Demand and capacity models

Aggregation module user guidance

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Contents

1. Introduction

1.1 What is the aggregation module?

The aggregation module is a tool you can use to link a number of demand and capacity models for a service, creating a view of the whole service.

For each part of the service the outputs from the aggregation module include:

- the balance of required capacity against available capacity
- the size of waiting list backlogs that need to be cleared so patients are treated in a timely manner.

The aggregation module also converts the outputs of the demand and capacity models from 'operational' units (**what do I need to do to ensure my patients are treated on time?**) into 'strategic' units (**what is my expected activity outturn?**).

1.2 How to use this guide

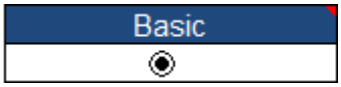
This is a quick reference guide to using the aggregation module. We assume that users are familiar with the basic concepts of demand and capacity management.

If you need a refresher on the basics, you can find relevant resources at https://www.england.nhs.uk/ourwork/demand-and-capacity/resources/.

There is also guidance in the model, which can be accessed in one of two ways:

- If you see the icon below, click it to bring up an information window. Click the icon again to hide it.

- If you see a cell with a small red triangle in the upper right corner, hover your mouse cursor over the cell to reveal an information window.



2. Process mapping your pathway

2.1 Before you start

You will need a process map of your overall service pathway.

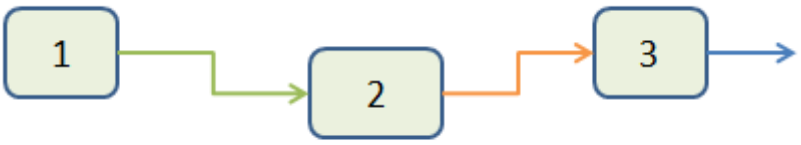
You will also need to have completed a demand and capacity model for each part of the service pathway, using one of the following:

- any of the Intensive Support Team (IST)'s demand and capacity models
- the core model
- the high complexity model.

2.2 Required information

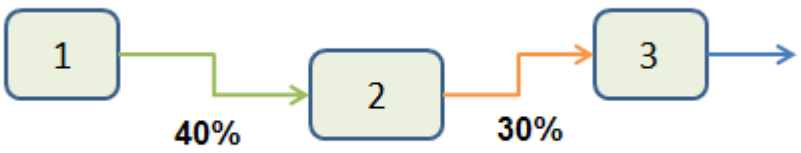
When process mapping your service, you will the following information:

- In what order does a patient go through the different parts of the service?



- What proportion of patients goes on to the next stage of the service pathway?

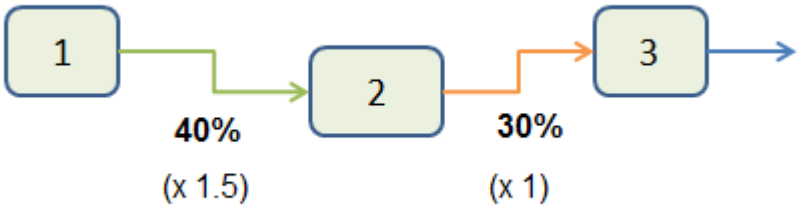
  We refer to this as the **flow**.



In this example, for every 10 patients seen in (1), 4 go on to (2).

- How many times does a patient need to be seen in a given part of the service pathway?

  We refer to this as the **conversion**.



For every 10 patients seen in (1), 4 go on to (2) and they need an average of 1.5 appointments per patient.

3. Loading the files

The ‘Data files’ sheet is where you can set up the overall structure of the workbook, and link the aggregation module to your completed demand and capacity models.

You can specify up to 20 parts of your service (service components) – each will require a completed model.

You can link the activity for each part of your service to a point of delivery (POD). These activities will be collated later into an overall service activity estimate.

You can use the activity estimates to help with your annual planning.

