NHS ELECTRONIC STAFF RECORD

ESR-NHS0266 ESR BI REPORT WRITER'S GUIDE

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1. DOCUMENT CONTROL

1.1. CHANGE RECORD

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1.2. REVIEWERS

Name	Position
NHS Development Team	

1.3. DISTRIBUTION

Copy No.	Name	Location
1	Library Master	Programme Library
2		

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3. GETTING STARTED

3.1. INTRODUCTION

ESR Business Intelligence (ESRBI) provides the main reporting solution for ESR. It has the ability to report on hundreds of data items, each sourced from ESR to give the NHS a fully flexible and efficient reporting suite. A number of NHS Standard Dashboards and analyses (reports) are provided for NHS Organisations to utilise. In addition, ESRBI provides the capability for organisations to either customise NHS Standard Dashboards or create ad-hoc dashboards and analyses from scratch. The ESRBI Report Writers Guide is intended as a reference document for users wishing to create or customise ESRBI dashboards and analyses in order to serve organisations' strategic and business requirements.

Note: In order to follow this document and create your own reports/analyses in ESR BI, you must have already been allocated the 'BI Administration URP' within ESR.

3.2. ANALYSES, DASHBOARDS AND PROMPTS

Reports within ESRBI are referred to as analyses. Each analysis queries an organisation's data and returns results displayed in a variety of views (such as tables or graphs). Analyses can be setup to work as individual reports to be run in isolation, or can be arranged within a dashboard to work with dashboard prompts.

A dashboard is a BI object which allows users to group analyses together and run the dashboard as a single object (containing many analyses). This allows a variety of analyses to be run together and display a range of information to the user. A dashboard can be setup to enable a user to enter parameters which would affect the analyses held within it. To do this a dashboard prompt is added to the dashboard.

A dashboard prompt is a BI object which can be setup to include one or more prompts (such as drop-down lists or check boxes) based on ESR data items or custom values. An example might be a drop-down list based on the data item Assignment Category, which would allow a user to pick from a LOVs and update analyses within the dashboard based on those selections. Dashboard prompts cannot be used in isolation and should be used within dashboards.

3.3. SUBJECT AREAS

Subject Areas within ESRBI are how data from different business areas is grouped together. Some subject areas can be joined with others and some cannot. For further information on joining subject areas please see section *7. Joining Subject Areas*. The below table provides a description of how each of the Subject Areas in ESRBI can be used and how each is designed to return data.

Subject Area	Description
Human Resources – Absence	This subject area enables users to report on all types of absence. This includes closed absence records, all absences planned in the future, absences that are due to begin before the end of next financial year and all open ended absences. The time dimension is linked to the absence - for example, setting the time dimension to today will return anyone absent as at today. Setting the time dimension to a period will return employees absent during that period. Assignment details are returned as at the time dimension, for example reporting over a period of time, if an assignment changes position, multiple rows will be returned when the assignment changed. Non-absent employees can be included in the report (for % FTE calculations) by using one of the standard measures (such as Headcount or % FTE).
Human Resources – Annual Leave Balance	This subject area enables users to report on annual leave balances. It provides the information required to review Annual leave entitlements and supports identification of instances where leave may have been overtaken or undertaken in the year. NOTE: This subject area provides data in real time.

Human Resources – Applicant EIT Details	This subject area enables users to report on the Extra Information fields that can be populated against an Applicant record for example ID and Employment Checks, Employee Relations information and IAT details. EITs in this subject area should not be combined.
Human Resources – Applicant SIT Details	This subject area enables users to report on the Special Information fields that can be populated against an Applicant record for example Medical and Dental information, details recorded in the Property Register and Driving Licence information. NOTE: SITs in this subject area should not be combined.
Human Resources – Application Position EIT Details	This subject area enables users to report on the Position Extra Information fields that can be populated against an Applicant record for example Care Group, Medical and Dental Post Requirements, Qualification Post Requirements and Registration and Membership Post Requirements.
Human Resources – Appraisals and PMPs	This subject area enables users to report on Appraisals and PMPs including information on Appraisals, Objectives, Questionnaires and Scorecards. Data returned here is only included where the appraisal was done via ESR Self Service. If the appraisal was entered via the core forms only then use the Assignment EIT subject area to return the basic appraisal details.
Human Resources - Archives	This subject area enables users to report on payslip archive information and should not be joined with any other subject area. Data is returned in real-time.
Human Resources – Assignment EIT Details	This subject area enables users to report on the Extra Information fields that can be populated against a Person's Assignment record for example Appraisal dates, Additional Supervisors, TUPE transfer information and Exit Questionnaire details.
Human Resources – Audit Change Event	This subject area enables users to report on changes made in ESR including the type of change, who made the change and the date of the change. This subject area also enables reporting on the changes made by proxy users. The time dimension is linked to when the change was made. For example setting the time dimension to a period will return changes made during that period (even if the effective date of the change is outside of the period).
Human Resources – Audit View Event	This subject area enables users to report on who has viewed the records of each employee within the organisation, including proxy users, the responsibility and form that was viewed along with the date and time. The time dimension is linked to when the view took place. For example setting the time dimension to a period will return records that were viewed in that period.
Human Resources – Changes and Highlights	This subject area enables users to validate the accuracy of data entered onto ESR by displaying selected date tracked changes and highlighting selected conditions for employees and leavers within a specified period. In addition users can report on changes made to an employee's data detailing the actual and effective dates of the change, the user making the change, and a description of the change. NOTE: This subject area provides data in real time.

Human Resources – Element Entries	This subject area enables users to report on element entry related information including the element name and type and associated entry values. The time dimension works in a similar way to the Workforce profile subject area - it returns employees as at a specific date.
Human Resources – Employment Position EIT Details	This subject area enables users to report on the Position Extra Information fields that can be populated against a position record for example Care Group, Medical and Dental Post Requirements, Qualification Post Requirements and Registration and Membership Post Requirements.
Human Resources – Job EIT Details	This subject area enables users to report on extra information held against the Job data item. This includes 'Capacity Code'.
Human Resources – Learning Certifications	The subject area enables users to report on learning certifications and subscriptions to them as well as progress and completion details. Learning Certifications with no subscriptions can also be reported on. The time dimension can be filtered in a number of ways.
Human Resources – Learning Enrolment and Completion	This subject area enables users to report on Learning and Enrolment related information for internal delegates, customers, external learners, STC delegates and applicants. All items within the OLM catalog can be reported on including Courses, Offerings and Classes (classroom based and e-Learning). Furthermore users can report on competencies attached to a course, resources and resource bookings, learner groups, external learning and supplementary roles. Using this subject area it is also possible to report on 'empty' objects such as courses without offerings, classes without delegates etc. The time dimension can be filtered in a number of ways, such as Enrolment Date, Date First Played, and Completion Date.
Human Resources – Pay Balances	This subject area enables users to carry out real time reporting on Payroll Balances. The calculated balance values will display an exact match of the balance values calculated in ESR Payroll as the data is retrieved directly from ESR. Users can select single or multiple defined balances. A maximum of 10 defined balances can be used within the same analysis. This Subject Area should not be combined with any other ESR BI Subject Areas.
Human Resources – Payroll	This subject area enables users to report on Payroll run results data including gross and net pay, deductions and allowances. Using this subject area users can also report on net pay comparisons and variances on gross and net pay over a chosen time period. The time dimension can be filtered by pay period, accounting period or regular payment date. The data in this subject area is updated multiple times throughout the day to provide up to date pay run results values (the latest update date can be found on the Introduction to BI Dashboard).
Human Resources – Payroll Costing	This subject area enables users to report on data from the costing run. This can be used for reports such as Element Schedule or Financial Cost Analysis. The time dimension can be filtered by pay period, accounting period or regular payment date.

Human Resources – Person EIT Details	This subject area enables users to report on the Extra Information fields that can be populated against an Employee record for example ID and Employment Checks, Employee Relations information and IAT details. EITs in this subject area should not be combined.
Human Resources – Person SIT Details	This subject area enables users to report on the Special Information fields that can be populated against an Employee record for example Medical and Dental information, details recorded in the Property Register and Driving Licence information. SITs in this subject area should not be combined.
Human Resources – Personal Competence and Qualifications Profile	This subject area enables users to report on competency data such as competency requirements, competency profile and competency matching. The 'Personal' competency folder returns only competencies that have been achieved. The 'All' competency folder returns all competencies against every assignment (even if that assignment hasn't achieved it) for use in competency matching. The time dimension works in the same way as workforce profile - i.e. return all employees and assignments as at a specific date.
Human Resources – Position Analysis	This subject area enables users to report on organisation and position information regardless of whether each position or organisation is populated with assignments. In other subject areas, users can only report on positions and organisations where at least one assignment is based in each position, however for some reports (such as Vacant Posts Analysis or Establishment Control) users need to return 'empty' positions and organisations too. This subject area allows users to report on organisations and positions whether populated or not.
Human Resources – Real Time Reporting	This subject area provides a number of folders enabling users to create and run reports in real time as follows Staff List Detail, System Data Quality, Batch Element Entry Messages, Payslip Messages, Recalled Leavers Report, Financial Cost Analysis, Gross Cost Tables Analysis, Bank and Agency Staff, Learning Path (Individual Learning Paths and Learning Path Subscriptions), Bank Account Details, Pension Extract and Grade Scale Setup. NOTE: This folder cannot be combined with any other folders.
Human Resources – Recruitment	This subject area enables users to report on Recruitment data including Vacancies, Applicants and Employment Checks. Using this subject area it is also possible to report on the amount of time it takes for an applicant to progress through the Recruitment process. By default the time dimension uses recruitment 'events' - For example setting the time dimension to a period will return applicant events over that time (e.g. changed status, were created etc.). Using a measure from the application folder will change this behaviour. When using an application measure, the time dimension now returns data in a similar way to the workforce profile subject area, but for applicants only. i.e. return all applicants as at a specific date.

Human Resources – Vehicle Repository	This subject area enables users to create vehicle repository reports including vehicle usage, allocated and unallocated vehicles and 'empty' vehicles (those which are not allocated to any employee).
Human Resources – Workforce Profile	This is the main subject area used in ESR BI. It returns data about employees only for a specified date or period of time. The time dimension works as an 'effective date'. For example, setting the time dimension to today's date will return all employee data effective today.
NHS – External Data Integration	This subject area enables users to report on external data loaded by Organisations and also contains key pieces of data from ESR to include alongside the external data where required. For further information on using this functionality see section 19.

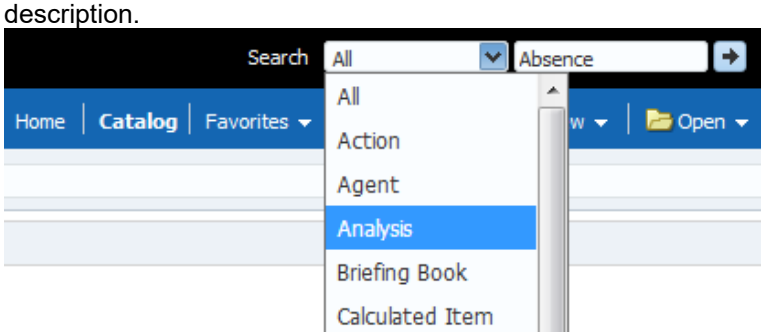
3.4. CATALOG

All BI Objects (such as analyses or dashboard prompts) are held within the Catalog in ESRBI. The catalog is based on a simple folder structure of which some parts are customisable by users and other not. Each user is assigned a *My Folders* folder, access to which is limited by individual username. Within the *Shared Folder* each Organisation is assigned a VPD folder which is named with the three digit VPD number of the organisation. This folder enables users to share BI Objects (such as analyses or dashboards) across the organisation, either across the whole organisation, by URP or by User. For further information on setting permissions in ESRBI, please see section *15. Permissions and Archiving*. Users can add folders beneath the VPD top level folder but cannot change the VPD top level folder itself. Also within the shared folder is the *NHS Standard Dashboards* folder. This is where all the BI Objects that make up the NHS Standard Dashboards are stored. Users can browse the BI objects from within the folder or copy and paste the objects locally to customise them. Users cannot make changes to the NHS Standard Dashboards folder or change folders or BI objects within it.

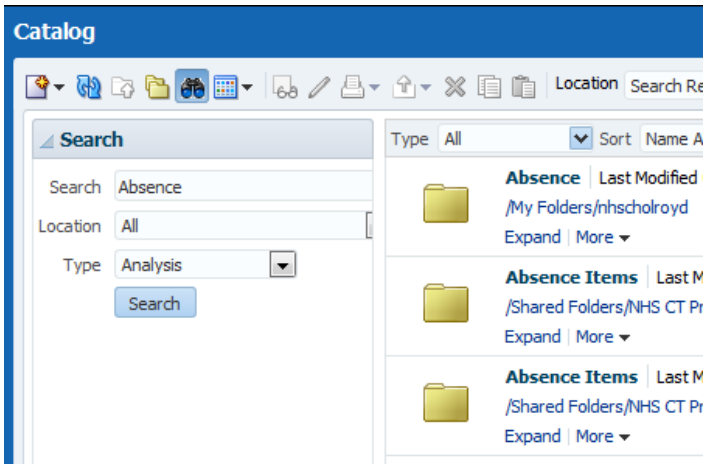
3.5. SEARCHING

3.5.1. SEARCHING THE CATALOG

A search facility is available within the ESRBI Global Header which allows users to quickly search for Catalog objects. In the Search field click the drop-down list and select the object type for which you want to search. Place the cursor in the field next to the Search type and enter part or all of the object's name or description.

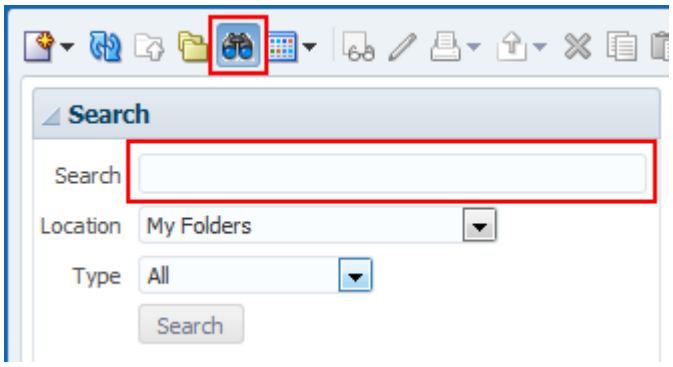


Once the arrow icon is clicked the Catalog page displays the results that match the search criteria.



Navigation Path: Business Intelligence > Search

Users are also able to search for dashboards or any other BI objects saved in the Catalog using the Advanced Search facility in the upper left corner of the Catalog page. Clicking the Binoculars icon enables search criteria to be entered.

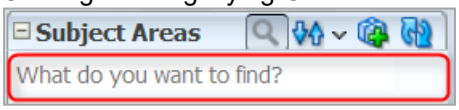


By default, *Location* is set to My Folders and *Type* is set to All meaning the search criteria will only return all matching objects from the My Folders location. Users can change the Location to the Shared Folders option and specify what type of object to search for e.g. an Analysis, Dashboard or Filter.
Navigation Path: Business Intelligence > Catalog > Binoculars Icon

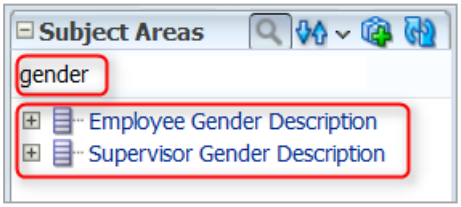
3.5.2. Searching Subject Areas

A search facility is available within ESR BI on the Subject Areas Pane. It allows users to search for data items within a Subject Area.

Clicking the Magnifying Glass icon enables search criteria to be entered.



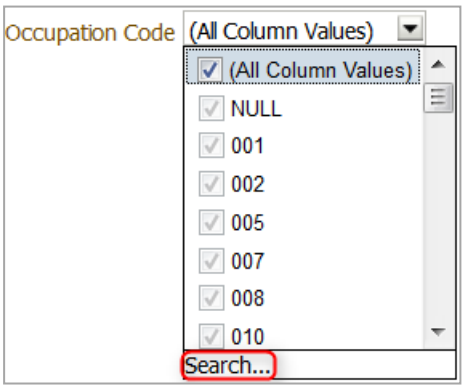
After entering search criteria, press enter and ESRBI returns all items that contain part or all of the text entered. ***Please Note:*** This feature also works with the % wildcard search.



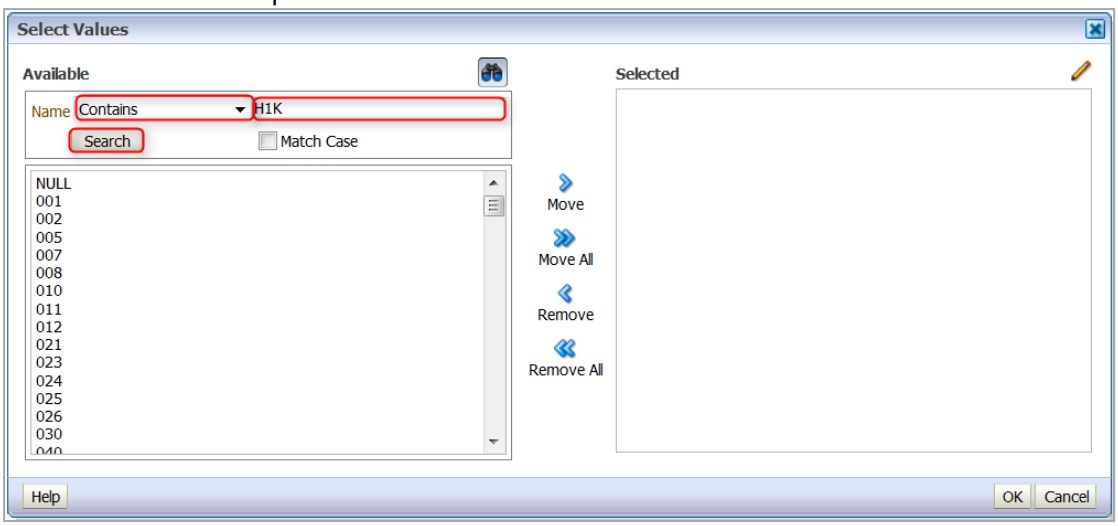
Navigation Path: Business Intelligence > New > Analysis > Select Subject Area > Magnifying Glass Icon

3.5.3. Searching a Dashboard Prompt

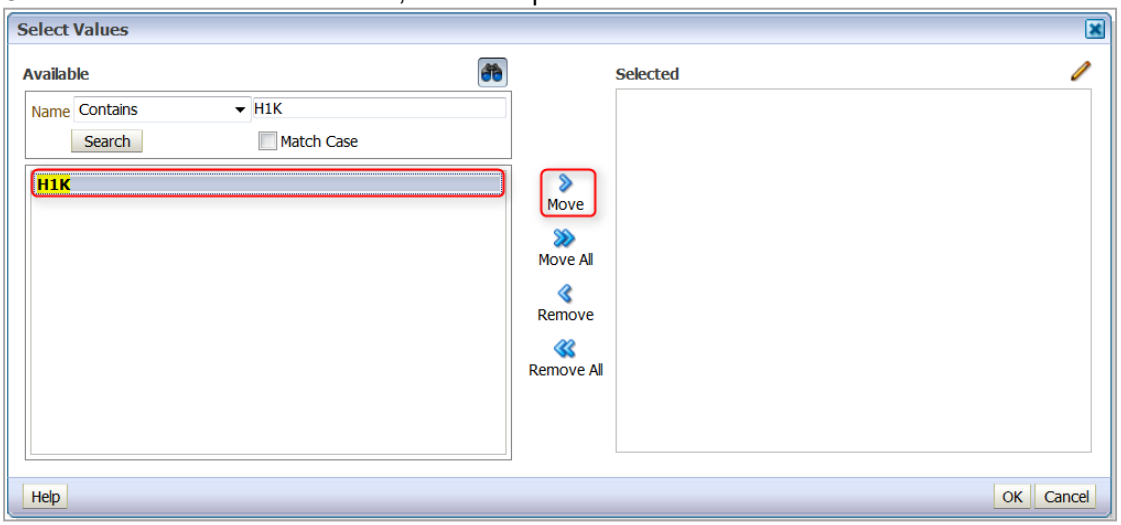
Users are able to search dashboard prompt values making it possible to quickly select only the values they require. The Search function is located at the bottom of each dashboard prompt list of values.



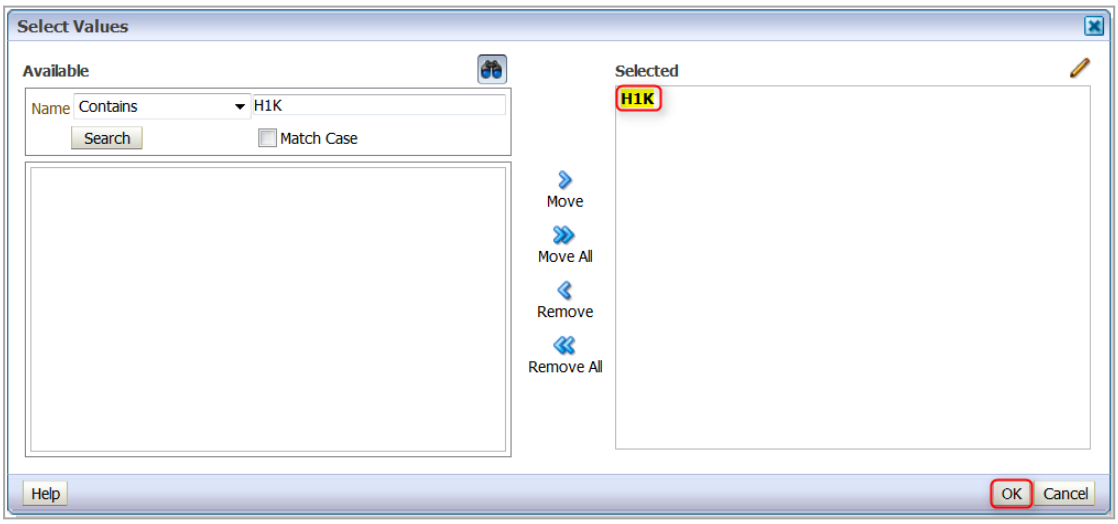
Once the Search option is clicked users are presented with a 'Select Values' window which allows users to search for values. Within the Name field, click the drop-down list and select one of the four choices available (Contains, is Like (Pattern Match), Starts and Ends). Place the cursor in the search field and enter the search value as required.



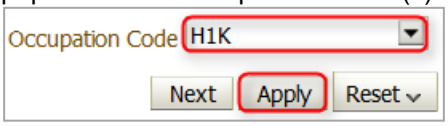
Once the Search button is clicked, users are presented with the results of the search criteria.



Select the desired value(s) and click the Move option. ***Please Note:*** It is also possible to select more than one value using the Shift key.



Once the value(s) has been moved to the selected pane click the OK button and the Prompt will be populated with the specified value(s) as shown in the below example:

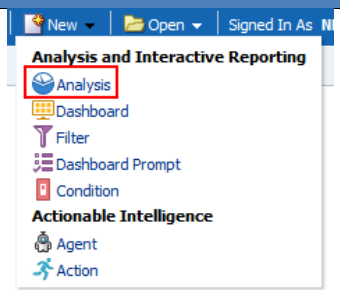
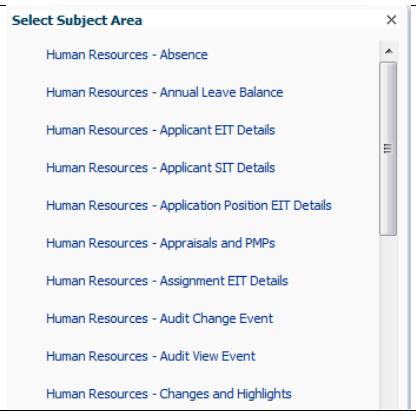


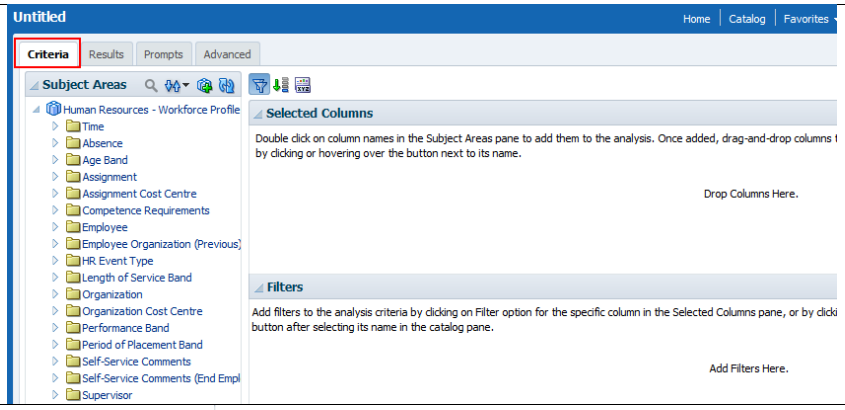
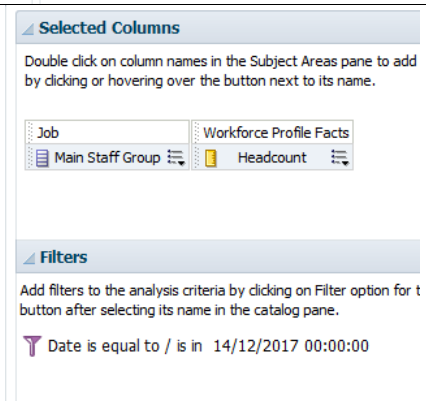
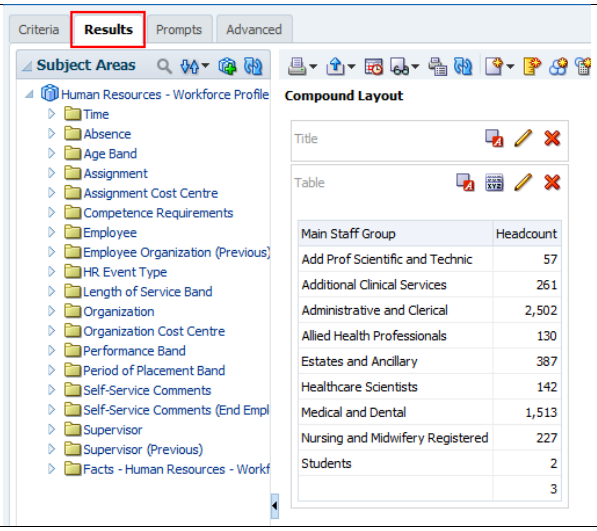
Click Apply and the analysis will filter the data accordingly.
Navigation Path: Business Intelligence > Dashboard > Dashboard Prompt > Prompt Drop-down List > Search

4. CREATING AN ANALYSIS

A report in BI is referred to as an analysis. Analyses are setup based on dimensions (data items) and facts (pre-defined measures) which can be customised as required. The information can then be presented using different views such as tables and graphs. The two main tabs when setting up an analysis are the Criteria and Results tabs. The criteria is where users setup the analysis data and the results tab is where users can view the data and change the way it is presented.

4.1. LAYOUT

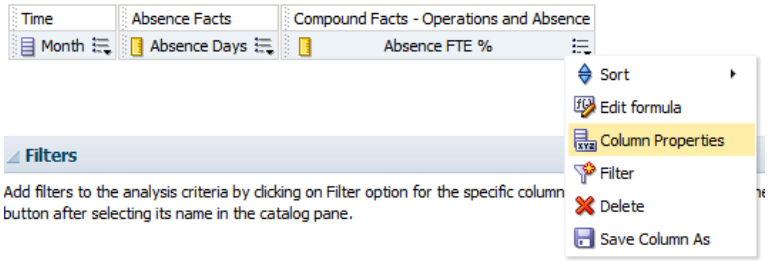
Step No.	Screen	Description
1		Select New from the upper toolbar and click on 'Analysis'.
2		Select the subject area upon which to base the new analysis.

3		This is the Criteria page. Here data items (dimensions) and measures (facts) can be added to an analysis by either locating the item and dragging into the Selected Columns window or by double clicking on the data item.
4		In this example we have added Staff Group (dimension) and Headcount (fact). Dimensions and Facts are displayed against different icons as shown here. We have also added a filter based on Time.Date. This is important when creating an analysis because without a date filter the analysis will return an entire history of data from ESR. Here we have specified data correct as of 14/12/2017.
5		Once the setup of the analysis is complete, users can click on the Results tab to view how the data returns. In this example we can see Headcount grouped by Staff Group has returned correctly. Click the Criteria tab to go back to the setup of the analysis if changes need to be made.

There are many options to consider when setting up an analysis. The following sections of the document cover how to setup the key functionality when building an analysis in BI.

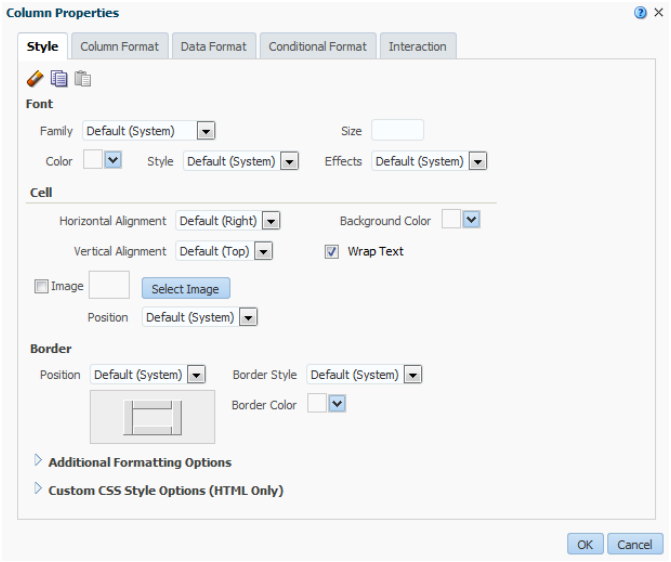
5. COLUMN PROPERTIES AND FORMULAS

The column properties option enables users to alter various properties of either the dimension or fact they have selected to be part of an analysis. Open the column properties by clicking on the column options to the right of each column and select Column Properties:



5.1. STYLE TAB

The column properties window will open on the 'Style' tab:



Within the Style Tab users are able to change the look of the columns when they are displayed as results. The font, font size and font colour, the cell border and cell fill colours and the position and style of the borders for the column can be changed.

By expanding the 'Additional Formatting Options' section, users are able to change the width and height of the column by entering the number of pixels and entering cell indents.

Example of how using the column properties can change the look of the data.

Month	Absence Days	Absence FTE %
2016 / 01	14,711	12.65
2016 / 02	14,710	13.25
2016 / 03	21,709	18.50
2016 / 04	12,321	10.77
2016 / 05	17,972	15.22
2016 / 06	16,367	14.34
2016 / 07	17,078	14.28
2016 / 08	22,809	18.77
2016 / 09	16,672	14.12
2016 / 10	15,535	12.76
2016 / 11	13,460	11.23
2016 / 12	22,649	18.70

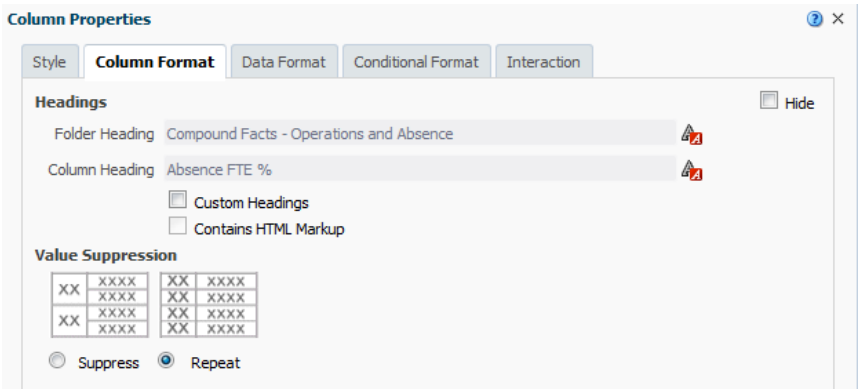
Note: The column headers do not change when you alter the column properties. This is covered later in this section.

5.2. COLUMN FORMAT

Within the Column Format Tab users are able to alter the folder heading (under which you can have multiple columns) and column heading. Tick the 'Custom Headings' tick box and enter the name of the

folder and columns as required. The format of each can also be changed by clicking on the icon and setting the font, font colour etc. as required.

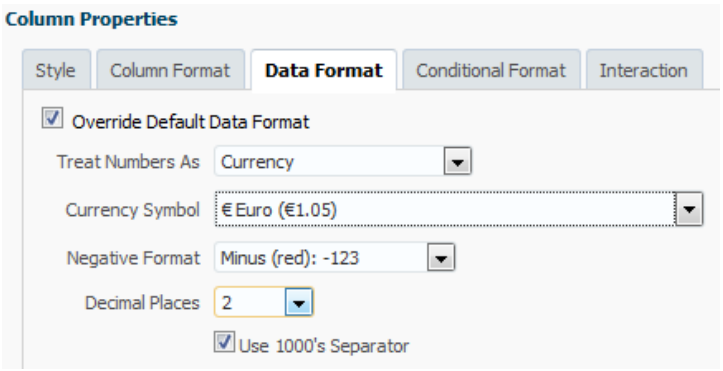
Users are also able to hide the column completely from the results. Tick the 'Hide' tick box to ensure the column is not shown. *Note: It will still be available under the Criteria Tab of the Analysis.*



Under the Column Format Tab users are also able to change how the results of the analysis are shown when viewed as a table. Under 'Value Suppression' select 'Supress' to shown one merged cell and one value. Select Repeat to show a value for each line in the table.

5.3. DATA FORMAT

Under the Data Format Tab users are able to change the format of the data in a column and display it in a variety of data formats. Tick the 'Override Default Data Format' tick box and select the data type the data is to be converted to. There are then a number of parameters to change depending on the data format selected.



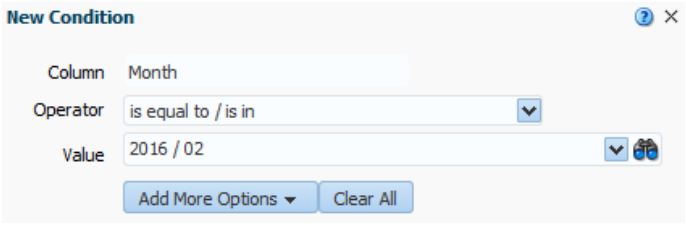
Example of the data format for the Absence Days column shown as 'Currency'.

Month	Absence Days	Absence FTE %
2016 / 01	€ 14,711.00	12.65
2016 / 02	€ 14,710.00	13.25
2016 / 03	€ 21,709.00	18.50
2016 / 04	€ 12,321.00	10.77
2016 / 05	€ 17,972.00	15.22
2016 / 06	€ 16,367.00	14.34
2016 / 07	€ 17,078.00	14.28
2016 / 08	€ 22,809.00	18.77
2016 / 09	€ 16,672.00	14.12
2016 / 10	€ 15,535.00	12.76
2016 / 11	€ 13,460.00	11.23
2016 / 12	€ 22,649.00	18.70

5.4. CONDITIONAL FORMATTING

Use this tab to specify a condition to affect the formatting of values based on certain criteria. The formatting that can be specified for a column or hierarchy level on this tab is visible in any view that can display data excluding graphs, funnel graphs and gauges.

Select the conditional format tab and click ‘Add Condition’. Users are then presented with the columns available in the analysis. Select the column the condition is to be based on and the New Condition window will display allowing setup of the condition.

