

# ESR Business Intelligence

## Aggregation

There are a number of areas within ESR BI where users may want to consider aggregation of data and there a number of options users can utilise. This guide will cover the most used options (throughout the NHS Standard Dashboards) and some of the NHS specific customisations within ESR BI.

One of the main benefits of using Aggregation in ESR BI is that it helps to speed up the time taken by analyses when running calculations to the delivery of the results. A number of fields in ESR BI are already aggregated i.e. designed to return results of different calculations such as Headcount (Count of Primary Assignments) or Starters and Leavers Headcounts (Distinct Count of Employee Numbers with Latest Start Date or Actual Termination Date within a given period). For example; instead of the Employee Number field returning a list of all employee numbers for the organisation as at the date specified in the analysis filters, when aggregated using a Count Distinct function, returns just a count of all employees for the organisation.

## Dimensions and Measures

As this guide will frequently use the words 'Dimension and Measure' it is necessary that we define them at this stage. Measures (also known as Facts) are fields that return a numerical value of those records that are aggregated, for example summed or averaged, to arrive at a final result or total. Examples of such fields in ESR BI are shown below:

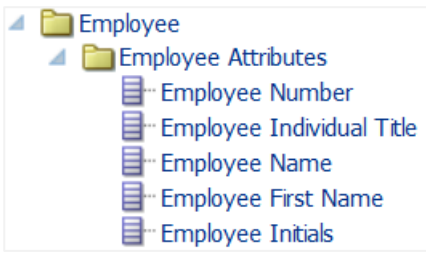


Dimensions on the other hand do not total a sum of any calculation as these are fields that might be used to group or describe data. Examples of such fields in ESR BI are Employee Names & Numbers (see below example), Assignment Status & Category etc.:



## Electronic Staff Record

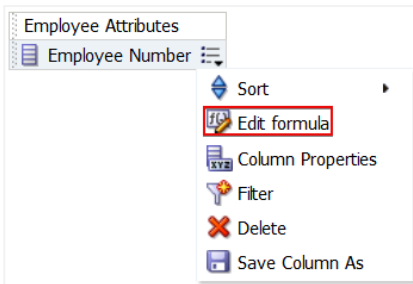




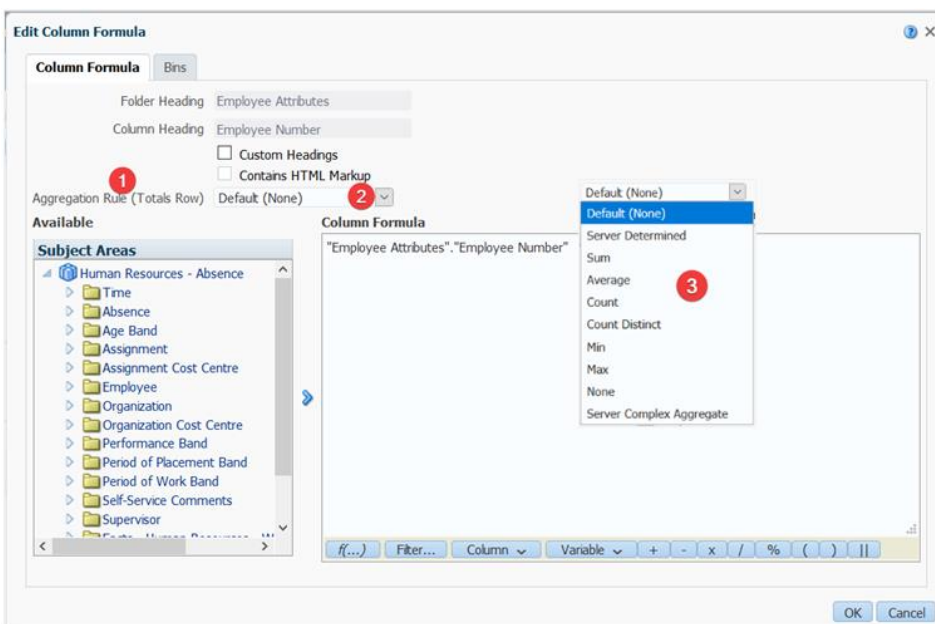
Please note that not all columns containing numerical data are considered measures. For example Employee Number returns a numerical value but is not considered a measure. However some Dimension fields can be converted from being a dimension field to a measure using a number of aggregate functions available in ESR BI.

