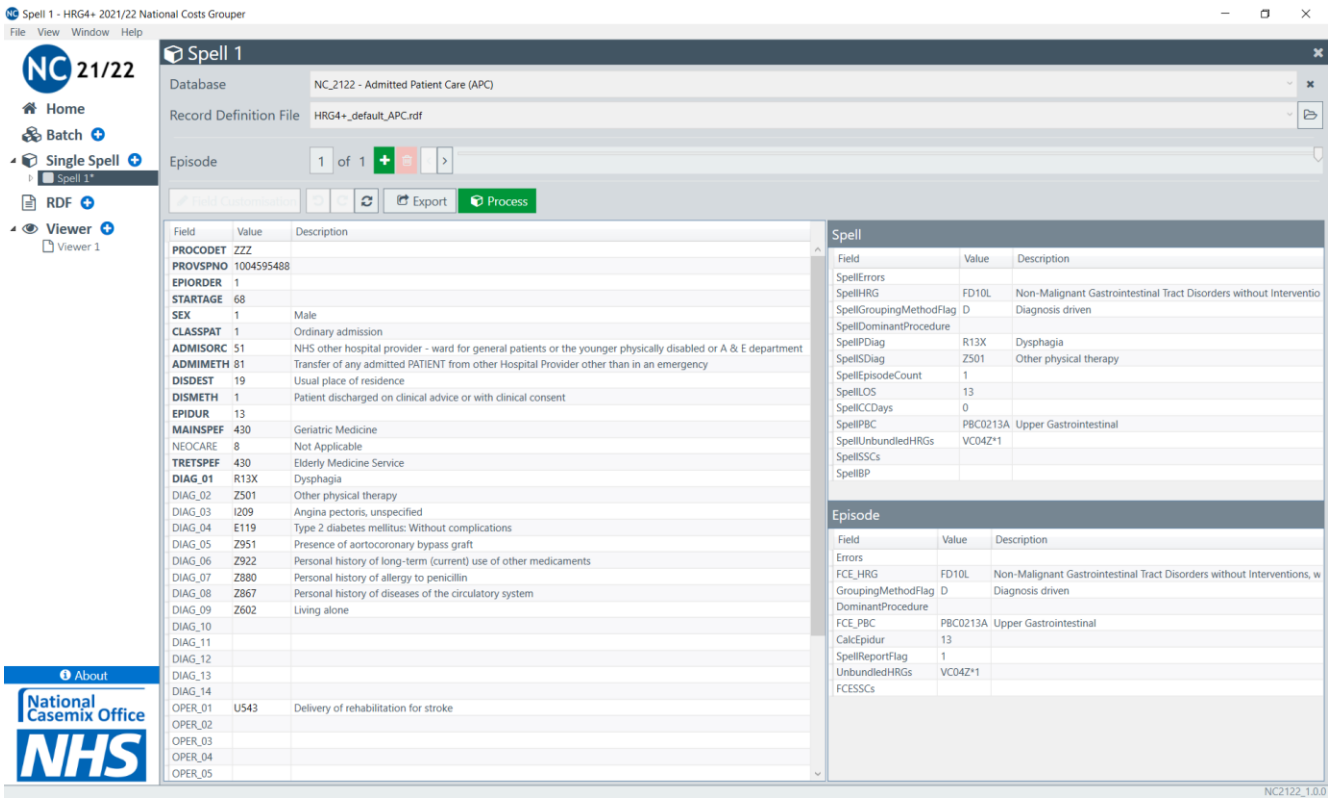


This will open a new Single Spell window populated with the data shown in the **File View** window.



This feature only works where a relevant Record Definition File is selected with the selected File.

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Input File Preparation

This section provides guidance about preparing input files for processing with the Grouper.

Validation

Unless otherwise stated, the values in each field are validated against enumerated sets of values – generally based on NHS Data Dictionary definitions.

File Format

Input data must be in comma-separated value (CSV) format using the American Standard Code for Information Interchange (ASCII) character set, excluding the non-printing ASCII characters. The input file must not include qualifiers, such as quotation marks, around the fields.

Text qualifiers in any original fields can be ignored by selecting the appropriate “Text Qualifiers < > none” when either extracting the CSV or importing into Excel prior to saving as a CSV file.

Using Excel for File Preparation

If some of the records end with empty fields, historically a file structure issue can arise when saving a text file using Microsoft Excel. To prevent this issue from arising, you can populate the final (rightmost) column of data, for every record in the file, with dummy data, for example a column of cells which all contain the value “x”.

Data Set Types with Leading Zeros

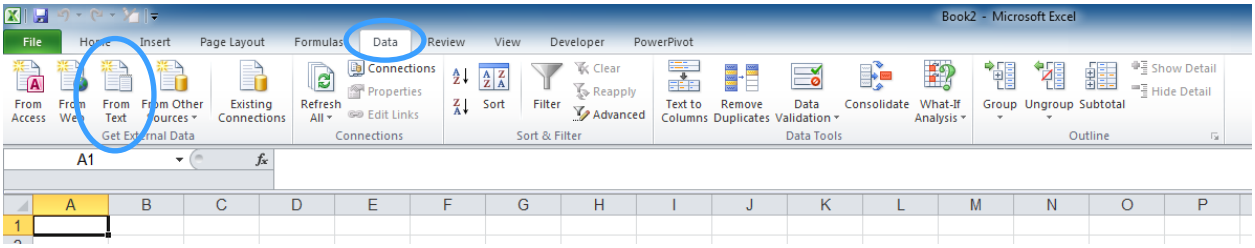
Please be aware that unless properly imported, opening a CSV in Excel will cause changes to the data. A common occurrence is for leading zeros to be stripped out when a CSV file is opened in Excel.

All Data Set Types utilised by the Grouper, except for APC and NAC, use leading zeros in certain fields. If the leading zeros are not present, the record may fail validation or worse, will lead to incorrect grouping (this is especially important for EM grouping, where Treatment Codes such as 011 and 11 are different).

The following screenshots illustrate how a CSV file can be imported into Excel for manipulation while maintaining leading zeros.

To open a CSV in Excel while retaining the correct values, please follow the guide below:

