



Making the health sector  
work for patients

**Care spend  
estimating tool:  
User guide  
September 2014**



## About Monitor

As the sector regulator for health services in England, our job is to make the health sector work better for patients. As well as making sure that independent NHS foundation trusts are well led so that they can deliver quality care on a sustainable basis, we make sure: essential services are maintained if a provider gets into serious difficulties; the NHS payment system promotes quality and efficiency; and patients do not lose out through restrictions on their rights to make choices, through poor purchasing on their behalf, or through inappropriate anti-competitive behaviour by providers or commissioners.

## Disclaimer

The Care Spend Estimating Tool has been published to help commissioners estimate indicative population segmentation and forecast commissioner spends associated with each segment across different health and social care settings. There is no requirement to use the tool and if you choose to rely on it please be aware that you do so entirely at your own risk. Monitor has no liability or responsibility to you in contract or in tort or otherwise for any loss, damage, cost or expense caused by your reliance on the model or the information contained in this user guide.

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## Introduction

### Context

Increasingly, focus is turning towards integrated care and how we can tailor the care we provide to our population. To do so efficiently and effectively, we need an in-depth understanding of patients' needs.

The best examples of this in-depth understanding of patient needs rely on robust patient-level linked datasets. However, getting to this level can take several months. This is why we have the 'Care Spend Estimating Tool', to help commissioners estimate indicative population segmentation and forecast commissioner spends associated with each segment across different health and social care settings.

### **What is the 'Care Spend Estimating Tool' who is it for, and what should it be used for?**

The 'Care Spend Estimating Tool' is a simple Excel tool designed to approximate how the local care economy spends its money by age group, patient group and care settings, and how this may evolve over time. It is a new tool which may be revised from time to time as assumptions are tested and data are verified.

**The model is intended for commissioners.** There is no requirement to use the model but it is intended to support you in carrying out detailed assessments. At the simplest level, it allows you to create a quick indicative patient segmentation for a given locality, while only filling in some basic variables (and without requiring patient-level information). It also allows you to do some simple tailoring, such as choosing one of the four available locality archetypes and the size of the total population, or providing more detailed input regarding the total spend per setting of care, population per age group/patient group and future demographic and non-demographic growth rates.

### **Note:**

The model is deliberately built in a fairly simple manner with limited ability to tailor settings. It does not pretend to precisely calculate the forecasted values for your locality. It is intended more as a quick and approximate calculation tool to help localities that do not have easily accessible information based on patient-level (linked) data. It will therefore be of limited use if your locality has a patient-level linked dataset or a risk stratification tool that would provide more accurate results.

## **What are the locality archetypes?**

The four model archetypes of localities are Rural, Urban high income, Urban low income and a Hybrid of all three (default setting). They are based on previous work with areas that fit these archetypes and their anonymised aggregated data.

Given that the outputs are based on sample data for each archetype, they should all be treated as estimates. They will be more accurate if you use actual clinical commissioning group (CCG) data and tailor the assumptions to the specifics of your locality (see 'Preparing to use the tool' for more information).

For some archetypes there is missing, or zero-value data, ie, either no data exist for a certain patient group, or there are no patients in that patient-group for the sample areas. This could lead to spurious results if you do not over-ride the gaps for your particular CCG. Data gaps and zero-value inputs per archetype are detailed in Exhibit 1.

The 'Hybrid' archetype, which is a weighted average of the Rural, Urban high income and Urban low income archetypes, has fewer data gaps and zero values. However, some of the 'hybrid' results will be skewed towards those archetypes for which the data is available.

## Exhibit 1: List of data gaps for each archetype

Each archetype has some missing or zero value data. This is either because of a lack of data, or because no-one fitting the given profile exists within our sample areas

Each archetype has data gaps or zero values which could lead to spurious results (1/2)

Arche-type	Age group	Patient group	Setting of care
Rural	Child	• Multiple LTC	• MH, SC
		• Dementia	• All
		• Cancer	• MH
		• Learning disability	• All
		• Physical disability	• All
	16-69	• Learning disability	• All
	70+	• Physical disability	• All
		• Learning disability	• All
		• Physical disability	• All
Urban high income	Child	• SEMI	• All
		• Dementia	• All
		• Cancer	• All
		• Learning disability	• All
		• Physical disability	• All

Each archetype has data gaps or zero values which could lead to spurious results (2/2)

Arche-type	Age group	Patient group	Setting of care
Urban low income	Child	• Mostly healthy	• SC
		• 1 LTC	• SC
		• Multiple LTC	• NEL, MH, SC
		• SEMI	• NEL, EL, SC
		• Dementia	• All
		• Cancer	• SC
		• Learning disability	• All
		• Physical disability	• All
		• Physical disability	• All
		• Physical disability	• All
Hybrid	Child	• Multiple LTC	• Multiple LTC
		• Dementia	• Dementia
		• Learning disability	• Learning disability
		• Physical disability	• Physical disability

## Preparing to use the tool

### Overview of the model

The Care Spend Estimating Tool is an Excel model that contains six tabs, detailed below.

The first two tabs are the ones that require inputs. Broadly, two types of input are required: data and assumptions. Data inputs are classified in the 'Necessary data' section as those which have to be filled in by the user and those which can be tailored to yield more accurate results (but are not necessary if not available). The assumptions that are required relate to demographic, non-demographic and commissioner spend growth rates, but the level on which they are made can be varied (see 'Necessary data' section). These feed into the model and alter outputs, which are found on the last four tabs.

Outputs focus on population figures and commissioner spend data, and decompositions of the two in percentage terms. There are different outputs available, from ready-to-use graphs and tables to a pivot table that allows you to cut the data in the way you want.

#### 'Step 1 – Basic Inputs' tab

This tab allows you to input the essential information needed to make your patient segmentation (in the yellow cells). Once you have filled in all information, an indicative patient segmentation and spend for each setting of care in year 0 is provided.

Instructions for Basic Assumption Inputs  
On this worksheet, you can input custom population sizes and total costs for any local health economy. This means that you can use the specific demographics and expenditures of your local population and feed them into the final output of the model. Follow Steps 1a-1d below. Input cells are marked with yellow colour.

Step 1a: Choose between three available locality archetypes: **Hybrid**

Step 1b: Input registered population for the locality: **250,000**

Estimated population breakdown of a representative CCG (based on our available datasets)

	Mostly healthy	Multiple LTI's	DM	Diabetes	Cancer	Learning Disability	Physical Disability	Overall total
CGM	17.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	17.0%
DM	12.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	12.0%
Diabetes	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Overall total	16.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	16.0%

Step 1c (optional): Override the default distribution of the population [enter percentages] - ensure that the total in Cell L34 equals to 100%

	Mostly healthy	Multiple LTI's	DM	Diabetes	Cancer	Learning Disability	Physical Disability	Overall total
CGM	17.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	17.0%
DM	12.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	12.0%
Diabetes	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Overall total	16.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	16.0%

#### 'Step 2 – Growth Inputs' tab

This tab allows you to create projected patient segmentation by inputting growth assumptions projections through to year 4 (in the yellow cells). These assumptions can be the same for all segments according to the 'Default growth rate inputs for all segments' option, or over

Instructions for Future Growth Assumption Inputs  
On this worksheet, you can input the assumptions about Year-on-Year percentage changes in segment population distribution, costs and utilisation per setting for each of the different segments. You can apply default values to all segments and then override any values for specific segment (or segments). To do so, please click "CHOOSE SEGMENT" button on the right. Then, in the section for that segment, edit any of the percentage assumptions that you would like, and the output sheet will automatically update.

Default growth rate inputs for all segments

	Year 1	Year 2	Year 3	Year 4
Population growth	0.0%	0.0%	0.0%	0.0%
Costs	0.0%	0.0%	0.0%	0.0%
Utilisation	0.0%	0.0%	0.0%	0.0%

CHOOSE SEGMENT

These are the default segment growth assumptions that apply to all segments, unless overridden by segment-specific values.