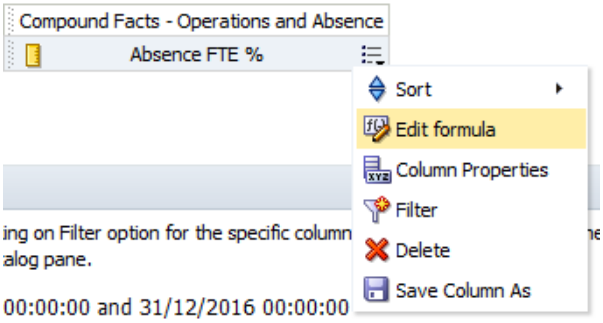


Select an Operator (in the example above ‘is equal to / is in’ has been selected) and enter a value that should trigger the condition. Clicking on the drop down box enables users to view all available values in the column selected. By clicking on the icon, a search window is displayed enabling users to search the column for a specific value. In the example above ‘2016 / 02’ has been selected. Click ‘Ok’ and the Format window is displayed where users can edit the format of the column cells depending on whether the condition returns a ‘true’ value. In the example below the condition is placed on the ‘Absence Days’ column but is based on the Month column. Where Month is equal to ‘2016 / 02’, the condition has turned the cell background colour red.

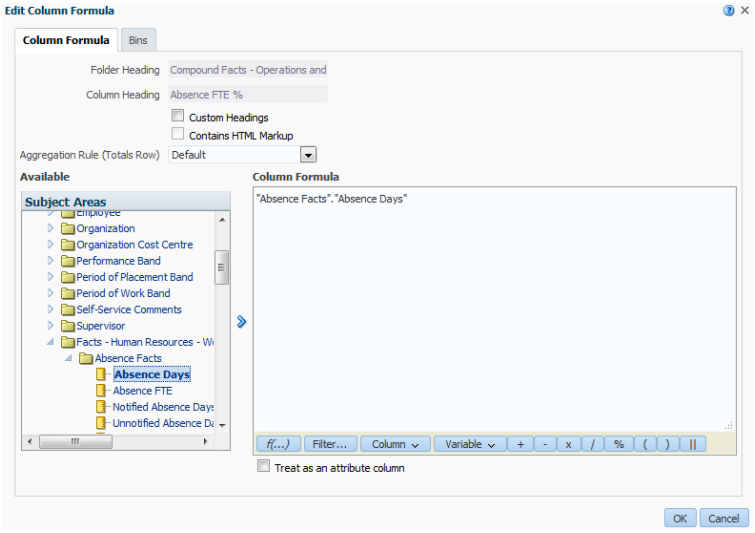
Month	Absence Days	Absence FTE %
2016 / 01	€ 14,711.00	12.65
2016 / 02	€ 14,710.00	13.25
2016 / 03	€ 21,709.00	18.50
2016 / 04	€ 12,321.00	10.77
2016 / 05	€ 17,972.00	15.22
2016 / 06	€ 16,367.00	14.34
2016 / 07	€ 17,078.00	14.28
2016 / 08	€ 22,809.00	18.77
2016 / 09	€ 16,672.00	14.12
2016 / 10	€ 15,535.00	12.76
2016 / 11	€ 13,460.00	11.23
2016 / 12	€ 22,649.00	18.70

5.5. EDIT FORMULA

The Edit Formula option enables users to enter a custom formula (Logical SQL). Select ‘Edit Formula’ from the column options in the Criteria view.



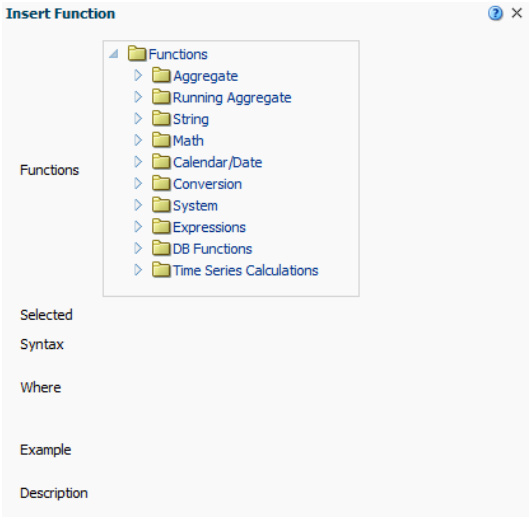
Within the ‘Edit Column Formula’ window there are a number of options to aid users in completing the formula as required. In the example below the Facts>Absence Facts folder has been expanded and the ‘Absence Days’ fact selected. By clicking on the icon the formula for the Absence Days fact is entered into the column formula window.



Note: Users are able to alter the Folder and Column Headings in the Edit Column Formula window in the same way as through the Column Properties>Column Format. If they have already been customised, it will be reflected in the Edit Column Formula window.

5.6. FUNCTIONS

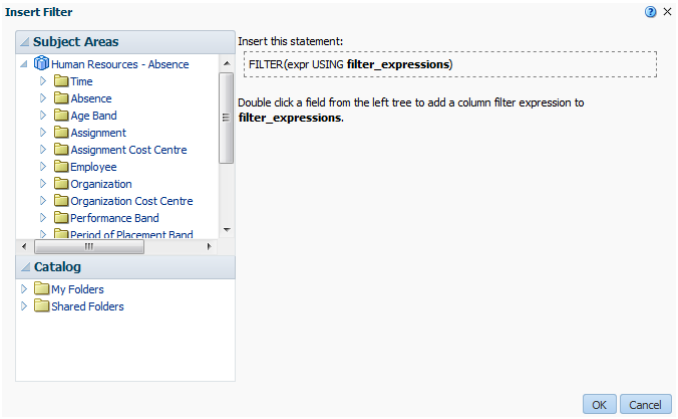
Along the bottom of the of the Column Formula window are a number of options to help users build a formula required to extract data. By clicking on the f(...) icon the Insert Function window is displayed. From here, users can select a function and display a range of helpful information about that function. When clicking on OK, the function is put into the formula as intuitively as possible to aid users when writing formulas.



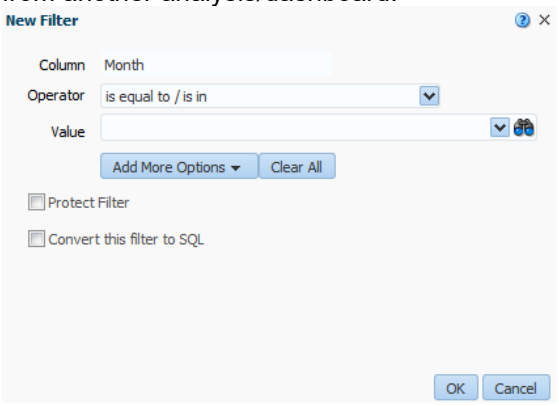
One or many functions can be selected depending on how the data is to be manipulated. A list and description of useful functions can be found in the ESRBI Quick Reference Guide on the ESR Hub.

5.7. FILTER

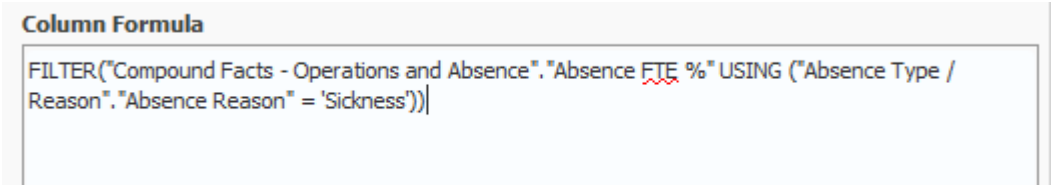
By clicking on the Filter... icon users are able to add a filter function to a formula enabling filtering on a specific column, rather than adding a filter in the criteria which would filter the entire analysis. Expand the dimension or fact folder until you reach the data item to be filtered. Double click on the item to open the filter criteria window where you are able to setup the filter.



When setting up the filter users have the option to view and search all values available by either opening the drop down list next to 'Value' or clicking on the icon. You also have the option to 'Protect Filter'. Select this option to protect the filter's value from being overridden by either a prompt value or navigation from another analysis/dashboard.

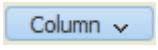


Enter the filter parameter as required, click 'OK' and the formula for the filter will be entered into the Column Formula window. Below you can see the formula for filtering Absence FTE % an Absence Reason of 'Sickness'.



Note: If you already have a formula entered into the column formula window then the filter formula will be applied as intuitively as possible.

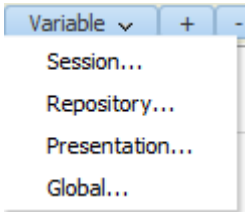
5.8. COLUMN

The Column button 

is a shortcut to any column added to an analysis saving time looking through the entire Subject Area for a column. By selecting a column, the formula to return that column data is automatically entered into the column formula.

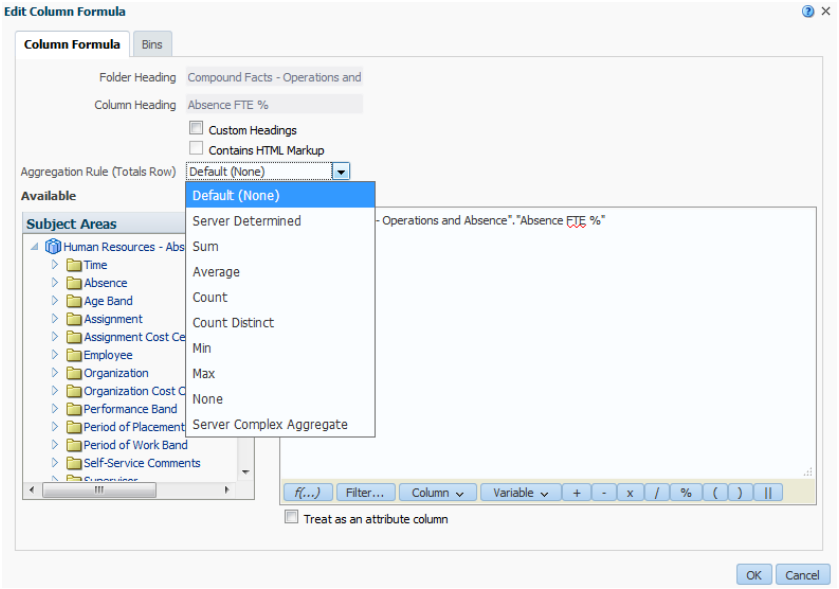
5.9. VARIABLE

Clicking on the Variable button gives three options to enter a variable in the column formula. Session variables are fixed variables based on your current ESR BI session e.g. 'USER' is the variable to display the username of the current user. Repository variables are global variables such 'CURRENT_YEAR' where all users see the same value. Presentation variables are variables which can be set by a using a prompt. Further information on variables is available in section 16 of this document.



5.10. AGGREGATION RULE

The Aggregation Rule option allows users to determine how grand totals and sub totals for the column are calculated. By selecting 'Sum' ESRBI returns a total sum of the values in that column. By selecting 'Count' ESR BI returns a count of the populated rows in the column. If a total is not being calculated correctly, setting the aggregation rule to 'Server Complex Aggregate' forces ESRBI to run a separate query to calculate the total, for example, a column is showing a running absence total by month. You would not want the grand total to be a SUM of each month (because it is a running total), rather just reflect what is held for the latest month (as the most recent value in a running total). The server complex aggregate option would resolve this problem.



5.11. COMMON FUNCTIONS

Below is a list of the more common functions available to use within ESRBI when creating custom formulas.

5.11.1. CONVERSION FUNCTIONS

Function	Syntax	Example
CAST: Changes the data type of an expression to another data type. data_types = CHARACTER, VARCHAR, INTEGER, FLOAT, SMALLINT, DOUBLE PRECISION, DATE, TIME,TIMESTAMP, BIT, BIT VARYING	CAST(expr AS data_type)	CAST(staffgroup AS CHAR)
IFNULL: Tests if an expression evaluates to a null value, and if it does, assigns the specified value to the expression.	IFNULL(expr, value)	IFNULL(FTE,0)

5.11.2. DATE/TIME FUNCTIONS

Function	Syntax	Example
CURRENT_DATE: Returns the current date.	CURRENT_DATE	CURRENT_DATE
DAYNAME: Returns the name of the day of the week for a specified date.	DAYNAME(dateExpr)	DAYENAME(startDate)
MONTHNAME: Returns the name of the month for a specified date.	MONTHNAME(dateExpr)	MONTHNAME(startDate)

Function	Syntax	Example
WEEK_OF_YEAR: Returns a number (between 1 and 53) corresponding to the week of the year for the specified date.	WEEK_OF_YEAR(dateExpr)	WEEK_OF_YEAR(startDate)
DAYOFMONTH: Returns the number corresponding to the day of the month.	DAYOFMONTH(dateExpr)	DAYOFMONTH(startDate)
TIMESTAMPADD Adds a specified number of intervals to a specified timestamp, and returns a single timestamp. Adding a week translates to adding seven days, and adding a quarter translates to adding three months. A negative integer value results in a subtraction (such as going back in time).	TIMESTAMPADD(interval, intExpr, timestamp) Intervals = SQL_TSI_SECOND SQL_TSI_MINUTE SQL_TSI_HOUR SQL_TSI_DAY SQL_TSI_WEEK SQL_TSI_MONTH SQL_TSI_QUARTER SQL_TSI_YEAR	This example asks for the resulting timestamp when 3 days are added to 2000-02-27 14:30:00. Since February, 2000 is a leap year, the query returns a single timestamp of 2000-03-01 14:30:00. TIMESTAMPADD(SQL_TSI_DAY, 3, TIMESTAMP'2000-02-27 14:30:00')
TIMESTAMPDIFF: Returns the total number of specified intervals between two timestamps.	TIMESTAMPDIFF(interval, timestamp1, timestamp2) Intervals = SQL_TSI_SECOND SQL_TSI_MINUTE SQL_TSI_HOUR SQL_TSI_DAY SQL_TSI_WEEK SQL_TSI_MONTH SQL_TSI_QUARTER SQL_TSI_YEAR	Difference in days between timestamps 1998-07-31 23:35:00 and 2000-04-01 14:24:00. It returns a value of 610. Notice that the leap year in 2000 results in an additional day. TIMESTAMPDIFF (SQL_TSI_DAY, TIMESTAMP'1998-07-31 23:35:00',TIMESTAMP'2000-04-01 14:24:00')

5.11.3. STRING FUNCTIONS

Function	Syntax	Example
CHAR_LENGTH: Returns the length, in number of characters, of a specified string. Leading and trailing blanks are not counted in the length of the string.	CHAR_LENGTH(strExpr)	CHAR_LENGTH(orgName)
CONCAT: Concatenates two character strings	CONCAT(strExpr1, strExpr2)	CONTACT(firstName,lastName)
INSERT: Inserts a specified character string into a specified location in another character string.	INSERT(strExpr1, integer1, integer2, strExpr2)	In the first string, starting at the second position, three characters (the numbers 2, 3, and 4) are replaced by the string abcd. INSERT('123456', 2, 3, 'abcd') Result: 1abcd56
LEFT: Returns a number of characters from the left of a string.	LEFT(strExpr, integer)	LEFT('123456', 3) Result:123
LENGTH: Returns the length, in number of characters, of a string.	LENGTH(strExpr)	LENGTH('abcd') Result: 4
LOCATE: Returns the numeric position of a character string in another character string. If the string cannot be found, 0 is returned.	LOCATE(strExpr1, strExpr2 [, integer]) strExpr1 = needle strExpr2 = haystack	LOCATE('d', 'abcdef') Result: 4 LOCATE('g', 'abcdef') Result: 0
REPLACE: Replaces one or more characters from a character expression with one or more other characters.	REPLACE(strExpr1, strExpr2, strExpr3)	Replace('abcd1234', '123', 'zz') Result: abcdzz4
SUBSTRING: Creates a new string starting from a fixed number of characters into the original string.	SUBSTRING(strExpr FROM starting_position)	SUBSTRING('ABCDE' FROM 2) Result: BCDE

5.11.4. AGGREGATE FUNCTIONS

Function	Syntax	Example
AGGREGATE AT: Aggregates columns based on the level or levels you specify.	AGGREGATE(expr AT level [, level1, levelN])	AGGREGATE(sales AT Year)
AVG: Calculates the average (mean) value of an expression in a result set.	AVG(numExpr)	AVG(FTE)
BOTTOMN: ranks the lowest n values of the expression argument from 1 to n, 1 = the lowest numeric value.	BOTTOMN(numExpr, integer)	BOTTOMN(absenceDays, 10)
COUNT: Calculates the number of rows having a nonnull value for the expression	COUNT(expr)	Count(empNo)

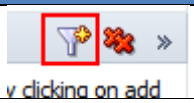
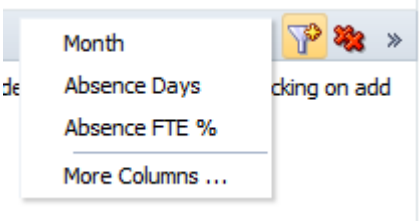
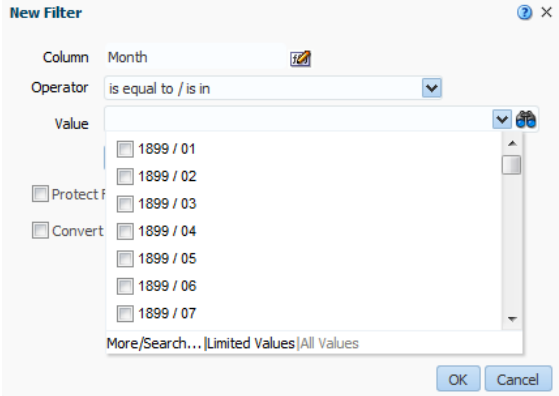
COUNTDISTINCT: Count the number of distinct values in a result set.	COUNT(DISTINCT expr)	COUNT(DISTINCT empNo)
COUNT(*): Counts the number of rows.	COUNT(*)	COUNT(*)
MIN: Calculates the minimum value (lowest numeric value) of the rows.	MIN(numExpr)	MIN(absDays)
MAX: calculates the maximum value (highest numeric value) of the rows.	MAX(numExpr)	MAX(absDays)
MEDIAN: Calculates the median (middle) value of the rows satisfying the numeric expression argument. When there are an even number of rows, the median is the mean of the two middle rows.	MEDIAN(numExpr)	MEDIAN(absDays)
RANK: calculates the rank for each value satisfying the numeric expression argument. The highest number is assigned a rank of 1, and each successive rank is assigned the next consecutive integer (2, 3, 4,...). If certain values are equal, they are assigned the same rank (for example, 1, 1, 1, 4, 5, 5, 7...).	RANK(numExpr)	Rank(empScore)
STDDEV: returns the standard deviation for a set of values. If ALL is specified, the standard deviation is calculated for all data in the set.	STDDEV([ALL | DISTINCT] numExpr)	STDDEV(empScore)
SUM: Calculates the sum obtained by adding up all values	SUM(numExpr)	SUM(empScore)
TOPN: Ranks the highest n values of the expression argument from 1 to n, 1 = the highest numeric value.	TOPN(numExpr, integer)	Top 10 rows by absence days: TOPN(absDays, 10)

6. FILTERS

There are a number of ways a filter can be created and applied to an analysis in ESR BI to limit the data shown in the results. Filters can be applied directly to columns (covered in section 5.7), created separately within an analysis or even created as standalone objects to be applied to multiple analyses.

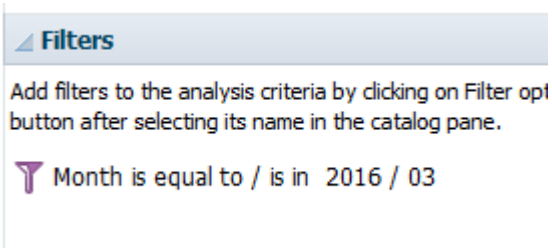
6.1. ADDING A FILTER TO AN ANALYSIS

Within the criteria window of an analysis, the lower half of the screen is allocated to managing filters. To create a new filter:

Step No.	Screen	Description
1		Click the filter icon on the toolbar
2		Select one of the displayed columns or select 'More Columns' and select an item to base the filter on.
3		When setting up the filter users have the option to view or search all the values available.

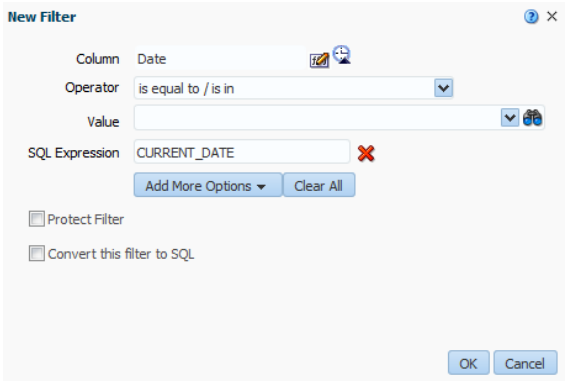
4		A Protect Filter option is available. Select this option to protect the filter's value from being overridden (by either a prompt value or when a user navigates from another analysis). When a user navigates from one analysis to another, any prompt values that were specified in the first analysis transfer to the second analysis.

In the example below the filter is restricting records to where the Month equals March 2016. Notice that hovering the mouse over the filter enables users to Edit, Copy, Paste and Delete the filter.

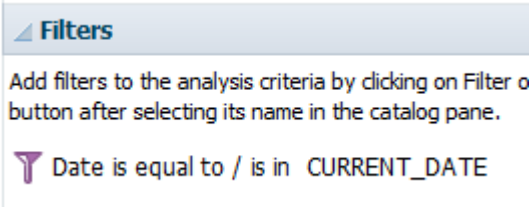


6.1.1. SQL FILTERS

In some cases it may be more appropriate to create a filter based on a formula rather than a fixed value. For instance to filter for the current day, a user would not simply enter a date because it would require an update each day. In such cases an SQL filter could be used. Select 'SQL Expression' from the Add More Options drop down box and enter the formula CURRENT_DATE ensuring it is appropriate to the column chosen to filter on (in the below example "Time"."Date").

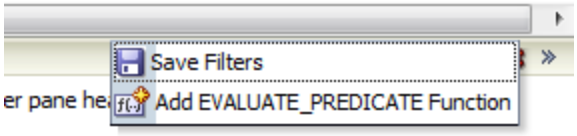


Click OK and the filter is applied.

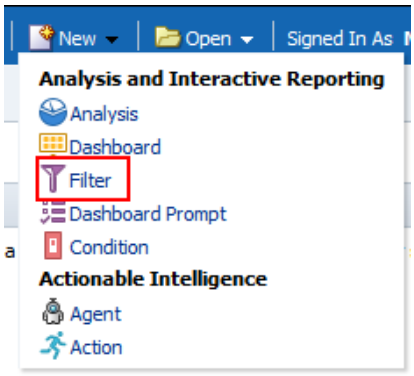


6.2. SAVED FILTERS

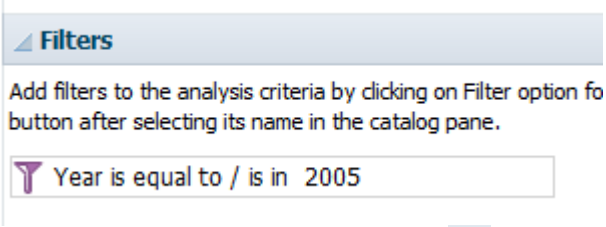
Filters can be saved and shared to encourage greater reuse of formulas and consistency across analyses. There are two ways to create a saved filter. Filters already created as part of an analysis can be saved using the filters menu to the top right of the filters window:



Alternatively a filter can be created under the 'New' menu in the toolbar.

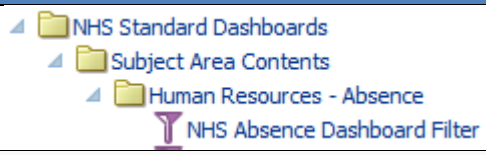
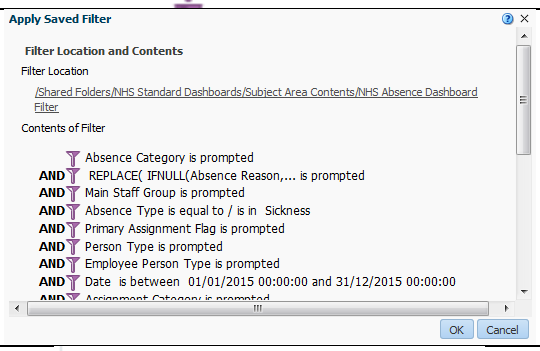
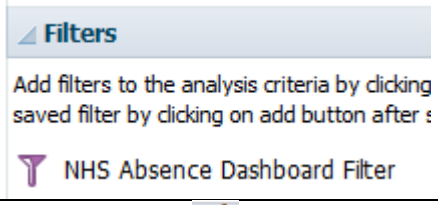


Once the subject area has been selected, the data item to be filtered should be selected from the Subject Area window. In the example below the dimension 'Year' has been selected; the Operator 'is equal to / is in' used and the value '2005' selected to return a 'true' result.



The filter can then be saved using the icon to the top right of the filters section.

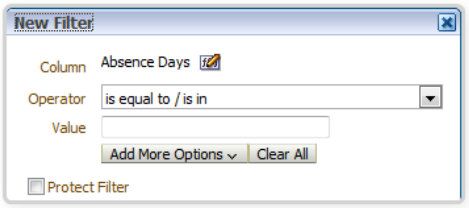
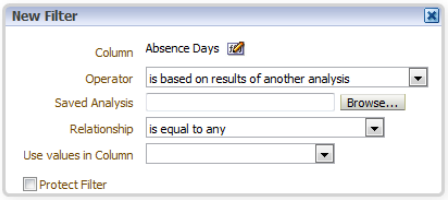
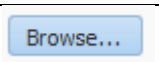
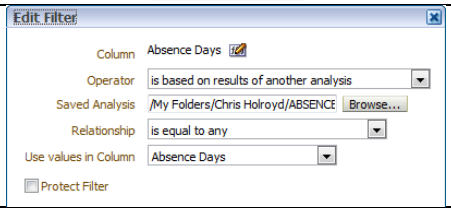
6.2.1. Applying a Saved Filter to an Analysis

Step No.	Screen	Description
1		Open the analysis in the criteria tab and find the filter in the catalog window towards the bottom left of the screen
2		Double click on the filter and apply by clicking OK
3		The filter will then be applied to the analysis.
4		Saved filters can be opened and edited as normal using the open menu on the toolbar and clicking on the edit icon

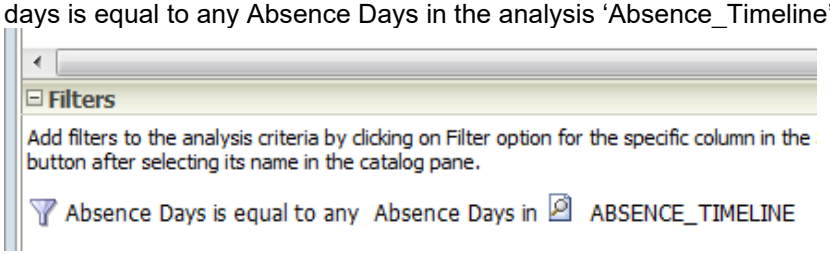
6.3. Filters Based on another Analysis

When creating a filter an option exists to base a filter on the results of another analysis. For example a user may have an analysis that returns the top ten organisations by total number of absence days. A user can then set up a filter within another analysis to only include organisations from that analysis (i.e. in the top ten).

Step No.	Screen	Description

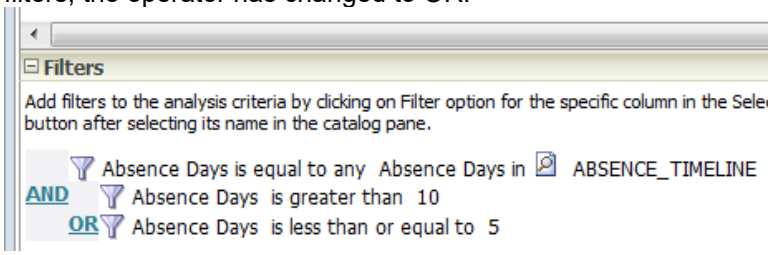
1		Select the column to place the filter against in the normal way
2		In the operator drop down box select 'is based on results of another analysis'
3		Select the Saved Analysis to base the filter on
4		Select the relationship to that analysis and a column from that analysis ensuring the column data is relevant to the column the filter is based on.

In the example shown below the column Absence Days has been filtered where the number of absence days is equal to any Absence Days in the analysis 'Absence_Timeline'.

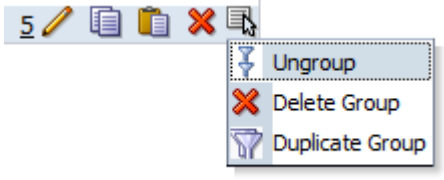


6.4. NESTED FILTERS

By default, where multiple filters are added to an analysis the default operator is AND, meaning both filters must return true to return data. The option exists to create more complex Nested filters by changing the AND operator to OR. In the example below, by clicking on the AND condition for the third of the three filters, the operator has changed to OR.



In order to reverse a nested filter, the option to ungroup is available by hovering the mouse over the filter and selecting Ungroup from the filter options. Operators can be changed against all filters until the correct nesting is achieved. A *Filters* view is available in the Results tab which shows a simple graphical version of how all the filters are acting on an analysis.

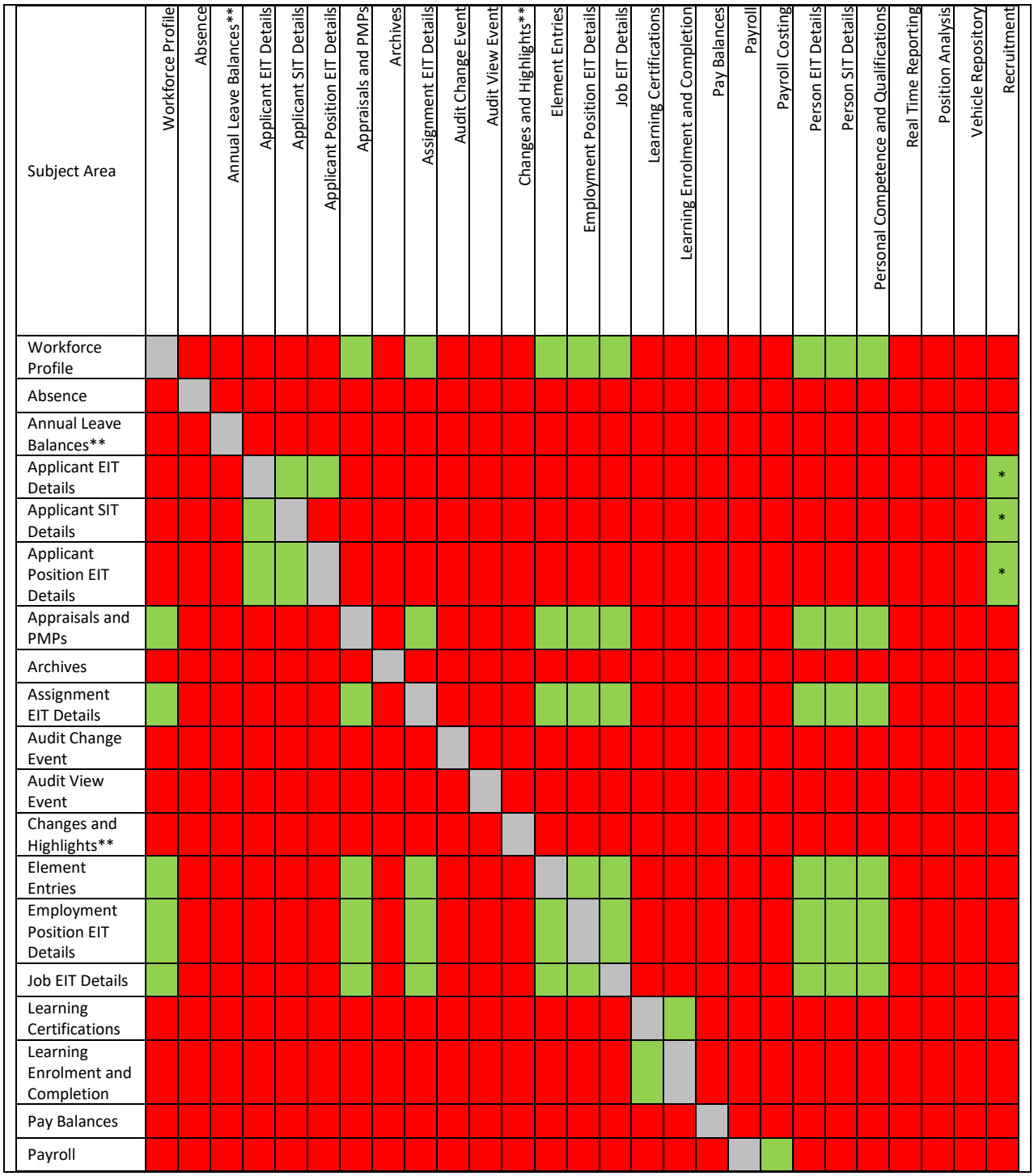


7. JOINING SUBJECT AREAS

Subject Areas can be 'joined' together in two ways within ESRBI. They can be combined where the subject areas are related, or they can be joined using a Union query and the results displayed as if one report.

7.1. COMBINING RELATED SUBJECT AREAS

When using the Add/Remove Subject Area functionality, it is important to remember that not all subject areas can be joined together. Generally speaking, if subject areas are based on the same time dimension (e.g "Time"."Date") then it may be possible to join them. An example could be the subject areas Workforce Profile and Assignment EIT Details. This is not always the case however, for instance the subject areas Workforce Profile and Recruitment could not be joined (despite them both being based on the same time dimension). A number of subject areas are 'Real-Time' and query ESR directly. These subject areas cannot be joined with any other subject areas. A basic matrix of how subject areas can be joined using the Add/Remove Subject Area functionality is below:

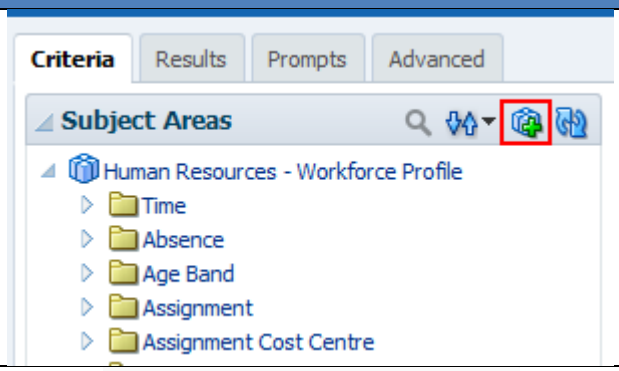
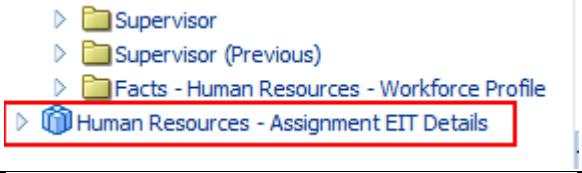
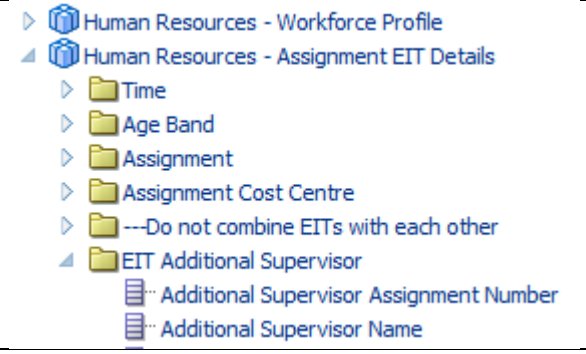


Payroll Costing	
Person EIT Details	
Person SIT Details	
Personal Competence and Qualifications	
Real Time Reporting	
Position Analysis	
Vehicle Repository	
Recruitment	* * *

* Can only be joined using an Application Fact.

