Transforming urgent and emergency care services in England

Urgent & Emergency Care Consolidated Channel Shift Model User Guide

NHS North of England Commissioning Support (NECS)
Capita
NHS England

Urgent and Emergency Care Consolidated Channel Shift Model User Guide

Version number: 1.0

First published: February 2017

NHS Gateway approval no. 06315

Prepared by: NHS North of England Commissioning Support (NECS); Capita; Urgent & Emergency Care (Acute Care), NHS England

Classification: OFFICIAL

Acknowledgments

The Urgent and Emergency Care Vanguard Channel Shift Modelling project has used the cumulative skills of people from a wide number of NHS Organisations. We would like to acknowledge the time and commitment of colleagues from the Urgent and Emergency Care (UEC) vanguards for proactively engaging with the project team.

Endorsement

The Consolidated Channel Shift Model has been endorsed by Gwyn Bevan, Professor of Policy Analysis at London School of Economics and Political Science who says “The Consolidated Channel Shift Model is vital in helping Sustainability and Transformation Boards (STBs) [within Sustainability and Transformation Plan (STP) footprints] work through options to understand what real financial savings can be released through channel shifts; the key elements being introducing thresholds at which staff savings can be made and working out, through the determination factor, the scale of likely savings. This will require people to think through both the scale at which even minimal savings can be made and the gulf between these, and what the activity change at tariff would be.

This model, if used appropriately by STBs will enable them to assess what changes in channel shifts, if any, make material savings and understand what they need to do to make them happen. It ought also to provoke questions about looking for savings in saved costs that seem to be unaffected by even large shifts in activity across channels.”

Equality and Health Inequalities

Promoting equality and addressing health inequalities are at the heart of NHS England’s values. Throughout the development of the policies and processes cited in this document, we have:

- Given due regard to the need to eliminate discrimination, harassment and victimisation, to advance equality of opportunity, and to foster good relations between people who share a relevant protected characteristic (as cited under the Equality Act 2010) and those who do not share it; and

- Given regard to the need to reduce inequalities between patients in access to, and outcomes from healthcare services and to ensure services are provided in an integrated way where this might reduce health inequalities.

Users are reminded to pay due regard to the two duties above when this guidance is implemented locally.

Technical Requirements

The Consolidated Channel Shift Model runs on Excel 2010 and later versions.

Terms and Conditions

By using the Consolidated Channel Shift Model, you are deemed to have accepted its terms and conditions of use.

1 Document summary

1.1 Background

NHS England has expressed a strategic intent to connect all urgent and emergency care (UEC) services together so the overall system becomes more than just the sum of its parts. This entails dissolving traditional boundaries between hospital and community based services and supporting the free flow of information and specialist expertise needed to achieve the delivery of patient care in the most appropriate and convenient setting.

UEC Interventions, as initially set out in the UEC Review End of Phase 1 report, are purposefully designed to address the reality that much UEC activity is taking place in a sub-optimal setting of care. The interventions shift activity to the most appropriate setting of care and away from less appropriate settings of care. This is called **channel shift.** There is an expectation that channel shift will always improve quality and, in most cases, that it will be more efficient. In some cases, channel shift will also result in cash releasing savings.

As a result of a set of UEC interventions, the channel shift effect may be represented in a diagram like this:

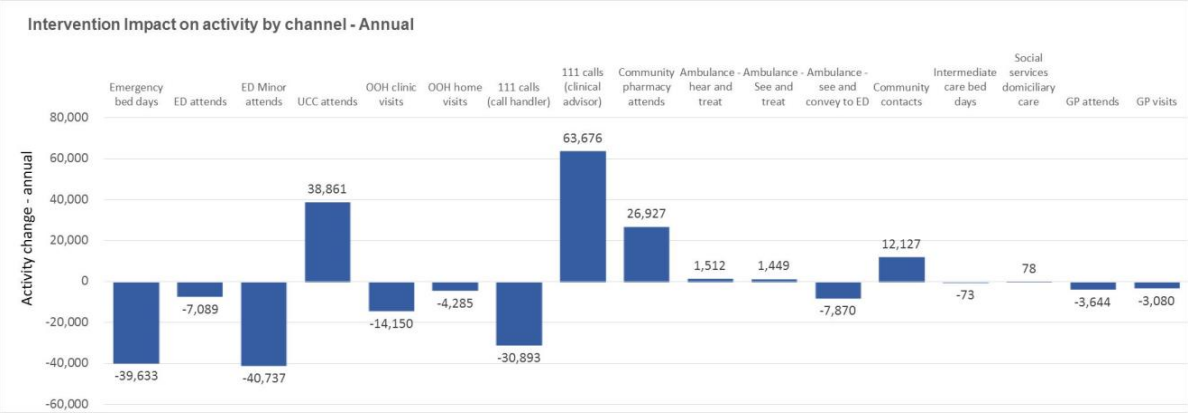


Figure 1: System channel shift effect on UEC channels

Many UEC interventions designed in local health economies are also intended to improve the quality of care through a shift in activity. A local health economy might implement a number of UEC interventions; there is no single point solution to ease the pressure on UEC services; it is the combined effect of a number of interventions that makes the difference.

The difference must be appreciated as a **system change**; some parts of the system will have to do more, other parts of the system will do less. NHS England have commissioned a Consolidated Channel Shift Model (CCSM) which allows system leaders to be informed on three key areas:

- firstly to understand the system effects of individual UEC interventions on activity;

- secondly to understand the consolidated system effects of combining different UEC interventions;
- thirdly to appreciate the system financial implications of system activity shift.

The Consolidated Channel Shift Model is actually a suite of models. Each national intervention has its own model and local areas are easily able to construct additional models within the suite to represent UEC interventions that are designed locally. There is an overarching model which brings all the UEC intervention models together and calculates their combined effect.

The purpose of the CCSM suite is to provide system leaders with a tool for system thinking: the model will underpin the local debate on the journey to accountable care.

1.2 Purpose of this document

This document describes how to populate and use the CCSM suite.

1.3 Intended readership

The intended readership for this document are those responsible for the business intelligence which underpins strategic system planning including strategic finance. This may be at CCG, A&E Delivery Board, UEC Network or STP footprint level.

1.4 Structure of this document

The user guide has two main parts plus a set of appendices. This reflects the structure of the modelling suite. The modelling suite comprises a set of UEC intervention models which are brought together within a *Consolidated Channel Shift Model.* **This document also contains a Quick Start Guide in Annex 3** to help users get a sense of what the model is capable of and how to navigate it.

Each intervention model captures the dynamic relationship between activity shift and cost shift as a result of a specific scheme or initiative for the local urgent and emergency care system. A local area may have a number of schemes intended to shift activity within its local urgent and emergency care system. Each one of these UEC initiatives will have a distinct model within this modelling suite. Although each UEC initiative will have a separate model, the model for each UEC initiative follows the same set of questions and is built round the same schema. The Consolidated Model then brings all the separate intervention models together to calculate the combined system effect of the selected local initiatives.

The first main part of the user guide describes the *Consolidated Channel Shift Model*. This is where the user is required to input fields describing the local operational context and the local cost assumptions. The Consolidated Model requires the user to select which local initiatives will contribute to the system change.

The second main part of the user guide describes a generic UEC intervention. It is here that the user is required to provide information on the resourcing required for the intervention and the capacity that will be thereby generated. The user will also

supply parameters that estimate the likely effect that the initiative will have on the UEC channels.

The appendices contain more detailed descriptions of intervention models specific to a set of UEC interventions defined by NHS England. This set includes 10 national UEC intervention models recommended by the Keogh review and a further set of out of hospital interventions that have been promoted by the UEC vanguard sites.

2 Model Overview

2.1 How the suite of models will be used

The Consolidated Channel Shift Model suite should be used as a system wide planning tool. As such, the inputs for the model should be agreed system wide. The inputs required fall into one of two categories: inputs that are system wide and inputs that are specific to particular UEC interventions.

Inputs that are system wide:

A. Local cost data
B. Baseline activity and demographic information
C. Population
D. Inflation and activity growth assumptions
E. Workforce cost assumptions

Inputs that are specific to particular UEC interventions

F. The quantified opportunity for the intervention to make a difference
G. Resource assumptions for the intervention to make a difference
H. Data on set up costs
I. Activity shift parameters to quantify the effectiveness of an intervention in deflecting activity to an alternative channel

The CCSM suite should be owned by the local Sustainability and Transformation Board. The detailed running of the model should be the responsibility of the Director whose portfolio includes Business Intelligence and delegated to experts within his/her team.

Once the CCSM suite is populated, it can form the basis of a system wide decision conference. This would allow system leaders to consider the system effects of combined interventions and the financial impact of the system change. These would include pressure on incumbent providers arising from stranded assets in addition to increased income to providers of new services. Transformation will have different impacts on different organisations but the imperative is that the system improves the patient experience and patient outcomes whilst maximising the effectiveness of system resources.

2.2 A note on the need for local data

Each of the intervention models contained within the modelling suite should be populated with local data covering points F, G, H and I above.

Point F is specifically the activity data for each channel.

Point G is the local staffing and other running costs required for the intervention.

Point H is any specific initial set up costs for the intervention.

Point I is more subtle. It is the quantification of the difference the intervention is expected to make. For every 100 contacts, how many have been shifted from an alternative UEC channel. This set of numbers describes the anticipated effect of the intervention.

All of these are pre-populated in the model, but of course for this to make sense the figures must be reviewed and modified for each local area. The figures in point I are pre-populated using the best available evidence. However, local users may be aware of specific local evidence that provides a better local guide. The figures in point I really set the expectation for any new intervention and should ideally be tracked closely as part of the performance management of the new intervention.

2.3 Structure of the CCSM suite

The Consolidated Channel Shift Model is an Excel workbook which consists of a number of worksheets. The user is able to navigate through the workbook using the links provided.

The diagram below illustrates the concept behind the CCSM suite and its structure.

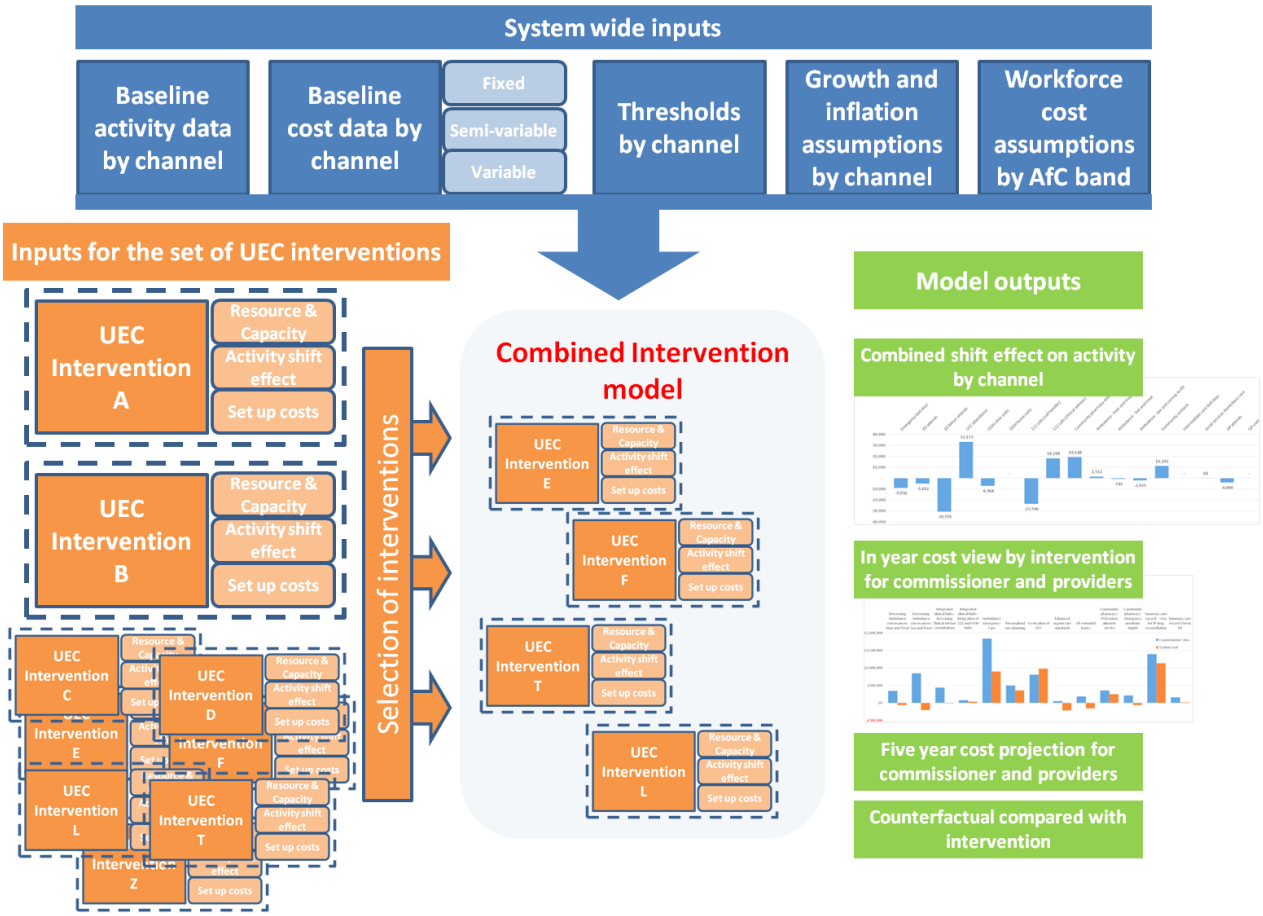


Figure 2: How the whole model is assembled

2.4 Validation of the Models

Every model is necessarily a simplification of a real world situation. To that extent, every model is wrong in some way or another. The question is, whether the model is *useful* – that is, does it adequately capture the right aspects of the issue under consideration and provide insight into it? Is it sufficiently rich to represent the dynamics of the situation so that when people explore alternative scenarios, they are confident that the model outputs will be reasonable?

In any model, there is also always a trade-off to be made between complexity and transparency. If a model becomes so sophisticated that it becomes fiendishly complicated to populate with data and the internal workings of the model are understood by only a very few people, then the model becomes a "black box" and people quite reasonably become suspicious of its outputs.

A successful model is one that adequately represents a complex problem in a way which people understand without being simplistic.

In the development of this modelling suite we have been careful to work with seven UEC vanguard sites to "validate" the models and the parameters in them. This means:

1. Checking the model logic to make sure that it is transparent yet sufficiently rich to capture the nature of the individual interventions.
2. Confirming that the input parameters to each of the intervention models are reasonable.
3. Confirming that the outputs of the model make sense given the set of input parameters.

For point 2, it is important to appreciate that the parameters which require the closest scrutiny are the ones which quantify the extent to which the intervention will make a difference in terms of activity channel shift. These parameters we have set using the best available published evidence or by using case studies or by using the expert judgement of colleagues in the vanguard sites. These parameters are locally configurable, so the user has the option to modify them. If there is local evidence suggesting a more appropriate setting for those parameters then it is recommended that such evidence should be fully exploited.

The table below summarises the validation status of each of the UEC intervention models within the Consolidated Channel Shift Model. The rating key is as follows:

> Level 1. Extensive review of numbers and detailed feedback, with evidence based changes.
>
> Level 2. Model assumptions reviewed and explicitly accepted by vanguards with some local data.
>
> Level 3. Model assumptions reviewed and explicitly accepted by vanguards (no local data).

Level 4. Pre-populated model data and assumptions where no feedback has been obtained by vanguards.

Intervention model	Rating Level	Evidence sources	Source of Activity Data (Local Vanguard or National	Local Channel shift parameters
Decreasing Ambulance conveyances to Emergency Departments: See and Treat	3.	East Midlands Ambulance Service - Case study	Nationally published statistics on activity informed the scope of the intervention.	Vanguards confirmed that initial assumptions on channel shift, which were based on published evidence were reasonable.
Integrated Urgent Care Standards (111/GP out of Hours and Clinical Assessment Service s) Clinical Advisor	3.	University of Sheffield - Evaluation of 111 pilot sites	Nationally published statistics on activity informed the scope of the intervention, supplemented by data from vanguard plans. Comments received from vanguards informed model (e.g. pay bands / role of staff)	Vanguards confirmed that initial assumptions on channel shift, which were based on published evidence were reasonable.
Integrated Urgent Care Standards (111/GP out of Hours and Clinical Assessment Services) Call hand-offs	3.	Discussions with experts from the Primary Care Foundation.	Nationally published statistics on activity informed the scope of the intervention, supplemented by data from vanguard plans.	Vanguards confirmed that initial assumptions on channel shift, which were based on published evidence were reasonable.
Personalised Care Planning	3.	Reference: 1. Guided Care: Cost and Utilization Outcomes in a Pilot Study; Martha L Sylvia et al Disease Management; 2. Interventions to reduce unplanned hospital admissions; Purdy et al University of Bristol (2012)	Detailed discussion with NE informed model, but no additional data provided. Care matrons present at the Barking, Havering & Redbridge modelling meeting. Model tweaked to reflect their case staffing and activity.	The original parameters were set using research sources cited in column 3. The vanguard sites that reviewed this model were Barking, Havering and Redbridge (BHR) and the North East Network. They confirmed that the assumptions on channel shift were reasonable. The one exception to this was that BHR believed that the target population was smaller i.e. likely to be 1% rather than 5%.

Intervention model	Rating Level	Evidence sources	Source of Activity Data (Local Vanguard or National	Local Channel shift parameters
Enhanced Urgent Care Centre Standards	3.	1. Review of research on walk-in-centres; University of Sheffield (2000) 2. Review of Urgent Care Centres - Primary Care Foundation (2012)	Includes some local activity assumptions from Barking, Havering and Redbridge who also validated staff roles and pay bands.	Vanguards confirmed that initial assumptions on channel shift, which were based on published evidence were reasonable.
Extended General Practice opening hours	3.	Greater Manchester demonstrator site report on GP extended hours, in particular the Bury demonstrator as this matched the definition most closely	Model assumptions reflected detailed discussion with the North East Network vanguard.	Vanguards confirmed that initial assumptions on channel shift, which were based on published evidence were reasonable.
Minor Ailments Service (MAS) Patient Groups Directive	2.	South Devon Local report on the Pharmacy First scheme	Built on South Devon evaluation. Models returned with further local data.	The original parameters were set using the formal evaluation provided by South Devon and Torbay. These parameters were modified by South Devon and Torbay in the validation session.
Minor Ailments Service (MAS) Emergency Prescriptions	2.	South Devon Local report on the Pharmacy First scheme	Built on South Devon evaluation. Models returned with further local data.	The original parameters were set using the formal evaluation provided by South Devon and Torbay. These parameters were modified by South Devon and Torbay in the validation session.
Co-location of Urgent Care Centres (UCCs) with Emergency Departments (EDs)	3.	Evidence review commissioned by South Tyneside on Consolidating Urgent Care Centres - Centre for Reviews and Dissemination University of York. Findings limited	Had some local activity assumptions from Cambridge & Peterborough (team structure - validated staff roles and grades)	Vanguards confirmed that initial assumptions on channel shift, which were based on published evidence were reasonable.

Intervention model	Rating Level	Evidence sources	Source of Activity Data (Local Vanguard or National	Local Channel shift parameters
Increased use of Summary Care Records	3.	Benefits lead at HSCIC and CIO at Leeds West CCG	No additional data from vanguards	Vanguards confirmed that initial assumptions on channel shift, which were based on published evidence were reasonable.
Ambulatory emergency Care Interventions	3.	Case studies from Ambulatory Care network website and these hospitals: East Kent; Watford, Whittington, Middlesbrough; Nottingham and Bassetlaw plus discussions with NHS Elect	Cambridge & Peterborough CCG. validated data used in initial model.	Vanguards confirmed that initial assumptions on channel shift, which were based on published evidence were reasonable.

Table 1: Validation Status of each National Intervention Model

3 The Consolidated Channel Shift Model

3.1 Quick Start Guide

Please note that this document contains a Quick Start Guide in Annex 3 to help users get a quick sense of what the model is capable of and how to navigate it. This section covers a detailed description of the model.

3.2 Welcome Page

The model opens with the *Welcome Page.* To continue to use the model you must accept the conditions under which the model must be used.

3.3 Main Menu Page

The main menu sheet allows you to navigate to the working areas of the model and to the control sheet.

There is a section with links to instructions on how to use the model.