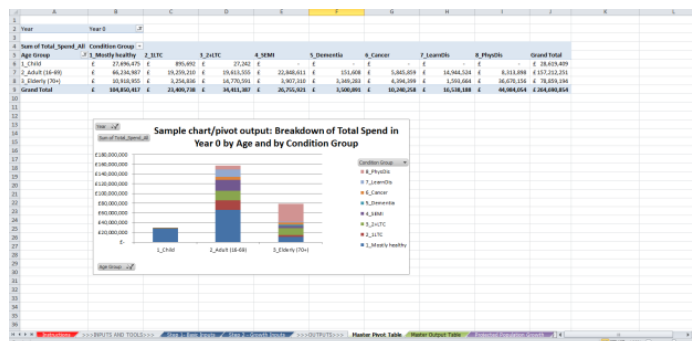
To override growth values for a combination of segments, please click on the "CHOOSE SEGMENTS" box above.

Year 0 is assumed to be the current (base) year. Usually, this implies growth rate of 0% in that year.

rides are possible for different segments to improve the accuracy of your results.

## ‘Master Pivot Table’ tab

The ‘Master Pivot Table’ tab should only be used by those with pivot-table experience. It allows you to generate new ‘cuts’ of the data and generate a corresponding pivot chart. For example, you could generate a breakdown of total spend in year 0 by age and by patient group which would tell you, that in commissioner spend terms ‘Mostly healthy’ children account for the majority of spend on children for the Hybrid archetype.



## ‘Master Output Table’ tab

This tab provides the granular output of your inputs and assumptions. Three types of results are provided for each age group and patient group, as well as at an ‘Overall’ level:

1. population projections for years 0–4
2. projections of total spend by setting of care for years 0–4
3. projections of average spend per capita.

**Instructions for Output Table**  
On this worksheet, you will be able to see the output projections for five years based on the assumptions that you entered into the input worksheets.

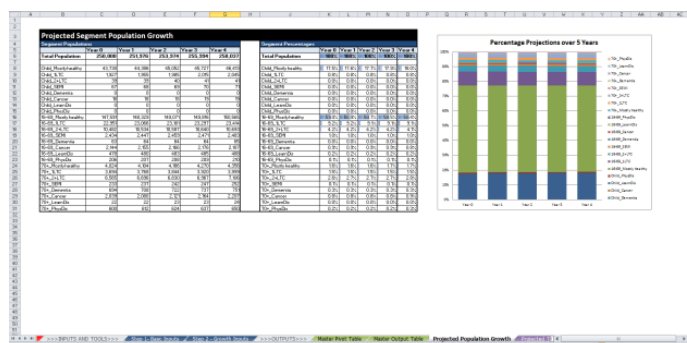
Overall						
Projections of population size	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Total population	250,000	251,976	253,974	255,994	258,037	260,104
Projections of total spend						
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
AC	9,670,878	9,690,311	9,709,744	9,729,177	9,748,610	9,768,043
NEI	71,576,886	71,576,886	71,576,886	71,576,886	71,576,886	71,576,886
EL	50,192,945	50,192,945	50,192,945	50,192,945	50,192,945	50,192,945
GP	48,272,379	48,272,379	48,272,379	48,272,379	48,272,379	48,272,379
MS	47,692,967	47,692,967	47,692,967	47,692,967	47,692,967	47,692,967
GP	38,944,335	38,944,335	38,944,335	38,944,335	38,944,335	38,944,335
Prescribing	28,812,275	28,812,275	28,812,275	28,812,275	28,812,275	28,812,275
SC	84,710,658	84,710,658	84,710,658	84,710,658	84,710,658	84,710,658
CL	12,175,040	12,175,040	12,175,040	12,175,040	12,175,040	12,175,040
<b>Total</b>	<b>430,330,361</b>	<b>430,330,361</b>	<b>430,330,361</b>	<b>430,330,361</b>	<b>430,330,361</b>	<b>430,330,361</b>
Projections of average spend						
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
<b>Total</b>	<b>1,721.32</b>	<b>1,721.32</b>	<b>1,721.32</b>	<b>1,721.32</b>	<b>1,721.32</b>	<b>1,721.32</b>

To find results for specific population segments, scroll down the table. For each population segment, the same three types of output are provided.

## ‘Projected Population Growth’ tab

The ‘Projected Population Growth’ tab focuses on the change in population composition, rather than commissioner spend. It provides three useful outputs:

1. total population (absolute numbers) for years 0–4 by patient group, eg, 16–69 Cancer
2. the composition of the total population in percentage terms for each of year 0–4 by age and patient group
3. a sample graph for the composition of the population in percentage terms for each age and patient group.

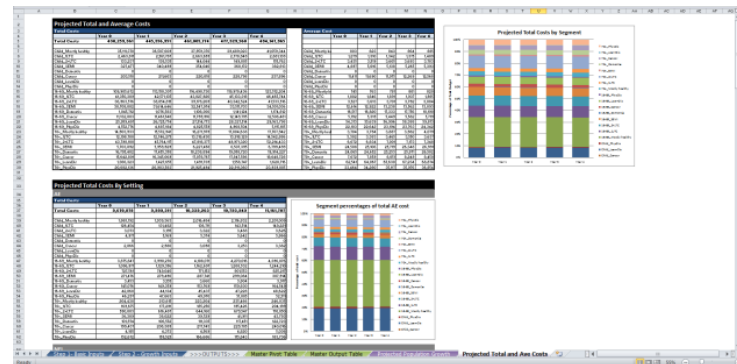




### **‘Projected Total and Ave Costs’ tab**

The ‘Projected Total and Ave Costs’ tab focuses on the composition and changes in commissioner spends. It provides several useful outputs:

1. total commissioner spend projections for years 0-4 by age and patient group
2. average commissioner spend projections for year 0-4 by age and patient group
3. a sample graph showing the percentage breakdown of total commissioner spend for each of year 0–4.



Moreover, total commissioner spend projections and the sample graph are available for each setting of care further down the worksheet.

### **Necessary data**

Before using the ‘Care Spend Estimating Tool’, you must assemble the data you will need. You can then create an indicative population segmentation for your CCG based on one of the four archetypes.

To use the tool, a minimum of four inputs are required:

1. the total population of the CCG
2. demographic growth assumptions for years 0–4 (by age group)
3. non-demographic growth assumptions (ie increase in activity per capita) by setting of care (eg whether the average number of A&E attendances per capita is likely to increase), for years 0–4
4. commissioner spend growth assumptions for each setting of care for years 0–4.

You can customise other elements of the model to obtain more accurate insights, by overriding the default settings with your CCG’s data. Inputs that can be tailored are:

1. population profile by age and patient group (eg 6% of your population is known to be 16–69 with one long term condition (LTC) rather than the default 9%)
2. total spend by setting of care for year 0

3. demographic growth assumptions for years 0-4 by patient group, as well as age group
4. non-demographic growth assumptions for increase in activity per capita by age and patient group, as well as care setting, for years 0-4
5. commissioner spend growth assumptions per patient group as well as each setting of care for years 0-4.

## Exhibit 2: Inputs required and available to tailor

The 'Care Spend Estimating Tool' can be adapted for different CCGs



Inputs required

Available to tailor

	Input	Level of detail	Sample data available	Inputs required/available to tailor
Data inputs	Total population	Total		
		By age (Child, 16-69 or 70+) and health status(e.g., Mostly health, 1 LTC)		
	Total spend	By care delivery model e.g., AE, NEL, EL		
Assumption inputs	Demographic population growth	For different years (Y0 to Y4) and by age (Child, 16-69 or 70+)		
	Non-demographic growth per capita	For different years (Y0 to Y4) and by settings of care e.g., AE, NEL		
	Project change in average cost of interactions	For different years (Y0 to Y4) and by settings of care e.g., AE, NEL		

## Inputting data

To begin creating the indicative patient segmentation, two types of input are needed: data and assumptions.