## Using Aggregation in ESR BI

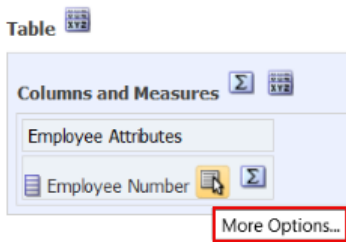
The Aggregation Rule is a key feature in ESR BI which enables the aggregation of data at different levels. To access or change the Aggregation Rule (Totals Row), edit the column you're interested in, changing the aggregation as per the below example:



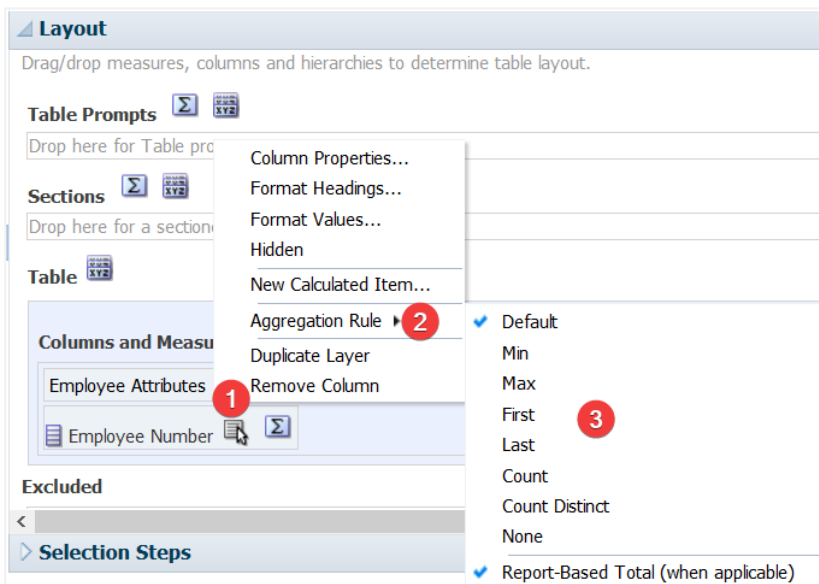
Selecting the above highlighted 'Edit formula' will present the below screen, which has been marked with numbers which can be followed in order so users can change the default aggregation to an aggregation of choice. Please note that by default Aggregation Rule (Totals Row) is set to Default (None) as per the below example. This can be changed to suit different reporting requirements:



Aggregation Rule (Totals Row) can also be accessed via the Results>Columns and Measures>Employee Number column (in this example)>More Options as per the below example:



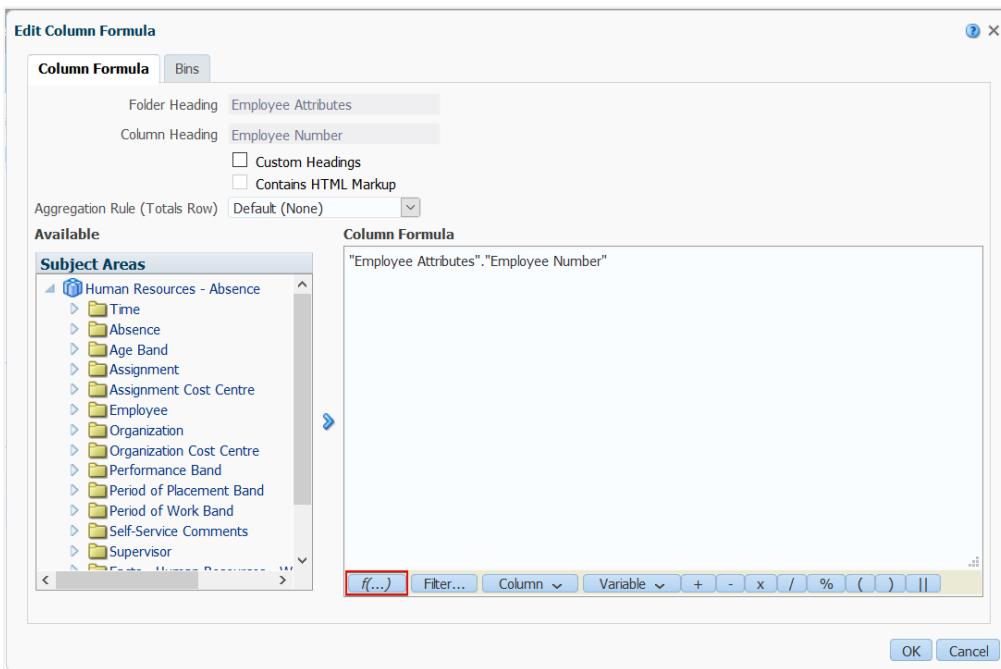
Selecting the above highlighted 'More Options' will present the below screen, which again has been marked with numbers which can be followed in order to be able to change the default aggregation to an aggregation of choice. Please note that by default the results Aggregation Rule is set to Default and Reports-Based Total (when applicable) as per the below example. Again, this can be changed to suit different reporting requirements:



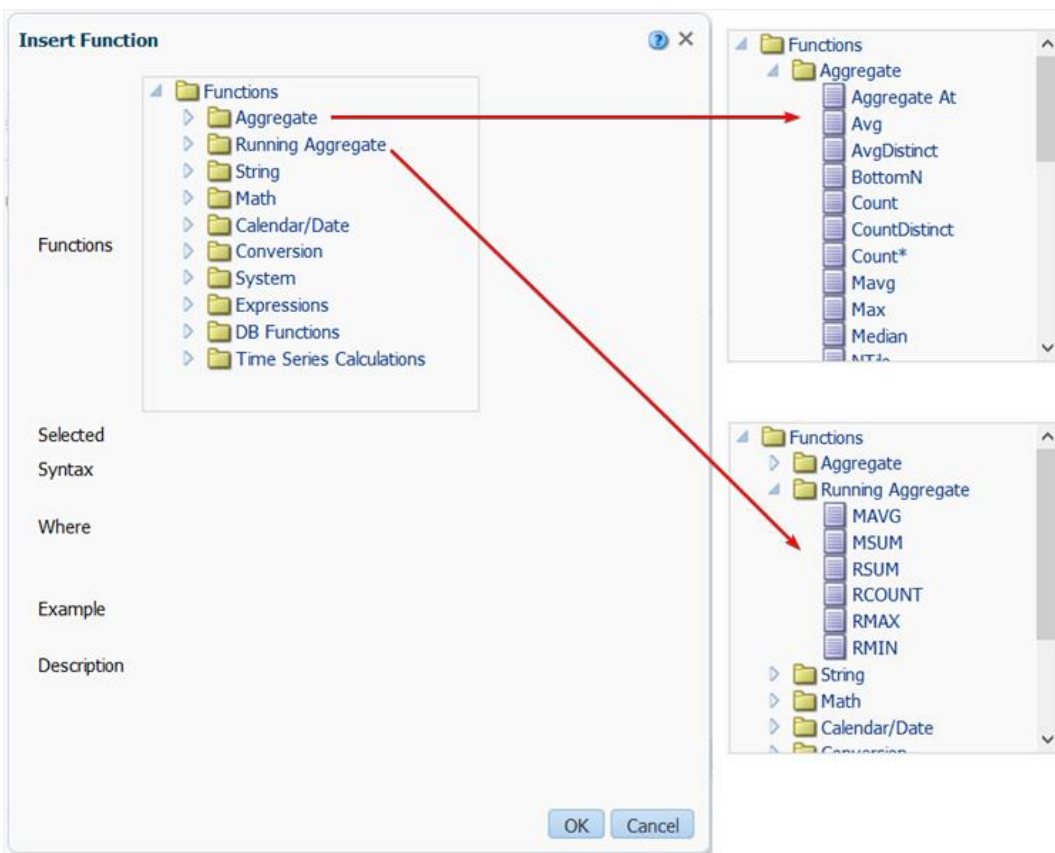
*Please note that where Report-Based Total (when applicable) is selected (default) ESR BI calculates the total with the analysis filters already applied to the measures. Where it is not selected ESR BI first calculates the total based on the result set before applying any filters to the measures.*