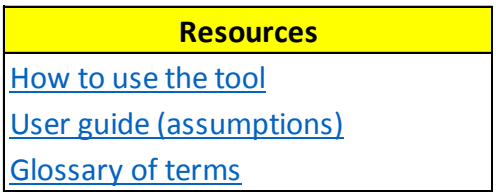


Figure 3: Instructions within the model

The first working area is the local data input area. This requires the user to populate the model with information on local costs, local activity, local demographic information, assumptions on demand growth and inflation and staff costs.

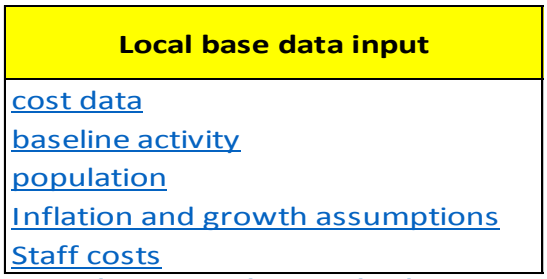


Figure 4: Local system data input

The second working area lists all the UEC intervention models that are ready to be populated with local data. The data inputs for each of these will be explained in the appendices. Clicking on “M” takes you to the intervention model, clicking on “E” takes you to the evidence base used to configure some of the parameters within the model, clicking on “C” takes you to specific additional cost information for that particular intervention model.

A blank intervention template is also included so that local users can model specific local schemes within this modelling suite.

	Navigation to:		
Interventions	**Model**	**Description and evidence base**	**Additional cost info**
Decreasing Ambulance conveyances: Hear and Treat	M	E	C
Decreasing Ambulance conveyances: See and Treat	M	E	C
Integrated clinical hubs - Increasing Clinical advisor consultations	M	E	C
Integrated clinical hubs - Integration of 111 and OOH hubs	M	E	C
Ambulatory Emergency Care	M	E	C
Personalised care planning	M	E	C
Co-location of UCC	M	E	C
Enhanced urgent care standards	M	E	C
GP extended hours	M	E	C
Community pharmacy: PGD minor ailments service	M	E	C
Community pharmacy: Emergency medicine supply	M	E	C
Summary care record: - Use for IP drug reconciliation	M	E	C
Summary care record: Use in ED	M	E	C
template for input other local intervention	M		

Figure 5: The navigation to each UEC intervention model

The third working area on the menu sheet takes you to the results where you can select which of the interventions you wish to include and what their combined effect is on the activity and cost profile within the local health system.

Results
Control sheet and results
Intervention data Outputs by channel
Projection calculations

Figure 6: The navigation to the model outputs

3.4 Local data Input

From the main menu, it is possible to navigate to the five sections of local data which should be populated by local users.

3.4.1 **Cost data**

By clicking on the link for “Cost data”, the user is taken to a table. The user is required to populate the blue fields in the table as shown below:

1) Price and cost	Commissioner view (tariff / price base)	Provider based view (cost base)	% fixed	% semi variable	% variable	threshold	variable cost	Extractable at threshold	Determination factor. % semi fixed that is addressable
Emergency bed days	£ 461.68	£ 570.65	15%	75%	10%	2,190	£ 57.06	£ 485.05	100%
ED attends	£ 153.12	£ 184.25	16%	72%	12%	4,725	£ 22.11	£ 154.77	100%
ED Minor attends	£ 120.02	£ 122.88	16%	72%	12%	6,300	£ 14.75	£ 103.22	100%
UCC attendance	£ 66.21	£ 67.05	22%	73%	6%	4,725	£ 3.96	£ 52.63	100%
OOH clinic visits	£ 68.30	£ 69.76	15%	75%	10%	6,300	£ 6.98	£ 59.30	100%
OOH home visits	£ 150.00	£ 153.21	15%	75%	10%	1,575	£ 15.32	£ 130.23	100%
111 calls (call handler)	£ 7.00	£ 7.15	15%	75%	10%	9,450	£ 0.71	£ 6.08	100%
111 calls (clinical advisor)	£ 20.00	£ 20.43	15%	75%	10%	9,450	£ 2.04	£ 17.36	100%
Community pharmacy attends	£ 14.00	£ 14.30	0%	0%	100%	1	£ 14.30	£ 14.30	100%
Ambulance - hear and treat	£ 36.00	£ 53.69	15%	75%	10%	3,150	£ 5.37	£ 45.64	100%
Ambulance - see and treat	£ 179.83	£ 236.42	15%	75%	10%	3,150	£ 23.64	£ 200.96	100%
Ambulance - see and convey to ED	£ 233.02	£ 237.71	15%	75%	10%	3,150	£ 23.77	£ 202.05	100%
Community contacts	£ 37.26	£ 44.32	15%	75%	10%	3,150	£ 4.43	£ 37.67	100%
Intermediate care bed days	£ 282.26	£ 238.23	15%	75%	10%	1,460	£ 23.82	£ 202.49	100%
social services domiciliary care	£ 24.00	£ 24.51	15%	75%	10%	3,150	£ 2.45	£ 20.84	100%
GP attends	£ 37.00	£ 37.79	15%	75%	10%	1	£ 3.78	£ 32.12	100%
GP visits	£ 61.00	£ 62.30	15%	75%	10%	1	£ 6.23	£ 52.96	100%

Figure 7: The cost data table

Each of the UEC channels is listed in the first column. For each channel the user is required to provide two cost figures.

- The first cost figure is the commissioner view of the cost of a unit activity within that channel. This may be the tariff for a bed day or the local tariff for an Emergency Department (ED) attendance. Where there is no tariff based price to commissioner, the entry should be the unit price to commissioners as calculated from local data.
- The second cost figure is the provider view of the cost of a unit activity within that channel. This may be the local reference cost for that channel, or it may be a figure derived from more sophisticated local analysis.

The commissioner view of cost by channel is the input for the second column. The provider view of cost per channel is the input for the third column.

The provider view of cost by channel must be split into fixed, semi-variable and variable cost. Variable costs vary directly with activity; in contrast fixed costs remain unchanged and semi-variable costs only change once a threshold level of activity is reached. The user must specify in the fourth column, for each channel, what is the percentage of the provider cost that is fixed cost. The user must specify in the fifth column, for each channel, what is the percentage of the provider cost that is semi-variable cost. The percentage of provider cost which is variable is then calculated automatically and populates the sixth column.

The table is pre-populated with percentages relating to fixed, semi-variable and variable costs. These figures have been derived from submissions from national UEC vanguard sites covering a range of providers from four vanguard sites:

- The North East Urgent Care Network
- West Yorkshire Urgent and Emergency Care Network
- Leicester, Leicestershire & Rutland Urgent and Emergency Care (formerly System Resilience Group)

- Barking, Havering and Redbridge A&E Delivery Board (formerly System Resilience Group)

These returns encompassed data from the following providers;

- North Tees and Hartlepool NHS FT
- County Durham and Darlington NHS FT
- Gateshead Health NHS FT
- South Tyneside NHS FT
- Newcastle Upon Tyne NHS FT
- North East Ambulance Service NHS FT
- Airedale NHS Foundation Trust
- Calderdale and Huddersfield NHS Trust
- University Hospitals of Leicester NHS Trust

In some cases, such as the submissions from the North East vanguard, the information that has been used is the same as that used to underpin the work of payment reform groups formed as part of the vanguard programme.

Although a definitive list of costs classified under each heading is not outlined here, the broad headings outlined below should indicate generally how these costs have been classified.

Variable Costs

These are costs that vary directly with activity levels and do not require significant decision making to remove from the system. Typically, these include medical and surgical equipment, drugs costs and catering costs (e.g. meals for patients in hospital).

Fixed costs

These are costs that do not vary with activity levels and would require more significant transformational change to remove from a system. Typically, these include overheads, PFI costs and building rental costs.

In the model, this has been calculated as the residual of variable and semi-variable costs (these being simpler to identify and determine).

Semi-variable Costs

These are costs that relate in some way to activity levels, but behave in a ‘stepped’ manner as costs increase or do not vary directly to activity levels. Typically, these also require a level of management intervention or decision to be taken to remove/add costs to the system.

An example of semi-variable costs could be staffing associated with a ward, or a bay on a ward. As activity rises, additional beds are required, but are typically planned for on a ward or ward bay basis. Costs associated with staffing levels would typically rise each time a ward or bay is opened, but not in response to fluctuations in occupied bed days at the margin. They will include the costs of staffing on wards and the costs of diagnostic services such as pathology and radiology.

The seventh column is where the user is required to set the levels of threshold activity levels for each channel. By definition, as stated above, a semi-variable cost is a cost which varies once a threshold of activity is reached. The concept in this model is that once a threshold of activity has been reduced, it becomes potentially possible to extract a much greater proportion of the cost associated with the activity no longer present in that channel.

> *For example, reducing the number of emergency bed days by 2,190 begins to raise the possibility of closing a bay within a ward. This may allow a reduction in the staffing levels required and, as a consequence, it may provide an opportunity to realise a cashable saving. Any fewer than 2,190 bed days reduced and the full bay is still needed. If fewer than 2,190 bed days are reduced, then the only cost reduction possible is the result of avoided variable cost.*

The model is pre-populated with suggested thresholds based on the level of activity required either to close a bay or to reduce whole time equivalent staff. All the threshold figures are to be locally specified. Local areas may decide that 2,190 bed days saved is not the level at which they anticipate the extraction of semi-variable costs. The user must decide what the setting for local thresholds should be for each channel.

The tenth column is labelled "*Management Determination*". This is a parameter intended to provide a realistic view on the confidence with which the semi-variable cost can actually be extracted.

For example, if a threshold of 2,190 bed days is achieved, then the semi-variable cost becomes extractable, at least in principle. On paper, this amounts to just over £1M in cash releasing savings. In practice, this figure may be unrealistic and a local manager may reasonably argue that a significantly lower figure is achievable without compromising safety and quality. The *management determination parameter* is for local users to specify what proportion of the semi-variable cost would realistically be extracted.

This is an important distinction to make and an important discussion to have within the system. The model exposes a tension between what may appear to be a saving opportunity and what in reality can be taken as a genuine cashable cost saving.

3.4.2 **Baseline activity**

The model requires the user to input annual activity levels for the major channels of UEC activity:

Emergency bed days	1,430,353	general acute only
ED attends	924,082	type 1. excluding minors (see below)
ED Minor attends	622,612	type 1. Defined as HRGs VB08Z, VB09Z and VB011Z excluding admissions
UCC attendance	51,438	type 3 and 4
OOH clinic visits	98,835	
OOH home visits	34,485	
111 calls (call handler)	594,403	
111 calls (clinical advisor)	111,787	
Ambulance - hear and treat	21,347	
Ambulance - see and treat	92,498	
Ambulance - see and convey to ED	253,610	

Figure 8: Baseline activity figures

3.4.3 **Population**

The population link on the main menu page will take the user to the following table:

3) Population	851,700

Figure 9: Population

The user should populate the table with the weighted population size for the local health and care economy under consideration. Where there is an absence of local data for a particular intervention model, this figure is used as a scaling factor to estimate the effect in the local area using data from elsewhere.

3.4.4 **Inflation and growth assumptions**

The link for *Inflation and growth assumptions* takes the user to two tables. The first is a table containing the activity growth assumptions of a five year period:

a) Vanguard specific Activity growth assumption by channels

	2016-17	2017-18	2018-19	2019-20	2020-21	IHAM Rate applied
Emergency bed days	1.93%	1.91%	2.05%	2.03%	1.95%	Non elective admissions
ED attends	2.21%	2.12%	2.21%	2.21%	2.11%	A&E attends
ED Minor attends	2.21%	2.12%	2.21%	2.21%	2.11%	A&E attends
UCC attends	2.21%	2.12%	2.21%	2.21%	2.11%	A&E attends
OOH clinic visits	2.21%	2.12%	2.21%	2.21%	2.11%	A&E attends
OOH home visits	2.21%	2.12%	2.21%	2.21%	2.11%	A&E attends
111 calls (call handler)	2.21%	2.12%	2.21%	2.21%	2.11%	A&E attends
111 calls (clinical advisor)	2.21%	2.12%	2.21%	2.21%	2.11%	A&E attends
Ambulance - hear and treat	2.21%	2.12%	2.21%	2.21%	2.11%	A&E attends
Ambulance - see and treat	2.21%	2.12%	2.21%	2.21%	2.11%	A&E attends
Ambulance - see and convey to ED	2.21%	2.12%	2.21%	2.21%	2.11%	A&E attends

Figure 10: Activity growth assumptions table

These figures are derived from the NHS ENGLAND Indicative Hospital Activity Model (IHAM) but local users may wish to provide their own estimates for activity growth assumptions.
The second table in this section is the annual inflation figures to be included in the five year projections.

b) Cost Inflation assumptions

	2016/17	2017/18	2018/19	2019/20	2020/21
National assumptions	**3.10%**	**2.30%**	**2.00%**	**2.00%**	**2.90%**

Figure 11: Inflation assumption table

This inflation assumption covers pay and pensions, drugs, capital costs and other operating costs. The table is pre-populated with NHS Improvement national assumptions but may be populated with alternative local cost assumptions.

3.4.5 Staff costs

The link for *staff costs* takes the user to the following table. It is used to calculate the staff cost for each UEC intervention.
:

Band		Agenda for Change mid range salary 15/16	Pension % & on cost	uplift for High Cost Area	Total Cost	cost per hour (band 1-9 42 weeks, 37.5 hours)	cost per minute
	uplift		24%	0%			
1	Band 1	£ 15,516	£ 3,724		£ 19,240	£ 12.22	£ 0.20
2	Band 2	£ 16,372	£ 3,929		£ 20,301	£ 12.89	£ 0.21
3	Band 3	£ 18,152	£ 4,356		£ 22,508	£ 14.29	£ 0.24
4	Band 4	£ 21,052	£ 5,052		£ 26,104	£ 16.57	£ 0.28
5	Band 5	£ 25,298	£ 6,072		£ 31,370	£ 19.92	£ 0.33
6	Band 6	£ 30,357	£ 7,286		£ 37,643	£ 23.90	£ 0.40
7	Band 7	£ 36,250	£ 8,700		£ 44,950	£ 28.54	£ 0.48
8a	Band 8a	£ 44,703	£ 10,729		£ 55,432	£ 35.19	£ 0.59
8b	Band 8b	£ 53,285	£ 12,788		£ 66,073	£ 41.95	£ 0.70
8c	Band 8c	£ 62,397	£ 14,975		£ 77,372	£ 49.13	£ 0.82
8d	Band 8d	£ 74,825	£ 17,958		£ 92,783	£ 58.91	£ 0.98
9	Band 9	£ 90,537	£ 21,729		£ 112,266	£ 71.28	£ 1.19
FHO1	Foundation house officer 1	£ 24,289	£ 5,829		£ 30,118	£ 19.12	£ 0.32
FHO2	Foundation house officer 2	£ 30,211	£ 7,251		£ 37,462	£ 23.79	£ 0.40
Reg	Registrar	£ 53,060	£ 12,734		£ 65,794	£ 41.77	£ 0.70
As.S	Associate specialist	£ 73,544	£ 17,651		£ 91,195	£ 57.90	£ 0.97
Cons	consultant	£ 111,863	£ 26,847		£ 138,710	£ 88.07	£ 1.47
GP	GP	£ 90,200	£ 21,648		£ 111,848	£ 71.01	£ 1.18

Figure 12: Table of staff costs

This is pre-populated with the mid-range salary for the Agenda for Change banding. The local user may choose to vary the costs within this table, depending on local circumstances.

3.5 Thresholds – how they work and two important caveats

3.5.1 How thresholds affect the model outputs

By introducing the element of fixed, semi-variable and variable cost we are able to bring greater insight into the system pressures that are introduced as a result of shifting activity to alternative channels. As activity is moved away from a particular channel, the question arises to what extent it might be possible to extract cost from the less busy channel. This is especially important where activity is directly linked to

income as is the case in “Payment by Results” (PbR) contracts. But even where contracts are not tariff based, it is important to identify efficiency opportunities.

It is through good analysis and understanding semi-variable costs that savings opportunities can be identified. By definition, semi-variable costs have an element of fixed cost and an element of variable cost to them. They are not truly variable because they do not vary with unit activity, but they are not truly fixed because they do vary by threshold of activity.

For example, if activity increases beyond a threshold then it may become necessary to hire an additional staff member. If activity drops by a threshold amount then it may become possible to provide the same service with one fewer member of staff.

The diagram below shows the possible cost saving associated with a reduction in A&E attendance.

- The dark green area shows the cost saving as a result of variable cost.
- The light green area shows how the semi-variable cost grows by unit activity. This does not show a cost saving because semi-variable cost is not variable!
- The blue line shows the threshold effect. Once a threshold is met, then the semi-variable cost becomes addressable in terms of savings. The blue line is a “step graph”. It includes the variable cost savings and it shows how reaching successive thresholds allows for additional release of the semi-variable cost.
- The red line shows the fully absorbed cost. This illustrates the reduction in income as a result of reduced activity.

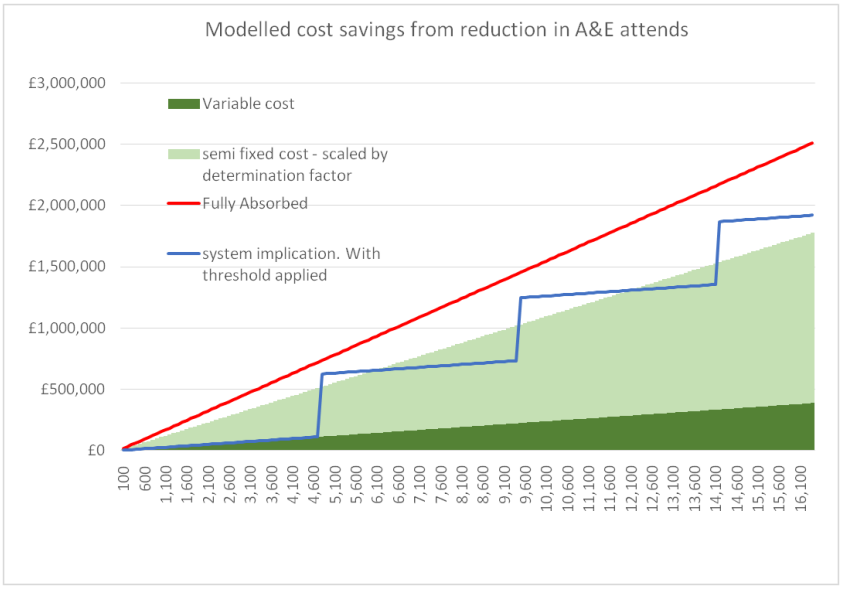


Figure 13: The effect of thresholds

3.5.2 **Thresholds – two important caveats**

The diagram above shows that the threshold effect in the model is very significant, especially where there is a large percentage of semi-variable cost for a given channel. It also shows a significant difference between the possible savings as indicated by the fully absorbed cost (the red line) and the cashable savings, resulting from reaching the thresholds to release semi-variable cost.
It is crucially important that a local health and care system appreciates the reasons underpinning the gap between the red line and the blue line: this relates to the sustainability of services and the sustainability of the local health economy.

3.5.3 **In reality there is not a single threshold for a single channel**

The semi-variable cost is made up of a number of different things: nursing staff costs, administration staff costs, portering staff costs, catering staff costs, diagnostic equipment costs among others. In reality, each of these cost types has a slightly different threshold but for simplicity within the model and for ease of use, we have limited it to one threshold per channel. The level at which this threshold is set is to be locally determined, but it is important to do a sense check once the level is set. Consider the maximum amount of cash releasing savings the model calculates once a threshold is reached. Does this number seem realistic? The user may consider modifying the percentage set for semi-variable costs and increase the percentage of fixed costs. In the context of this particular piece of analysis that may be perfectly justifiable. An alternative is to introduce more realism by modifying the parameter for *management determination*. This would adjust the amount of cash savings that could be expected once a threshold is reached.

The difference between the red line and the blue line in the diagram above must be discussed between commissioner and provider. It is important that there is a shared understanding of the long term sustainable efficiencies that the local health economy can realise.

3.5.4 **Activity must be concentrated in a single point of delivery for a threshold to be met**

If the threshold for emergency bed days is set at 2,190 it is clear that all of those 2,190 bed days must be in the same hospital for a bay closure to be considered. The model does not distinguish points of delivery so it is important that the user should take this into consideration when using the model. This is especially important if the geography to be modelled has more than one major provider. There are two ways to address this challenge. You might increase the thresholds to be sure that there is enough concentration of activity shift achieved before asserting that semi-variable cost has become addressable. Alternatively you might build a version of the model around the health economy based on a single large acute provider.

