**Demand and Capacity Team UEC A&E Department Model**

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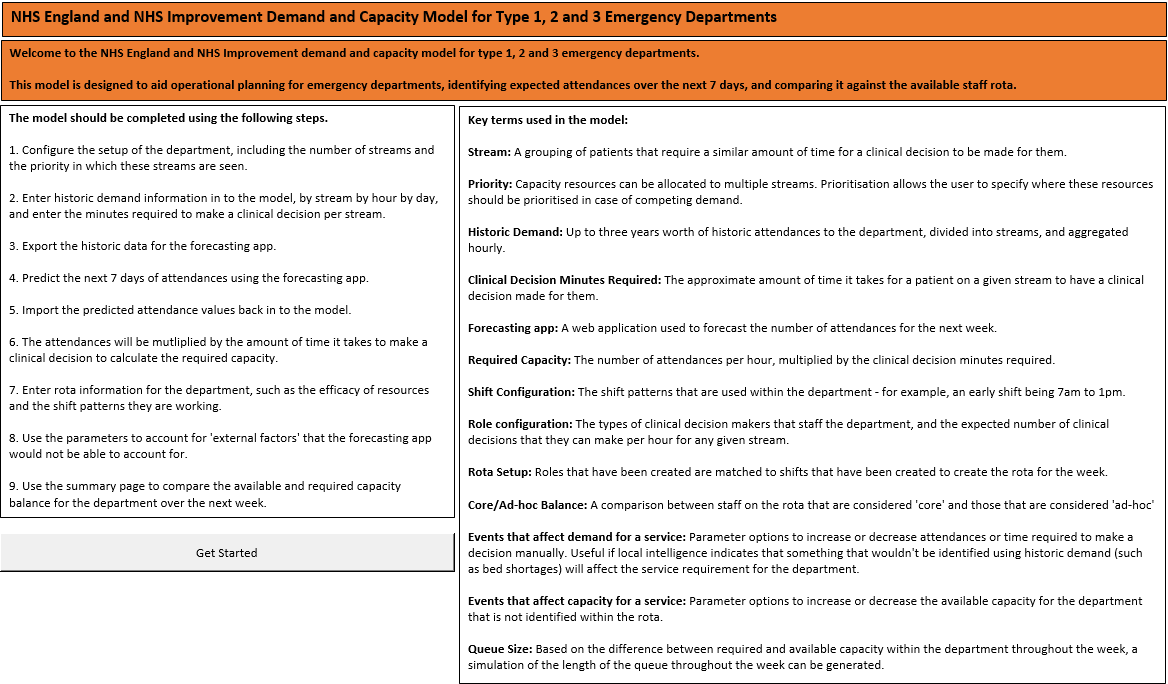
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# Step by Step User Guide

The following guide applies to the model version listed in the table above. Processes are subject to change as the model develops, and are limited in some instances by outstanding work to be done. Please see the development information at the end of this document for additional features that will be available in upcoming versions of the model.

Model builds prior to release will generally be unlocked, and key cells will be modifiable. If errors occur after inadvertently changing cell values or formulas, it is recommended that the model is closed and re-opened.

## Get Started



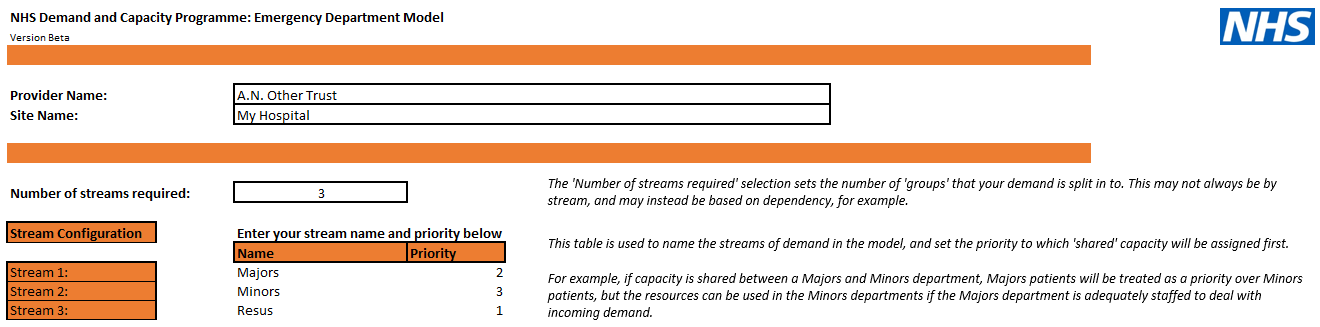
The Get Started splash page describes the steps to complete the model, as well as a glossary of the key terms used. This page will display first when a new model has been opened, and the rest of the model will display once the ‘Get Started’ button is clicked.

## Notes



This sheet is a simple text entry for any notes that need to accompany the model. This can be used to log assumptions and any additional information that should be tracked within the model.