1. Open Excel. Click on the **Data** tab and click **From Text** in the ribbon.



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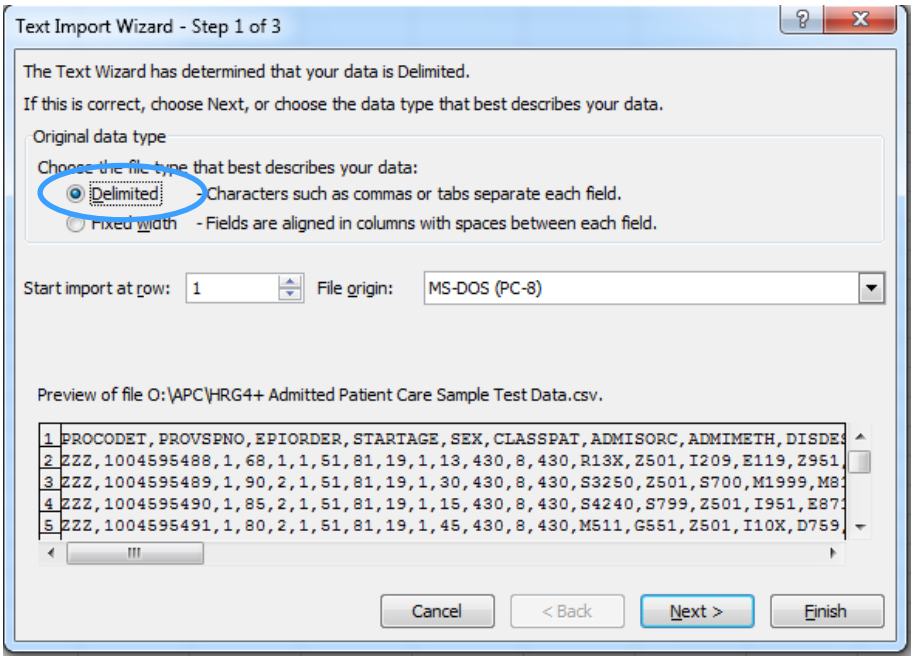
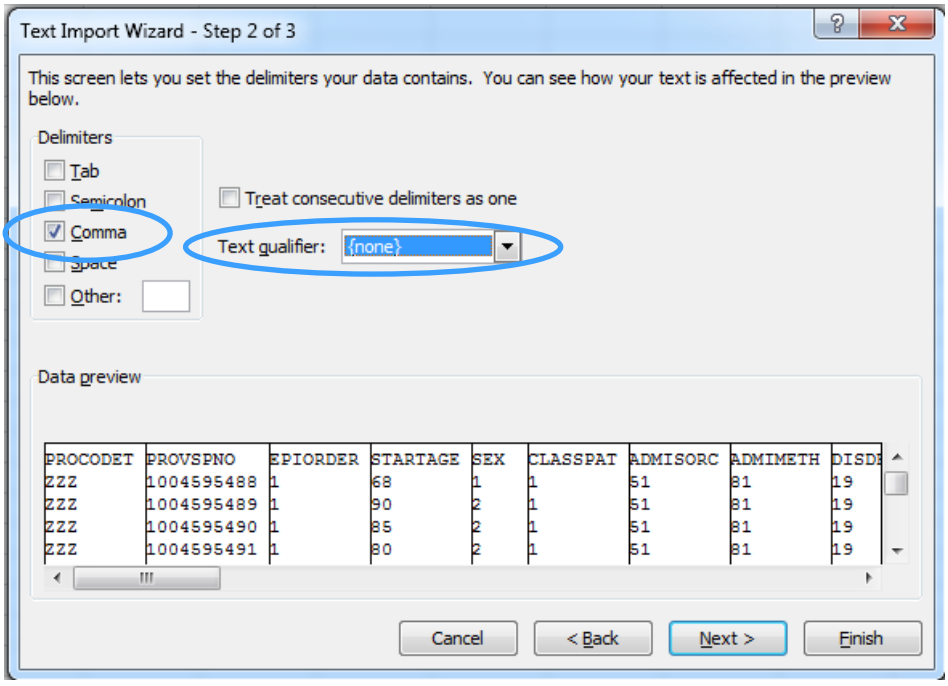
2. Navigate to your input file. In the Text Import Wizard, select **Delimited** in step 1/3.



3. Then tick the **Comma** tick box under “Delimiters” in step 2/3.



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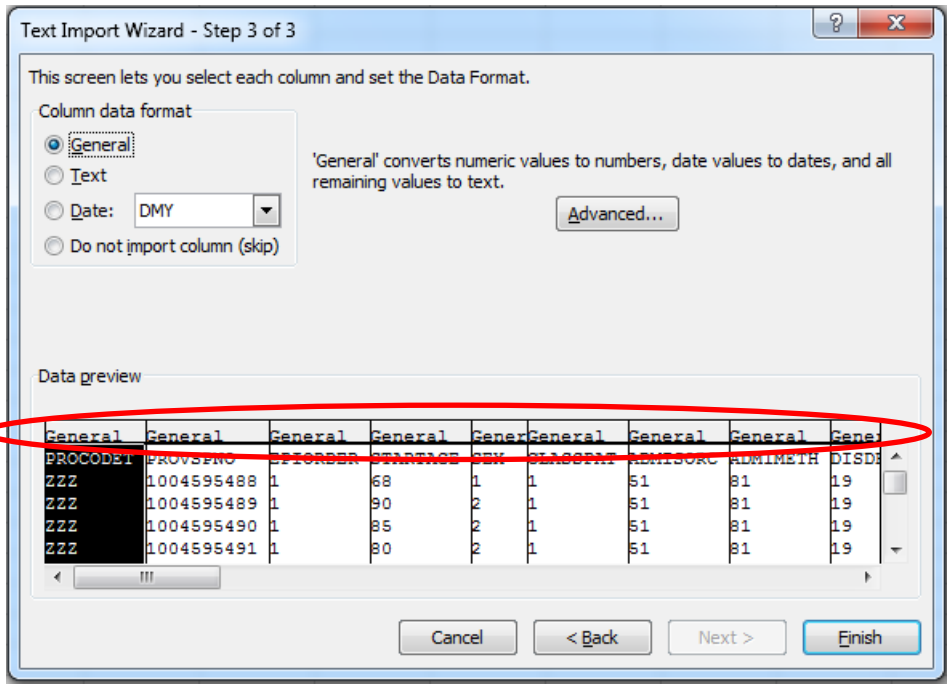
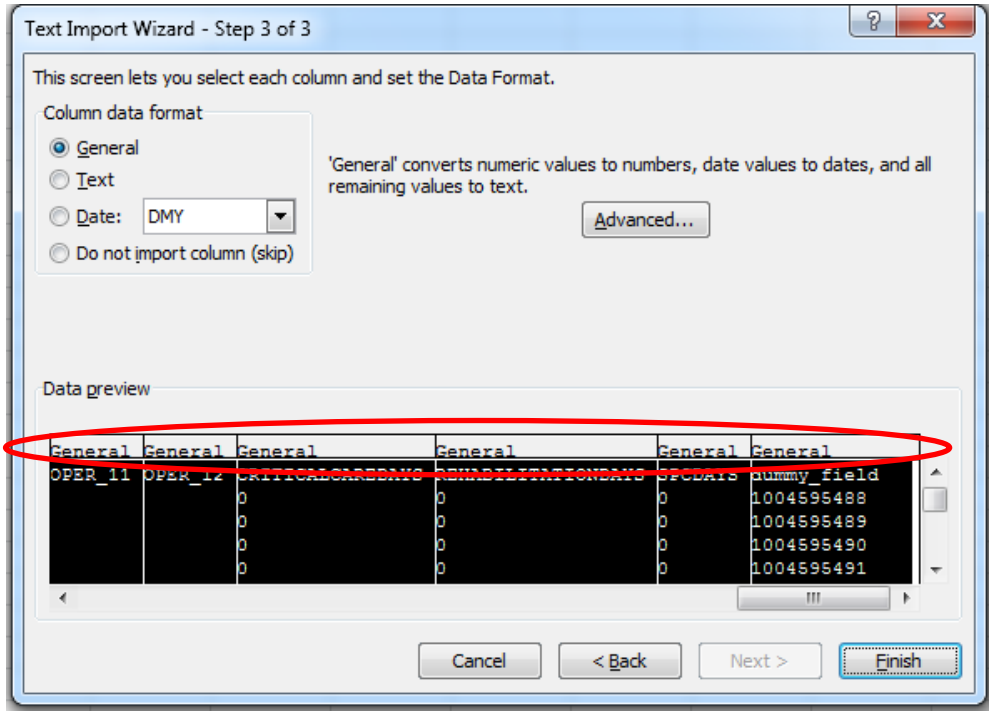
4. In step 3/3, notice Excel wants to pull the data into cells formatted as “General”, not “Text”. You will need to change this, but first…



It is essential that the user highlight all columns when changing the format option to text. To do this, scroll all the way to the right and press the **Shift** key and click on the last column. This will select all columns.



Then select the **Text** radio button.