Organisation	A. N. Other Trust		
	Name	**Description**	**TFC Code**
Service	RESPIRATORY MEDICINE	Also known as Thoracic Medicine	340
Number of service components:		4	
Differentiate diagnostic activity in POD?		No	
See details of file upload sheets?		No	

Reload All

Index	Description	Filename	Path	Status	Model Type	POD 1	POD 2	POD 3	
File 1	First Outpatients	Outpatient Model Completed.xlsx	\\ims.gov.uk\	File loaded	Outpatient v2.02fii	New			Load 1
File 2	Endoscopy	Endoscopy Model Completed.xlsx	\\ims.gov.uk\	File loaded	Endoscopy v2.02hi	Follow Up			Load 2
File 3	Diagnostics	Diagnostic model Completed.xlsx	\\ims.gov.uk\	File loaded	Diagnostic v2.02dii	Follow Up			Load 3
File 4	Inpatients	Inpatient Model Completed.xlsx	\\ims.gov.uk\	File loaded	Inpatient v2.02biii	Admission			Load 4

The details of the models will need to be entered here.

Please ensure that you list the models in the order of your process flow.

This will ensure you can correctly set dependencies later in the workbook.

If you are unsure of how to enter your file details, contact your informatics team for help.

Press the ‘Load’ button to load an individual model, or ‘Reload All’ to load all the models.

This may take a few minutes to complete.

If the ‘Status’ cell does not show ‘File loaded’, check your file details are correct.

4. Describing process dependencies

The ‘Dependency set-up’ sheet is where you can link the different parts of your service.

A. N. Other Trust, RESPIRATORY MEDICINE SERVICE

Source process	Type source values...	Dependent process	Consider activity as...	% Flow	Conversion
1. First Outpatients	New	2. Endoscopy	Follow Up	0.4	1.1
1. First Outpatients	New	3. Diagnostics	Follow Up	0.3	1
2. Endoscopy	Follow Up	4. Inpatients	Admission	0.3	1
3. Diagnostics	Follow Up	4. Inpatients	Admission	0.3	1

The **source** process is where patients come from. The **dependent** process is where patients go to after the **source**.

In the first row of the example above, patients who attend **First Outpatients** then go to **Endoscopy**.

The **flow** and **conversion** values are:

- the proportion of patients who move from the source process to the dependent process (**flow**)
- the average number of appointments each patient will need in the dependent process (**conversion**).

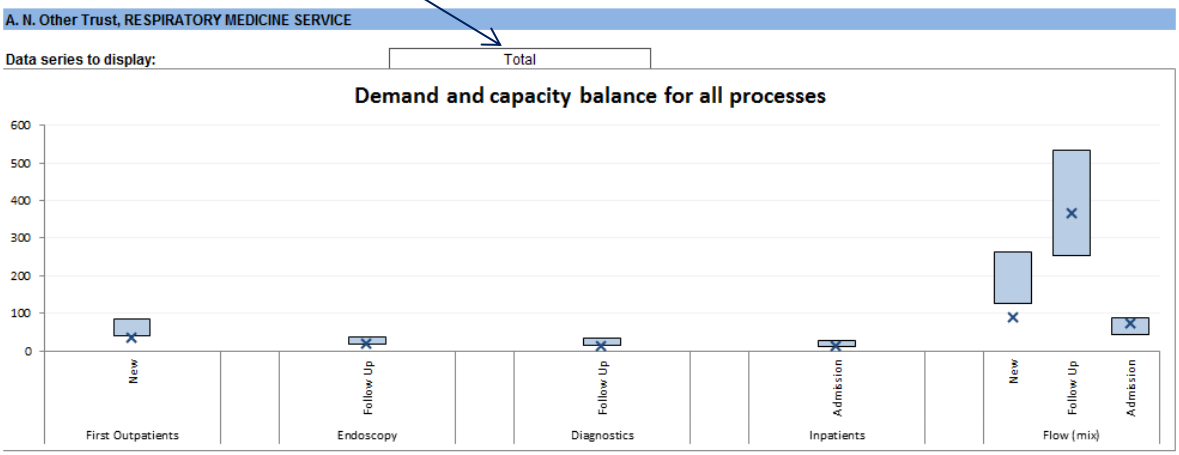
Taking the first row of the table as an example, we have indicated that 40% of patients who attend **First Outpatients** then go on to **Endoscopy**, and need an average of 1.1 appointments per patient.