## Setup

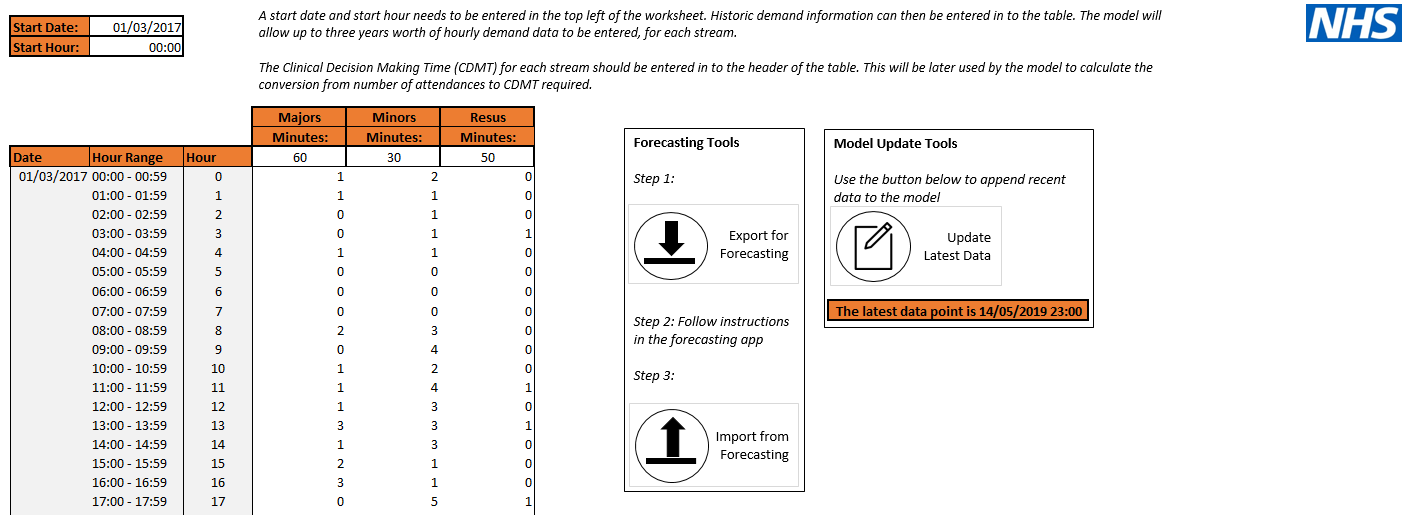


The setup sheet is used to determine the layout of later sheets in the model. A Provider and Site Name should be entered.

The number of streams required dictates the number of streams/groups that the department uses.

Each stream should be named and given a treatment priority. The treatment priority is used to assign capacity to the highest priority patients if the capacity is able to ‘flex’ between patients in different streams, and the priority ranking will determine how the flexible capacity moves within the department, to ensure patients are seen in a timely manner.

## Demand

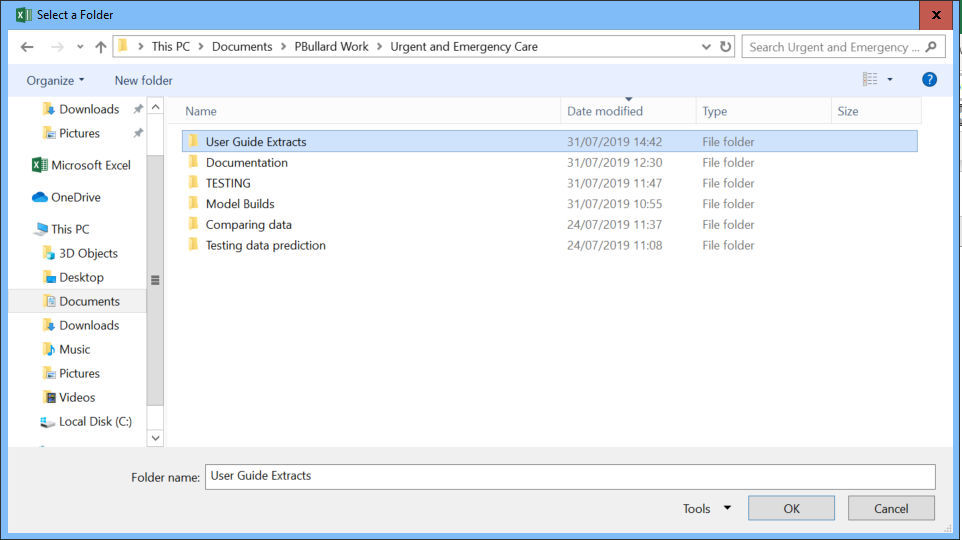


The demand tab is used to enter historic demand information per hour, per stream. Up to three years of information can be entered in to the model.

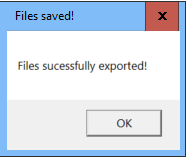
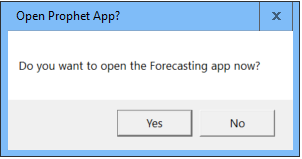
The initial start date and start hour should be entered by the user at the top of the sheet. This will auto-populate the date, hour range and hour columns in the model.

If you are updating the model to include more recent data, clicking the Update Latest Data button allows the user to enter up to four weeks of additional demand information that will added to the bottom of the demand table in the tab, ready to be exported.

Once arrival information has been entered per hour per stream, the Export for Forecasting function can then be used to extract the data back out in a format that can be processed by the forecasting app.