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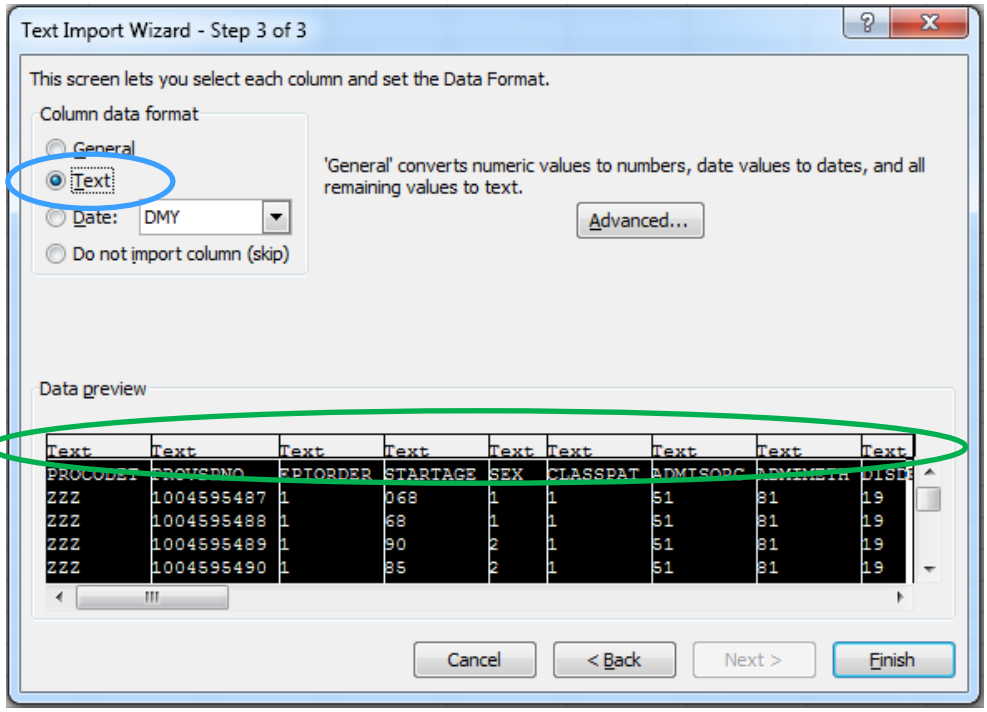

Finally click **Finish** and choose which cell you want to pull the data into. This will ensure the data is imported as text for all columns.

It is recommended that you pull the data into cell A1 if you intend to save the file as a CSV file to run through the Grouper.

For more information on which fields have leading zeros, please see the notes column in the dataset tables below.

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Grouper Data Sets

There are seven data sets which are supported by the Grouper. The tables below show what input fields are required for each data set type for grouping. The Mandation column indicates which fields must be present in the input file for grouping to take place. The Auto Complete column indicates which input fields in Single Spell have an autocomplete function meaning that when a user starts typing in the cell, a list of 10 relevant codes will be displayed along with their description.

Admitted Patient Care (APC)

The Grouper sorts APC data prior to processing so that records with the same Provider Code and Provider Spell Number are placed in Episode Number order.

The field list below shows the fields required by the Grouper. The field order of the input file is defined by the Record Definition File used for the grouping session; there is no significance to the order in which the fields are listed below.

Grouper Field Name	CDS/DD Field Name	Mandation	Auto Complete	Notes
PROCODET	ORGANISATION CODE (CODE OF PROVIDER)	Mandatory	No	A value must be supplied but is not validated. For NHS organisations, use the first 3 characters. For non-NHS organisations, use all 5 characters.
PROVSPNO	HOSPITAL PROVIDER SPELL NUMBER (or alternative)	Mandatory	No	A value must be supplied but is not validated. It is possible to use an alternative spell identifier as PROVSPNO, in place of the Hospital Provider Spell Number.
EPIORDER	EPISODE NUMBER	Mandatory	No	Duplicates within a spell will create an error. EPIORDER values 98 and 99 are invalid for grouping.
STARTAGE	Derived	Mandatory	No	Whole years rounded down: START DATE (EPISODE) – PERSON BIRTH DATE
SEX	PERSON GENDER CODE CURRENT	Mandatory	Yes	Must be the same for all episodes within a spell

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Grouper Field Name	CDS/DD Field Name	Mandation	Auto Complete	Notes
CLASSPAT	PATIENT CLASSIFICATION CODE	Mandatory	Yes	Must be the same for all episodes within a spell
ADMISORC	SOURCE OF ADMISSION CODE (HOSPITAL PROVIDER SPELL)	Mandatory	Yes	Must be the same for all episodes within a spell
ADMIMETH	ADMISSION METHOD CODE (HOSPITAL PROVIDER SPELL)	Mandatory	Yes	Must be the same for all episodes within a spell
DISDEST	DISCHARGE DESTINATION CODE (HOSPITAL PROVIDER SPELL)	Mandatory	Yes	Must be populated with a valid value. The Grouper uses the code from the last episode.
DISMETH	DISCHARGE METHOD CODE (HOSPITAL PROVIDER SPELL)	Mandatory	Yes	Must be populated with a valid value. The Grouper uses the code from the last episode.
EPIDUR	Derived	Mandatory	No	Range: 0-99999. Whole days: END DATE (EPISODE) – START DATE (EPISODE)
MAINSPEF	CARE PROFESSIONAL MAIN SPECIALTY CODE	Mandatory	Yes	Must be populated with a valid value.
NEOCARE	NEONATAL LEVEL OF CARE CODE	Optional	Yes	May be blank.
TRETSPEF	ACTIVITY TREATMENT FUNCTION CODE	Mandatory	Yes	Must be populated with a valid value.
DIAG_01	PRIMARY DIAGNOSIS (ICD)	Mandatory	Yes	Valid ICD-10 code. If this field is blank an error will be generated.
DIAG_02 - DIAG_99	SECONDARY DIAGNOSIS (ICD)	Optional	Yes	As above, but blank allowed

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Grouper Field Name	CDS/DD Field Name	Mandation	Auto Complete	Notes
OPER_01 - OPER_99	PRIMARY PROCEDURE (OPCS) and PROCEDURE (OPCS)	Optional	Yes	Valid OPCS-4 codes or blank
CRITICALCAREDAYS	Derived	Optional	No	Range: 0-99999 or blank Count of distinct days within the episode when the patient was in Critical Care If the patient was in Critical Care on the last day of an episode that was not the last episode of the spell, then that day in critical care should be assigned to the next episode.
REHABILITATIONDAYS	LENGTH OF STAY ADJUSTMENT (REHABILITATION)	Optional	No	Range: 0-99999 or blank This field should only be populated with days that meet the following Data Dictionary definition and will result in a length of stay adjustment. The total number of days within a Consultant Episode (Hospital Provider) that a discrete period of ACTIVITY such as Rehabilitation occurred that requires an adjustment to the total length of stay for National Tariff Payment System purposes. Where several discrete periods of applicable activity for the same LENGTH OF STAY ADJUSTMENT REASON occur within one Consultant Episode (Hospital Provider), the number of days under the same LENGTH OF STAY ADJUSTMENT REASON should be totalled and reported in a single LENGTH OF STAY ADJUSTMENT.

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Grouper Field Name	CDS/DD Field Name	Mandation	Auto Complete	Notes
SPCDAYS	LENGTH OF STAY ADJUSTMENT (SPECIALIST PALLIATIVE CARE)	Optional	No	Range: 0-99999 or blank This field should only be populated with days that meet the following Data Dictionary definition and will result in a length of stay adjustment. The total number of days within a Consultant Episode (Hospital Provider) that a discrete period of ACTIVITY such as Specialist Palliative Care occurred that requires an adjustment to the total length of stay for National Tariff Payment System purposes. Where several discrete periods of applicable activity for the same LENGTH OF STAY ADJUSTMENT REASON occur within one Consultant Episode (Hospital Provider), the number of days under the same LENGTH OF STAY ADJUSTMENT REASON should be totalled and reported in a single LENGTH OF STAY ADJUSTMENT.

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Non-Admitted Consultations (NAC)

Non-admitted consultations are outpatient attendances or attendances by patients for nursing care on a ward (ward attenders). Since 1 April 2005, the Outpatient Attendance CDS has contained both of these types of data.

The field list below shows the fields required by the Grouper. The field order of the input file is defined by the Record Definition File used for the grouping session; there is no significance to the order in which the fields are listed below.