First, enter data on the 'Step 1 – Basic Inputs' tab.



Please note: only fill in data in boxes marked for inputs: no columns or rows should be unhidden and no formulas should be edited.

**Step 1.a:** Select CCG type from the drop down at (1.a) in Exhibit 3: relevant sample data will automatically enter the required fields. The 'Hybrid' option is the default. If your CCG more closely resembles a 'Rural', 'Urban high income' or 'Urban low income' locality, then select one of those options.

**Step 1.b:** Enter CCG's overall population at (1.b) in Exhibit 3

**Step 1.c (optional):** Override the default population distribution across age and health, eg, 16–69 Dementia at (1.c) in Exhibit 3.



When overriding the distribution of the population ensure that the values sum to exactly 100%. This can be checked in two ways: cell L14 continues to be equal to 100%, cell L20 reads 'Yes' indicating the override was successful

**Step 1.d (optional):** Over-ride the total spend by setting of care at point (1.d) in Exhibit 3, otherwise the sample data for per capita commissioner spend of each setting of care will be taken and applied to the total population inputted at (1.b)

## Exhibit 3: Step 1 – Basic Inputs tab

Instructions for Basic Assumption Inputs  
On this worksheet, you can input custom population sizes and total costs for any local health economy. This means that you can use the specific demographics and expenditures of your local population and feed them into the final output of the model. Follow Steps 1a-1d below. Input cells are marked with Yellow colour

**Step 1a: Choose between three available locality archetypes:** Rural

**Step 1b: Input registered population for the locality** 60,000,000

**Estimated population breakdown of a representative CGO (based on our available datasets)**

	Healthy	1 LTC	Multiple LTCs	SEMI	Dementia	Cancer	Learning Disability	Physical Disability	Grand Total
Child	16.0%	1.4%	0.3%	0.3%	0.0%	0.0%	0.0%	0.0%	17.4%
16-69	42.8%	14.9%	6.3%	0.8%	0.3%	2.4%	0.0%	0.0%	67.8%
70+	3.2%	3.8%	4.4%	0.3%	0.7%	2.8%	0.0%	0.0%	19.3%
<b>Grand Total</b>	<b>62.0%</b>	<b>20.2%</b>	<b>10.8%</b>	<b>1.0%</b>	<b>0.8%</b>	<b>5.2%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>100.0%</b>

**Step 1c (optional): Override the default distribution of the population [enter percentages]**

**Override current population breakdown (enter percentages)**

	Healthy	1 LTC	Multiple LTCs	SEMI	Dementia	Cancer	Learning Disability	Physical Disability
Child								
16-69								
70+								

**Estimated population breakdown based on user inputs**

	Healthy	1 LTC	Multiple LTCs	SEMI	Dementia	Cancer	Learning Disability	Physical Disability	Grand Total
Child	9,600,004	956,063	30,651	76,700	-	0,079	-	-	10,558,462
16-69	25,679,962	8,931,315	3,654,091	403,133	31,061	1,423,021	-	-	40,211,103
70+	1,935,666	2,330,031	2,774,511	65,111	434,652	1,645,651	-	-	9,201,350
<b>Grand Total</b>	<b>37,215,732</b>	<b>12,124,415</b>	<b>6,467,264</b>	<b>625,729</b>	<b>466,513</b>	<b>3,090,351</b>	<b>-</b>	<b>-</b>	<b>60,000,000</b>

**Estimated total spend by setting, based on estimated population**

	AE	NEL	EL	OP	MH	GP	Prescribing	SC	CC	Total
<b>Total Spend</b>	£ 21,061,734,264	£ 9,817,695,339	£ 2,929,522,059	£ 10,240,970,510	£ 9,040,643,715	£ 105,470,113,124	£ 1,755			
<b>Implied cost per capita</b>	£ 32.49	£ 351	£ 244.45	£ 16.4	£ 149	£ 151	£ 171	£ 305	£ 151	£ 1,758

**Step 1d (Optional): Override total budget for the current year (Year 0) by setting of care**

**Override total spend by setting (in year annum)**

	AE	NEL	EL	OP	MH	GP	Prescribing	Social Care	Care	Total
<b>Total Spend</b>	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ 105,470,113,124
<b>Implied cost per capita</b>	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ 1,755
<b>Delta with original per capita</b>										£ -

**Revised total spend by setting (in year annum)**

	AE	NEL	EL	OP	MH	GP	Prescribing	Social Care	Community	Total
<b>Total Spend</b>	£ 21,061,734,264	£ 9,817,695,339	£ 2,929,522,059	£ 10,240,970,510	£ 9,040,643,715	£ 105,470,113,124	£ 1,755			
<b>Implied cost per capita</b>	£ 32.49	£ 351	£ 244.45	£ 16.4	£ 149	£ 151	£ 171	£ 305	£ 151	£ 1,758

1a

1b

1c

1d

Second, assumptions, required in order to project for future years, can be entered on the 'Step 2 – Growth Inputs' tab. Growth rate assumptions could be sourced directly from the 5-year strategic plan.

**Step 2.a:** Input population change assumptions at (2.a) in Exhibit 4 for each of the three age categories

**Step 2.b:** Input non-demographic growth per capita assumptions at (2.b) in Exhibit 4 for each of the settings of care

**Step 2.c:** Input projected change in average commissioner spend of interactions ('cost uplifts and efficiency' and inflation) assumptions at (2.c) in Exhibit 4 for each of the settings of care

**Step 2.d (optional):** Tailor assumptions to specific segments, eg, 16-69 Dementia, by selecting the segment in the drop-down box at (2.d) in Exhibit 4.



Ensure all values in yellow cells are input as percentages. Where over-riding assumptions for specific patient segments, only over-ride cells which need to vary from the 'default for all segment' values, taking care not to enter anything that isn't necessary in the other cells

## Exhibit 4: Step 2 – Growth Inputs tab

	A	F	G	H	I	J	K	N
1		<b>Instructions for Future Growth Assumption Inputs:</b>						
2		On this worksheet, you can input the assumptions about Year-over-Year percentage changes in segment population distribution, costs and utilisation per setting for each of the different segments. You can apply default values to all segments and then override any values for specific segment (or segments). To do so, please click "CHOOSE SEGMENT" button on the right. Then, in the section for that segment, edit any of the percentage assumptions that you would like, and the output sheet will automatically update.						
3								
4								
5		<b>Default growth rate inputs for all segments</b>						
6		Percentage year-over-year change in population (split by 3 age categories)						
7			Year 0	Year 1	Year 2	Year 3	Year 4	
8		Child (<16) population growth	0.0%	1.5%	1.5%	1.5%	1.5%	
9		16-69 population growth	0.0%	0.5%	0.5%	0.5%	0.5%	
10		70+ population growth	0.0%	2.0%	2.0%	2.0%	2.0%	
11								
12		Projected change in average non-demographic growth per capita						
13			Year 0	Year 1	Year 2	Year 3	Year 4	
14		AE	0.0%	4.0%	4.0%	4.0%	5.0%	4.0%
15		NEL	0.0%	4.0%	4.0%	4.0%	4.0%	4.0%
16		EL	0.0%	4.0%	4.0%	4.0%	4.0%	4.0%
17		GP	0.0%	4.0%	4.0%	4.0%	4.0%	4.0%
18		PH	0.0%	4.0%	4.0%	4.0%	4.0%	4.0%
19		GP	0.0%	4.0%	4.0%	4.0%	4.0%	4.0%
20		Prescribing	0.0%	4.0%	4.0%	4.0%	4.0%	4.0%
21		SC	0.0%	4.0%	4.0%	4.0%	4.0%	4.0%
22		CC	0.0%	4.0%	4.0%	4.0%	4.0%	4.0%
23								
24		Projected change in average cost of interactions (tariff deflation + GDP inflation)						
25			Year 0	Year 1	Year 2	Year 3	Year 4	
26		AE	0.0%	-1.5%	-1.5%	-1.5%	-1.5%	-1.5%
27		NEL	0.0%	-1.5%	-1.5%	-1.5%	-1.5%	-1.5%
28		EL	0.0%	-1.5%	-1.5%	-1.5%	-1.5%	-1.5%
29		GP	0.0%	-1.5%	-1.5%	-1.5%	-1.5%	-1.5%
30		PH	0.0%	-1.5%	-1.5%	-1.5%	-1.5%	-1.5%
31		GP	0.0%	-1.5%	-1.5%	-1.5%	-1.5%	-1.5%
32		Prescribing	0.0%	-1.5%	-1.5%	-1.5%	-1.5%	-1.5%
33		SC	0.0%	-1.5%	-1.5%	-1.5%	-1.5%	-1.5%
34		CC	0.0%	-1.5%	-1.5%	-1.5%	-1.5%	-1.5%
35								
36								