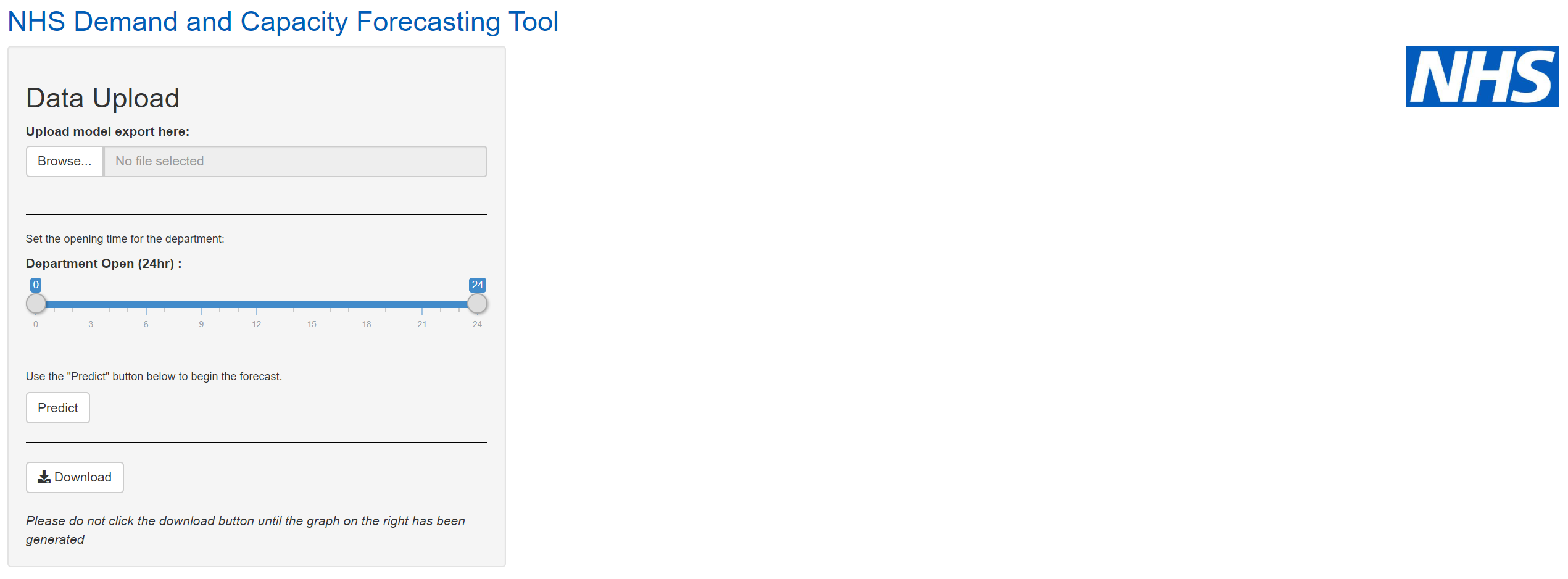


The model will ask the user to select a folder to save the exported files to. Clicking OK will then start the export process.



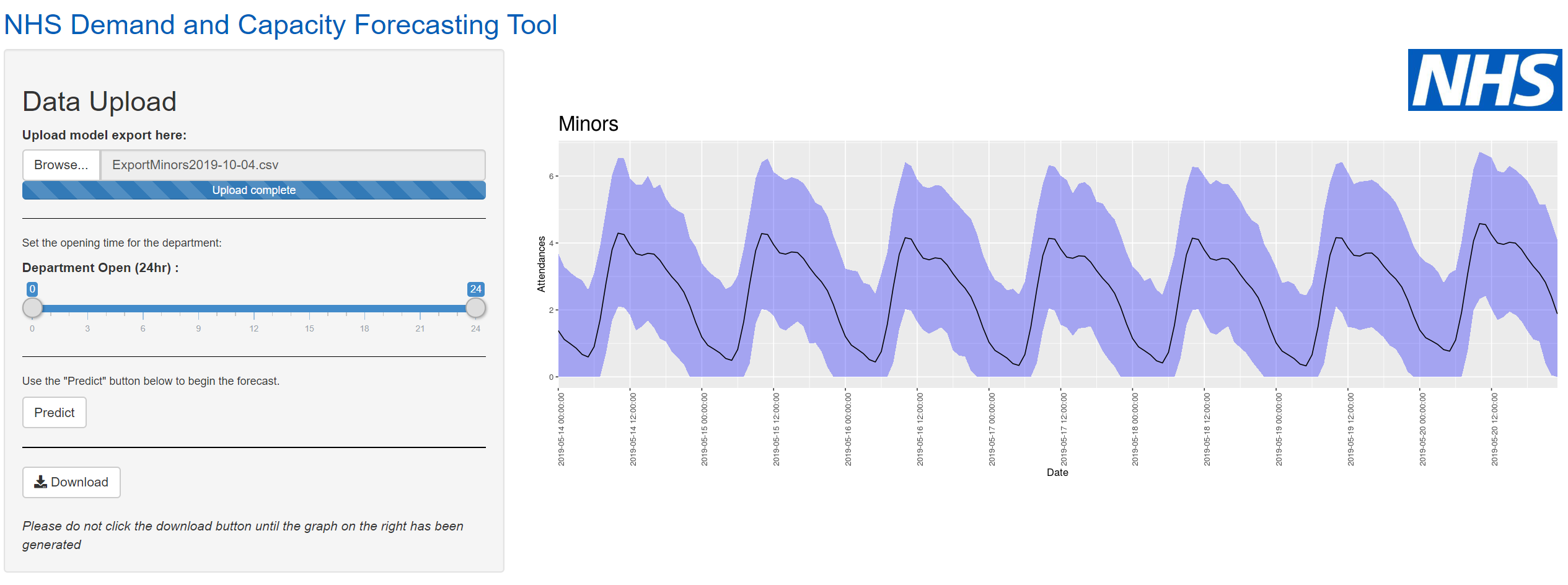
The model will display a message if the export has been successful, and will prompt the user to open the forecasting app.

**Note: the app is currently hosted at** [**https://paulgbullard.shinyapps.io/EDForecasting/**](https://paulgbullard.shinyapps.io/EDForecasting/) **, if the user declines opening the app at the prompt. Please note that this address will be updated with the full release of the model.**

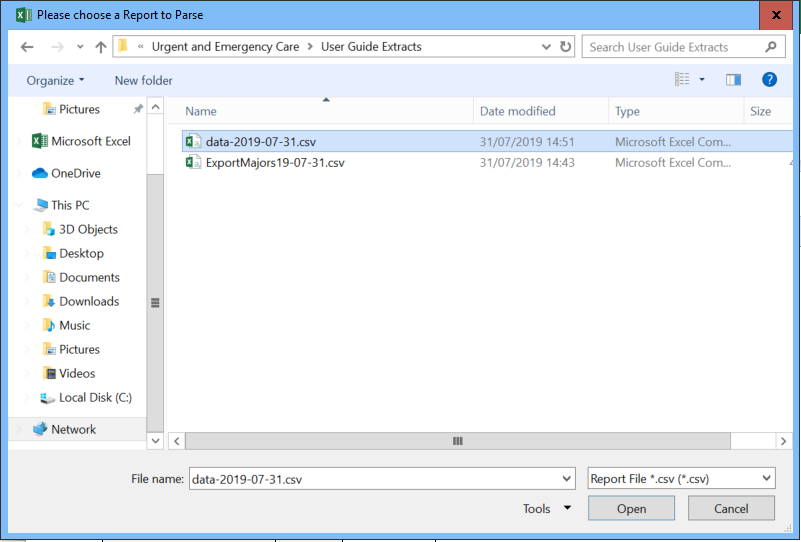


The forecasting app will open. The user should use the Browse… button to navigate to where the files were exported from the model. If the service being modelled is not a 24 hour service, the opening times (for example, 8am to 8pm) should be configured in the app. Once the data has been uploaded and the department opening times set, clicking the predict button will start the forecasting app.