**Real-Time area, cannot be joined.

To use the Add/Remove Subject Area functionality:

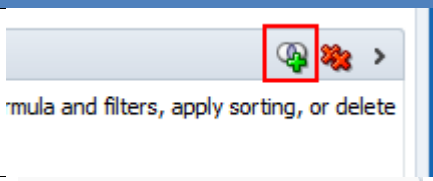
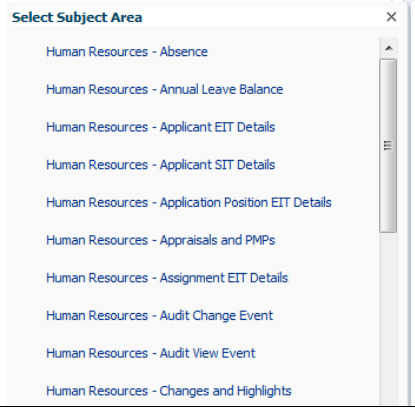
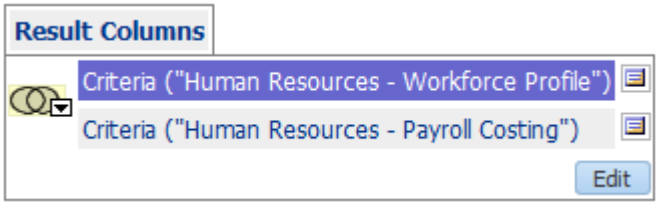
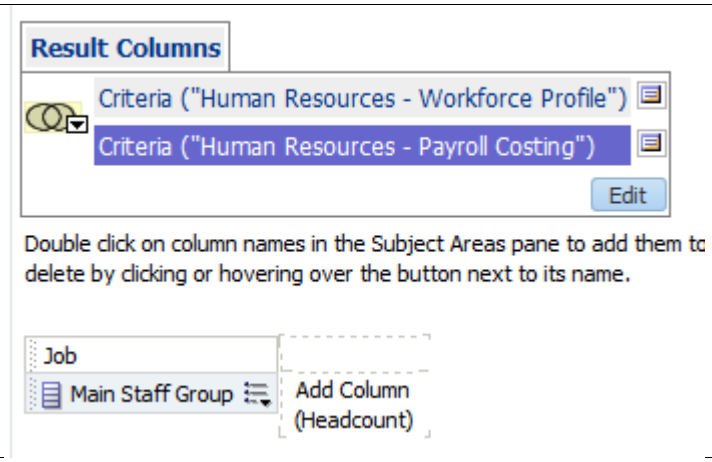
Step No.	Screen	Description
1		From the criteria tab of an analysis, click the Add/Remove Subject Area icon within the Subject Areas pane on the left side of the screen.
2		Tick the additional Subject Area to be added and click OK.
3		The Subject Area will appear in the Subject Areas pane.
4		Expand the Subject Area and select items to use in the normal way.

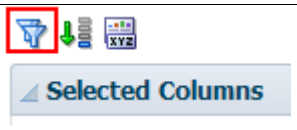
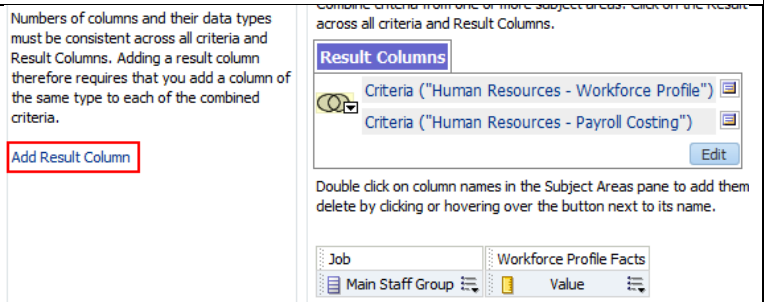
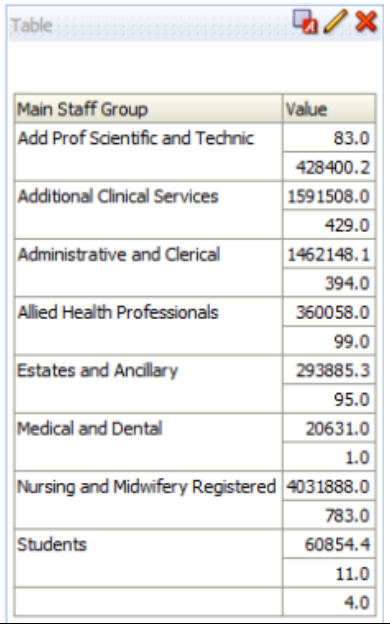
7.2. SET OPERATIONS

The most common way to join subject areas using Set Operations is to create a Union query. Two analyses are setup within one criteria and a query is created to return results, combining the two analyses. There are a number of things to remember when creating a Union:

- The number and data types of the columns combined must be the same.
- Users can select columns from the same subject area or from a different subject area.
- Users cannot use hierarchical columns, selection steps, or groups when you combine criteria.

To use the Set Operations functionality:

Step No.	Screen	Description
1		From the criteria tab of an analysis, click the Combine Results icon towards the upper right section of the screen.
2		Select the additional subject area upon which to base the new analysis.
3		The Selected Columns pane will update and each subject area will display. The subject area highlighted in blue is the subject area being worked on. The subject area folder tree will update depending on which subject area is selected.
4		Data items can be added in the normal way however, the number of data types of items must match between the criteria. In this example, Staff Group and Headcount have been added on the Workforce Profile side but only Staff Group has been added on the Pay Costing side so users are prompted to add another column.

5		We have now added Amount from the Payroll Costing subject area. The Workforce Profile side will return Headcount by Staff group and the Payroll Costing side will return Amount by Staff Group.
6		Filtering of each subject area is setup in the normal way however users should click on the Filters icon on the upper toolbar to display the filters pane
7		Once each criteria of the Union has been setup, users can click on the *Results Columns* to view how the results will be laid out. Additional result columns can be added using the Add Result Column available in the Subject Area pane.
8	 Main Staff Group / Value Add Prof Scientific and Technic 83.0 428400.2 Additional Clinical Services 1591508.0 429.0 Administrative and Clerical 1462148.1 394.0 Allied Health Professionals 360058.0 99.0 Estates and Ancillary 293885.3 95.0 Medical and Dental 20631.0 1.0 Nursing and Midwifery Registered 4031888.0 783.0 Students 60854.4 11.0 4.0	Clicking on the Results tab will return the results in this example. We can see that the *Value* data item is returned against the common data item (*Staff Group*). Because the values for staff group match across both subject areas the values are supressed but the values within the *Value* data item are different per subject area (one is Headcount and the other Amount) so these are each returned against the staff group.

7.3. DIFFERENCE BETWEEN COMBINING RELATED SUBJECT AREAS AND SET OPERATIONS

Combining columns using a Union operation produces different results to adding columns from related subject areas:

- When you combine columns using a Union operation, the analysis results show a single newly combined column governed by a Union operation.
- When you add columns from related subject areas to an analysis, the results show each added column individually.

An interactive guide to using Set Operations which provides additional detail is available on the ESR Hub.
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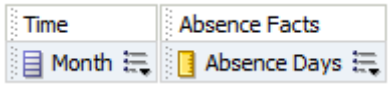
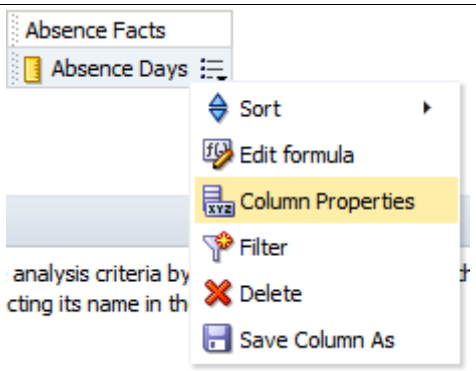
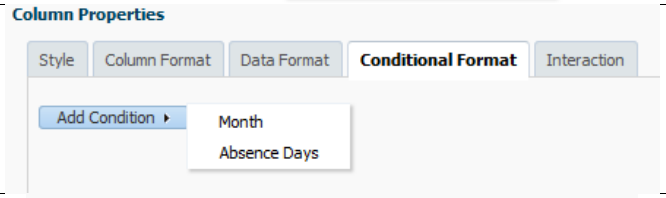
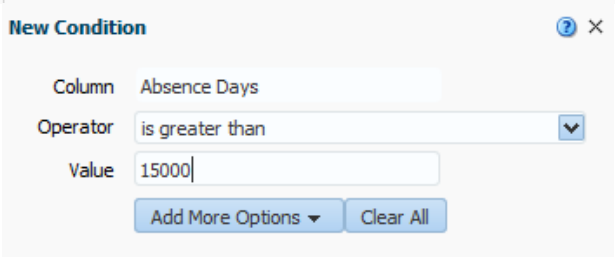
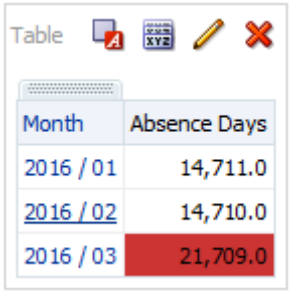
8. CONDITIONAL FORMATTING

Within tables, pivot tables and graphs, conditional formatting helps direct attention to specific data if it meets a certain condition. The format of items such as cells and text in tables or bars and pies in graphs can be changed to highlight data to users.

8.1. ADDING CONDITIONAL FORMATTING TO A COLUMN

Conditional formatting can be applied directly to a column in order to alter the format of that column based on set criteria. To apply conditional formatting to a column:

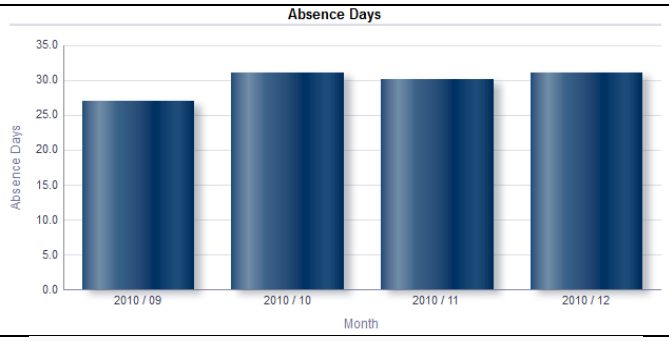
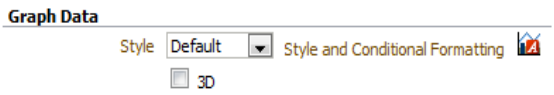
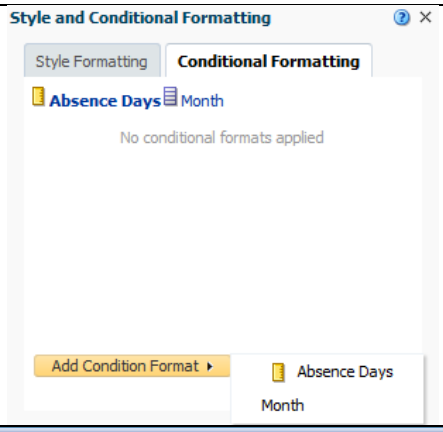
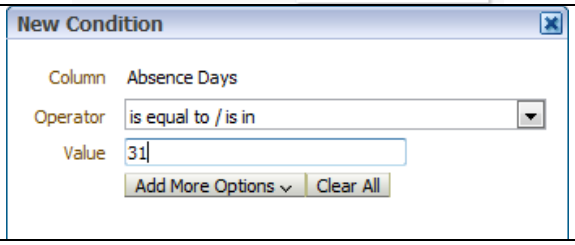
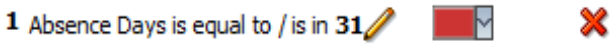
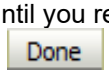
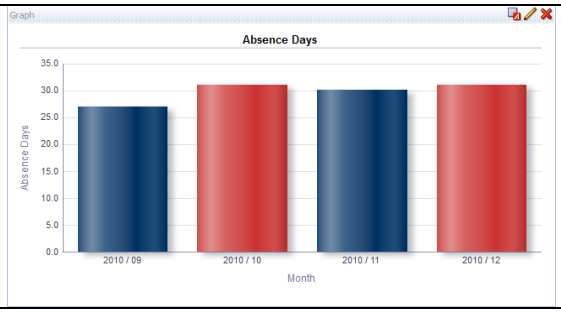
Step	Screen	Description
1		Select the required columns in the Criteria tab
2		Select Column Properties from the column options
3		Select the Conditional Format tab from the Column Properties window and click 'Add Condition'. Select the column that the condition is to be based upon.
4		Enter the parameters of the new condition. In the example we have selected where the column Absence Days Is Greater Than 15,000.
5		Enter the formatting options as required and click OK. Go to the results tab and the formatting will appear where the criteria is met. In the example we have changed the cell colour to red where the value is greater than 15,000.

Note: The format of the data can also be changed along with the style using the Data Format tab when in the Edit Format window.

8.2. ADDING CONDITIONAL FORMATTING TO A GRAPH

Conditional Formatting can be added to a graph to alter the style of the graph based on set criteria. To add conditional formatting to a graph:

Step	Screen	Description

1		Under the Results tab, add a graph view to the compound layout and click on the icon to open the Edit View.
2		Click on the icon on the upper toolbar to open the graph properties window and select the Style tab
3		The style of the graph can be altered under this tab. Click on the icon to open the style and conditional formatting window
4		Select the Conditional Formatting tab, select the column the format is to be applied against and click 'Add Conditional Format' to select the column the condition is to be based on.
5		Setup the parameters of the condition in the New Condition window. In the example we have selected where Absence Days equals 31.
6		Change the bar colour using the selector and click Ok until you return to the edit view. Click  and return to the compound layout.
7		The graph will now reflect the conditional formatting setup against it. In the example the two bars showing the value 31 have been changed to red.

9. STANDARD MEASURES

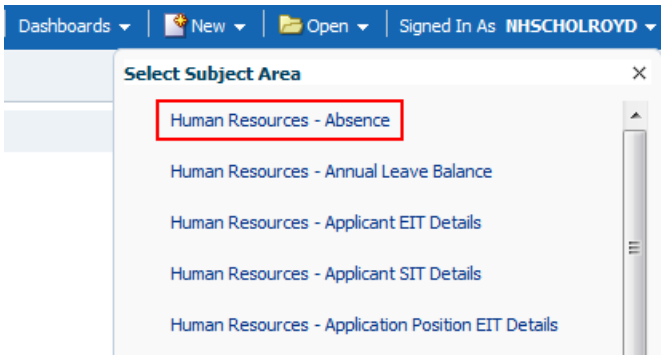
HR and Workforce professionals use a number of calculations to measure changes within organisations and departments. These include:

- FTE Days Lost
- FTE % Lost
- Long Term / Short Term Analysis
- # Occurrences

It is possible to recreate these and other measures in ESR BI when creating new analyses from scratch. This document aims to detail the calculation behind each measure, and quickly show how to implement this in ESR BI.

9.1. ABSENCE

All of the measures in this section are based on the “Human Resources – Absence” Subject Area in ESR BI:



9.1.1.FTE DAYS LOST

FTE Lost is a measure of the full time equivalent lost within a period (normally due to Sickness absence). This is calculated as:

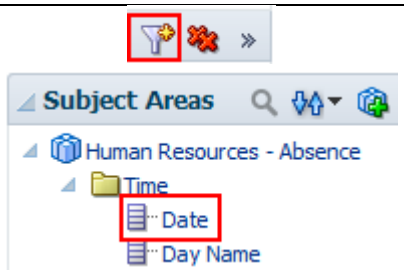
FTE * Calendar Days Absent.

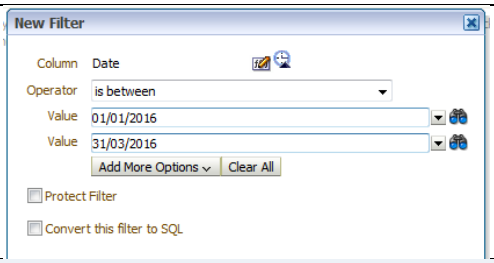
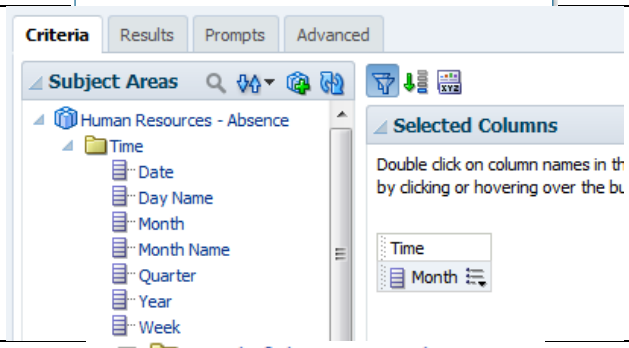
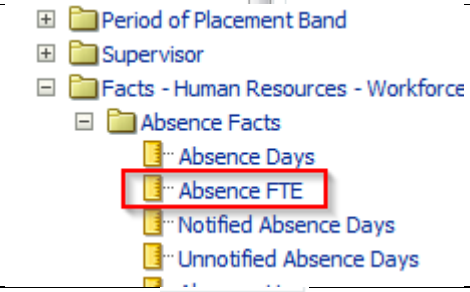
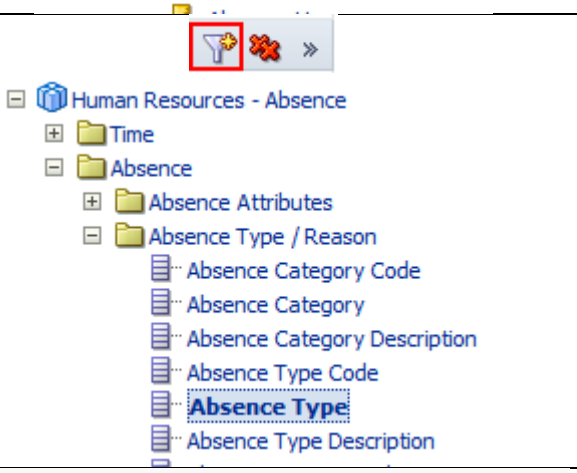
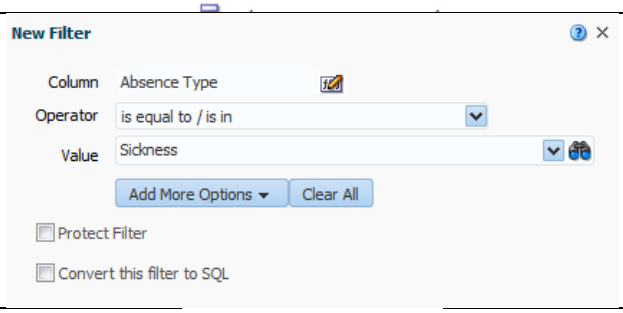
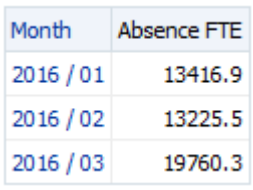
An example might be where an employee with an FTE of 1 (AfC Assignment who works 37.5 hours / week) is away from work for 2 weeks due to sickness:

Absence Start Date: 04/01/2016
Absence End Date: 17/01/2016

Their FTE Days Lost is measured as ‘14’ since their FTE is 1 and the number of calendar days absent is 14. 14 x 1 = 14.

Were the employee to have an FTE of 0.5, then their FTE Days Lost would be 7.

Step	Screenshot	Description
1		Create a new analysis based on the Absence Subject Area
2		Create a new filter on the ‘Date’ item from the ‘Time’ folder.

3		Restrict the date to a period of your choosing (use at least 3 months as an example)
4		Add any columns to group by to the analysis (in this example, we will group by 'Month').
5		Expand the Facts folder, then the absence facts folder. Within here you will find the Absence FTE measure. Double-click it.
6		Create a new filter to filter for a specific absence type (normally 'Sickness')
7		Enter a value to filter for (Sickness)
8		Click the results tab. You now have the FTE Lost by Month

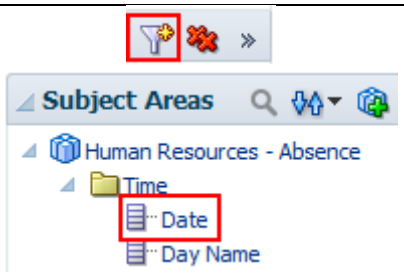
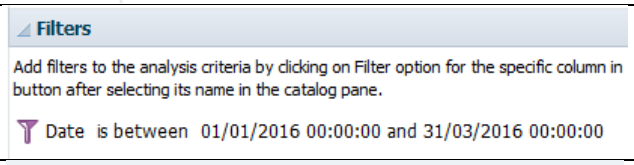
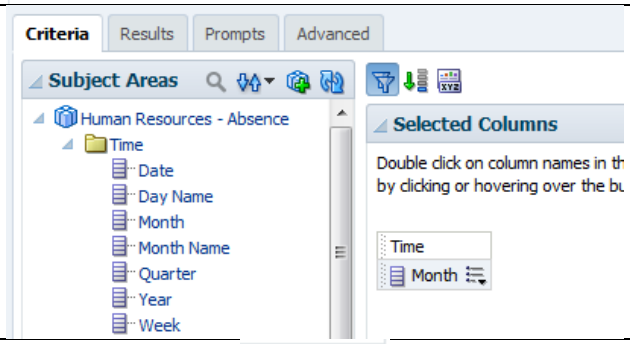
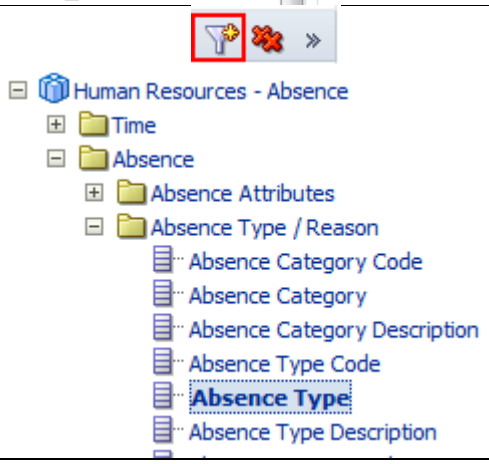
9.1.2.FTE % Lost

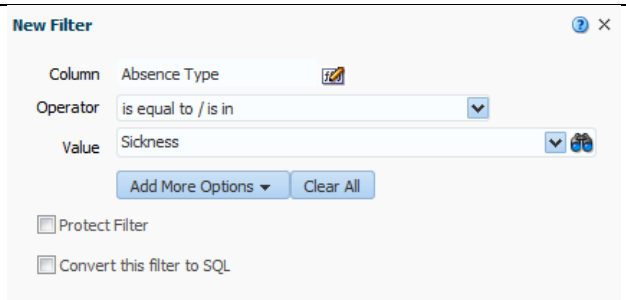
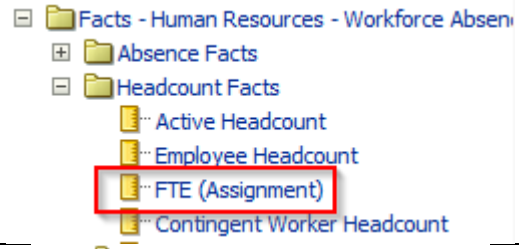
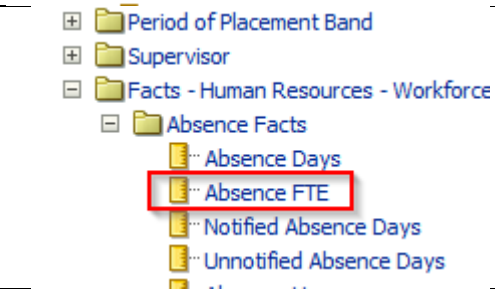
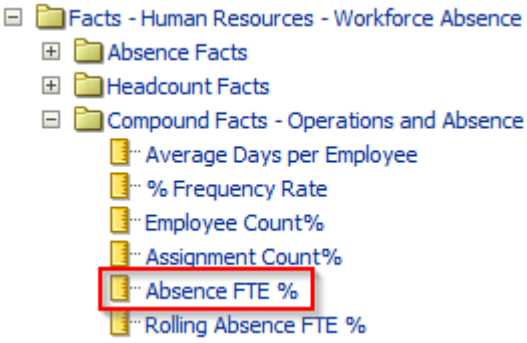
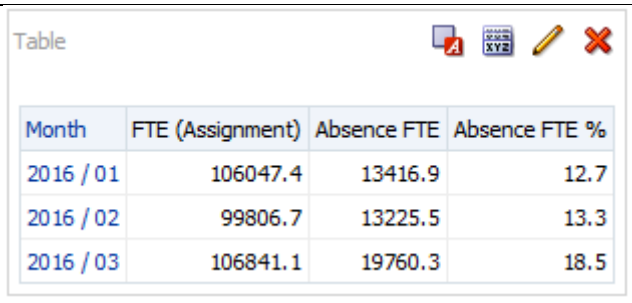
FTE % Lost is a measure of the % of working time lost compared to 'available' working time. Since ESR does not record when a person works, both FTE Lost and FTE Available are calculated using calendar days. As an example, take an employee who has an FTE of 1 (37.5 hours / week) who works throughout January. Although they may only work Monday to Friday, their available time is calculated as 31 (31 Days x 1 FTE).

In the same example, let's assume the employee had 3 days off work due to sickness (11/01 – 13/01). For the whole of January, their Available FTE is 31. The FTE lost is 3. To work out the FTE % Lost, simply divide the FTE Lost by Available FTE and multiply the result by 100:

(3/31) * 100 = 9.68 %

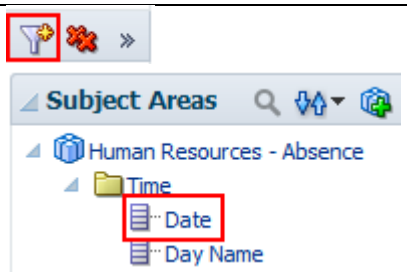
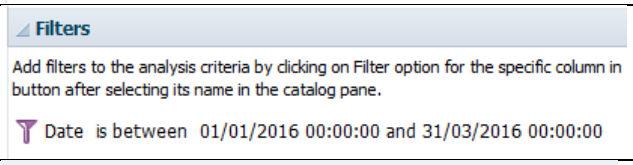
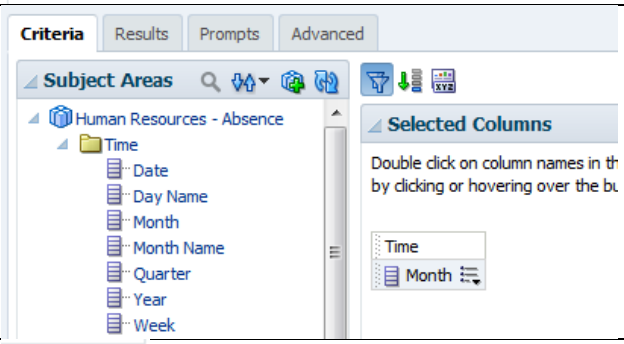
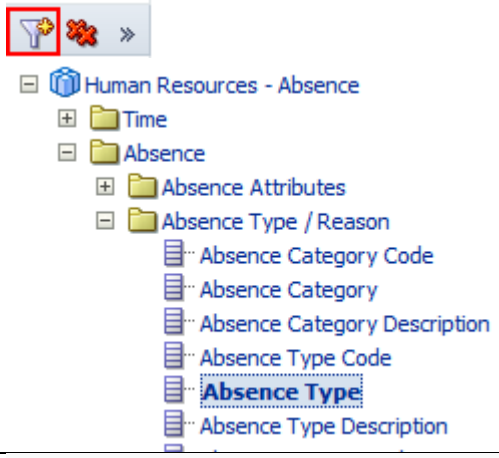
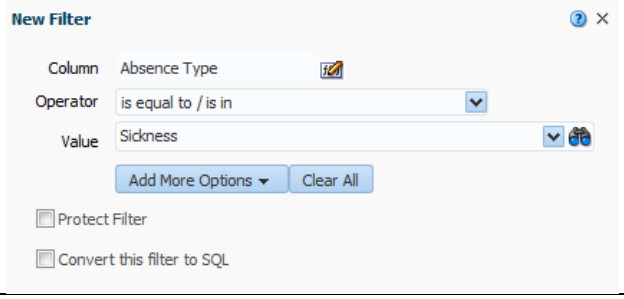
This figure is normally calculated for Sickness absence only, and is done at an aggregated level (e.g. Staff Group, Organisation etc).

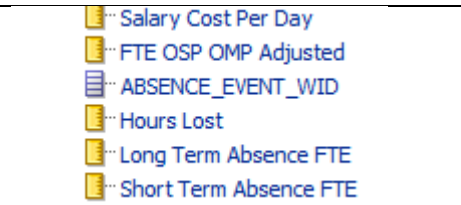
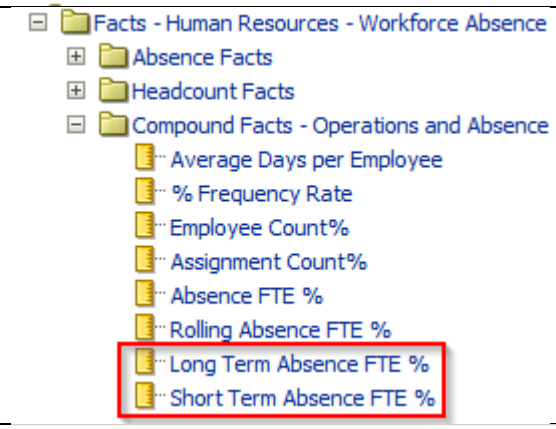
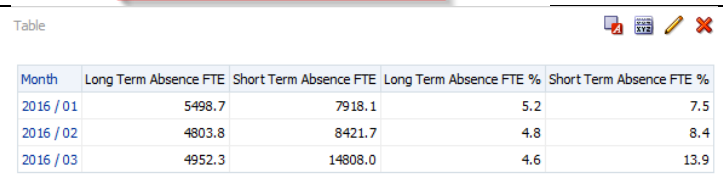
Step	Screenshot	Description
1		Create a new analysis based on the Absence Subject Area
2		Create a new filter on the 'Date' item from the 'Time' folder.
3		Restrict the date to a period of your choosing (use at least 3 months as an example)
4		Add any columns to group by to the analysis (in this example, we will group by 'Month').
5		Create a new filter to filter for a specific absence type (normally 'Sickness')

6		Enter a value to filter for (Sickness)
7		Expand the Facts folder, then expand the Headcount Facts folder. Find the FTE (Assignment) item and double click it (This will return 'Available' FTE).
8		Expand the absence facts folder. Find the Absence FTE measure and double-click it.
9		Expand the Compound Facts folder and find the 'Absence FTE %' item. Double click it.
10	 Month / FTE (Assignment) / Absence FTE / Absence FTE % 2016 / 01 — 106047.4 — 13416.9 — 12.7 2016 / 02 — 99806.7 — 13225.5 — 13.3 2016 / 03 — 106841.1 — 19760.3 — 18.5	Click the results tab – you now have FTE Available, FTE Lost and % FTE rates.

9.1.3. LONG TERM / SHORT TERM

This measure divides absences by the total length of the absence (even if the absence starts or ends outside of the reporting period). Generally across the NHS the accepted length of a Long Term absence is 28 calendar days or greater – anything else is considered Short Term. The below measures use the 28 day period by default although it is possible to change this by setting a request variable. Setting request variables is covered later in this document.

Step	Screenshot	Description
1		Create a new analysis based on the Absence Subject Area
2		Create a new filter on the 'Date' item from the 'Time' folder.
3		Restrict the date to a period of your choosing (use at least 3 months as an example)
4		Add any columns you wish to group on to the analysis (in this example, we will group by 'Month').
5		Create a new filter to filter for a specific absence type (normally 'Sickness')
6		Enter a value to filter for (Sickness)

		Expand the Facts folder and the Absence Facts folder. Add the Long Term Absence FTE and Short Term Absence FTE items to the analysis.
7		Expand the Compound Facts folder. Add the Long Term Absence FTE % and Short Term Absence FTE % items to the analysis.
8	 Month | Long Term Absence FTE | Short Term Absence FTE | Long Term Absence FTE % | Short Term Absence FTE % 2016 / 01 | 5498.7 | 7918.1 | 5.2 | 7.5 2016 / 02 | 4803.8 | 8421.7 | 4.8 | 8.4 2016 / 03 | 4952.3 | 14808.0 | 4.6 | 13.9	Click the Results tab. All Long Term/Short Term measures are now included.

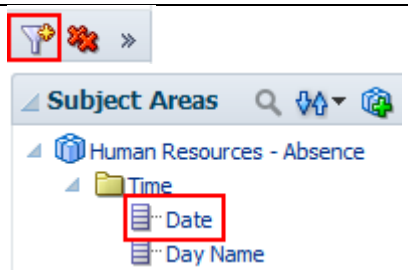
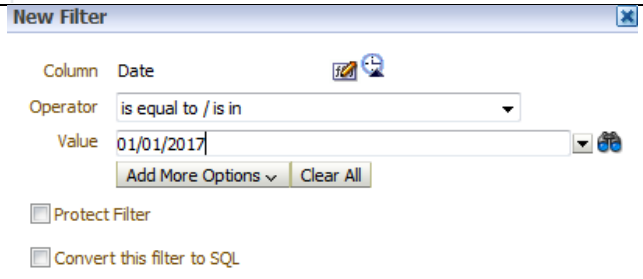
9.2. ABSENCE WITHIN WORKFORCE

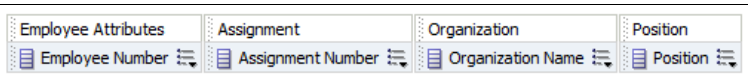
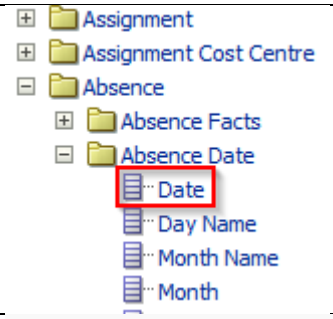
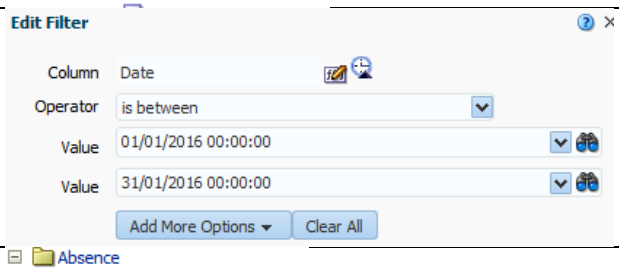
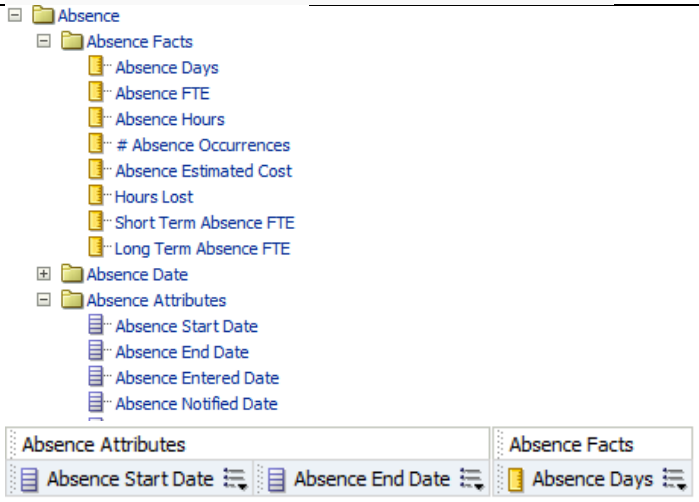
Within the Workforce Subject Area users can return Absence Attributes and Absence Measures in a similar way to using them within the Absence Subject Area. When returning assignment information within the Absence Subject Area, data is returned as at the absence date. Using the Workforce Subject Area allows users to return assignment information as at an effective date alongside absence information.

9.2.1. USING ABSENCE ITEMS WITHIN WORKFORCE

When using absence within workforce, two separate date filters are required in order to define a workforce effective date and an absence period.

Implementation in ESRBI

Step	Screenshot	Description
1		Create a new analysis based on the Workforce Subject Area
2		Create a new filter on the 'Date' item from the 'Time' folder.
3		Restrict the date to an effective date. This will be the effective date of the assignment/employee information included within the analysis.

4		Add any assignment/employee columns to be used within the analysis.
5		Add a new filter based on the Date item from the Absence Date folder.
6		Restrict the Absence Date to a period. This will define the period of absence to return.
7		Include any absence columns to be included within the analysis.
8		Click the Results tab. Assignment details are now returned at an effective date alongside absence information.