A similar issue might become apparent for ED attendances. Thresholds here must be concentrated in a single point of delivery for there to be a realistic prospect of cash release.

3.6 Results

The menu page has links to three different results sections: the *control sheet and graphical results,* the *intervention data outputs by channel* and the five year *projection calculations.*

3.7 Results: The control panel

The control panel consists of a table of all possible UEC interventions within the model, from which the user may select which might be applied locally. There is also a series of graphs which update depending on the selection of which interventions are to be applied.

NOTE: All the graphs in the user guide section 3.7 are purely illustrative and are included to explain the content of each chart, not present results under some set of assumptions.

The table lists each UEC intervention that would be applied locally. If the number next to the intervention is 0% then that intervention is not included in the calculations. If it is set at 100% then that intervention is fully included. It is possible to set the level of inclusion at any point in between or even beyond 100%. If the user wanted to double the capacity in a particular intervention, then setting a figure at 200% would achieve this. It is also possible to set negative numbers of the intervention, but this is not advisable.

Intervention	% implementation	Intervention	% implementation
Decreasing Ambulance conveyances: Hear and Treat	100%	Enhanced urgent care standards	100%
Decreasing Ambulance conveyances: See and Treat	100%	GP extended hours	100%
Integrated clinical hubs - Increasing Clinical advisor consultations	100%	Community pharmacy: PGD minor ailments service	100%
Integrated clinical hubs - Integration of 111 and OOH hubs	100%	Community pharmacy: Emergency medicine supply	100%
Ambulatory Emergency Care	100%	Summary care record: - Use for IP drug reconciliation	100%
Personalised care planning	100%	Summary care record: Use in ED	100%
Co-location of UCC	100%		

Figure 14: Example table of UEC interventions selected

There is then a series of graphs which are dynamically updated depending on which of the UEC interventions are selected.

If the user chooses to set all interventions to 0% and switch all the interventions off, then the resulting graphs illustrate the counterfactual position: the growth in activity (using the assumptions provided by the IHAM model supplied by NHSE) projected over five years. The user can inspect each of the UEC channels individually for the counterfactual growth. The counterfactual cost pressures summed over all channels are also illustrated in graph form.

By setting a single intervention to 100% and leaving all others at 0%, the user can see the impact of that single intervention. The power of the combined model is to explore the combination of interventions that might have the best impact in a local system.

3.7.1 In year net effect on activity by channel

The first graph shows the net impact across the interventions on annual activity in the different UEC channels.

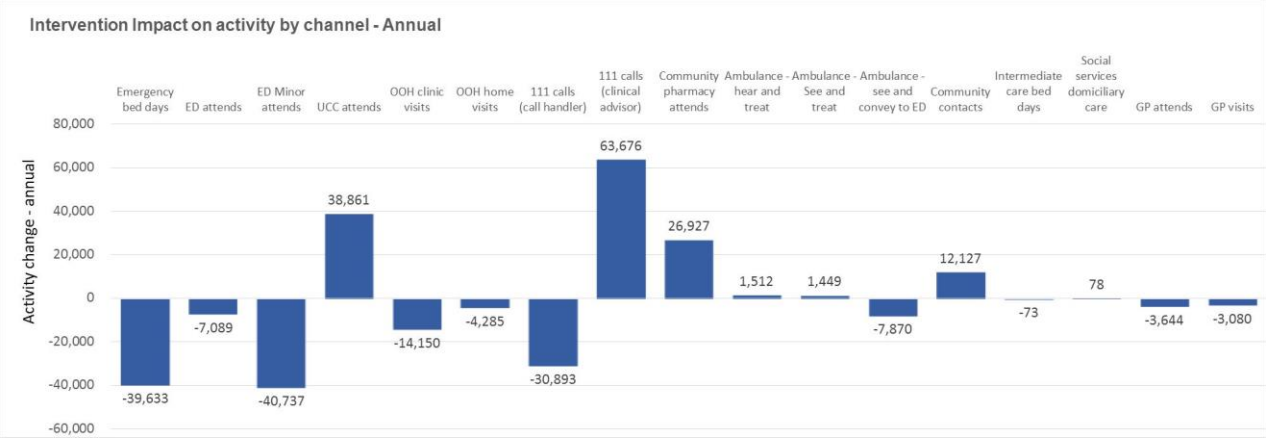


Figure 15: Example net annual channel shift effect

This gives the user a first indication of which areas might yield some cash release.

3.7.2 Five year counterfactual activity and effectiveness of intervention for a single selected channel

The user must select a specific channel of interest. Once selected, the blue bars in the graph show the five year projected growth within that channel without any interventions applied, *the counterfactual*. The orange bars show the combined effect of the selected interventions on that chosen channel.

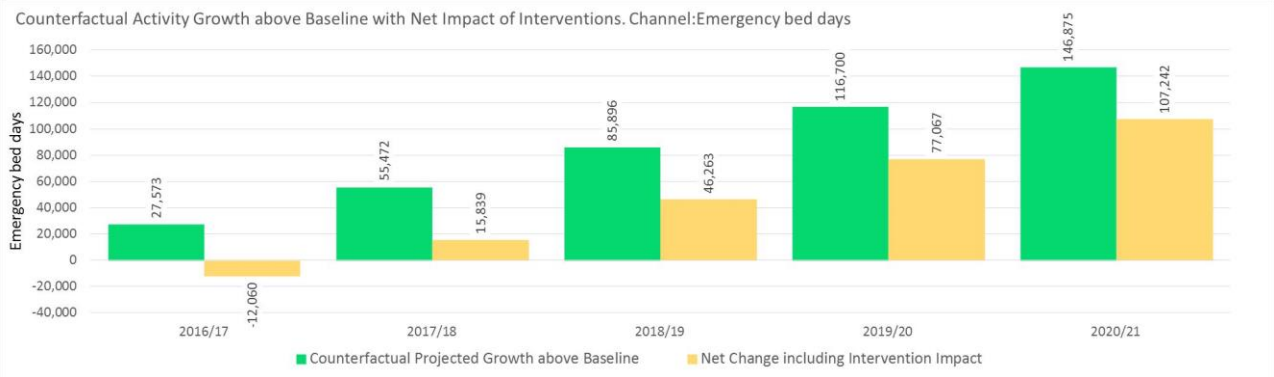


Figure 16: Example five year activity projection for selected channel, with and without UEC interventions in force

3.7.3 Five year projections for major channels

The channels with the greatest channel shift (and the consequent greatest opportunity for cash savings) are emergency bed days, A&E attendances and UCC attendances. This graph shows the 'do nothing' counterfactual activity growth for these major UEC channels as a solid line and the impact of the interventions on these channels is shown as the dashed line.

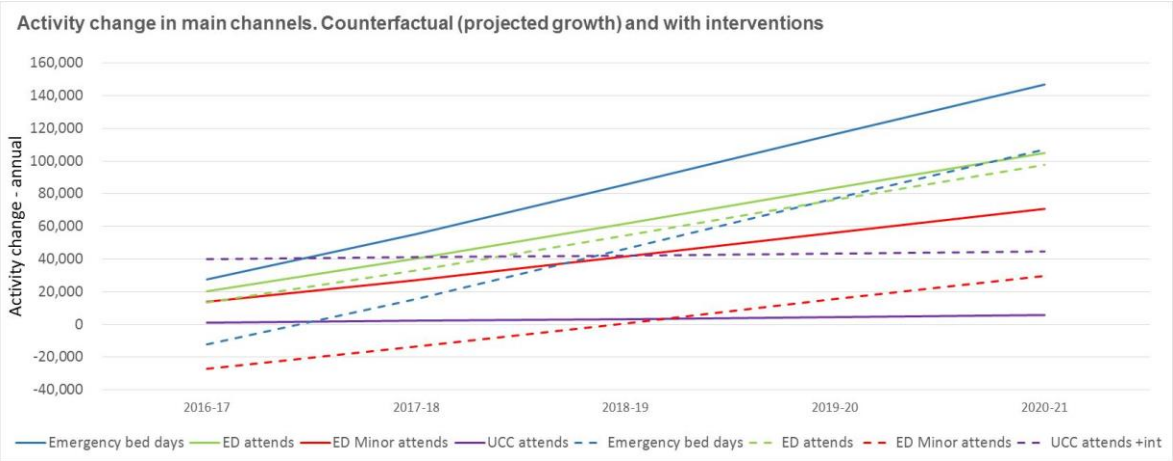


Figure 17: Example five year projection for major channels: counterfactual and with interventions

3.7.4 Full year cost implications by intervention – commissioner view and provider view

Each intervention has an associated set up cost and annual running cost. Each intervention will result in a level of activity shift which then brings the potential of cash release in those parts of the system where activity has reduced. From a commissioner perspective, this may represent a significant shift in financial flows and may appear to offer significant opportunity for reduced costs. The provider view is almost always markedly different since so much of their cost is stranded.

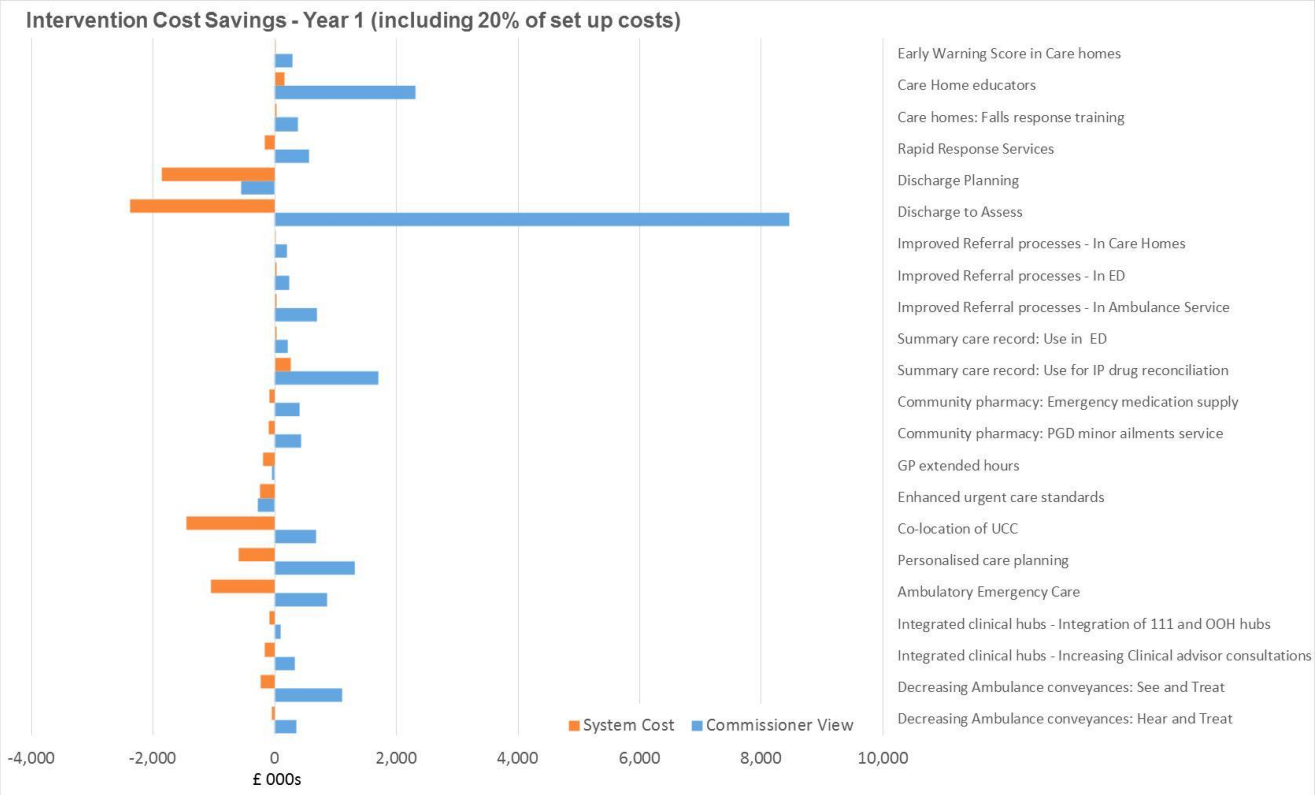


Figure 18: Example year 1 cost implications for commissioner and providers

NB: this considers each intervention separately. It does not take into account the possible synergistic effect of interventions together.

3.7.5 Five year system cost pressure projections - counterfactual

The next graph illustrates the commissioner's and provider's five year view of the cost pressure in the system as a result of activity growth and inflation. This assumes that no UEC intervention is in place.

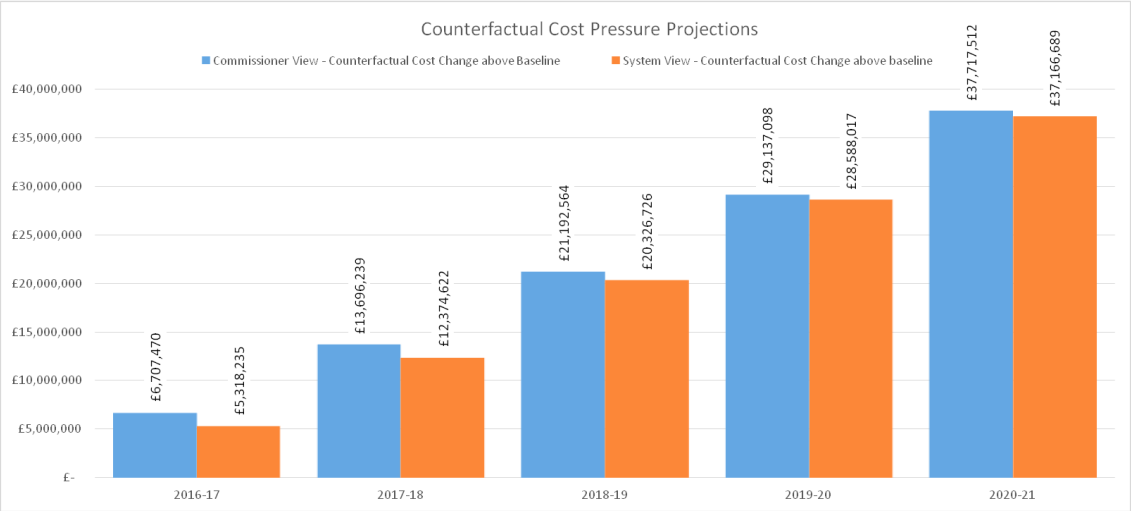


Figure 19: Example five year counterfactual cost pressure - commissioner and providers view

3.7.6 Five year system cost pressure – with interventions in place

The next graph is a contrast with the previous one but it now assumes that the selected UEC interventions are in place and are effective and are realising cost savings.

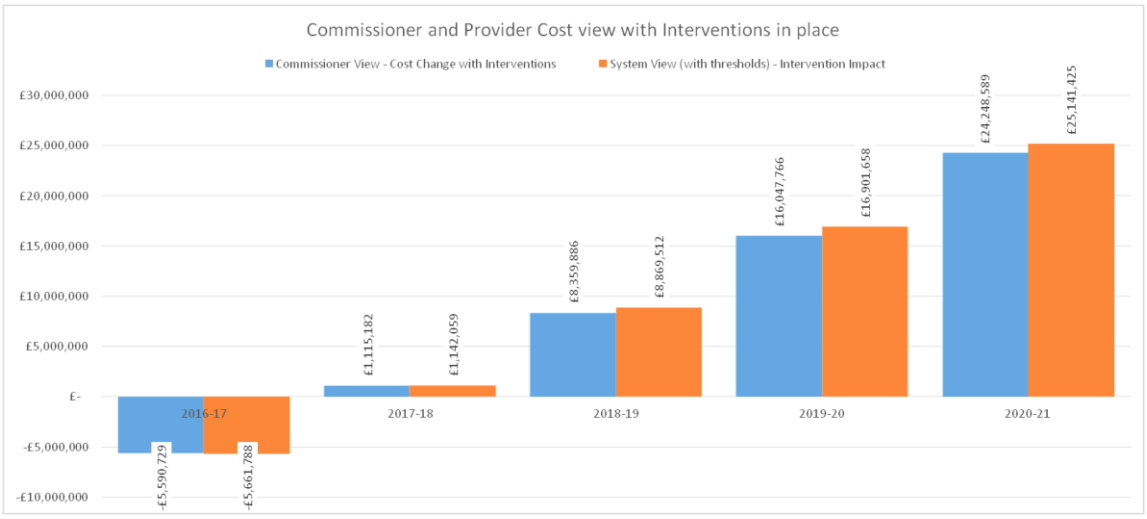


Figure 20: Example five year cost pressure with interventions in place – commissioner and provider view

3.7.7 Threshold challenge

The final graph shows how far each channel is from the next threshold. With an appreciation of how important the thresholds are for the release of cash in the system, this may help local planners to determine whether relatively small changes might realise a disproportionate financial impact.

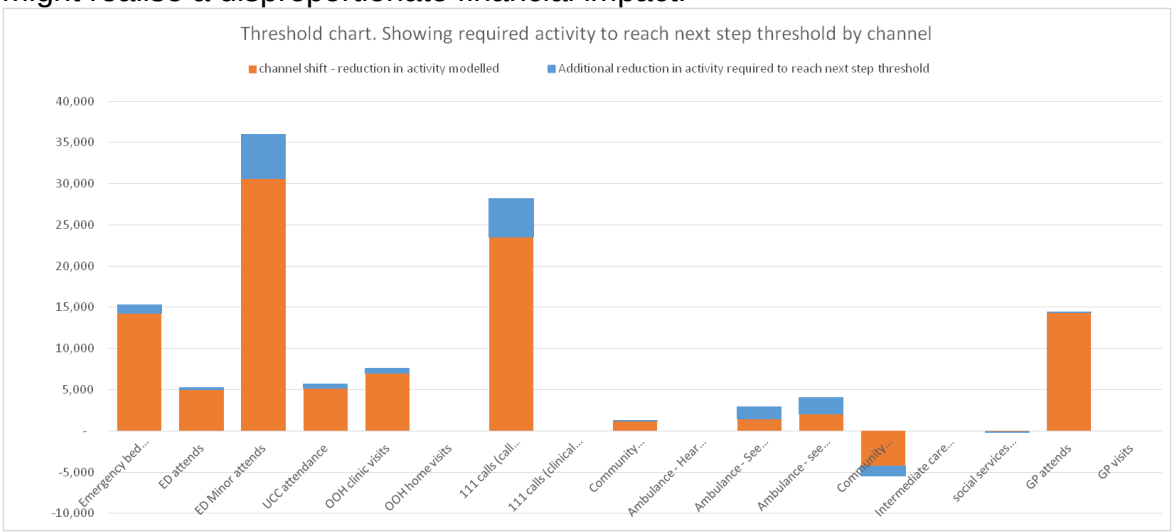


Figure 21: Example threshold chart for each channel

3.7.8 Intervention data outputs by channel

The user can click on the link for *intervention data outputs by channel* to arrive at the detailed outputs for the system as a whole and for the UEC interventions individually.

This is the place where the whole system effect can be greater than the sum of the effects of the individual interventions. The main reason for this is that the threshold effects are reached more easily if interventions are combined. For example, the Ambulatory Emergency Care Intervention may contribute an expected reduction of 1,500 bed days and the Personalised Care Planning Intervention may contribute an expected reduction of 600 emergency bed days. Neither of these interventions is strong enough on its own to reach the threshold for emergency bed days, but together they contribute 2,100 bed days, almost certainly quite distinctly, and as a result the threshold for emergency bed days is achieved.

3.8 Results: The intervention data output by channel

The intervention data output by channel provides the numerical values for activity shift by channel for each intervention and the cost implications. The user can look in detail at the individual inputs which are summarised in the graphs on the control sheet.

3.9 Results: The five year projections

The five year projection sheet provides the numerical values for the five year activity by channel and the five year cost implications, both with the selected interventions in place and also with the counterfactual.

4 Generic UEC Intervention Model

Each of the UEC intervention models follows the same framework:

- What is the scope of the intervention to make a difference?
- What is the resource required for the intervention and what capacity does that generate?
- What is the anticipated effect on the activity within all the UEC channels?

Each model has a set of notes included in column A. The user can reveal these notes by unhiding column A.