Grouper Field name	CDS/DD Field Name	Mandation	Auto Complete	Notes
STARTAGE	Derived	Mandatory	No	Whole years rounded down: APPOINTMENT DATE – PERSON BIRTH DATE
SEX	PERSON GENDER CODE CURRENT	Mandatory	Yes	Must be populated with a valid value
MAINSPEF	CARE PROFESSIONAL MAIN SPECIALTY CODE	Mandatory	Yes	Must be populated with a valid value
TRETSPEF	ACTIVITY TREATMENT FUNCTION CODE	Mandatory	Yes	Must be populated with a valid value
FIRSTATT	FIRST ATTENDANCE CODE	Mandatory	Yes	Must be populated with a valid value
OPER_01 - OPER_99	PRIMARY PROCEDURE (OPCS) and PROCEDURE (OPCS)	Optional	Yes	Valid OPCS-4 codes or blank

Each row of the input file represents a single attendance.

Diagnosis codes are excluded from the HRG4+ algorithm for non-admitted consultations as these data are not mandated as part of the Outpatient Commissioning Data Set.

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Emergency Medicine (EM)

The field list below shows the fields required by the Grouper. The field order of the input file is defined by the Record Definition File used for the grouping session; there is no significance to the order in which the fields are listed below.

Grouper Field Name	CDS/DD Field Name	Mandation	Auto Complete	Notes
AGE	Derived	Mandatory	No	Whole years rounded down: ARRIVAL DATE – PERSON BIRTH DATE Validated, but not used in grouping
AEPATIENTGROUP	A AND E PATIENT GROUP	Optional	Yes	Valid A and E patient group code, but blank allowed
INV_01 - INV_99	ACCIDENT AND EMERGENCY INVESTIGATION – FIRST and ACCIDENT AND EMERGENCY INVESTIGATION – SECOND	Optional	Yes	Valid national code component (always 2 characters) or blank The “Local Sub-Analysis” part should not be submitted. Leading zeroes must be included where they form part of the national code component.
TREAT_01 - TREAT_99	ACCIDENT AND EMERGENCY TREATMENT – FIRST and ACCIDENT AND EMERGENCY TREATMENT – SECOND	Optional	Yes	Valid national code component (2 or 3 characters) or blank The “Local Sub-Analysis” part should not be submitted. Leading zeroes must be included where they form part of the national code component.

Each row of the input file represents one Accident and Emergency Attendance.

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Renal Dialysis (NRD)

Renal Dialysis HRGs are generated using fields from the National Renal Dataset.

The field list below shows the fields required by the Grouper. The field order of the input file is defined by the Record Definition File used for the grouping session; there is no significance to the order in which the fields are listed below.

Grouper Field Name	DD Field Name	Mandation	Auto Complete	Notes
RENALMOD	RENAL TREATMENT MODALITY CODE	Mandatory	Yes	Leading zeros are significant.
RENALSITE	RENAL TREATMENT PRIMARY SUPERVISION CODE	Mandatory	Yes	Leading zeros are significant.
RENALACCESS	RENAL DIALYSIS ACCESS TYPE	Optional	Yes	Leading zeros are significant.
HBV	HEPATITIS B ANTIGEN STATUS (RENAL CARE)	Optional	No	Accepted values are NEG, POS and UNK.
HCV	HEPATITIS C ANTIBODY STATUS (RENAL CARE)	Optional	No	Accepted values are NEG, POS and UNK.
HIV	HUMAN IMMUNODEFICIENCY VIRUS STATUS (RENAL CARE)	Optional	No	Accepted values are NEG, POS and UNK.
AGE	Derived	Mandatory	No	The age of the patient in whole years at the start date of the session Range: 0-130

Each row of the input file represents either one haemodialysis session or one day of peritoneal dialysis.

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Adult Critical Care (ACC)

The field list below shows the fields required by the Grouper. The field order of the input file is defined by the Record Definition File used for the grouping session; there is no significance to the order in which the fields are listed below.

Grouper Field Name	CDS/DD Field Name	Mandation	Auto Complete	Notes
CCUF	CRITICAL CARE UNIT FUNCTION	Mandatory	Yes	Leading zeros are significant.
BCSD	BASIC CARDIOVASCULAR SUPPORT DAYS	Optional	No	Range: 0-99999
ACSD	ADVANCED CARDIOVASCULAR SUPPORT DAYS	Optional	No	Range: 0-99999
BRSD	BASIC RESPIRATORY SUPPORT DAYS	Optional	No	Range: 0-99999
ARSD	ADVANCED RESPIRATORY SUPPORT DAYS	Optional	No	Range: 0-99999
RSD	RENAL SUPPORT DAYS	Optional	No	Range: 0-99999
NSD	NEUROLOGICAL SUPPORT DAYS	Optional	No	Range: 0-99999
DSD	DERMATOLOGICAL SUPPORT DAYS	Optional	No	Range: 0-99999
LSD	LIVER SUPPORT DAYS	Optional	No	Range: 0-99999

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CCL2D	CRITICAL CARE LEVEL 2 DAYS	Optional	No	Range: 0-99999
CCL3D	CRITICAL CARE LEVEL 3 DAYS	Optional	No	Range: 0-99999
CC_Start_Date	CRITICAL CARE START DATE	Optional	No	Format is YYYYMMDD, e.g. 1 April 2018 = 20180401
CC_Discharge_Date	CRITICAL CARE DISCHARGE DATE	Optional	No	Format is YYYYMMDD, e.g. 1 April 2018 = 20180401

Critical Care Start Date and Critical Care Discharge Date fields are used to calculate critical care days in the Grouper output file. They are not used in HRG derivation.

Each row of the input file represents one Adult Critical Care Period.

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Paediatric Critical Care (PCC)

The Grouper sorts Paediatric Critical Care data prior to grouping so that records with the same provider code and local identifier are placed in activity date order.

The field list below shows the fields required by the Grouper. The field order of the input file is defined by the Record Definition File used for the grouping session; there is no significance to the order in which the fields are listed below.

Grouper Field Name	CDS/DD Field Name	Mandation	Auto Complete	Notes
PROCODET	ORGANISATION CODE (CODE OF PROVIDER)	Optional	No	A value must be supplied but is not validated. For NHS organisations, use the first 3 characters. For non-NHS organisations, use all 5 characters.
CCLocalID	CRITICAL CARE LOCAL IDENTIFIER	Optional	No	This and the provider field together is the key that keeps records for the same patient together. They must be supplied.
CCDate	ACTIVITY DATE (CRITICAL CARE)	Mandatory	No	Format is YYYYMMDD, e.g. 1 April 2018 = 20180401
DISDATE	DISCHARGE DATE (HOSPITAL PROVIDER SPELL)	Mandatory	No	Format is YYYYMMDD, e.g. 1 April 2018 = 20180401
DISMETH	DISCHARGE METHOD CODE (HOSPITAL PROVIDER SPELL)	Mandatory	Yes	Must be populated with a valid value. The Grouper uses the code from the last episode.
CCUF	CRITICAL CARE UNIT FUNCTION	Mandatory	No	Leading zeros are significant.
CCAC_01	CRITICAL CARE ACTIVITY CODE	Optional	Yes	Valid CCAC code from list in Paediatric Critical Care Minimum Dataset (PCCMDS)

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Grouper Field Name	CDS/DD Field Name	Mandation	Auto Complete	Notes
CCAC_02 - CCAC_20	CRITICAL CARE ACTIVITY CODE	Optional	Yes	Valid CCAC code from list in Paediatric Critical Care Minimum Dataset (PCCMDS)
OPER_01 - OPER_20	HIGH COST DRUGS (OPCS)	Optional	Yes	Valid OPCS-4 codes or blank The PCC MDS specifies two appropriate procedure codes only.
DIAG_01 - DIAG_99	PRIMARY DIAGNOSIS (ICD) and SECONDARY DIAGNOSIS (ICD)	Optional	Yes	Valid ICD-10 codes or can be blank

Each paediatric critical care day is represented by a data row in the input file. Where a child moves between units with different Critical Care Unit Function Codes, a new critical care period starts. This may result in the generation of more than one critical care record for the day of transfer and consequently more than one HRG for that day.