5. Demand and capacity balance

The ‘DC Balance’ sheet provides an overview of the required capacity for each process in your pathway, and compares it against the available capacity.

All summary sheets let you switch between a view of the whole service and of individual models.

You can select the desired view using dropdown boxes like this one.



File level overview

Figures provided on a per week basis

File / Process	Status
1. First Outpatients	
2. Endoscopy	
3. Diagnostics	
4. Inpatients	
5. Flow (mix)	

Show/hide multi level processes: Hide

Hide if you are not using multi stage processes

Process 1

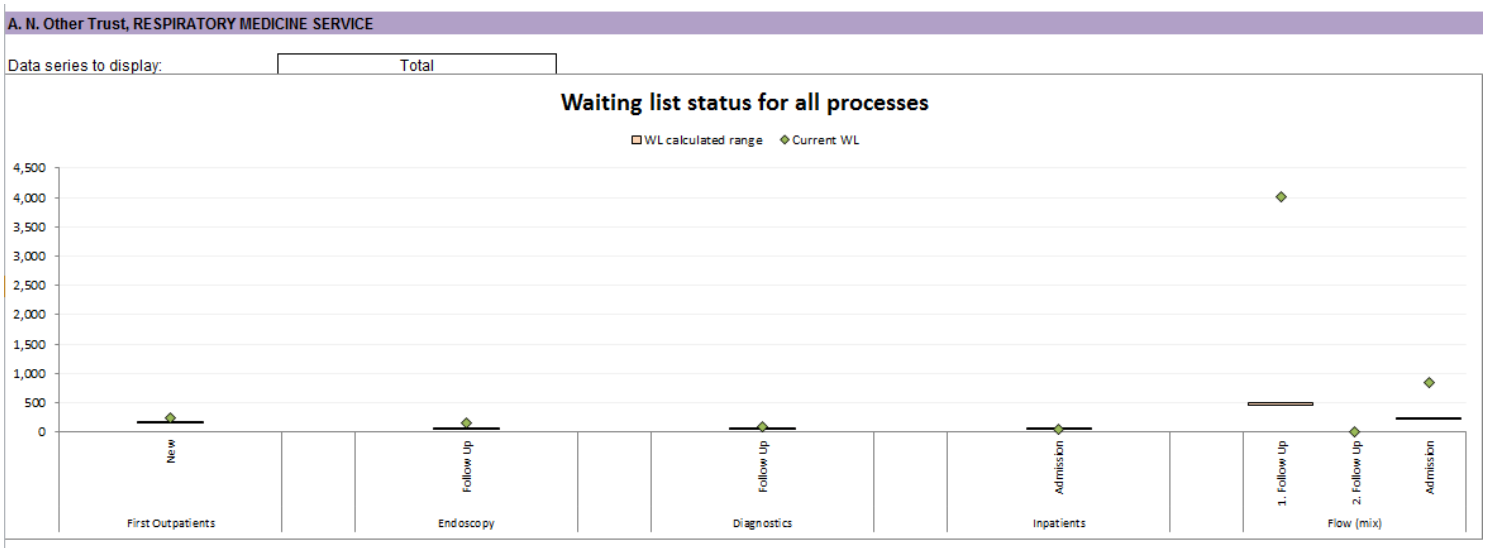
POD Type	Lower bound	Upper bound	Available Capacity
New	40.4	44.6	33.5
Follow Up	17.8	20.4	18.1
Follow Up	15.5	17.9	13.2
Admission	12.8	13.6	11.0
New	125.8	137.9	88.0

If you have loaded a copy of the IST flow model, you can expand the view to see the extra follow-up and inpatient elements using this switch.