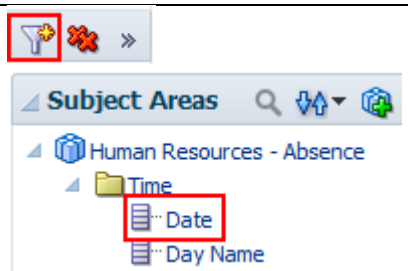
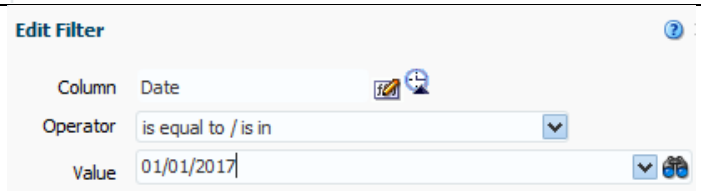
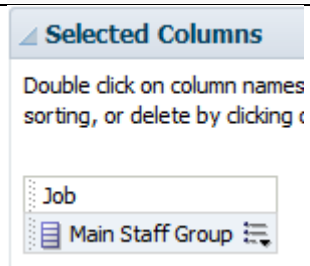
9.3. STAFF REQUIREMENTS

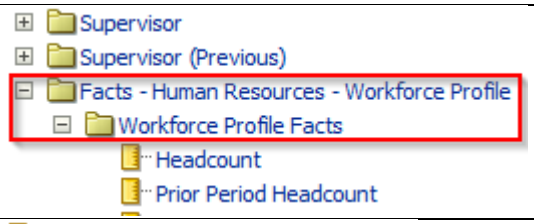
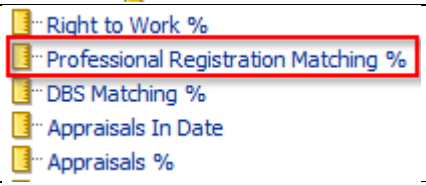
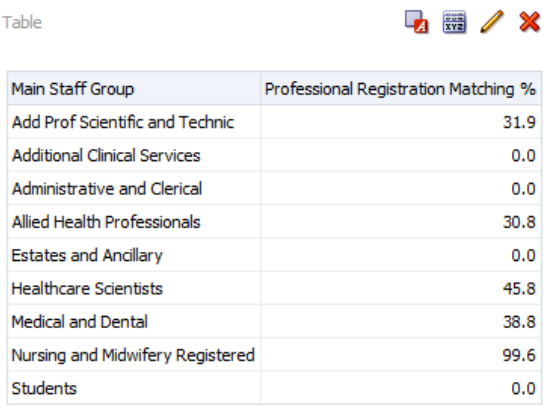
All of the items described in this section of the document are based on the 'Human Resources – Workforce Profile' subject area within ESRBI but may be available in multiple subject areas:

9.3.1. PROFESSIONAL REGISTRATION MATCHING %

Professional Registration Matching % is the number of employees who require a professional registration (recorded against the position) and who have a valid matching professional registration (recorded against their employee record) as a percentage of the total number of employees that require a professional registration.

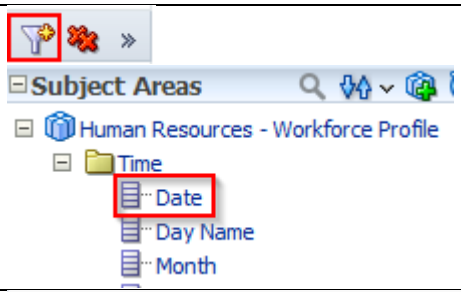
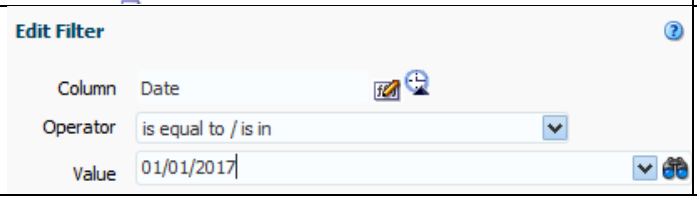
Implementation in ESRBI

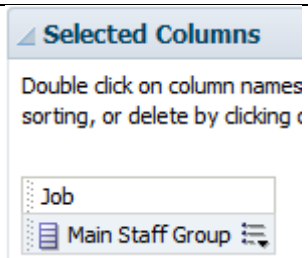
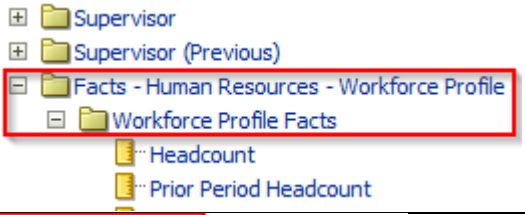
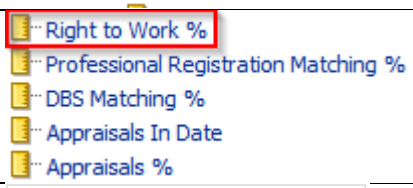
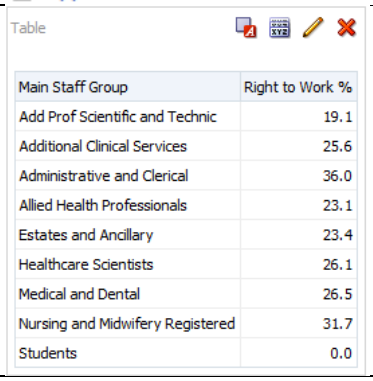
Step	Screenshot	Description
1		Create a new analysis based on the Workforce Subject Area (although this measure is available across a number of subject areas).
2		Create a new filter based on the Date item from the Time folder.
3		Restrict the date to an effective date.
4		Add any columns you wish to group on to the analysis (in this example, we will group by 'Staff Group').
5		Expand the Facts – Human Resources - Workforce Profile>Workforce Profile Facts folder.

		
6		Scroll down and include the Professional Registrations Matching % measure in the analysis.
7	 Main Staff Group / Professional Registration Matching % Add Prof Scientific and Technic 31.9 Additional Clinical Services 0.0 Administrative and Clerical 0.0 Allied Health Professionals 30.8 Estates and Ancillary 0.0 Healthcare Scientists 45.8 Medical and Dental 38.8 Nursing and Midwifery Registered 99.6 Students 0.0	Click the Results Tab and the results of the analysis are displayed.

9.3.2. RIGHT TO WORK %

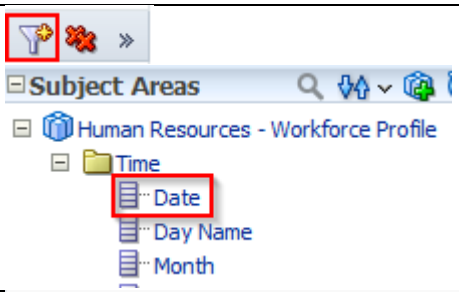
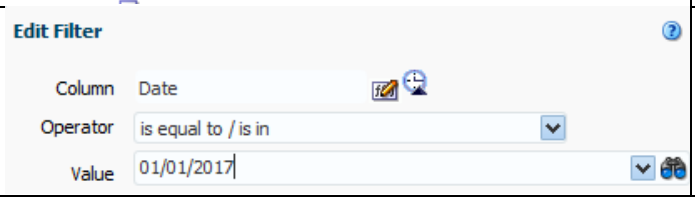
All employees within ESR should have a Right to Work recorded within the system. An Employee fulfils the Right to Work criteria if:
(Work Permit Required = 'Yes' AND List B (First Combination) Reference Number IS NOT NULL and Is in Date)
OR (Residency Status = 'Temporary' AND List B Group 1 Source Document Checked IS NOT NULL and Is in Date)
OR (Residency Status = 'Temporary' AND LIST B Group 2 Source Document Checked IS NOT NULL and Is in Date)
OR List A Source Document Checked IS NOT NULL. The number of employees fulfilling the criteria is divided by the total headcount to provide a percentage.

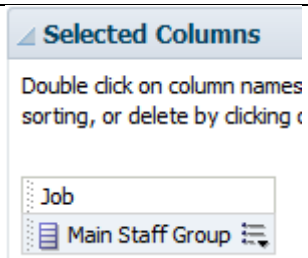
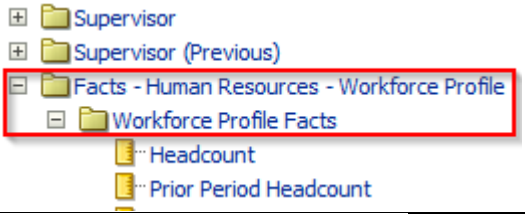
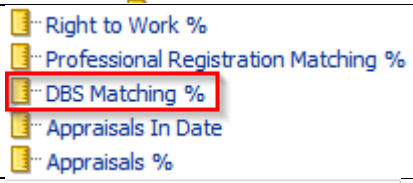
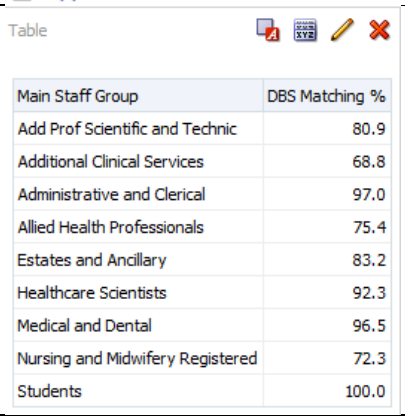
Step	Screenshot	Description
1		Create a new analysis based on the Workforce Subject Area (although this measure is available across a number of subject areas).
2		Create a new filter based on the Date item from the Time folder.
3		Restrict the date to an effective date.

4		Add any columns you wish to group on to the analysis (in this example, we will group by 'Staff Group').
5		Expand the Facts – Human Resources - Workforce Profile>Workforce Profile Facts folder.
6		Scroll down and include the Right to Work % measure in the analysis.
7		Click the Results Tab and the results of the analysis are displayed.

9.3.3.DBS MATCHING %

The DBS Matching % measure is based on the below formula and provides the % of assignments that have a correct and valid DBS recorded against them. Formula: (Number of assignments that require a DBS (as recorded against the position) with a DBS check at the correct level or higher recorded / Number of assignments with a DBS requirement) * 100

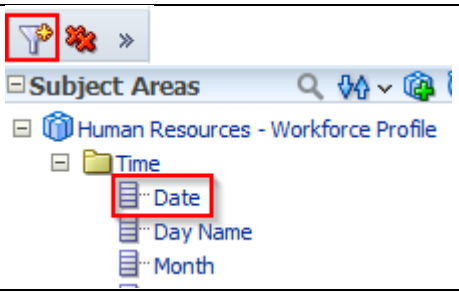
Step	Screenshot	Description
1		Create a new analysis based on the Workforce Subject Area (although this measure is available across a number of subject areas).
2		Create a new filter based on the Date item from the Time folder.
3		Restrict the date to an effective date.

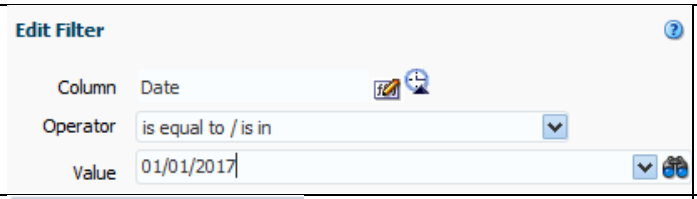
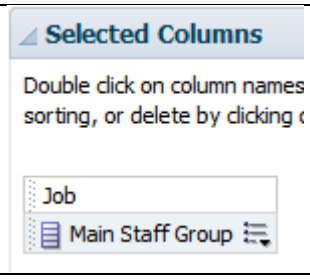
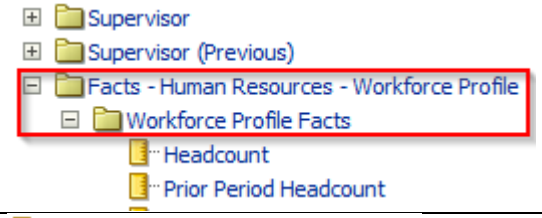
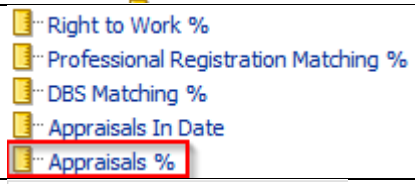
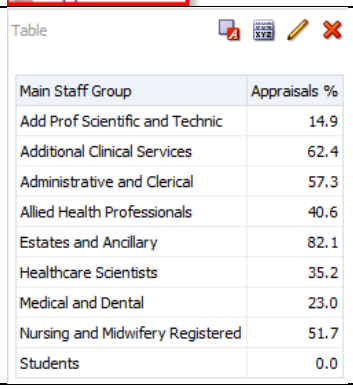
4		Add any columns you wish to group on to the analysis (in this example, we will group by 'Staff Group').
5		Expand the Facts – Human Resources - Workforce Profile>Workforce Profile Facts folder.
6		Scroll down and include the DBS Matching % measure in the analysis.
7		Click the Results Tab and the results of the analysis are displayed.

9.3.4. APPRAISALS %

All employees within ESR should have an Appraisal recorded every 12 months. The Appraisals % measure provides users with the number of Appraisals completed / Headcount * 100. Completed appraisals can be defined as a distinct count of completed appraisals in the last 12 months. (e.g. if a person has 2 completed appraisals in the period, this should be counted only once).

Implementation within ESRBI

Step	Screenshot	Description
1		Create a new analysis based on the Workforce Subject Area (although this measure is available across a number of subject areas).
2		Create a new filter based on the Date item from the Time folder.

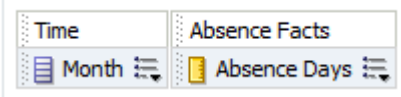
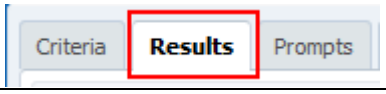
3		Restrict the date to an effective date.
4		Add any columns you wish to group on to the analysis (in this example, we will group by 'Staff Group').
5		Expand the Facts – Human Resources - Workforce Profile>Workforce Profile Facts folder.
6		Scroll down and include the Appraisals % measure in the analysis.
7		Click the Results Tab and the results of the analysis are displayed.

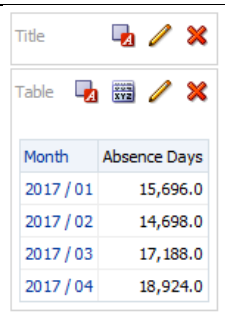
10. VIEWS

The results of an analysis can be displayed in three primary ways, as a Table, a Pivot Table or a Graph. These three views allow a user to display the results in different ways depending on the type of information to be displayed and highlighted.

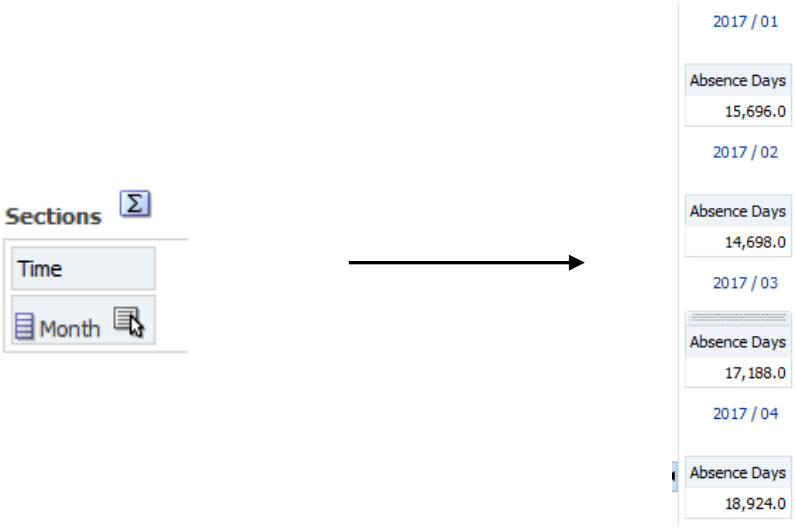
10.1. ADDING A TABLE

A table is normally the default view to display the results of an analysis when navigating to the results tab. To view the results of an analysis as a table:

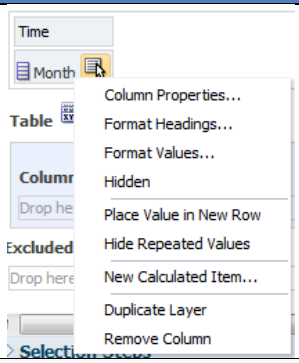
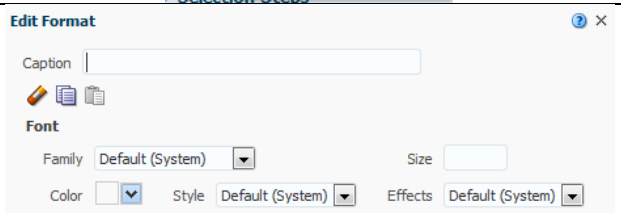
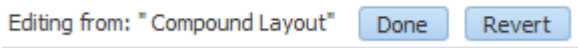
Step	Screen	Description
1		Select the required columns in the Criteria tab
2		Click on the 'Results' tab

3		The results of the analysis are displayed in the Compound Layout. Two views are shown, a Title view and a Table view.

The table can then be customised to display the results as required. Click on the icon to open the table in edit view. Within the Layout area, drag and drop functionality allows the columns to be moved around or excluded from the table to display the results as desired. In the below example the month column has been moved into the 'Sections' area resulting in each month being displayed as a separate section in the table.

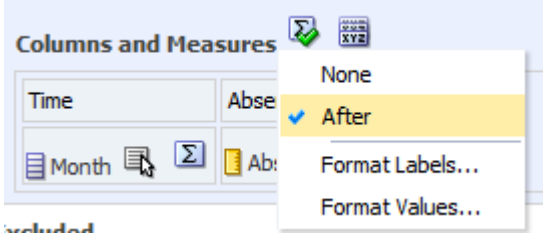


To change the format of each column within a table:

Step No.	Screen	Description
1		Click the icon within the column and select either Format Headings or Format Values depending on the area of the graph to be modified
2		Use the Edit Format window to change the format of the Heading/Values as required
3		Click 'Done' from the upper right corner options.
4		The results will now be shown in the Compound window of the results tab. In this example the Headings have been set to **Bold**.

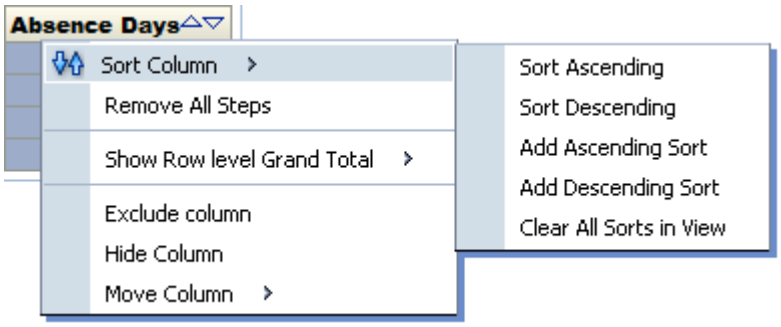
10.1.1. ADDING TOTALS

Within the 'edit view' of a table, the option is available to add a Grand Total. Click on the Σ icon and select 'After' or 'Before' to add a Grand Total to the table.



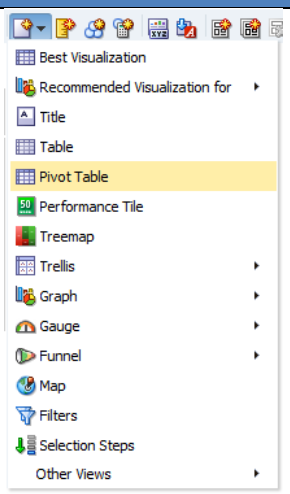
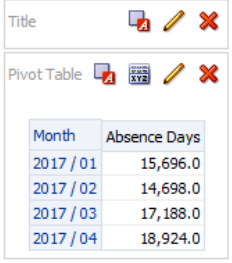
10.1.2. SORTING

To sort a column within a table from the compound view, right click on the column name, select 'Sort Column' and choose the sort type required.



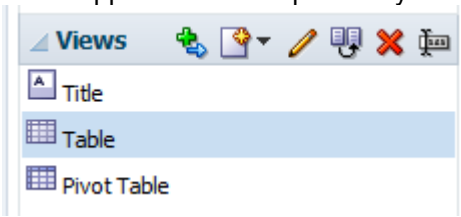
10.2. PIVOT TABLES

A Pivot Table in ESR BI is similar to a standard Table in that they both allow drag and drop functionality either in the compound view or edit view, sorting, drilling and conditional formatting. To add a Pivot Table to the results of an analysis:

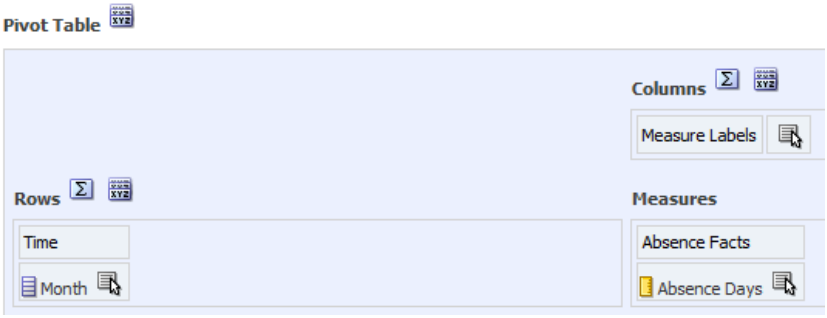
Step	Screen	Description
1		Click the icon within the top toolbar and select Pivot Table.
2		A Pivot Table is then added to the compound view of the results. You should see it is similar to a standard table

To remove (but not delete) any view (Table, Pivot Table, Graph etc) from the compound layout, click the icon in the upper right corner of the view and it will be moved to the 'Views' window in the lower left

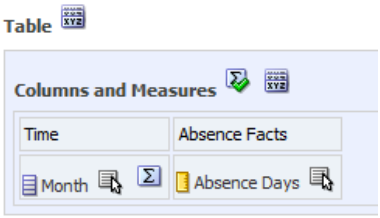
corner of the screen. In the example below a Pivot Table has been added and the Table view removed from the Compound Layout. To add a view back to the compound layout, click the icon and the view will re-appear in the compound layout.



The primary difference between tables and pivot tables is that within the edit view of a pivot table, Rows are available as a drop target as well as Columns and Measures, whereas in a Table edit view Columns and Measures are in the same drop target and Rows is not available. Being able to drag and drop columns into Rows, Columns and Measures enables greater flexibility and aggregation of the data.
Example Edit View of a Pivot Table:

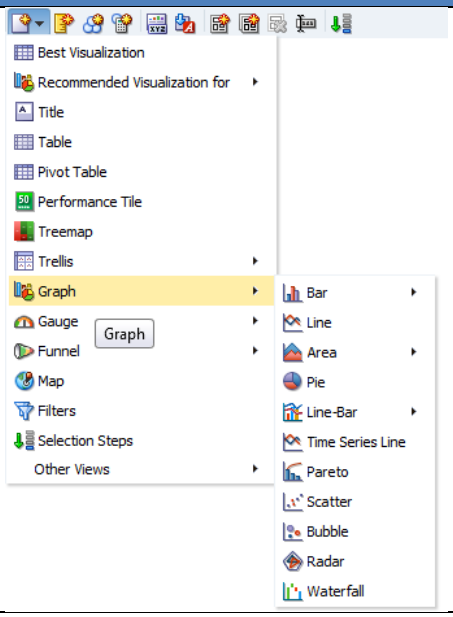


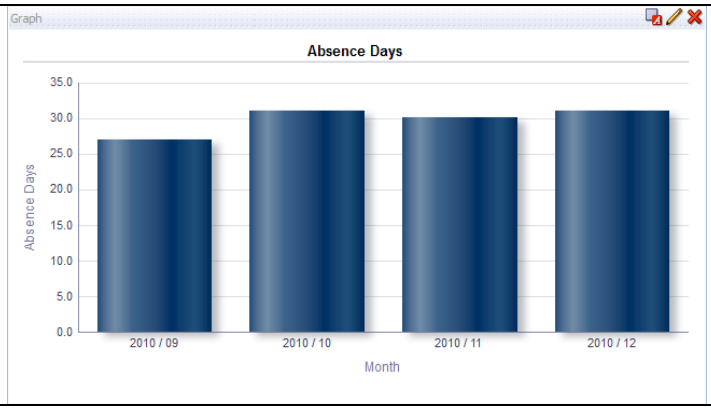
Example Edit View of a Table:



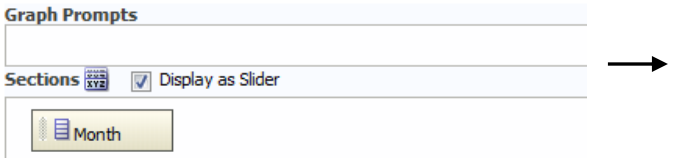
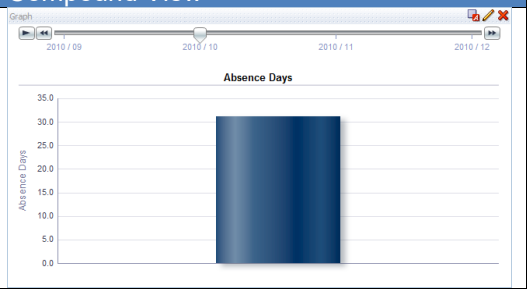
10.3. GRAPHS

Graphs can be used for various ways of analysing and displaying data. To add a graph to an analysis:

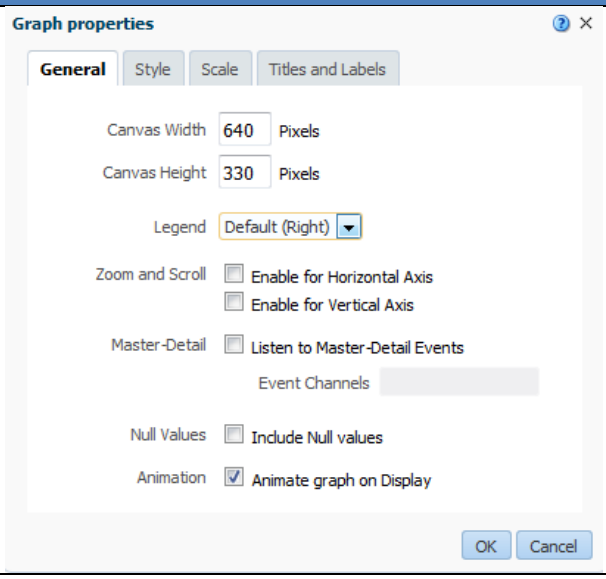
Step	Screen	Description
1		Click the icon within the top toolbar and select Graph. Then select the type of graph to be added to the compound view

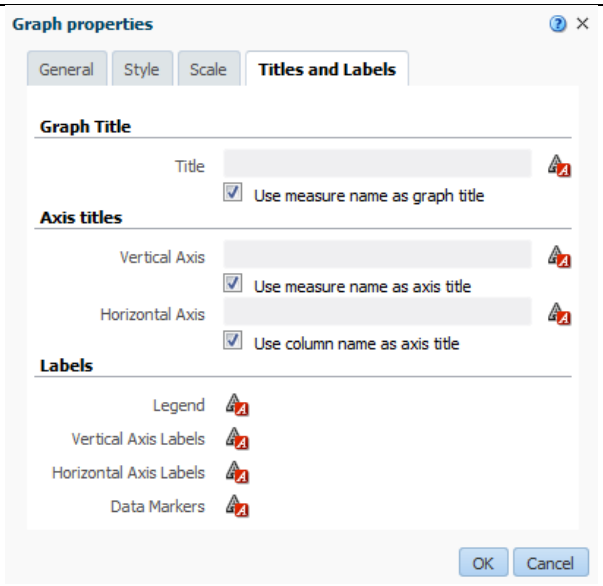
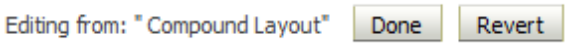
2		A Graph is then added to the compound view of the results.

Click on the icon to enter the Edit View of the graph. The layout window is similar to a Table layout except the drop targets are now Measures and Bars (or similar depending on the graph type). In the example below the month dimension has been moved to the sections drop target and 'Display as Slider' has been enabled. This has resulted in the graph now reflecting the month that has been selected on the slider above.

Edit View	Compound View
	

To edit the properties of the graph:

Step No.	Screen	Description
1		Click the icon within the top toolbar to open the Graph properties window.

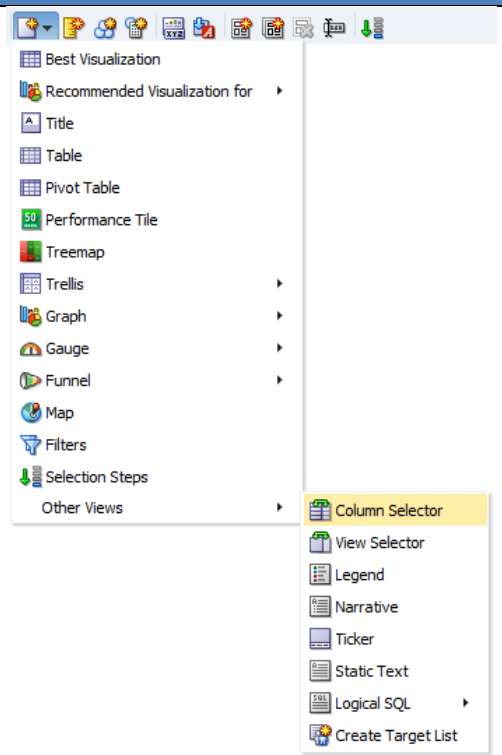
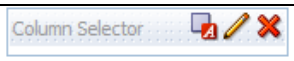
2		Select 'Title and Labels' tab to alter the titles as required. Un-tick the 'use measure name as graph title' and enter the required text. The format of the titles can also be changed by clicking on the icon
3		Click 'Done' in the upper right corner to return to the compound layout view.

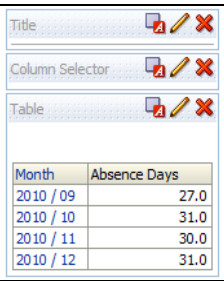
11. COLUMN AND VIEW SELECTORS

Column selectors in ESRBI are drop-down lists that contain pre-selected columns. Users can select columns and change the data that is displayed in the view of an analysis. A view selector enables users to select a specific way to view the results of an analysis from a selected list of views. When added to an analysis (in the compound layout), the view selector is displayed as a drop-down list from which users can choose the view required.

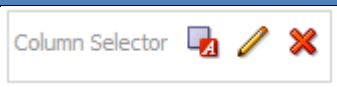
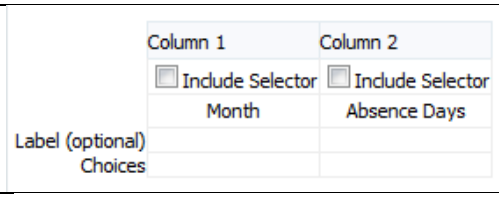
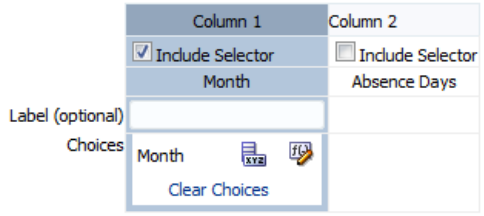
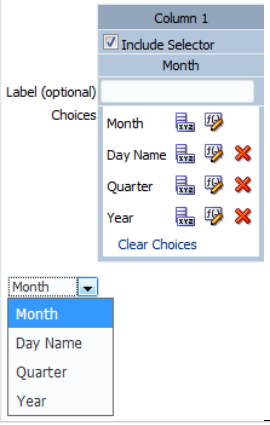
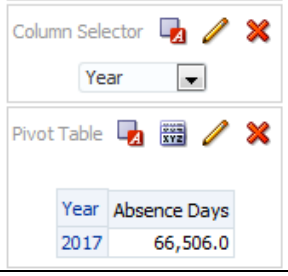
11.1. ADDING A COLUMN SELECTOR

To add a column selector view the compound layout of an analysis:

Step	Screen	Description
1		Click on the icon and select Other Views > Column Selector.
2		The Column Selector View will then appear in the compound layout under the table. *Note: A column selector view will also display in the views window*

3		Drag the Column Selector view up so it sits between the Title and Table view.

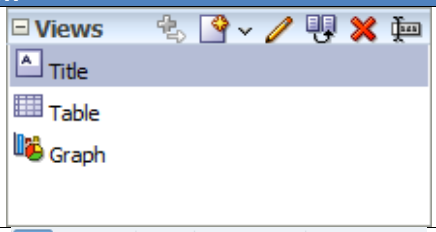
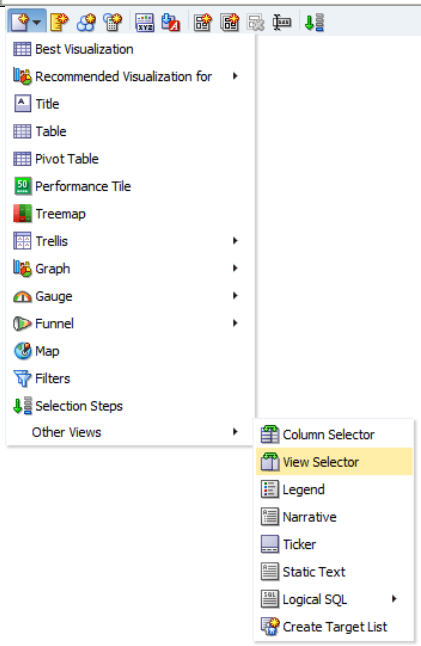
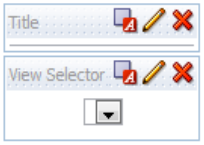
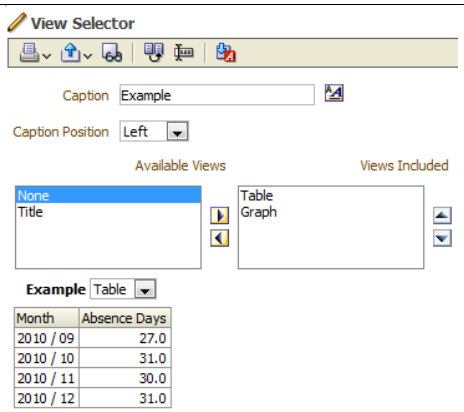
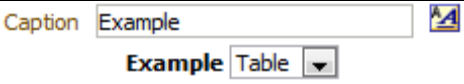
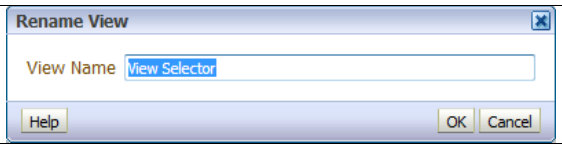
To setup the column selector:

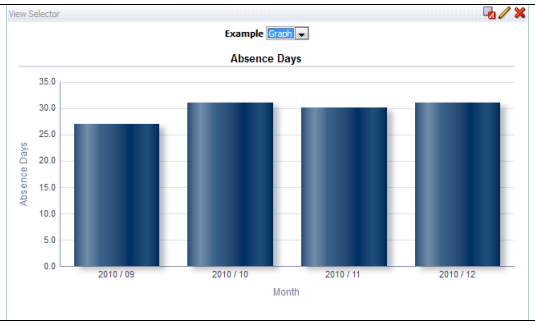
Step No.	Screen	Description
1		Click on the icon in the column selector view to edit it.
2		The columns available to base the column selector on are displayed.
3		Tick the column(s) the column selector is to be based on and an example of the column selector will display below.
		Select the dimensions or facts to add to the column selector by double clicking on each from within the Subject Areas window. In this example we have added the 'Day Name', 'Quarter' and 'Year' dimensions to the Month column. You can see they are displayed in the example column selector.
		Click Done and the column selector will display in the compound layout. Here we have selected 'Year' and the table has updated to reflect the Year column.