**CHOOSE SEGMENT:**

These are the default segment growth assumptions that apply to all segments, unless overridden by segment-specific values.

To override growth values for a combination of segments, please click on the "CHOOSE SEGMENTS" box above.

Year 0 is assumed to be the current (base) year. Usually, this implies growth rate of 0% in that year

2d

2a

2b

2c

## Accessing outputs

If you have filled in all the necessary data, the model will calculate an extensive range of ready-to-use outputs. Population projections, commissioner spend projections and a percentage breakdown of both are available by population segment from years 0–4. Both data tables and graphs are provided. Below are some screenshots, Exhibits 5–10, which demonstrate the format of the sample outputs.

### Exhibit 5: Sample output table for overall population

Population, total spend and spend per capital projections for four years by setting of care for the total population in the locality are available on the 'Master Output Table' tab.

Overall					
Projection of population size					
	Year 0	Year 1	Year 2	Year 3	Year 4
Total population	60,000,000	60,543,930	61,094,929	61,653,112	62,218,594
Projection of total spend					
	Year 0	Year 1	Year 2	Year 3	Year 4
AE	£ 1,949,667,231	£ 2,017,352,250	£ 2,087,476,572	£ 2,180,901,967	£ 2,256,906,111
NEL	£ 21,061,734,264	£ 21,868,817,389	£ 22,707,968,146	£ 23,580,500,102	£ 24,487,781,948
EL	£ 17,066,979,343	£ 17,673,725,068	£ 18,302,959,240	£ 18,955,549,481	£ 19,632,398,102
OP	£ 9,817,685,339	£ 10,162,579,917	£ 10,520,069,867	£ 10,890,633,054	£ 11,274,766,121
MH	£ 8,929,522,059	£ 9,229,531,568	£ 9,540,006,870	£ 9,861,328,177	£ 10,193,890,084
GP	£ 9,053,382,353	£ 9,371,480,728	£ 9,701,220,953	£ 10,043,046,550	£ 10,397,418,565
Prescribing	£ 10,248,970,588	£ 10,618,123,584	£ 11,001,132,016	£ 11,398,536,422	£ 11,810,899,148
SC	£ 18,281,580,882	£ 19,021,188,970	£ 19,791,600,708	£ 20,594,127,915	£ 21,430,139,194
CC	£ 9,060,661,765	£ 9,397,972,341	£ 9,748,304,375	£ 10,112,176,978	£ 10,490,130,524
<b>Total</b>	<b>£ 105,470,183,824</b>	<b>£ 109,360,771,816</b>	<b>£ 113,400,738,748</b>	<b>£ 117,616,800,646</b>	<b>£ 121,974,329,797</b>
Projection of average spend					
	Year 0	Year 1	Year 2	Year 3	Year 4
AE	32	33	34	35	36
NEL	351	361	372	382	394
EL	284	292	300	307	316
OP	164	168	172	177	181
MH	143	152	156	160	164
GP	151	155	159	163	167
Prescribing	171	175	180	185	190
SC	305	314	324	334	344
CC	151	155	160	164	169
<b>Total</b>	<b>£ 1,758</b>	<b>£ 1,806</b>	<b>£ 1,856</b>	<b>£ 1,908</b>	<b>£ 1,960</b>

## Exhibit 6: Sample output table for population segments

Population, total spend and average spend per capita projections for four years by care setting for different population segments, eg, Child Mostly Healthy, in the locality are also available on the 'Master Output Table' tab

Child: Mostly Healthy					
Projection of population size					
	Year 0	Year 1	Year 2	Year 3	Year 4
Projected segment size as a percentage of overall population	16.0%	16.1%	16.2%	16.3%	16.4%
Population Change	9,600,084	9,744,085	9,890,246	10,038,600	10,189,179
Projection of total spend					
	Year 0	Year 1	Year 2	Year 3	Year 4
AE	£ 203,315,302.42	£ 211,400,339	£ 219,806,885	£ 230,745,299	£ 239,921,117
NEL	£ 1,029,800,388	£ 1,070,751,431	£ 1,113,330,932	£ 1,157,603,650	£ 1,203,636,917
EL	£ 593,968,524.46	£ 617,588,277	£ 642,147,292	£ 667,682,921	£ 694,234,000
OP	£ 882,753,967.14	£ 917,857,561	£ 954,357,085	£ 992,308,049	£ 1,031,768,171
MH	£ 251,436,517	£ 261,435,142	£ 271,831,372	£ 282,641,018	£ 293,880,521
GP	£ 489,221,175	£ 508,675,545	£ 528,903,536	£ 549,935,914	£ 571,804,666
Prescribing	£ 458,182,057	£ 476,402,125	£ 495,346,731	£ 515,044,690	£ 535,525,957
SC	£ 68,543,229	£ 71,268,919	£ 74,102,999	£ 77,049,779	£ 80,113,740
CC	£ 1,294,635,772	£ 1,346,118,258	£ 1,399,647,996	£ 1,455,306,399	£ 1,513,178,113
<b>Total</b>	<b>£ 5,271,856,933</b>	<b>£ 5,481,497,596</b>	<b>£ 5,699,474,829</b>	<b>£ 5,928,317,719</b>	<b>£ 6,164,063,202</b>
Projection of average spend					
	Year 0	Year 1	Year 2	Year 3	Year 4
AE	£ 21	£ 22	£ 22	£ 23	£ 24
NEL	£ 107	£ 110	£ 113	£ 115	£ 118
EL	£ 62	£ 63	£ 65	£ 67	£ 68
OP	£ 92	£ 94	£ 96	£ 99	£ 101
MH	£ 26	£ 27	£ 27	£ 28	£ 29
GP	£ 51	£ 52	£ 53	£ 55	£ 56
Prescribing	£ 48	£ 49	£ 50	£ 51	£ 53
SC	£ 7	£ 7	£ 7	£ 8	£ 8
CC	£ 135	£ 138	£ 142	£ 145	£ 149
<b>Total</b>	<b>£ 549</b>	<b>£ 563</b>	<b>£ 576</b>	<b>£ 591</b>	<b>£ 605</b>