6. Waiting list balance

The ‘WL Balance’ sheet shows the balance of current waiting list size against the estimated sustainable waiting list size for each part of your pathway.

This identifies which parts of your pathway may have waiting time issues, and where you may need to act to reduce waiting list sizes.



File level overview Show/hide multi level processes: Show

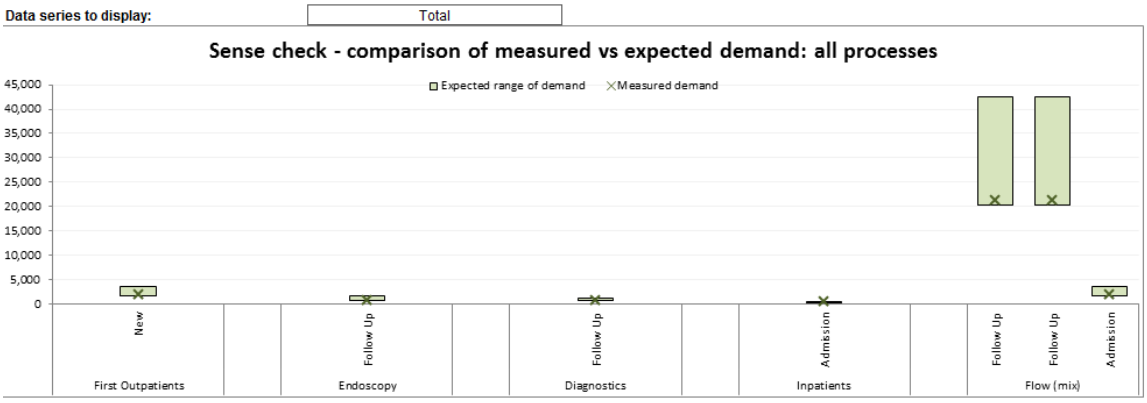
File / Process	POD Type	Lower bound	Upper bound	WL Size
1. First Outpatients	New	157	173	249
2. Endoscopy	Follow Up	55	60	157
3. Diagnostics	Follow Up	46	50	92
4. Inpatients	Admission	41	46	45

POD Type	Lower bound	Upper bound	WL Size
	--	--	--
	--	--	--
	--	--	--
	--	--	--

POD Type	Lower bound	Upper bound	WL Size
	--	--	--
	--	--	--
	--	--	--
	--	--	--

7. Sense checking

The ‘Sense check’ sheet compares the expected demand calculated from your estimated flow against the measured demand in the models.



File level overview

Figures provided on a per week basis

Show/hide multi level processes: Hide

Hide if you are not using multi stage processes.

File / Process
1. First Outpatients
2. Endoscopy
3. Diagnostics
4. Inpatients
5. Flow (mix)

Process 1

POD Type	Lower bound	Upper bound	Measured
New	1,733	1,916	1,824
Follow Up	772	854	813
Follow Up	623	689	656
Admission	184	204	594
Follow Up	20,245	22,376	21,264

Your calculated demand is within 5% of your measured demand

Your calculated demand differs from your measured demand - please check your flow measurements

The sheet will highlight the parts of your pathway that have very different values for expected and measured demand.

In these cases, the flow values you entered in the ‘Dependency set-up’ sheet are not consistent with the observed values in the model and need to be checked.

8. Aggregate activity

The ‘Aggregate activity’ sheet provides an estimate of the expected activity outturn for your service, based on some simple rules.

Estimated activity is based on the expected attendances for each part of your pathway, aggregated by point of delivery (POD), as defined in the initial set-up.

If you selected the option to differentiate diagnostic services by POD, you should also have the option to assign the following POD options:

- new (diagnostic)
- follow-up (diagnostic).

These will also be visible in the summary on this sheet.