The format and style of each column added to the column selector can be customised to suit requirements. Clicking on the icon in the edit view opens the column properties window where items such as folder and column headings can be updated. The column formula can also be customised by clicking on the icon. The edit column formula window enables a user to add/remove columns, functions, filters and variables to/from the formula.

11.2. VIEW SELECTOR

To add a view selector to the compound layout of an analysis:

Step	Screen	Description
1		Ensure you have created each view you would like to add to the view selector and that they are visible in the views window. Here we have created a Table and a Graph view. *Note: They can be removed from the compound layout using the* *icon.*
2		Click on the icon and select Other Views > View Selector.
3		Position the View Selector so that it sits under the title view.
4		Click on the icon in the view selector to edit it. Select the available views to be included and use the arrow to add them to the *Views Included* box. The up/down arrows can be used to determine the default view which is the first view in the list. An example view will be displayed. In this example we have added a Table and Graph view.
5		A caption can be added and positioned around the drop-down box. Use the icon to format the caption.
6		The view selector can be renamed using the icon on the upper toolbar.

7		Click the Done icon and the view selector will display in the compound layout. In the example the graph view has been selected.

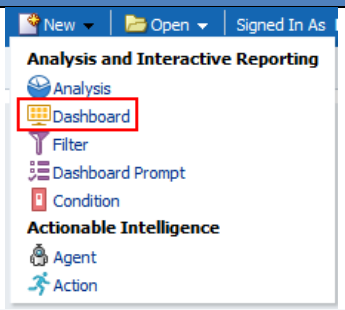
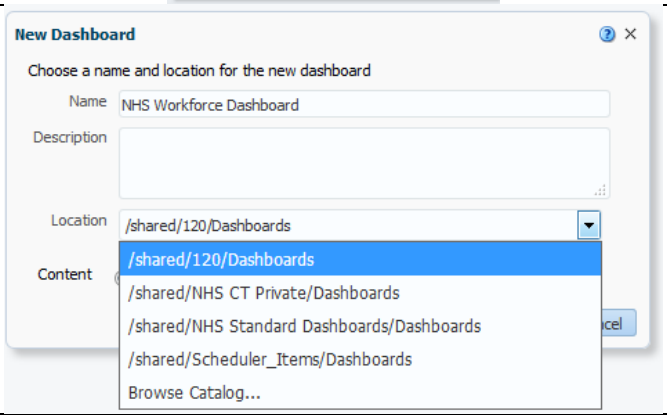
12. DASHBOARDS

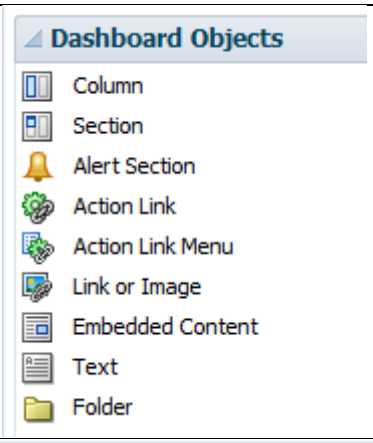
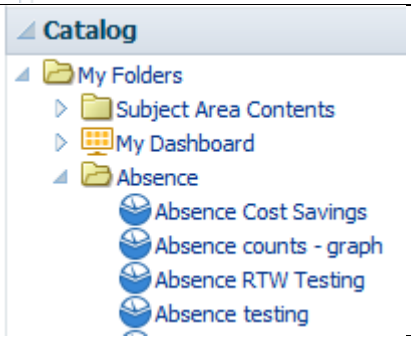
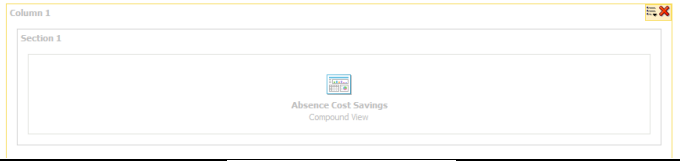
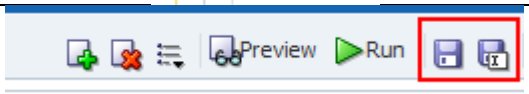
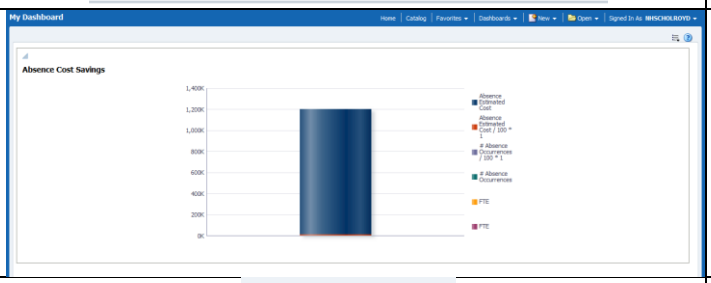
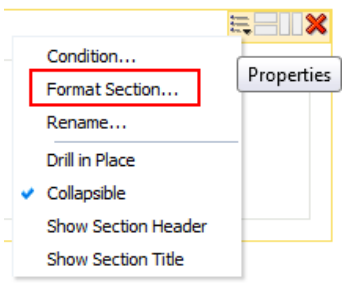
Most ESRBI Users will only ever be in contact with Dashboards. BI Administrators are the only users who can create or update analyses directly. It is therefore important that dashboards are well designed, easy to use and not full of 'clutter'. Dashboards can be access via the Dashboards link Dashboards within the top toolbar. National Dashboards are listed under the NHS Standard Dashboards header, any locally shared dashboards are listed under the VPD header. A normal dashboard will consist of one or more tab, a dashboard prompt and one or more analyses. Dashboards are essentially containers to hold other BI objects (such as analyses and dashboard prompt) and are used to display those objects and enable them to function together.

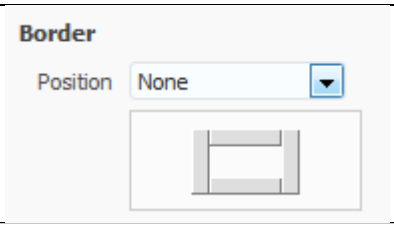
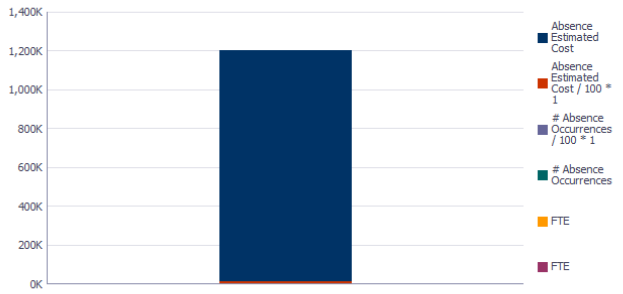
When setting up a dashboard, there are a number of good practices that should be followed:

- Always build and test dashboards with a screen resolution of 1024x768 because this is the most common resolution for desktop PCs. If you know your organisation uses a different resolution, ensure you conform to this.
- Use colours from the NHS colour scheme. A copy of this is available within the ESRBI Quick Reference Guide available on the ESR Hub.
- Format sections of the dashboard consistently. All national dashboards have section borders removed and prompt sections are collapsible.
- Keep it simple! Too much information on one page can be confusing for the user. Try to summarise data first and lead the user to more detailed information either using Drills or Action Links to different tabs.
- Use conditional formatting to highlight data/issues. This can really help users to focus on areas of the business that need attention.

Creating a Dashboard:

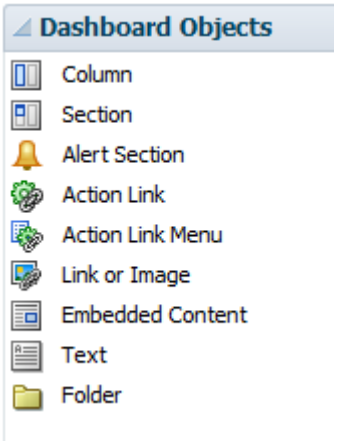
Step	Screen	Description
1		Click on the New drop down menu and select Dashboard.
2		Name the dashboard and select a location to save it. Note: Users will always be prompted to save a new dashboard in a *Dashboards* folder. Users can Browse for a different folder but the dashboard will not then appear in the dashboards menu. Users will be prompted for this.

3		Dashboards are made up of a number of Dashboard Objects. A brief description of each object is given in the next section.
4		Depending on where the dashboard has been saved, expand the folder tree and find the BI object you want to include within the dashboard. This will normally be an analysis or dashboard prompt etc.
5		Click and drag the object into the dashboard. In this example we have dropped in an analysis titled 'Absence Cost Saving'.
6		A column and a section will be automatically created (where not already included) when a BI object is dropped into a dashboard.
7		Before running the dashboard it must be saved.
8		Click the run icon and the dashboard will run. You can see that a border has been placed around the section. This can be removed using the section properties.
9		Click the dashboard page options in the upper right corner to go back to the dashboard edit page.
10		Hover the mouse over the upper right corner of the section and click the section properties. Click the Format Section option.

11		Update the Border Position to 'None'. Click OK. Save the dashboard and run it again.
12		The border has now been removed.

12.1. DASHBOARD OBJECTS

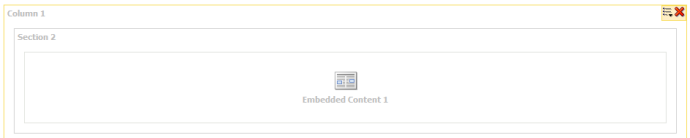
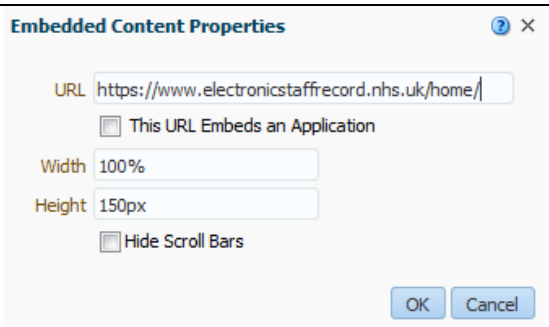
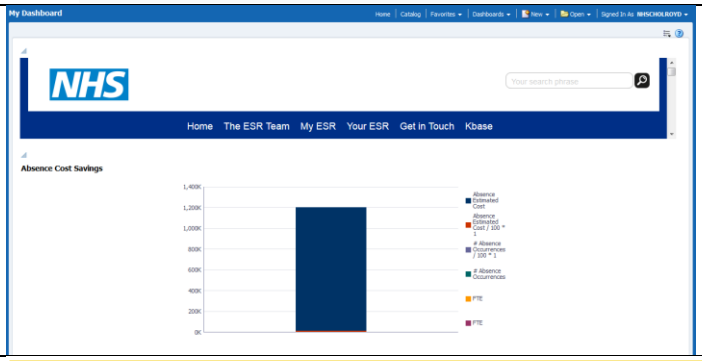
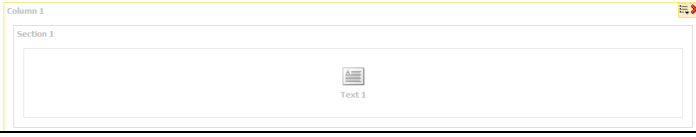
Dashboards can be made up of the following objects. These are the 'building blocks' of the dashboard into which users can place their own BI objects (such as analyses and prompts).

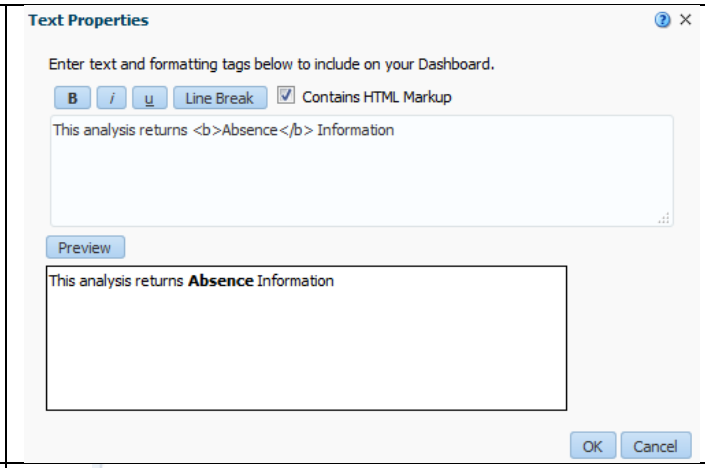
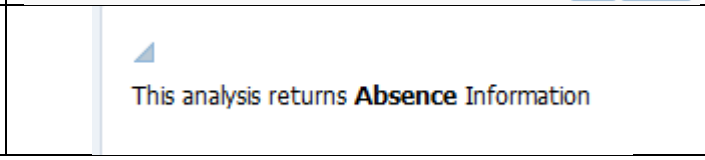


Object	Description
Column	Used to align content on a dashboard. (Sections within columns hold the actual content.) You can create as many columns on a dashboard page as you need, and you can place columns on a dashboard horizontally or vertically.
Section	Used within columns to hold the content, such as action links, analyses, and so on. You can drag and drop as many sections as you require for a column.
Alert Section	Used to add a section in which to display Alerts from agents, if any. On users' My Dashboard, an Alert section is added automatically to the first page, if you do not manually place one there. You cannot disable the appearance of an Alert section on the first page of users' My Dashboard. You can add an Alert section to an additional dashboard page so that section is then displayed on both dashboard pages.
Action Link	Used to add an action link. An action link is a link that you embed in an analysis, dashboard page, or KPI that, when clicked, runs an associated action.
Action Link Menu	Used to add an action link menu. An action link menu let users choose, from a list of action links, the right action to be executed.
Link or Image	Used to add text links and image links and specify what should happen when a user clicks them. For example, you can direct users to another

	web site or dashboard, open documents, launch applications, or perform any other action that the browser supports. You can also add an image or text only, without any links.
Embedded Content	Used to add embedded content. Embedded content is any content that is displayed within a window (called a frame) inside the dashboard, as opposed to content that is accessed by clicking a link. Content that you might want to embed includes analyses, Excel charts, documents, web sites, tickers from web sites, and so on. When you embed content into a dashboard, the required HTML is automatically added to the target content. Analyses are embedded by default. Embedding an analysis in a dashboard causes it to execute automatically and to display the results within the dashboard. This provides access to current results.
Text	Used to add plain text or HTML.
Folder	Used to add a view of a Catalog folder and its contents. For example, you might add a folder that contains a collection of saved analyses that you run frequently. Then from the dashboard, you can open the folder, navigate to a saved request, and click it to run it.

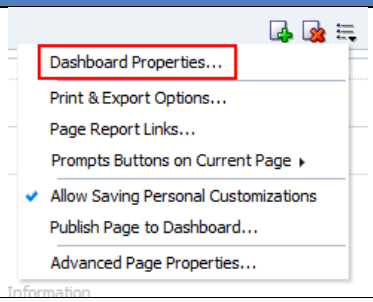
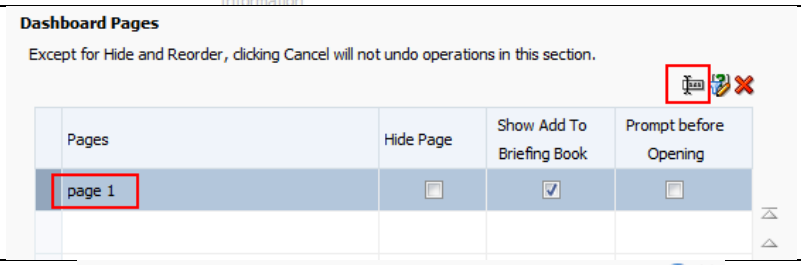
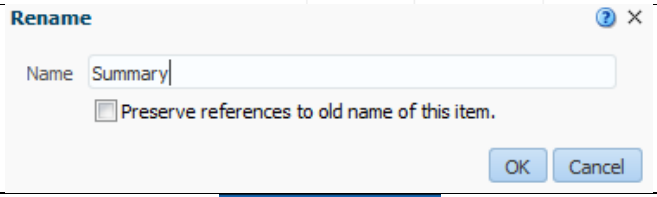
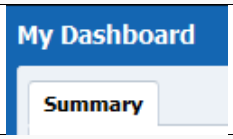
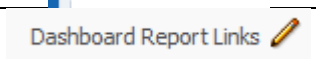
12.2. USING DASHBOARD OBJECTS

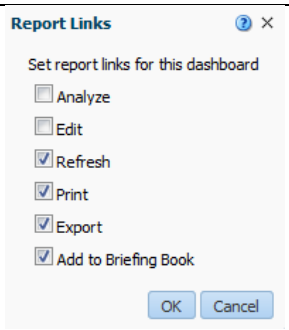
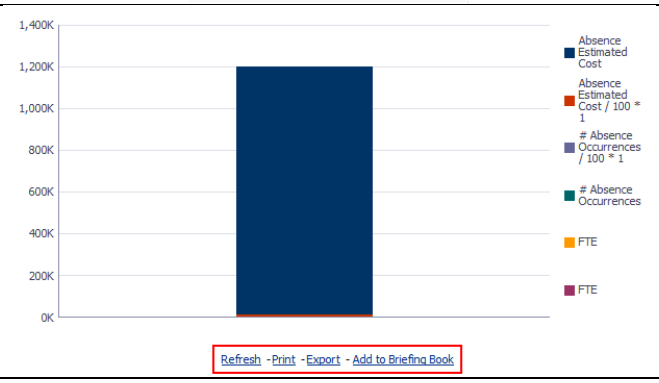
Step	Screen	Description
1		To add Embedded Content to a dashboard, drag and drop the embedded content object onto the dashboard.
2		Click on the icon and open the embedded content properties window. Here users can enter a URL and change the width and height of the object. In this example we have entered a URL and set the width of the object to full screen.
3		Save and run the dashboard. The website is now embedded into the dashboard and displays correctly.
4		To add Text to a dashboard click and drag the Text object into the dashboard.

5		Click on the icon and open the text properties window. Enter the text or HTML to be entered. In this example we have added some text and basic HTML. *Note: the 'Contains HTML Markup' has been ticked. The preview has been displayed also.*
		Save and run the dashboard. The text is displayed correctly within the dashboard.

12.3. DASHBOARD PROPERTIES

The dashboard properties window is where items like the dashboard page names and dashboard links can be set.

Step No.	Screen	Description
1		When editing a dashboard, click on the tools icon in the upper toolbar and select Dashboard Properties.
2		Highlight the page to be renamed and click the rename icon.
3		Rename the Page as required and click OK.
4		The dashboard page name is now updated.
5		To change the dashboard links that are included within the dashboard by default, click the Dashboard Report Links icon.

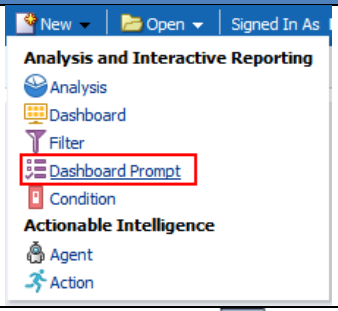
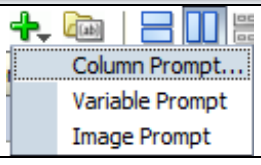
6		Select the report links to be included beneath each analysis. In this example we have selected Refresh, Print, Export and Add to Briefing Book. Save and Run the dashboard.
7		The links are included beneath each analysis in the dashboard.

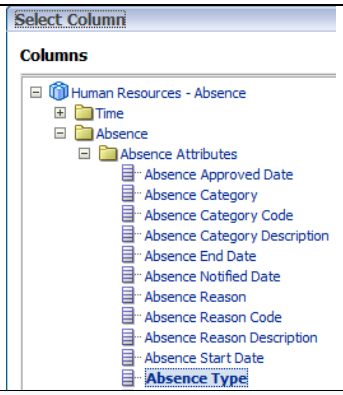
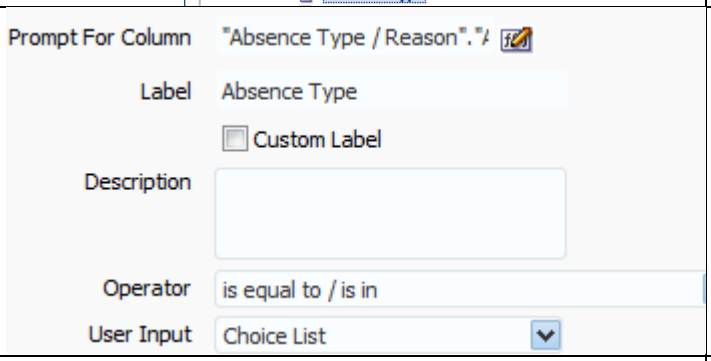
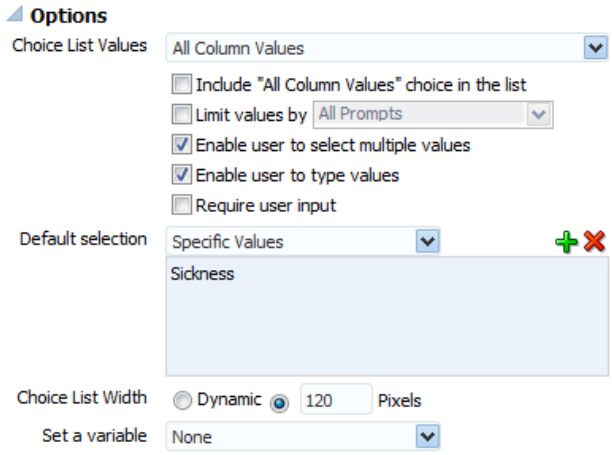
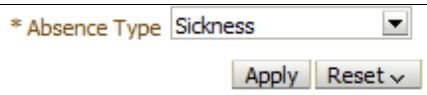
13. DASHBOARD PROMPTS

A dashboard prompt is the most common and flexible prompt type. Dashboard prompts allow users to specify data values that determine the content of one or all of the analyses contained in the dashboard. Dashboard prompts are reusable so you can create one prompt and use it many times. The prompt is created outside of a specific dashboard and is stored in the catalogue as an object. Each set of prompts within a dashboard prompt is based on a specific subject area.

13.1. CREATING A DASHBOARD PROMPT

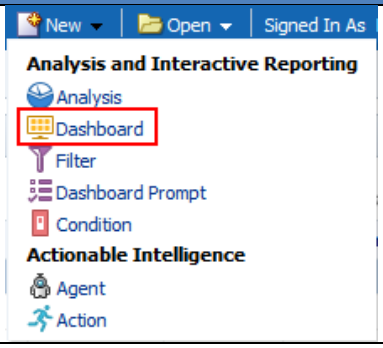
To create a dashboard prompt:

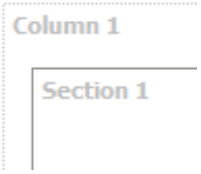
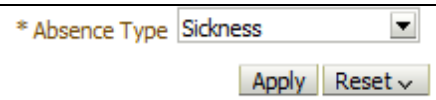
Step	Screen	Description
1		Click on the New drop down menu, select Dashboard Prompt and select the Subject Area on which to base the prompt
2		Click on the icon and select Column Prompt from the drop down list to add a new prompt

3		Select the Column to base the prompt on. In this example we have selected Absence Type
4		Ensure the correct column is being prompted for, to change the formula click on the icon. Give the prompt a label and set an operator and User input choice. In the example we have used 'is equal to / is in', and 'Choice List' to select a value from.
5		Within the options menu setup the prompt as required and select how the default selection should be displayed. In the example we have chosen 'Sickness' as the default absence type to use. To select the default from the available data items use the icon.
		Click ok and an example of the prompt will appear in the display window. Save the prompt.

13.2. APPLYING A PROMPT TO A DASHBOARD

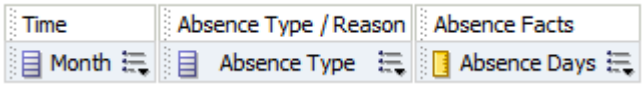
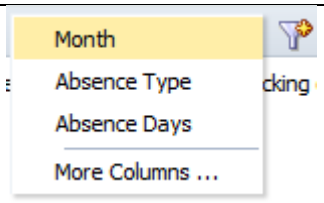
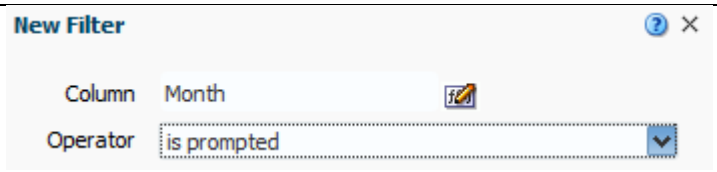
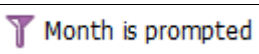
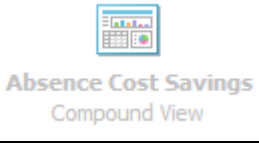
Once a prompt has been created and saved, it can be added to a dashboard to control available analyses within that dashboard. To add a prompt to a dashboard:

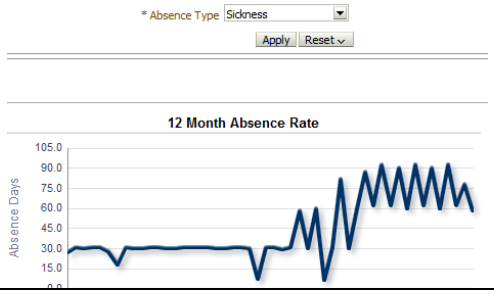
Step No.	Screen	Description
1		Click on the New drop down menu, select Dashboard. Save the new dashboard when prompted. *Note: If the dashboard is to appear under the Dashboard drop-down menu, it should be saved within the Shared Area.*

2		Add a new section to the Dashboard by dragging a 'Section' object from the Dashboard Objects window. *Note: A column will automatically be created, Sections sit within Columns in Dashboard design.*
3		Locate the saved prompt from the Catalog window and drag it into the new section.
4		The prompt will appear in the Dashboard Edit View. Save the Dashboard.
5		Click the Run icon and the dashboard will run and display the prompt

13.3. Enabling an Analysis to be affected by a Prompt

For any dashboard prompt to be effective, one or more analyses within the dashboard need to be setup to allow the prompt to filter the analysis according to the value(s) selected by the user. To setup an analysis to be filtered by a prompt:

Step No.	Screen	Description
1		Open the analysis in the criteria view and click on the icon to add a new filter.
2		Select the column that the prompt will control. *Note: This should be the same column that the prompt was created with to ensure the data matches and is filtered correctly.*
3		Setup the filter in the New Filter window and select an Operator of 'is prompted' from the drop down list.
4		Click Ok and the filter will appear in the filter window showing the column to be controlled by the prompt.
5		Open the Dashboard and drag a new section into the Edit View
6		Drag the analysis into the new section from the catalog window and save the dashboard

7		Click the Run icon and the dashboard will run and display the prompt and analysis. These will update depending on the data item selected within the prompt

14. EXPORTING

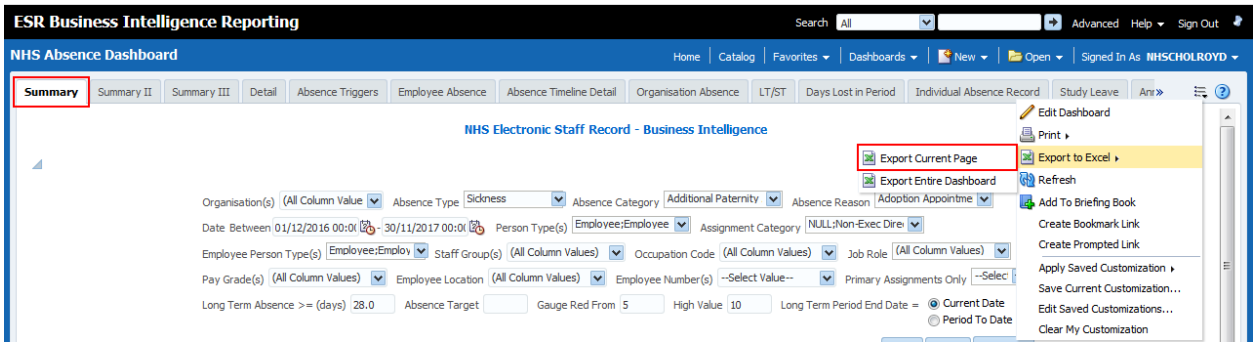
There are a number of different export options available within ESR Business Intelligence which allow users to export analyses or dashboards as required.

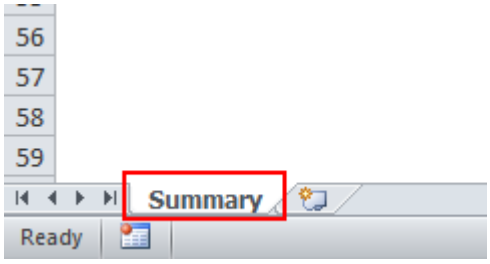
14.1. EXPORTING TO EXCEL

ESRBI allows users to export an entire dashboard or a single dashboard page to Microsoft Excel 2007+. When users export to Excel, the state of the dashboard (such as prompts or drill) is maintained however, some customisations and views may not be supported.

14.1.1. EXPORTING A SINGLE DASHBOARD PAGE

When users export a single dashboard page to Microsoft Excel, only that particular page is included in the Excel workbook. The page will automatically inherit the name of its corresponding dashboard page:

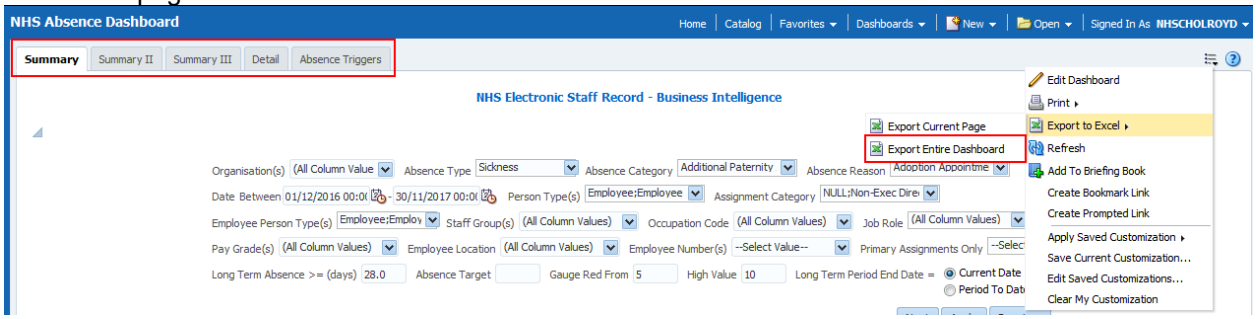


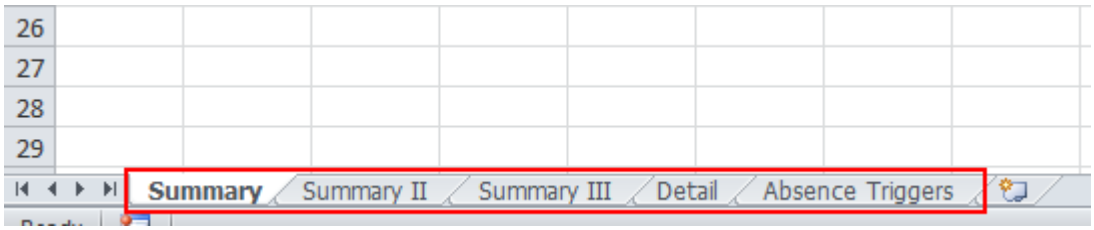


Navigation Path: Business Intelligence > Dashboard > Page Options > Export to Excel > Export Current Page

14.1.2. EXPORTING AN ENTIRE DASHBOARD

Users are able to export an entire dashboard to Excel 2007+. Where dashboards have more than one tab, the Excel workbook will contain multiple worksheets with each sheet given the name of its corresponding dashboard page:



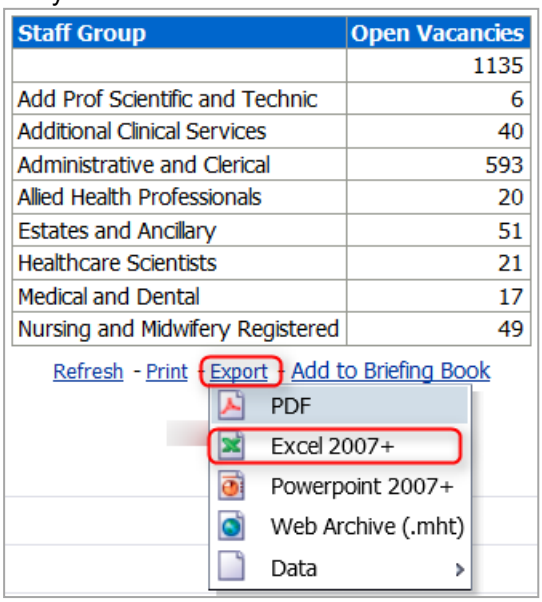


Navigation Path: Business Intelligence > Dashboard > Page Options > Export to Excel > Export Entire Dashboard

Please Note: *To ensure ESRBI remains performant, we would advise users to only export single dashboard pages rather than entire dashboards where possible.*

14.2. EXPORTING A SINGLE ANALYSIS

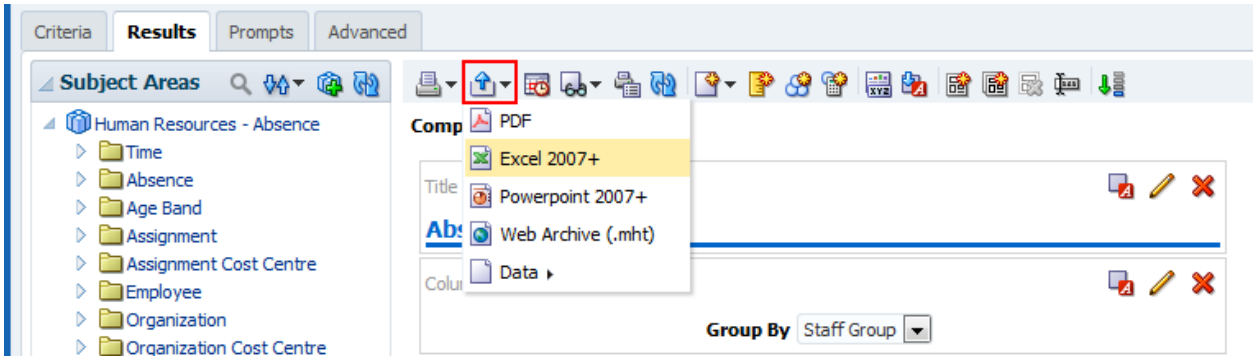
ESRBI enables users to export a single analysis using the Export dashboard report link available at the bottom of standard analyses. When users export a single analysis to Microsoft Excel, only that particular analysis is included in the Excel workbook:



Navigation Path: Business Intelligence > Dashboard > Report Links > Export > Excel 2007+

14.3. EXPORT ANALYSIS RESULTS

ESRBI allows users to export analysis results outside of the dashboard using the '*Export this Analysis*' option available within the Results page of the analysis. When users export results to Microsoft Excel, only that particular analysis is included in the Excel workbook:



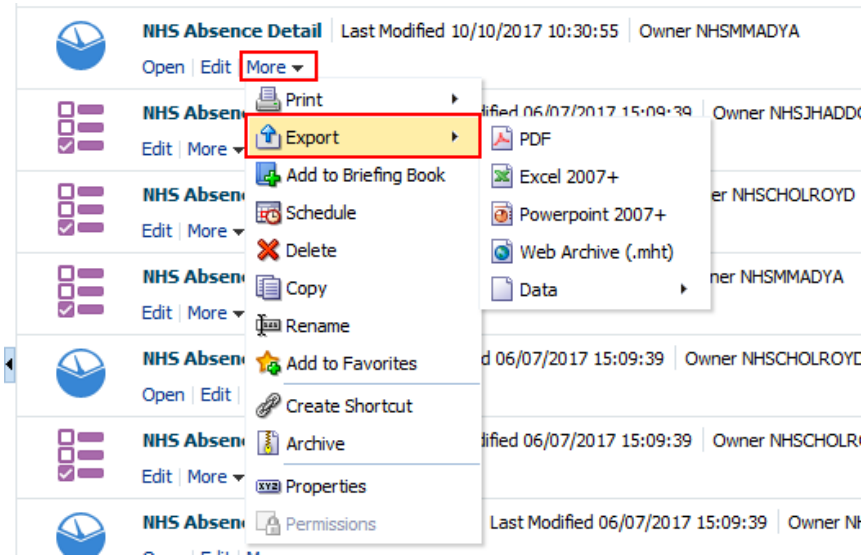
Navigation Path: Business Intelligence > New > Analysis > Results > Export this Analysis (Blue Arrow) > Excel 2007+