4.1 Definition of the UEC Intervention

Each UEC intervention should be described in terms of what difference it will make to existing services. Is this a change in terms of decision points in a pathway of care? Is it a change involving the establishment of a new team? Is it about increasing the capacity of an existing service through additional opening hours?

4.2 First question: what is the scope of this intervention to make a difference?

The user must specify and quantify the patient activity which should be affected by this intervention. There is a table to be populated:

Figure 22: Table to describe the intended patient group for this intervention

A target is set for the intervention to make a difference and the dark blue cells calculate to what extent the intervention generates sufficient capacity to match that target. The capacity of the intervention is described in the next section.

4.3 Second question: what is the resource required and what capacity does this generate?

The user must decide on staffing required and capacity generated by this workforce. Is this additional workforce or not? Does the capacity generated match or exceed the anticipated capacity described above?

There is a set of tables to be populated.

4.3.1 Year 1 set up costs

The Year 1 set up costs are populated using a link to an additional sheet. This allows the user to develop detailed set up costs within the model. The total is then pulled into the main working sheet.

Year 1 set up cost		£	10,000

Figure 23: Year 1 set up costs within an intervention model

4.3.2 **Staff Cost**

The user should specify the staffing required for the intervention together with any additional hours required and the uplift expected for unsocial hours.

Staff cost	Band	WTE	baseline Cost per WTE	% time unsocial hours	% additional salary cost per unsocial hour
GP	GP	0.5	£ 111,848	20%	35%
Advanced nurse practitioner	7	1.0	£ 44,950	20%	35%
Band 5 nurse	5	1.0	£ 31,370	20%	35%
Band 3 receptionist	3	1.0	£ 22,508	20%	35%
total WTE		3.5			

Figure 24: resourcing table for a UEC intervention

The light blue boxes require a user input. All other figures are calculated by the model.

There is a further table for the user to include other recurring costs required for this intervention.

Other recurring cost	Unit	Est. Recurring Cost per Unit	
variable cost linked to WTE	3.5	£ 100	eg IT, HR, training etc
variable cost linked to capacity / cases	1750.0	£ 20	eg diagnostics
Other recurring cost	1.0	£ 20,000	eg for maintenance of equipment, rent etc

Figure 25: Other recurring costs for a UEC intervention

The final table in this section links the resource to capacity generated:

linking resources to capacity		
Resource input that drives capacity	3.5	here linked to WTE -
		but could be other calculation, eg WTE excluding admin
Capacity generated per resources input	500.0	annual capacity per resource input above. eg cases per WTE

Figure 26: linking resources to capacity

The user must specify how the resource generates capacity. In this instance, there are 500 contacts per WTE and 3.5 WTE in the intervention. The user must reflect on how best to calculate the capacity generated by the intervention. Usually this will be determined by the skill mix and their utilisation.

4.4 What is the anticipated effect on the other channels

The user must decide what the expected effect is likely to be in terms of reduction (or increase) in activity elsewhere. This should ideally be informed by evidence. To assist users, each of the intervention models have been pre-populated with values to estimate these shifts in activity. These have been guided by a blend of published evidence and local vanguard experience. Each intervention model is described in a separate appendix and the provenance of all material assumptions is described. In addition, the model contains links to the evidence sources used. In practice, users should review this evidence to assure themselves that they are satisfied that it is applicable to local circumstances.

4.5 Supply-Induced Demand

Supply-Induced Demand is recognition that when we change services, we do more than redistribute activity across available service channels and may increase the overall level of activity. There are a multitude of reasons why this might be: new services may be more accessible or attractive than those they replace; legacy services may become more attractive, for example due to reduced waiting times; providers of legacy services may feel less restrained in making referrals or offering treatment if more capacity is created. A recent study noted the following:

“The paradox is that ...we will in turn free up capacity and thus allow doctors to admit more patients...The findings show that whilst attendances at major A&E departments rose by only 1.2%, emergency admissions from these departments rose by 14.3%...”[1]

It is therefore reasonable to assume some impact and we have included a section at the end of the intervention worksheets for users to model it. The evidence on the scale of impact is slender. The following is a recent estimate of the impact of releasing more capacity in an elective service, which might be used as a rule of thumb:

“A 1 percent fall in waiting times leads to an increase in demand of between 0.13 percent and 0.235 percent.”[2]

In summary, it is prudent to allow for some additional demand if new or legacy services become more attractive or providers feel less constrained following a change in services. Since the size of the impact is uncertain, start with a rule of thumb and monitor post implementation.

---

[1] [Trends in Emergency Admissions in England 2004 – 2009: Blunt et al Nuffield Trust.]

[2] 1. WAITING TIMES FOR ELECTIVE SURGERY: A HOSPITAL-BASED APPROACH Martin et al – University of York – June 2003

4.6 Assumptions and caveats

The evidence base supporting the intervention is captured in the evidence tab associated to that intervention model. This is accessed from the main menu.

It must be acknowledged that the evidence base for some of the interventions is not conclusive. Sometimes the quantification of the evidence is difficult to establish, sometimes there is contradictory evidence, and sometimes there is no substantial evidence. A lack of robust evidence should not lead to a paralysis of decision making and action. Where the evidence is lacking, it is necessary to place greater reliance on expert judgement. The important thing is to document clearly what the balance is between the evidence and expert judgement. With that clearly documented, it is vital to make sure that proceeding with the intervention provides an opportunity to build the evidence base.

4.7 Further guidance

Each intervention model sheet has additional notes contained in column A which the user can unhide and click on for further guidance.

Appendices

1 Integrated Clinical Assessment Service – Clinician Consultations

1.1 Definition of the UEC Intervention

The objective of the intervention is to enable commissioners to deliver a functionally integrated 24/7 urgent care service that is seen by service users as the 'front door' of the NHS. The service provides both access to treatment and clinical advice.

Part of this will be providing an integrated 'Clinical Assessment Service ' for calls across NHS 111 providers, GP Out-of-hours services and ambulance services.

The intervention model has two distinct sub-models:

- *Clinician consultations*: this models the impact of an increased share of calls being taken by clinical advisors in place of call handlers. It is assumed that this will result in improved assessment and advice and more appropriate onward referral.
- *Integration of hubs*: This models the benefit of integrating OOH, and 111 calls in reducing the staff time spent in 'hand offs' (transferring calls between different services)

1.1.1 Boundaries of the intervention as modelled

It is acknowledged that there may be other savings that are not modelled here, in particular:

- savings from re-procurement of GP Out of Hours / 111 contracts,
- efficiencies from having a single Clinical Assessment Service compared with separate 111, OOH and 999 services such as reduced management overheads, improved ability to manage demand, enabling higher utilisation rates and
- improved systems for call handling.

In some health economies, Clinical Assessment Services will be able to book directly into a wider range of services (i.e. not limited to ambulance and OOH) and may encompass a single point of access for community and mental health services.

This may be achieved by developing referral pathways, a directory of services and direct booking. We have modelled this separately in the 'referral processes' intervention model. Care should be taken to avoid double counting of the benefits of these interventions.

1.1.2 Clinician Consultations - Using the Spreadsheet Model

In common with all of the intervention models, the input sheet considers 4 questions:

1. What is the scope of the intervention to make a difference?
2. What is the additional resource needed / what additional capacity is required?
3. What is the impact on the urgent care system?
4. Does the intervention stimulate additional demand (Supply-Induced Demand)?

Figure 27 below shows a high level schema for this model – the key issues that users should consider.

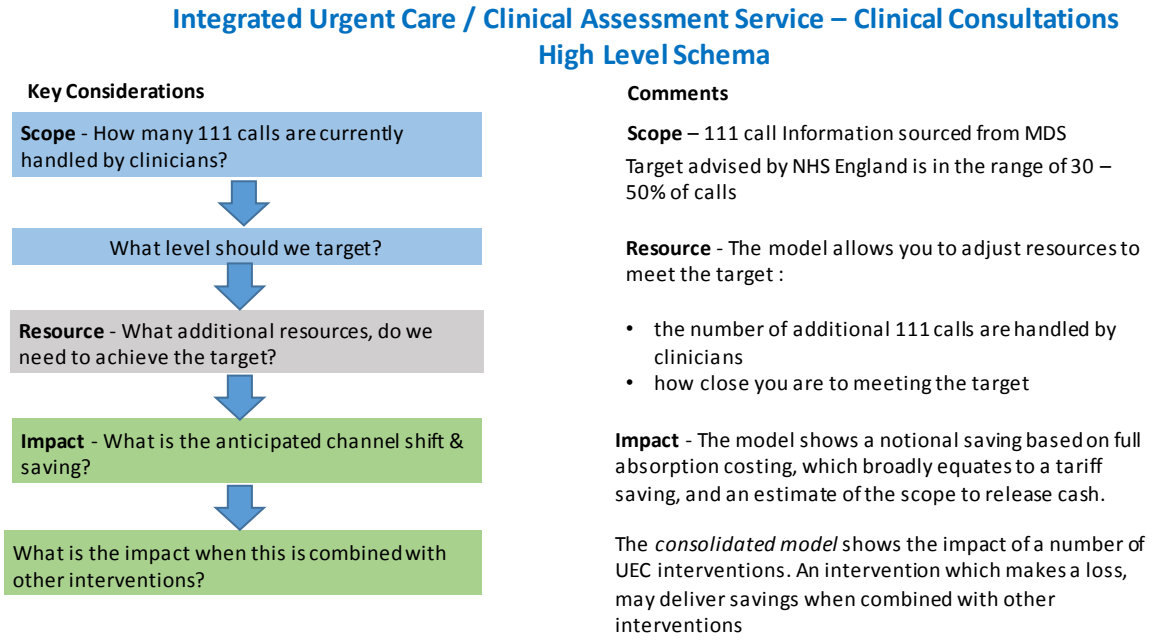


Figure 27

1.2 First question: what is the scope of this intervention to make a difference

The intervention entails increasing the proportion of 111 calls handled by a clinician up to a target which takes account of casemix. Since this is a new intervention it is hard to be specific about what the optimal percentage of calls handled by an advisor might be. At the time of writing NHS England's advice is that health economies should aim for 30% by April 2017 and for 60% by April 2019.

The panel in the model which covers the scope of the intervention (see figure 27) guides the user to consider the following:

- The total number of 111 calls and the percentage answered by clinicians. Inputs for these are available from the Minimum Data Set
- Users can then set a target, which generates an additional call volume for clinicians

- The final box in the panel, states how close this is to current delivery “the % of target calls modelled”
- Where the gap is material, users will need to consider investing in more staff.

1.3 Second question: what is the resource required and what capacity does this generate

1.3.1 Reflecting these resourcing considerations in model inputs

Set up / non recurrent costs:

The intervention workbook contains a value for these. Evidence on set up costs for this initiative was limited and these were set at a notional level of £20,000 to cover training and recruitment. The modelling was validated by two vanguard sites, who confirmed that this was a reasonable level.

Staffing:

The resourcing panel of the worksheet has been pre-populated with staff grades which reflect the guidance referenced above. Users should amend the following areas of the resourcing panel in the worksheet to reflect local circumstances:

- Additional/fractional whole time equivalents

It is anticipated that users of this model will refer to the NHS England guidance in completing this section of the worksheet. The guidance document: *Commissioning Standards Integrated Urgent Care (September 2015)*, describes the standards which commissioners should adhere to in order to commission a functionally integrated 24/7 urgent care access, clinical assessment, advice and treatment service.

1.3.2 Reflecting capacity considerations in model inputs

Staffing parameters such as utilisation and average time on calls is entered in the worksheet table. The capacity created is shown in the adjacent output table. The parameters in these parts of the work sheet reflect recent work by the Primary Care Foundation (PCF).

The PCF have developed a more detailed financial model that focuses particularly on the NHS 111 and OOH ‘front end’ to an integrated urgent care system (but also looks at the cost of onward referrals to other services).

This can be used by commissioners and providers to plan services in more detail. It requires users to define the nature of the 111 service that they are looking to establish, how the Clinical Assessment Service will work, what mix of skills it might contain and challenges them to estimate what proportion of calls will go through the hub and what dispositions might be expected from the system. It also models the out of hours services across the locality and includes looking at and costing the referrals to other services such as UCCs or extended hours GP services.

1.4 What is the anticipated effect on the other channels

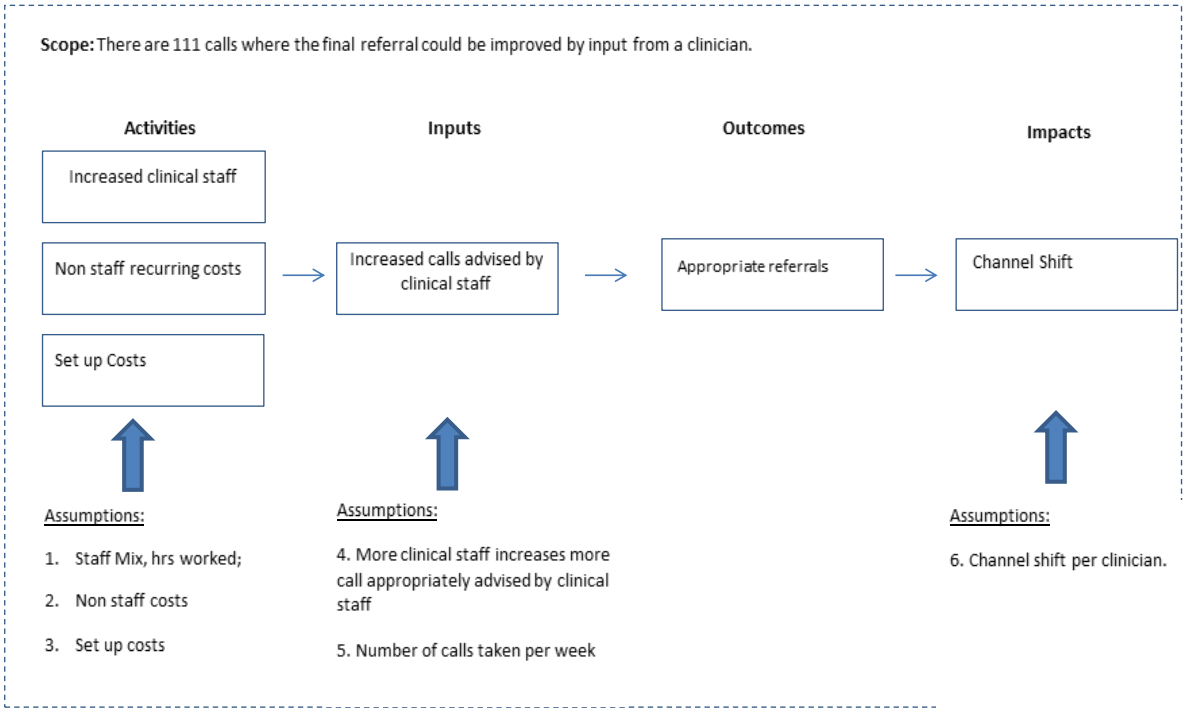
The main source of evidence for channel shift in the model is the University Of Sheffield's Evaluation of NHS 111 pilot sites (Final Report August 2012). The evidence base is now being enhanced through evaluation of sites where the IUC model is being implemented. The University of Sheffield evaluation, whilst the most recent review, is related to the Clinicians using NHS Pathways. The IUC model uses a range of clinicians and we therefore anticipate a greater effect. The modelled activity here may be viewed as a lower estimate accordingly.

This review looked at the disposition of call from call handler versus clinicians. We modelled change in disposition where there was clinician triage. The rate change in disposition per triaged call achieved is shown in the table below.

Disposition	Call Advisor	Clinician	Rate change per triage
Ambulance n(%)	11%	7%	-0.04
A&E n(%)	6%	6%	-0.022
Primary Care n(%)	51%	40%	-0.215
Other service n(%)	5%	2%	-0.037
No service n(%)	13%	23%	0.167

This evidence is used to model the channel shifts in the final panel of the worksheet.

1.4.1 Schematic



2 Integrated Clinical Assessment Services – Integration of 111 and OOH hubs

2.1 Definition of the UEC Intervention

The intent is to enable commissioners to deliver a functionally integrated 24/7 urgent care service that is the ‘front door’ of the NHS and which provides the public with access to both treatment and clinical advice. Part of this will be providing an integrated Clinical Assessment Service for calls across NHS 111 providers and GP Out-of-hours services.
This model is simply to reflect the potential impact of integrating OOH, and 111 calls in terms of reducing 'hand offs' (transfer of calls) between these two services and the consequent saving in staff time.

There may well be other savings that are not modelled in the prepopulated model here that are dependent on local circumstances e.g.

- Savings from re-procurement of GP Out of Hours / 111 contracts
- Further efficiency savings from having a single Clinical Assessment Service such as reduced management overheads, ability to manage demand better thus enabling higher utilisation rates
- Savings from improved systems for call handling.

2.2 First question: what is the scope of this intervention to make a difference

The scope for this intervention is simply the total number of handovers between the OOH and 111 hubs. In some areas the OOH, 111 and ambulance hubs are integrated thus there is also scope for users to input numbers of handovers to and from ambulance hubs if integration is planned to cover 999 services too.

2.3 Second question: what is the resource required and what capacity does this generate

There are likely to be significant set up resources. Users should consider the cost of integrating the hub, but may also want to apportion some of the underlying ‘enabling’ development associated with development of IT infrastructure that might enable several interventions (e.g. improved referral processes, shared care records).

The user can input a recurring cost for the integrated hub. In the pre-populated model, it has been assumed that there are no additional recurring costs.

If there are recurrent savings associated with having an integrated hub, the user can include savings by putting a negative figure as recurrent cost. These may include:

- savings from re-procurement of GP Out of Hours / 111 contracts;

- reduced management overheads; and
- ability to manage demand better thus enabling higher utilisation rates.

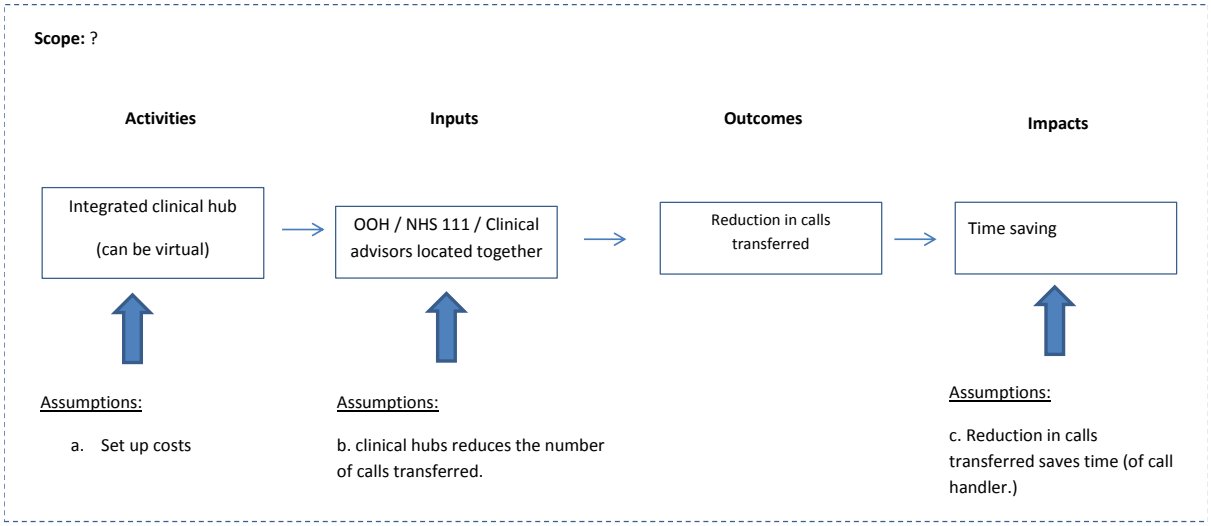
2.4 What is the anticipated effect on the other channels

It is assumed that all call transfers between hubs would be avoided. To elaborate where a call to 111 needs to be transferred to an OOH clinician this will happen directly, instead of it needing to be transferred to the OOH hub and then being transferred to a clinician.

2.5 Assumptions and caveats

This intervention was informed by the work of the Primary Care Foundation. They are developing a financial model that focuses particularly on the NHS 111 and OOH 'front end' to an integrated urgent care system but also looks at the cost of onward referrals to other services. This can be used by commissioners and providers to plan services in more detail. (For further detail see the evidence worksheet in the model.)