The estimated activity is calculated as follows:

Estimated demand =

Average demand – removals other than treatment

– non-attendances (slot reused, discharged

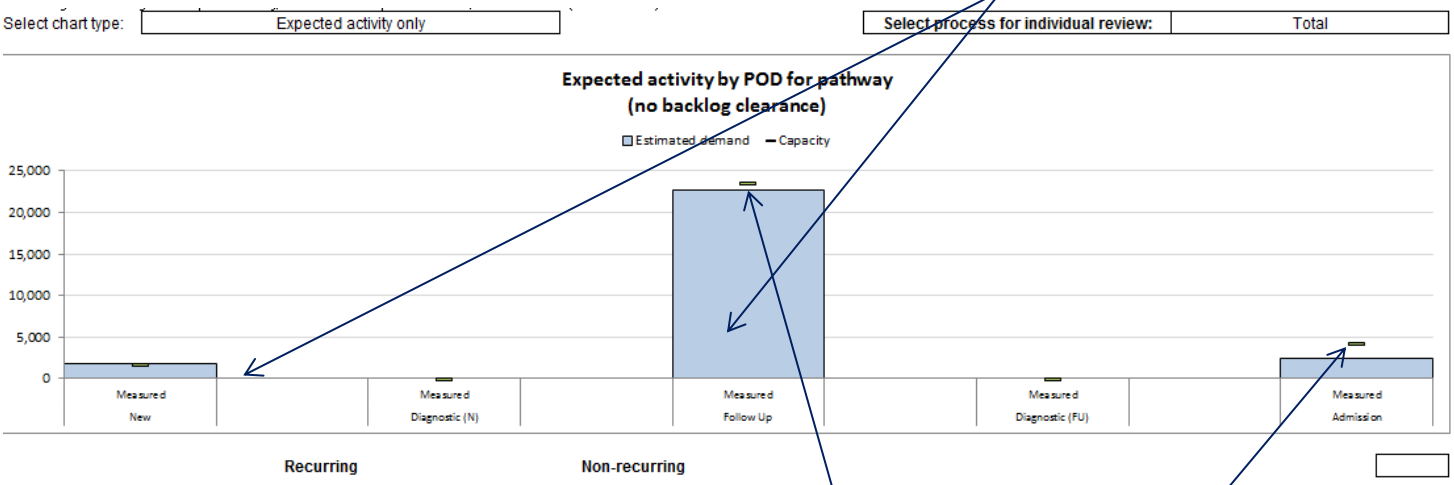
– non-attendances (slot lost)

+ non-attendances (rebooked)

8.1 Estimated activity

Demand-based activity

This uses the average demand to give **the expected activity based on what you need to do to meet demand**.



Overall position

POD	Demand (measured)	Available capacity	WL Clearance (no flow)	+ Clearance from flow
New	1,824	1,683	81	0
Diagnostic (New)	0	0	0	0
Follow up	22,733	23,412	2,669	9,288
Diagnostic (FU)	0	0	0	0
Admission	2,432	4,229	483	1,399