14.4. EXPORT FROM THE CATALOG

ESRBI enables users to export an entire dashboard or a single analysis to Microsoft Excel 2007+ directly from the Catalog:

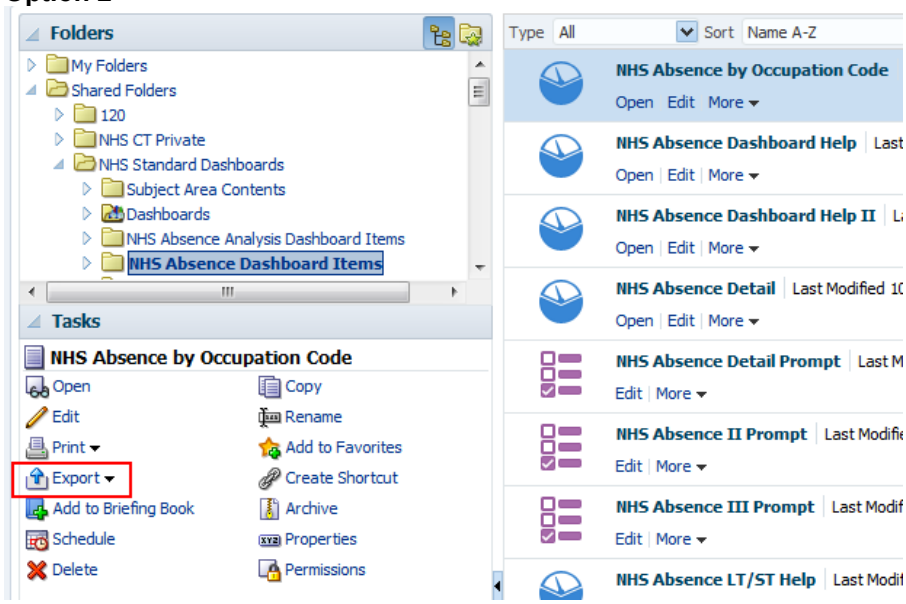
Single Analysis:

Option 1



Navigation Path: Business Intelligence > Catalog > Saved Analysis > More > Export > Excel 2007+

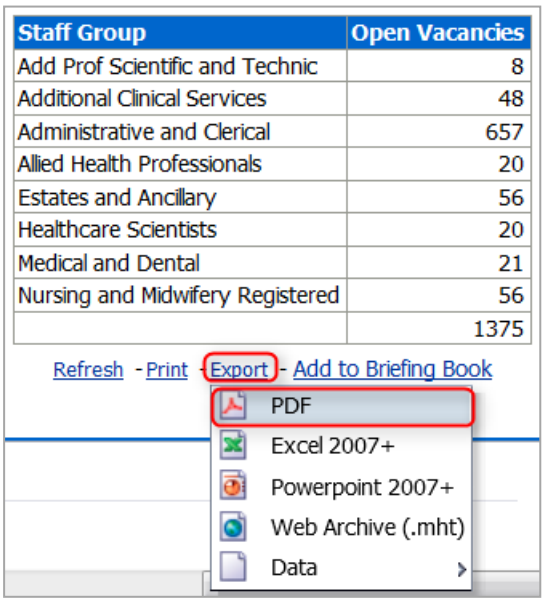
Option 2



Navigation Path: Business Intelligence > Catalog > Saved Analysis > Export > Excel 2007+

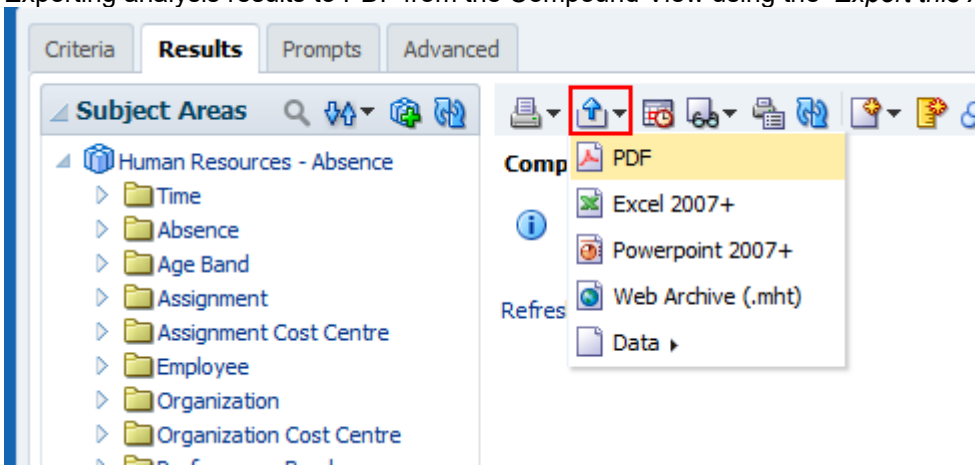
14.5. EXPORTING TO PDF AND CSV

ESRBI also enables users to export single analyses or full dashboard pages to other formats such as PDF and CSV.
Exporting a single analysis to PDF using dashboard report links:



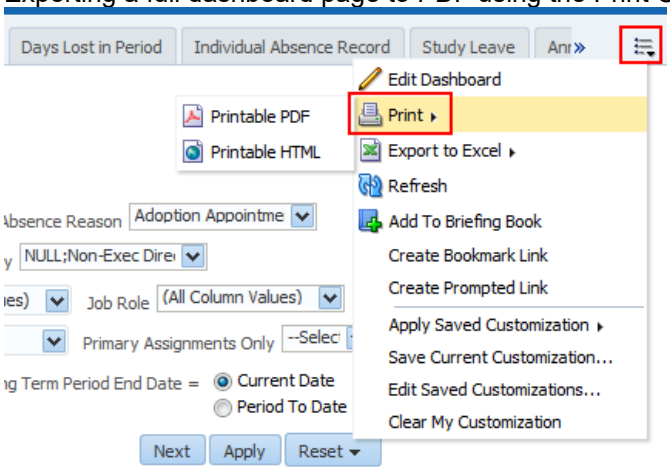
Navigation Path: Business Intelligence > Dashboard > Export > PDF

Exporting analysis results to PDF from the Compound View using the '*Export this Analysis*' option:



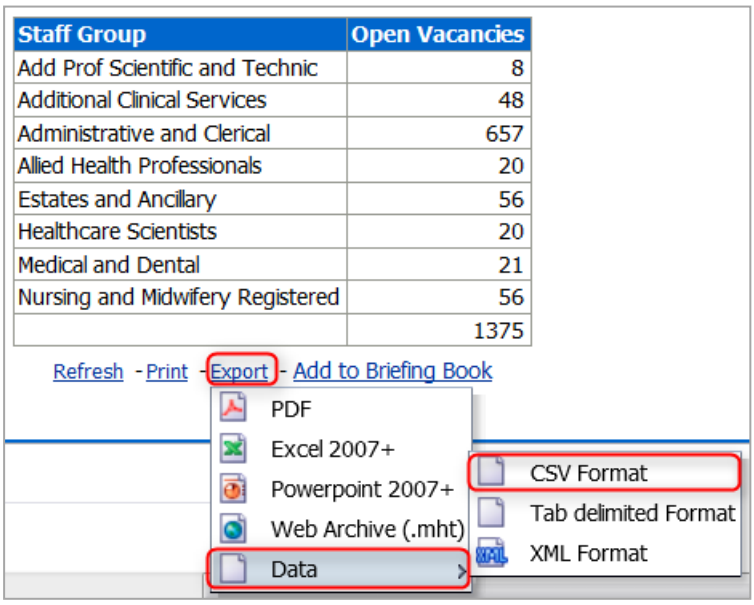
Navigation Path: Business Intelligence > New > Analysis > Results > Export this Analysis (Blue Arrow) > PDF

Exporting a full dashboard page to PDF using the Print Option:



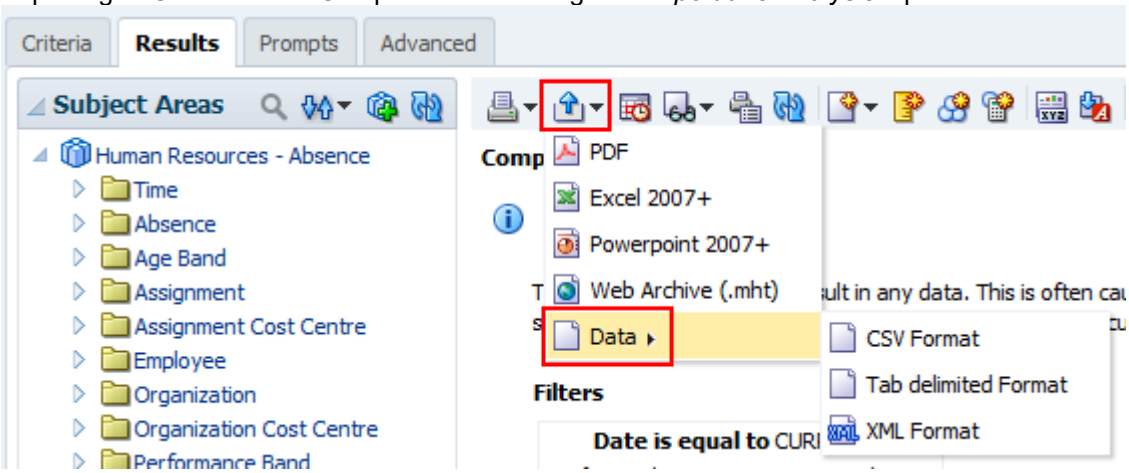
Navigation Path: Business Intelligence > Dashboard > Page Options > Print > Printable PDF

Exporting to CSV using dashboard report links:



Navigation Path: Business Intelligence > Dashboard > Export > Data > CSV Format

Exporting to CSV from the Compound View using the '*Export this Analysis*' option:



Navigation Path: Business Intelligence > New > Analysis > Results > Export this Analysis (Blue Arrow) > Data > CSV Format

15. PERMISSIONS AND ARCHIVING

15.1. SHARING OBJECTS TO OTHER USERS

Setting permissions on objects in ESR BI enables you to control which users with the correct URPs are able to use the dashboards and analyses that you create. This section shows how permissions can be set, the common issues when using permissions and other ways of sharing objects across organisations.

15.1.1. OBJECT STRUCTURE

Objects are structured into folders in ESR BI – similar to how files are stored on a computer. For example if an analysis was saved in a folder called 'HumanResources' within the 'MyFolder' folder in ESR BI, the object location would be:

'/MyFolder/HumanResources/'

If the HumanResources folder was moved into the VPD folder of the Shared Folder, the location might be:

'/Shared Folders/123/HumanResources/'

It is important that BI Administrators understand the object structure in ESR BI as the structure is used when adding objects to a dashboard and when setting permissions.

Example

For example; we have developed a new analysis called ‘NHS Absence Rate’ which is currently saved in the below location:

‘/My Folder/Absence Items/NHS Absence Rate’

Create a dashboard called ‘NHS Absence Dashboard’ which is at the below location:

‘/Shared Folders/123/Dashboards/NHS Absence Dashboard’

Edit the dashboard and add the analysis to it. When we run the dashboard we see the analysis as expected, however we will experience two major problems with this when we come to share the dashboard with other users.

Issues

1) The dashboard uses the location of the ‘Absence Rate’ analysis to display it in the dashboard. Although this will work for us, when we share the dashboard another user will not have the analysis stored in their folder (the ‘My Folder’ is unique to each user). Therefore we need to move the analysis into the ‘shared folders’ so that other users may see it.
2) Let’s say that we’ve now moved the analysis to the below location:

   ‘/Shared Folders/123/Absence Items/NHS Absence Rate’

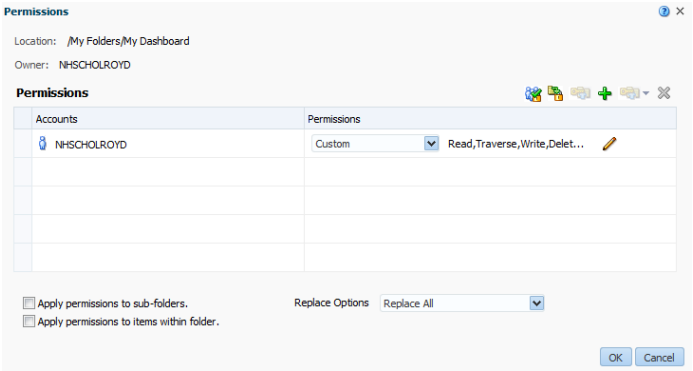
   When we run the dashboard we just see a blank page. Why? The dashboard is still referencing the old location. We must therefore edit the dashboard again, remove the existing analysis and replace it with the one at the new location. When we share the dashboard with other users, they will be able to see it correctly as they have access to both objects.

15.2. PERMISSIONS

By default there are a number of permissions automatically set on certain areas of BI. These include:

1. ‘My Folder’ – This folder is unique to each user and items within your folder can only be seen by you. You cannot change the permissions on this folder.
2. ‘Shared Folders’ – Inside the ‘Shared Folders’, there are two folders:
   a. National Dashboards – This contains all the objects for national dashboards and is maintained by the NHS Central Team.
   b. VPD (e.g. 123). Each organisation has a folder with their own VPD. Items placed in this folder will be automatically shared with all users within the organisation.

Permissions are set using the Permissions menu item in ESR BI:



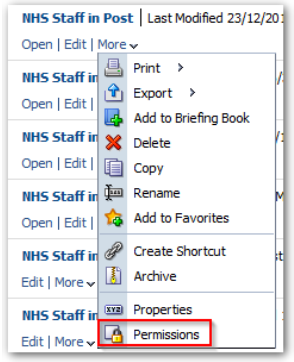
In ESR BI permissions are set using ‘Application Roles’ or ‘Users’. These roughly translate to either URPs in ESR or Usernames – the difference between the application roles and ESR URPs is that the roles will have the ‘BI’ prefix, usernames will display as per ESR.

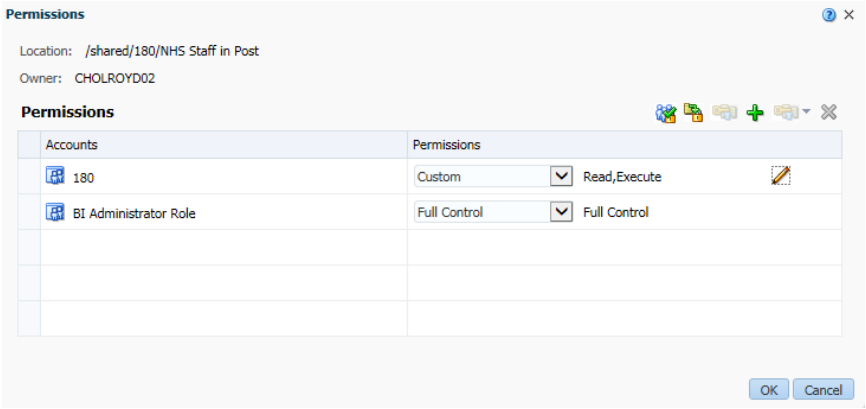
When setting permissions on objects in ESR BI the permissions are added with an ‘OR’ operator. In the example, the Staff in Post analysis can be accessed by anyone with the Trust Power User (e.g. 123 BI TRUST POWER USER) **or** HR Admin application roles (this translates to BI Administration URP or HR Administration URP).

Users should note that some objects may include a previous application role called 'BI Trust Power User' (without the VPD prefix). For local permission setting, users are only able to use the role prefixed with their VPD.

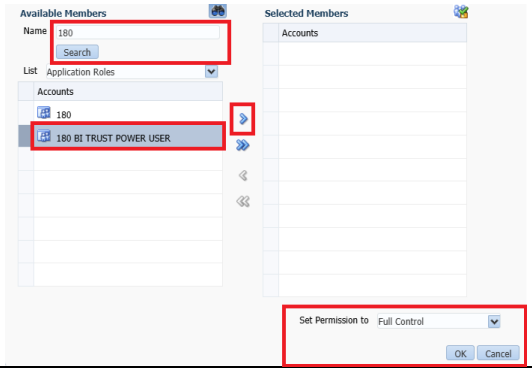
15.2.1. SHARING AN OBJECT TO A SPECIFIC URP WITHIN THE ORGANISATION

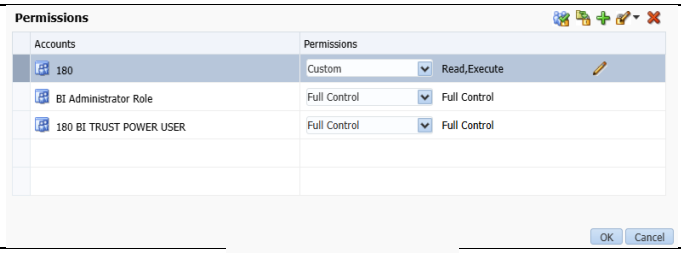
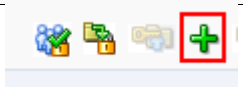
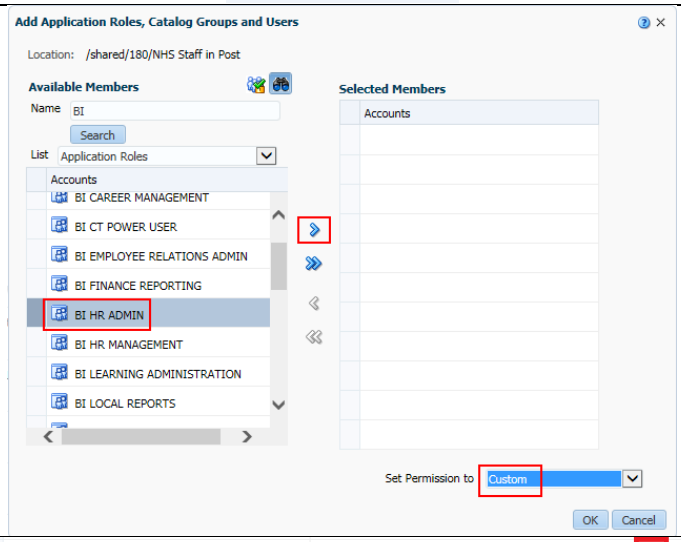
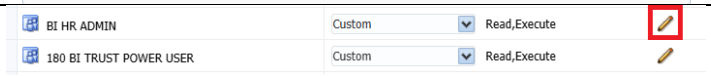
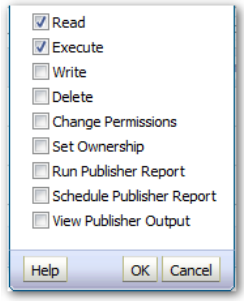
In this example we have created an analysis which we have copied to our VPD (180 in this example) shared folder:

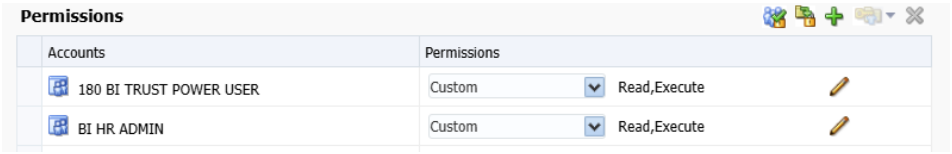




We can see the default permissions are set to Read and Execute for VPD 180. This means all users in our VPD can see the analysis. We want to restrict the analysis so that only users of the HR Administration URP can see it. To do this we need to firstly ensure that the BI TRUST POWER USER permission is granted (this gives all other BI Administrators in the organisation access including ourselves). Then we remove the VPD role and add the roles we want to restrict to. This is described step-by-step below:

Step No.	Screen	Description
1		On the permissions screen, click the 'Add' icon
2		Search for the VPD and select the application role 'XXX BI TRUST POWER USER' then click the 'Move' icon. Ensure the 'Set Permission to' value is 'Full Control'. Click OK
3		You will now have application roles for the VPD and the Trust Power User.

		Click the VPD role then click the delete icon.
4		Click the Add icon
5		Search for BI. Scroll down to find the correct role (BI HR ADMIN in this example), then click 'Move'. Ensure the Set Permission to is 'Custom'
6		Your permissions are displayed. Edit the permissions for the URP access
7		Ensure permissions are set to 'Read' and 'Execute' only. Click OK Permissions are now set.



Permissions are now set as above. Only users with the BI Administration URP **OR** the HR Administration URP can access the analysis. If using the HR Administration URP, the user may only read or execute the analysis and not modify or delete it.
The important part of this process is to ensure you remove the VPD role and correctly set access for the TRUST POWER USER role. If you remove the VPD role and do not set the access for BI Administrators, you may lose access to your own object!

Important Notes:

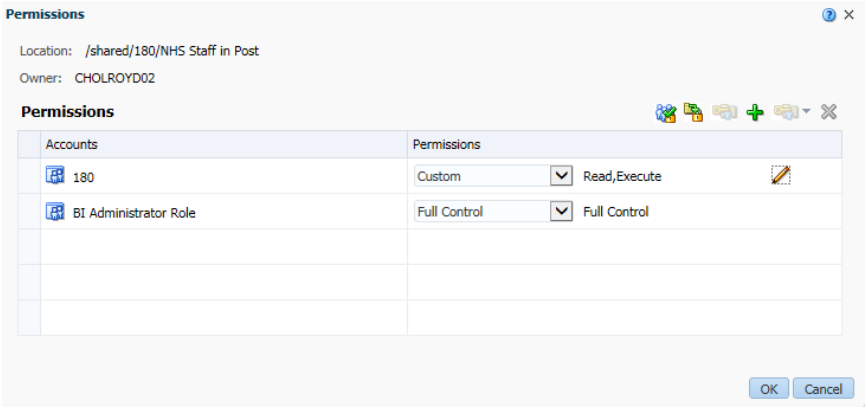
1) If you do not remove the VPD role from the permissions screen, all users in your organisation will have access to the object.
2) By default new objects in a folder will automatically inherit the permissions of that folder.
3) Only apply or change permissions to application roles that are in capital letters. Do not use or change permissions not in capitals as these are used for central administration.

4) When sharing a dashboard with application roles, you must ensure that the objects within the dashboard have appropriate permissions to enable the user to view/execute them. It is not enough to change the permissions on the dashboard only.
5) It is not possible to share a report publicly – archiving functionality can be used to share objects across different organisations (covered later in this document).

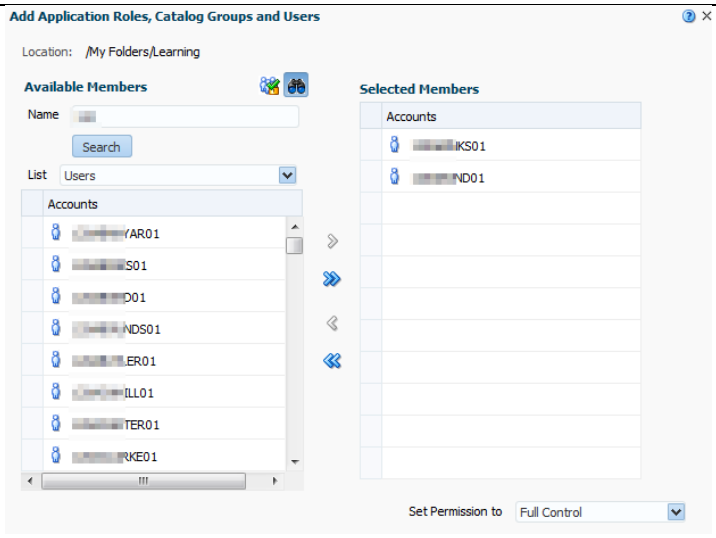
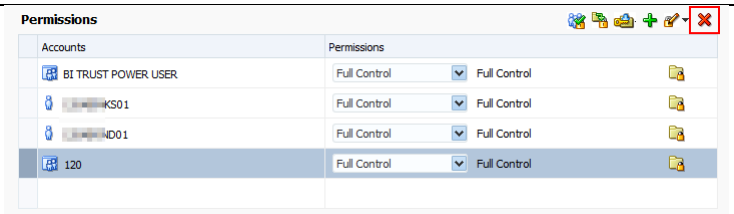
6) If you accidentally set incorrect permissions and lose access to your own object, please raise an SR stating the steps you took and the name and location of the object.

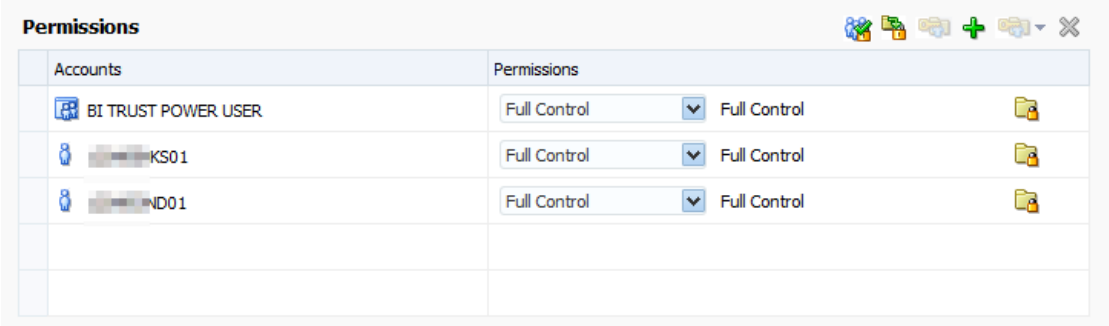
15.2.2. SHARING AN OBJECT TO A SPECIFIC USER WITHIN THE ORGANISATION

In this example we have created an analysis which we have copied to our VPD (180 in this example) shared folder:



We can see the default permissions are set to Read and Execute for VPD 180. This means all users in our VPD can see the analysis. We want to restrict the analysis so that only BI Admin users and two specific users can see it. To do this we need to firstly ensure that the BI TRUST POWER USER permission is granted (this gives all other BI Administrators in the organisation access including ourselves). We add the two specific usernames then we remove the VPD role. This is described step-by-step below:

Step No.	Screen	Description
1		On the permissions screen, click the 'Add' icon
2		Set the List drop-down to 'User' and enter the username of the person to be given access. *Note: If you want to search for all users in the organisation enter the VPD number. This may take some time to return results.* Ensure the 'Set Permission to' value is set as required. Click OK
3		You will now have application roles for the VPD, the Trust Power User and the individual Users Click the VPD role then click the delete icon.



Permissions are now set as above. Only users with the BI Administration URP **OR** the individual users assigned can access the analysis.

The important part of this process is to ensure you remove the VPD role and correctly set access for the TRUST POWER USER role. If you remove the VPD role and do not set the access for BI Administrators, you may lose access to your own object!

15.3. Sharing Objects to Other Organisations

15.3.1. Sharing objects to users in another VPD

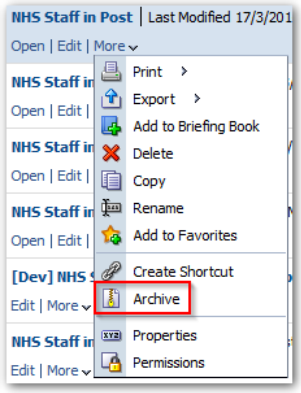
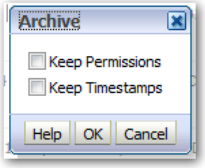
In ESR Discoverer reports can be shared to other organisations by making the report workbook 'Public'. This enabled other organisations to view your report and run it on their own data. Users could also make a copy of your public report and save a customised version.

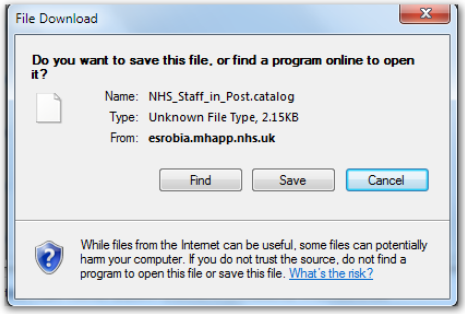
In ESR BI there is no public user, however objects can be shared to other users in other VPDs by using the 'Archive' functionality.

Archiving enables you to export an object or objects to a file format that is downloaded from ESR BI. This file can then be shared (e.g. by e-mail) and imported back in to ESR BI. For our requirement above we could send our report to another user in another VPD, have them import it back into ESR BI and run the report on their data.

15.3.2. Archiving an Object

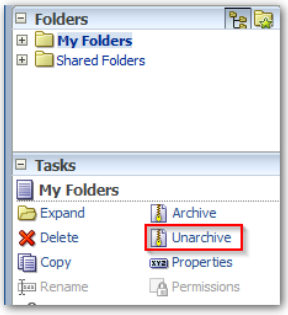
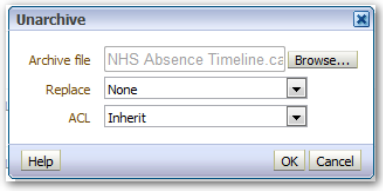
Archiving can be applied to an object or folder. We will archive an object in this example.

Step No.	Screen	Description
1		Click the 'More' link on the object you wish to share. Click the Archive button.
2		Click OK

3		You will now see the usual file download dialog box. Save the file in a memorable location.

15.3.3. IMPORTING A FILE BACK INTO ESR BI

The process of importing a file back into ESR BI is known as 'Unarchiving'. This functionality can only be used to import files that were originally created by ESR BI.

Step No.	Screen	Description
1		Click the folder you wish to import the file into. Click the 'Unarchive' button.
2		Click the browse button to find the file to import, then click OK.
3		Your file has been imported.

Important notes:

1) When archiving a dashboard, you will need to ensure that you also archive the objects referenced by the dashboard.
2) When another user imports a dashboard back into ESR BI, if other objects (such as analyses) are also imported, the user may need to re-link the objects into the dashboard as the dashboard will still reference their previous location (see object structure at the start of this document).

16. VARIABLES

Variables are 'pockets' of memory available within a dashboard. Specific values can be assigned to a variable for reuse across dashboards and analyses.

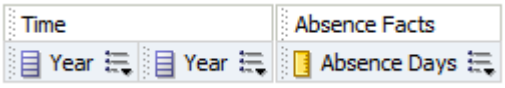
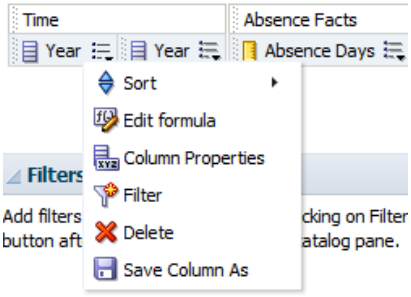
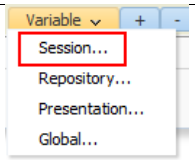
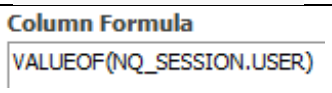
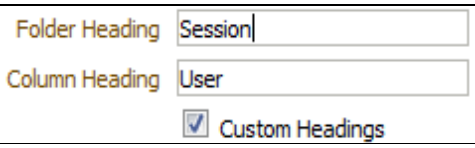
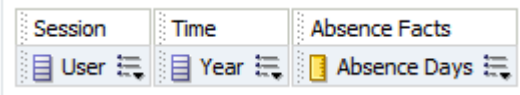
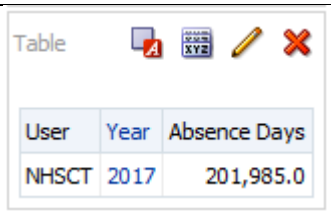
A user can reference variables in several areas of ESR BI, including in analyses, dashboards and filters. For example, a reference variable can be used to include a user's name in the title of an analysis.

There are three types of variables that can be used: Session, Repository and Presentation. This section will describe how to add each type of variable to a specific area of ESR BI, however the variables can be added to each area as required.

16.1. SESSION VARIABLES

A session variable is a variable that is initialised at the login time for each user. When a user begins a session, ESR BI creates a new instance of a session variable and initialises it. For example, the variable USER would return the logon name of the current ESR BI user. To add a session variable to an analysis:

Step	Screen	Description

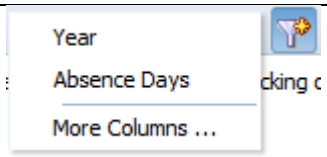
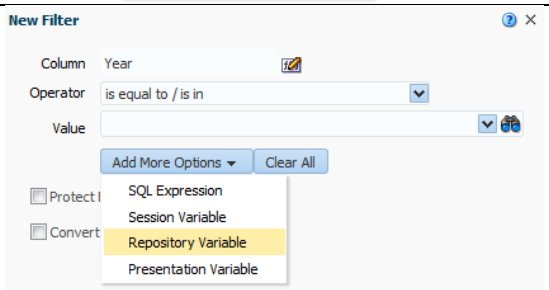
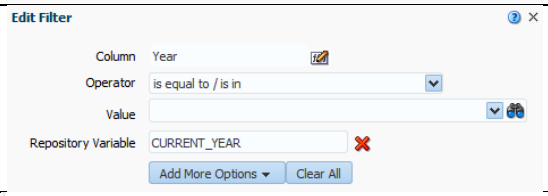
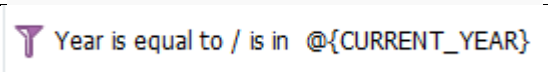
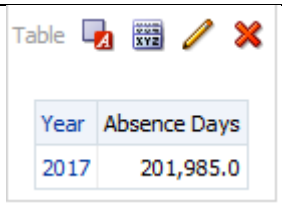
1		Select the required columns in the Criteria tab. Note two 'Year' columns are selected. One of these will become the User column.
2		Select Edit Formula from the column options
3		Click on the Variable drop down list from the Edit Column Formula window and select Session… *Note: a Repository or Presentation Variable can also be chosen (covered later in this document).*
4		Insert the Variable Name. In the example, USER has been entered
5		Click Ok and the formula of the column changes to reflect the variable name entered.
6		Tick the Custom Headings tick box and enter a Folder and Column Heading. In the example, the folder has been named 'Session' and the Column 'User'
7		Click Ok to return to the Criteria view and notice how the folder and column names have changed.
8		Go to the Results tab and the column 'User' will now appear in the compound layout showing the logon name of the user. Clearly in this example the 'User' column is not relevant, however the same formula could be used to add the value to the dashboard header which then shows who ran the dashboard following export / print.