## Converting a Dimension into a Measure

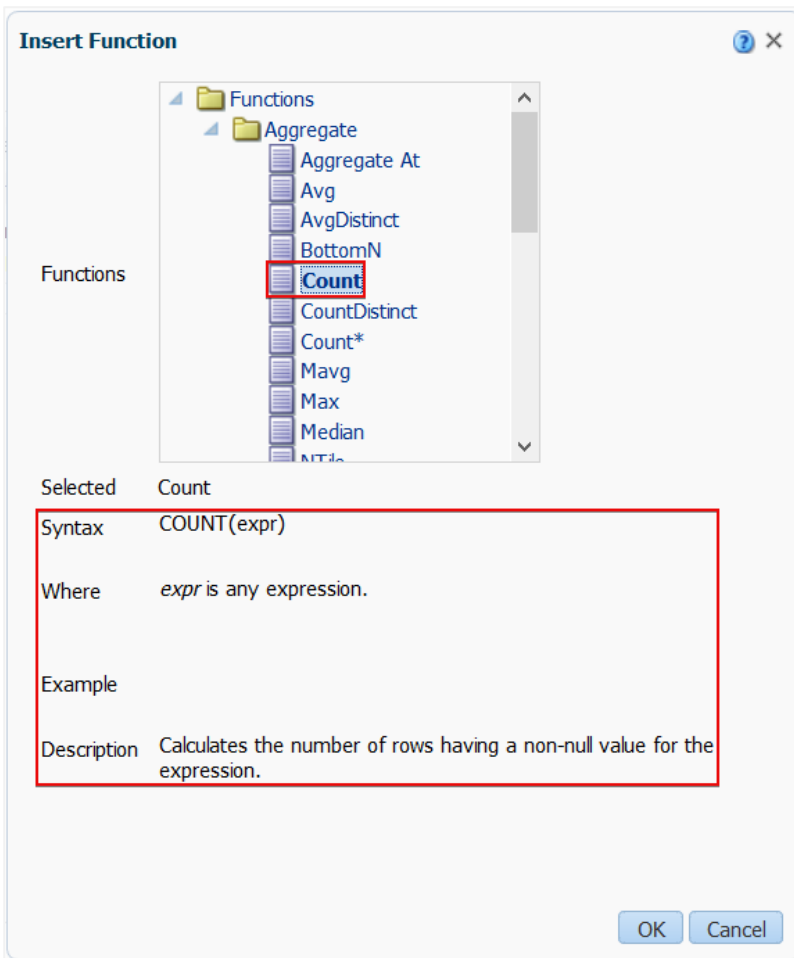
A number of Aggregate functions are available in ESR BI. These can be accessed via the below highlighted 'Functions' button, alongside other important function groups such as String, Conversion and Expressions. Aggregate functions can be used to convert dimensions (non-aggregated fields) to measures (aggregated fields). We will use the Employee Number field in this example:



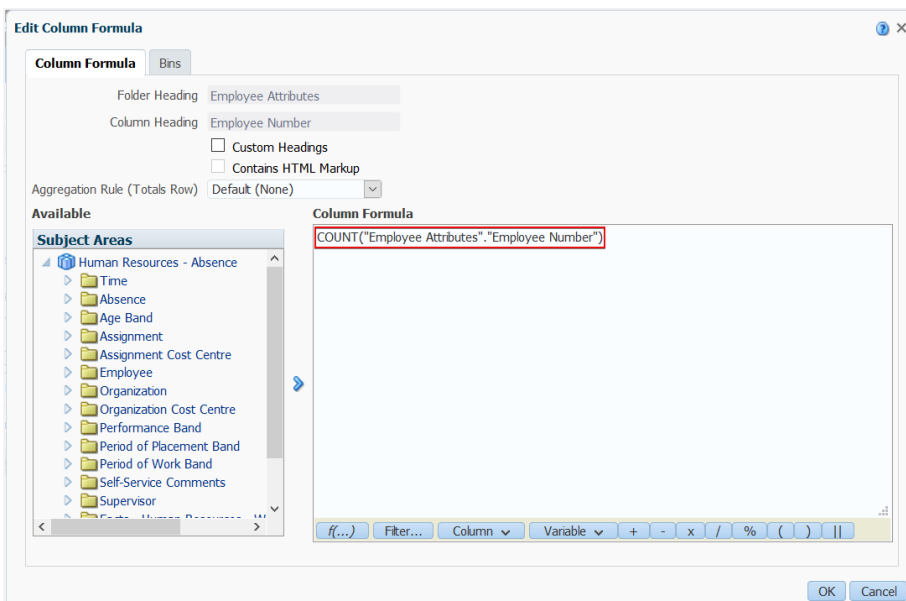
Selecting the above highlighted 'Functions' button will present the below screen, which shows the ESR BI Aggregate and Running Aggregate folders and their contents as highlighted in the example:



Selecting for example the 'Count' aggregate function above will present the below screen, which shows an example Syntax of how the function can be used and a description of what the function does:

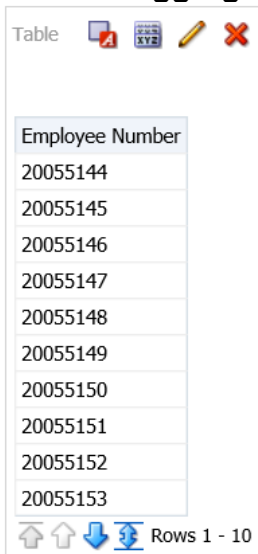


Double clicking the above highlighted function (Count) will automatically create a new formula with the function already wrapped around the formula of the field you're interested in aggregating, Employee Number in this example. This however can be changed to add other functions if and as required as it is possible to use more than one aggregation function (MAX, RANK, SUM etc.) in one single column. Below is an example of how the newly created measure column looks, based on a single aggregation type of Count:



Instead of returning a list of all employee numbers in the organisation as at the date specified in the filters, with the above newly aggregated column formula the analysis will now return just a count of all employees in the organisation, as per the below examples:

### Without Aggregation:

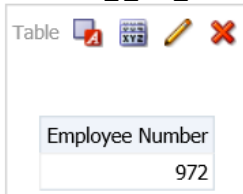


Table

Employee Number
20055144
20055145
20055146
20055147
20055148
20055149
20055150
20055151
20055152
20055153

Rows 1 - 10

### With Aggregation:



Table

Employee Number
972

Further information on Aggregation functions can be found in the 'Aggregate Functions' section within the ESR BI - Quick Reference Guide available on the ESR Hub within the Reporting folder.

## Aggregation and Report Views in ESR BI

The default view in ESR BI is a Table however these lack most of the features of Pivot Tables which are capable of re-arranging or 'pivoting' the data as a result of the various aggregations they offer. Pivot Tables are the preferred view in situations where data needs to be aggregated or just summarised in order to make comparisons.