Based on available capacity

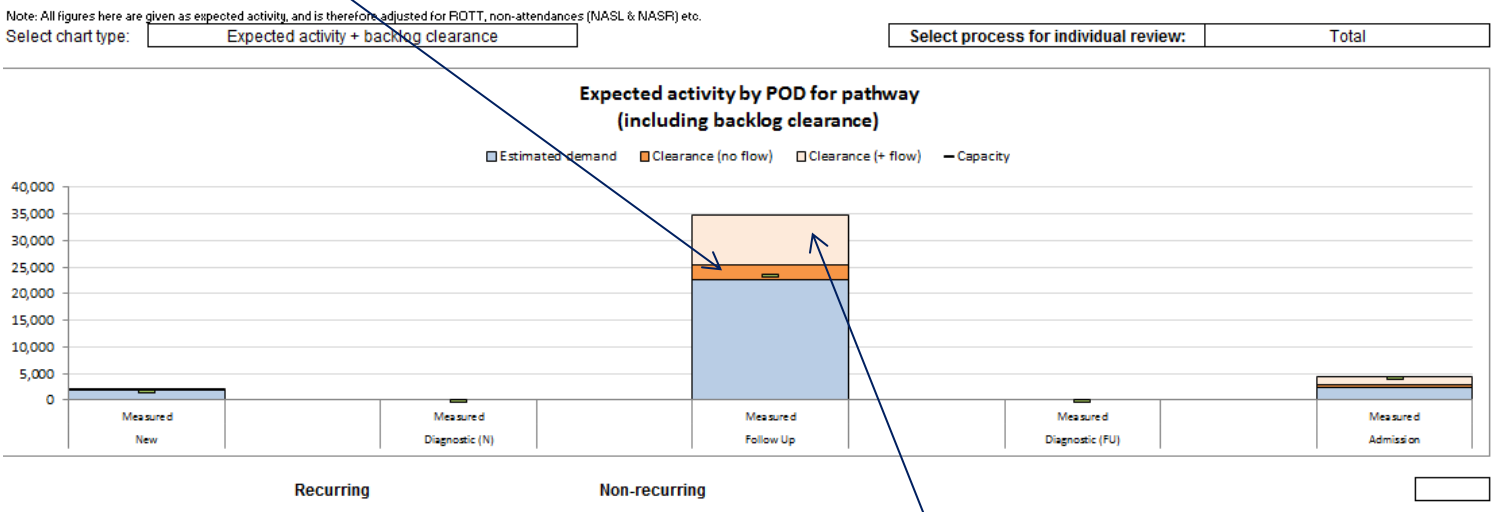
This uses the total available to give **you the expected activity based on what you think you can provide**.

8.2 Factoring in waiting list backlog clearances

You will see two extra data series when you turn this option on:

The sum of the backlog aggregated by POD.

This is the sum of any waiting list excess in any of the loaded models, grouped by POD.



Recurring **Non-recurring**

Overall position

POD	Demand (measured)	Available capacity	WL Clearance (no flow)	+ Clearance from flow
New	1,824	1,683	81	0
Diagnostic (New)	0	0	0	0
Follow up	22,733	23,412	2,669	9,288
Diagnostic (FU)	0	0	0	0
Admission	2,432	4,229	483	1,399

The additional work generated from your initial backlog clearance. This is based on the pathway dependencies you described in the ‘Dependency set-up’ sheet.

This is also grouped by POD.

9. Appendix: Glossary of key terms

Activity

Clinical contact that has taken place. As activity simply reflects what the service is capable of delivering, it is not the same as demand.

Activity can be biased by changes in capacity or by additional ad-hoc capacity such as waiting list initiatives, so we discourage using historical activity as a basis for planning your service.

Capacity

Available capacity is the resource you can deploy to provide a service for your patients. This needs to be operationally verified and compared against the required capacity.

Required capacity is what your service needs to provide so that your waiting list does not increase over time. Required capacity is a combination of your demand (adjusted for variation), and the removals and additions to your waiting list resulting from non-attendances and discharges.

Demand

Requests for service – this can be in the form of a referral, a decision to admit (DTA) or an appointment in an earlier part of your service as part of the continuation of a treatment pathway.

Non-attendances

There are two types:

- non-attendances, where the slot was reused (NASR)
- non-attendances, where the slot was lost (NASL).

Any patients who were discharged from the service subsequent to their non-attendance are described as NASR (discharge) or NASL (discharge).

Waiting list

The waiting list is the number of patients who have requested an appointment in your service, with or without a booking, and are waiting for that appointment to take place.

The estimated sustainable waiting list size is the size your service should aim for to treat patients in a timely manner, while ensuring a steady flow of patients to your clinics.

Patients removed from the waiting list for reasons other than treatment (ROTT)

This represents the patients who are included in your demand but end up not needing an appointment slot.

Examples of ROTT are inappropriate referrals or patients who are transferred to another service due to an urgent medical condition.

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