Custom session variables can also be setup for use within custom measures. The NHS has setup a number of custom measures across the subject areas in ESRBI. For further information on custom session variables used within measures please see section *16.4 Request Variables.*

16.2. Repository Variables

A repository variable is a variable that has a single value at any point in time for example the variable CURRENT_YEAR is a repository variable that returns the current year value. To add a repository variable to a filter:

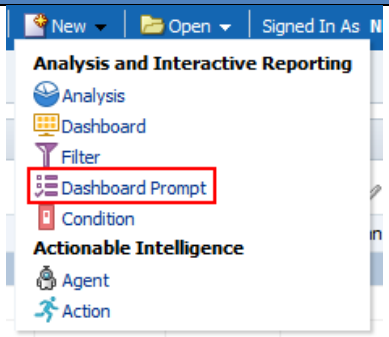
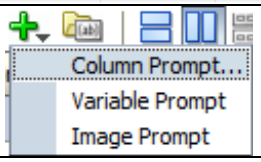
Step No.	Screen	Description

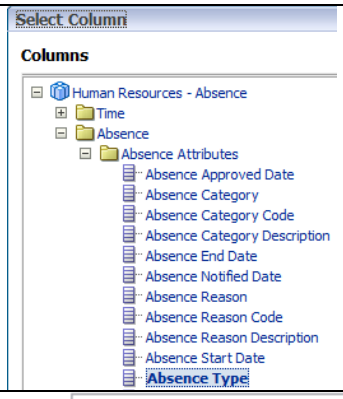
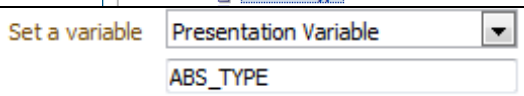
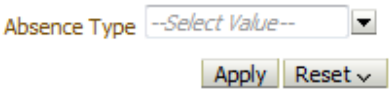
1		Click on the icon to add a new filter to an analysis and select the column to base the filter on.
2		In the New Filter window open the Add More Options drop down box and select Repository Variable. *Note: a Session Variable can also be selected (described earlier in this document) or a Presentation Variable, covered later.*
3		Enter the Variable as required. This example uses CURRENT_YEAR
4		Click Ok and the filter will appear in the filter pane showing the variable entered
5		Select the results tab to view the results filtered by the current year

16.3. PRESENTATION VARIABLES

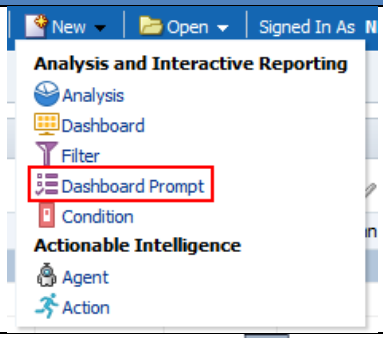
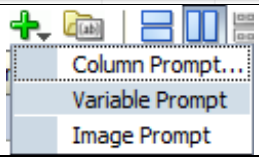
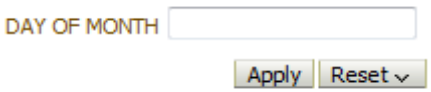
A presentation variable is a variable that can be created as part of the process of creating either a column or a variable prompt. The value of a presentation variable is populated by the column or variable prompt with which it is created. Each time a user selects a value in the column or variable prompt, the value of the presentation variable is set to the value that the user selects.

16.3.1. SETTING UP A PRESENTATION VARIABLE BASED ON COLUMN PROMPT

Step	Screen	Description
1		Click on the New drop down menu, select Dashboard Prompt and select the Subject Area to base the prompt on
2		Click on the icon and select Column Prompt from the drop down list to add a new prompt

3		Select the Column to base the prompt on. This example uses Absence Type
4		Setup the prompt as required then within the New Prompt window expand the Options menu and select Presentation Variable from the 'Set a Variable' drop down box. Give the new variable a name. In the example it has been named ABS_TYPE
5		Click Ok and the prompt will appear in the display window. The variable ABS_TYPE has now been defined as based on the Absence Type column prompt. Save the prompt

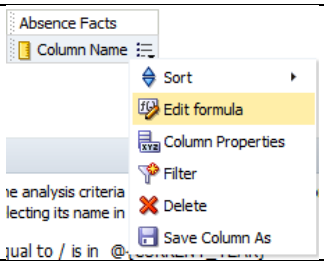
16.3.2. SETTING UP A PRESENTATION VARIABLE BASED ON VARIABLE PROMPT

Step	Screen	Description
1		Click on the New drop down menu, select Dashboard Prompt and select the Subject Area to base the prompt on
2		Click on the icon and select Variable Prompt from the drop down list to add a new prompt
3		Enter a name for the Presentation Variable and setup the Prompt as required.
4		Click Ok and the prompt will appear in the display window. The variable DAY has now been defined as based on the DAY OF MONTH (Prompt Label) variable prompt. Save the prompt

16.3.3. USING A PRESENTATION VARIABLE WITHIN A FORMULA

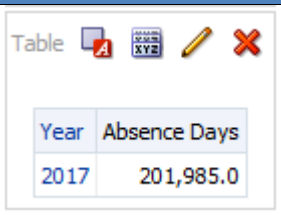
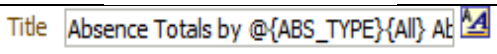
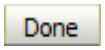
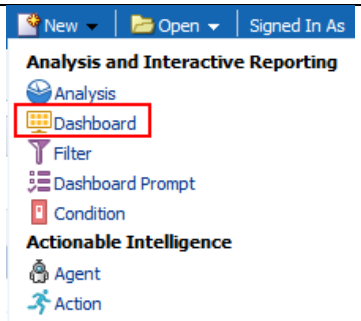
Once a Presentation Variable has been setup, it can be used within a formula so that when the analysis is run within the dashboard, the prompt can affect the formula within the analysis directly:

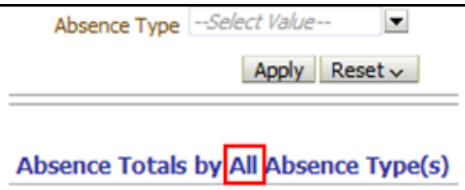
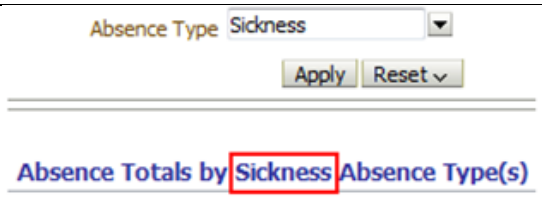
Step	Screen	Description

1		When setting up the analysis from the criteria tab, click 'Edit Formula' to navigate to the Edit Column Formula window
2	'@{VariableName}{Defaultvalue}'	When referencing a Presentation Variable in a formula, the following format is used where the first value in brackets is the variable name and the second is a default value.
3	CASE WHEN "Absence Type / Reason"."Absence Type" = '@{absType}{Sickness}' THEN 'Sickness Absence' ELSE NULL END	In this example, we have set a presentation variable titled *absType* and used it with the Absence Type data item. We have also set a default value of *Sickness*. When the Case statement is met, 'Sickness Absence' is returned else Null. When we run this example in the dashboard, *absType* will be replaced with a value from the prompt which will complete the Case Statement.

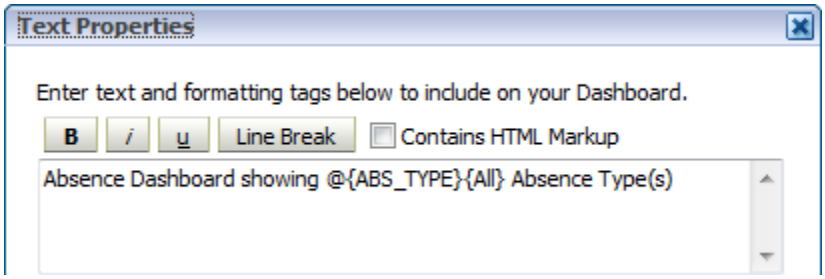
16.3.4. DISPLAYING A PRESENTATION VARIABLE

Once a Presentation Variable has been setup, it can be added to the title or text of an Analysis or Dashboard and will update the text in line with the value of the prompt. To add a Presentation Variable to the title or text of and analysis or dashboard:

Step	Screen	Description
1		Setup an analysis as required and view it in the results tab. Click on the icon of the Title View to open the Edit View
2		Enter the title and reference the Presentation variable by entering @{*Variable Name}{Default Value}*. In the example, 'Absence Totals by @{ABS_TYPE}{All} Absence Type(s)' has been entered where ABS_TYPE is the Presentation Variable name setup earlier
3		Check the preview pane below to see how the title will look in the compound view. Click  to return to the compound layout. *Note: The title will reflect the default value until placed into the dashboard and controlled by the prompt*
4		Create a new dashboard and add the prompt and analysis saved earlier

5		This shows that no value has been selected within the prompt and the analysis title shows the default value.
6		Select a value from the prompt and click 'Apply'. The analysis title updates in line with the prompt value selected.

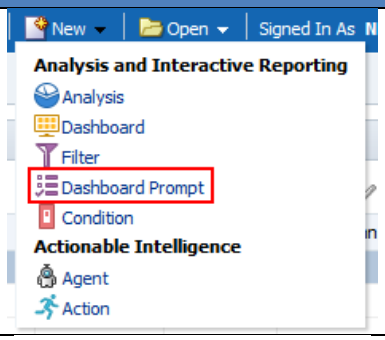
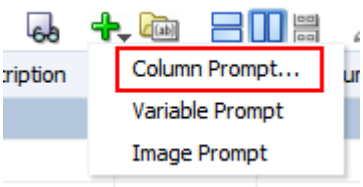
The same principles apply when adding text to a dashboard. In the example below a text box and relevant text has been added along with the Presentation Variable.

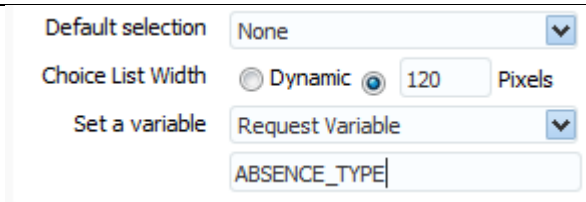
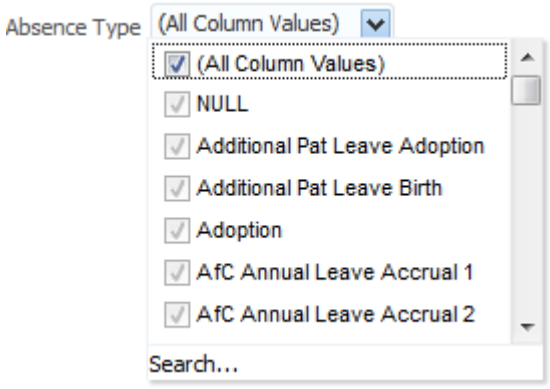


16.4. REQUEST VARIABLES

Request variables enable users to override the value of a session variable but only for the duration of a database request. They are initiated from a column prompt or a variable prompt. Request variables are useful where a custom session variable has been setup for use within a custom measure. The NHS uses a number of custom measures created for NHS business needs. In some cases a variable with a built in default value has been used within the measure so that it works 'off the shelf' but can also be customised by users where required. An example of this is the Absence FTE % measure available in the absence subject area. Where users include this measure in an analysis, by default it is restricted to *Sickness* absence (Absence Type = 'Sickness'). If a variable prompt is setup to define a request variable for the variable name ABSENCE_TYPE, the *Sickness* default value can be overwritten.

16.4.1. DEFINING A REQUEST VARIABLE USING A DASHBOARD PROMPT

Step	Screen	Description
1		Click on the New drop down menu, select Dashboard Prompt and select the Subject Area to base the prompt on
2		Click on the icon and select Column Prompt from the drop down list to add a new prompt. *Note: Request Variables can also be defined using a Variable Prompt.*

3		Select Request Variable from the Set a variable list and enter the variable name. In this example we are setting a value for the variable ABSENCE_TYPE.
4		Click Ok and the prompt will appear in the display window. The session variable ABSENCE_TYPE used within the Absence FTE % measure will now be updated depending on the value selected in the prompt. Save the prompt .

A list of the most common session variables used within NHS measures in ESRBI is below. Users should set a Request Variable to change the default value of any of the below session variables.

Variable Name	Measure	Subject Area	Description	Default
ABSENCE_TYPE	Absence FTE %	Absence	Defines the Absence Type	Sickness
LONG_TERM_ABSENCE_DAYS	Long Term Absence FTE	Absence	Defines Long Term in Absence Days (Greater Than or Equal To)	28
SHORT_TERM_ABSENCE_DAYS	Short Term Absence FTE	Absence	Defines Short Term in Absence Days (Is Less Than)	28
AB_EFFECTIVE_DATE	Long Term Absence FTE Short Term Absence FTE	Absence	Defines the end date of open ended absences	Current Date
REV_DATE_FROM	Appraisals in Date Appraisal in Date %	Workforce	Defines the from date for the appraisal period	Current Date minus 12 months.
REV_DATE_TO	Appraisals in Date Appraisal in Date %	Workforce	Defines the to date for the appraisal period	Current Date
REVIEW_TYPE	Appraisals in Date Appraisal in Date %	Workforce	Defines the Appraisal Type	Review
EFF_DATE	Appraisals in Date Appraisal in Date %	Workforce	Defines the appraisal effective	Current Date

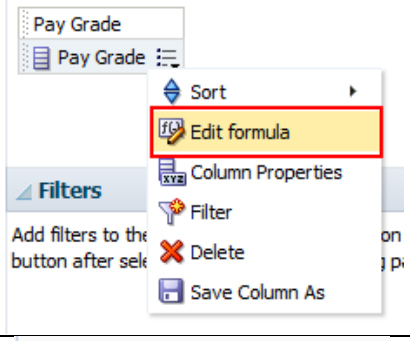
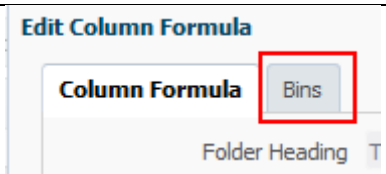
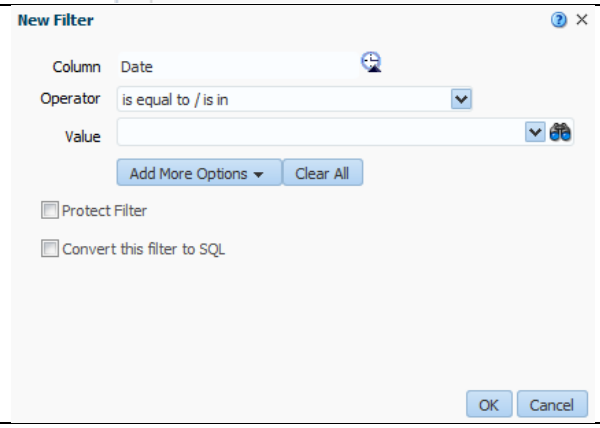
			date i.e. only count appraisal date less than or equal to EFF_DATE	
NHS_AVG_VAC_CAL_DT	Vacancy Open Time (Days)	Recruitment	Defines the Vacancy Closed Date where it is NULL or in the future.	Current Date

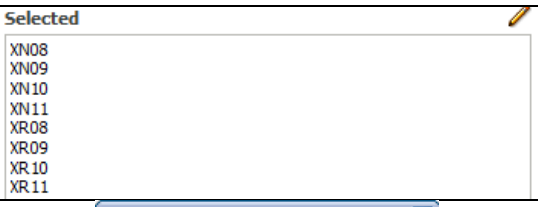
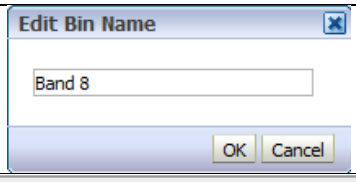
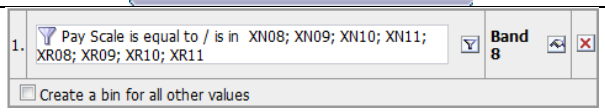
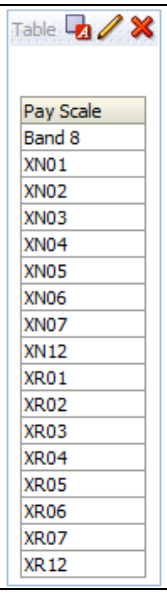
17. BINS

The Bins functionality can be found as a tab within the "Edit Column Formula dialog" and enables users to perform "binning", where users can combine values for the column into sets. You can combine multiple values or ranges of values from a given column into bins. When you add and name the bins, all instances of the various values that comprise the bin are replaced by the bin name. Aggregations are performed accordingly.

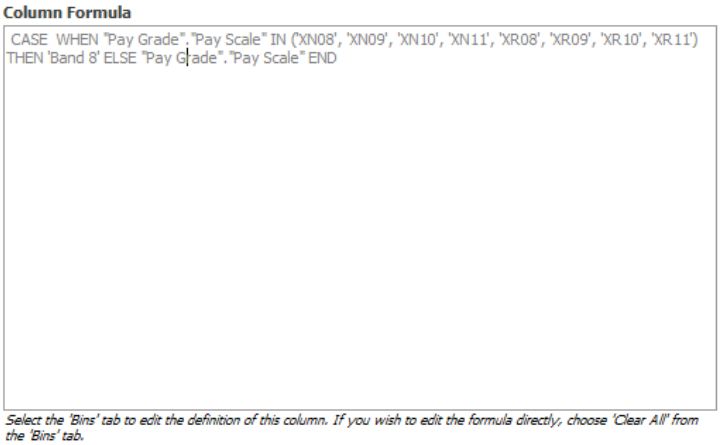
17.1. SETTING UP A BIN

To add a column selector view the compound layout of an analysis:

Step	Screen	Description
1		Open the menu of the column you would like to group values for and select 'Edit Formula'
2		Select the Bins tab at the top of the window and click on Add Bin towards the lower left corner.
3		Within the New Filter window, click on the icon and select the values you would like to group together.

4		In this example we have selected the pay grades relevant to AfC Band 8a, Band 8b, Band 8c and Band 8d and we are going to group them all as 'Band 8'.
5		Give the Bin a name and click Ok.
6		You can see the Bin has been created and the values selected are shown. *Notice the option to 'Create a Bin for all other values'. This negates the need to select all other values from the Filter Window.*
7		When the analysis is run, you will see the Bin created as part of the column. Here you can see the Bin we created and named 'Band 8' within the Pay Grade column. *Notice the values selected for the Bin are not shown within the results, they are part of the Bin so are not shown additionally as well.*

Clicking back to the 'Edit Formula' window within the Criteria tab of the analysis will show you the formula created by using the Bins functionality. Below is the formula created when creating the Bin in the example above:



Notice the formula is greyed out by default. Users are not able to edit the formula in the standard way, in order to change it users can either click back into the Bins tab and edit the Bins setup or, to enter a custom formula, select 'Clear All' from the Bins tab. A message prompts you to decide whether to keep the CASE statement in the formula on the Formula tab:

- If Yes is selected, all Bins are cleared from the Bins tab and the formula with the CASE statement is available for you to edit on the Formula tab.

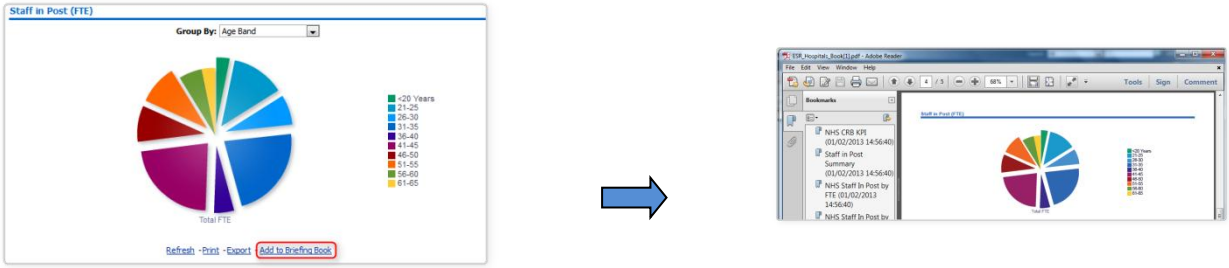
- If No is selected, all Bins are cleared and the formula on the Formula tab returns to its default value.

17.2. EXAMPLE USES:

Along with grouping Pay Bands as we have in the example above, other uses for the Bins functionality could be to group organisations into ad-hoc groups where total figures may be required across a number of organisations or grouping organisations/positions into clinical or non-clinical groups.

18. BRIEFING BOOKS

Briefing Books are used to store and capture a series of static images of analyses allowing the information to be viewed offline and shareable with others.



18.1. HOW DOES IT WORK?

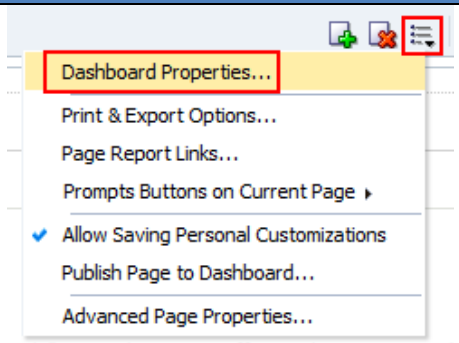
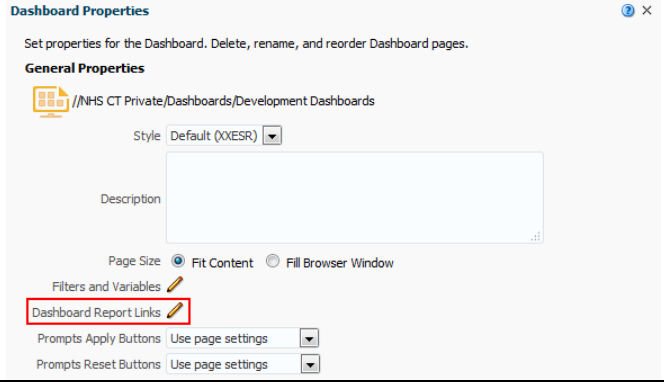
Beneath each analysis an 'Add to Briefing Book' link can be added. If this is enabled, when users clicks on it the analysis will be added to a briefing book of the user's choice. Note: All analyses on National Dashboards will have this link enabled.

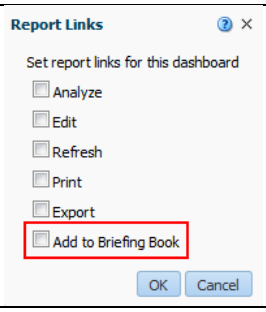
Once the link has been clicked users have the choice of whether the information within the analysis inside the briefing book should be a snapshot of the data as it was displayed when they clicked the link; or whether it should be updated each time the briefing book is produced.

As well as having a link at the bottom of each analysis, users is able add an entire dashboard page to a briefing book if required.

18.2. HOW DO I ENABLE THE BRIEFING BOOK FUNCTIONALITY ON OUR LOCAL ANALYSES?

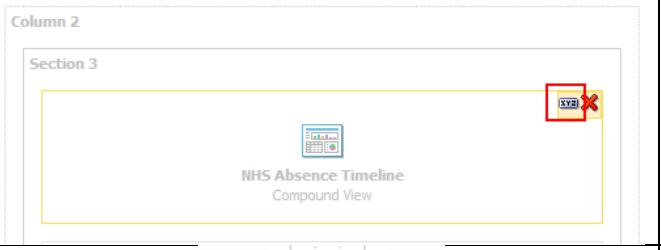
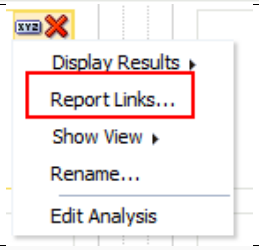
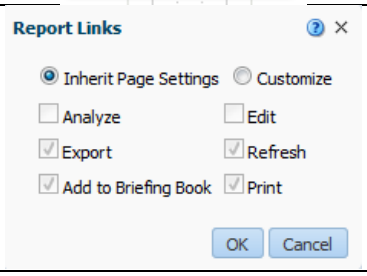
The easiest way to do this is by enabling the link in your dashboard:

Step	Screen	Description
1		Edit the dashboard. Open the Dashboard Options and select 'Dashboard Properties'.
2		Select the 'edit' icon next to Dashboard Report Links

3		Ensure 'Add to Briefing Book' is ticked

18.3. WHAT ABOUT IF I WANT TO ENABLE THE LINK ON SPECIFIC ANALYSES ONLY?

If you really need to you can disable any of the links displayed beneath an analysis:

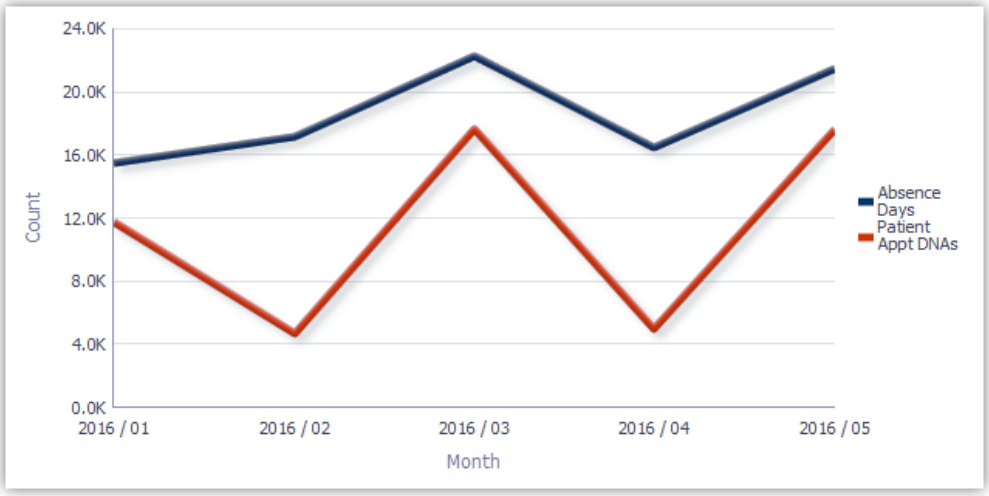
Step	Screen	Description
1		Hover your mouse over the analysis that you want to edit, then select the 'Analysis Options' icon.
2		Select the 'Report Links…' item
3		You may now change the setting to customise the links displayed to the user.

18.4. HOW LONG DO BRIEFING BOOKS REMAIN IN THE CATALOGUE?

Briefing books will remain in the catalog for 60 days (same as ESR concurrent request output), however the 60 days is calculated from the time the briefing book was last used, not created. For example if a briefing book is refreshed once a month then it would never be purged. Briefing books that are not being modified will be removed after 60 days.

19. EXTERNAL DATA

ESR BI provides the main reporting solution for ESR. It has the ability to report on hundreds of data items, each sourced from ESR to give the NHS a fully flexible and efficient reporting suite. In addition to this, ESR BI has the ability to report on non-ESR data alongside ESR data, to allow organisations to combine their data and pinpoint issues and efficiencies across the service.



The above example shows the absence rate compared with external data – in this example the number of appointments where patients did not attend.

In order to report on this non-ESR data, organisations must first 'load' this data via an interface into ESR BI. From there the data can be combined with regular ESR data (such as workforce or absence).

19.1. How can data be imported?

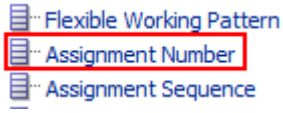
A standard template has been developed and is provided as a guide within this section of the document, which will allow organisations to load aggregated (i.e. summarised) data against one of three different 'objects' in ESR:

1. Assignment
2. Position
3. Organisation

Users should obtain the unique identifiers (i.e. Assignment Number, Position Number or Organisation Number) for any object they wish to load data against, and populate a file with the relevant information within the format defined in this document (the example file is provided later in this document).

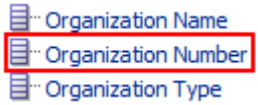
Note: These identifiers can be obtained by running a report from ESR BI or from ESR Discoverer.

Assignment Number:



Position Number:

Organisation Number:



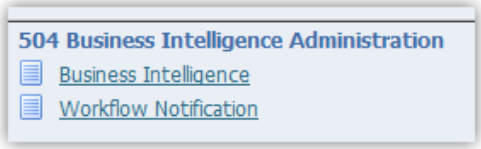
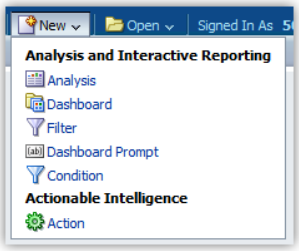
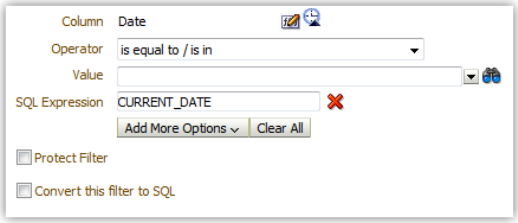
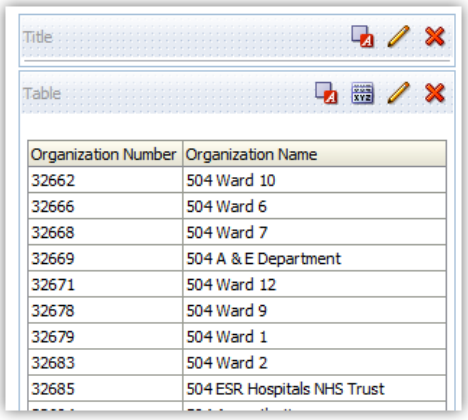
The template allows users to load 10 columns of numeric data, and 10 columns of text data against each object for a specific date. An example set of data is provided below:

Key Type	Key Value	Record Type	Date	Delete Flag	Decimal1	Decimal2
ORG	123456	FIN	20160131		12309.23	23
ORG	123456	FIN	20160228		12093.48	24
ASG	475849	PAT	20160131		93	2
ASG	475849	PAT	20160228		80	5

Figure 1 - Example External Data Template

19.2. Obtaining Object IDs

As specified above, aggregated data can be loaded against Positions, Organisations or Assignments. To identify each of these objects uniquely, their number or ID is required. The easiest way to obtain these is from ESR BI itself by following the steps below:

Step	Screenshot	Description
1		Login to ESR BI with the Business Intelligence Administration URP
2		Create a new analysis based on the Human Resource – Workforce Profile Subject Area
3		Add a filter to your analysis to return data as at today's date (or any date you choose)
4		Add the items you need. You can find Organisation Number in the 'Organization' folder, Assignment Number in the 'Assignment' folder and 'Position Number' in the Position folder within the employee folder.

19.3. Data Import Template

The template to load data into ESR BI has been made as generic as possible; this provides flexibility to load data to use in different ways in ESR BI with the drawback that specific column names are not available to correctly identify the data in each column (e.g. Decimal1 in the above example).

Note: Where all 10 Decimal fields are not in use, the columns must be left blank in the file and text entered from column P onwards. If in doubt, please see the example excel file embedded within this guide (section 3.6.4).

The template is designed as below:

Data Item	Data Format	Comments
Key Type	X(3)*	String – Identifier for key i.e. Org for Organisation Number
Key Value	X(15)*	Numeric ID - Organisation, Position or Assignment Number
Record Type	X(3)*	String – A three letter code i.e. FIN for Finance data
Date	F(10)*	Date – The date by which the entry will be reported YYYYMMDD
Delete Flag	X(1)	Set to Y to delete a previously loaded record Can be null.
Decimal 1	N(10,2)	
Decimal 2	N(10,2)	
Decimal 3	N(10,2)	
Decimal 4	N(10,2)	
Decimal 5	N(10,2)	
Decimal 6	N(10,2)	
Decimal 7	N(10,2)	
Decimal 8	N(10,2)	
Decimal 9	N(10,2)	
Decimal 10	N(10,2)	
Text Attribute 1	X(100)	
Text Attribute 2	X(100)	
Text Attribute 3	X(100)	
Text Attribute 4	X(100)	
Text Attribute 5	X(100)	
Text Attribute 6	X(100)	
Text Attribute 7	X(100)	
Text Attribute 8	X(100)	
Text Attribute 9	X(100)	
Text Attribute 10	X(100)	

The key fields are described below:

- Key Type – This should be populated with the letters ORG, ASG or POS depending on which object data is being loaded against. For example data being loaded against an organisation would be populated with ORG. This field is mandatory and if not completed, the record will be rejected.
- Key Value – This is the unique ID for the object referenced in the Key Type field. For example if key type is set to ORG, then the Key Value field should be populated with the Organisation Number. This field is mandatory and if not completed, the record will be rejected.
- Record Type – A field to help users categorise data in the template, and for eventual reporting in ESR BI. This should be 3 letters only. For example if you are loading finance data, you may choose FIN to categorise the data in that row.
- Date – The date for which this data should be loaded in the format YYYYMMDD. For example if we wanted to load monthly finance data against objects in ESR, we could choose the last date of each month to load the data against. For January 2017 this would be 20170131.

- Delete Flag – A field to be populated with 'Y' if this template is being loaded to delete records from ESR BI. Only the Key Type, Key Value, Record Type and Date fields need to be populated alongside the delete flag to delete the data.

Note: The unique identifiers in the template are Date, Key Identifier and Key Type. If you load a record with the same IDs twice, all values will be overwritten with new values. For example if the following record was loaded:

Key Type	Key Value	Record Type	Date	Delete Flag	Decimal1	Decimal2	Decimal3	Decimal4
ORG	123456	FIN	20160131		12309.23	23	24	11.2

Then the following week the below record was loaded

Key Type	Key Value	Record Type	Date	Delete Flag	Decimal1	Decimal2	Decimal3	Decimal4
ORG	123456	FIN	20160131		12309.23	23		

The second record is what would be returned in ESR BI (i.e. Decimal3 and Decimal4 would be blank) since the same three key values were used.

Note; Column headings should not be included within the file submitted, they are included here for illustration purposes only. If in doubt, please see the example excel file embedded within this guide (section 3.6.4).

19.4. Restrictions

The following rules should be followed to ensure the file will be processed by ESR BI in the interface:

1. Each file **should not exceed 30,000 rows**
2. Personally identifiable information should not be entered into the template (including patients, customers or staff). Data should be aggregated where possible.
3. Symbols should not be used (including @&*; etc). Where symbols are encountered, these will be replaced with an underscore ('_') when imported into ESR BI.

If the file does not meet the standards above, it will be rejected, following the process described in section 19.8.

19.5. Template Format

Once the template has been completed it needs to be output into CSV format with a very specific filename. For security and consistency reasons, the file must also contain a 'header' and 'trailer' which contain specific pieces of information to allow consistency to be checked before loading into ESR BI.

The header and trailer are simply additional 'rows' in the file in which additional information can be provided.

19.5.1. File Name

The files need to be named in a consistent manner so as to accommodate the identification of disparate source systems and to assist in the support of the interface. The format of the name is:

BI_vvv_xxx_yyyymmdd_uuuuuuuu.DAT

Letters	Description
BI	Main file/system type identifier (fixed)
vvv	Trust Identifier (VPD) e.g. 210
xxx	Secondary file type identifier e.g. PAS, FIN, GEN
yyyymmdd	**Date the file is created/submitted e.g. 20160721**
uuuuuuuu	An 8 char id used to ensure all filenames are unique. Unless otherwise advised this should be an incremental file sequence number, starting from 00000001. **Please note:** This sequence

	must be incremented for each load – use of the same number on the sequence will result in the file being rejected.

An example filename could be:
BI_210_PAS_20160927_00000001.DAT

19.5.2. FILE HEADER

The file must contain a header record with the following information:

Data Item	Data Format	Comments
Record Type	F(3) *	Type of record Fixed value of 'HDR'
File Name	X(40)*	The name of this file
Creation Stamp	F(15) *	File creation Timestamp. Format YYYYMMDD HH24MISS

* Mandatory field

19.5.3. FILE TRAILER

The file must contain a trailer record with the following information:

Data Item	Data Format	Comments
Record Type	X(3)*	Fixed value 'TRL'
Record Count	N(10)*	Number of records in the file including the header and trailer records.

* Mandatory field

19.5.4. EXAMPLE FILES

Example files are provided here for users to compare their information against. These files should not be transferred over the interface – they are examples only.

1) This file is in the correct format however it has not yet been renamed to the correct extension (.DAT). This enables the file to still be opened in Excel to review. Once the file is in this format, the file simply needs to be updated to include the correct extension and can then be loaded through the interface.

BI_123_XXX_201610
19_00000001.csv

2) This file is the same as the above CSV file, however it has been correctly renamed to the .DAT extension, and therefore no longer opens correctly in Excel.

BI_123_XXX_201610
19_00000001.DAT

19.6. INITIAL IMPLEMENTATION AND FILE TRANSFER

Once a file has been created and is ready to load, the file can be sent for loading to the NHS ESR Systems Integration Team via a dedicated secure FTP (sFTP) account.

The first step for an organisation wishing to implement an FTP connection to ESR is to log an SR with the ESR Supplier Support. Appropriate account (user & password), IP Address and other details will not be issued or acted upon without this. More details on setting up the FTP connection will be provided to users on the SR.

Once an SR has been logged, users will be asked to provide a designated contact to receive notifications from the hub regarding the processing of any submitted files.

Inbound files will be validated on the NHS Hub and will be rejected if any of the following apply:

- The file extension is not .DAT;
- The contents of the file are not identified as text in csv format;
- The row count figure in the file footer entry does not match the actual row count;
- The row count figure in the file footer entry exceeds 30,000;
- The file name is not in the correct format.