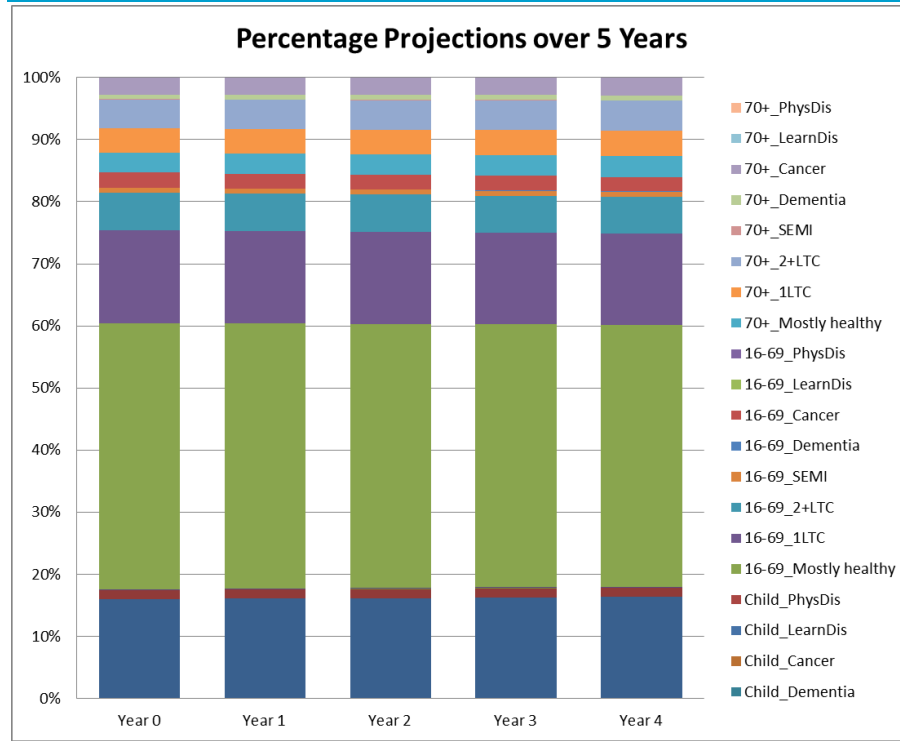
## Exhibit 7: Population projections by age and patient group

Population projections for different population segments e.g., Child Mostly Healthy, in the locality are also available on the 'Projected population growth' tab

Projected Segment Population Growth					
Segment Populations					
	Year 0	Year 1	Year 2	Year 3	Year 4
<b>Total Population</b>	<b>60,000,000</b>	<b>60,543,930</b>	<b>61,094,929</b>	<b>61,653,112</b>	<b>62,218,594</b>
Child_Mostly healthy	9,600,084	9,744,085	9,890,246	10,038,600	10,189,179
Child_ILTC	856,068	868,909	881,943	895,172	908,600
Child_2+LTC	38,651	39,231	39,819	40,417	41,023
Child_SEMI	76,780	77,931	79,100	80,287	81,491
Child_Dementia	0	0	0	0	0
Child_Cancer	8,879	9,012	9,148	9,285	9,424
Child_LearnDis	0	0	0	0	0
Child_PhysDis	0	0	0	0	0
16-69_Mostly healthy	25,679,962	25,808,362	25,937,404	26,067,091	26,197,426
16-69_ILTC	8,938,315	8,983,007	9,027,922	9,073,061	9,118,427
16-69_2+LTC	3,654,091	3,672,361	3,690,723	3,709,176	3,727,722
16-69_SEMI	483,138	485,554	487,982	490,421	492,874
16-69_Dementia	31,861	32,020	32,180	32,341	32,503
16-69_Cancer	1,423,821	1,430,940	1,438,095	1,445,285	1,452,512
16-69_LearnDis	0	0	0	0	0
16-69_PhysDis	0	0	0	0	0
70+_Mostly healthy	1,935,686	1,974,400	2,013,888	2,054,166	2,095,249
70+_ILTC	2,330,031	2,376,632	2,424,164	2,472,648	2,522,101
70+_2+LTC	2,774,518	2,830,009	2,886,609	2,944,341	3,003,228
70+_SEMI	65,811	67,127	68,470	69,839	71,236
70+_Dementia	436,652	445,385	454,293	463,379	472,647
70+_Cancer	1,665,651	1,698,964	1,732,943	1,767,602	1,802,954
70+_LearnDis	0	0	0	0	0
70+_PhysDis	0	0	0	0	0
Segment Percentages					
	Year 0	Year 1	Year 2	Year 3	Year 4
<b>Total Population</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>
Child_Mostly healthy	16.0%	16.1%	16.2%	16.3%	16.4%
Child_ILTC	1.4%	1.4%	1.4%	1.5%	1.5%
Child_2+LTC	0.1%	0.1%	0.1%	0.1%	0.1%
Child_SEMI	0.1%	0.1%	0.1%	0.1%	0.1%
Child_Dementia	0.0%	0.0%	0.0%	0.0%	0.0%
Child_Cancer	0.0%	0.0%	0.0%	0.0%	0.0%
Child_LearnDis	0.0%	0.0%	0.0%	0.0%	0.0%
Child_PhysDis	0.0%	0.0%	0.0%	0.0%	0.0%
16-69_Mostly healthy	42.8%	42.6%	42.5%	42.3%	42.1%
16-69_ILTC	14.9%	14.8%	14.8%	14.7%	14.7%
16-69_2+LTC	6.1%	6.1%	6.0%	6.0%	6.0%
16-69_SEMI	0.8%	0.8%	0.8%	0.8%	0.8%
16-69_Dementia	0.1%	0.1%	0.1%	0.1%	0.1%
16-69_Cancer	2.4%	2.4%	2.4%	2.3%	2.3%
16-69_LearnDis	0.0%	0.0%	0.0%	0.0%	0.0%
16-69_PhysDis	0.0%	0.0%	0.0%	0.0%	0.0%
70+_Mostly healthy	3.2%	3.3%	3.3%	3.3%	3.4%
70+_ILTC	3.9%	3.9%	4.0%	4.0%	4.1%
70+_2+LTC	4.6%	4.7%	4.7%	4.8%	4.8%
70+_SEMI	0.1%	0.1%	0.1%	0.1%	0.1%
70+_Dementia	0.7%	0.7%	0.7%	0.8%	0.8%
70+_Cancer	2.8%	2.8%	2.8%	2.9%	2.9%
70+_LearnDis	0.0%	0.0%	0.0%	0.0%	0.0%
70+_PhysDis	0.0%	0.0%	0.0%	0.0%	0.0%

## Exhibit 8: Sample graph showing population composition over time

Charts of population composition projections in the locality are also available on the 'Projected population growth' tab



## Exhibit 9: Total and average commissioner spend projections by age and health status

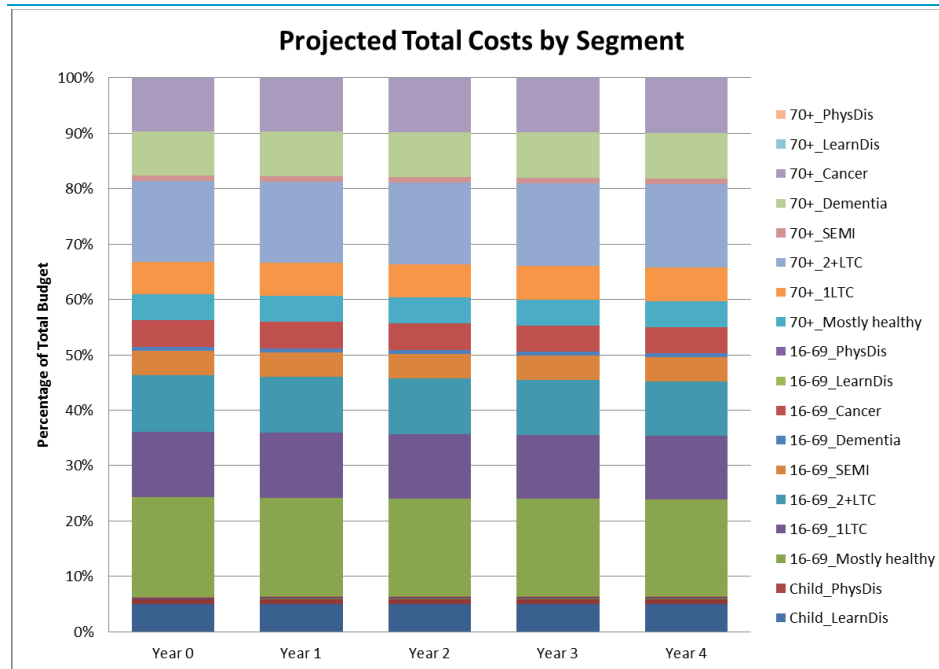
Total and average commissioner spend projections for different population segments, eg, Child Mostly Healthy, in the locality are also available on the 'Projected total and ave costs' tab