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Neonatal Critical Care (NCC)

The Grouper sorts Neonatal Critical Care prior to grouping so that records with the same provider code and local identifier are placed in activity date order.

The field list below shows the fields required by the Grouper. The field order of the input file is defined by the Record Definition File used for the grouping session; there is no significance to the order in which the fields are listed below.

Grouper Field Name	CDS/DD Field Name	Mandation	Auto Complete	Notes
PROCODET	ORGANISATION CODE (CODE OF PROVIDER)	Optional	No	A value must be supplied but is not validated. For NHS organisations, use the first 3 characters. For non-NHS organisations, use all 5 characters.
CCLocalID	CRITICAL CARE LOCAL IDENTIFIER	Optional	No	This and the provider field together is the key that keeps records for the same patient together. They must be supplied.
CCDate	ACTIVITY DATE (CRITICAL CARE)	Mandatory	No	Format is YYYYMMDD, e.g. 1 April 2018 = 20180401
DISDATE	DISCHARGE DATE (HOSPITAL PROVIDER SPELL)	Mandatory	No	Format is YYYYMMDD, e.g. 1 April 2018 = 20180401
CCUF	CRITICAL CARE UNIT FUNCTION	Mandatory	Yes	Leading zeros are significant.
AGE_DAYS	Derived			Whole days rounded down: ACTIVITY DATE (CRITICAL CARE) - PERSON BIRTH DATE
DISMETH	DISCHARGE METHOD CODE (HOSPITAL PROVIDER SPELL)	Mandatory	No	Must be populated with a valid value. The Grouper uses the code from the last episode.
GestLen	GESTATION LENGTH (AT DELIVERY)	Mandatory	No	Must be populated with a valid value. These are 10 to 49 inclusive (whole numbers only).

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Grouper Field Name	CDS/DD Field Name	Mandation	Auto Complete	Notes
PERWT	PERSON WEIGHT	Mandatory	No	Kilograms, to 3 decimal places Range: greater than zero kg and less than 10 kg Leading zeroes are accepted.
CCAC_01	CRITICAL CARE ACTIVITY CODE	Optional	Yes	Valid CCAC code from list in Neonatal Critical Care Minimum Dataset (NCCMDS)
CCAC_02 - CCAC_20	CRITICAL CARE ACTIVITY CODE	Optional	Yes	Valid CCAC code from list in Neonatal Critical Care Minimum Dataset (NCCMDS)

Each neonatal critical care day is represented by a data row in the input file. Where a baby moves between units with different Critical Care Unit Function Codes, a new critical care period starts. This may result in the generation of more than one critical care record for the day of transfer and consequently more than one HRG for that day.

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Output Files

In the text below and in the tables in the following pages, the output file name supplied by the user during processing is referred to as `[name]`; the remainder of the file name is a standard suffix that is appended by the Grouper.

A single input file produces several output files. User requirements determine which files are used; some users may not require certain output files. In most cases, an output field appears in more than one file, enabling users to select the files that best suit their needs.

Output files are produced as comma-separated text. These files may be opened with Microsoft Excel, but very large files may exceed the maximum number of rows for Excel. In these cases, an error message such as “File not loaded completely” will be displayed when attempting to open the file. The output files may be opened with a variety of other applications, including Windows Notepad.

Relational Outputs

Relational output files can be identified by the presence of “`_rel`” as part of the filename. They are characterised by the following features:

- They include row number references in order to allow files to be linked.
- Where items are repeated (e.g. unbundled HRGs, error messages), this is represented by the addition of rows rather than columns, i.e. the data is normalised.

The relational output files are supplied to support users who wish to import the Grouper output into a relational database; other users may choose to ignore them – and vice versa.

RowNo Field

RowNo is an identifier that can be used to link rows in output files to rows in other output files. This is particularly useful in the case of the relational output files. Use of a system generated row number avoids problems using input values where they may not be unique.

Note that depending on the file’s role in a relationship with another file, **RowNo** may not contain consecutive values, i.e. there may be values missing; this is by design. For example, the **RowNo** values in the `[name]_spell_rel.csv` file will contain non-consecutive values where the input data contains multi-episode spells.

Iteration Field

Iteration appears in some relational output files where it is used to distinguish between occurrences within the same key value. There is no significance to the numerical values of “Iteration”; the values are assigned in consecutive order starting with 1.

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Admitted Patient Care (APC)

There are eleven output files. Note: From January 2022 no NCO Grouper product will output the redundant **fce_flag_rel file**

File Name/Field Name		Description
[name].csv		A list of all the other output files
[name]_sort.csv		A copy of the input data after it has been sorted by Provider Code, Spell Number and Episode Number prior to grouping
	<input data>	All of the input data, including any non-mandatory fields
	RowNo	The generated row number of the record after sorting. This will match the equivalent fields in other output files from the same Grouper run.
[name]_FCE.csv		Contains both episode and spell output fields The spell fields are repeated for each episode in the spell; care must be taken to avoid double-counting when using spell fields.
	<input data>	All of the input data, including any non-mandatory fields
	RowNo	Matches the run generated row number
	FCE_HRG	The episode HRG
	GroupingMethodFlag	The grouping method used for the spell P=Procedure driven, D=Diagnosis driven, B=Burns driven, M=Multiple trauma, G=Global exception and U=Error
	DominantProcedure	The dominant procedure
	FCE_PBC	Programme Budgeting Code for the episode
	CalcEpidur	The calculated episode duration. This is the input Episode duration minus the number of days in the input fields CRITICALCAREDAYS, REHABILITATIONDAYS and SPCDAYS. If the sum of these deductions is larger than the episode duration, then CalcEpidur will be zero.
	ReportingEPIDUR	Not populated (redundant field)
	FCETrimpoint	Not populated (redundant field)

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File Name/Field Name		Description
	FCEExcessBeddays	Not populated (redundant field)
	SpellReportFlag	Populated with 1 if the episode contains the grouping variable used for deriving the spell HRG (Dominant Episode) or 0 for other episodes in the spell
	FCESSC_Ct	Not populated (redundant field containing default 0)
	FCESSCs1 to FCESSCs7	Not populated (redundant field)
	SpellHRG	The spell HRG
	SpellGroupingMethodFlag	The grouping method used for the spell P=Procedure driven, D=Diagnosis driven, B=Burns driven, M=Multiple trauma, G=Global exception and U=Error
	SpellDominantProcedure	The dominant procedure for the spell
	SpellPDiag	The primary diagnosis used when spell grouping
	SpellSDiag	The first secondary diagnosis in the spell
	SpellEpisodeCount	The number of episodes in the spell
	SpellLOS	The spell duration used for grouping. This is the total of the CalcEpidur fields for the episodes in the spell.
	ReportingSpellLOS	Not populated (redundant field)
	SpellTrimpoint	Not populated (redundant field)
	SpellExcessBeddays	Not populated (redundant field)
	SpellCCDays	The number of critical care days in the spell
	SpellPBC	Programme Budgeting Code for the spell

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File Name/Field Name		Description
	UnbundledHRGs	Variable number of fields containing unbundled HRGs (episode level) If days are reported in the REHABILITATION DAYS or SPCDAYS, the unbundled HRGs will be followed by an asterisk representing the number of days. Note that only certain HRGs are eligible for "* multipliers", and these are output on each instance of the unbundled code generated within the episode. Therefore, where multiple HRGs are output, the number of days will be recorded against each HRG. Care is therefore required in using the "* multiplier" to tell you anything other than the discrete number of days recorded and used for LOS adjustment.
[name]_spell.csv		Contains one row per spell
	RowNo	Matches the run generated row number
	PROCODET	The organisation code from the input file
	PROVSPNO	The hospital provider spell number from the input file
	SpellHRG	The spell HRG
	SpellGroupingMethodFlag	The grouping method used for the spell HRG derivation P=Procedure driven, D=Diagnosis driven, B=Burns driven, M=Multiple trauma, G=Global exception and U=Error
	SpellDominantProcedure	The dominant procedure for the spell
	SpellPDiag	The primary diagnosis used for spell grouping
	SpellSDiag	The first secondary diagnosis in the spell
	SpellEpisodeCount	The number of episodes in the spell
	SpellLOS	The spell duration used for grouping
	ReportingSpellLOS	Not populated (redundant field)
	SpellTrimpoint	Not populated (redundant field)
	SpellExcessBeddays	Not populated (redundant field)
	SpellCCDays	The number of critical care days in the spell