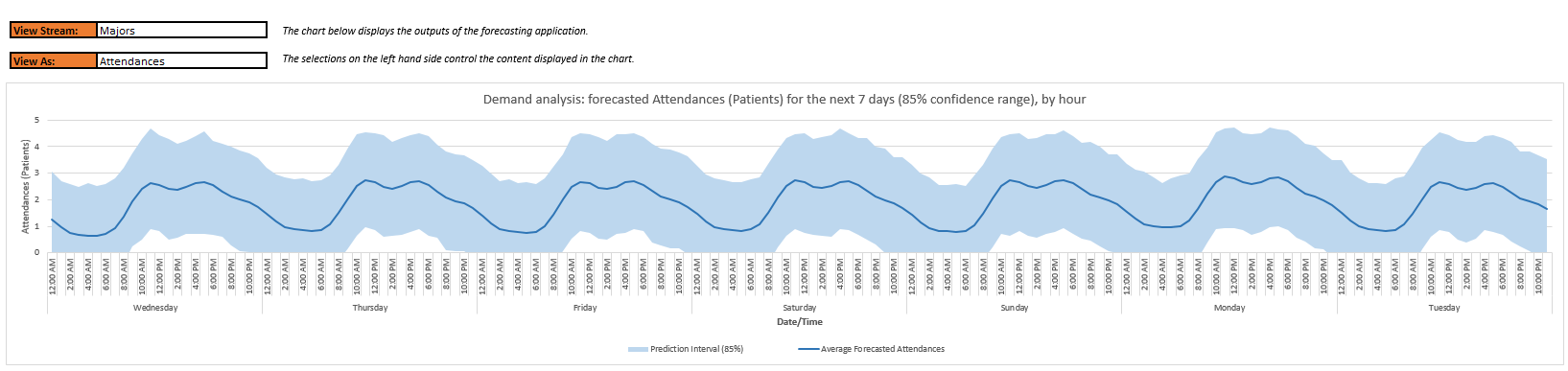
**Note: Once the prediction has started, there will be loading bars displayed on the right hand side of the page. Please wait whilst the app processes the file, and do not click on the download button until a graph is shown (this indicates that the data has been fully processed).**



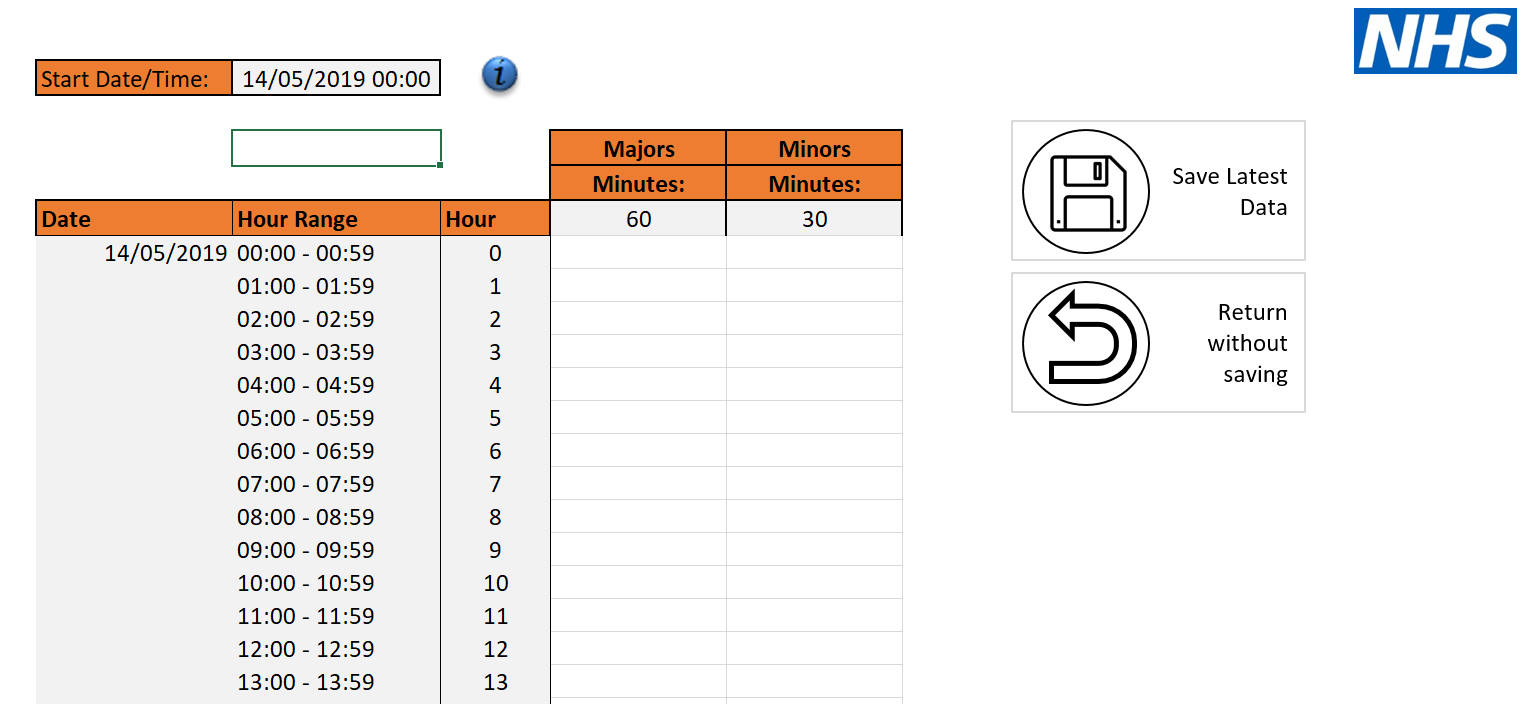
Once the file has been processed, the data report can be downloaded from the app and imported back in to the model using the import from forecast button on the Demand worksheet. Select the location of the downloaded file.