Projected Total and Average Costs						Average Cost					
Chart Area	Year 0	Year 1	Year 2	Year 3	Year 4		Year 0	Year 1	Year 2	Year 3	Year 4
<b>Total Costs</b>	<b>105,470,183,824</b>	<b>109,360,771,816</b>	<b>113,400,738,748</b>	<b>117,616,800,646</b>	<b>121,974,329,797</b>						
Child_Mostly healthy	5,271,856,933	5,481,497,596	5,699,474,829	5,928,317,719	6,164,063,202	Child_Mostly healthy	549	563	576	591	605
Child_1LTC	867,897,769	902,410,532	938,295,851	976,088,227	1,014,903,352	Child_1LTC	1,014	1,039	1,064	1,090	1,117
Child_2+LTC	125,971,503	130,980,886	136,189,471	141,637,658	147,270,021	Child_2+LTC	3,259	3,339	3,420	3,504	3,590
Child_SEMI	288,348,027	293,614,475	311,736,897	324,192,232	337,084,123	Child_SEMI	3,756	3,847	3,941	4,038	4,136
Child_Dementia	0	0	0	0	0	Child_Dementia	0	0	0	0	0
Child_Cancer	161,445,259	167,865,292	174,540,623	181,487,994	188,705,045	Child_Cancer	18,182	18,626	19,080	19,547	20,024
Child_LearnDis	0	0	0	0	0	Child_LearnDis	0	0	0	0	0
Child_PhysDis	0	0	0	0	0	Child_PhysDis	0	0	0	0	0
16-69_Mostly healthy	18,923,378,244	19,482,034,217	20,057,182,831	20,655,154,634	21,264,936,109	16-69_Mostly healthy	737	755	773	792	812
16-69_1LTC	12,460,912,874	12,828,783,944	13,207,515,304	13,600,655,711	14,002,174,268	16-69_1LTC	1,394	1,428	1,463	1,499	1,536
16-69_2+LTC	10,741,896,498	11,059,020,825	11,385,505,238	11,723,717,276	12,069,824,858	16-69_2+LTC	2,940	3,011	3,085	3,161	3,238
16-69_SEMI	4,677,803,068	4,815,901,171	4,958,076,205	5,105,264,440	5,255,982,057	16-69_SEMI	9,682	9,918	10,160	10,410	10,664
16-69_Dementia	740,459,563	762,319,410	784,824,604	808,008,553	831,862,582	16-69_Dementia	23,240	23,807	24,388	24,984	25,593
16-69_Cancer	5,127,728,422	5,279,109,220	5,434,959,083	5,596,062,253	5,761,269,203	16-69_Cancer	3,601	3,689	3,779	3,872	3,966
16-69_LearnDis	0	0	0	0	0	16-69_LearnDis	0	0	0	0	0
16-69_PhysDis	0	0	0	0	0	16-69_PhysDis	0	0	0	0	0
70+_Mostly healthy	4,852,876,117	5,070,712,021	5,298,326,142	5,536,633,729	5,785,162,144	70+_Mostly healthy	2,507	2,568	2,631	2,695	2,761
70+_1LTC	6,219,683,197	6,498,872,336	6,790,593,718	7,096,138,605	7,414,670,075	70+_1LTC	2,669	2,734	2,801	2,870	2,940
70+_2+LTC	15,322,018,852	16,003,734,680	16,728,442,343	17,481,416,442	18,266,122,264	70+_2+LTC	5,522	5,657	5,795	5,937	6,082
70+_SEMI	1,004,348,611	1,049,431,812	1,096,536,707	1,145,902,807	1,197,340,032	70+_SEMI	15,261	15,633	16,015	16,408	16,806
70+_Dementia	8,480,582,019	8,861,258,385	9,253,022,551	9,675,203,045	10,109,503,560	70+_Dementia	19,422	19,896	20,361	20,880	21,353
70+_Cancer	10,202,373,866	10,660,364,957	11,139,514,352	11,640,919,260	12,163,456,043	70+_Cancer	6,126	6,275	6,428	6,586	6,746
70+_LearnDis	0	0	0	0	0	70+_LearnDis	0	0	0	0	0
70+_PhysDis	0	0	0	0	0	70+_PhysDis	0	0	0	0	0



## Exhibit 10: Sample graph showing projected commissioner spend composition by age and health status

Charts of projected total and average commissioner spend composition by age and health status in the locality are also available on the 'Projected total and ave costs' tab



In addition to these, there is a ready-to-use standard Microsoft Excel pivot table for other cuts of the projected data (see 'Master Pivot Table' tab). (Note: prior experience of pivot tables is required.) The source data for this pivot table comes from the 'Master Output Table' tab.

## Cost saving worksheet

This section describes the tab 'Cost saving worksheet'. The subsections below mirror the previous sections and should be regarded in the same way.

### Overview of the tab

#### 'Cost saving worksheet' tab

This tab allows you to gain a quick overview of the savings required to meet a particular inputted budget target. Moreover, it provides a breakdown, by patient and age group, of the yearly total spend to reach this budget target.

The screenshot shows the 'Cost saving worksheet' tab. At the top, there are instructions: 'Instructions for Cost Saving Worksheet: This worksheet allows a quick back of the envelope way to calculate the required savings to meet a particular budget target by a certain date, as well as select specific segments to determine their segment-specific target budgets to meet the overall target. Input cells are marked with yellow colour.' Below this, Step A asks to select the target year, with a dropdown menu showing '2'. Step B asks to enter the total target budget in Year 2 (in £), with a text box containing '£ 400,000,000'. There is a table for 'Patient profile spend' with columns for 'Year 1', 'Year 2', 'Year 3', 'Year 4', and 'Year 5'. The table shows values for 'Patient profile spend', 'Patient profile spend - growth (compound)', and 'Patient profile spend - growth (linear)'. An 'Optional step' asks to enter the override to the default savings ramp up rate, with a text box containing '0.05'.

#### Necessary data

Before starting to use the 'Cost saving worksheet', assemble all the data you will need.

To use the tab, at minimum, two inputs are required:

1. the year in which your target budget needs to be met
2. your budget in a single given year

To obtain a more accurate overview of savings required, it is possible to customise the forecasts. The input that can be tailored is:

- a. Savings ramp up rate, allowing you to 'phase' the rate at which the target budget is met in the intervening years

#### Inputting data

To begin using the 'Cost saving worksheet', two inputs are needed: target budget and the year in which it needs to be met.



Please note: only fill in data in boxes marked for inputs: no columns or rows should be unhidden and no formulas should be edited.

**Step a:** Select the target year from the drop-down at (A) in Exhibit 11. The options in the drop-down refer to the number of years post your 'current year' data in year 0.

**Step b:** Enter the total target budget at (B) in Exhibit 11.

**Step c (optional):** Override the default savings ramp-up rate at (C) in Exhibit 11, otherwise a linear extrapolation across years is used, ie, the same proportion of the gap to target budget forms required savings in the intervening years between current year and target year.