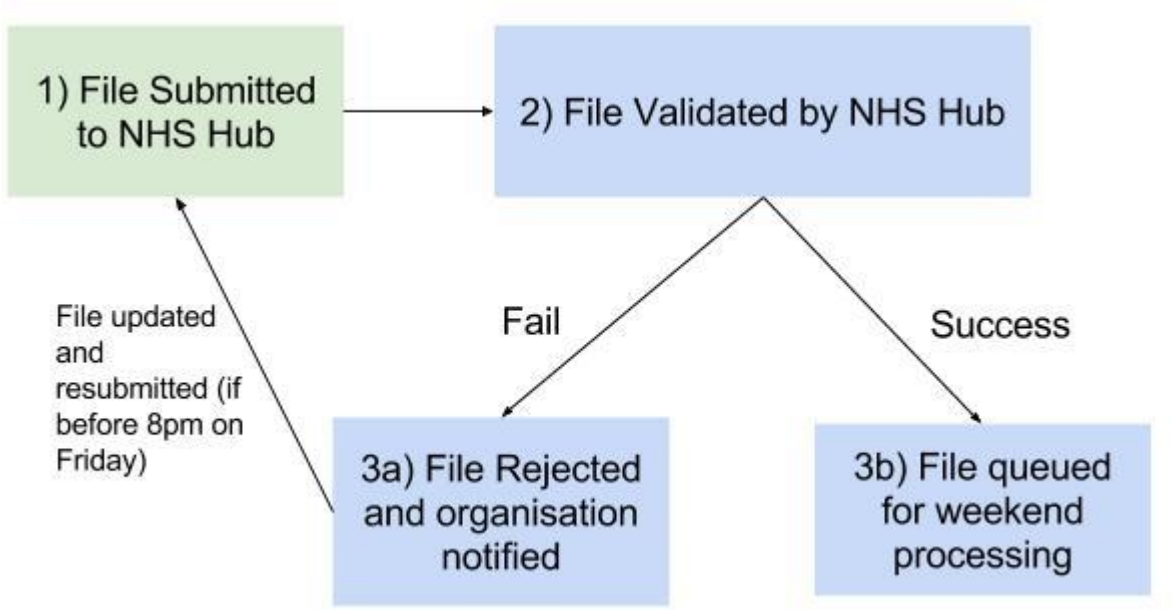
Once the file has been validated, it will be queued for processing into ESR BI for the weekend run. Organisations should make sure their files are submitted well in advance of CoB on Fridays to allow validation and re-submission of files if required.

19.7. TESTING

In instances where this is a new process for organisations, users may wish to 'test' the functionality before using it on a production scale. Organisations can do this by loading a small amount of data using the interface process and 'testing' the data once it has arrived in ESR BI. After 'testing' is complete, simply load the file through the interface again with the 'Delete' column populated to remove the data from ESR BI.

19.8. SUCCESS / FAILURE HANDLING

When files are submitted to the interface (Process 1 in the illustration below), the file will be validated (a short time after being submitted) by the NHS Hub (Process 2 in the illustration below) before being sent to ESR BI. Where a file has been rejected by the NHS Hub during the week (process 3a in the illustration below), the file can be corrected and re-submitted to be revalidated. The ESR BI interface runs once per week at the weekend – therefore we advise users to submit a file early in the week where possible to allow for any validation rejections and resubmissions before the BI interface weekend run. Any files submitted **after 8pm** on Friday will not be processed until the following week.



After the file has been submitted and successfully validated by the NHS Hub, the file will be transferred to the ESR supplier for processing into ESR BI (process 3b in the illustration above). If there is a problem with the file and the process fails to import the data into ESR BI, then an error will be communicated back to the NHS Integration Team who will in turn contact the designated contact for your organisation.

19.8.1. NHS HUB VALIDATION ERRORS

Where a validation error has occurred (on the NHS Hub) using validation rules in section 19.3 19.4 and 19.5, the following email will be sent to the relevant contact at the organisation (nomination of the contact is undertaken during implementation of this process, as described in section 19.7):

```
================================================================================
NHS Interface Hub External Data & BI Inbound Processing for 210

File BI_210_FIN_20170123_00000103.DAT has been processed on the NHS Interface
Hub at 2017/02/07 14:10:44
Target file BI_210_FIN_20170123_00000103.DAT generated
 Recs Read   : 1317
  Recs with Errors: 4 *** Error records have been dropped and will not be
forwarded to ESR ***
  Recs with Warnings: 17
  Recs Written: 1313
Validation file BI_210_FIN_20170123_00000103_V.DAT is available for collection
by VPD 210 using 'Secure FTP'.
This gives details of errors and warnings on a record by record basis.

The target file of 1313 records (including Header & Trailer) has been forwarded
to ESR for BI Load Processing.


Please do not reply to this e-mail address as it is not monitored

If you have received this e-mail in error please forward it to:
esr.interfaces@nhs.net
If you wish to change the email contact details, please log a Service Request
(SR) via the ESR Service Desk for the attention of the NHS Interface Team.
================================================================================
```

19.8.2. NHS HUB CONFIRMATION

Where validation has been successful, the relevant organisation contact will receive the following email to confirm the file has now been forward to the ESR supplier for processing into ESR BI:

```
================================================================================
NHS Interface Hub External Data & BI Inbound Processing for 210

File BI_210_PAS_20160927_00001234.DAT has been processed on the NHS Interface
Hub at 2016/10/31 11:36:06 Target file BI_210_PAS_20160927_00001234.DAT
generated
  Recs Read   : 659
  Recs Written: 659
BI_210_PAS_20160927_00001235_V.DAT is available for collection by VPD 210 using
secure FTP.
This gives details of errors and warnings on a record by record basis, if any.


Please do not reply to this e-mail address as it is not monitored

If you have received this e-mail in error please forward it to:
esr.interfaces@nhs.net If you wish to change the email contact details, please
log a Service Request (SR) via the ESR Service Desk for the attention of the
NHS Interface Team.
================================================================================
```

19.8.3. BI LOAD ERRORS

Where the file has passed validation and been sent to the ESR supplier for processing, but a subsequent error has occurred in loading the data into BI, the following email will be received by the organisation contact:

```
================================================================================
NHS Interface Hub External Data & BI Inbound Processing for 210
```

```
File BI_210_PAS_20160927_00001234.DAT has been processed and uploaded
SUCCESSFULLY into BI  at 2017/10/31 11:36:06.

File BI_210_PAS_20160927_00001234.DAT has been REJECTED in BI at 2017/10/30
11:56:06.

Please do not reply to this e-mail address as it is not monitored

If you have received this e-mail in error please forward it to:
esr.interfaces@nhs.net If you wish to change the email contact details, please
log a Service Request (SR) via the ESR Service Desk for the attention of the
NHS Interface Team.
================================================================================
```

19.8.4. BI LOAD SUCCESS

Where no error has occurred, users should expect to see their data in ESR BI following the weekend run. Where the file was not loaded due to validation problems, the organisation should update the files to resolve any validation issues and re-submit the updated file as required. **Important: The same name cannot be used for the updated file.**

19.8.5. CONFIRMATION FILES

A Text file will be made available to the organisations via FTP which provides them with details about the file transfer and details of where and what errors have occurred if applicable.

The naming convention of the file will follow that of the original inbound file
BI_210_PAS_20160927_00001235_V.DAT (where 'V' stands for Validation)
The format of the file will be as follows:

Validation File Header

Ref.	Data Item	Data Format	Comments
BV_HDR01	Record Type	F(3)+	Type of record Fixed value of 'HDR'
BV_HDR02	File Name	X(40)+	The name of this file
BV_HDR03	Creation Stamp	F(15)+	File creation Timestamp. Format YYYYMMDD HH24MISS
BV_HDR04	Inbound Filename	X(40)+	Corresponding inbound file name
BV_HDR05	Inbound Creation Stamp	F(15)	File creation Timestamp of corresponding inbound file. Format YYYYMMDD HH24MISS

Validation File record Outcome

Ref.	Data Item	Data Format	Comments
BV_REO01	Record Type	F(3)+	Type of record Fixed value of 'REO'. One REO to be produced for each inbound record (except HDR & TRL)
BV_REO02	Outcome Code	X(1)+	Outcome of the load process - 'S' (Successfully validated), 'W' (Validated but with Warnings, as per following recs), 'E' (Not validated due to Errors as per following recs)
BV_REO03 onwards	Inbound Record reflection	X(size of the inbound record)	Field by field reflection of Inbound Record

Validation File Warning Detail

Ref.	Data Item	Data Format	Comments
BV_WAR01	Record Type	F(3)+	Type of record Fixed value of 'WAR'. One record for each Warning Message for the preceding REO record.
BV_WAR02	Warning Message	X(150)	Warning message e.g. 'Field 7 contains invalid characters which have been replaced by underscore characters'

Validation File Error detail

Ref.	Data Item	Data Format	Comments
BV_ERR01	Record Type	F(3)+	Type of record Fixed value of 'ERR'. One record for each Error Message for the preceding REO record.
BV_ERR02	Error Message	X(150)	Error message e.g. 'Invalid Key of Type ORG, record rejected'

Validation File Trailer

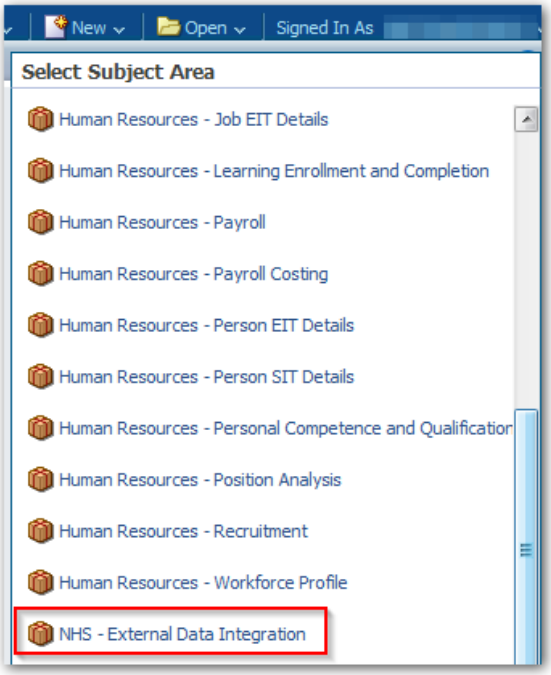
Ref.	Data Item	Data Format	Comments
BV_TRL01	Record Type	F(3)+	Type of record Fixed value of 'TRL'
BV_TRL02	Record Count	N(10)+	Number of Records in this file including HDR & TRL
BV_TRL03	Validation Record Count	N(10)+	Number of Records in corresponding inbound file excluding HDR & TRL
BV_TRL04	Validation Record Success Count	N(10)+	Number of Records in corresponding inbound file which have been validated fully successfully (number of REO,S records in this file)
BV_TRL05	Validation Record Warning Count	N(10)+	Number of Records in corresponding inbound file which have been validated with warnings (number of REO,W records in this file)
BV_TRL06	Validation Record Error Count	N(10)+	Number of Records in corresponding inbound file which have not been validated due to errors (number of REO,E records in this file)
BV_TRL07	Total Warning Count	N(10)+	Number of Warning messages (number of WAR records in this file)
BV_TRL08	Total Error Count	N(10)+	Number of Error messages (number of ERR records in this file)

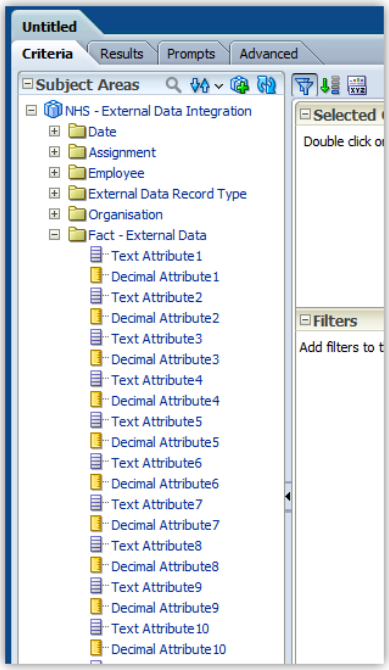
An example confirmation file is provided below:

HDR	BI_308_FII	20170302	BI_308_FII	20170223	120000
REO	E	ASG		FIN	20170223
ERR	Mandatory field [Key Value] is empty				
REO	S	POS	12345	FIN	20170223
REO	S	ORG	5645745	FIN	20170223
REO	S	ASG	456745	FIN	20170223
REO	S	POS	345	FIN	20170223
REO	S	ORG	6	FIN	20170223
REO	S	ASG	456	FIN	20170223
REO	S	POS	7546	FIN	20170223
REO	S	ORG	546	FIN	20170223
TRL	12	10	8	0	1

19.9. USING THE DATA IN ESR BI

A subject area is available within ESR BI which contains the external data loaded via the above process. The subject area also contains key pieces of data from ESR to include alongside the external data where required.





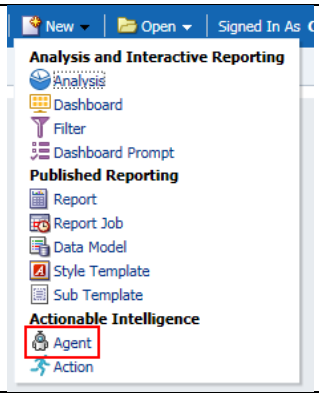
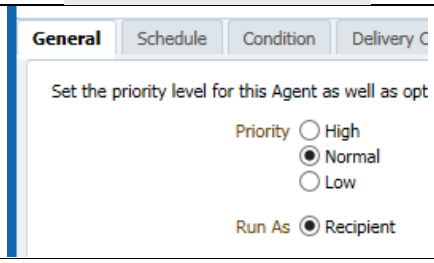
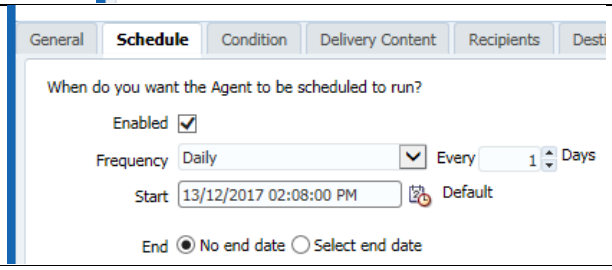
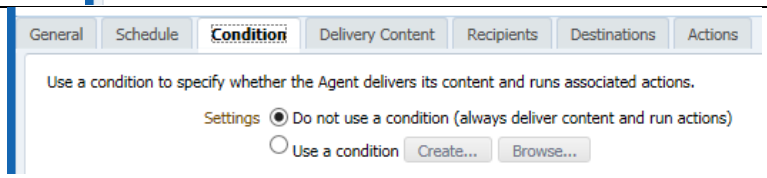
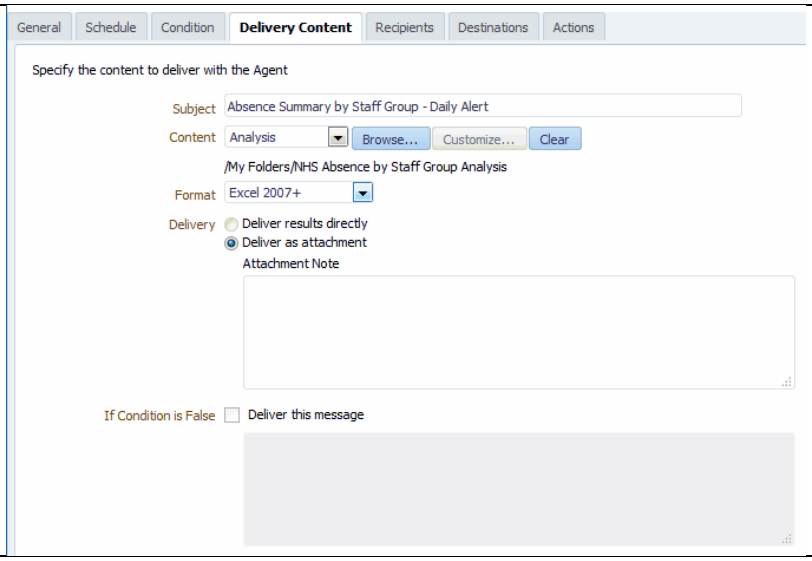
Since this solution is generic to allow all types of information to be used in ESR BI, it is not possible to 'join' the subject areas with any other subject areas. If other pieces of information are required to measure against the data imported via this solution, a 'Set Operation' or 'Union' type query should be used to return data from other subject areas in combination with the external data.

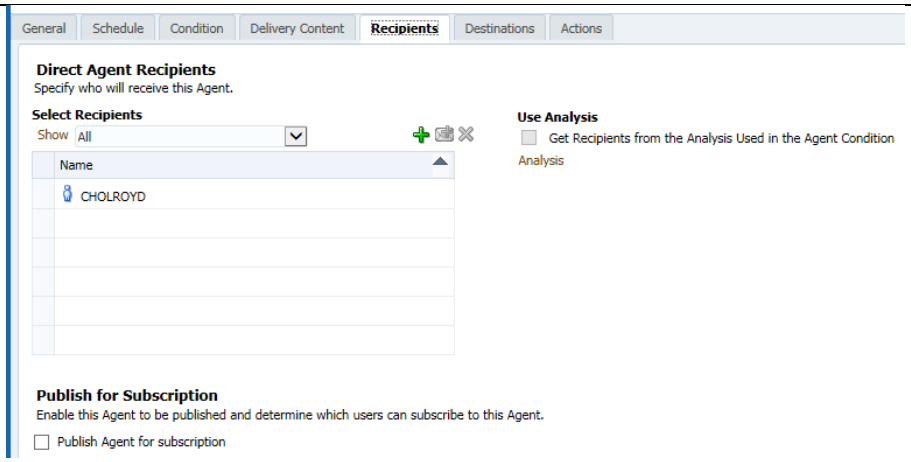
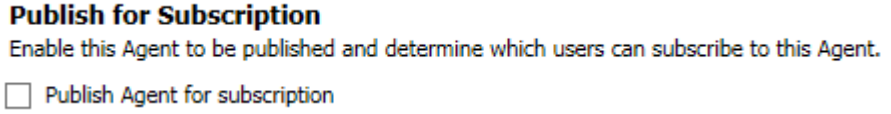
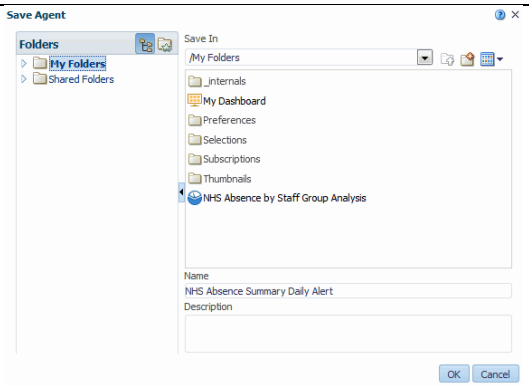
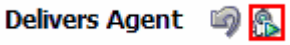
20. ALERTING

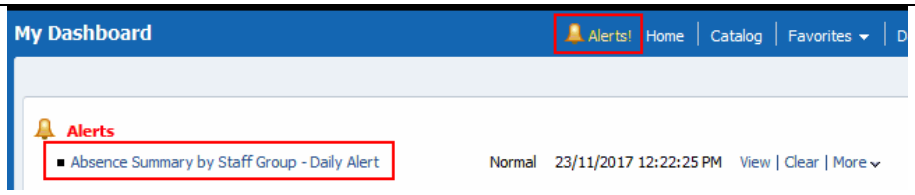
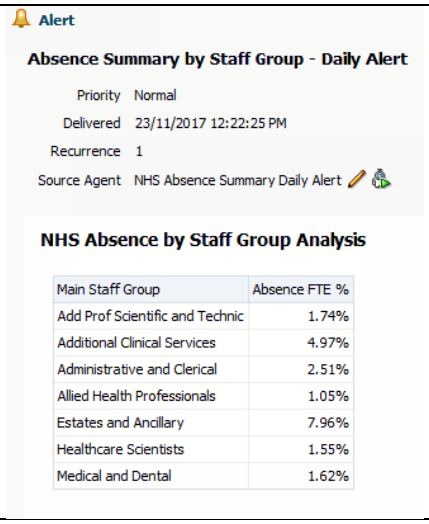
Alerting is functionality in ESRBI which enables users to schedule 'summary' reports for delivery directly to users via BI or email. Alerts can be run regularly (e.g. daily, monthly) and contain a condition to only run if a certain rule is met (e.g. absence rate is greater than 5%). Alerts can only be created by BI Administrator users, but can be run for any user with BI access (e.g. Managers). Alerting may only be used for summary type reporting. A limit of 75 rows is imposed on the result of any analysis run by an alert.

20.1. SETTING UP A BASIC ALERT

Step No.	Screen	Description
1	Title **NHS Absence by Staff Group Analysis** Table Main Staff Group / Absence FTE % Add Prof Scientific and Technic 7.95% Additional Clinical Services 3.76% Administrative and Clerical 2.17% Allied Health Professionals 5.03% Estates and Ancillary 9.13% Healthcare Scientists 1.02% Medical and Dental 1.60% Nursing and Midwifery Registered 5.61%	Setup a summary analysis which will be sent by the alert. Remember only the first 75 rows of any analysis will be delivered by an alert. Here we have setup Absence FTE % grouped by Staff Group.

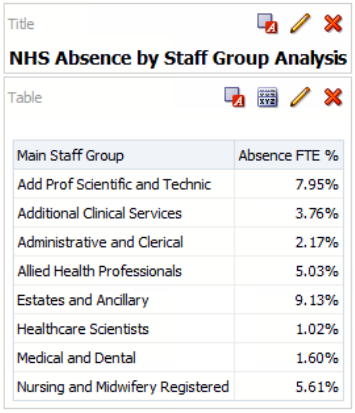
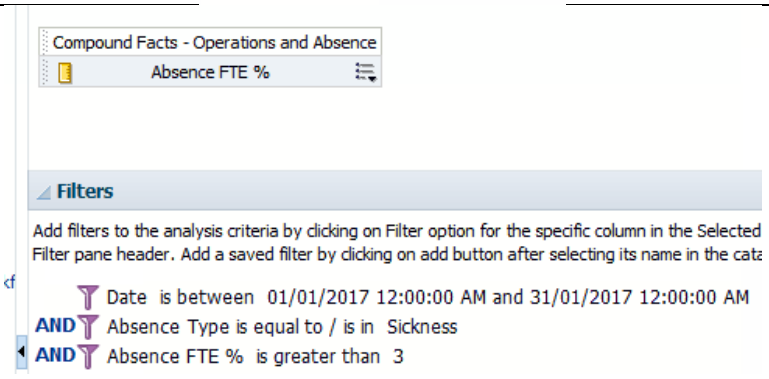
2		To setup the Alert, select 'Agent' from the New menu.
3		There is no need to change anything on the General tab.
4		The Schedule tab is used to establish when the agent is to run. Here we have selected 'Daily'.
5		The Condition tab can be used to determine whether an agent should run, for example only send an alert if another analysis returns data. This will be covered later in this section.
6		The Delivery Content tab defines how the alert should look. In this example we have given the alert a name, picked an analysis to include within the alert and selected a format by which to deliver the analysis.

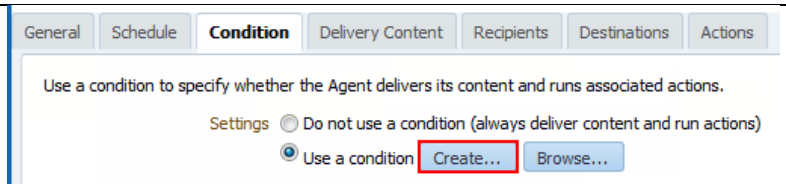
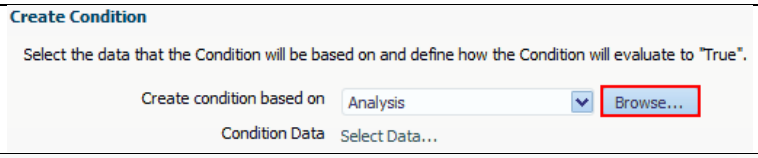
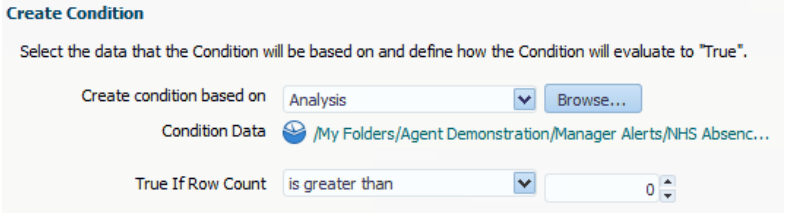
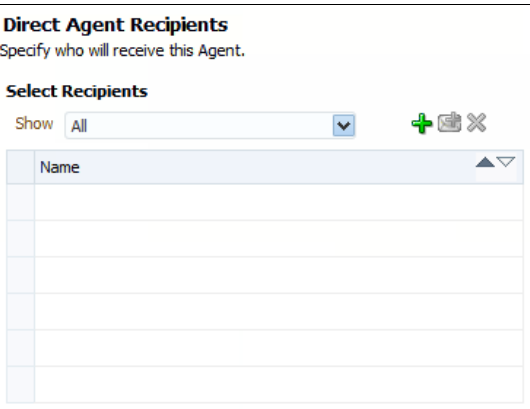
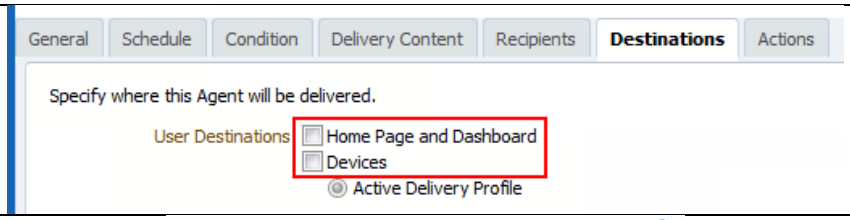
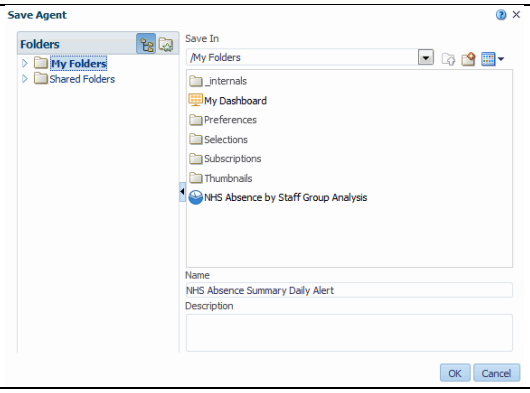
7		The Recipients tab defines who the alert should be run for. By default it is populated with the logged in user. The alert will run in the context of the user added as a recipient, for example if a user with manager self-service is added, the report will include only data for the employees the user manages. Users will only be included in the search list if they have accessed BI previously. Running alerts for specific URPs is covered later in this section.
8		Ticking the *Publish Agent for subscription* tick box allows users to subscribe to the alert from the catalog. Clicking the *Subscribe* link below the Alert BI object subscribes the user to the alert.
9		Save the alert using the save icon.
10		The agent can be tested using the *Run Agent Now* icon in the upper right corner.

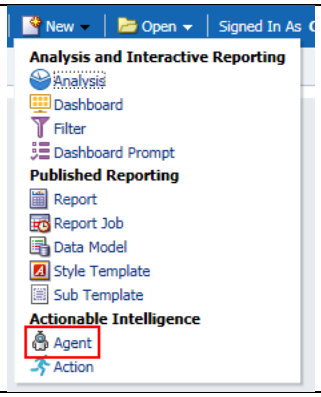
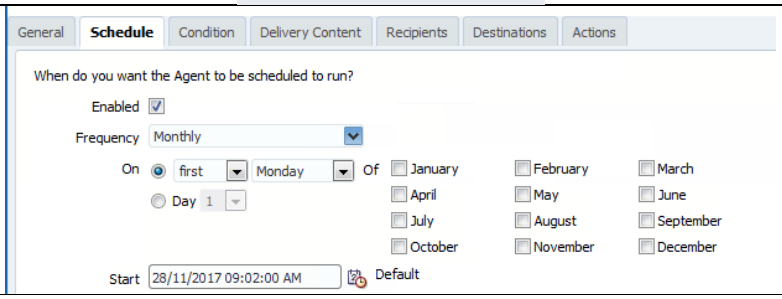
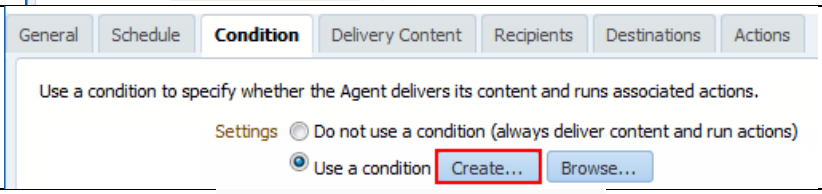
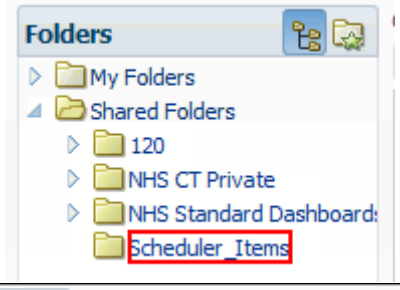
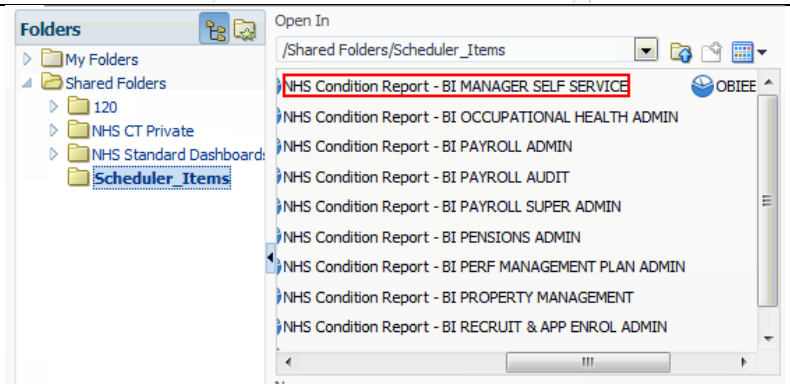
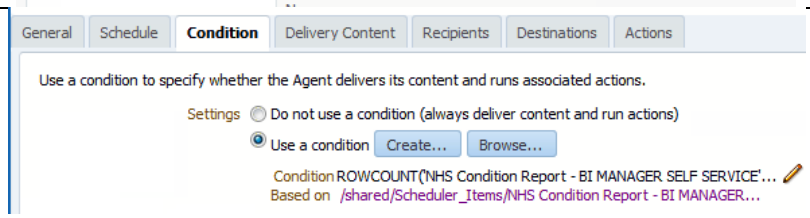
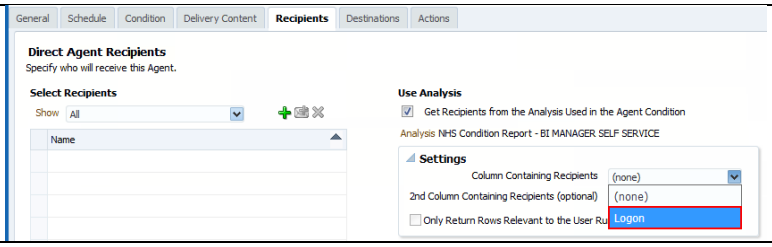
11		The Agent has run and we can see the alert is displayed on the top toolbar and on the BI home page.
12		Clicking on the alert displays the content of the alert.

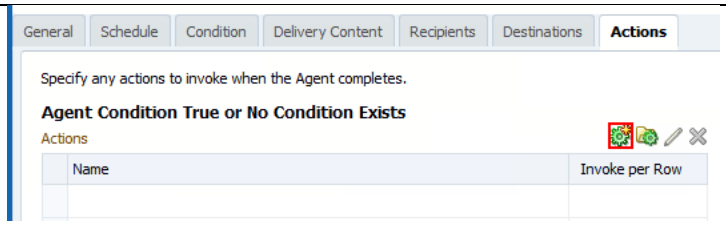
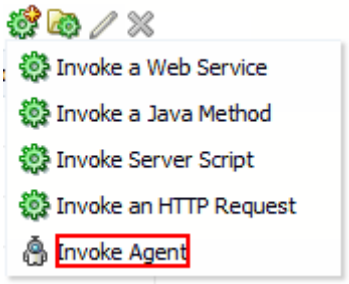
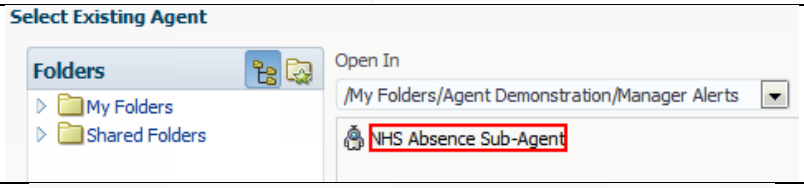
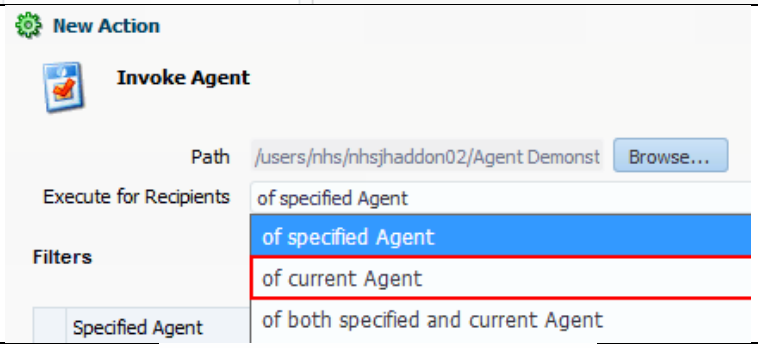
20.2. SETTING UP A COMPLEX ALERT

In this example we will look at setting up an alert based on a condition and an alert for users of a specific URP.

Step No.	Screen	Description
1		Setup a summary analysis which will be sent by the alert. Remember only the first 75 rows of any analysis will be delivered by an alert. Here we have setup Absence FTE % grouped by Staff Group.
2		We now need to setup a condition analysis which will determine whether or not an alert will run. Here you can see we have setup a simple analysis based on Absence FTE % being greater than 3%. If this analysis returns data (i.e. the absence rate is greater than 3%) then the alert will be sent.

3		When setting up the alert, the Condition tab can be used to select the condition analysis we set earlier. Click Create.
4		Click Browse and select the analysis we setup earlier.
5		We don't need to change this setup because the analysis is set to return data only when the Abs FTE % is greater than 3%. When that happens, the Row Count will be greater than 0 i.e. data will return and this condition will be met.
6		Within the Recipients tab, remove all recipients. This will be covered in the next agent we create which will determine the recipients.
7		Within the Destinations tab, remove all user destinations.
9		Save the alert using the save icon. We have now setup our 'Sub' agent which will determine what is sent and when it is sent. We now need to setup another agent to determine how it is sent and to whom.

10		Create another Alert.
11		Schedule when the alert is to run. In this example we have selected Monthly.
12		Within the Condition tab tick *Use a condition* and click Create.
13		Browse for an analysis and expand the Shared Folders and select Scheduler_Items
14		This folder contains a number of pre-built analyses that return a list of users that hold each URP. In this example we have chosen Manager Self-Service.
15		Click OK and the condition is setup. This means the alert will only run if the user it is running for has the Manager Self Service URP.
16		Within the Recipients tab remove all recipients. Click the *Get Recipients from the Analysis Used in the Agent Condition* check box. Open the

		Column Containing Recipients combo box and select 'Logon'.
17		We have now setup this agent to run if the user has the MSS URP. We now need to add an action for this agent to trigger the previous agent. Within the Actions tab click the Add New Action icon.
18		Select Invoke Agent.
19		Find and select the agent we previously setup.
20		Open the Execute for Recipients combo box and select *of Current Agent*. This ensures the recipient list of this agent is passed to the previous agent.
21		Save the Agent.