Once the file has been successfully imported, the Demand Analysis worksheet will open, presenting the expected arrivals per hour for the next week, with 85% confidence bounds.

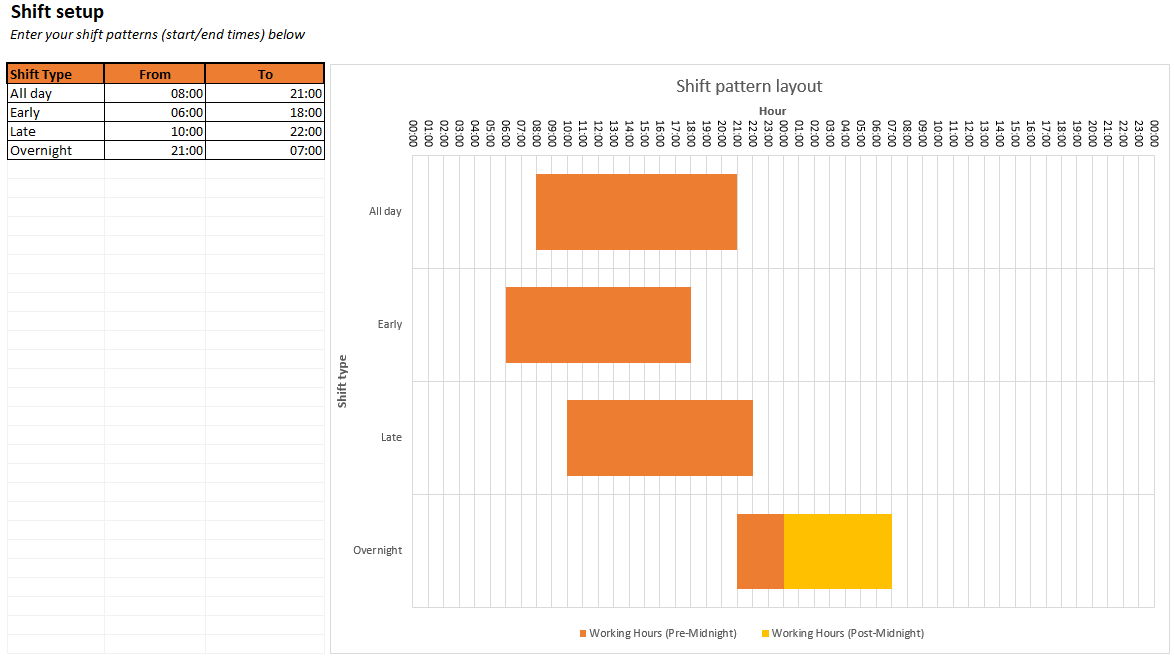


The update latest data button allows the user to enter up to a month of data to the end of the demand table. As there are potentially thousands of rows of datapoints, it allows easy updating of the table for consistent re-use. Clicking the button will open a new worksheet called “Demand Data Update”.



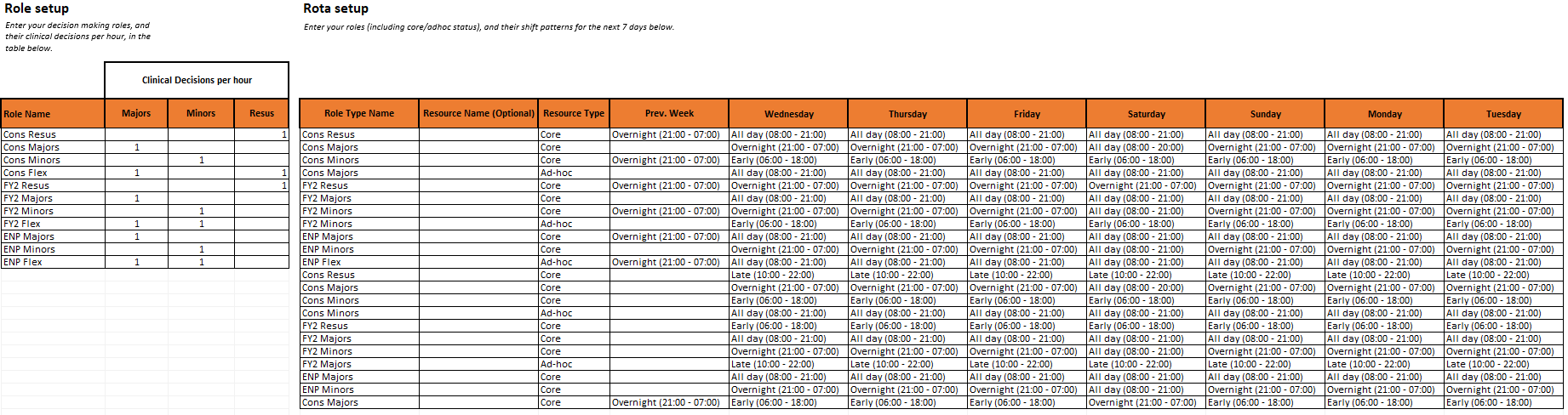
The start date and time for this table is based on the last data point entered on the Demand tab. Four weeks of data can be entered in to the Demand Data Update table, and clicking the Save Latest data button will move this information to the bottom of the Demand table.

## Capacity – Shift Config



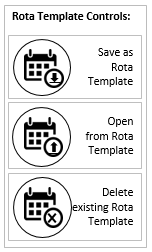
The capacity – shift config worksheet is used to express the different types of shifts that resources within the department can be expected to work. Each shift type should be given a name and a start and end time.