**Step d (optional):** Select segments from the drop-down lists at (D) in Exhibit 11 to see an indicative target spend per segment.

## Exhibit 11: 'Cost saving worksheet' tab

	A	B	C	D	E	F	G	H	
1									
2	<b>Instructions for Cost Saving Worksheet</b>								
3	This worksheet allow a quick back of the envelope way to calculate the required savings to meet a particular budget target by a certain date, as well as select specific segments to determine their segment-specific target budgets to meet the overall target. Input cells are marked with Yellow								
4									
5									
6	Step A: Please select the target year, by the end of which the target budget needs to be met				2				
7									
8	Step B: Please enter the total target budget in Year 2 (in £)				£ 400,000,000				
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## Accessing outputs

If you have filled in all the necessary data, the worksheet will create several useful outputs. These give an overview of the total spend and spend per age and patient group. Screenshots of these are shown in Exhibits 12 and 13.

## Exhibit 12: Sample outputs for total spend

Absolute and percentage gaps between forecast and the target budget are available on the 'Cost saving worksheet' tab. This calculated the 'required savings', yearly, from projections in order to meet the target budget in the target year at the 'ramp-up' rate required.

Step A: Please select the target year, by the end of which the target budget needs to be met

2

Step B: Please enter the total target budget in Year 2 (in £)

£ 400,000,000

Current Budget (Year 0)	Implied cumulative growth (savings) rate	Implied compounded annual saving rate
£ 430,259,361	-7.03%	-3.58%

Forecast yearly spend	Year 0	Year 1	Year 2	Year 3	Year 4
Total Spend under current growth assumptions	£430,259,361	£439,665,675	£450,731,734	£469,176,653	£483,608,451
Assumed savings ramp up rate (using linear extrapolation)	n/a	50.0%	50.0%	0.0%	0.0%

Optional step: Please enter the override to the default savings ramp-up rate, if needed

Year 1	Year 2	Year 3	Year 4	Cumulative
				100.0%

Yearly total spend to achieve target	Year 0	Year 1	Year 2	Year 3	Year 4	
Ramp-up rate post over-ride		50%	50%	0%	0%	100.0%
Total spend to achieve target	£430,259,361	£415,129,681	£400,000,000	£416,368,867	£429,176,306	
Required savings	n/a	£24,535,994	£50,731,734	£52,807,786	£54,432,145	
% Change in Spend from Previous Year	n/a	-3.52%	-3.64%	4.09%	3.08%	
% Change in Spend from Base projection		-5.58%	-11.26%	-11.26%	-11.26%	

## Exhibit 13: Sample outputs for spend by segment

Required spend per segment, to meet the target budget in the target year, is also available. This calculation keeps the percentage of total spend per segment constant across time and as such should be treated as indicative. This represents one way of attributing the required savings across segments.

Optional step: Please choose specific segments from the droplist below to identify target budget by year for those segments to fit within the overall savings trajectory

Target spend by individual segment	Year 0	Year 1	Year 2	Year 3	Year 4
Child_Mostly healthy	£ 35,111,370	£ 33,876,711	£ 32,642,051	£ 33,977,835	£ 35,022,987
	£ -	£ -	£ -	£ -	£ -
	£ -	£ -	£ -	£ -	£ -
	£ -	£ -	£ -	£ -	£ -
	£ -	£ -	£ -	£ -	£ -
	£ -	£ -	£ -	£ -	£ -
	£ -	£ -	£ -	£ -	£ -
	£ -	£ -	£ -	£ -	£ -
	£ -	£ -	£ -	£ -	£ -
	£ -	£ -	£ -	£ -	£ -

## Appendix

### Frequently asked questions

#### **Where did the four CCG archetypes come from?**

They were based on previous work with aggregated and anonymised data from areas that were part of the 'Payment Innovation and Local Support' (PILS) project. This underlying data can give an estimate of your CCG, but may not be completely accurate so there are various over-rides that enable you to tailor the outputs to your area.

#### **How do I determine which archetype my CCG falls into?**

It is up to you to decide what archetype would fit your CCG best. If you are not sure, the 'Hybrid' archetype should be used as a default.

#### **How is the Hybrid archetype calculated?**

The 'Hybrid' archetype is a population-weighted average of the Urban high income, Urban low income and Rural archetypes. Where any of these archetypes is missing data, the Hybrid scenario would effectively 'ignore' these particular areas because the population-weighting would lead to a zero-weighting.

#### **Where did the 'patient groups', eg long term condition, dementia, come from?**

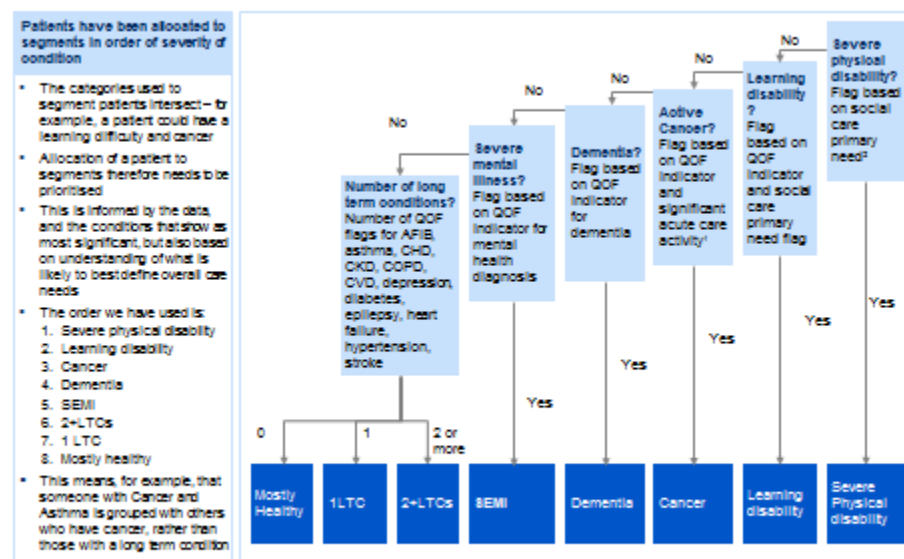
This segmentation is based on multivariate regression analysis of the original underlying datasets from various localities that was conducted as part of the 'Payment Innovation and Local Support' (PILS) project. As a result, common segmentation variables were selected. This approach was developed for the Care Spend Estimating Tool and might not align with the national view of what the approach to segmentation should be.

#### **What do I do if there is a patient who falls into more than one health category, eg, they have cancer and multiple long term conditions?**

Exhibit 14 below is a diagram of the logic flow used by the tool, showing that some patient groups effectively take precedence.

## Exhibit 14: Logic flow used to allocate patients to each segment

### Order of allocation of patients



<sup>1</sup> Acute care above average for a healthy individual

<sup>2</sup> Indicates 'critical', 'substantial', or 'greater/moderate' needs according to FACS eligibility

0

### How was a long term condition defined?

LTCs were identified according to Quality and Outcomes Framework (QOF) flags (eg patients with a long term condition have a QOF flag).

### What assumptions underpin the 'Mostly Healthy' patient group?

The 'Mostly Healthy' patient group is formed of those who do not fall into the other categories but may require care as a result of a 'catastrophic' event.

### Can I cut the data for different age profiles?

Unfortunately all data is set at the level of Child, 16–69 and 70+ and cannot be reclassified according to different cut-offs.

### Can I amend the proportion of a setting of care's commissioner spend which is attributed to each age and patient group?

It is not possible to adjust these assumptions, which are formed on the basis of our sample archetype data, at this time. We would recommend building a patient-level linked database to do a bottom-up patient segmentation if this level of accuracy is required.

**Do I have to enter growth assumptions for every age/health status profile?**

No. The 'default growth rate inputs' you input will be applied to every age/health status profile unless that specific profile has an override.