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File Name/Field Name		Description
	SpellPBC	Programme Budgeting Code for the spell
	SpellSSC_Ct	Not populated (redundant field containing default 0)
	SpellSSCs1 to SpellSSCs7	Not populated (redundant field)
	SpellBP_Ct	Only populated by Payment Groupers Number of distinct BPTs produced for the spell. Only one BP is output for each spell.
	SpellBP1 to SpellBP7	Only populated by Payment Groupers Candidate Best Practice Tariff codes for the spell. Only one BP is output for each spell.
	SpellFlag_Ct	Not populated (redundant field containing default 0)
	SpellFlag1 to SpellFlag7	Not populated (redundant field)
	UnbundledHRGs	Variable number of fields containing unbundled HRGs (episode level) If days are reported in the REHABILITATION DAYS or SPCDAYS, the unbundled HRGs will be followed by an asterisk representing the number of days. Note that only certain HRGs are eligible for "* multipliers", and these are output on each instance of the unbundled code generated within the episode. Therefore, where multiple HRGs are output, the number of days will be recorded against each HRG. Care is therefore required in using the "* multiplier" to tell you anything other than the discrete number of days recorded and used for LOS adjustment.
[name]_quality.csv		Contains a row for each episode that contains an error
	<input data>	All of the input data, including any non-mandatory fields
	RowNo	Matches the run generated row number
	Error Message	A variable number of fields, each consisting of Code Type, Code and Error Message, separated by pipe (|) symbols
[name]_FCE_rel.csv		Episode-level output in relational form
	RowNo	Matches the run generated row number

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File Name/Field Name		Description
	FCE_HRG	The episode HRG
	GroupingMethodFlag	The grouping method used for the spell HRG derivation P=Procedure driven, D=Diagnosis driven, B=Burns driven, M=Multiple trauma, G=Global exception and U=Error
	DominantProcedure	The dominant procedure
	FCE_PBC	Programme Budgeting Code for the episode
	CalcEpidur	The calculated episode duration. This is the input Episode duration minus the number of days in the input fields CRITICALCAREDAYS, REHABILITATIONDAYS and SPCDAYS
	ReportingEPIDUR	Not populated (redundant field)
	FCETrimpoint	Not populated (redundant field)
	FCEExcessBeddays	Not populated (redundant field)
	SpellReportFlag	Identifies the dominant episode
[name]_spell_rel.csv		Spell-level output in relational form; one row per spell
	RowNo	Matches the run generated row number
	PROCODET	The organisation code from the input file
	PROVSPNO	The hospital provider spell number from the input file
	SpellHRG	The spell HRG
	SpellGroupingMethodFlag	The grouping method used for the spell HRG derivation P=Procedure driven, D=Diagnosis driven, B=Burns driven, M=Multiple trauma, G=Global exception and U=Error
	SpellDominantProcedure	The dominant procedure for the spell
	SpellPDiag	The primary diagnosis used when spell grouping
	SpellSDiag	The first secondary diagnosis in the spell
	SpellEpisodeCount	The number of episodes in the spell

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File Name/Field Name		Description
	SpellLOS	The spell duration used for grouping
	ReportingSpellLOS	Not populated (redundant field)
	SpellTrimpoint	Not populated (redundant field)
	SpellExcessBeddays	Not populated (redundant field)
	SpellCCDays	The number of critical care days in the spell
	SpellPBC	Programme Budgeting Code for the spell
[name]_quality_rel.csv		Relational format includes a row for each error for each episode
	RowNo	Matches the run generated row number
	Iteration	The ordinal number of the quality message
	Code Type	The type of code that has failed validation
	Code	The value of the code that has failed validation. Blank where the code is missing from the input data
	Error Message	Description of the error
[name]_flag_rel.csv		Only populated by Payment Groupers Relational format includes a row for each Best Practice Tariff (BPT)
	RowNo	Matches the run generated row number
	PROCODET	The organisation code from the input file
	PROVSPNO	The hospital provider spell number from the input file
	Iteration	The ordinal number of the BP Flag
	SpellFlag	Includes the distinct Best Practice Tariff (BPT) code
[name]_ub_rel.csv		The unbundled HRGs. There are no entries for episodes that do not have any unbundled HRGs.
	RowNo	Matches the run generated row number
	Iteration	The ordinal number of the unbundled HRG

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File Name/Field Name		Description
	UnbundledHRGs	Variable number of unbundled HRGs output in a relational format for each episode within a spell
[name]_summary.csv		A single-row file containing details about the grouping session
	Grouper Version	Version of the Grouper that produced the output files
	Database Version	The Grouper's internal HRG database version
	FCE Count	The number of episodes submitted
	Spell Count	The number of spells submitted
	FCE Error Count	The number of episodes having errors
	Spell Error Count	The number of spells having errors
	Run Start Date/Time	The date and time that the grouping session started
	Run End Date/Time	The date and time that the grouping session finished
	Input Filename	The path and filename of the input file
	Output Filename	The path and filename selected by the user
	RDF path and name	The path and filename of the Record Definition File used for grouping

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Non-Admitted Consultations (NAC)

There are seven output files. Note: From January 2022 no NCO Grouper product will output the redundant **flag_rel file**

File Name/Field Name		Description
[name].csv		A list of other output files
[name]_attend.csv		The main grouped output file
	<input data>	All of the input data, including any non-mandatory fields
	RowNo	The generated row number of the record
	NAC_HRG	The Outpatient HRG
	GroupingMethodFlag	The grouping method used for the HRG derivation P=Procedure driven, G=Global exception, O=Outpatient default and U=Error
	DominantProcedure	The dominant procedure
	AttendanceHRG	Only populated by Payment Groupers The Attendance HRG is provided to support the National Reimbursement System when the Outpatient Core (non-WF*) HRG does not have a mandatory tariff and is equivalent to the SUS_HRG.
	AttendSSC_Ct	Not populated (redundant field containing default 0)
	AttendSSC1 to AttendSSC5	Not populated (redundant field)
	AttendBP_Ct	Not populated (redundant field containing default 0)
	AttendBP1 to AttendBP5	Not populated (redundant field)
	AttendFlag_Ct	Not populated (redundant field containing default 0)
	AttendFlag1 to AttendFlag5	Not populated (redundant field)
	UnbundledHRGs	A variable number of fields containing unbundled HRGs appended to the end of each record.
[name]_quality.csv		Contains a row for each attendance that contains errors

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File Name/Field Name		Description
	<input data>	All of the input data, including any non-mandatory fields
	RowNo	Matches the run generated row number
	Error Message	A variable number of fields, consisting of Code Type, Code and Error Message, separated by pipe (|) symbols
[name]_attend_rel.csv		Output in relational form
	<input data>	All of the input data, including any non-mandatory fields
	RowNo	Matches the run generated row number
	NAC_HRG	The Outpatient HRG
	GroupingMethodFlag	The grouping method used for the HRG derivation P=Procedure driven, G=Global exception, O=Outpatient default and U=Error
	DominantProcedure	The dominant procedure
	AttendanceHRG	Only populated by Payment Groupers The Attendance HRG is provided to support the National Reimbursement System when the Outpatient Core (non-WF*) HRG does not have a mandatory tariff and is equivalent to the SUS_HRG.
[name]_quality_rel.csv		All error messages in relational form
	RowNo	Matches the run generated row number
	Iteration	The ordinal number of the quality message
	Code Type	The type of code that has failed validation
	Code	The code that failed validation. Blank if code missing from input data
	Error Message	Description of the error
[name]_ub_rel.csv		The unbundled HRGs. There are no entries for attendances without unbundled HRGs.
	RowNo	Matches the run generated row number
	Iteration	The ordinal number of the unbundled HRG