2.6 Schematic



3 Decreasing Ambulance Conveyances to Emergency Departments: Hear and Treat

3.1 Definition of the UEC Intervention

The objective of the intervention is to increase the use of Hear and Treat to deflect unnecessary ambulance journeys.

Hear and Treat refers to any call that is successfully completed ("closed") without despatching an ambulance vehicle response. This may include advice, self-care or a referral to other urgent care services. The intervention modelled here involves investment in clinical advisors who re-triage green ambulance calls with the aim of resolving more issues over the phone.

Note: evaluation of the success of Hear and Treat should include anonymised measurement of subsequent contacts with the entire integrated urgent care system, to ensure that the call has been fully resolved, and not simply deferred.

3.2 First question: what is the scope of this intervention to make a difference

Thus the scope is expressed in terms of an increase in the % Hear and Treat. This is expressed as a % of all ambulance calls that have a response. The user needs to input the current annual number of ambulance calls with response and the current % resolved via Hear and Treat. The target % is suggested to be 11%, in line with discussions with the Association of Ambulance Chief Executives, although this should be reviewed in line with current work led by NHS England and local planning/ambition.
This generates the additional number of Hear and Treat calls that are required to reach the target.

3.3 Second question: what is the resource required and what capacity does this generate

Set up costs will need to be locally determined. If the intervention is an expansion of a local team, then set up costs may be minimal. If setting up a new team, then costs will be higher and might include significant non staff costs (buildings, IT etc.).

The user must then decide on recurrent staffing required, in terms of WTE by band. Non staff recurrent costs can also be input.

To determine additional capacity, there follows a calculation to translate numbers of additional staff to numbers of staff hours available for direct patient care. Users are likely to leave the standard weeks worked as 42 (to account for leave, sickness training) and the hours per week (37.5) as in the pre-populated model, but they may have local data to inform the % utilisation of clinical adviser time.

Users can then input a figure for the average length of time clinical advisers spend on a call per patient.

This enables a calculation of the total number of additional clinical adviser hours available and the capacity for additional re-triaged calls generated.

3.4 What is the anticipated effect on the other channels

The user must decide what the expected effect is likely to be in terms of reduction (or increase) in activity elsewhere for re-triaged patients.

The impact is expressed in terms of expected reduction in See and Treat, see and convey and avoided ED attendances (following conveyance). Users can also input assumptions for increases in OOH clinic visits, UCC attendance and GP attends where patients are referred to attend here instead of waiting for an ambulance.

It should be noted that, as with other interventions, the impact is the change in activity rather than the absolute referral rates. So if the rate of ambulance conveyance to ED is expected to reduce from 50% of calls (before re-triage), to 40% after re-triage the impact of the retrieve is a reduction of 10%, or 0.1 conveyance per re-triage.

3.5 Assumptions and caveats

Resource and capacity assumptions:

The modelling in the prepopulated model is for an extension of an existing service; an incremental change, not the introduction of a new service to cover a whole vanguard geography.

The staff parameters input to generate hours of clinical adviser time available have various assumptions.

The 42 weeks a year is a standard figure from the Personal Social Services Research Unit (PSSRU) cost of health and social care to take account of leave, sickness and training. The hours per week are standard.

The assumptions in the prepopulated model around percentage clinical adviser time utilised and the minutes per call, are not evidence based beyond sense checking with local vanguards.

Impact assumptions:

Impact assumptions are not evidence based beyond reflecting local vanguard opinion.

4 Decreasing Ambulance Conveyances to Emergency Departments: See and Treat

4.1 Definition of the UEC Intervention

The objective of the intervention is to increase the use of See and Treat to deflect unnecessary ambulance conveyances to emergency departments.

See and Treat: aims to bring care to patients as opposed to conveying them to hospital, and can be described as focused clinical assessment at the patient's location, followed by appropriate immediate treatment, discharge and/or referral. The intervention modelled in the pre-populated model is based on a case study of a specialist paramedic team for falls patients, but the parameters can be changed to model any scenario where paramedics are given additional assessment, treatment and/ or referral skills.

4.2 First question: what is the scope of this intervention to make a difference

Thus the scope is expressed in terms of an increase in the % of See and Treat. This is expressed as a % of all ambulance calls that have a response. The user needs to input the current annual number of ambulance calls with response and the current % with a See and Treat response. The target % is suggested to be 40%, in line with discussions with the Association of Ambulance Chief Executives, although this should be reviewed in line with current work led by NHS England and local planning/ambition.

This generates the additional number of See and Treat responses that are required to reach the target.

4.3 Second question: what is the resource required and what capacity does this generate

Set up costs will need to be locally determined. If the intervention is an expansion of a local team, then set up costs may be minimal. If setting up a new team, then costs will be higher and might include significant non staff costs (buildings, IT etc.)

The user must then decide on recurrent staffing required, in terms of WTE by band. Non staff recurrent costs can also be input.

To determine additional capacity, there follows a calculation to translate numbers of additional staff to numbers of staff hours available for direct patient care. Users are likely to leave the standard weeks worked as 42 (to account for leave, sickness training) and the hours per week (37.5) as in the pre-populated model but they may have local data to inform the % utilisation of clinical adviser time.

Users can then input a figure for the average minutes clinical advisers spend on a call.

This enables a calculation of the total number of additional clinical adviser hours available and the capacity for additional re-triaged calls generated.

4.4 What is the anticipated effect on the other channels

The user must decide what the expected effect is likely to be in terms of reduction (or increase) in activity elsewhere for re-triaged patients.

The impact is expressed in terms of expected increase in See and Treat, See and Convey and avoided ED attendances (following conveyance). Users can also input assumptions for increases in OOH clinic visits, UCC attendance and GP attends.

It should be noted that, as with other interventions, the impact is the change in activity rather than the absolute referral rates. So if the rate of ambulance conveyance to ED is expected to reduce from 50% of calls (before re-triage), to 40% after re-triage, the impact of the retrieve is a reduction of 10%, or 0.1 conveyances per re-triage.

4.5 Assumptions and caveats

Resource and capacity assumptions:

The modelling in the prepopulated model is for an extension of service and not a new service to cover a whole vanguard geography.

The staff parameters input to generate hours of clinical adviser time available has various assumptions.

The 42 weeks a year is a standard figure from the PSSRU Unit cost of health and social care to take account of leave, sickness and training. The hours per week are standard.

The assumptions in the prepopulated model around % clinical adviser time utilised and the minutes per call are not evidence based beyond sense checking with local vanguards.

Impact assumptions:

Other impact assumptions are based on local vanguard experience and opinion rather than published evidence.

Personalised Care Planning

4.6 Definition of the UEC Intervention

General Practice Co-produced personalised care plans (PCP) for at least 5% of patients who would benefit the most from this, particularly long-term conditions, with potential for care closer to home due to fewer ambulance conveyances and ED attendances and admissions.

4.7 First question: what is the scope of this intervention to make a difference

4.7.1 Considerations on Scope

This intervention is targeted at people with a high level of morbidity who can avoid unnecessary admissions through a mixture of community based support and improved self -management (the latter includes support from carers). A lot of the benefit is derived from introducing proactive care in place of reactive care. This rests on the ability to predict care needs accurately through risk stratification and/or actuarial analysis.

There is a trade-off between the accuracy of these predictions, which *increases* with the level of morbidity, and the scope to avoid unnecessary treatment through prevention, which largely *falls* with the level of morbidity. There is therefore likely to be an optimal size of target population which minimises the cost of treating people unnecessarily, due to inaccurate prediction, and maximises the benefits of intervention for those who receive treatment through preventive treatment before morbidity is so severe that acute interventions become inevitable.

4.7.2 Reflecting these considerations in model inputs

The size of target population is input at the top of the worksheet. This percentage is net of personal care plans already in place. There is no evidence that the financially optimal size of target population is 5% of the health economy population, as cited in the definition. Feedback received from the vanguards was that this might be closer to 1%.

Clearly, the optimum will vary between health economies. In the absence of detailed local analysis from risk stratification tools, health economies could use data from NHS Right Care on high cost patients as a rough estimate of scope.

4.8 Second question: what is the resource required and what capacity does this generate

4.8.1 Considerations on Resourcing

The evidence on this intervention is limited to a small number of robust studies (which use randomised control trials or difference-in-difference analysis). The majority of these were conducted outside the UK and often addressed effectiveness

but not costs. The staffing numbers in the model reflect client experience moderated by the vanguard sites. Hence these default values should be reviewed carefully by users.

4.8.2 **Capacity Considerations**

The default values in the model again reflect a mixture of sources. The default value of 240 PCPs per WTE per year, is based on experience of the implementing the Guided Care service model (referenced in the evidence tab) in the UK. This reflects a maximum case load of 60 service users per WTE and an average service duration of 3 months. Once again these default values should be reviewed carefully by model users.

4.9 What is the anticipated effect on the other channels

There are 2 key considerations here:

For those service users who derive benefit from a PCP, what is the expected impact on the UEC channels?
How effective is the intervention, or to put it another way, of all the clients given a PCP, how many derive a benefit?

Expected Impact for those who derive benefits from PCPs

As noted above, evidence on this intervention is slight and primarily from international sources. Users may wish to start with the default values in the model, but keep these under review and revise in light of local piloting. Assumptions can be amended in the worksheet table. The evidence suggests an increase in primary care activity over and above the resourcing described above. Assumptions can also be amended in the table.

Effectiveness of the intervention

The evidence sources cited in the intervention work book show the number needed to treat (NNT) fall in a range from 8 to 17. ‘Number needed to treat’ is the number of people who would need to receive an intervention for an admission to be avoided. It is a measure of how effective an intervention is. The cited papers therefore show a lot of variation in effectiveness: from 1 in 8 receiving a benefit down to 1 in 17.

The evidence is drawn largely from international practice and hence the default values in the model may need to be amended to reflect local experience. The size of the NNT largely reflects the accuracy of the risk stratification tool and the efficiency of the multi-disciplinary team that uses it. Hence you may wish to assume a lower NNT if you have a lot of confidence in both of these areas.

5 Community pharmacy: Minor Ailments Service via Patient Group Directions

5.1 Definition of the UEC Intervention

Patient Group Directions (PGDs) are written instructions which allow non-doctors (in this case pharmacists), to supply a defined range of prescription only medicines. The intervention allows patients who are for example on repeat prescriptions, to receive medication outside GP opening times.

Such schemes can also provide patients with access to self-care advice and treatment for a number of specific minor illnesses which would otherwise involve a visit to a GP practice. The objective is to free up practice appointments. Patients can self-refer or be referred to a participating pharmacy from local medical practices or other primary care providers including the NHS 111 service.

5.2 First question: what is the scope of this intervention to make a difference

This needs careful consideration and will depend on the specific conditions covered and achieving behavioural change in the population so that patients attend a pharmacy rather than a GP practice.

The inputs required are:
Total Population and average GP contacts per person per year to calculate a figure for total GP contacts per year.
% GP contacts that could be managed in community pharmacy under the proposed scheme. This will be the percentage of GP contacts that relate to the minor ailments covered in the proposed PGD scheme and will depend on the conditions included.

This will give the number of GP contacts for minor ailments that could be managed in the community pharmacy

Then the user needs to enter a target % of these contacts to be managed in the community pharmacy. This target is or can be influenced by the ability to achieve behaviour change in the population so patients will consider going to the pharmacy for certain conditions as well as knowing about the scheme and be willing to attend a pharmacy. Patients would also need to be able to self-diagnose that they had these conditions.

This then will give a target number for the number of community pharmacy minor ailments contacts.

The user is required to input the current number of such contacts and then the required additional contacts are calculated.

5.3 Second question: what is the resource required and what capacity does this generate

The user should assess set up costs. This could include project management and communications.

The recurrent costs would generally be based on a fee per contact negotiated locally.

It is assumed that the drugs would have been prescribed elsewhere if the scheme was not in place so the base costs of the drugs to be dispensed are not requested. However under PGD schemes, VAT on drugs supplied by the pharmacy would need to be paid (not required for NHS prescribed drugs) and this should be accounted for.

5.4 What is the anticipated effect on the other channels

The user must decide what the expected effect is likely to be in terms of reduction (or increase) in activity elsewhere.

5.5 Assumptions and caveats

The pre-populated model is based on the evaluation of a scheme in Devon.

The conditions covered by the scheme were: Bacterial conjunctivitis, impetigo, nappy rash, uncomplicated Urinary Tract Infections (UTIs) and oral candidiasis.

In the calculation for scope, the average GP contact per year is suggested as 6.9 per person which comes from national data (For further detail, see the evidence worksheet in the model). The % GP contacts that could be managed in a community pharmacy under the proposed scheme came from a local query on GP practice data to look at the proportion of consultations that result in prescribing for these conditions.

The target % to be managed is relatively low at 10% but reflects what was thought to be achievable locally.

In terms of cost, the cost per contact is based on a fee per service of £10 plus assessment and that the VAT on drugs supplied was 82 pence per contact.

The impact figures are based on an evaluation of the scheme (see evidence tab in the model). This reported that the majority of patients (75%) self-reported they would have attended their GP practice if the pharmacy service was not available, with another 19% reporting they would have accessed the OOH GP services while 3.1% stated they would have visited A&E / urgent care centres. The total of all the patients that would have sought treatment elsewhere was 97.2%.

6 Community pharmacy: Emergency medicine supply.

6.1 Definition of the UEC Intervention

This service is aimed to support patients who need their regular medication urgently but who don't have a prescription. The patient can present at a pharmacy and be provided with their regular medicines without the need to pay (if they are exempt from NHS prescription charges).

The aim of this service is to relieve pressure on urgent and emergency care services and general practitioner appointments at times of high demand. It is estimated by NHS England that up to 30% of calls to NHS 111 services on a Saturday are for urgent requests for repeat medication.[3]

Repeat prescription medicines can be issued in an emergency under current regulations with the exclusion of Schedule 1, 2 or 3 Controlled Drugs if there is immediate need. Patients can access the service when their GP practice is closed, for example on evenings and weekends.

6.2 First question: what is the scope of this intervention to make a difference

The inputs requested are:

- Current contacts urgent prescriptions (across all services)
- A target % to deflect to community pharmacy
- Current community pharmacy urgent prescription contacts

This gives a target figure for additional emergency supply contacts.

6.3 Second question: what is the resource required and what capacity does this generate

The user should assess set up costs.

The recurrent costs would generally be based on a fee per contact dependent on the number of drugs supplied, negotiated locally.

It is assumed that the drugs would have been prescribed elsewhere if the scheme was not in place so the base costs of the drugs to be dispensed are not requested. However we have assumed that under Patient Group Directions (PGD) (see section

[3] https://www.england.nhs.uk/wp-content/uploads/2015/03/rept-medictn-guid-nhs111.pdf

5.1 for more information on the PGD intervention) schemes VAT on drugs supplied by the pharmacy would need to be paid (not required for NHS prescribed drugs) and this should be accounted for. You should confirm the VAT situation for the model you are considering locally and reflect this in the modelling.

6.4 What is the anticipated effect on the other channels

The user must decide what the expected effect is likely to be in terms of reduction (or increase) in activity elsewhere.

6.5 Assumptions and caveats

The pre-populated model is based on the evaluation of a scheme in Devon.

In terms of the cost, the cost per contact is based on an average fee per patient of £10.82, plus VAT on drugs dispensed of 82 pence. We have assumed that this intervention will not change the volume of drugs dispensed, just where they are dispensed, which in turn effects VAT status. We have used an average drug cost of £4.09 to estimate this VAT payment at 82 pence. Hence the default value used for cost per patient is £11.64.

The impact figures are based on an evaluation of the scheme (see evidence tab in the model). This reported that 53.3% would have contacted the out of hours GP, 17.9% their GP practice, 5.4 % would have visited A&E or a UCC, 8.9% a pharmacy, 1.4 % another service and 13.9% would have gone without medication.

7 Co-location of Urgent Treatment Centres (UTCs) with Emergency Departments (EDs)

7.1 Definition of the UEC Intervention

Urgent treatment centres (UTC), encompassing urgent care centres, minor injury units, walk in centres and other community-based urgent care facilities, co-located with an A&E department on a hospital site with access to diagnostics and a full range of clinical staff. There will be different models in different areas and may encompass GP OOH. They may have shared 'streaming' or front door triage.

The co-location of UTC services with emergency departments provides opportunities for collaboration, routine two-way transfer of appropriate patients and can help decongest emergency departments.

A patient's default is often to attend A&E with a minor problem that could be treated elsewhere in the urgent care system (Urgent Care Centre (UCC)/ Minor Injuries Unit (MIU)/ Walk in Centre (WIC) / Out of Hours (OOH)). There are many reasons for this but may include lack of awareness of location and opening hours of alternative UTCs. Co-locating UTCs with A&E will address some of these reasons.

The main channel shift considered in the model is from reduced ED attendance. But a UTC may attract attendances from other channels too dependent on achieving population behavioural change, or possibly other changes such as closure of other WIC/ MIU/ OOH facilities.

Quality benefits, such as improved patient flows through ED and thus reduced waiting times, are not considered.

7.2 First question: what is the scope of this intervention to make a difference

This intervention is aimed at ensuring patients are treated in the most appropriate facility and in particular to target the more minor ED attenders that could be seen at a UCC. These more minor ED attenders are expressed in terms of the emergency medicine HRGs:

- VB08Z Category 2 Investigation with Category 1 Treatment
- VB09Z Category 1 Investigation with Category 1-2 Treatment
- VB11Z No Investigation with No Significant Treatment

In addition, the patients that are admitted are excluded as these would not be considered minor. It is recognised that this definition is essentially a proxy for minor ED cases and locally, a different definition may be used, possibly based on analysis of numbers of patients treated in the 'minors' section of the current ED department.

The user needs to input the current number of ED minors (or VB08, 09, 011 not admitted) and the target % of these that the co-located UTC is to divert. This will give a figure for the additional activity needed to model. Where these facilities are planned to close, model users will need to reflect this in additional activity transferred to the new co-located centre.

7.3 Second question: what is the resource required and what capacity does this generate

There are likely to be significant set up resources. These will depend on local plans which may range from a relatively simple re-designation and minor redesign of existing facilities, to wholesale development of new facilities.

Set up costs may include:

- Planning / project management
- Development / Redevelopment of buildings
- Costs of decommissioning if other UTCs are closed
- Communication to promote public awareness of change
- HR costs, training, development, recruitment

In terms of recurring cost, the user should input details of additional staffing (grades, WTEs, uplift for unsocial hours). The model will then calculate total additional staff costs.

For each staff band and type, the user can input assumptions about the number of cases expected to be seen and treated per hour.
There is also a required input for % utilisation.
These assumptions will be combined with assumptions about hours worked to generate a capacity for additional patients the unit is expected to see.

The user is then required to input assumptions about other recurring costs.

The user can use these fields to reflect local expected costs and plans. The user may want to pull in top level figures from their own calculations here. However, they can use the template to reflect cost that will change, i.e. other inputs such as:
.

- Patient related variable costs, e.g. for diagnostics
- There may be staff related costs, e.g. for HR, IT, etc.

There may also be other overhead costs directly related to the new co-located service that should be included here.

The output of this section includes total costs, and a total expected number of patient attendances expected at the co-located UTC.

7.4 What is the anticipated effect on the other channels

The user must decide what the expected effect is likely to be in terms of reduction (or increase) in activity elsewhere for patients attending the co-locating UTC.

The impact is expressed in terms of expected reduction in ED minor attendances, UTC attendances elsewhere, OOH clinic visits and GP attendances.

7.5 Assumptions and Caveats

South Tyneside CCG were considering implementing an 'urgent care hub', locating out-of-hours provision on a single site adjacent to an accident and emergency department, and asked University of York to carry out an evidence review of co-locating urgent care services.

The University of York reported that:

- *We did not find any systematic reviews assessing the effectiveness of a single site "urgent care hub".*
- *Reviews assessing strategies for triage and treating non-emergency cases presenting to emergency departments may inform elements of a single site hub.*
- *We found evidence that suggests triage liaison physicians, working in a team or alone, and fast-tracking patients with less serious symptoms both reduce emergency department waiting times and length of stay.*
- *Evidence from a small number of poor quality studies suggests that rapid assessment zones and employing general practitioners and nurse practitioners in emergency departments may improve the flow of non-emergency cases through the department.*
- *The evidence about the safety and cost-effectiveness of any of these strategies is lacking.*

The pre-populated models reflect data from a co-located UTC service in a vanguard.