## Capacity – Role Config

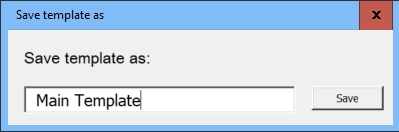


This sheet is used to define the different types of role within the department, their ‘productivity’ in terms of clinical decisions per hour, and the planned shifts that they are going to work over the next week. Each role may encompass multiple staff operating at the same productivity but on different shifts, and therefore each role can be selected multiple times in the rota table on the right. You should also specify if the staff are ‘core’ capacity or ‘ad-hoc’ capacity. How this is determined will vary between organisations, but could be considered as ‘contract’ staff vs. ‘locum’ staff.

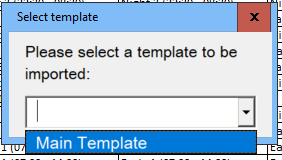
Up to ten different rota templates can be stored in the model.



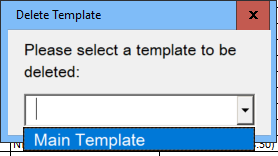
With the rota template completed, clicking on the “Save as Rota Template” button to store the template within the model.



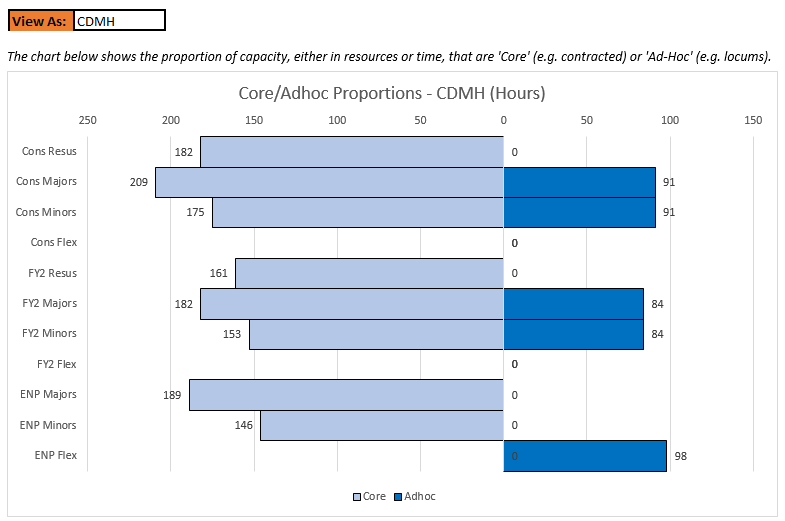
Using the “Open from Rota Template” button will allow you to recall any saved templates back in to the model and make it the active capacity.



Templates can be removed using the “Delete existing Rota Template” button.

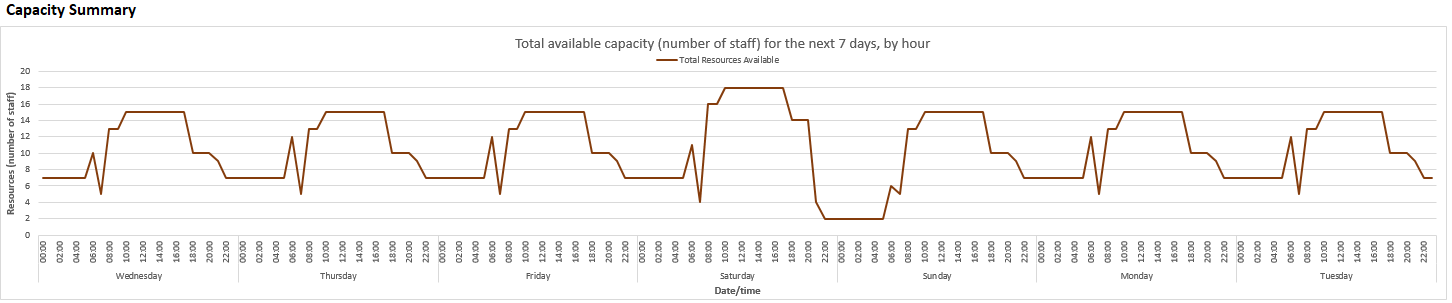


## Capacity – Core/Ad-hoc Balance



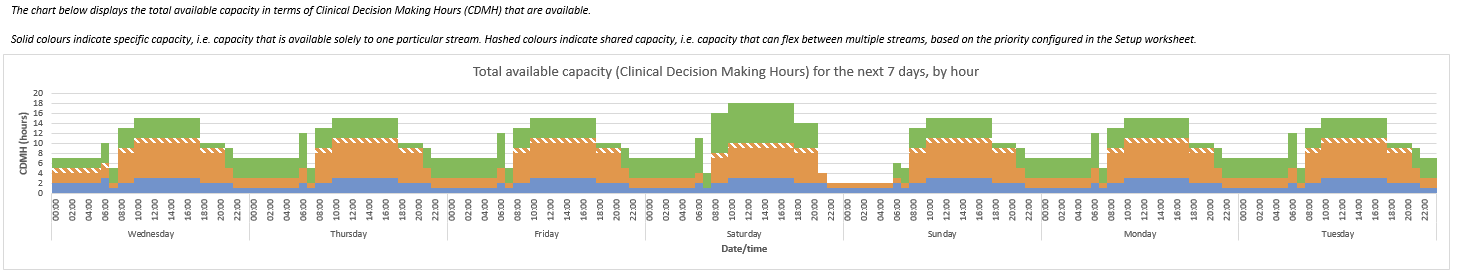
The Capacity – Core/Ad-hoc Balance sheet is used to visualise the proportions of capacity that are either ‘Core’ (e.g. contracted staff) or ‘Ad-hoc’ (e.g. locum staff) across the next week, for each role type. It can be viewed as either time in clinical decision making hours (CDMH) or as resources (i.e. how many staff on the rota for each role are core or ad-hoc).