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File Name/Field Name		Description
	UnbundledHRGs	The unbundled HRGs. There is no significance to the output order.
[name]_summary.csv		A single-row file containing details about the grouping session
	Grouper Version	The version of the Grouper that produced the output files
	Database Version	The Grouper's internal HRG database version
	Attendance Count	The number of records submitted
	Attendance Error Count	The number of records having errors
	Run Start Date/Time	The date and time that the grouping session started
	Run End Date/Time	The date and time that the grouping session finished
	Input Filename	The path and filename of the input file
	Output Filename	The path and filename selected by the user
	RDF path and name	The path and filename of the Record Definition File used for grouping

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Emergency Medicine (EM)

There are five output files.

File Name/Field Name		Description
[name].csv		A list of other output files
[name]_attend.csv		The main grouped output file
	<input data>	All of the input data, including any non-mandatory fields
	RowNo	The generated row number of the record
	EM_HRG	The attendance HRG
[name]_quality.csv		Contains a row for each input record that contains errors
	<input data>	All of the input data including any non-mandatory fields
	RowNo	Matches the run generated row number
	Error Message	A variable number of fields, consisting of Code Type, Code and Error Message, separated by pipe (|) symbols
[name]_quality_rel.csv		All error messages in relational form
	RowNo	Matches the run generated row number
	Iteration	The ordinal number of the quality message
	Code Type	The type of code that has failed validation
	Code	The code that failed validation. Blank if code missing from input data
	Error Message	Description of the error
[name]_summary.csv		A single-row file containing details about the grouping session
	Grouper Version	The version of the Grouper that produced the output files
	Database Version	The Grouper's internal HRG database version
	Attendance Count	The number of records submitted
	Attendance Error Count	The number of records having errors
	Run Start Date/Time	The date and time that the grouping session started

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File Name/Field Name		Description
	Run End Date/Time	The date and time that the grouping session finished
	Input Filename	The path and filename of the input file
	Output Filename	The path and filename selected by the user
	RDF path and name	The path and filename of the Record Definition File used for grouping

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Renal Dialysis (NRD)

There are five output files.

File Name/Field Name		Description
[name].csv		A list of other output files
[name]_renal.csv		The main grouped output file
	<input data>	All of the input data, including any non-mandatory fields
	RowNo	The generated row number of the record
	NRD_HRG	The HRG for the dialysis record
[name]_quality.csv		Contains one row for each record that contains errors
	<input data>	All of the input data, including any non-mandatory fields
	RowNo	Matches the run generated row number
	Error Message	A variable number of fields, consisting of Code Type, Code and Error Message, separated by pipe (|) symbols
[name]_quality_rel.csv		All error messages in relational form
	RowNo	Matches the run generated row number
	Iteration	The ordinal number of the quality message
	Code Type	The type of code that has failed validation
	Code	The code that failed validation. Blank if code missing from input data
	Error Message	Description of the error
[name]_summary.csv		A single-row file containing details about the grouping session
	Grouper Version	The version of the Grouper that produced the output files
	Database Version	The Grouper's internal HRG database version
	NRD Record Count	The number of records submitted
	NRD Record Error Count	The number of records having errors
	Run Start Date/Time	The date and time that the grouping session started

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File Name/Field Name		Description
	Run End Date/Time	The date and time that the grouping session finished
	Input Filename	The path and filename of the input file
	Output Filename	The path and filename selected by the user
	RDF path and name	The path and filename of the Record Definition File used for grouping

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Adult Critical Care (ACC)

There are five output files.

File Name/Field Name		Description
[name].csv		A list of other output files
[name]_acc.csv		The main grouped output file
	<input data>	All of the input data, including any non-mandatory fields
	RowNo	The generated row number of the record
	ACC_HRG	The unbundled HRG for the Adult Critical Care period
	Calc_CC_Days	The number of Critical Care days calculated as: CC Discharge Date - CC Start Date + 1 This will be set to -1 if there are problems with the dates.
	CC_Warning_Flag	Flag to indicate the result of validation of dates and respiratory support day's fields. Failure does not prevent HRG derivation Blank indicates passing validation F indicates date validation failure; applied if any of the following are true: Calc_CC_Days = -1. (This indicates that CC Discharge Date is before CC Start Date, or CC Start Date or CC Discharge Date is blank, is not a valid date or does not match the required format.) CCL2 Days + CCL3 Days > Calc_CC_Days ARSD + BRSD > Calc_CC_Days ARSD + BRSD > CCL2 Days + CCL3 Days
[name]_quality.csv		Contains a row for each input record that contains errors
	<input data>	All of the input data, including any non-mandatory fields
	RowNo	Matches the run generated row number
	Error Message	A variable number of fields, consisting of Code Type, Code and Error Message, separated by pipe (|) symbols
[name]_quality_rel.csv		All error messages in relational form

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File Name/Field Name		Description
	RowNo	Matches the run generated row number
	Iteration	The ordinal number of the quality message
	Code Type	The type of code that has failed validation
	Code	The code that failed validation. Blank if code missing from input data
	Error Message	Description of the error
[name]_summary.csv		A single-row file containing details about the grouping session
	Grouper Version	The version of the Grouper that produced the output files
	Database Version	The Grouper's internal HRG database version
	ACC Period Count	The number of records submitted
	ACC Period Error Count	The number of records having errors
	Run Start Date/Time	The date and time that the grouping session started
	Run End Date/Time	The date and time that the grouping session finished
	Input Filename	The path and filename of the input file
	Output Filename	The path and filename selected by the user
	RDF path and name	The path and filename of the Record Definition File used for grouping

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Paediatric Critical Care (PCC)

There are six output files.

File Name/Field Name		Description
[name].csv		A list of other output files
[name]_sort.csv		A copy of the input data after it has been sorted
	<input data>	All of the input data, including any non-mandatory fields
	RowNo	The generated row number of the record after sorting
[name]_pcc.csv		The main grouped output file
	<input data>	All of the input data including any non-mandatory fields
	RowNo	Matches the run generated row number
	PCC_HRG	The unbundled HRG for the Paediatric Critical Care day
[name]_quality.csv		Contains one row for each record that contains errors
	<input data>	All of the input data, including any non-mandatory fields
	RowNo	Matches the run generated row number
	Error Message	A variable number of fields, consisting of Code Type, Code and Error Message, separated by pipe (|) symbols
[name]_quality_rel.csv		All error messages in relational form
	RowNo	Matches the run generated row number
	Iteration	The ordinal number of the quality message
	Code Type	The type of code that has failed validation
	Code	The code that failed validation. Blank if code missing from input data
	Error Message	Description of the error
[name]_summary.csv		A single-row file containing details about the grouping session
	Grouper Version	The version of the Grouper that produced the output files
	Database Version	The Grouper's internal HRG database version

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File Name/Field Name		Description
	PCC Record Count	The number of records submitted
	PCC Record Error Count	The number of records having errors
	Run Start Date/Time	The date and time that the grouping session started
	Run End Date/Time	The date and time that the grouping session finished
	Input Filename	The path and filename of the input file
	Output Filename	The path and filename selected by the user
	RDF path and name	The path and filename of the Record Definition File used for grouping

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Neonatal Critical Care (NCC)

There are six output files.