For this intervention, local input is essential as there is no one model for co-located services. All local areas will have a different starting point with a different mixture of ED and UTC services, different contracts for OOHs and WIC services, different potential and issues with buildings, thus it would be inappropriate to set one model.

At present, little evidence has been gathered on the impact of this initiative. A review by the University of York (referenced in the evidence sheet of the model) found no systematic reviews of single site hubs. York found some evidence for improved flows through ED departments, but the studies concerned were of "poor quality".

8 Enhanced Urgent Care Centre / Urgent Treatment Centre Standards

8.1 This section is not currently included in the model and will be completed following the publication of new standards for Urgent Treatment Centres.

9 Increased use of Summary Care Records: Inpatient drug reconciliation

9.1 Definition of the UEC Intervention

This intervention is about using the Summary Care Record (SCR) to reconcile the secondary care prescription record for inpatients against that recorded as being prescribed in primary care. This has been shown to lead to a reduction in prescribing errors for inpatients which in turn will lead to a reduction in adverse drug events.

Benefits of the Summary Care Record not modelled
Access to the Summary Care Record (or shared care record) has the ability to inform and improve clinical decision making anywhere where a clinician has access to the SCR, e.g. Clinical Assessment Services, urgent care centres etc. The only benefits considered in the interventions modelled are those associated with inpatient drug reconciliation (this intervention) and from reduced prescribing errors for accident and emergency attenders (see next intervention). We have specifically not considered benefits of accessing SCR / shared records elsewhere to avoid double counting of benefits. Access to SCR could potentially contribute to benefits for many interventions modelled, but in particular those for improved referral processes, ambulance Hear and Treat and integrated Clinical Assessment Services.

Benefits not modelled because of a lack of robust quantified evidence could include:

- Improved quality of care
- Reduction in referrals and admissions through more informed clinical decisions.
- Reduction in time taken to check medication. This intervention is limited to inpatient services, however, the SCR would potentially also reduce checking time in all points of delivery including A&E, OOH, through to GP surgeries.
- Reduction in litigation costs because of reduction in adverse drug events
- Reduction in the number of referrals for further tests and procedures
- Reduction in drugs wastage - by avoiding incorrect medication and duplication of existing.
- Reduction in time taken to compile To Take Out (TTO - medication patients are sent home with)

Information regarding the Summary Care Record (SCR), including benefits, is set out on the HSCIC website http://systems.hscic.gov.uk/scr .

9.2 First question: what is the scope of this intervention to make a difference

A proportion of all bed days used will be due to adverse drug events, some of which will arise from the incorrect recording of existing prescriptions in secondary care. Using the SCR for drug reconciliation has been shown to reduce these errors. The user is asked to enter the number of non-elective admissions and average length of stay to calculate the number of bed days. There is then applied an assumed % of

bed days that can be avoided by this intervention which gives the scope of this intervention in terms of saved bed days

9.3 Second question: what is the resource required and what capacity does this generate

Users need to determine the set up and recurring costs of using the SCR for inpatient reconciliation. In the pre-populated model, we have not considered the cost of populating the SCR in primary care but assumed that the SCR is already available on the spine. However, there will be some set up costs for training, and ongoing training and smart care management costs. Users should consider the costs they would expect to incur locally.

9.4 What is the anticipated effect on the other channels

The user must decide what the expected effect is likely to be in terms of reduction (or increase) in activity elsewhere.
Users are required to input a figure for the % emergency admissions where reconciliation is performed. In the pre-populated model, this is set at 90%.

There follow assumptions about:

- Average prescribing errors avoided per admitted patient by use of SCR (as opposed to other sources)
- Number of adverse drug events resulting from each prescribing error
- The average number of additional days spent in hospital as a result of an adverse drug event

Together, this calculates an expected reduction in emergency bed days per reconciliation performed.
This then generates a figure for expected reduction in emergency days over all emergency admissions.

There also follows a model to calculate the amount of time saved by using the SCR for reconciliation versus other methods (e.g. requesting a fax of prescription from GP surgery). Users may wish to enter the assumptions for this calculation.
Users are asked to input the average time saved per reconciliation, and the percent done by grade of pharmacy staff. The model uses these inputs to calculate how much time would be saved over a year and what this equates to in WTEs.

9.5 Assumptions and caveats

The assumptions in the pre-populated model are largely from published research papers. However, the overall robustness is questionable as it relies on joining up the results of different bits of research for each assumption, with some research several years old and not based in UK hospitals.

We cite a systematic review of the prospective and retrospective studies of adverse drug reactions in hospital patients (see evidence page, Wiffin 2002). This gives a

figure that 4% of bed days are due to adverse drug reactions. Only a proportion of these will arise because of incorrect recording of existing prescriptions. 1% is thought to be a reasonable estimate of potential impact. This paper also suggests an average of 2 days extra length of stay per adverse drug reaction.

Another paper (Boockvar 2009) reports analysis of how discrepancies in a patient prescribing record that can result in an adverse drug event and reported a figure of 65 Adverse Drug Events ADE's per 1300 discrepancies or 0.048 events per discrepancy. However, we need to treat this with caution as it relates to patient transfers from care homes to hospital care in America in 1995-2005. In the absence of UK specific published evidence, it can be used to set initial values in the model but then replaced by local data generated through piloting.

The figures for the additional discrepancies found by using SCR versus other methods and time saved by using the SCR were reported by the HSCIC following a study.

In conclusion, the assumptions are based on the best evidence available, but cannot be taken to be completely robust.

Local feedback on time savings from using the SCR for medication reconciliation was that it was unlikely that these would lead to savings in pharmacy staff and hence cash releasing. It was thought to be more likely that freed-up pharmacist time would be used in more productive activities such as additional medication reviews. The cost savings that might result from these alternative activities have not been estimated in the model.

10 Increased use of Summary Care Records: Use in emergency department

10.1 Definition of the UEC Intervention

This intervention is about using the Summary Care Record (SCR) in ED to check patients' current prescriptions and information about allergies.
This is thought to result in a reduction in prescribing errors which in turn will lead to a reduction in adverse drug events.

For commentary on other benefits on SCR please see intervention above.

10.2 First question: what is the scope of this intervention to make a difference

This simply looks at the overall number of ED attendances and suggests a percentage where the SCR could be accessed.

10.3 Second question: what is the resource required and what capacity does this generate

The resource required will be similar to the previous intervention, so training and smart care management.

10.4 What is the anticipated effect on the other channels

The user must decide what the expected effect is likely to be in terms of reduction (or increase) in activity elsewhere.
The user inputs:

- The % of ED attenders where the SCR is accessed
- Average medication errors avoided where SCR is accessed
- Number of adverse drug events resulting from each prescribing error
- The average number of additional days spent in hospital as a result of an adverse drug event

10.5 Assumptions and caveats

Many of the assumptions are the same as in the previous model.

NHS Digital have carried out an unpolished survey which suggested that a benchmark for SCR viewing is up to 15% of patients (i.e. for other patients the information in SCR may not be appropriate/significant to the care they receive). Actual % where used can be a lot less so this assumption needs to be informed by local data. Avoidance of medication errors where SCR was accessed was reported to be 41% but the sample size was small.

Other assumptions come from the same sources as the previous intervention.

In conclusion, the assumptions are based on some evidence available, but need to be considered locally.

11 Extended General Practice Opening Hours

11.1 Definition of the UEC Intervention

Every person to have access to a GP (either their own or through another GP that is a part of a federation of which their practice is a member) between 18:00 and 20:00, Monday to Friday and for at least 4 hours each day on Saturday and Sunday.

The main evidence source that was used to develop the model was the NHS Greater Manchester Primary Care Demonstrator Evaluation[4] and in particular the Bury Demonstration Project which was closest in scope to the definition above. The model was subsequently validated by two UEC vanguards: Barking, Havering & Redbridge and the North East Network.

11.2 First question: what is the scope of this intervention to make a difference

11.2.1 **Considerations on Scope**

A key focus for the modelling work on channel shift is the extent to which interventions relieve pressure on A&E in terms of attendances and admissions. The evidence from the demonstrator sites on this is mixed. The evidence from the site that is most closely aligned with the definition (Bury in Greater Manchester), is that extended GP opening has greatest impact on other channels namely: Out of Hours services and Walk in Centres with only a small (non-significant) impact on ED attendances. The other demonstrator sites offered new services that go beyond the definition such as case management for care home residents and rapid response step up and did see greater impact on ED attendances.

This needs to be borne in mind when considering scope. It may be that there are local advantages in reducing pressure on these other channels, and/or that this intervention makes a valuable contribution to addressing failure demand in ED when included alongside other interventions. This can be explored by switching the intervention on and off in the CCSM to see how that changes the overall results.

In all of the interventions we have looked for evidence of supply-induced demand. This is new demand stimulated by the intervention from those who would otherwise have self-cared and not accessed any point of care were it not for the availability of extended hours. Supply-induced demand was not found to be statistically significant in the evidence sources cited.

[4] NHS Greater Manchester Primary Care Demonstrator Evaluation Final Report; NIHR CLAHRC Greater Manchester June 2015; http://clahrc-gm.nihr.ac.uk/our-work/organising-healthcare/demonstrator/

11.2.2 **Reflecting these considerations in model inputs**

To reflect these impacts in the worksheets, the user should make the following inputs in the scope panel of the worksheet:

- The target population for this initiative is taken to be the *current VB08, 09, 011 not admitted type 1 ED attenders*. This is the maximum size of the opportunity.
- *What % of this population do you want to address?* – Given the considerations outlined above, the user should make an assessment of how much of the target population could be addressed by the intervention by entering a percentage in the worksheet. As noted above, the default values in the model reflect evidence from the extended hours demonstrator sites, which show a small impact for avoided ED attendances.

Outputs in the scope panel:

An adjacent table in this panel of the worksheet shows:

- the resulting number of ED attendances that would be avoided if that target is met.
- this is compared with the number of ED attendances that could be shifted to the UCC given the extra resource capacity modelled.
- how close to target you are given this resourcing.
- Given that there is a larger impact on Out of Hours services and Walk in Centres, it will be useful to look at shifts in these channels when scoping this intervention.

11.3 Second question: what is the resource required and what capacity does this generate

11.3.1 **Considerations on Resourcing**

The default staff mix and numbers in the model reflect the demonstrator site evidence cited above. These are for an urban patient population of around 30,000:

- 2 GPs for each additional hour
- 1 receptionist

Internet research and discussions with vanguard sites suggest that there is a lot of local variation in payments of premiums for working anti-social hours.
The demonstrator site evidence did not record a material increase in buildings, facilities management and estate costs. There was no additional IT investment.

11.3.2 **Reflecting these resourcing considerations in model inputs**

Set up / non recurrent costs:

The workbook contains a value for these based on the Bury demonstrator which covered a population of 30,000. The evaluation report does not provide a breakdown for these, but they are likely to include publicity and recruitment costs.

Staffing:

The resourcing panel of the worksheet has been pre-populated with staff grades which reflect the guidance referenced above. Users should amend the following values in the worksheet to reflect local circumstances:

- Additional/fractional whole time equivalents
- Adjustments to pay costs to reflect unsociable hours

11.3.3 **Reflecting capacity considerations in model inputs**

It is envisaged that health economies will in many cases have at least partially implemented extended hours, hence there is provision in the worksheet to allow for local input.

The evidence from demonstrator sites showed large variation in bookings and DNA rates. Default values in the model reflect the general experience in the demonstrators. These values can be amended. Each GP is assumed to have a maximum capacity of 6 patients per hour. This can also be modified.

Output from this panel of the worksheet:

The output table shows the additional appointment capacity created and the corresponding costs. A particular challenge for this intervention is judging what level of capacity is a reasonable starting point. A target can be set in terms of additional appointments per 1000 population, however there is varied evidence on what the optimal value for this is.

11.4 What is the anticipated effect on the other channels

As noted, the evidence suggests that the main channel impacts are on Out of Hours and Walk in Centres plus a very small impact on ED attendances. As noted above, supply-induced demand was not found to be statistically significant.
The following table gives a rough guide to channel impacts based on the Bury demonstrator.

Channel	Number of additional appointments needed to avoid 1 attendance or contact
Out of Hours Service	2.63
Walk-in-Centre	7.34
A&E Attendance	25

11.4.1 **Considerations on impact**

The evidence set out above was used to set the default values in the work sheet. As always, these should be reviewed in light of local circumstances.

11.5 Assumptions and caveats

The assumptions and caveats have been discussed above; nevertheless, it is important to note the following:

- Where the intervention is limited purely to extended GP access, the direct impact on A&E attendances may be small, therefore it is advisable to assess its impact alongside other initiatives, i.e. as a component of a more extensive change or an enabler.
- It is not clear what level of capacity an area should start with since metrics such as additional appointments per 1000 population do not provide reliable guides, hence implementation should allow flexibility to learn from trial and error.

12 Improving referral pathways

12.1 Definition of the UEC Intervention

Information can be found in the NHS England document 'Improving referral pathways between urgent and emergency services in England'.[5] The basic premise behind the intervention is set out in the guidance and repeated here:

> *In order to facilitate an improved flow of patients and information within the UEC system with the potential for improved patient outcomes ('right care, first time'), all registered health and social care professionals within physical and mental, following telephone consultation or face-to-face contact with a patient, should be empowered, based on protocols developed and agreed locally, to make direct referrals and/or appointments for patients with:*
>
> - *The patient's registered general practice or corresponding out of hours (OOH) service;*
> - *Urgent Care Centres;*
> - *Emergency Departments in Emergency Centres and in Emergency Centres with Specialist Services;*
> - *Mental health crisis services and community mental health teams;*
> - *Rapid response nursing teams (JET);*
> - *Specialist clinicians, if the patient is under the active care of that specialist service for the condition which has led to them accessing the urgent and emergency care system.*

Key components that underlie this are the online NHS Pathways Directory of Services (DoS) and systems that enable direct booking into the above services. These will often be supported by online access to patient records (Summary Care Record or shared cared record) and decision support, either automated or via voice contact with a clinical advisor, that will help direct the practitioner towards the appropriate service for a patient.

Direct booking is generally only available to clinicians in the Clinical Assessment Service, and then only to specific services that allow direct booking. Potential for changes in referral patterns from the Clinical Assessment Service are specifically NOT modelled because of potential for duplication with the integrated Clinical Assessment Service model, but the model templates could be used to do this by the user instead of using the integrated Clinical Assessment Service model.

These models enable modelling of activity and cost shifts from points of referral to services included in the DoS. For the services on which this is based, clinicians can

[5] https://nhsengland.sharepoint.com/sites/NUECS/UEC Document Library/Urgent & Emergency Care Review Reports & Outcomes/Improving-referral-pathways- advice for urgent and emergency care networks.pdf

access the DoS from MiDoS, a mobile search tool that assists clinicians to direct patients to the most appropriate and available place of care. Referrals can be made, but direct booking is currently generally not enabled unless via Clinical Assessment Service.
Three services are considered here where having access to the DoS (via MiDoS) and support from the Clinical Assessment Service can enable more appropriate and more efficient referrals. Namely referrals from:

- Paramedics
- Accident and emergency departments
- Care homes

The model template could also be used to model the impact of change in referral patterns from other services with access to the DoS, e.g. the integrated hub (if care is taken not to duplicate with the integrated Clinical Assessment Service model), GP practices, hospital based discharge teams, urgent care centres etc.

As well as a reduction in referrals, there may also be additional impact of improved intelligence from transparent referral activity, leading to better management of service provision, informed planning, etc. This in turn may redistribute referral activity more cost-effectively.

There is little evidence on the quantified impact of these interventions thus users should view modelled scenarios as examples only and use local evidence and opinion to inform assumptions.

12.2 First question: what is the scope of this intervention to make a difference

There are three interventions modelled. Each intervention is for where a service has access to a Directory of Service (DoS) or Mobile Directory of Services (MiDoS). The user should consider the most significant potential impact of this. In the prepopulated model, the impacts modelled are:

- a reduction of Ambulance conveyances for where paramedics have access to MiDoS;
- a reduction in short stay admissions for ED where clinicians have access to MiDoS; and
- a reduction in admissions from care homes where care home carers have access to MiDoS.

In all these cases, the channel shift would be due to clinicians being able to be informed about and access alternative appropriate services via a DoS or MiDoS.

12.3 Second question: what is the resource required and what capacity does this generate

The user must consider the costs involved in terms of set up and also recurrent costs. This will include those that relate directly to enabling a particular service to access DoS/ MiDoS and potentially an apportionment over overall 'enabling' costs that might span several interventions. An IT infrastructure and software development might enable several projects such as integrated Clinical Assessment Services, shared care records and improved referral process and cost to be apportioned across all interventions that the development enables.

12.4 What is the anticipated effect on the other channels

For this intervention, the model is built by assumptions that generate an estimated number of DoS/ MiDoS accesses and assumptions about channel shift per access. It is important to consider shift; this should be the change in patient flow expected, not simply a change in the way patients are referred to particular services.

12.5 Assumptions and caveats

The prepopulated models are example scenarios only. Local evidence and opinion must inform assumptions.

The NHS England referral processes document does cite a number of case studies where improved referral processes have led to a change in referral patterns. However, achieving change in referral patterns is multifactorial and not simply dependent on developing a DoS/ MiDoS. For example, users would need to consider whether referral pathways need to be developed, whether services had the capacity to accept more referrals, how behavioural change was going to be achieved, how much decision support will underlie the DoS/ MiDoS and whether users would have access to a summary or shared care record.

As with all interventions, users should be careful not to overstate impacts where several interventions might be targeting the same population. For example, using a model for referral processes for an ambulance might be targeting the same cohort of patients and increasing See and Treat. Users might decide to use one or the other model, or if using both, possibly consider reducing expectation of individual model impacts where there could be overlap.

13 Ambulatory Emergency Care

13.1 Definition of the UEC Intervention

Ambulatory emergency care (AEC) is an approach which results in a significant proportion of emergency adult patients being managed safely and efficiently on the same day avoiding admission to a hospital bed.

Models may vary between hospitals. It is considered best practice to have a unit that is distinct from the emergency department and medical decision unit. The AEC facility should have immediate access to a senior doctor who is responsible for agreeing the case management plan for each patient. The time frames for initial assessment and medical review in the AEC facility should be similar to those in the main emergency department. Patients in the AEC facility should have access to diagnostics within the same timeframe as all other emergency patients.

Hospitals introducing AEC for the first time should expert to convert 25% of their adult acute medical admissions to ambulatory emergency care episodes. In time, this can be increased to around 30% of all medical admissions with all patients considered for AEC management as a first line unless they are clinically unstable.

Benefits include improvement in patient flow with more patients being diagnosed, treated and safely discharged with an appropriate care package on the same day, thus avoiding admissions which are costly for the trust and unwanted by the patient. Cost benefits considered are:

- Avoided A&E attenders / or reduced cost A&E attenders where patients are triaged directly to AEC.
- Avoided emergency overnight admissions and saved bed days.

Further information can be found at: http://www.ambulatoryemergencycare.org.uk/

13.2 First question: what is the scope of this intervention to make a difference

The scope is expressed in terms of an increase in the % of cases that attend AEC. This is calculated from the total number of medical emergency admissions, the current percentage of those attending ambulatory emergency care, and a target % for those attending AEC. The target % is suggested to be 30% which has been advised by NHS Elect as an appropriate target.

This generates the additional number of AEC attendances required to reach the target.

13.3 Second question: what is the resource required and what capacity does this generate

Users will need to consider the inputs and costs of their proposed schemes.

The user should first consider set up costs. In the pre-populated model, an expansion of an existing unit is modelled thus set up costs are minimal. If a new unit is being set up from scratch, costs may be a lot higher.

The user must decide on the additional staffing required, in terms of WTE by band, and any uplift for unsocial hours. The user must also be able to estimate non staff recurrent costs including diagnostics. This will generate a figure for total cost of the expansion of the unit.

The number of hours of additional staff time is calculated.

The amount of staff time per patient, and the percentage utilisation of the unit together with the staff time, generate the capacity of the additional staff in terms of attendances.

13.4 What is the anticipated effect on the other channels

The user must decide what the expected effect is likely to be.

A number of assumptions require an input from the user:

- % AEC attendances where ED attendances are avoided or triaged directly to AEC. This is the % of cases seen in AEC which would otherwise have been processed in ED.
- % AEC attenders subsequently admitted. Some patients after diagnostics will not be safe for discharge and will require admission.
- % inappropriate referrals (below threshold). These are patients who attend AEC, but don't meet the criteria of needing AEC workup. Possibly they could have been managed in primary care, or seen and discharged from ED without significant diagnostic workup.