## Capacity – CDMH



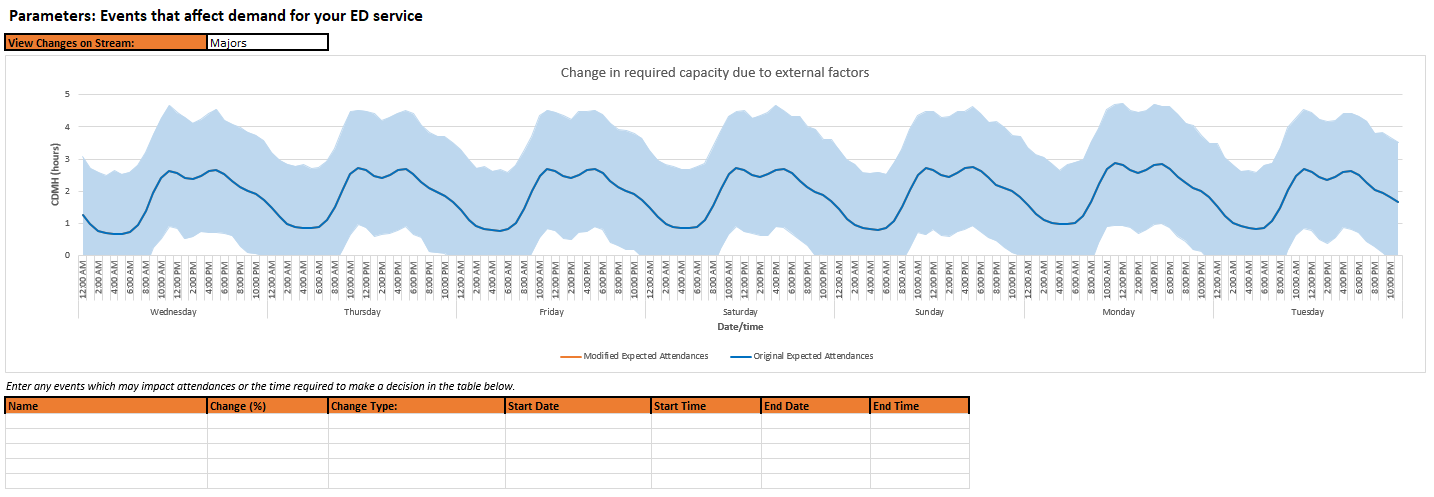
The Capacity – CDMH sheet is a summary sheet that displays the available capacity in terms of number of resources and total decisions that could be made per hour per day.

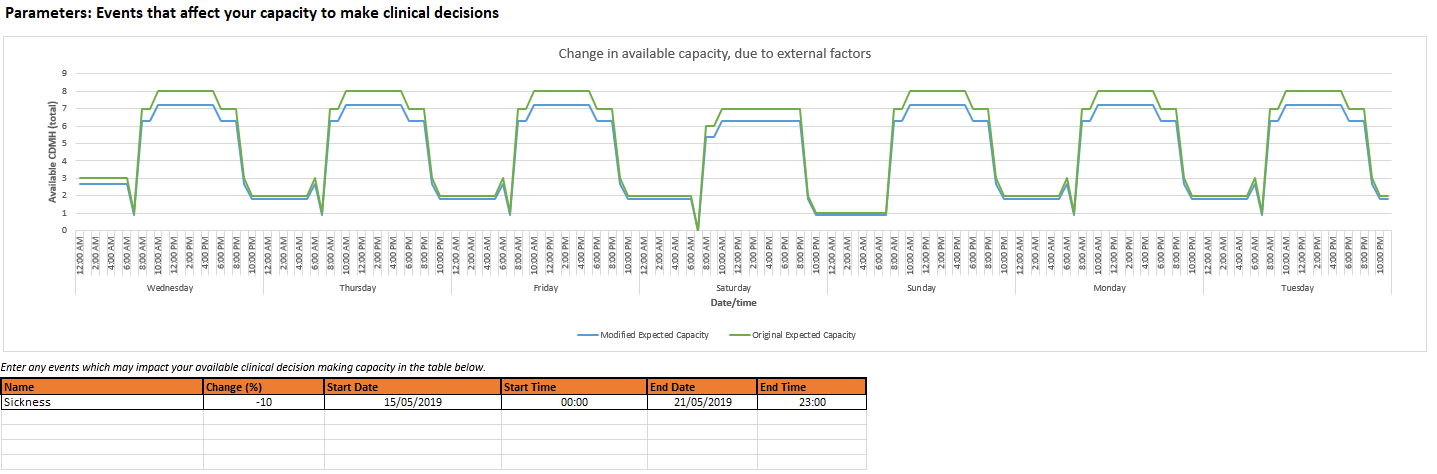
The summary table at the top of the sheet visualises the total available resources in terms of people (i.e. how many roles) are available per hour per day. It is important to note that this is not the available capacity, as this needs to be transformed to the same CDMH unit that the demand is multiplied by.



The capacity in terms of clinical decision making hours is shown as a number of stacked bars, in the priority order set in the Setup tab. Solid bars indicate that the capacity is specific to an individual stream, and hashed bars indicate that the capacity is shared between two or more streams – the colour of the hashing indicates which stream is the priority.

## Parameters





The Parameters tab is used to increase or decrease key model outputs based on external factors that have not been accounted for in the model.