File Name/Field Name		Description
[name].csv		A list of other output files
[name]_sort.csv		A copy of the input data after it has been sorted
	<input data>	All of the input data, including any non-mandatory fields
	RowNo	Generated row number of the record after sorting
[name]_ncc.csv		The main grouped output file
	<input data>	All of the input data, including any non-mandatory fields
	RowNo	Matches the run generated row number
	NCC_HRG	The unbundled HRG for the Neonatal Critical Care day
[name]_quality.csv		Contains one row for each record that contains errors
	<input data>	All of the input data, including any non-mandatory fields
	RowNo	Matches the run generated row number
	Error Message	A variable number of fields, consisting of Code Type, Code and Error Message, separated by pipe (|) symbols
[name]_quality_rel.csv		All error messages in relational form
	RowNo	Matches the run generated row number
	Iteration	The ordinal number of the quality message
	Code Type	The type of code that has failed validation
	Code	The code that failed validation. Blank if code missing from input data
	Error Message	Description of the error
[name]_summary.csv		A single-row file containing details about the grouping session
	Grouper Version	The version of the Grouper that produced the output files
	Database Version	The Grouper's internal HRG database version

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File Name/Field Name		Description
	NCC Record Count	The number of records submitted
	NCC Record Error Count	The number of records having errors
	Run Start Date/Time	The date and time that the grouping session started
	Run End Date/Time	The date and time that the grouping session finished
	Input Filename	The path and filename of the input file
	Output Filename	The path and filename selected by the user
	RDF path and name	The path and filename of the Record Definition File used for grouping

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Errors and Validation

As part of the grouping process, the Grouper carries out validation checks on the mandatory input fields. Where one or more fields fail validation, the Grouper derives the HRG **UZ01Z Data Invalid for Grouping**.

When one error is found in a record, the Grouper does not stop the validation process. The grouping software aims to identify all errors and output them together.

In Admitted Patient Care, errors cascade upwards to the spell level. If any episode within a spell generates a UZ01Z, the spell HRG will be UZ01Z. Similarly, if an unbundled HRG is a UZ01Z, the episode and therefore the spell (core) HRG will be UZ01Z.

The exception to this rule is where unbundled HRGs relating to Critical Care are generated. These are the XA*, XB* and XC* HRGs and capture activity for Neonatal (NCC), Paediatric (PCC) and Adult (ACC) critical care respectively. The generation of these HRGs occur within the specific critical care modules within the Grouper and flow outside of the Admitted patient Care CDS(s), so cannot influence the core HRGs generated as part of APC grouping.

Errors do not cascade downwards. A UZ01Z episode HRG will not result in any unbundled HRGs being overwritten by a UZ01Z.

In Admitted Patient Care data, Best Practice Tariff codes are suppressed if the spell HRG is UZ01Z.

Details of all errors are reported in the output quality file. The detail in the Output Files section of this document includes a description of the quality file for each of the data types processed by the Grouper. The Input File Preparation section provides further information about valid values for various input fields.

All values input into the Grouper are validated against the design database. Codes used that are not valid will result in the generation of a UZ01Z HRG.

ICD-10 codes that are not on the list are classified as invalid but will not result in a specific error category code. This error will generate the following error message in the DQ report:

```
DIAG_XX|XXXX|Diagnosis is invalid
```

OPCS-4 codes that are not on the list are similarly classified as invalid but will not result in a specific error category code. This error will generate the following error message in the DQ report:

```
OPER_XX|XXXX|Procedure is invalid
```

Error Message Format

Error messages in the quality file are displayed in three sections, separated by a pipe delimiter:

```
Code Type|Code|Error Message
```

`Code Type` identifies the field or field type.

`Code` is the unrecognised value. Where an error is due to the absence of a code, this section is left blank.

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`Error Description` explains the nature of the error.

An example error message is:

```
DIAG_01|P102|UZ03 - Diagnosis Conflicts with Age
```

Error Types

There are three types of errors:

Field Validation Errors are generated where field values are missing or are outside of the accepted range of values. Example error messages of this type are:

```
DIAG_01||Primary Diagnosis is blank
```

```
DIAG_01|R69X6|UZ01 – Invalid Primary Diagnosis
```

```
OPER_02|C992|Procedure is invalid
```

Spell Validation Errors result from cross checks across records in a spell. For example, where consistency checks for sex or age fail:

```
SEX||Sex is inconsistent in spell
```

```
STARTAGE||Age rises by more than expected in the spell
```

Clinical Coding Errors are mainly due to the use of clinical codes that violate clinical coding conventions or standards or are not useful resource indicators for HRG grouping.

Clinical coding errors produce error messages that contain the error category codes described in the following section.

Error Categories

Error Categories are used mainly for clinical coding errors. Critical Care grouping error descriptions also include error category codes.

UZ01 Invalid Primary Diagnosis

Diagnosis code is present but should not be used in the primary diagnosis position (DIAG_01), according to clinical coding conventions.

```
DIAG_01|Z509|UZ01 - Invalid Primary Diagnosis
```

(Z509 Care involving use of rehabilitation procedure, unspecified)

UZ02 Poorly Coded Primary Diagnosis

Diagnosis code is valid as a primary diagnosis but is too vague to determine the resource use.

```
DIAG_01|T140|UZ02 - Poorly Coded Primary Diagnosis
```

(T140 Superficial injury of unspecified body region)

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UZ03 Diagnosis Conflicts with Age

A paediatric primary diagnosis has been recorded for an adult patient (age 19 years and over).

```
DIAG_01|P704|UZ03 - Diagnosis Conflicts with Age
```

(P704 Other neonatal hypoglycaemia)

UZ04 Diagnosis Conflicts with Anatomical Site

Indicates an invalid combination of primary diagnosis and anatomical site. This only applies to specific musculoskeletal codes containing a 5th digit.

```
DIAG_01|M7217|UZ04 - Diagnosis Conflicts with Anatomical Site
```

(M7217 Knuckle pads: Ankle and foot)

UZ05 Invalid procedure for Casemix grouping purposes

Indicates invalid dominant procedure (e.g. an anatomical site). All Y (methods of operations) and Z (anatomical sites) OPCS-4 codes as well as a number of codes in the main body system chapters cannot be the dominant procedure.

```
OPER_01|Y841|UZ05 - Invalid procedure for Casemix grouping purposes
OPER_01|W540|UZ05 - Invalid procedure for Casemix grouping purposes
```

(Y841 Gas and air analgesia in labour)

(W540 Conversion from previous prosthetic replacement of articulation of bone NEC)

UZ06 Poorly coded procedure for Casemix grouping purposes

Indicates a dominant or unbundled procedure that is too vague and unspecific to determine resource use from an HRG design perspective.

```
OPER_01|A579|UZ06 - Poorly coded procedure for Casemix grouping
purposes
OPER_01|U019|UZ06 - Poorly coded procedure for Casemix grouping
purposes
```

(A579 Unspecified operations on spinal nerve root)

(U019 Unspecified diagnostic imaging of whole body)

UZ11 Neonatal Critical Care Error

This is a general-purpose grouping error for Neonatal Critical Care, generated when the input record does not meet any of the criteria in the neonatal critical care grouping algorithm.

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UZ13 ACC Grouping Error

This is a general-purpose grouping error for Adult Critical Care, generated when the input record does not meet any of the criteria in the adult critical care grouping algorithm.

UZ14 Renal (NRD) Error

This is a general error for grouping renal activity using the National Renal Data Set and is generated when conditions in the grouping algorithm have not been met.

UZ15 Burns Error

Indicates where a burns primary diagnosis code of unspecified body region or total body surface area (TBSA) is recorded, or where a burns diagnosis code is recorded, in any position, with no subsequent TBSA code present.

UZ21 CCAC Inappropriate in NCC

Generated when the Critical Care Activity Code is inappropriate for the Neonatal Critical Care HRG algorithm.

Further details regarding validations and UZ01Z generation can be found in the Chapter Summaries document included in the documentation suite for the relevant Grouper. See the section on Subchapter **UZ Undefined Groups**. The Grouper Documentation Suite is available for download from the National Casemix Office website.

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