The above generate a % AEC attenders discharged same day.

The user then inputs assumptions for the:

- Average bed days saved per patient discharged
- Average additional out of hospital (community, domiciliary / respite) contacts per patient discharged from AEC. Some patients will be safe to discharge home if additional home care is arranged.

Together the assumptions above generate figures for channel shift for each AEC attendance, for reductions in emergency bed days and ED attendances, and increases in out of hospital care.

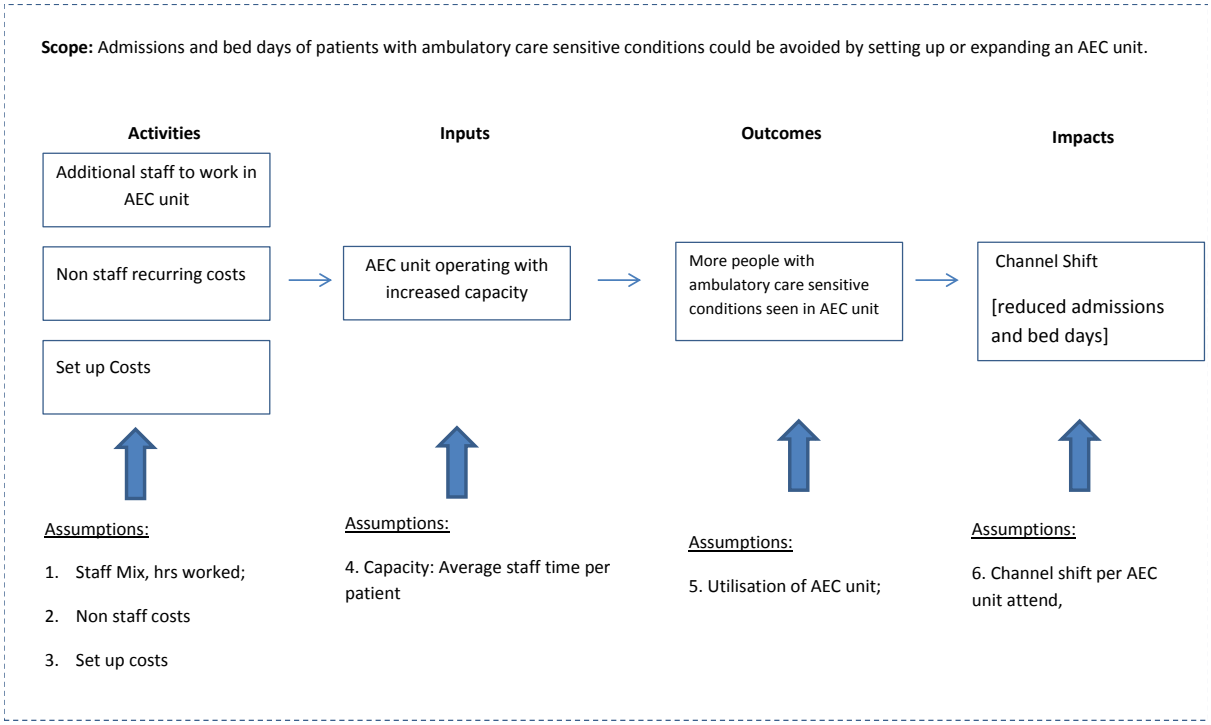
13.5 Assumptions and caveats

The assumptions in the pre-populated model reflect discussions with NHS Elect experts on ambulatory emergency care who run the ambulatory emergency care delivery network.

There are several case studies cited in the evidence that set out reductions in bed use after implementation of AEC. But none provide a costed and quantified whole system view.

Thus assumptions are not evidence based beyond reflecting expert opinion. They have been presented to local vanguards who validated the model and whose feedback led to minor changes in the assumptions.

13.6 Schematic



14 Care Home Educators

14.1 Definition of the UEC Intervention

This is not a national intervention. It is being implemented in one UEC vanguard after a successful pilot. It is designed to address local issues about improving the quality of care in care homes as well as delivering financial benefits.

The intervention is to deliver training to carers in care homes by professional nursing staff (care educators) covering the areas of:

- Falls awareness and management
- Urinary tract infection (UTI) awareness and management including catheter care and signs and recognitions of UTI
- Pressure ulcer awareness and management/tissue viability
- Respiratory awareness and management including inhalers and overview of respiratory decline
- Medicine management
- DNAR (Do Not Attempt Resuscitation) and end of life awareness and management
- Understanding of services available and when appropriate to access

The aim is to improve and enhance patient care, leading to early identification of deteriorating residents and early intervention with professional care leading to the residents remaining in their own care home and being looked after professionally.

There will be benefits in terms of quality of care and also potential avoidance of care home closures in cases where there is scrutiny by the CQC.

However, for this model, financial benefits modelled are reductions in non-emergency admissions and ED attendances.

14.2 First question: what is the scope of this intervention to make a difference

To estimate the scope, the vanguard has identified the number of emergency bed days used by care home residents and has a target for reduction expected from this intervention. There is some information in the guidance column about how users might estimate this for their local area, either by applying a national expected rate, or looking at admissions from care home postcodes, or users can apply their own methodology to estimate this. The impact expected will depend on the scheme implemented. So for example, if it was decided to target a small number of care homes with high admission rates, the number of admissions and bed days could be for just these care homes (which would be smaller than vanguard wide figures) but the impact in terms of the percentage reduction in bed days may be higher.
If the educators scheme is directed at training in specific areas, then the scope for reduction should be expressed in terms of admissions for these areas, e.g. just UTIs, or falls.

14.3 Second question: what is the resource required and what capacity does this generate

Users will need to consider the inputs and costs of their proposed schemes.

The user should first consider set up costs. In the pre-populated model, set-up costs are estimated to be half proposed running costs, on the assumption that results scale up from zero to maximum over a year as training covers more care homes.

The user must decide on staffing required, in terms of WTE by band, and also be able to estimate non staff recurrent costs which could include IT (tablets/ laptops) and travel.

In terms of the capacity generated, this is expressed in terms of care home residents covered by the scheme. Users should input their own data on the average size of their care homes and numbers of care homes to be covered to estimate this.

14.4 What is the anticipated effect on the other channels

The user must decide what the expected effect is likely to be in terms of reduction (or increase) in activity elsewhere.

This should ideally be informed by evidence and debated locally to translate to local circumstances.

The impact is expressed in change in activity (i.e. reductions in admissions, attendances etc.) for each care home resident covered by the scheme.

Each admission may be accompanied by an ambulance conveyance and an ED attendance so reductions here are also modelled. There may be increases in activity in other areas.

14.5 Assumptions and caveats

14.5.1 **Resource and capacity assumptions.**

For this intervention, the staffing in the pre-populated model reflects the actual planned establishment of the care educators' project for one vanguard and the additional recurring costs are those estimated by the vanguard.

The capacity (numbers and size of care homes to give the number of residents covered) reflects local vanguard analysis.

Local users will need to input the information that reflects their local scheme.

14.5.2 **Impact assumptions:**

In terms of impact, the published paper[6] on which the vanguard scheme was modelled reported a reduction in admissions of 51%. However, the rate of initial admissions was not included in the publication so it is not possible to translate this directly into a reduction in rate of admission per resident. National data (see evidence tab in the model) suggests emergency admission rates for care home residents is around 0.57 admissions per resident per year. If this rate is reduced by 51%, then the new admission rate would be 0.29 (0.57*51%), which translates to a channel shift of a reduction of 0.28 admissions per resident covered. At a length of stay of 10.3 days (a vanguard researched figure), a reduction of 0.28 admissions per resident would translate to a reduction in bed days of around 3 days per resident. However, analysis of vanguard data suggests a lower figure for their scheme. The prepopulated model suggests a modest reduction of one bed day per resident which may be expected if the scheme covers all care homes. If the local scheme to be modelled covers just high admitting care homes, the reduction might be expected to be more. If the local scheme only targets one area of care (e.g. UTIs or falls), then the impact would be expected to be lower.

The Brownhill paper also reported reduction in GP and community nurse contacts. In the vanguard scheme modelled, all care homes calls to 111 or ambulance were diverted to a clinical adviser unless the patient was unconscious or bleeding profusely, thus we have modelled an expected increase in 111 adviser contacts. Local schemes will differ.

In summary, there is evidence available on impact (e.g. reduction in admissions), but as with many models, users will need to consider the scheme to be implemented in their area and make full use of local analysis and opinion to inform assumptions.

[6] (Brownhill, K (2013) Training in care homes to reduce avoidable harm, Nursing Times; 09:43, 20-22)

15 Rapid Response

15.1 Definition of the UEC Intervention

Note: To avoid overlap with the discharge planning and discharge to assess models, this intervention is focussed on admission avoidance rather than early supported discharge.

Rapid response teams are integrated multi-disciplinary, community based teams that provide rapid assessment and clinical support with the aim of preventing admission to hospital. Patients referred should be those experiencing an acute alteration in their physical well-being which, without the input of this service, would result in acute hospital admission. The team can include Nurses, Physiotherapists, Occupational Therapists, Social Workers and Healthcare Assistants.

A rapid response admission avoidance service generally offers short-term (1-10 days) intensive support including nursing and therapeutic assessments and social care with:

- rapid assessment of patients once a referral is accepted
- care plan developed and agreed with the patient and their carers where appropriate to enable the patient to remain at home.
- visits to implement care plan.
- safe handover to appropriate services on discharge for ongoing packages of care and liaison with the patient's GP.

There will be interaction with other interventions, e.g. referrals may be accepted from Clinical Assessment Services which may lead to avoided secondary care use, or may be received from ambulatory emergency care units thus avoiding overnight admission.

Most if not all areas will have a community service that can provide a rapid response to support people in their own homes and teams may be organised on different models. Where there is evidence that people are being admitted to hospital because of lack of capacity in community based 'rapid response', this model could be used to investigate the cost benefits of increasing capacity of such a service.

This intervention template could be used to model a new 'rapid response' team or new model or service or an extension of an existing team.

15.2 First question: what is the scope of this intervention to make a difference

The intervention is targeted at avoidable admissions. Thus the scope is expressed in terms of a reduction in potentially avoidable admissions. The definition used for avoidable admissions is from the CQC paper '[The state of health care and adult social care in England of 2012/13]'. However, local users may wish to use an alternative definition. The % reduction required will need local consideration

potentially following benchmarking work to look at the current comparative rate of avoidable admissions for their local trusts.

15.3 Second question: what is the resource required and what capacity does this generate

Set up costs will need to be locally determined. If the intervention is an expansion of a local team, then set up costs may be minimal. If setting up a new team, then costs will be much higher.

The user must then decide on recurrent staffing required, in terms of WTE by band. Non staff recurrent costs can also be input.

To determine additional capacity, there follows a calculation to translate numbers of additional staff to numbers of staff hours available for direct patient care. Users are likely to leave the standard weeks worked as 42 (to account for leave, sickness, training) and the hours per week (37.5) as in the pre-populated model but they may have local data to inform the % time of direct face to face care.

There then follows a calculation to estimate the hours of direct face to face staff time each patient will use taking into account that assessment visits are generally longer, and that visits may need 2 staff members (double handed).

The final input is an estimate of the % of inappropriate referrals. Calculations of the impact are on the basis that the patients would otherwise have been admitted. If the service is being referred patients that would not otherwise have been admitted, this needs to be taken into account.

The output of this section included the total cost of the service and the total appropriate patient caseload (total caseload excluding inappropriate referrals).

15.4 What is the anticipated effect on the other channels

The impact is expressed in terms of expected reduction in admissions, ED attendances, ambulance conveyances and emergency respite care use per patient.

Users are able to input their only assumptions for expected rates of reduction.

15.5 Assumptions and caveats

Resource and capacity assumptions:

The staff numbers and band input reflect the proportionate make up of a local service. The modelling here is for an extension of a service, not of a service to cover a whole vanguard area.

The staff parameters input to generate hours of direct patient care available has various assumptions.

The 42 weeks a year is a standard figure from the PSSRU Unit cost of health and social care to take account of leave, sickness and training. The hours per week are standard. The PSSRU suggest that the figure for direct patient care for community nurses is 46%, however the local vanguards considered this was too low but were unable to provide data to verify this. The prepopulated model has a figure of 50%.

The assumptions in the prepopulated model relating to time for visits, whether the team are double handed, and the number of visits largely reflect a rapid response service in a community trust. The assumptions were validated by local vanguards.

Impact assumptions:
There is a case study from Salford cited in the evidence that reported that for 321 patients evaluated, 307 (95%) avoided an ambulance journey, 308 (96%) avoided A&E or acute admission and 39 (12%) avoided emergency social care respite care. If these figures are used, the impact rates would be far higher than in the prepopulated model. The assumptions in the pre-populated model reflect discussions with vanguards. A point to consider is that a proportion of patients will deteriorate and need to be admitted anyway.

16 Implementing Early Warning Score in Care Homes

16.1 Definition of the UEC Intervention

This intervention involves care home residents having baseline observation parameters measured such as blood pressure and alertness. Thresholds are set for each parameter at which care home staff triggers an ‘alert’.

Observations for residents are taken at regular intervals. Where observations are recorded that meet the threshold criteria, the carer places a call with a Clinical Assessment Service who will appropriately advise on actions to support the resident.

This intervention makes use of digital tablets and associated software/apps to support the intervention.

This approach is expected to reduce the activity for ambulance services, ED attendances, ambulatory care and admissions, and applies to the care home residents cohort comprising mainly 75+ frail elderly.

This intervention was validated in the North East and South Devon & Torbay.

16.2 First question: what is the scope of this intervention to make a difference

16.2.1 **Considerations on Scope**

This approach is expected to reduce the activity for ambulance services, Emergency Department attendances, ambulatory care and admissions, and applies to the Care Home residents cohort comprising mainly 75+ frail and/or elderly.

The scope has been defined by considering the proportion of emergency admissions and A&E attendances from care homes. These admissions were identified in the validating vanguards by using postcode as a proxy for a specific flag in the data to identify care home admissions.

The size of the opportunity will depend on the operational efficiency of the local care homes in managing patients, the availability, efficiency and suitability of existing community services as well as their level of interaction and support with local care homes. The level of underlying need for care in the local population is also a factor. Clearly, whether local care homes have already implemented the National Early Warning Score (NEWS) will be a factor.

Each local health economy will start from a different position, therefore the following default assumptions are made:

- NEWS has not been implemented in local care homes
- It is assumed that a Clinical Assessment Service or equivalent advisory service is already in place.

With these assumptions in place, we would expect the size of opportunity to be closely related to the weighted population.

16.2.2 **Reflecting these considerations in model inputs**

To reflect these impacts in the worksheets, the user should make the following inputs:

- total admissions
- the percentage of emergency admissions from care homes (validating vanguards used post code information here as a proxy)
- the target reduction in admissions from care homes (an assumption 4 days length of stay, which is the targeted reduction in bed days)
- the % of ED attendances
- the target reduction in ED attendances in care homes

16.3 Second question: what is the resource required and what capacity does this generate

16.3.1 **Considerations on Resourcing**

The resourcing panel of the workbook contains assumptions concerning the number of care homes covered by each trainer and patients covered by NEWS. The default values in the model are based on the detail provided by Sunderland CCG in developing the model. The inputs drive capacity estimate *total patients covered by NEWS*. This supports the calculation of an average cost per patient reported in the workbook. These inputs also drive the WTE requirements to deliver the intervention.

This intervention relies on the implementation of NEWS using specific IT equipment such as tablet computers and associated software and WIFI support. Cost assumptions are based on the validating vanguards' experience and cost estimates. The number of tablets and associated licences is driven by the assumptions made in the worksheet.

Users should bear the following in mind:

- The default resourcing estimates for the intervention in the model assume that the health economy is starting from scratch. In some cases, users will need to revise the number of staff down to reflect an incremental change.
- The WTE requirement is based on the default assumptions. These are broad estimates drawn from vanguard experience and will in practice be driven by specific roles, existing support in care homes and the skill base of existing care home workers.
- It has been assumed that improved NEWS would not have a material impact on other services and assumes a Clinical Assessment Service or other advisory service is in place.

16.4 What is the anticipated effect on the other channels

16.4.1 Considerations on impact

The primary evidence source for reductions in admissions, ED attendances and ambulance conveyances was data provided by the validating vanguard as a result of the implementation of a pilot study. The findings are that:

- For each patient where an outcome was altered as a result of NEWS, a length of stay reduction in a hospital setting was achieved of 4 days.
- For each patient where an outcome was altered as a result of NEWS, a reduction of 1.5 ED attends was achieved.
- For each patient where an outcome was altered as a result of NEWS, a reduction of 1 ambulance conveyance was achieved.
- Increases in GP visits, community contacts and 111 calls were observed and are outlined as prepopulated figures in the worksheet.

This evidence was used to set the default values in the work sheet.

16.5 Assumptions and caveats

All of the interventions modelled should be considered as being parts of a package of responses to problems in the UEC system. The model estimates its individual impact, but this very probably underestimates its value in creating an efficient UEC system as the implementation of all the UEC models should culminate in a larger impact than the sum that individual interventions could achieve together, primarily due to the cumulative effect on reaching thresholds to release costs from individual channels of care.

As noted above, this is not a new intervention. Users will need to modify the estimated opportunity based on local knowledge:

- Adjusting the opportunity estimate down to reflect the extent to which NEWS has already been implemented.

17 Discharge Planning

17.1 Definition of the UEC Intervention

"The development and implementation of a plan to facilitate the transfer of an individual from hospital to an appropriate setting. An ongoing process that should start prior to admission for elective admissions, and as soon as possible for non-elective ones. This involves building on, or adding to, any assessments undertaken prior to admission. Effective and timely discharge requires the availability of alternative, and appropriate, care options to ensure that any rehabilitation, recuperation and continuing health and social care needs are identified and met…" *Discharge from hospital: pathway, process and practice*; Department of Health (2003)

This intervention was validated in Barking, Havering & Redbridge, Leicester, Leicestershire & Rutland, Greater Nottingham and South Devon & Torbay.

17.2 First question: what is the scope of this intervention to make a difference

17.2.1 **Considerations on Scope**

This intervention differs from the other models in that it is concerned with what happens *after* treatment has been completed. Hence the link between the size of the target population for treatment and the opportunity for improvement is not straightforward. The size of the opportunity will depend on the operational efficiency of the local acute hospital in managing patient flows, the availability and efficiency of suitable services outside hospital and the level of need in the population.

A number of default assumptions have been made to overcome these difficulties and make the model straightforward to use. These are:

- To address the issue of the efficiency of the acute hospital, it is assumed that the hospital does not have adequate discharge planning in place.
- In terms of the adequacy of out of hospital services, it is assumed that these are either in place or planned. In this respect, other interventions in the model such as Discharge to Assess, may address local service gaps and hence should be considered alongside this intervention.

With these assumptions in place, we would expect the size of opportunity to be closely related to the weighted population.

17.2.2 **Reflecting these considerations in model inputs**

To reflect these impacts in the worksheets, the user should make the following inputs:

The key input cell is the number of complex discharges per year. This should be used to align resourcing in the panel that follows.

17.3 Second question: what is the resource required and what capacity does this generate

17.3.1 **Considerations on Resourcing**

The top section of this panel of the worksheet contains resourcing assumptions for the Discharge Planning team. The default values in the model are based on a detailed study of this intervention in the Cambridge & Peterborough vanguard[7]. The inputs drive a capacity estimate – *total patient referrals*, calculated at cell J69, which is modelled on the same source. As noted above, the user should aim to align resources with the number of complex discharges in cell D17.

Users should bear the following in mind:

- The default resourcing estimates for a discharge planning team in the model assume that the health economy is starting from scratch. Hence in most cases, users will need to revise the number of staff down to reflect an incremental change.
- The capacity of the team "number of patient referrals" (cell J69) increases with the total WTEs. This is clearly a simplification and will in practice be driven by specific roles e.g. social workers and care co-ordinators.
- It has been assumed that improved discharge planning would not have a material impact on other hospital teams referenced in the evidence source namely patient transport; physiotherapy; OT and general hospital administration. Similarly, in terms of social care, the direct costs of locality reablement are included in the model but any additional costs for care assistants are assumed to be non-material.
- The primary evidence source used for the resource estimates, refers to the patient flow management software *RealTime*. The costs of this software have not been included on the grounds that it has wider applications than are relevant to this intervention, and hence it is assumed that most

[7] CARE PATHWAYS CASE STUDY. WORKFORCE AND THE DISCHARGE PATHWAY IN CAMBRIDGESHIRE; Centre for Workforce Intelligence Care Pathways Case Study (November 2011)

organisations will have this or equivalent software already in place. If this is not the case, the set up cost in cell D25 should be adjusted.