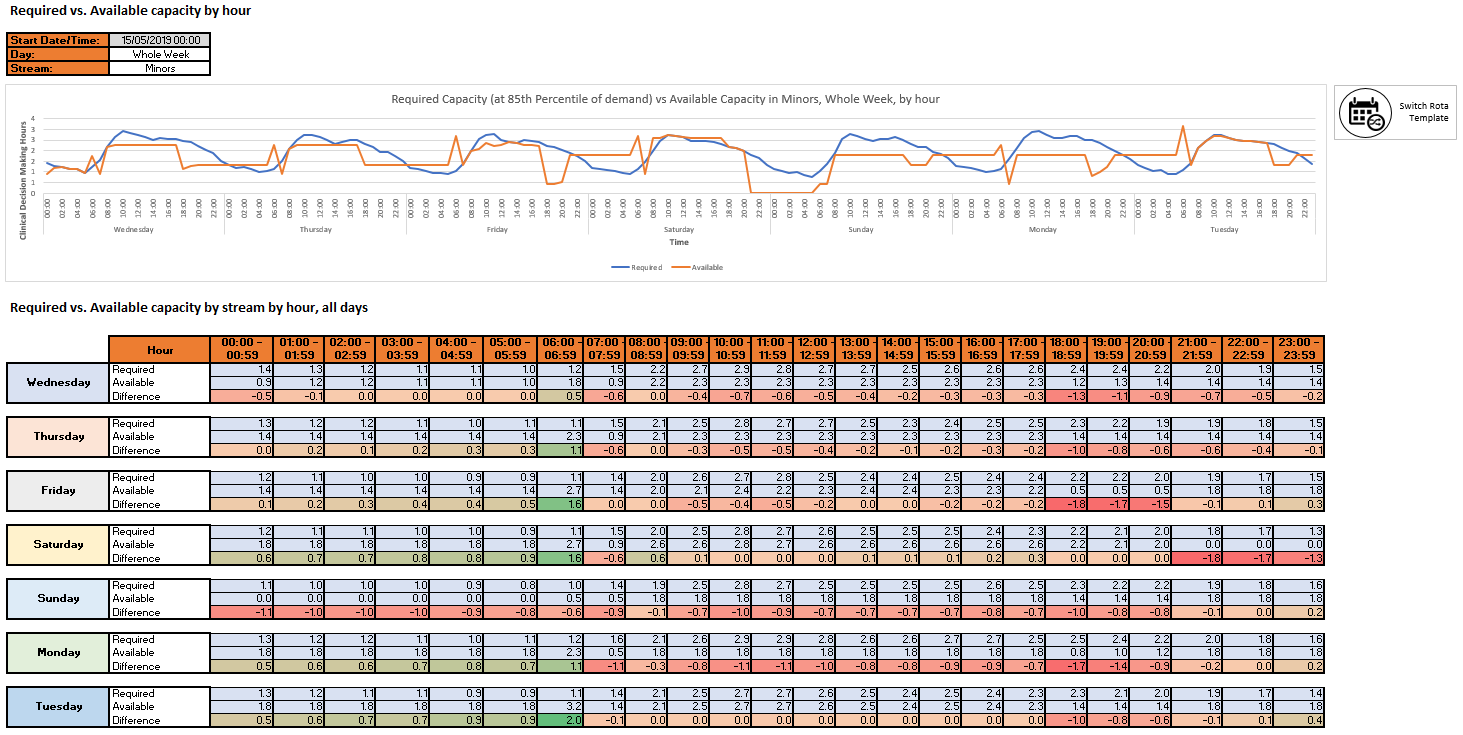
The user can use the options to account for external factors that affect attendances (a hot day, for example), external factors that influence the time required for a decision to be made (a lack of pathology availability, for example), and external factors that affect the availability of capacity.

Changes are measured as a percentage and can be positive or negative, and a start date, start time, end date and end time should be entered for the periods which need to be modified.

The model applies this evenly across all streams.

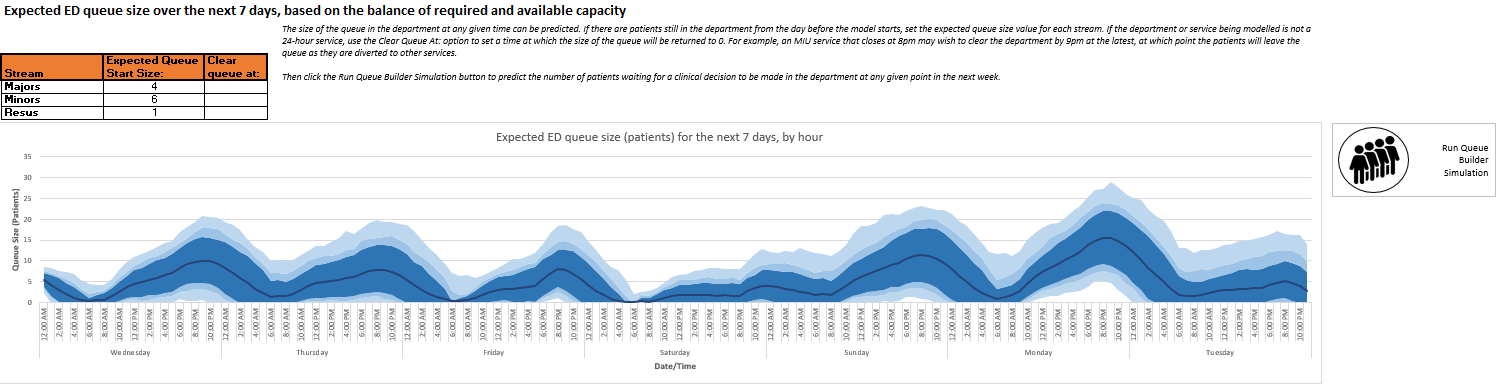
**Note: Individual changes for each different stream may be included in a future release. Please let the team know if this would be an essential feature for the model.**

## Summary



The summary sheet shows some of the key outputs of the model. The graph displays the balance of available capacity versus the required capacity (both in CDMH).

The table shows the difference between the predicted required capacity and the available capacity. A positive number indicates a surplus of capacity, and a negative number indicates a deficit in capacity.



The queue builder simulation will simulate the size of the queue of patients waiting for a clinical decision to be made for them at any given time over the next week. If there is a higher level of required capacity than available capacity, you can expect the queue size to increase, and vice versa. There are options to enter the size of the queue in the department at midnight at the start of the period that is being modelled, as well as the option to ‘clear’ the queue at a certain time of day – this is to be used if the department is not a 24-hour service, and the department is routinely ‘cleared’ of patients when the department closes.