**Where can I find my growth assumptions?**

Depending on your CCG, five year strategic plans are usually a good source of growth assumptions. For demographic growth assumptions, ONS projections for your locality should be used. Otherwise the default growth assumptions in the original model could be used as these represent the outcome of expert interviews and ONS data.

**In the 'Cost saving worksheet' tab, can I input multiple target budgets in different target years?**

Unfortunately, only one target budget can be entered in a single target year.

**In the 'Cost saving worksheet' tab, what happens after I reach my target budget in my target year?**

Once the target budget is met in the target year, subsequent years' forecasts are made by multiplying the target budget by the projected growth in spend according to the inputs assumptions previously provided: demographic, non-demographic and cost growth.

**Who should I contact with any other queries?**

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## Terms and acronyms

AE	Accident and Emergency attendances
CC	Community care
EL	Elective admissions
GP	General practitioner/primary care
LearnDis	Learning disability
LTC	Long term condition
MH	Mental health
NEL	Non-elective admissions
OP	Outpatient attendances
PhysDis	Physical disability
SC	Social care
SEMI	Severe enduring mental illness

## How are the outputs calculated?

The methodology for calculating outputs differs between calculating year 0 values and year 1–4 values. Moreover, the methodology is slightly adapted, according to the data which is customised by individual CCGs. Exhibit 15 below provides a flowchart of calculations

### Year 0

**Population:** The total population is an input from CCGs, the distribution by patient group is taken from our sample archetype data, unless an over-ride is applied

**Total spend by setting of care:** The total spend by care setting is calculated by taking the population for the CCG and multiplying it by commissioner spend per capita for each care setting taken from our sample archetype data, unless an over-ride is applied

**Spend by age, patient group and setting of care:** In order to break down the total spend by care setting into spend by patient group and setting of care, the percentage of total care setting spend made up for by each patient group – according to our sample archetype data – is applied to the total spend by care setting.

### Year 1–4

**Population:** The total population for future years takes the Year 0 population by age and patient group and multiplies it by the population growth assumption: at minimum, this is by age, however, it is possible to make assumptions for individual patient groups.



**Total spend by setting of care:** The total spend by care setting is calculated by multiplying future population projections by age and patient group by the average commissioner spend of each care setting for each relevant age and patient group.

**Spend by age, patient group and setting of care:** To calculate spend by age, patient group and care setting, the corresponding output from Year 0 is converted into a per capita spend by age, patient group and setting of care. This is then multiplied by the non-demographic and commissioner spend growth assumptions. The projected per capita spend is then multiplied by the size of the relevant population group.

### **Cost saving worksheet**

**Total spend under current growth assumptions:** See 'Total spend by setting of care' for Year 1-4 above.

**Assumed savings ramp up rate:** The assumed percentages spread the required savings evenly over the years between current year and the target year, ie, if the target needs to be reached in two years, each of these two years must lead to savings relative to the previous year of 50% of the total required savings; if the target needs to be reached in three years, then each year would be allocated 33% of the total required savings in year-on-year savings.

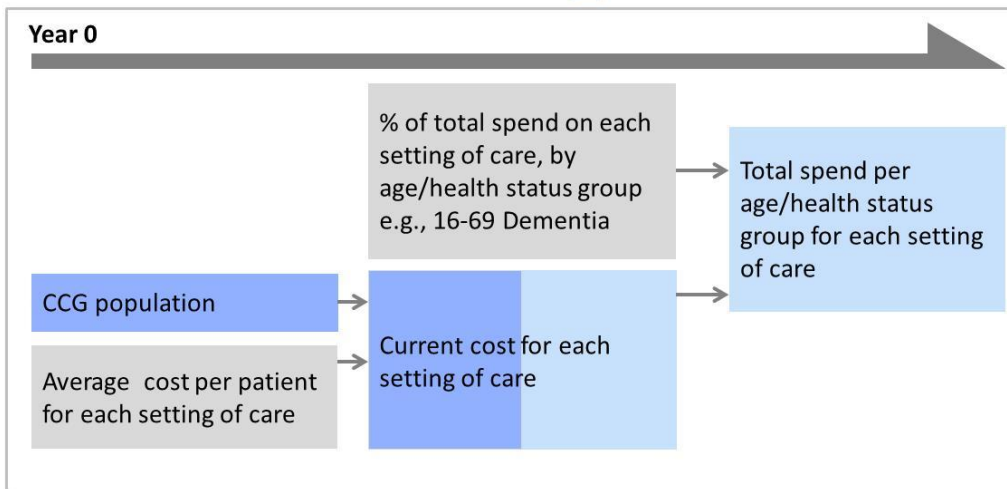
**Total spend to achieve target:** The total spend to achieve target is calculated in years prior to the target year by multiplying the difference between current (year 0) spend and the target spend, by the 'assumed savings ramp up rate', ie, the phasing of how the savings should be delivered, and adding this to the previous year's spend. Once the target spend has been reached in the target year, the rate of growth forecast from demographic, non-demographic and cost projections are applied.

**Target spend by individual segment:** Year 0 spend by segment (See 'Spend by age, patient group and setting of care' for Year 0 above) is multiplied by the rate of change of total spend. It is worth noting that this represents one of many possible ways to allocate spend across segments.

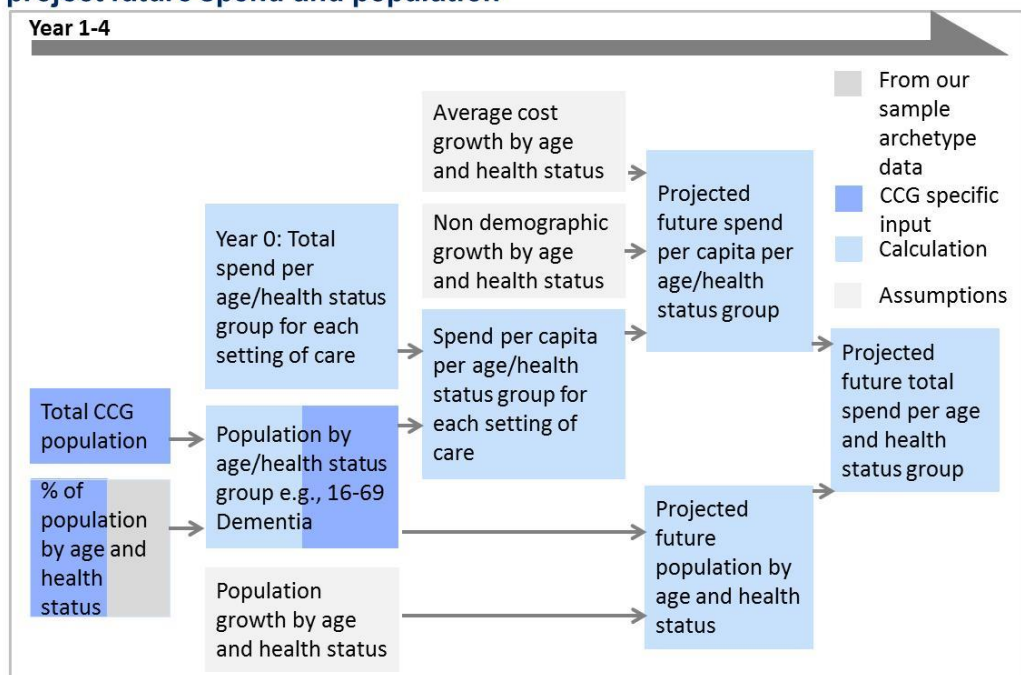
## Exhibit 15: Model logic flowchart

The 'Care Spend Estimating Tool' uses intuitive calculations to generate an indicative population and cost segmentation

- From our sample Archetype data
- CCG specific input
- Calculation



The 'Care Spend Estimating Tool' decomposes growth assumptions to project future spend and population





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