17.4 What is the anticipated effect on the other channels

17.4.1 Considerations on impact

The primary evidence source for reductions in excess bed days is a Cochrane review[8]. The findings are that:

- there is moderate evidence of an impact in mean Length of Stay of a reduction of 0.73 days (95% CI: -1.33 to - 0.12) on older people with medical conditions.
- In terms of the readmission rate, the study found moderate evidence of a reduction of 3% in the target population.

This evidence was used to set the default values in the work sheet. As always, these should be reviewed in light of local circumstances.

17.5 Assumptions and caveats

All of the interventions modelled should be considered as being parts of a package of responses to problems in the UEC system. This is especially true of discharge planning. The model estimates its individual impact, but this very probably underestimates its value in creating an efficient UEC system. It is a crucial component/enabler, rather than a direct contributor to improved performance.

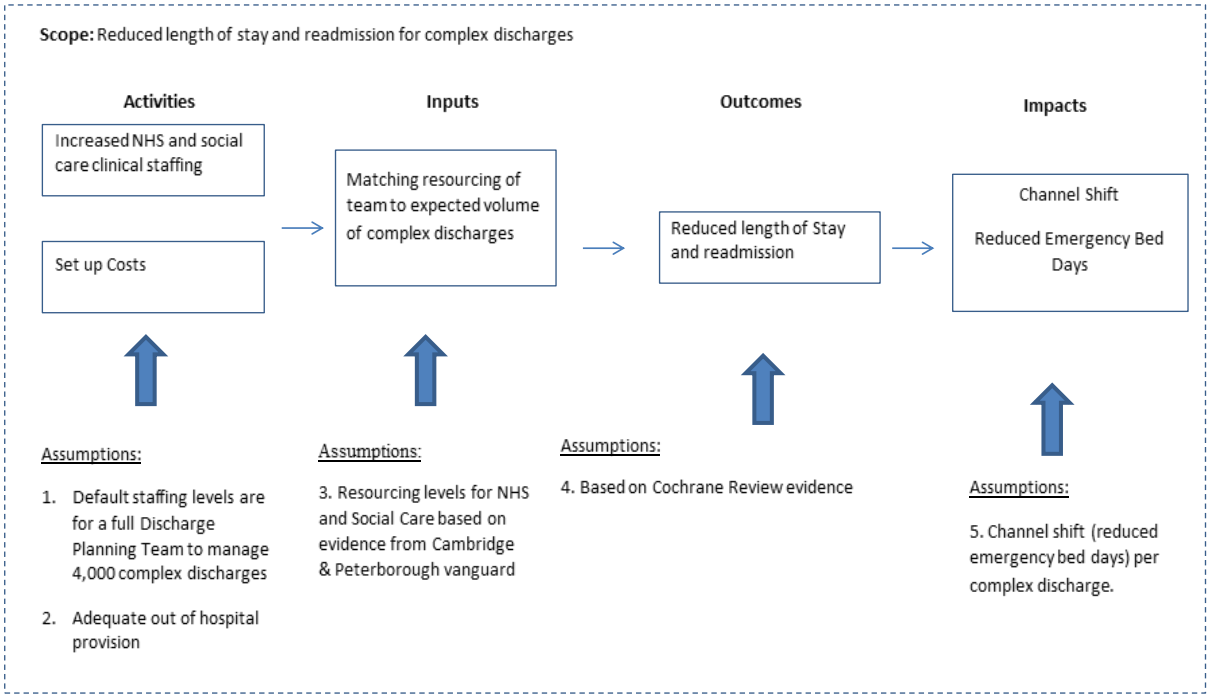
As noted above, this is not a new intervention. Users will need to modify the estimated opportunity based on local knowledge:

- Adjusting the opportunity estimate down to reflect the extent to which discharge planning is already in place.
- Clearly, the most efficient discharge planning team will be confounded if out of hospital provision is inadequate. Users should draw on local knowledge to allow for this.

The following schematic is a high level summary of the modelled intervention.

[8] Cochrane Library Discharge Planning from Hospital (Review) (2016)

17.6 Schematic



18 Discharge to Assess

18.1 Definition of the UEC Intervention

This intervention involves establishing a community facility to discharge medically fit patients into, for patients that are identified as potentially requiring Continuing Health Care (CHC). There are a number of variations on this particular intervention which could apply equally to various patient cohorts.

Patients are identified as potentially requiring CHC requirements and transferred as soon as medically appropriate where the assessment phase is completed in the community.

This intervention also involves embedding a clear transfer to assess pathway across both acute and community teams.

This intervention was validated by Greater Nottingham and North East vanguard sites.

18.2 First question: what is the scope of this intervention to make a difference

18.2.1 **Considerations on Scope**

This intervention is expected to reduce hospital bed days provided for patients who are medically fit for discharge, specifically associated with patients identified as potentially requiring CHC packages.

The types of packages patients are expected to be given upon assessment are also expected to change as their assessments will be performed in a more appropriate setting.

The scope for discharge to assess and transfer to assess schemes has been defined by considering the total number of bed days associated with patients who are medically fit for discharge. Full implementation of the transfer to assess intervention will address some, but not all, of this ‘failure demand’. The remainder could be addressed through variations on this scheme targeting a different patient cohort, for example.

Each local health economy will start from a different position, therefore the following default assumption has been made:

- No transfer to assess or discharge to assess scheme is currently in place in the local health economy which targets CHC patients.

With this assumption in place, we would expect the size of opportunity to be closely related to the weighted population.

18.2.2 **Reflecting these considerations in model inputs**

To reflect these impacts in the worksheets, the user should make the following inputs:

- total non-elective admissions
- the average length of stay of patients (all)
- input the total bed days identified that are associated with medically fit for discharge patients. The validating vanguard captured this using a field in their local data. Where this is unavailable, other vanguard sites may wish to use bed days associated with delayed transfers of care (DTOC) or use the proportion of bed days occupied by medically fit patients observed by the vanguard site (c16%)

18.3 Second question: what is the resource required and what capacity does this generate

18.3.1 **Considerations on Resourcing**

This intervention includes two tabs used to calculate the costs of the intervention and the capacity it generates (in bed days).

Users are required to input assumptions around numbers of beds and occupancy levels of these beds in the front sheet. These should be selected from drop down lists.

These inputs help to determine the staffing levels required for the community facility and the effective cost per occupied bed day.

If no other inputs are adjusted, this will populate the template with staffing levels and ratios assumed as part of the intervention costs of validating vanguards.

<u>Rota Costing</u>
These inputs will flow through into the ‘intervention costs – rota’ tab where additional fields are available to input:

1. RGN Nurse: bed ratio
2. HCA Nurse to bed ratio
3. Hours per shift
4. Weekly numbers of shifts
5. Bank holiday shift lengths and annual numbers (to calculate impact of increased costs of bank holiday cover
6. Basic salary for RGNs and HCS and hourly rates (used to calculate costs)

21% is assumed as headroom on the staffing structure to account for annual leave, training and sickness absence.

Intervention costs
Once populated, the 'rota' sheet costs flow into the intervention costs tab where other aspects of the ward costs can be directly input/adjusted to suit local cost estimates.

Medication costs are automatically calculated at £4.49 per occupied bed day.

These costs are then totalled to give a total intervention cost based on the inputs given. A table is included which details how the cost per occupied bed day varies with bed occupancy levels.

Costs assume a facility/estate is available for use as a community ward. The capital costs associated with building a new facility are not included in the intervention.

18.4 What is the anticipated effect on the other channels

18.4.1 **Considerations on impact**

The primary evidence source for reductions in emergency bed days and packages of care are based on the pilot completed by the validating vanguards. The findings are that:

- Average length of stay within the community facility was 35 days whilst awaiting assessment. These bed days would otherwise have been provided in an acute setting.
- The model calculates a shift in the mix of packages given to patients. This is based on audits performed by the validating vanguard site. These showed reductions in fully funded, joint funded and Funded Nursing Care (FNC) packages.

This evidence was used to set the default values in the work sheet.

18.5 Assumptions and caveats

All of the interventions modelled should be considered as being parts of a package of responses to problems in the UEC system. The model estimates its individual impact, but this very probably underestimates its value in creating an efficient UEC system as the implementation of all the UEC models should culminate in a larger impact than the sum that individual interventions could achieve together, primarily due to the cumulative effect on reaching thresholds to release costs from individual channels of care.

Users will need to modify the estimated opportunity based on local knowledge.

19 Discharge to Assess

19.1 Definition of the UEC Intervention

This intervention involves establishing a community facility to discharge medically fit patients into for patients that are identified as potentially requiring Continuing Health Care (CHC). There are a number of variations on this particular intervention which could apply equally to various patient cohorts.

Patients are identified as potentially requiring CHC requirements and transferred as soon as medically appropriate where the assessment phase is completed in the community.

This intervention also involves embedding a clear transfer to assess pathways across both acute and community teams.

This intervention was validated by Greater Nottingham and North East vanguard sites.

19.2 First question: what is the scope of this intervention to make a difference

19.2.1 **Considerations on Scope**

This intervention is expected to reduce hospital bed days provided for patients who are medically fit for discharge – specifically associated with patients identified as potentially requiring Continuing Health Care packages.

The scope for discharge to assess and transfer to assess schemes has been defined by considering the total number of bed days associated with patients who are medically fit for discharge. Full implementation of the discharge to assess intervention will address some, but not all, of this ‘failure demand’. The remainder could be addressed through variations on this scheme targeting a different patient cohort, for example.

Each local health economy will start from a different position, therefore the following default assumption has been made:

- No transfer to assess or discharge to assess scheme is currently in place in the local health economy which targets CHC patients

With this assumption in place, we would expect the size of opportunity to be closely related to the weighted population.

19.2.2 **Reflecting these considerations in model inputs**

To reflect these impacts in the worksheets the user should make the following inputs:

- Cell E15 and E16 should be used to estimate populate assumptions around admissions and length of stay for CCH patients.

19.3 Second question: what is the resource required and what capacity does this generate

19.3.1 **Considerations on Resourcing**

This intervention includes two tabs used to calculate the costs of the intervention and the capacity it generates (in bed days).

Users are required to input assumptions around numbers of beds and occupancy levels of these beds in the front sheet. These should be selected from drop down lists.

These inputs help to determine the staffing levels required for the community facility and the effective cost per occupied bed day.

If no other inputs are adjusted, this will populate the template with staffing levels and ratios assumed as part of the intervention costs of validating vanguards.

Rota Costing
These inputs will flow through into the 'intervention costs – rota' tab where additional fields are available to input:

1. RGN Nurse to bed ratio
2. HCA Nurse to bed ratio
3. Hours per shift
4. Weekly numbers of shifts
5. Bank holiday shift lengths and annual numbers (to calculate impact of increased costs of bank holiday cover)
6. Basic salary for RGNs and HCS and hourly rates (used to calculate costs)

21% is assumed as headroom on the staffing structure to account for annual leave, training and sickness absence.

Intervention costs
Once populated, the 'rota' sheet costs flow into the intervention costs tab where other aspects of the ward costs can be directly input/adjusted to suit local cost estimates.

Medication costs are automatically calculated at £4.49 per occupied bed day. These costs are then totalled to give a total intervention cost based on the inputs given. A table is included which details how the cost per occupied bed day varies with bed occupancy levels.

Costs assume a facility/estate is available for use as a community ward. The capital costs associated with building a new facility are not included in the intervention.

19.4 What is the anticipated effect on the other channels

19.4.1 Considerations on impact

The primary evidence source for reductions in emergency bed days are based on the pilot completed by the validating vanguards. The findings are that:

- Average length of stay within the community facility was 35 days whilst awaiting assessment. These bed days would otherwise have been provided in an acute setting.

This evidence was used to set the default values in the work sheet.

19.5 Assumptions and caveats

All of the interventions modelled should be considered as being parts of a package of responses to problems in the UEC system. The model estimates its individual impact, but this very probably underestimates its value in creating an efficient UEC system as the implementation of all the UEC models should culminate in a larger impact than the sum that individual interventions could achieve together – primarily due to the cumulative effect on reaching thresholds to release costs from individual channels of care.

Users will need to modify the estimated opportunity based on local knowledge.

20 Annex 1 - Urgent and Emergency Care (UEC) vanguards that participated in this project

Barking, Havering and Redbridge A&E Delivery Board (formerly System Resilience Group)

Cambridge and Peterborough CCG

Greater Nottingham A&E Delivery Board (formerly System Resilience Group)

Leicester, Leicestershire & Rutland Urgent and Emergency Care (formerly System Resilience Group)

North East Urgent Care Network

South Devon and Torbay Urgent and Emergency Care (formerly System Resilience Group)

West Yorkshire Urgent Emergency Care Network

21 Annex 2 - Glossary of terminology and acronyms used in this guide

AEC – Ambulatory emergency care is an approach which results in a significant proportion of emergency adult patients being managed safely and efficiently on the same day avoiding admission to a hospital bed

Channel shift – Moving activity to the most appropriate setting of care and away from less appropriate settings of care

CCSM – Consolidated Channel Shift Model – The part of the financial model that calculates the combined effect on activity and finance of all or a selection of interventions

CCSM Suite – The Consolidated Channel Shift Model and the models for individual interventions

CHC – Continuing Health Care

CQC – Care Quality Commission

Commissioner View – The commissioning cost of the intervention, assumed to be the extra resources that would need to be funded to achieve a target channel shift less a reduction in contract payment to the providers of the channel shift. In the absence of open book agreements with providers of channel services, the latter is assumed to be estimated from reference costs (see Provider View)

Cost classification – Variable, Semi-variable and Fixed - Variable s vary directly with activity, in contrast fixed costs remain unchanged and semi-variable costs only change once a threshold level of activity is reached (see threshold)

Counterfactual – This is the do-nothing scenario, the expected change in activity and finance over 5 years if interventions were not implemented

DoS – Directory of Services (see also MiDoS)

ED – Emergency Department

Failure Demand – Demand caused by a failure to do something or do something right for a patient / service user

HCA – Health Care Assistant

HSCIC – Health and Social Care Information Centre

IHAM – Indicative Hospital Activity Model – this is the source for the default values for growth used in the Consolidated Channel Shift Model

LHE – local health economy

Management Determination – a parameter in the model which reflects the level of confidence that semi-variable costs can actually be avoided

MiDoS – a mobile search tool that assists clinicians to direct patients to the most appropriate and available place of care

MIU – Minor Injuries Unit (see UCC)

NNT – Number needed to treat is the number of people who would need to receive an intervention for an admission to be avoided

OOH – Out of Hours services

PCP – Personalised Care Plan

PGD – Patient Group Directions are written instructions which allow non-doctors (in this case pharmacists) to supply a defined range of prescription only medicines

Provider view – the scope for a provider to reduce resources and hence costs in response to a fall in activity. In the model this is a function of thresholds for semi-variable costs and the management determination parameter (see Commissioner View)

PSSRU – Personal Social Services Research Unit – A source for local authority unit costs

SCR – Summary Care Record

STB – Sustainability and Transformation Board

Supply-Induced Demand – a recognition that when we change services we do more than redistribute activity across available service channels but may increase the overall level of activity

Threshold – the activity levels for each channel where semi-variable costs change (see cost classification). For example, the reduction in activity necessary to reduce staff numbers for those involved directly in patient care

UCC – Urgent Care Centre - community and primary care facilities providing access to urgent care. They encompass walk-in-centres, minor injuries units

UEC – Urgent and Emergency Care

WiC – Walk–in–Centre (see UCC)

WTE – Whole Time Equivalent

22 Annex 3 – Quick Start Guide

The full user guide above contains important information about: how to populate the models' assumptions; methodological considerations and caveats; the limitations and ways in which to appropriately interpret the output of the tool. Bearing that in mind, this annex gives a quick guide to help someone first coming to the tool to get a sense of what it is capable of.

There are three quick steps a user can take to see what outputs for their area look like given the default assumptions:

1. Turn on those interventions that they are interested in seeing the impact of.
2. Set the proportion of releasable semi-variable costs to 100%.
3. Adjust the population to the population of the area they are interested in understanding the impact on.

1. Turning on the interventions

To do this go to **tab called 'control sheet and graphs'** and **set the implementation to 100% for any of the interventions you wish to turn on**. E.g. in the screen shot below the two ambulance interventions are turned on and all others are turned off:

Intervention	% Implementation	Intervention	% Implementation	Intervention	% Implementation
Decreasing Ambulance conveyances: Hear and Treat	100%	GP extended hours	0%	Discharge to Assess	0%
Decreasing Ambulance conveyances: See and Treat	100%	Community pharmacy: PGD minor ailments service	0%	Discharge Planning	0%
Integrated clinical hubs - Increasing Clinical advisor consultations	0%	Community pharmacy: Emergency medication supply	0%	Rapid Response Services	0%
Integrated clinical hubs - Integration of 111 and OOH hubs	0%	Summary care record: Use for IP drug reconciliation	0%	Care homes: Falls response training	0%
Ambulatory Emergency Care	0%	Summary care record: Use in ED	0%	Care Home educators	0%
Personalised care planning	0%	Improved Referral processes - In Ambulance Service	0%	Early Warning Score in Care homes	0%
Co-location of UCC	0%	Improved Referral processes - In ED	0%		
Enhanced urgent care standards	0%	Improved Referral processes - In Care Homes	0%		

2. Setting releasable semi-variable costs to 100%

By default the model is set so that no semi-variable costs are released when a saving is made at a point of delivery. To get a quick sense of the potential savings that might be achievable change the model so that all semi-variable costs are released when the default point of delivery threshold is met.

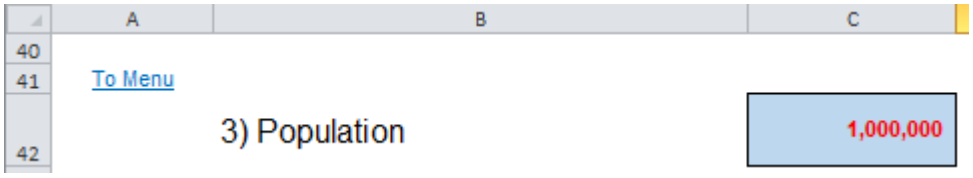
To do this go to the **tab called 'local data input'** and at column K **set the determination factor to 100% for all points of delivery.** This has been done in the screen shot below; when you first use the model all these figures which are 100% below will be 0%:

I	J	K	L

variable cost	Extractable at threshold	Determination factor. % semi fixed that is addressable	threshold rationale. (NB one WTE = 42 weeks*37.5 hours = 1575 hours)
£75.36	£413.89	100%	6 bed bay, 365 days a year
£13.95	£109.52	100%	1 WTE 3 patients an hour
£10.86	£85.27	100%	1 WTE, 4 patients an hour
£4.30	£31.86	100%	1 WTE, 3 patients an hour
£7.63	£59.54	100%	1 WTE, 4 patients an hour
£16.76	£130.75	100%	1 WTE, 1 patient an hour
£0.36	£6.50	100%	1 WTE, 6 patients an hour
£1.02	£18.56	100%	1 WTE, 6 patients an hour
£14.30	£14.30	100%	at cost per contact - no threshold
£1.67	£30.30	100%	2 WTE, 1 patient an hour
£16.28	£146.62	100%	2 WTE, 1 patient an hour
£23.29	£209.71	100%	2 WTE, 1 patient an hour
£3.65	£28.47	100%	1 WTE, 2 patient an hour
£20.80	£162.23	100%	4 beds 365 days
£2.68	£20.92	100%	1 WTE, 2 patient an hour
£4.13	£32.25	100%	see comment
£6.82	£53.17	100%	see comment

3. Adjusting the population

In the **tab called 'local data input' set the population at cell C42 to the population of the local health economy you are interested in**. E.g. in the screen shot below this has been set to 1,000,000:



Having carried out these three steps you can **explore the outputs for the default assumptions** at the **tab called 'outputs by channel'**.

It is important to note that this only gives you outputs based on the model's default assumptions and you will need to adjust these to reflect your local situation to get an output that reflects your local situation.